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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

SKYLAB
OPERATIONS HANDBOOK

ORBITAL WORKSHOP (OWS)
AIRLOCK MODULE (AM)
MULTIPLE DOCKING ADAPTER (MDA)

VOLUME II
SYSTEMS OPERATING PROCEDURES

PREPARED BY
MCDONNELL DOUGLAS ASTRONAUTICS COMPANY
UNDER DIRECTION OF
CREW PROCEDURES DIVISION
SYSTEMS PROCEDURES BRANCH

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

18 MAY 1970
REVISED 20 DECEMBER 1971

SKYLAB OPERATIONS HANDBOOK

OWS/AM/MDA

VOLUME II

SYSTEMS OPERATING PROCEDURES

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CREW PROCEDURES CHANGE REQUEST

INITIATED BY	ORGANIZATION	DATE

CHANGE NUMBER	S/C EFFECTIVITY	

DOCUMENT AFFECTED

TITLE	DOCUMENT NO.	PAGE NO.	BASIC OR CHANGE DATE	TIME OR ETR NO.

DETAIL CHANGE IN EXACT WORDING

REASON:

REMARKS:

☐ APPROVED ☐ DISAPPROVED	COORDINATOR'S SIGNATURE	DATE

FINAL DISPOSITION

☐ APPROVED ☐ DISAPPROVED	PCCB SIGNATURE	DATE SIGNED	SUSPENSE DATE

MSC Form 482 (Rev Jun 68) *(Previous editions are obsolete)* NASA — MSC

RULES FOR HANDBOOK CHANGE CONTROL

The 21 June 1971 publication of this handbook shall be baseline. Continuity from this baseline text to subsequent publications shall be documented by applicable "Crew Procedures Change Request" - MSC Form 482. Systems operating procedures which cannot be adequately defined due to lack of hardware definition will be identified as TBS or TBD. No procedural "TBS" or "TBD" will be repeated in any subsequent handbook update providing hardware configuration is adequate to define operating procedures. New procedures added to the handbook will be placed under change control with the issue following their initial release. All approved change proposals shall be included in the next published handbook update, allowing 2 weeks cutoff prior to publication date for copy and edit functions. There are two types of changes: RECORD CHANGE and CONTROL CHANGE.

RECORD CHANGE: A record change may be incorporated by the contractor without formal coordination and approval by NASA. Such changes shall consist of non-procedural changes to the format or Remarks column (except Malfunction Procedures), corrections of an editorial nature, and implementation of specific changes directed by CCB or CPCB actions where interpretation of procedural intent is clear. Classification of record changes and supporting information as appropriate shall be included on Form 482 in the space marked "Reason for Change." Informational copies of all record changes will be directed to MSC (CPD-CG2) on MSC Form 482.

CONTROL CHANGE: A control change originates on MSC Form 482 as a handbook change proposal, and includes the technical rationale in support of the proposed change, applicable references, etc. The scope of a change proposal shall be of a small enough magnitude to properly lend itself to the intent of change control. The initiator shall direct the original copy of Form 482 to CPD-CG2, where a control number and suspense date will be assigned (approx. 2 weeks); the change proposal will be reproduced and distributed to affected organizations for technical review and response within five working days of receipt of the proposed change. A "no response" philosophy is adopted for individual MSC organizations. No reply to CPD-CG2 prior to change suspense date indicates change concurrence by the reviewing organization; however, MSFC and contractor shall give positive concurrence or nonconcurrence to CPD-CG2 for each change prior to expiration of change suspense date. All change proposals originating within MSFC or contractor organizations must be approved by that originating organization (MSFC or MDAC as applicable) prior to submittal to CPD-CG2. During the review cycle (prior to expiration of suspense date), CPD-CG2 may modify the change proposal by an "A" revision (new data, change error, effectivity change, etc.), assign a new suspense date and recycle review copies of the modified change. At the expiration of the suspense date, CPD-CG2 shall approve or disapprove each change proposal, contingent upon review results. NASA will direct the contractor to incorporate those NASA-approved changes into the next published handbook update -- allowing 2 weeks cutoff prior to publication date for copy and edit functions. Every disapproval by CPD-CG2 will be supported by the technical rationale for disapproval, and such rationale will be directed back to the change initiator. If the disapproval is not applicable to the entire change proposal, the change initiator must resubmit the valid portions (if any) of the disapproved change as a new change proposal. If the disapproval by CPD-CG2 appears erroneous or unjustified by the change initiator, he may petition the CPCB for disposition reversal.

This handbook identifies all changes incorporated by control and record change numbers with applicable change or bar identifiers for the technical changes in the text margin. An MSC Form 482 "CREW PROCEDURES CHANGE REQUEST" is included within this handbook for user convenience -- and may be reproduced for multiple change submittals.

CHANGE CONTROL RECORD

Procedures Change Control Number	Issue Date
N/A	18 May 1970
N/A	20 July 1970
N/A	18 Sept 1970
N/A	4 Jan 1971
N/A	21 June 1971
001	20 Sept 1971
002	20 Dec 1971

The following table reflects the status of Control Changes and Record Changes for the 20 December 1971 issue of this handbook. All changes noted as "Incorporated" have been incorporated into this issue.

CONTROL CHANGES

MDAC	Incorporated	Disapproved
1237 - 1254	X	
1255		X
1256 - 1312	X	
1313 - 1315		X
1316 - 1324	X	
1325		X
1326 - 1344	X	
1345 - 1349		X
1350 - 1372	X	
1373		X
1374 - 1380	X	
1381		X
1382	X	
1383		X
1384	X	
1385		X
1386 - 1388	X	
1389		X
1390 - 1394	X	
1395		X
1396 - 1408	X	
1409, 1410		X
1411 - 1499	X	

MSC	Incorporated	Disapproved
43A - 49	X	
50, 51		X
52	X	
53		X
54, 55	X	
56 - 58		X
59 - 63	X	
64, 65		X
66, 67	X	
68 - 71		X
72- 75A	X	
76 - 83		X
84	X	
85		X
86, 87	X	
88		X
89, 90	X	

RECORD CHANGES

No.	Withdrawn	Incorporated
29 - 31		Applicable to Activity Elements Only
32, 33		X
34	X	
35 - 47		X

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INTRODUCTION

This document is Volume II of the Skylab Operations Handbook (SLOH) for the Orbital Workshop (OWS), Airlock Module (AM), and Multiple Docking Adapter (MDA), and provides flight crews with the information and procedures necessary to safely and efficiently operate and maintain the systems and equipment during all manned phases of the Skylab missions. Volume II supplements Volume I, which is separately bound and provides functional descriptions of the systems and equipment.

Where an interface occurs between OWS/AM/MDA systems procedures and other SLOH procedures, appropriate references to procedures contained in other handbooks have been made. Operational procedures for the Command and Service Module (CSM), Apollo Telescope Mount (ATM), and Skylab Experiments are contained in Volume II of the applicable SLOH. In addition to these references, applicable procedures from sections 4.2 through 4.5 have been assembled together in section 4.19 to represent OA integrated procedures. This section (4.19) is identical in the CSM and OWS/AM/MDA SLOHs and represents operational requirements to manage interfacing systems in two vehicles simultaneously.

When applicable, operational sequences contained in this document are to be used during spacecraft systems, and integrated, tests. This will provide additional assurance of compatibility between systems operations and inflight procedural activity.

Volume II is divided into two sections; section 4.0 presents normal/backup procedures and section 5.0 contains the contingency procedures. (Sections 1.0, 2.0, and 3.0 are contained in Volume I.)

Normal procedures consist of detailed control actions and anticipated displays for systems management when systems are operating normally and for scheduled maintenance required to assure continued systems operation.

Backup procedures are alternate operating methods for use when a system failure or other anomaly precludes the use of normal techniques. Additional backup procedures are also provided to increase operational flexibility.

An in-flight maintenance task is defined as the unscheduled restoration or replacement of a degraded or inoperative item or system to its normal function.

Contingency procedures fall into three basic categories: abort, emergency, and malfunction.

Abort procedures cover situations requiring crew action for mission aborts. None have been identified for OWS/AM/MDA systems.

Emergency procedures cover situations that preclude diagnosis and decision and that require immediate action to avoid or alleviate a condition potentially hazardous to the crew.

Malfunction procedures (all contingencies other than abort and emergency) provide for symptom identification, diagnosis, and corrective action.

Appendix A provides definitions for the abbreviations and acronyms employed throughout the handbook. Illustrations of the controls and displays are contained in Appendix B, and Appendix C is a tool matrix that lists the required tools for each procedure.

The more significant guidelines employed in selecting and preparing procedures for this document are as follows:

1. Procedures reflect crew accomplishment of tasks independent of MSFN support to the maximum extent possible.

2. Procedures cover only those activities reflecting an interface between the crew and an active system of component.

3. Contingency procedures are prepared only for conditions discernible to the crew, including caution and warning alerts, and only when safing techniques, corrective action, or alternate crew operating capabilities exist.

4. Quantities used to define pressure, temperature, and other parameters will be true values not corrected for instrumentation errors.

5. Power down procedures provide the capability to reduce OA average power consumption at the system level. An individual system or groups of systems may be powered down to provide mission flexibility. Power down procedures retain systems or components as operational which provide crew safety, crew comfort, and equipment integrity. Further depth of power reduction may be accomplished per the MIN POWER column configuration of systems or components in 4.1.

   Power values shown are reductions which occur only if that system (component) is operational at time of power down.

Changes to this handbook must be submitted on MSC Form 482 to M. E. Dement, MSC CG2, phone 713/483-5558, Crew Procedures Division, Systems Procedure Branch, Building 4, MSC, Houston, Texas 77058.

MMC comments should be submitted on MSC Form 482 to M. E. Dement. MDAC comments should be directed to E. A. Thompson, extension 212, phone 713/488-5660, McDonnell Douglas Astronautics Company, 16915 El Camino Real, Houston, Texas 77058.

Acknowledgement is made to the Martin-Marietta Corporation, Flight Crew Operations, Houston, Texas, and to the North American Rockwell Corporation, Space Division, for technical assistance and documentation received pertinent to respective interface responsibilities for the MDA, ATM, experiments, and CSM systems.

SECTION 4.0

NORMAL/BACKUP PROCEDURES

INTRODUCTION

This section contains a Control and Display Configuration List and the procedures necessary to accomplish OWS/AM/MDA systems activation, management, and deactivation for all manned Skylab missions.

CONTROL AND DISPLAY CONFIGURATION LIST

The configuration list defines nominal control and display status for three mission milestones. Devices are tabulated by the number of the panel on which they appear. Control devices are not to be sequentially positioned as listed. Controls and displays and their positions or indications are generally identified by their placard titles or abbreviations of the placard information, and the nomenclature and abbreviations listed form the standard usage for this document. (Abbreviations and acronyms employed are defined in Appendix A.) If no placard title exists, appropriate descriptors are used. These descriptors include position nomenclature presented in brackets, e.g. [ON/OFF], when this information appears on the panel. Placard information is shown capitalized, other descriptors are not.

When the system configuration differs from the control device position, the system configuration is indicated in parentheses immediately following the control device position callout. Where the control or display position or callout is not applicable to any particular mission milestone, N/A will indicate this.

CLOSEOUT Column - Provides the control positions and indications necessary to verify final spacecraft systems configuration for launch. This information generally coincides with that which will be apparent to the flight crew upon entry to the Saturn Workshop (SWS). If ground commanding, automatic sequencing, or environmental changes result in a change to system configuration between closeout and crew arrival, the system configuration at crew arrival is indicated in brackets on the line below the control device position or display indication in the CLOSEOUT column.

Example on Panel 205: The SEQ BUS switch is in the CMD position at crew arrival, but the OWS switch selector will have armed the sequential bus. Therefore, the CLOSEOUT column indicates the CMD switch position, a (safe) system configuration at pre-launch closeout, and then a system configuration of [armed] at crew arrival.

POST-ACTIV Column - Provides the control positions and display indications at the completion of the SL-2 activation, and/of the SL-3 and 4 reactivations, which are indicated separately only when they differ from SL-2. The configurations reflect the status for normal systems management and may be used as a checklist to verify completion of an activation sequence.

STORAGE Column - Provides the control positions and display indications existing at the completion of SL-2, 3, and 4 deactivation sequences. This column also serves as a checklist to assure proper configuration for MSFN management of OWS/AM/MDA systems during unmanned phases of the Skylab missions. This column will also reflect the configurations presented to the crew upon arrival for SL-3 and 4 manned missions. System configuration changes between the deactivation sequence for one manned mission and crew arrival for the next manned mission are indicated by brackets exactly as system changes prior to crew arrival for SL-2 are covered in the CLOSEOUT column. The SL-4 configuration is identified separately only when it differs from the SL-3 configuration.

MIN POWER Column - This column will provide the control positions and display indications that define a system status consistent with minimum electrical power consumption. This status maintains an adequate environment for crew survival during mission termination.

NORMAL/BACKUP PROCEDURES

Normal/backup procedures provide the information required to accomplish normal OWS/AM/MDA systems activities and management, and also provide alternate operating techniques.

Information is presented in tabular form, identifying the crewman and panel location for each procedure with clarifying remarks provided as needed.

CREWMAN Column - Identifies the crewmember assigned to perform a procedure or step. CDR, SPT, and PLT correspond to the CSM left, middle, and right crew couch positions, respectively.

PANEL Column - Indicates the location of a particular control or display by C&D panel number. C&D panel numbers have been assigned by module and by sections within a module. (panel configurations are illustrated in Appendix B.)

MDA (100 to 199):
- MDA controls and displays: 100 to 140
- ATM controls and displays: 141 to 199

AM (200 to 399):
- STS: 200 to 299
- Forward compartment: 300 to 310
- Lock: 311 to 389
- Aft compartment: 390 to 399

OWS (400 to 1099):
- Dome: 400 to 499
- Forward section: 500 to 599
- Experiment compartment: 600 to 699
- Wardroom: 700 to 799
- Waste management compartment: 800 to 899
- Sleep compartment: 900 to 999
- Aft compartment: 1000 to 1099

For C&D panel applications where a step or complete procedure may be performed at one of many locations (connection to power outlets, etc), the specific C&D panel number is omitted and replaced by an abbreviation of the multiple item. Abbreviations used are ACCESS for Hi Power Accessory Outlets, UTIL for Utility Power Outlets, TV for TV Stations, FSA for Fire Sensor Assembly, FSCP for Fire Sensor Control Panels, and INTERCOM for Intercom Boxes.

PROCEDURE Column - Provides the step-by-step sequence required to successfully complete a function. Procedure numbers identify activities that constitute significant overall tasks, and sequentially numbered steps within the procedures are further organized into related functions. With the exception of the activation and deactivation sequences, the procedure numbers identify tasks that may be performed independent of other procedures. Activation and deactivation procedures, however, may assume conditions based on the completion of preceding operations. References to "operations" indicate those individual actions contained within the numbered steps. Backup procedures are identified by a perimeter of X's.

Procedural steps are applicable to all Skylab missions, except where specifically noted (SL-3 indicates that the step is applicable only for that mission, and IFM indicates that the step is applicable only during inflight maintenance).

When a control device is called out in a specific position and followed by (verify), it is assumed that the crewman will position the device as indicated if it is not already in that position.

CAUTION and WARNING notes in the procedure column are used to alert the user and should not be confused with activities relating to management of the Caution and Warning System.

CAUTION - Identifies an operation or configuration potentially restrictive to the accomplishment of mission objectives.

WARNING - Identifies an operation or configuration potentially hazardous to the crew or spacecraft systems.

REMARKS Column - Provides the rationale supporting the procedure, where necessary, and provides clarifying and supporting data. Stowage locations are identified within parentheses.

Activity Element (A.E.) designators are centered in parentheses above the applicable procedures, steps, and operations. All items following a centered activity element are part of that activity element. When an activity element is a subordinate part of another activity element, the A.E. designator for the subsidiary activity element appears in the Remarks Column, unless the subsidiary activity element appears as a separate entity elsewhere in the SLOH.

SECTION 4.1

CONTROL AND DISPLAY CONFIGURATION

AM MDA OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Multiple Docking Adapter						NOTE: MINIMUM POWER data TBS
Panel 100						
Axial Hatch						
PRESS EQUAL VLV	CLOSE (capped)	CLOSE (uncapped)	CLOSE (capped)			
Release handle	CLOSE	OPEN	CLOSE			
CSM/MDA ΔP ind - CSM side	0.0 psid	0.0 psid	0.0 psid			
CSM/MDA ΔP ind - MDA side	0.0 psid	0.0 psid	0.0 psid			
Panel 101						
Interior Lights Panel						
INTERIOR LTS sw	ctr (off)	ctr (on)	ctr (off)			
MDA Floodlight Integral Switches						
Fwd lt 1 sw	HI (off)	as required	HI (off)			
Fwd lt 2 sw	HI (off)	as required	HI (off)			
Fwd lt 3 sw	HI (off)	as required	HI (off)			
Fwd lt 4 sw	HI (off)	as required	HI (off)			
Aft lt 1 sw	HI (off)	as required	HI (off)			
Aft lt 2 sw	HI (off)	as required	HI (off)			
Aft lt 3 sw	HI (off)	as required	HI (off)			
Aft lt 4 sw	HI (off)	as required	HI (off)			
Panel 102						
Intercom Box						
Rcd lt	off	off	off			
[RCD/OFF] sw	ctr (off)	ctr (off)	ctr (off)			
COMM CHAN sel	A SLEEP	as required	A SLEEP			
[ICOM/XMIT] sw	ctr (off)	ctr (off)	ctr (off)			
[CALL] sw	up (off)	up (off)	up (off)			
MASTER ALARM lt	off	off	off			
SPKR VOL	indexed	as required	N/A			
CHAN A sel	OFF	OFF	OFF			
CHAN B sel	OFF	OFF	OFF			
CHAN A receptacle	capped	capped	capped			
CHAN B receptacle	capped	capped	capped			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 103						
Vent Panel						
vent sealing device	STOW (latch/ closed)	VENT (latch/ closed)	VENT (latch/ closed)			
M512 BAT VENT VLV	OPEN	OPEN	CLOSED			
Panel 104						
Utility Outlet						
UTIL OUTLET 3 sw	OFF	OFF	OFF			
UTIL OUTLET 3	capped	capped	capped			
Panel 105						
Experiment M512	----------Ref SLEOH----------					
Panel 106						
Experiment S190	----------Ref SLEOH----------					
Panel 107						
Window Cover Latch						
[LATCH/UNLATCH] knob	LATCH	LATCH	LATCH			
[LOCK] latch	LOCK	LOCK	LOCK			
Panel 108						
Window Cover Crank						
[OPEN/CLOSE] knob	CLOSE	CLOSE	CLOSE			
[LOCK/UNLOCK] handle	LOCK	LOCK	LOCK			
Panel 109						
Experiment S191 C&D	----------Ref SLEOH----------					
Panel 110						
EREP C&D	----------Ref SLEOH----------					

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 111						
Experiment S009	----------Ref SLEOH----------					
Panel 112						
Utility Outlet						
UTIL OUTLET 1 sw	OFF	OFF	OFF			
UTIL OUTLET 1	capped	capped	capped			
Panel 113						
M512 Work Chamber Vent Valve	----------Ref SLEOH----------					
Panel 114						
M512 Bulkhead Vent Valve	----------Ref SLEOH----------					
Panel 115						
High Power Accessory Outlet						
HI PWR ACC OUTLET 1 sw	OFF	OFF	OFF			
HI PWR ACC OUTLET 1	capped	capped	capped			
Panel 116						
Intercom Box	----------See Panel 102----------					
Panel 117						
Window Heater						
WINDOW HEATER AUTO HEAT sw	OFF	ON	OFF			
WINDOW HEATER ΔTEMP pb/lt	off	off	off			
WINDOW HEATER OVERTEMP pb/lt	off	off	off			
WINDOW HEATER [RESET] sw	down (set)	down (set)	down (set)			
Panel 118						
Radial Hatch						
PRESS EQUAL VLV	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
Release handle	CLOSE	CLOSE	CLOSE			
CSM/MDA ΔP ind - MDA side	0.0 psid	OSH	OSH			
CSM/MDA ΔP ind - CSM side	0.0 psid	OSL	OSL			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 119	----------Unassigned----------					
Panel 120						
Fire Sensor Control Panel						
SNSR 1 lt	off	off	off			
SNSR 1 sw	BUS 1 (off)	BUS 1	BUS 1 (off)			
[MASTER ALARM RESET/TEST] sw	ctr (off)	ctr (off)	ctr (off)			
SNSR 2 lt	off	off	off			
SNSR 2 sw	BUS 2 (off)	BUS 2	BUS 2 (off)			
Panel 121						
Digital Address System	----------Ref SLOH/ATM----------					
Panel 122 - 127	----------Unassigned----------					
Panel 128						
Radio Noise Burst Mon (Backup)	----------Ref SLOH/ATM----------					
Panel 129						
Radio Noise Burst Mon	----------Ref SLOH/ATM----------					
Panel 130						
ATM Display and Control Console	----------Ref SLOH/ATM----------					
Panel 131						
Intercom Box	----------See Panel 102----------					
Panel 132						
Video Selector						
VIDEO sel	TV	as required	TV			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 133						
Television Station						
TV PWR sw	OFF	OFF	OFF			
GAIN	Adjusted prior to launch	as required	N/A			
TV CAMR input	capped	capped	capped			
Panel 134						
Utility Outlet						
UTIL OUTLET 2 sw	OFF	OFF	OFF			
UTIL OUTLET 2	capped	capped	capped			
Panel 135						
EREP Coolant Valve	BYPASS	BYPASS	BYPASS			
Panel 136						
Experiment S192	----------Ref SLEOH----------					
Panel 137 - 138	----------Unassigned----------					
Panel 139						
High Power Accessory Outlet						
HI PWR ACC OUTLET 2 sw	OFF	OFF	OFF			
HI PWR ACC OUTLET 2	capped	capped	capped			
Panel 140						
Utility Outlet						
UTIL OUTLET 4 sw	OFF	OFF	OFF			
UTIL OUTLET 4	capped	capped	capped			
Panel 141 - 159	----------Unassigned----------					
Panel 160						
ATM Canister Roll Control	----------Ref SLOH/ATM----------					
Panel 161 - 199	----------Unassigned----------					
MDA Air Diffusers						
Fan 1 diffuser	WIDE	as required	N/A			
Fan 2 diffuser	WIDE	as required	N/A			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
AM Structural Transition Section						
NOTE: Panel 200, 201, 202 cb are open when in the up position (toward nomenclature) and closed when in the down position						
Panel 200						
Circuit Breaker Panel						
cb MDA/OWS HTRS CNTL 1	closed	closed	closed			
cb MDA/OWS HTRS CNTL 2	closed	closed	closed			
cb OWS RADIANT HTRS [1•5]	closed	closed	closed			
cb OWS RADIANT HTRS [2•6]	closed	closed	closed			
cb OWS RADIANT HTRS [3•7]	closed	closed	closed			
cb OWS RADIANT HTRS [4•8]	closed	closed	closed			
cb MDA PORT HTRS PRI	closed	closed	closed			
cb MDA PORT HTRS SEC	closed	closed	closed			
cb AM WALL HTRS 1	closed	closed	closed			
cb AM WALL HTRS 2	closed	closed	closed			
cb MDA WALL HTRS PRI 1	closed	closed	closed			
cb MDA WALL HTRS PRI 2	closed	closed	closed			
cb MDA WALL HTRS SEC 1	closed	closed	closed			
cb MDA WALL HTRS SEC 2	closed	closed	closed			
cb MDA TUNL HTRS PRI 1	closed	closed	closed			
cb MDA TUNL HTRS PRI 2	closed	closed	closed			
cb MDA TUNL HTRS SEC 1	closed	closed	closed			
cb MDA TUNL HTRS SEC 2	closed	closed	closed			
cb O2/N2 GAS CONTRS [1•3]	closed	closed	closed			
cb O2/N2 GAS CONTRS 2	closed	closed	closed			
cb O2/N2 GAS FILL PRI	closed	closed	closed			
cb O2/N2 GAS FILL SEC	closed	closed	closed			
cb MOL SV A TMRS PRI	open	closed	open			
cb MOL SV A TMRS SEC	open	closed	open			
cb MOL SV A FANS PRI	closed	closed	closed			
cb MOL SV A FANS SEC	open	closed	open			
cb MOL SV A BED HTRS	open	closed	open			
cb VENT HTRS PRI	open	closed	open			
cb VENT HTRS SEC	open	closed	open			
cb AM FANS CIRC 1	open	closed	open			
cb AM FANS CIRC 2	open	closed	open			
cb AM FANS CIRC 3	open	closed	open			
cb AM FANS DUCT 1	open	open	open			
cb AM FANS DUCT 2	open	closed	open			
cb MOL SV B TMRS PRI	open	closed	open			
cb MOL SV B TMRS SEC	open	closed	open			
cb MOL SV B FANS PRI	open	closed	open			
cb MOL SV B FANS SEC	closed	closed	closed			
cb MOL SV B BED HTRS	open	closed	open			
cb CNDST DUMP PRI	open	closed	open			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 200 (cont'd)						
cb CNDST DUMP SEC	open	closed	open			
cb OWS HT EXCH FANS 1	open	closed	open			
cb OWS HT EXCH FANS 2	open	closed	open			
cb OWS HT EXCH FANS 3	open	closed	open			
cb OWS HT EXCH FANS 4	open	closed	open			
cb MDA FANS 1	open	closed	open			
cb MDA FANS 2	open	closed	open			
cb MDA FANS CSM 1	open	closed	open			
cb MDA FANS CSM 2	open	open	open			
cb RAD FLOW PRI	closed	closed	closed			
cb RAD FLOW SEC	closed	closed	closed			
cb CLNT PUMP CONTS PRI [A•B]	closed	closed	closed			
cb CLNT PUMP CONTS PRI [B•C]	closed	closed	closed			
cb CLNT PUMP CONTS PRI [C•A]	closed	closed	closed			
cb CLNT PUMP CONTS SEC [A•B]	closed	closed	closed			
cb CLNT PUMP CONTS SEC [B•C]	closed	closed	closed			
cb CLNT PUMP CONTS SEC [C•A]	closed	closed	closed			
cb CLNT PUMP INVS PRI 1	closed	closed	closed			
cb CLNT PUMP INVS PRI 2	closed	closed	closed			
cb CLNT PUMP INVS PRI 3	closed	closed	closed			
cb CLNT PUMP INVS SEC 1	closed	closed	closed			
cb CLNT PUMP INVS SEC 2	closed	closed	closed			
cb CLNT PUMP INVS SEC 3	closed	closed	closed			
cb CMD SYS PRI	closed	closed	closed			
cb CMD SYS SEC	closed	closed	closed			
cb TIME REF SYS ELECT PRI	closed	closed	closed			
cb TIME REF SYS ELECT SEC	closed	closed	closed			
cb TIME REF SYS BUFFER PRI	open	closed	open			
cb TIME REF SYS BUFFER SEC	open	closed	open			
cb TIME REF SYS CLOCK	open	closed	open			
cb TIME REF SYS EVENT TMR	open	closed	open			
cb AUDIO SYS BUFFER AMPS 1	open	closed	open			
cb AUDIO SYS BUFFER AMPS 2	open	closed	open			
cb AUDIO SYS INTERCOM A	open	closed	open			
cb AUDIO SYS INTERCOM B	open	closed	open			
cb AUDIO SYS CCU A	open	closed	open			
cb AUDIO SYS CCU B	open	closed	open			
cb AUDIO SYS CREW ALERT CALL 1	open	closed	open			
cb AUDIO SYS CREW ALERT CALL 2	open	closed	open			
cb INSTR SYS CONVS 1	closed	closed	closed			
cb INSTR SYS CONVS 2	closed	closed	closed			
cb INSTR SYS CONVS 3	closed	closed	closed			
cb INSTR SYS XMTRS A	closed	closed	closed			
cb INSTR SYS XMTRS B	closed	closed	closed			
cb INSTR SYS XMTRS C	closed	closed	closed			
cb VHF XPNDR	closed	open	closed			
cb TELEPRINT	open	closed	open			
cb VOICE RCDR LTS	open	closed	open			
cb INSTR SYS DISP CONVS INPUT PRI	open	closed	open			
cb INSTR SYS DISP CONVS INPUT SEC	open	closed	open			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 200 (cont'd)						
cb INSTR SYS DISP CONVS OUTPUT +24V	open	closed	open			
cb INSTR SYS DISP CONVS OUTPUT -24V	open	closed	open			
cb INSTR SYS DISP CONVS OUTPUT +5V	open	closed	open			
cb INSTR SYS OWS MUX HTRS 1	closed	closed	closed			
cb INSTR SYS OWS MUX HTRS 2	closed	closed	closed			
cb ANT CNTL 1	closed	closed	closed			
cb ANT CNTL 2	closed	closed	closed			
cb INSTR SYS CONT CONV	open	closed	open			
cb INSTR SYS CONT PROG CMD	closed	closed	closed			
cb INSTR SYS CONT PROG MAN	open	closed	open			
cb INSTR SYS CONT ELECT CMD	closed	closed	closed			
cb INSTR SYS CONT ELECT MAN	open	closed	open			
cb INSTR SYS CONT RCDR CMD	closed	closed	closed			
cb INSTR SYS CONT RCDR MAN	closed	closed	closed			
cb INSTR SYS CONT TM CMD	closed	closed	closed			
cb INSTR SYS CONT TM MAN	closed	closed	closed			
cb QCM MON	closed	closed	closed			
cb INSTR SYS XDUCER GRP 1-1	closed	closed	closed			
cb INSTR SYS XDUCER GRP 1 +24V	closed	closed	closed			
cb INSTR SYS XDUCER GRP 1 -24V	closed	closed	closed			
cb INSTR SYS XDUCER GRP 1 +5V	closed	closed	closed			
cb INSTR SYS XDUCER GRP 2-2	closed	closed	closed			
cb INSTR SYS XDUCER GRP 2 +24V	closed	closed	closed			
cb INSTR SYS XDUCER GRP 2 -24V	closed	closed	closed			
cb INSTR SYS XDUCER GRP 2 +5V	closed	closed	closed			
cb INSTR SYS SIG CONDG MDA	closed	closed	closed			
cb INSTR SYS SIG CONDG OWS 1	closed	closed	closed			
cb INSTR SYS SIG CONDG OWS 2	closed	closed	closed			
Panel 201						
Circuit Breaker Panel						
cb AH INTEGRATOR 1	closed	closed	closed			
cb AH INTEGRATOR 2	closed	closed	closed			
cb AH INTEGRATOR 3	closed	closed	closed			
cb AH INTEGRATOR 4	closed	closed	closed			
cb BAT CONT 1	closed	closed	closed			
cb BAT CONT 2	closed	closed	closed			
cb BAT CONT 3	closed	closed	closed			
cb BAT CONT 4	closed	closed	closed			
cb PCG CNTLS 1	open	closed	open			
cb PCG CNTLS 2	open	closed	open			
cb PCG CNTLS 3	open	closed	open			
cb PCG CNTLS 4	open	closed	open			
cb OWS BUS 1 FEEDERS CONT AM	closed	closed	closed			
cb OWS BUS 1 FEEDERS CONT OWS	open	closed	open			
cb OWS BUS 1 FEEDERS 1	closed	closed	closed			
cb OWS BUS 1 FEEDERS 2	closed	closed	closed			
cb OWS BUS 1 FEEDERS 3	closed	closed	closed			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 201 (cont'd)						
cb OWS BUS 1 FEEDERS 4	closed	closed	closed			
cb OWS BUS 1 FEEDERS 5	closed	closed	closed			
cb OWS BUS 1 FEEDERS 6	closed	closed	closed			
cb OWS BUS 1 FEEDERS 7	closed	closed	closed			
cb OWS BUS 1 FEEDERS 8	closed	closed	closed			
cb OWS BUS 1 FEEDERS 9	closed	closed	closed			
cb REG BUS TIE 1	closed	closed	closed			
cb REG BUS TIE 2	closed	closed	closed			
cb PWR SYS STATUS LTS 1	open	closed	open			
cb PWR SYS STATUS LTS 2	open	closed	open			
cb XFER 1/CSM MNA FEEDERS 1	open	open	open			
cb XFER 1/CSM MNA FEEDERS 2	open	open	open			
cb XFER 1/CSM MNA FEEDERS 3	open	open	open			
cb XFER 1/CSM MNA FEEDERS 4	open	open	open			
cb XFER 1/CSM MNA FEEDERS 5	open	open	open			
cb PWR SYS CONT 1	open	closed	open			
cb PWR SYS CONT 2	open	closed	open			
cb BUS AMMETERS 1	closed	closed	closed			
cb BUS AMMETERS 2	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 1	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 2	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 3	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 4	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 5	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 6	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 7	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 8	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 9	closed	closed	closed			
cb XFER BUS TIE CNTL 1	open	closed	open			
cb XFER BUS TIE CNTL 2	open	closed	open			
cb PWR DISCON AM CNTL 1	open	closed	open			
cb PWR DISCON AM CNTL 2	open	closed	open			
cb PWR DISCON ATM CNTL 1	open	closed	open			
cb PWR DISCON ATM CNTL 2	open	closed	open			
cb ATM 1/XFER 1 FEEDERS 10	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 11	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 12	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 13	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 14	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 15	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 16	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 17	closed	closed	closed			
cb ATM 1/XFER 1 FEEDERS 18	closed	closed	closed			
cb AH INTEGRATOR 5	closed	closed	closed			
cb AH INTEGRATOR 6	closed	closed	closed			
cb AH INTEGRATOR 7	closed	closed	closed			
cb AH INTEGRATOR 8	closed	closed	closed			
cb PCG CNTLS 5	open	closed	open			
cb PCG CNTLS 6	open	closed	open			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 201 (cont'd)						
cb PCG CNTLS 7	open	closed	open			
cb PCG CNTLS 8	open	closed	open			
cb BAT CONT 5	closed	closed	closed			
cb BAT CONT 6	closed	closed	closed			
cb BAT CONT 7	closed	closed	closed			
cb BAT CONT 8	closed	closed	closed			
cb OWS BUS 2 FEEDERS CONT AM	closed	closed	closed			
cb OWS BUS 2 FEEDERS CONT OWS	open	closed	open			
cb OWS BUS 2 FEEDERS 1	closed	closed	closed			
cb OWS BUS 2 FEEDERS 2	closed	closed	closed			
cb OWS BUS 2 FEEDERS 3	closed	closed	closed			
cb OWS BUS 2 FEEDERS 4	closed	closed	closed			
cb OWS BUS 2 FEEDERS 5	closed	closed	closed			
cb OWS BUS 2 FEEDERS 6	closed	closed	closed			
cb OWS BUS 2 FEEDERS 7	closed	closed	closed			
cb OWS BUS 2 FEEDERS 8	closed	closed	closed			
cb OWS BUS 2 FEEDERS 9	closed	closed	closed			
cb XFER 2/CSM MNB FEEDERS 1	open	open	open			
cb XFER 2/CSM MNB FEEDERS 2	open	open	open			
cb XFER 2/CSM MNB FEEDERS 3	open	open	open			
cb XFER 2/CSM MNB FEEDERS 4	open	open	open			
cb XFER 2/CSM MNB FEEDERS 5	open	open	open			
cb ATM 2/XFER 2 FEEDERS 1	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 2	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 3	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 4	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 5	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 6	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 7	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 8	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 9	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 10	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 11	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 12	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 13	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 14	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 15	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 16	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 17	closed	closed	closed			
cb ATM 2/XFER 2 FEEDERS 18	closed	closed	closed			
Panel 202						
Circuit Breaker Panel						
cb M512	open	open	open			
cb NOISE BURST ANT	open	closed	open			
cb PROT SPECT	closed	closed	closed			
cb OWS REFRIG CNTL 1	closed	closed	closed			
cb OWS REFRIG CNTL 2	closed	closed	closed			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 202 (cont'd)						
cb EXTENDIBLE BOOM 1	open	closed	open			
cb EXTENDIBLE BOOM 2	open	closed	open			
cb S009	open	open	open			
cb ER EREP PWR CNTL 1	open	closed	open			
cb ER EREP PWR CNTL 2	open	closed	open			
cb ER PNL PWR	open	closed	open			
cb ER RCDR 1	open	closed	open			
cb ER RCDR 2	open	closed	open			
cb ER S190 1	open	closed	open			
cb ER S190 2	open	closed	open			
cb ER S190 3	open	closed	open			
cb ER WINDW HTR	open	closed	open			
cb OWS SOLENOID VENT VLVS CNTL 1	closed	open	closed			
cb OWS SOLENOID VENT VLVS CNTL 2	closed	open	closed			
cb OWS SOLENOID VENT VLVS 1	closed	open	closed			
cb OWS SOLENOID VENT VLVS 2	closed	open	closed			
cb ER S191 VTS	open	closed	open			
cb ER S191 SPECT	open	closed	open			
cb ER S192	open	closed	open			
cb ER S193 1	open	closed	open			
cb ER S193 HTR	closed	closed	closed			
(SL-4)			open			
cb ER S194 HTR	closed	closed	closed			
(SL-4)			open			
cb COMPT LTS MDA 1	closed	closed	closed			
(SL-4)			open			
cb COMPT LTS MDA 2	closed	closed	closed			
(SL-4)			open			
cb COMPT LTS AM 1	closed	closed	closed			
(SL-4)			open			
cb COMPT LTS AM 2	closed	closed	closed			
(SL-4)			open			
cb EMER LTS MDA/AM 1	open	closed	open			
cb EMER LTS MDA/AM 2	open	closed	open			
cb EMER LTS OWS 1	open	closed	open			
cb EMER LTS OWS 2	open	closed	open			
cb AM INSTR PNL LTS FLOOD	closed	closed	closed			
(SL-4)			open			
cb AM INSTR PNL LTS METER	closed	closed	closed			
(SL-4)			open			
cb AM INSTR PNL LTS STATUS	open	closed	open			
cb DOCKING LTS 1	closed	closed	closed			
(SL-4)			open			
cb DOCKING LTS 2	closed	closed	closed			
(SL-4)			open			
cb TRACKING LTS CNTL 1	closed	closed	closed			
(SL-4)			open			
cb TRACKING LTS CNTL 2	closed	closed	closed			
(SL-4)			open			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 202 (cont'd)						
cb TRACKING LTS 1 (SL-4)	closed	closed	closed open			
cb TRACKING LTS 2 (SL-4)	closed	closed	closed open			
cb TRACKING LTS 3 (SL-4)	closed	closed	closed open			
cb TRACKING LTS 4 (SL-4)	closed	closed	closed open			
cb EVA LTS 1	open	closed	open			
cb EVA LTS 2	open	closed	open			
cb MASTER ALARM STATUS LTS 1	open	closed	open			
cb MASTER ALARM STATUS LTS 2	open	closed	open			
cb SUS 1 LCG PUMPS PRI	open	closed	open			
cb SUS 1 LCG PUMPS SEC	open	closed	open			
cb SUS 1 EVA CCU 1	open	closed	open			
cb SUS 1 EVA CCU 2	open	closed	open			
cb SUS 2 LCG PUMPS PRI	open	closed	open			
cb SUS 2 LCG PUMPS SEC	open	closed	open			
cb SUS 2 EVA CCU 1	open	closed	open			
cb SUS 2 EVA CCU 2	open	closed	open			
cb ATM CLNT PUMPS A	open	closed	open			
cb ATM CLNT PUMPS B	open	closed	open			
cb ATM CLNT PUMPS C	open	closed	open			
cb DPLY BUS ARM PRI	closed	open	open			
cb DPLY BUS ARM SEC	closed	open	open			
cb DPLY SEQ BUS ARM PRI	closed	open	open			
cb DPLY SEQ BUS ARM SEC	closed	open	open			
cb MDA VENT VLVS 1	closed	open	open			
cb MDA VENT VLVS 2	closed	open	open			
cb OWS PNEU VENT VLVS 1	closed	open	open			
cb OWS PNEU VENT VLVS 2	closed	open	open			
cb LNCH TM	closed	open	open			
cb DPLY OWS SW SEL 1	closed	open	open			
cb DPLY OWS SW SEL 2	closed	open	open			
cb DPLY DISCONE ANT BUS 1 CNTL	closed	open	open			
cb DPLY DISCONE ANT BUS 1 PWR 1	closed	open	open			
cb DPLY DISCONE ANT BUS 1 PWR 2	closed	open	open			
cb DPLY DISCONE ANT BUS 2 CNTL	closed	open	open			
cb DPLY DISCONE ANT BUS 2 PWR 1	closed	open	open			
cb DPLY DISCONE ANT BUS 2 PWR 2	closed	open	open			
cb ATM ALTN TLM CNTL 1	closed	closed	closed			
cb ATM ALTN TLM CNTL 2	closed	closed	closed			
cb TV ATM VIDEO	open	closed	open			
cb TV PWR AM	open	closed	open			
cb TV PWR MDA	open	closed	open			
cb UTIL PWR MDA [1•3]	open	closed	open			
cb UTIL PWR MDA [2•4]	open	closed	open			
cb UTIL PWR AM [1•3•5]	open	closed	open			
cb UTIL PWR AM [2•4•6]	open	closed	open			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 202 (cont'd)						
cb HI PWR ACC OUTLETS 1	open	closed	open			
cb HI PWR ACC OUTLETS 2	open	closed	open			
cb I/LCA HTRS 1	closed	closed	closed			
cb I/LCA HTRS 2	closed	closed	closed			
cb TACS CMD CONT 1 PRI	closed	open	closed			
cb TACS CMD CONT 1 SEC	closed	open	closed			
cb TACS CMD CONT 2 PRI	closed	open	closed			
cb TACS CMD CONT 2 SEC	closed	open	closed			
cb TACS MAN CONT INHBT 1	open	closed	open			
cb TACS MAN CONT INHBT 2	open	closed	open			
cb TACS MAN CONT 1	open	closed	open			
cb TACS MAN CONT 2	open	closed	open			
cb SAL 1 CNTL 1	open	closed	open			
cb SAL 2 CNTL 2	open	closed	closed			
(SL-4)			open			
cb TACS THRUSTER 1-1	closed	closed	closed			
cb TACS THRUSTER 1-2	closed	closed	closed			
cb TACS THRUSTER 2-1	closed	closed	closed			
cb TACS THRUSTER 2-2	closed	closed	closed			
cb TACS THRUSTER 3-1	closed	closed	closed			
cb TACS THRUSTER 3-2	closed	closed	closed			
cb TACS THRUSTER 4-1	closed	closed	closed			
cb TACS THRUSTER 4-2	closed	closed	closed			
cb TACS THRUSTER 5-1	closed	closed	closed			
cb TACS THRUSTER 5-2	closed	closed	closed			
cb TACS THRUSTER 6-1	closed	closed	closed			
cb TACS THRUSTER 6-2	closed	closed	closed			
cb C/W CONVS EMER 1	open	closed	open			
cb C/W CONVS EMER 2	open	closed	open			
cb C/W CONVS C/W 1	open	closed	open			
cb C/W CONVS C/W 2	open	closed	open			
cb C/W CONVS SIG COND 1	open	closed	open			
cb C/W CONVS SIG COND 2	open	closed	open			
cb C/W SNSRS EMER 1	open	closed	open			
cb C/W SNSRS EMER 2	open	closed	open			
cb C/W SNSRS C/W 1	open	closed	open			
cb C/W SNSRS C/W 2	open	closed	open			
cb C/W TONE AMP C/W 1	open	closed	open			
cb C/W TONE AMP C/W 2	open	closed	open			
Panel 203						
Control Panel						
MOL SV DISP sw	SV A	SV A	SV A			
MOL SV PPCO2 IN ind	0.0 mmHg	0.0 to 5.5 mmHg	0.0 mmHg			
MOL SV PPCO2 OUT ind	0.0 mmHg	0.0 to 3.0 mmHg	0.0 mmHg			
MOL SV HT EXCH IN ind	0.0°F	60° to 80°F	0.0°F			
MOL SV HT EXCH OUT ind	0.0°F	46° to 55°F	0.0°F			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 203 (cont'd)						
MOL SV DEW PT ind	20°F	42° to 50°F	20°F			
MOL SV BED 1 ind	0.0°F	0.0°F	0.0°F			
MOL SV BED 2 ind	0.0°F	0.0°F	0.0°F			
MOL SV A TMRS sw	OFF	PRI	OFF			
MOL SV A VENT HTRS sw	OFF	ON	OFF			
MOL SV A FANS DISCON sw	OFF	AUTO	OFF			
MOL SV A FANS PWR sw	OFF	PRI	OFF			
MOL SV A BAKEOUT HTRS sw	OFF	OFF	OFF			
MOL SV B TMRS sw	OFF	OFF	OFF			
MOL SV B VENT HTRS sw	OFF	OFF	OFF			
MOL SV B FANS DISCON sw	OFF	OFF	OFF			
MOL SV B FANS PWR sw	OFF	SEC	OFF			
MOL SV B BAKEOUT HTRS sw	OFF	OFF	OFF			
MDA HTRS [MAN/CMD] sw	CMD	CMD	CMD			
MDA HTRS WALL sw	OFF (off) [pri on, enbl 70°F]	OFF (pri on, enbl 70°F)	OFF (pri on, enbl 70°F)			
MDA HTRS TUNL sw	OFF (off) [pri on]	OFF (pri on)	OFF (pri on)			
MDA HTRS PORT CSM sw	OFF (off) [pri on]	OFF (pri on)	OFF (pri on)			
MDA HTRS PORT SPARE sw	OFF (off) [sec on]	OFF (sec on)	OFF (sec on)			
AM WALL HTRS [ON/OFF/CMD] sw	CMD	CMD	CMD			
AM WALL HTRS [HI/LO] sw	LO(off) [enbl 40° and 60°F]	LO (enbl 40° and 60°F)	LO (enbl 40° and 60°F)			
OWS RADIANT HTRS 1 sw	CMD (off) [on]	OFF	CMD (off) [on]			
OWS RADIANT HTRS 2 sw	CMD (off) [on]	OFF	CMD (off) [on]			
AM FANS CIRC 1 sw	OFF	HI	OFF			
AM FANS CIRC 2 sw	OFF	HI	OFF			
AM FANS CIRC 3 sw	OFF	HI	OFF			
AM FANS DUCT sw	OFF	HI	OFF			
MDA FANS 1 sw	OFF	HI	OFF			
MDA FANS 2 sw	OFF	HI	OFF			
MDA FANS CSM sw	OFF	HI	OFF			
RAD FLOW PRI sw	CMD (byp) [norm]	CMD (norm)	CMD (norm)			
RAD FLOW SEC sw	CMD (norm)	CMD (norm)	CMD (norm)			
ATM CLNT PUMPS LO▲P lt	off	off	off			
ATM CLNT PUMPS A sw	OFF	ON	OFF			
ATM CLNT PUMPS B sw	OFF	OFF	OFF			
ATM CLNT PUMPS C sw	OFF	OFF	OFF			
PRI CLNT LOOP RES LO lt	off	off	off			
PRI CLNT LOOP INVS sel	CMD (inv 1)	CMD (inv 1)	CMD (inv 1)			
PRI CLNT LOOP PUMPS A sw	OFF (on)	OFF (on)	OFF (on)			
PRI CLNT LOOP PUMPS B sw	OFF (off)	OFF (off)	OFF (off)			
PRI CLNT LOOP PUMPS C sw	OFF (off)	OFF (off)	OFF (off)			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 203 (cont')						
SEC CLNT LOOP RES LO lt	off	off	off			
SEC CLNT LOOP INVS sel	CMD (inv 1)	CMD (inv 1)	CMD (inv 1)			
SEC CLNT LOOP PUMPS A sw	OFF (off) [on]	OFF (on)	OFF (on)			
SEC CLNT LOOP PUMPS B sw	OFF (off)	OFF (off)	OFF (off)			
SEC CLNT LOOP PUMPS C sw	OFF (off)	OFF (off)	OFF (off)			
Panel 204						
Control Panel						
CMD SYS sw	CMD (pri,sec.)	CMD (pri)	CMD (pri)			
ANT [(DISC 1/STUB)/DISC 2/CMD] sw	CMD	CMD	CMD			
ANT [DISC 1/STUB/CMD] sw	CMD	CMD	CMD			
	[Antenna selection commanded as required]					
INSTR SYS DISP CONV sw	OFF	PRI	OFF			
INSTR SYS CONVS sel	CMD (1&2)	CMD (1&2)	CMD (1&2)			
INSTR SYS PROG sw	CMD (pri)	CMD (pri)	CMD (pri)			
INSTR SYS ELECT sw	CMD (pri)	CMD (pri)	CMD (pri)			
INSTR SYS RCDR AUDIO sw	A	B	B			
TAPE RCDRS CONT sw	CMD	CMD	CMD			
	[Recorders selection commanded as required]					
TAPE RCDRS 1 STOP lt	off	off	off			
TAPE RCDRS 1 sel	DATA VOICE	DATA VOICE	DATA VOICE			
TAPE RCDRS 2 STOP lt	off	off	off			
TAPE RCDRS 2 sel	EXP 1 VOICE	EXP 1 VOICE	EXP 1 VOICE			
TAPE RCDRS 3 STOP lt	off	off	off			
TAPE RCDRS 3 sel	EXP 2	EXP 2	EXP 2			
XMTRS sw	CMD	CMD	CMD			
	[Commanded on as required]					
XMTR INPUT A sel	OFF	OFF	OFF			
XMTR INPUT B sel	OFF	OFF	OFF			
XMTR INPUT C sel	OFF	OFF	OFF			
MAN DUMP sw	OFF	OFF	OFF			
TAPE RECORDING DATA lt	off	off	off			
TAPE RECORDING DATA sw	CMD	CMD	CMD			
	[Commanded on as required]					
TAPE RECORDING EXP 1 lt	off	off	off			
TAPE RECORDING EXP 1 sw	ctr (off)	ctr (off)	ctr (off)			
TAPE RECORDING EXP 2 lt	off	off	off			
TAPE RECORDING EXP 2 sw	ctr (off)	ctr (off)	ctr (off)			
TAPE RECORDING EKG/ZPN sw	OFF	OFF	OFF			
Panel 205						
Control Panel						
DPLY BUS sw (lever lock)	CMD (safe)	SAFE	SAFE			
ANT sw (lever lock)	CMD (safe) [deployed]	SAFE	SAFE			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 205 (cont'd)						
SEQ BUS sw (lever lock)	CMD (safe) [armed]	SAFE	SAFE			
PWR SYS CONT sw (lever lock)	CMD	CMD	CMD			
PWR DISCON 1 sw (lever lock)	up (connected)	up (connected)	up (connected)			
PWR DISCON 2 sw (lever lock)	up (connected)	up (connected)	up (connected)			
SOLAR ARRAY OUTPUT 1 PCG 1 lt	off	off	off			
SOLAR ARRAY OUTPUT 1 sw	ctr (PCG 1)	ctr (PCG 1)	ctr (PCG 1)			
SOLAR ARRAY OUTPUT 1 PCG 2 lt	off	off	off			
SOLAR ARRAY OUTPUT 2 PCG 2 lt	off	off	off			
SOLAR ARRAY OUTPUT 2 sw	ctr (PCG 2)	ctr (PCG 2)	ctr (PCG 2)			
SOLAR ARRAY OUTPUT 2 PCG 3 lt	off	off	off			
SOLAR ARRAY OUTPUT 3 PCG 3 lt	off	off	off			
SOLAR ARRAY OUTPUT 3 sw	ctr (PCG 3)	ctr (PCG 3)	ctr (PCG 3)			
SOLAR ARRAY OUTPUT 3 PCG 4 lt	off	off	off			
SOLAR ARRAY OUTPUT 4 PCG 4 lt	off	off	off			
SOLAR ARRAY OUTPUT 4 sw	ctr (PCG 4)	ctr (PCG 4)	ctr (PCG 4)			
SOLAR ARRAY OUTPUT 4 PCG 1 lt	off	off	off			
SOLAR ARRAY OUTPUT 5 PCG 5 lt	off	off	off			
SOLAR ARRAY OUTPUT 5 sw	ctr (PCG 5)	ctr (PCG 5)	ctr (PCG 5)			
SOLAR ARRAY OUTPUT 5 PCG 6 lt	off	off	off			
SOLAR ARRAY OUTPUT 6 PCG 6 lt	off	off	off			
SOLAR ARRAY OUTPUT 6 sw	ctr (PCG 6)	ctr (PCG 6)	ctr (PCG 6)			
SOLAR ARRAY OUTPUT 6 PCG 7 lt	off	off	off			
SOLAR ARRAY OUTPUT 7 PCG 7 lt	off	off	off			
SOLAR ARRAY OUTPUT 7 sw	ctr (PCG 7)	ctr (PCG 7)	ctr (PCG 7)			
SOLAR ARRAY OUTPUT 7 PCG 8 lt	off	off	off			
SOLAR ARRAY OUTPUT 8 PCG 8 lt	off	off	off			
SOLAR ARRAY OUTPUT 8 sw	ctr (PCG 8)	ctr (PCG 8)	ctr (PCG 8)			
SOLAR ARRAY OUTPUT 8 PCG 5 lt	off	off	off			
BATS 1 ON lt	off	off	off			
BATS 1 sw	ctr (on)	ctr (on)	ctr (on)			
BATS 1 OFF lt	off	off	off			
BATS 2 ON lt	off	off	off			
BATS 2 sw	ctr (on)	ctr (on)	ctr (on)			
BATS 2 OFF lt	off	off	off			
BATS 3 ON lt	off	off	off			
BATS 3 sw	ctr (on)	ctr (on)	ctr (on)			
BATS 3 OFF lt	off	off	off			
BATS 4 ON lt	off	off	off			
BATS 4 sw	ctr (on)	ctr (on)	ctr (on)			
BATS 4 OFF lt	off	off	off			
BATS 5 ON lt	off	off	off			
BATS 5 sw	ctr (on)	ctr (on)	ctr (on)			
BATS 5 OFF lt	off	off	off			
BATS 6 ON lt	off	off	off			
BATS 6 sw	ctr (on)	ctr (on)	ctr (on)			
BATS 6 OFF lt	off	off	off			
BATS 7 ON lt	off	off	off			
BATS 7 sw	ctr (on)	ctr (on)	ctr (on)			
BATS 7 OFF lt	off	off	off			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 205 (cont'd)						
BATS 8 ON lt	off	off	off			
BATS 8 sw	ctr (on)	ctr (on)	ctr (on)			
BATS 8 OFF lt	off	off	off			
CHGR 1 NORM lt	off	off	off			
CHGR 1 sw	ctr (norm)	ctr (norm)	ctr (norm)			
CHGR 1 BYPASS lt	off	off	off			
CHGR 2 NORM lt	off	off	off			
CHGR 2 sw	ctr (norm)	ctr (norm)	ctr (norm)			
CHGR 2 BYPASS lt	off	off	off			
CHGR 3 NORM lt	off	off	off			
CHGR 3 sw	ctr (norm)	ctr (norm)	ctr (norm)			
CHGR 3 BYPASS lt	off	off	off			
CHGR 4 NORM lt	off	off	off			
CHGR 4 sw	ctr (norm)	ctr (norm)	ctr (norm)			
CHGR 4 BYPASS lt	off	off	off			
CHGR 5 NORM lt	off	off	off			
CHGR 5 sw	ctr (norm)	ctr (norm)	ctr (norm)			
CHGR 5 BYPASS lt	off	off	off			
CHGR 6 NORM lt	off	off	off			
CHGR 6 sw	ctr (norm)	ctr (norm)	ctr (norm)			
CHGR 6 BYPASS lt	off	off	off			
CHGR 7 NORM lt	off	off	off			
CHGR 7 sw	ctr (norm)	ctr (norm)	ctr (norm)			
CHGR 7 BYPASS lt	off	off	off			
CHGR 8 NORM lt	off	off	off			
CHGR 8 sw	ctr (norm)	ctr (norm)	ctr (norm)			
CHGR 8 BYPASS lt	off	off	off			
AH INTEGRATOR 1 PRI lt	off	off	off			
AH INTEGRATOR 1 sw	ctr (pri)	ctr (pri)	ctr (pri)			
AH INTEGRATOR 1 SEC lt	off	off	off			
AH INTEGRATOR 2 PRI lt	off	off	off			
AH INTEGRATOR 2 sw	ctr (pri)	ctr (pri)	ctr (pri)			
AH INTEGRATOR 2 SEC lt	off	off	off			
AH INTEGRATOR 3 PRI lt	off	off	off			
AH INTEGRATOR 3 sw	ctr (pri)	ctr (pri)	ctr (pri)			
AH INTEGRATOR 3 SEC lt	off	off	off			
AH INTEGRATOR 4 PRI lt	off	off	off			
AH INTEGRATOR 4 sw	ctr (pri)	ctr (pri)	ctr (pri)			
AH INTEGRATOR 4 SEC lt	off	off	off			
AH INTEGRATOR 5 PRI lt	off	off	off			
AH INTEGRATOR 5 sw	ctr (pri)	ctr (pri)	ctr (pri)			
AH INTEGRATOR 5 SEC lt	off	off	off			
AH INTEGRATOR 6 PRI lt	off	off	off			
AH INTEGRATOR 6 sw	ctr (pri)	ctr (pri)	ctr (pri)			
AH INTEGRATOR 6 SEC lt	off	off	off			
AH INTEGRATOR 7 PRI lt	off	off	off			
AH INTEGRATOR 7 sw	ctr (pri)	ctr (pri)	ctr (pri)			
AH INTEGRATOR 7 SEC lt	off	off	off			
AH INTEGRATOR 8 PRI lt	off	off	off			
AH INTEGRATOR 8 sw	ctr (pri)	ctr (pri)	ctr (pri)			
AH INTEGRATOR 8 SEC lt	off	off	off			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 205 (cont'd)						
CHG RATE 1 AUTO lt	off	off	off			
CHG RATE 1 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG RATE 1 LO lt	off	off	off			
CHG RATE 2 AUTO lt	off	off	off			
CHG RATE 2 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG RATE 2 LO lt	off	off	off			
CHG RATE 3 AUTO lt	off	off	off			
CHG RATE 3 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG RATE 3 LO lt	off	off	off			
CHG RATE 4 AUTO lt	off	off	off			
CHG RATE 4 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG RATE 4 LO lt	off	off	off			
CHG RATE 5 AUTO lt	off	off	off			
CHG RATE 5 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG RATE 5 LO lt	off	off	off			
CHG RATE 6 AUTO lt	off	off	off			
CHG RATE 6 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG RATE 6 LO lt	off	off	off			
CHG RATE 7 AUTO lt	off	off	off			
CHG RATE 7 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG RATE 7 LO lt	off	off	off			
CHG RATE 8 AUTO lt	off	off	off			
CHG RATE 8 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG RATE 8 LO lt	off	off	off			
CHG MODE 1 AUTO lt	off	off	off			
CHG MODE 1 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG MODE 1 TEMP LMTD lt	off	off	off			
CHG MODE 2 AUTO lt	off	off	off			
CHG MODE 2 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG MODE 2 TEMP LMTD lt	off	off	off			
CHG MODE 3 AUTO lt	off	off	off			
CHG MODE 3 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG MODE 3 TEMP LMTD lt	off	off	off			
CHG MODE 4 AUTO lt	off	off	off			
CHG MODE 4 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG MODE 4 TEMP LMTD lt	off	off	off			
CHG MODE 5 AUTO lt	off	off	off			
CHG MODE 5 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG MODE 5 TEMP LMTD lt	off	off	off			
CHG MODE 6 AUTO lt	off	off	off			
CHG MODE 6 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG MODE 6 TEMP LMTD lt	off	off	off			
CHG MODE 7 AUTO lt	off	off	off			
CHG MODE 7 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG MODE 7 TEMP LMTD lt	off	off	off			
CHG MODE 8 AUTO lt	off	off	off			
CHG MODE 8 sw	ctr (auto)	ctr (auto)	ctr (auto)			
CHG MODE 8 TEMP LMTD lt	off	off	off			

AM/MDA OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 205 (cont'd)						
DISCH LIMIT 1 AUTO lt	off	off	off			
DISCH LIMIT 1 sw	ctr (auto)	ctr (auto)	ctr (auto)			
DISCH LIMIT 1 INHBT lt	off	off	off			
DISCH LIMIT 2 AUTO lt	off	off	off			
DISCH LIMIT 2 sw	ctr (auto)	ctr (auto)	ctr (auto)			
DISCH LIMIT 2 INHBT lt	off	off	off			
DISCH LIMIT 3 AUTO lt	off	off	off			
DISCH LIMIT 3 sw	ctr (auto)	ctr (auto)	ctr (auto)			
DISCH LIMIT 3 INHBT lt	off	off	off			
DISCH LIMIT 4 AUTO lt	off	off	off			
DISCH LIMIT 4 sw	ctr (auto)	ctr (auto)	ctr (auto)			
DISCH LIMIT 4 INHBT lt	off	off	off			
DISCH LIMIT 5 AUTO lt	off	off	off			
DISCH LIMIT 5 sw	ctr (auto)	ctr (auto)	ctr (auto)			
DISCH LIMIT 5 INHBT lt	off	off	off			
DISCH LIMIT 6 AUTO lt	off	off	off			
DISCH LIMIT 6 sw	ctr (auto)	ctr (auto)	ctr (auto)			
DISCH LIMIT 6 INHBT lt	off	off	off			
DISCH LIMIT 7 AUTO lt	off	off	off			
DISCH LIMIT 7 sw	ctr (auto)	ctr (auto)	ctr (auto)			
DISCH LIMIT 7 INHBT lt	off	off	off			
DISCH LIMIT 8 AUTO lt	off	off	off			
DISCH LIMIT 8 sw	ctr (auto)	ctr (auto)	ctr (auto)			
DISCH LIMIT 8 INHBT lt	off	off	off			
PCG OUTPUT 1 ON lt	off	off	off			
PCG OUTPUT 1 sw	ctr (on)	ctr (on)	ctr (on)			
PCG OUTPUT 1 OFF lt	off	off	off			
PCG OUTPUT 2 ON lt	off	off	off			
PCG OUTPUT 2 sw	ctr (on)	ctr (on)	ctr (on)			
PCG OUTPUT 2 OFF lt	off	off	off			
PCG OUTPUT 3 ON lt	off	off	off			
PCG OUTPUT 3 sw	ctr (on)	ctr (on)	ctr (on)			
PCG OUTPUT 3 OFF lt	off	off	off			
PCG OUTPUT 4 ON lt	off	off	off			
PCG OUTPUT 4 sw	ctr (on)	ctr (on)	ctr (on)			
PCG OUTPUT 4 OFF lt	off	off	off			
PCG OUTPUT 5 ON lt	off	off	off			
PCG OUTPUT 5 sw	ctr (on)	ctr (on)	ctr (on)			
PCG OUTPUT 5 OFF lt	off	off	off			
PCG OUTPUT 6 ON lt	off	off	off			
PCG OUTPUT 6 sw	ctr (on)	ctr (on)	ctr (on)			
PCG OUTPUT 6 OFF lt	off	off	off			
PCG OUTPUT 7 ON lt	off	off	off			
PCG OUTPUT 7 sw	ctr (on)	ctr (on)	ctr (on)			
PCG OUTPUT 7 OFF lt	off	off	off			
PCG OUTPUT 8 ON lt	off	off	off			
PCG OUTPUT 8 sw	ctr (on)	ctr (on)	ctr (on)			
PCG OUTPUT 8 OFF lt	off	off	off			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 205 (cont'd)						
PCG OUTPUT 1 REG BUS 1 lt	off	off	off			
PCG OUTPUT 1 bus sel sw	ctr (reg bus 1)	ctr (reg bus 1)	ctr (reg bus 1)			
PCG OUTPUT 1 REG BUS 2 lt	off	off	off			
PCG OUTPUT 2 REG BUS 1 lt	off	off	off			
PCG OUTPUT 2 bus sel sw	ctr (reg bus 1)	ctr (reg bus 1)	ctr (reg bus 1)			
PCG OUTPUT 2 REG BUS 2 lt	off	off	off			
PCG OUTPUT 3 REG BUS 1 lt	off	off	off			
PCG OUTPUT 3 bus sel sw	ctr (reg bus 1)	ctr (reg bus 1)	ctr (reg bus 1)			
PCG OUTPUT 3 REG BUS 2 lt	off	off	off			
PCG OUTPUT 4 REG BUS 1 lt	off	off	off			
PCG OUTPUT 4 bus sel sw	ctr (reg bus 1)	ctr (reg bus 1)	ctr (reg bus 1)			
PCG OUTPUT 4 REG BUS 2 lt	off	off	off			
PCG OUTPUT 5 REG BUS 2 lt	off	off	off			
PCG OUTPUT 5 bus sel sw	ctr (reg bus 2)	ctr (reg bus 2)	ctr (reg bus 2)			
PCG OUTPUT 5 REG BUS 1 lt	off	off	off			
PCG OUTPUT 6 REG BUS 2 lt	off	off	off			
PCG OUTPUT 6 bus sel sw	ctr (reg bus 2)	ctr (reg bus 2)	ctr (reg bus 2)			
PCG OUTPUT 6 REG BUS 1 lt	off	off	off			
PCG OUTPUT 7 REG BUS 2 lt	off	off	off			
PCG OUTPUT 7 bus sel sw	ctr (reg bus 2)	ctr (reg bus 2)	ctr (reg bus 2)			
PCG OUTPUT 7 REG BUS 1 lt	off	off	off			
PCG OUTPUT 8 REG BUS 2 lt	off	off	off			
PCG OUTPUT 8 bus sel sw	ctr (reg bus 2)	ctr (reg bus 2)	ctr (reg bus 2)			
PCG OUTPUT 8 REG BUS 1 lt	off	off	off			
Panel 206						
Control Panel						
ARRAY AMPS 1 ind ARRAY AMPS 2 ind ARRAY AMPS 3 ind ARRAY AMPS 4 ind ARRAY AMPS 5 ind ARRAY AMPS 6 ind ARRAY AMPS 7 ind ARRAY AMPS 8 ind	NOTE: Timeline dependent. Nominal range for ARRAY AMPS 1-8 ind (8) is 0 to 30 amps					
timer [STRT/STOP] sw	ctr (STOP)	ctr (STOP)	ctr (STOP)			
timer [DECR/INCR] sel	ctr	ctr	ctr			
BAT VOLTS 1 ind BAT VOLTS 2 ind BAT VOLTS 3 ind BAT VOLTS 4 ind BAT VOLTS 5 ind BAT VOLTS 6 ind BAT VOLTS 7 ind BAT VOLTS 8 ind	NOTE: BAT VOLTS 1 - 8 ind (8) read as follows:					
	Charge					
	36 to 48	36 to 48	36 to 48			
	Discharge					
	N/A	30 to 36	30 to 36			
BUS AMPS PCG TOTAL 1 ind BUS AMPS PCG TOTAL 2 ind	NOTE:	Timeline dependent				

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 206 (cont'd)						
BUS AMPS OWS 1 ind						
BUS AMPS OWS 2 ind						
BUS AMPS CSM A ind	0.0	NOTE: Timeline dependent				
BUS AMPS CSM B ind	0.0					
BUS AMPS ATM 1 ind	0.0 [NOTE]					
BUS AMPS ATM 2 ind	0.0 [NOTE]					
BAT AMPS 1 ind						
BAT AMPS 2 ind	NOTE: BAT AMPS 1 - 8 ind (8) read as follows:					
BAT AMPS 3 ind	CHARGE					
BAT AMPS 4 ind	0.75 to 50	0.75 to 50	0.75 to 50			
BAT AMPS 5 ind	DISCHARGE					
BAT AMPS 6 ind	N/A	0.0 to 50	0.0 to 50			
BAT AMPS 7 ind						
BAT AMPS 8 ind						
REG ADJ BUS 1 pot	Adjusted prior to launch for open circuit bus voltages of 29.3 volts					
REG ADJ BUS 2 pot						
BUS VOLTS REG 1 ind	26.5 to 30.0	26.5 to 30.0	26.5 to 30.0			
BUS VOLTS REG 2 ind	26.5 to 30.0	26.5 to 30.0	26.5 to 30.0			
BUS VOLTS XFER 1 ind	0.0[26.5 to 30.0]	26.5 to 30.0	26.5 to 30.0			
BUS VOLTS XFER 2 ind	0.0[26.5 to 30.0]	26.5 to 30.0	26.5 to 30.0			
BAT CHG PRI ind	50.0 to 100.0%	50.0 to 100.0%	50.0 to 100.0%			
BAT CHG SEC ind	50.0 to 100.0%	50.0 to 100.0%	50.0 to 100.0%			
BAT CHG sel	1	1	1			
REG CONT FINE ADJ 1 pot						
REG CONT FINE ADJ 2 pot						
REG CONT FINE ADJ 3 pot						
REG CONT FINE ADJ 4 pot	NOTE: Adjusted prior to launch for equal load sharing					
REG CONT FINE ADJ 5 pot						
REG CONT FINE ADJ 6 pot						
REG CONT FINE ADJ 7 pot						
REG CONT FINE ADJ 8 pot						
AM BUS 1 REG BUS 1 lt	off	off	off			
AM BUS 1 sw	ctr (reg bus 1)	ctr (reg bus 1)	ctr (reg bus 1)			
AM BUS 1 REG BUS 2 lt	off	off	off			
AM BUS 2 REG BUS 2 lt	off	off	off			
AM BUS 2 sw	ctr (reg bus 2)	ctr (reg bus 2)	ctr (reg bus2)			
AM BUS 2 REG BUS 1 lt	off	off	off			
OWS BUS 1 ON lt	off	off	off			
OWS BUS 1 sw	ctr (on)	ctr (on)	ctr (on)			
OWS BUS 1 OFF lt	off	off	off			
OWS BUS 2 ON lt	off	off	off			
OWS BUS 2 sw	ctr (on)	ctr (on)	ctr (on)			
OWS BUS 2 OFF lt	off	off	off			
ELEC GND CSM lt	off	off	off			
ELEC GND sw	ctr (AM)	ctr (CSM)	ctr (AM)			
ELEC GND AIRLOCK lt	off	off	off			
ATM/XFER TIE BUS 1 CLOSED lt	off	off	off			
ATM/XFER TIE BUS 1 sw	ctr (open) [closed]	ctr (closed)	ctr (closed)			
ATM/XFER TIE BUS 1 OPEN lt	off	off	off			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 206 (cont'd)						
ATM/XFER TIE BUS 2 CLOSED lt	off	off	off			
ATM/XFER TIE BUS 2 sw	ctr (open) [closed]	ctr (closed)	ctr (closed)			
ATM/XFER TIE BUS 2 OPEN lt	off	off	off			
REG/XFER TIE BUS 1 CLOSED lt	off	off	off			
REG/XFER TIE BUS 1 sw	ctr (open) [closed]	ctr (closed)	ctr (closed)			
REG/XFER TIE BUS 1 OPEN lt	off	off	off			
REG/XFER TIE BUS 2 CLOSED lt	off	off	off			
REG/XFER TIE BUS 2 sw	ctr (open) [closed]	ctr (closed)	ctr (closed)			
REG/XFER TIE BUS 2 OPEN lt	off	off	off			
EPS SHUNT REG BUS 1 CONN lt	off	off	off			
EPS SHUNT REG BUS 1 sw	ctr (conn)	ctr (conn)	ctr (conn)			
EPS SHUNT REG BUS 1 DISCON lt	off	off	off			
EPS SHUNT REG BUS 2 CONN lt	off	off	off			
EPS SHUNT REG BUS 2 sw	ctr (conn)	ctr (conn)	ctr (conn)			
EPS SHUNT REG BUS 2 DISCON lt	off	off	off			
PWR SYS LTS BUS 1 sw	OFF	OFF	OFF			
PWR SYS LTS BUS 2 sw	OFF	OFF	OFF			
C/W MASTER ALARM pb/lt	off	off	off			
C/W MEM RECALL pb/lt	off	off	off			
C/W [CLEAR] sw	down (off)	down (off)	down (off)			
C/W PWR CAUT & WARN sw	OFF	ON	OFF			
C/W PWR EMER 1 sw	OFF	ON	OFF			
C/W PWR EMER 2 sw	OFF	ON	OFF			
C/W TEST ΔP sw	OFF	OFF	OFF			
C/W TEST WARN sw	OFF	OFF	OFF			
C/W TEST FIRE sw	OFF	OFF	OFF			
C/W TEST CAUT sw	OFF	OFF	OFF			
TONE VOL EMER pot	Adjusted	as required	N/A			
TONE VOL WARN pot	prior to	as required	N/A			
TONE VOL CAUT pot	launch	as required	N/A			
Panel 207						
Control Panel						
LTG PNL sel	OFF	as required	OFF			
LTG METER sel	OFF	as required	OFF			
LTG STS FWD sel	OFF	as required	OFF			
LTG STS AFT sel	OFF	as required	OFF			
LTG MDA FWD [1•3] sw	ctr (off)	ctr (on)	ctr (off)			
LTG MDA FWD [2•4] sw	ctr (off)	ctr (on)	ctr (off)			
LTG MDA AFT [1•3] sw	ctr (off)	ctr (on)	ctr (off)			
LTG MDA AFT [2•4] sw	ctr (off)	ctr (on)	ctr (off)			
LTG TRACKING sw	CMD (off)	OFF	CMD (off)			
LTG DKG sw	CMD (off) [on]	OFF	CMD (off) [on]			
(SL-3,4)						

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 207 (cont'd)						
LTG STATUS sw	down (off)	down (off)	down (off)			
C/W RAPID ΔP lt	off	off	off			
C/W OWS FWD FIRE lt	off	off	off			
C/W EMER SNSR PWR lt	off	off	off			
C/W EMER PWR lt	off	off	off			
C/W REG BUS 1 HI lt	off	off	off			
C/W REG BUS 2 HI lt	off	off	off			
C/W SV TEMP HI lt	off	off	off			
C/W PRI COOL FLOW lt	off	off	off			
C/W SEC COOL FLOW lt	off	off	off			
C/W PRI COOL TEMP HI lt	off	off	off			
C/W SEC COOL TEMP HI lt	off	off	off			
C/W CSM lt	off	off	off			
C/W MDA/STS FIRE lt	off	off	off			
C/W OWS EXP FIRE lt	off	off	off			
C/W BAT CHG LO lt	off	off	off			
C/W REG BUS 1 LO lt	off	off	off			
C/W REG BUS 2 LO lt	off	off	off			
C/W PPO2 LO lt	off	off	off			
C/W SV OUT PPCO2 HI lt	off	off	off			
C/W SV FLOW lt	off	off	off			
C/W PRI COOL TEMP LO lt	off	off	off			
C/W SEC COOL TEMP LO lt	off	off	off			
C/W CREW ALERT lt	off	off	off			
C/W AM AFT FIRE lt	off	off	off			
C/W OWS CREW QTRS FIRE lt	off	off	off			
C/W OWS BUS 1 LO lt	off	off	off			
C/W OWS BUS 2 LO lt	off	off	off			
C/W OWS GAS INTERCHG lt	off	off	off			
C/W CLSTR PRESS LO lt	off	off	off			
C/W CNDST TANK ΔP lt	off	off	off			
C/W SV TMR lt	off	off	off			
C/W C/W PWR lt	off	off	off			
C/W EVA 1 lt	off	off	off			
C/W EVA 2 lt	off	off	off			
C/W CLSTR ATT lt	off	off	off			
C/W ACS MALF lt	off	off	off			
C/W CMPTR MALF lt	off	off	off			
C/W ATM BUS 1 LO lt	off	off	off			
C/W ATM BUS 2 LO lt	off	off	off			
C/W ATM CNST THERM lt	off	off	off			
RAPID ΔP 1 sw	inhbt	enbl	inhbt	NOTE		
OWS FWD FIRE 1 sw	inhbt	enbl	inhbt	Inhibit switches enbl parameters in		
EMER SNSR 1 sw	inhbt	enbl	inhbt	the up position		
EMER PWR 1 sw	inhbt	enbl	inhbt			
REG BUS 1 HI sw	inhbt	enbl	inhbt			
REG BUS 2 HI sw	inhbt	enbl	inhbt			
SV A TEMP sw	inhbt	enbl	inhbt			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 207 (cont'd)						
PRI COOL PUMP A sw	inhbt	enbl	inhbt			
SEC COOL PUMP A sw	inhbt	enbl	inhbt			
PRI COOL TEMP HI sw	inhbt	enbl	inhbt			
SEC COOL TEMP HI sw	inhbt	enbl	inhbt			
CSM 1 sw	inhbt	enbl	inhbt			
RAPID ΔP 2 sw	inhbt	enbl	inhbt			
OWS FWD FIRE 2 sw	inhbt	enbl	inhbt			
EMER SNSR 2 sw	inhbt	enbl	inhbt			
EMER PWR 2 sw	inhbt	enbl	inhbt			
REG BUS 1 LO sw	inhbt	enbl	inhbt			
REG BUS 2 LO sw	inhbt	enbl	inhbt			
SV B TEMP sw	inhbt	enbl	inhbt			
PRI COOL PUMP B sw	inhbt	enbl	inhbt			
SEC COOL PUMP B sw	inhbt	enbl	inhbt			
PRI COOL TEMP LO sw	inhbt	enbl	inhbt			
SEC COOL TEMP LO sw	inhbt	enbl	inhbt			
CSM 2 sw	inhbt	enbl	inhbt			
MDA/STS FIRE 1 sw	inhbt	enbl	inhbt			
OWS EXP FIRE 1 sw	inhbt	enbl	inhbt			
BAT CHG LO 1 sw	inhbt	enbl	inhbt			
BAT CHG LO 2 sw	inhbt	enbl	inhbt			
BAT CHG LO 3 sw	inhbt	enbl	inhbt			
BAT CHG LO 4 sw	inhbt	enbl	inhbt			
PPO2 CONT sw	inhbt	enbl	inhbt			
PRI COOL PUMP C sw	inhbt	enbl	inhbt			
SEC COOL PUMP C sw	inhbt	enbl	inhbt			
EVA 1 PUMP ΔP sw	inhbt	enbl	inhbt			
EVA 2 PUMP ΔP sw	inhbt	enbl	inhbt			
CREW ALERT 1 sw	inhbt	enbl	inhbt			
MDA/STS FIRE 2 sw	inhbt	enbl	inhbt			
OWS EXP FIRE 2 sw	inhbt	enbl	inhbt			
BAT CHG LO 5 sw	inhbt	enbl	inhbt			
BAT CHG LO 6 sw	inhbt	enbl	inhbt			
BAT CHG LO 7 sw	inhbt	enbl	inhbt			
BAT CHG LO 8 sw.	inhbt	enbl	inhbt			
PPO2 MON sw	inhbt	enbl	inhbt			
SV A PPCO2 sw	inhbt	enbl	inhbt			
SV A GAS FLOW sw	inhbt	enbl	inhbt			
EVA 1 H2O IN TEMP sw	inhbt	enbl	inhbt			
EVA 2 H2O IN TEMP sw	inhbt	enbl	inhbt			
CREW ALERT 2 sw	inhbt	enbl	inhbt			
AM AFT FIRE 1 sw	inhbt	enbl	inhbt			
OWS QTRS FIRE 1 sw	inhbt	enbl	inhbt			
OWS BUS 1 LO sw	inhbt	enbl	inhbt			
OWS BUS 2 LO sw	inhbt	enbl	inhbt			
OWS GAS INTERCHG sw	inhbt	enbl	inhbt			
CLSTR PRESS sw	inhbt	enbl	inhbt			
CNDSATE TANK ΔP sw	inhbt	enbl	inhbt			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 207 (cont'd)						
SV B PPCO2 sw	inhbt	enbl	inhbt			
SV B GAS FLOW sw	inhbt	enbl	inhbt			
AM AFT FIRE 2 sw	inhbt	enbl	inhbt			
OWS QTRS FIRE 2 sw	inhbt	enbl	inhbt			
ACS MALF CMG SAT sw	inhbt	enbl	inhbt			
CMPTR XOVER sw	inhbt	enbl	inhbt			
ATM BUS 1 LO sw	inhbt	enbl	inhbt			
ATM BUS 2 LO sw	inhbt	enbl	inhbt			
ATM CNST PUMP ΔP sw	inhbt	enbl	inhbt			
SV A TMR sw	inhbt	enbl	inhbt			
C/W PWR 1 sw	inhbt	enbl	inhbt			
CLSTR ATT HI RATE sw	inhbt	enbl	inhbt			
ACS MALF TACS ONLY sw	inhbt	enbl	inhbt			
CMPTR SELF TEST sw	inhbt	enbl	inhbt			
ATM CNST CLNT TEMP sw	inhbt	enbl	inhbt			
SV B TMR sw	inhbt	enbl	inhbt			
C/W PWR 2 sw	inhbt	enbl	inhbt			
CLSTR ATT THRUSTER STUCK sw	inhbt	enbl	inhbt			
ACS MALF RATE GYRO sw	inhbt	enbl	inhbt			
ATM CNST HTR TEMP sw	inhbt	enbl	inhbt			
C/W SIG COND sw	inhbt	enbl	inhbt			
Panel 208						
Control Panel						
PROT SPECT sw	CMD (on)	CMD (on)	CMD (on)			
Panel 209						
Control Panel						
TELEPRINT sw	OFF	CMD	OFF			
SLEW pb	released	released	released			
Panel 210						
PCG Control Schematic	----------	Not Applicable	----------			
Panel 211						
Bus Distribution Schematic	----------	Not Applicable	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 212						
Clock						
DISPLAY sw	OFF	ON	OFF			
BRIGHTNESS adj	Adjusted prior to launch	as required	N/A			
TIME REF SYS BUFFER sw	OFF	PRI (counting)	OFF			
TIME REF SYS 24 HR sw	ctr (off)	ctr (off)	ctr (off)			
DAY COUNT 100 sw	ctr (off)	ctr (off)	ctr (off)			
DAY COUNT 10 sw	ctr (off)	ctr (off)	ctr (off)			
DAY COUNT 1 sw	ctr (off)	ctr (off)	ctr (off)			
Panel 213						
Utility Power Outlet						
UTIL PWR 1 sw	OFF	OFF	OFF			
UTIL PWR outlet 1	capped	capped	capped			
Panel 214						
Utility Power Outlet						
UTIL PWR 2 sw	OFF	OFF	OFF			
UTIL PWR outlet 2	capped	capped	capped			
Panel 215	----------	Unassigned	----------			
Panel 216						
Condensate Panel						
CNDST CONT SYS VENT VLV sw	OFF	OFF	OFF			
CNDST CONT SYS VENT HTRS PRI lt	off	off	off			
CNDST CONT SYS VENT HTRS SEC lt	off	off	off			
CNDST CONT SYS VENT HTRS sw	OFF	OFF	OFF			
CNDST CONT SYS TANK ΔP ind	0.0 psid	4.8 to 5.2 psid	0.0 psid			
CNDST CONT SYS VENT TEMP ind	0.0°F	TBS	0.0°F			
CNDST TANK H2O vlv	FILL	FILL	FILL			
CNDST TANK PRESS vlv	PRESS	CLOSED	PRESS			
Panel 217						
Control Panel						
SUS 1 LSU PWR sw	OFF	OFF	OFF			
SUS 1 PUMP sw	OFF	OFF	OFF			
SUS 1 HX COOLANT FLOW sw	BYPASS	BYPASS	BYPASS			
SUS 1 HX COOLANT FLOW EVA lt (2)	off	off	off			
SUS 1 O2 SUP vlv	CLOSE	CLOSE	CLOSE			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 217 (cont'd)						
SUS 1 EVA CCU AUDIO CHAN A receptacle	capped	capped	capped			
SUS 1 O2 SUP qd	capped	capped	capped			
SUS 1 LCG INLET qd	——┐*	——┐*	——┐*	*Jumper hose installed		
SUS 1 LCG OUTLET qd	——┘	——┘	——┘			
SUS 2 LSU PWR sw	OFF	OFF	OFF			
SUS 2 PUMP sw	OFF	OFF	OFF			
SUS 2 HX COOLANT FLOW sw	BYPASS	BYPASS	BYPASS			
SUS 2 HX COOLANT FLOW EVA lt (2)	off	off	off			
SUS 2 O2 SUP vlv	CLOSE	CLOSE	CLOSE			
SUS 2 EVA CCU AUDIO CHAN B receptacle	capped	capped	capped			
SUS 2 O2 SUP qd	capped	capped	capped			
SUS 2 LCG INLET qd	——┐*	——┐*	——┐*	*Jumper hose installed		
SUS 2 LCG OUTLET qd	——┘	——┘	——┘			
Panel 218						
Molecular Sieve B Vent Valve						
MOL SV B VENT vlv	OPEN	CLOSE	CLOSE			
Panel 219						
Control Panel						
UTIL PWR 3 sw	OFF	OFF	OFF			
UTIL PWR outlet 3	capped	capped	capped			
MOL SV B BED CYCLE N2 SUP vlv	CLOSE	CLOSE	CLOSE			
Panel 220						
Molecular Sieve A Vent Valve						
MOL SV A VENT vlv	OPEN	OPEN	CLOSE			
Panel 221						
Control Panel						
UTIL PWR 4 sw	OFF	OFF	OFF			
UTIL PWR outlet 4	capped	capped	capped			
MOL SV A BED CYCLE N2 SUP vlv	CLOSE	OPEN	CLOSE			
Panel 222	----------Unassigned----------					

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 223						
LCG Reservoir Pressurization Valve						
SYS 1 LCG RES PRESS vlv	OPEN	OPEN	CLOSE			
Panel 224						
LCG Reservoir Pressurization Valve						
SYS 2 LCG RES PRESS vlv	OPEN	OPEN	CLOSE			
Panel 225						
O2/N2 Control Panel						
O2 BOTTLES (PSI X 10) ind	0.0 psia	0.0 psia	0.0 psia			
O2 BOTTLES (°F) ind	-25°F	-25°F	-25°F			
O2 BOTTLES ind sel	OFF	OFF	OFF			
O2 BOTTLES PRI sw	CMD (closed) [open]	OPEN	CMD (closed) [open]			
O2 BOTTLES SEC sw	CMD (closed) [open]	OPEN	CMD (closed) [open]			
N2 BOTTLES PRI sw	CMD (closed) [open]	OPEN	CMD (closed) [open]			
N2 BOTTLES SEC sw	CMD (closed) [open]	OPEN	CMD (closed) [open]			
N2 BOTTLES (PSI X 10) ind	0.0 psia	0.0 psia	0.0 psia			
N2 BOTTLES (°F) ind	-25°F	-25°F	-25°F			
N2 BOTTLES ind sel	OFF	OFF	OFF			
120 PSI REG A tgl vlv	OPEN	OPEN	OPEN			
120 PSI REG B tgl vlv	OPEN	OPEN	OPEN			
REG O2 ind	0.0 psia	115 to 135 psia	0.0 psia			
REG N2 ind	0.0 psia	145 to 165 psia	0.0 psia			
150 PSI REG A tgl vlv	OPEN	OPEN	OPEN			
150 PSI REG B tgl vlv	OPEN	OPEN	OPEN			
OWS N2 vlv	CLOSE	OPEN	CLOSE			
5 PSI REG A tgl vlv	CLOSE	OPEN	CLOSE			
5 PSI REG B tgl vlv	CLOSE	OPEN	CLOSE			
O2 FILL PRI sw	CMD (closed)	CLOSE	CMD (closed)			
O2 FILL SEC sw	CMD (closed)	CLOSE	CMD (closed)			
N2 FILL PRI sw	CMD (closed)	CLOSE	CMD (closed)			
N2 FILL SEC sw	CMD (closed)	CLOSE	CMD (closed)			
CAL vlv	CLOSE	CLOSE	CLOSE			
CAB PRESS REG A tgl vlv	CLOSE	OPEN	CLOSE			
CAB PRESS REG B tgl vlv	CLOSE	OPEN	CLOSE			
[PRI/OFF/SEC] N2 vlv sel	OFF	PRI	OFF			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 225 (cont'd)						
PRESS OWS ind	0.0 psia	4.8 to 5.2 psia	0.0 psia			
PRESS FWD ind	0.0 psid	4.8 to 5.2 psid	0.0 psid			
PRESS LOCK ind	0.0 psid	4.8 to 5.2 psid	0.0 psid			
PRESS AFT ind	0.0 psid	4.8 to 5.2 psid	0.0 psid			
O2/N2 CONTR PPO2 1 ind	3.0 psia	3.3 to 3.9 psia	3.3 to 3.9 psia			
O2/N2 CONTR PPO2 2 ind	3.0 psia	3.3 to 3.9 psia	3.3 to 3.9 psia			
O2/N2 CONTR PPO2 3 ind	0.0 psia	0.0 psia	0.0 psia			
O2/N2 CONTR sel	1	1	1			
O2/N2 CONTR MON sel	2	2	2			
OWS FILL PRI sw	CMD (closed)	CLOSE	CMD (closed)			
OWS FILL SEC sw	CMD (closed)	CLOSE	CMD (closed)			
AM FILL PRI sw	CMD (closed)	CLOSE	CMD (closed)			
AM FILL SEC sw	CMD (closed)	CLOSE	CMD (closed)			
O2 sensor cover	closed	open	open			
Panel 226						
Molecular Sieve A Valve Control Panel						
SOLENOID SWITCHES S1 sw	OFF	AUTO	OFF			
SOLENOID SWITCHES S2 sw	OFF	OFF	OFF			
SOLENOID SWITCHES S3 sw	OFF	OFF	OFF			
SOLENOID SWITCHES S4 sw	OFF	AUTO	OFF			
Man interconnect V1 vlv	A	A	A			
Man interconnect V2 vlv	A	A	A			
Man interconnect V3 vlv	A	A	A			
Man interconnect V4 vlv	A	A	A			
Panel 227						
Molecular Sieve B Valve Control Panel						
SOLENOID SWITCHES S1 sw	OFF	OFF	OFF			
SOLENOID SWITCHES S2 sw	OFF	OFF	OFF			
SOLENOID SWITCHES S3 sw	OFF	OFF	OFF			
SOLENOID SWITCHES S4 sw	OFF	OFF	OFF			
Man interconnect V1 vlv	A	A	A			
Man interconnect V2 vlv	A	A	A			
Man interconnect V3 vlv	A	A	A			
Man interconnect V4 vlv	A	A	A			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 228						
Molecular Sieve A Bed Valves						
BED 1 man vlv	STORAGE	ADSORB *	STORAGE			
BED 1 pos ind	STORAGE	ADSORB *	STORAGE			
BED 2 man vlv	STORAGE	DESORB *	STORAGE			
BED 2 pos ind	STORAGE	DESORB *	STORAGE			
*The mol sv bed vlv will cycle automatically	between the adsorb and desorb positions					
Panel 229						
Molecular Sieve B Bed Valves						
BED 1 man vlv	STORAGE	STORAGE	STORAGE			
BED 1 pos ind	STORAGE	STORAGE	STORAGE			
BED 2 man vlv	STORAGE	STORAGE	STORAGE			
BED 2 pos ind	STORAGE	STORAGE	STORAGE			
Panel 230						
Mol Sv A Ht Exch Vlv Pnl						
PRI CLNT HT EXCH B vlv	CLOSE	CLOSE	CLOSE			
SEC CLNT HT EXCH B vlv	CLOSE	CLOSE	CLOSE			
Ht Exch A Cndst Isolation vlv	OPEN	OPEN	OPEN			
Ht Exch B Cndst Isolation vlv	OPEN	CLOSE	OPEN			
Panel 231	----------Unassigned----------					
Panel 232						
Mol Sv B Ht Exch Vlv Pnl						
PRI CLNT HT EXCH B vlv	CLOSE	CLOSE	CLOSE			
SEC CLNT HT EXCH B vlv	CLOSE	CLOSE	CLOSE			
Ht Exch A Cndst Isolation vlv	OPEN	OPEN	OPEN			
Ht Exch B Cndst Isolation vlv	OPEN	CLOSE	OPEN			
Panel 233						
Mol Sv A Air Flow Vlv Pnl						
CONDENSING HT EXCH AIR FLOW vlv	A	A	A			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 234						
MDA/OWS Air Selector Valve						
[OWS/BOTH/MDA] vlv	BOTH	OWS	BOTH			
Panel 235						
ATM Coolant Reservoir Pressurization Valve						
ATM CLNT RES PRESS vlv	OPEN	OPEN	CLOSE			
Panel 236						
Mol Sieve A Fire Sensor Control Panel	----------	See Panel 120	----------			
Panel 237						
Mol Sieve B Fire Sensor Control Panel	----------	See Panel 120	----------			
Panel 238						
AM/Circ Fans/Ht Exch Fire Sensor Control Panel	----------	See Panel 120	----------			
Panel 239						
Mol Sv B Air Flow Vlv Pnl						
CONDENSING HT EXCH AIR FLOW vlv	A	A	A			
Panel 240	----------	Unassigned	----------			
Panel 241						
STS +Z Window						
Crank WINDOW VENT vlv	full ccw (closed) SEAL	full ccw (closed) SEAL	full ccw (closed) SEAL			
Panel 242						
STS +Y Window						
Crank WINDOW VENT vlv	full ccw (closed) SEAL	full ccw (closed) SEAL	full ccw (closed) SEAL			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 243						
STS -Z Window						
Crank WINDOW VENT vlv	full ccw (closed) SEAL	full ccw (closed) SEAL	full ccw (closed) SEAL			
Panel 244						
STS -Y Window						
Crank WINDOW VENT vlv	full ccw (closed) SEAL	full ccw (closed) SEAL	full ccw (closed) SEAL			
Panel 245 - 299	----------	--Unassigned--	----------			
AM Forward Compartment						
Panel 300						
Forward Compartment Pressure Relief Valve						
CABIN PRESS RELIEF VLV	OPEN	OPEN	OPEN			
Panel 301 - 310	----------	--Unassigned--	----------			
AM Lock Compartment						
Panel 311						
Forward Hatch						
Press Equal vlv	OPEN (uncapped)	OPEN (uncapped)	OPEN (uncapped)			
Panel 312						
Forward Hatch Handle	CLOSE	OPEN	OPEN			
Panel 313						
Lock Compartment Pressure Relief Valve						
CABIN PRESS RELIEF VLV	OPEN	OPEN	OPEN			
Panel 314 - 315	----------	--Unassigned--	----------			
Panel 316						
Control Panel						
PRESS LOCK ind	0.0 psid	4.8 to 5.2 psid	0.0 psid			
PRESS AFT ind	0.0 psid	4.8 to 5.2 psid	0.0 psid			
PRESS OWS ind	0.0 psia	4.8 to 5.2 psia	0.0 psia			
PRESS O2 ind	0.0 psia	115 to 135 psia	0.0 psia			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 316 (cont'd)						
LTG METER sw (lever lock)	OFF	as required	OFF			
LTG LOCK sw (lever lock)	OFF	as required	OFF			
LTG EVA AM sw (lever lock)	OFF	OFF	OFF			
LTG EVA DA sw (lever lock)	OFF	OFF	OFF			
LTG EVA ATM sw (lever lock)	OFF	OFF	OFF			
VOICE sw (lever lock)	ctr (OFF)	ctr (OFF)	ctr (OFF)			
VOICE lt	off	off	off			
UTIL PWR 6 sw (lever lock)	OFF	OFF	OFF			
UTIL outlet 6	capped	capped	capped			
VACUUM SOURCE VLV	CLOSE	CLOSE	CLOSE			
Panel 317						
Control Panel						
SUS 1 LSU PWR sw (lever lock)	OFF	OFF	OFF			
SUS 1 PUMP sw (lever lock)	OFF	OFF	OFF			
SUS 1 O2 SUP vlv	CLOSE	CLOSE	CLOSE			
SUS 1 EVA CCU AUDIO CHAN A receptacle	capped	capped	capped			
SUS 1 O2 SUP qd	capped	capped	capped			
SUS 1 LCG INLET qd	capped	capped	capped			
SUS 1 LCG OUTLET qd	capped	capped	capped			
SUS 2 LSU PWR sw (lever lock)	OFF	OFF	OFF			
SUS 2 O2 SUP vlv	CLOSE	CLOSE	CLOSE			
SUS 2 EVA CCU AUDIO CHAN B receptacle	capped	capped	capped			
SUS 2 O2 SUP qd	capped	capped	capped			
SUS 2 LCG INLET qd	capped	capped	capped			
SUS 2 LCG OUTLET qd	capped	capped	capped			
Panel 318						
Lock Compartment Depressurization Valve						
LOCK COMPT DEPRESS VLV	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
Panel 319						
EVA Hatch						
Handle	CLOSE (unlocked)	CLOSE(locked)	CLOSE (locked)			
WINDOW VENT vlv	SEAL	SEAL	SEAL			
Panel 320						
Television Station	----------	See Panel 133	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 321						
Extendible Boom Control Panel						
EXTENDIBLE BOOM CTR sw	OFF	OFF	OFF			
EXTENDIBLE BOOM SUN END sw	OFF	OFF	OFF			
Panel 322	----------	Unassigned	----------			
Panel 323						
Control Panel						
SUS 1 LSU PWR sw (lever lock)	OFF	OFF	OFF			
SUS 1 O2 SUP vlv	CLOSE	CLOSE	CLOSE			
SUS 1 EVA CCU AUDIO CHAN A receptacle	capped	capped	capped			
SUS 1 O2 SUP qd	capped	capped	capped			
SUS 1 LCG INLET qd	capped	capped	capped			
SUS 1 LCG OUTLET qd	capped	capped	capped			
SUS 2 LSU PWR sw (lever lock)	OFF	OFF	OFF			
SUS 2 PUMP sw (lever lock)	OFF	OFF	OFF			
SUS 2 O2 SUP VLV	CLOSE	CLOSE	CLOSE			
SUS 2 EVA CCU AUDIO CHAN B receptacle	capped	capped	capped			
SUS 2 O2 SUP qd	capped	capped	capped			
SUS 2 LCG INLET qd	capped	capped	capped			
SUS 2 LCG OUTLET qd	capped	capped	capped			
Panel 324	----------	Unassigned	----------			
Panel 325						
Aft Hatch						
Press Equal vlv	OPEN (uncapped)	OPEN (uncapped)	OPEN (uncapped)			
Panel 326						
Aft Hatch Handle	CLOSE	OPEN	OPEN			
Panel 327 - 389	----------	Unassigned	----------			
EVA Hatch Retainer Cover	installed	removed	removed			
AM Aft Compartment						
Panel 390						
Control Panel						
M509 BOTTLE RECHG UMB VENT vlv	CLOSE	CLOSE	CLOSE			
M509 BOTTLE RECHG FILL vlv	CLOSE	CLOSE	CLOSE			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 390 (cont'd)						
M509 BOTTLE RECHG N2 supply 1-2 vlv	CLOSE	CLOSE	CLOSE			
M509 BOTTLE RECHG N2 supply 3-6 vlv	CLOSE	CLOSE	CLOSE			
LTS OWS ENTRY sw	OFF	OFF	OFF			
LTS AFT sw	OFF	as required	OFF			
OWS HT EXCH FANS 1 sw	OFF	OWS	OFF			
OWS HT EXCH FANS 2 sw	OFF	OWS	OFF			
OWS HT EXCH FANS 3 sw	OFF	OWS	OFF			
OWS HT EXCH FANS 4 sw	OFF	OWS	OFF			
UTIL PWR 5 sw	OFF	OFF	OFF			
UTIL outlet 5	capped	capped	capped			
Panel 391						
Aft Compartment Pressure Relief Valve						
CABIN PRESS RELIEF VLV	OPEN	OPEN	OPEN			
Panel 392						
OWS Ht Exch Fan Fire Sensor Control Panel	----------	See Panel 120	----------			
Panel 393						
Condensate Dump Port	capped	Dump Hose connected	Dump Hose connected			
Panel 394 - 399	----------	Unassigned	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Dome						
Panel 400						
OWS Hatch						
HATCH HANDLE	CLOSE	OPEN	OPEN			
RELEASE HANDLE	LOCK	LOCK	LOCK			
Panel 401						
Intercom Box	----------	See Panel 102	----------			
Panel 402						
Power Outlet						
UTIL OUTLETS 1	capped	capped	capped			
UTIL OUTLETS 2	capped	capped	capped			
HI PWR ACC OUTLETS 1	capped	capped	capped			
HI PWR ACC OUTLETS 2	capped	capped	capped			
Panel 403						
Solenoid Vent Port						
vent sealing device	stowed (latch/ closed)	installed (latch/ closed)	stowed (latch/ closed)			
Panel 404						
Television Station	----------	See Panel 133	----------			
Panel 405						
Pneumatic Vent Port						
vent sealing device	stowed (latch/ closed)	installed (latch/ closed)	installed (latch/ closed)			
Panel 406 - 499	----------	Unassigned	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Forward Compartment						
Panel 500						
Control Panel						
PRESS BLEED vlv	CLOSE	CLOSE	CLOSE			
150 PSI N2 SUP vlv	OPEN	OPEN	OPEN			
35 PSI REG A tgl vlv	CLOSE	OPEN	CLOSE			
35 PSI REG B tgl vlv	CLOSE	OPEN	CLOSE			
ESS/M171 SUP vlv	CLOSE	OPEN	CLOSE			
150 PSI N2 port	capped	capped	capped			
35 PSI N2 PORTABLE WATER TANK PRESS port	capped	capped	capped			
Panel 501 - 516	----------	Unassigned	----------			
Panel 517						
Scientific Airlock (+Z)						
SAL PRESS vlv	CLOSE	CLOSE	CLOSE			
SAL press ind	14.7 psia	4.8 to 5.2 psia	4.8 to 5.2 psia			
HANDLE RELEASE	EXP LOCK	EXP LOCK	EXP LOCK			
DOOR crank lock	LOCKED	LOCKED	LOCKED			
DOOR crank	CLOSE	CLOSE	CLOSE			
Panel 518						
Power Outlet						
+Z SAL OUTLETS PWR 1	capped	capped	capped			
+Z SAL OUTLETS PWR 2	capped	capped	capped			
+Z SAL OUTLETS INST	capped	capped	capped			
Panel 519	----------	Unassigned	----------			
Panel 520						
Intercom Box	----------	See Panel 102	----------			
Panel 521						
Power Outlet						
UTIL OUTLETS 1	capped	capped	capped			
UTIL OUTLETS 2	capped	capped	capped			
HI PWR ACC OUTLET 1	capped	capped	capped			
HI PWR ACC OUTLET 2	capped	capped	capped			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 522						
Experiment T020	----------Ref SLEOH----------					
Panel 523						
Experiment M509	----------Ref SLEOH----------					
Panel 524						
Experiment T027	----------Ref SLEOH----------					
Panel 525						
Experiment S020	----------Ref SLEOH----------					
Panel 526	----------Unassigned----------					
Panel 527						
Experiment M172	----------Ref SLEOH----------					
Panel 528	----------Unassigned----------					
Panel 529						
Fire Sensor Control Panel	----------See Panel 120----------					
Panel 530						
Fire Sensor Control Panel						
SNSR 1 lt	off	off	off			
SNSR 1 sw	BUS 1 (off)	BUS 1	BUS 1 (off)			
[MASTER ALARM RESET/TEST] sw	ctr (off)	ctr (off)	ctr (off)	NOTE		
SNSR 2 lt	off	off	off	Only sensor 1 is functional on this panel		
SNSR 2 sw	OFF	OFF	OFF	SNSR 2 sw is covered by switch guard		
Panel 531						
Power Outlet						
UTIL OUTLETS 3	capped	capped	capped			
UTIL OUTLETS 4	capped	capped	capped			
HI PWR ACC OUTLETS 3	capped	capped	capped			
HI PWR ACC OUTLETS 4	capped	capped	capped			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 532 - 533	----------	Unassigned	----------			
Panel 534						
Experiment T013	----------	Ref SLEOH	----------			
Panel 535 - 539	----------	Unassigned	----------			
Panel 540						
Intercom Box	----------	See Panel 102	----------			
Panel 541	----------	Unassigned	----------			
Panel 542						
Control Panel						
TAPE RCDRS EXP 1 lt	off	off	off			
TAPE RCDRS EXP 2 lt	off	off	off			
TAPE RCDRS EXP 1 sw	ctr (off)	ctr (off)	ctr (off)			
TAPE RCDRS EXP 2 sw	ctr (off)	ctr (off)	ctr (off)			
LAMP TEST sw	down (off)	down (off)	down (off)			
Panel 543						
Scientific Airlock (-Z)						
SAL PRESS vlv (SL-3,4)	CLOSE	CLOSE	VENT			
(SL-4)		VENT	CLOSE			
SAL press ind (SL-3,4)	14.7 psia	4.8 to 5.2 psia	0.0 psia			
(SL-4)		0.0 psia	4.8 to 5.2 psia			
HANDLE RELEASE	EXP LOCK	EXP LOCK	EXP LOCK			
DOOR crank lock	LOCKED	LOCKED	LOCKED			
DOOR crank (SL-3,4)	CLOSE	CLOSE	OPEN			
(SL-4)		OPEN	CLOSE			
Panel 544						
Power Outlet						
-Z SAL OUTLETS PWR 1	capped	capped	capped			
-Z SAL OUTLETS PWR 2	capped	capped	capped			
-Z SAL OUTLETS INST	capped	capped	capped			
-Z SAL OUTLETS S063 UV SYNC	capped	capped	capped			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 545						
Experiment SO19	----------	Ref SLEOH	----------			
Panel 546 - 550	----------	Unassigned	----------			
Panel 551						
Power Outlet						
UTIL OUTLETS 5	capped	capped	capped			
UTIL OUTLETS 6	capped	capped	capped			
HI PWR ACC OUTLETS 5	capped	capped	capped			
HI PWR ACC OUTLETS 6	capped	capped	capped			
Panel 552 - 554	----------	Unassigned	----------			
Panel 555						
Television Station	----------	See Panel 133	----------			
Panel 556 - 599	----------	Unassigned	----------			
Experiment Compartment						
Panel 600						
Intercom Box	----------	See Panel 102	----------			
Panel 601						
Power Outlet						
UTIL OUTLETS 1	capped	capped	capped			
UTIL OUTLETS 2	capped	capped	capped			
Panel 602 - 606	----------	Unassigned	----------			
Panel 607						
Flare Alert Panel						
FLARE ALERT sw	OFF	ON	OFF			
FLARE ALERT VOL cont	Adjusted prior to launch	as required	N/A			
Panel 608 - 609	----------	Unassigned	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 610						
Clock						
DISPLAY sw	OFF	ON	OFF			
BRIGHTNESS adj	Adjusted prior to launch	as required	N/A			
Panel 611						
Circuit Breaker Panel						
cb RS PRI LOOP PWR FEEDERS 1	closed	closed	closed			
cb RS PRI LOOP PWR FEEDERS 2	closed	closed	closed			
cb RS PRI LOOP PWR FEEDERS 3	closed	closed	closed			
cb RS PRI LOOP PWR FEEDERS 4	closed	closed	closed			
cb RS SEC LOOP PWR FEEDERS 1	closed	closed	closed			
cb RS SEC LOOP PWR FEEDERS 2	closed	closed	closed			
cb RS SEC LOOP PWR FEEDERS 3	closed	closed	closed			
cb RS SEC LOOP PWR FEEDERS 4	closed	closed	closed			
cb RS PRI LOOP CONTRS REGEN HTR	closed	closed	closed			
cb RS PRI LOOP CONTRS RAD BYPS VLV	closed	closed	closed			
cb RS PRI LOOP LOGIC	closed	closed	closed			
cb RS PRI LOOP PUMP INV	closed	closed	closed			
cb RS SEC LOOP CONTRS REGEN HTR	closed	closed	closed			
cb RS SEC LOOP CONTRS RAD BYPS VLV	closed	closed	closed			
cb RS SEC LOOP LOGIC	closed	closed	closed			
cb RS SEC LOOP PUMP INV	closed	closed	closed			
Panel 612						
Circuit Breaker Panel						
cb TV OUTLETS FWD COMPT	OPEN	closed	OPEN			
cb TV OUTLETS EXP COMPT	OPEN	closed	OPEN			
cb TV OUTLETS DOME	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS DOME 1	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS UPPER WALL 1	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS UPPER WALL 3	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS UPPER WALL 5	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS DOME 2	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS UPPER WALL 2	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS UPPER WALL 4	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS UPPER WALL 6	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS WMC 1	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS EXP COMPT 1	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS WMC 2	OPEN	closed	OPEN			
cb HI PWR ACC OUTLETS EXP COMPT 2	OPEN	closed	OPEN			
cb UTIL OUTLETS DOME 1	OPEN	closed	OPEN			
cb UTIL OUTLETS DOME 2	OPEN	closed	OPEN			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 612 (cont'd)						
cb UTIL OUTLETS UPPER WALL 1	OPEN	closed	OPEN			
cb UTIL OUTLETS UPPER WALL 3	OPEN	closed	OPEN			
cb UTIL OUTLETS UPPER WALL 5	OPEN	closed	OPEN			
cb UTIL OUTLETS UPPER WALL 2	OPEN	closed	OPEN			
cb UTIL OUTLETS UPPER WALL 4	OPEN	closed	OPEN			
cb UTIL OUTLETS UPPER WALL 6	OPEN	closed	OPEN			
cb UTIL OUTLETS WMC 1	OPEN	closed	OPEN			
cb UTIL OUTLETS EXP COMPT 1	OPEN	closed	OPEN			
cb UTIL OUTLETS EXP COMPT 3	OPEN	closed	OPEN			
cb UTIL OUTLETS EXP COMPT 5	OPEN	closed	OPEN			
cb UTIL OUTLETS WARDRM 1	OPEN	closed	OPEN			
cb UTIL OUTLETS WMC 2	OPEN	closed	OPEN			
cb UTIL OUTLETS EXP COMPT 2	OPEN	closed	OPEN			
cb UTIL OUTLETS EXP COMPT 4	OPEN	closed	OPEN			
cb UTIL OUTLETS EXP COMPT 6	OPEN	closed	OPEN			
cb UTIL OUTLETS WARDRM 2	OPEN	closed	OPEN			
Panel 613						
Circuit Breaker Panel						
cb LTG UPPER WALL 1	OPEN	closed	OPEN			
cb LTG UPPER WALL 3	OPEN	closed	OPEN			
cb LTG UPPER WALL 5	OPEN	closed	OPEN			
cb LTG UPPER WALL 7	OPEN	closed	OPEN			
cb LTG UPPER WALL 9	OPEN	closed	OPEN			
cb LTG DOME 1	OPEN	closed	OPEN			
cb LTG DOME 3	OPEN	closed	OPEN			
cb LTG DOME 5	OPEN	closed	OPEN			
cb LTG DOME 7	OPEN	closed	OPEN			
cb LTG BUS 1 EMER LT VOLTAGE SNSR	closed	closed	closed			
cb LTG UPPER WALL 2	OPEN	closed	OPEN			
cb LTG UPPER WALL 4	OPEN	closed	OPEN			
cb LTG UPPER WALL 6	OPEN	closed	OPEN			
cb LTG UPPER WALL 8	OPEN	closed	OPEN			
cb LTG UPPER WALL 10	OPEN	closed	OPEN			
cb LTG DOME 2	OPEN	closed	OPEN			
cb LTG DOME 4	OPEN	closed	OPEN			
cb LTG DOME 6	OPEN	closed	OPEN			
cb LTG DOME 8	OPEN	closed	OPEN			
cb LTG BUS 2 EMER LT VOLTAGE SNSR	closed	closed	closed			
cb LTG EXP COMPT 1	OPEN	closed	OPEN			
cb LTG EXP COMPT 3	OPEN	closed	OPEN			
cb LTG EXP COMPT 5	OPEN	closed	OPEN			
cb LTG EXP COMPT 7	OPEN	closed	OPEN			
cb LTG EXP COMPT 9	OPEN	closed	OPEN			
cb LTG EXP COMPT 11	OPEN	closed	OPEN			
cb LTG EXP COMPT 13	OPEN	closed	OPEN			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 613 (cont'd)						
cb LTG WARDRM 1	OPEN	closed	OPEN			
cb LTG WARDRM 3	OPEN	closed	OPEN			
cb LTG WMC 1	OPEN	closed	OPEN			
cb LTG WMC 3	OPEN	closed	OPEN			
cb LTG SLEEP COMPT 1	OPEN	closed	OPEN			
cb LTG SLEEP COMPT 3	OPEN	closed	OPEN			
cb LTG EXP COMPT 2	OPEN	closed	OPEN			
cb LTG EXP COMPT 4	OPEN	closed	OPEN			
cb LTG EXP COMPT 6	OPEN	closed	OPEN			
cb LTG EXP COMPT 8	OPEN	closed	OPEN			
cb LTG EXP COMPT 10	OPEN	closed	OPEN			
cb LTG EXP COMPT 12	OPEN	closed	OPEN			
cb LTG EXP COMPT 14	OPEN	closed	OPEN			
cb LTG WARDRM 2	OPEN	closed	OPEN			
cb LTG WARDRM 4	OPEN	closed	OPEN			
cb LTG WMC 2	OPEN	closed	OPEN			
cb LTG SLEEP COMPT 2	OPEN	closed	OPEN			
cb C/W LO VOLTAGE SENSE 1	closed	closed	closed			
cb C/W LO VOLTAGE SENSE 2	closed	closed	closed			
cb DISP BUS 1 DISP PWR/RCDR CONT	OPEN	closed	OPEN			
cb DISP BUS 1 LAMP TEST	OPEN	closed	OPEN			
cb DISP GMT CLOCK	OPEN	closed	OPEN			
cb DISP BUS 2 DISP PWR/RCDR CONT	OPEN	closed	OPEN			
cb DISP BUS 2 LAMP TEST	OPEN	closed	OPEN			
cb DISP FLARE ALERT	OPEN	closed	OPEN			
cb EXPS BUS 1 ESS	closed	closed	closed			
cb EXPS SAL -Z OUTLET 1	OPEN	closed	closed			
cb EXPS SAL +Z OUTLET 1	OPEN	closed	OPEN			
cb EXPS WMC SMMD	OPEN	closed	OPEN			
cb EXPS BUS 2 ESS	OPEN	closed	OPEN			
cb EXPS SAL -Z OUTLET 2	OPEN	closed	OPEN			
cb EXPS SAL +Z OUTLET 2	OPEN	closed	OPEN			
cb EXPS WARDRM SMMD	OPEN	closed	OPEN			
cb EXPS M131 CHAIR	OPEN	closed	OPEN			
cb EXPS M172 BMMD	OPEN	closed	OPEN			
cb EXPS T013	OPEN	OPEN	OPEN			
cb spare	open	open	open			
cb EXPS M509	OPEN	closed	OPEN			
Panel 614						
Circuit Breaker Panel						
cb HSS BUS 1 WATER TANK HTRS 1	closed	closed	closed			
cb HSS BUS 1 WATER TANK HTRS 2	closed	closed	closed			
cb HSS BUS 1 WATER TANK HTRS 3	closed	closed	closed			
cb HSS BUS 1 WATER TANK HTRS 4	closed	closed	closed			
cb HSS BUS 1 WATER TANK HTRS 5	closed	closed	closed			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 614 (cont'd)						
cb HSS BUS 1 WATER TANK HTRS 6	closed	closed	closed			
cb HSS BUS 1 WATER TANK HTRS 7	closed	closed	closed			
cb HSS BUS 1 WATER TANK HTRS 8	closed	closed	closed			
cb HSS BUS 1 WATER TANK HTRS 9	closed	closed	closed			
cb HSS BUS 1 WATER TANK HTRS 10	closed	closed	closed			
cb HSS WMC BLWR OUTLET 1	OPEN	closed	OPEN			
cb HSS BUS 2 WATER TANK HTRS 1	closed	closed	closed			
cb HSS BUS 2 WATER TANK HTRS 2	closed	closed	closed			
cb HSS BUS 2 WATER TANK HTRS 3	closed	closed	closed			
cb HSS BUS 2 WATER TANK HTRS 4	closed	closed	closed			
cb HSS BUS 2 WATER TANK HTRS 5	closed	closed	closed			
cb HSS BUS 2 WATER TANK HTRS 6	closed	closed	closed			
cb HSS BUS 2 WATER TANK HTRS 7	closed	closed	closed			
cb HSS BUS 2 WATER TANK HTRS 8	closed	closed	closed			
cb HSS BUS 2 WATER TANK HTRS 9	closed	closed	closed			
cb HSS BUS 2 WATER TANK HTRS 10	closed	closed	closed			
cb HSS WMC BLWR OUTLET 2	OPEN	OPEN	OPEN			
cb HSS BUS 1 DUMP HTRS WARDRM H20	OPEN	closed	OPEN			
cb HSS BUS 1 DUMP HTRS WMC H20	OPEN	closed	OPEN			
cb HSS BUS 1 DUMP HTRS URINE	OPEN	closed	OPEN			
cb HSS WARDRM H20 HTR	OPEN	closed	OPEN			
cb HSS BUS 1 FOOD TRAYS 1	OPEN	closed	OPEN			
cb HSS BUS 1 FOOD TRAYS 2	OPEN	closed	OPEN			
cb HSS BUS 1 FOOD TRAYS 3	OPEN	closed	OPEN			
cb HSS BUS 1 WASTE PROCESSORS [1/2]	OPEN	closed	OPEN			
cb HSS BUS 1 WASTE PROCESSORS [3/4]	OPEN	closed	OPEN			
cb HSS BUS 1 WASTE PROCESSORS [5/6]	OPEN	closed	OPEN			
cb HSS BUS 1 WASTE TANK VENT HTRS +Z	OPEN	closed	closed			
cb HSS BUS 1 WASTE TANK VENT HTRS -Z	OPEN	closed	closed			
cb HSS BUS 2 DUMP HTRS WARDRM H20	OPEN	closed	OPEN			
cb HSS BUS 2 DUMP HTRS WMC H20	OPEN	closed	OPEN			
cb HSS BUS 2 DUMP HTRS URINE	OPEN	closed	OPEN			
cb HSS WMC H20 HTR	OPEN	closed	OPEN			
cb HSS BUS 2 FOOD TRAYS 1	OPEN	OPEN	OPEN			
cb HSS BUS 2 FOOD TRAYS 2	OPEN	OPEN	OPEN			
cb HSS BUS 2 FOOD TRAYS 3	OPEN	OPEN	OPEN			
cb HSS BUS 2 WASTE PROCESSORS [1/2]	OPEN	closed	OPEN			
cb HSS BUS 2 WASTE PROCESSORS [3/4]	OPEN	closed	OPEN			
cb HSS BUS 2 WASTE PROCESSORS [5/6]	OPEN	closed	OPEN			
cb HSS BUS 2 WASTE TANK VENT HTRS +Z	OPEN	closed	closed			
cb HSS BUS 2 WASTE TANK VENT HTRS -Z	OPEN	closed	closed			
cb TCS BUS 1 WINDW HTR	OPEN	closed	OPEN			
cb TCS BUS 1 WMC FAN	OPEN	closed	OPEN			
cb TCS DUCT 1 FANS 1	OPEN	closed	OPEN			
cb TCS DUCT 1 FANS 2	OPEN	closed	OPEN			
cb TCS DUCT 1 FANS 3	OPEN	closed	OPEN			
cb TCS DUCT 1 FANS 4	OPEN	closed	OPEN			
cb TCS BUS 1 DUCT 3 FANS [1/2]	OPEN	closed	OPEN			
cb TCS BUS 1 DUCT 3 FANS [3/4]	OPEN	closed	OPEN			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 614 (cont'd)						
cb TCS BUS 2 WINDW HTR	OPEN	closed	OPEN			
cb TCS BUS 2 WMC FAN	OPEN	closed	OPEN			
cb TCS DUCT 2 FANS 1	OPEN	closed	OPEN			
cb TCS DUCT 2 FANS 2	OPEN	closed	OPEN			
cb TCS DUCT 2 FANS 3	OPEN	closed	OPEN			
cb TCS DUCT 2 FANS 4	OPEN	closed	OPEN			
cb TCS BUS 2 DUCT 3 FANS [1/2]	OPEN	closed	OPEN			
cb TCS BUS 2 DUCT 3 FANS [3/4]	OPEN	closed	OPEN			
cb TCS BUS 1 LOGIC	OPEN	closed	OPEN			
cb TCS DUCT 1 HTRS MAN [1•3]	OPEN	closed	OPEN			
cb TCS DUCT 1 HTRS MAN [2•4]	OPEN	closed	OPEN			
cb TCS DUCT 1 HTRS AUTO [1•3]	OPEN	closed	OPEN			
cb TCS DUCT 1 HTRS AUTO [2•4]	OPEN	closed	OPEN			
cb TCS BUS 1 DUCT 3 HTRS [1•3]	OPEN	closed	OPEN			
cb TCS BUS 1 DUCT 3 HTRS [2•4]	OPEN	closed	OPEN			
cb TCS HT EXCH FANS 1	OPEN	closed	OPEN			
cb TCS HT EXCH FANS 3	OPEN	closed	OPEN			
cb TCS BUS 2 LOGIC	OPEN	closed	OPEN			
cb TCS DUCT 2 HTRS MAN [1•3]	OPEN	closed	OPEN			
cb TCS DUCT 2 HTRS MAN [2•4]	OPEN	closed	OPEN			
cb TCS DUCT 2 HTRS AUTO [1•3]	OPEN	closed	OPEN			
cb TCS DUCT 2 HTRS AUTO [2•4]	OPEN	closed	OPEN			
cb TCS BUS 2 DUCT 3 HTRS [1•3]	OPEN	closed	OPEN			
cb TCS BUS 2 DUCT 3 HTRS [2•4]	OPEN	closed	OPEN			
cb TCS HT EXCH FANS 2	OPEN	closed	OPEN			
cb TCS HT EXCH FANS 4	OPEN	closed	OPEN			
Panel 615 Circuit Breaker Panel						
cb OWS BUS 1 FEEDERS 1	closed	closed	closed			
cb OWS BUS 1 FEEDERS 2	closed	closed	closed			
cb OWS BUS 1 FEEDERS 3	closed	closed	closed			
cb OWS BUS 1 FEEDERS 4	closed	closed	closed			
cb OWS BUS 1 FEEDERS 5	closed	closed	closed			
cb OWS BUS 1 FEEDERS 6	closed	closed	closed			
cb OWS BUS 1 FEEDERS 7	closed	closed	closed			
cb OWS BUS 1 FEEDERS 8	closed	closed	closed			
cb OWS BUS 1 FEEDERS 9	closed	closed	closed			
cb OWS BUS 2 FEEDERS 1	closed	closed	closed			
cb OWS BUS 2 FEEDERS 2	closed	closed	closed			
cb OWS BUS 2 FEEDERS 3	closed	closed	closed			
cb OWS BUS 2 FEEDERS 4	closed	closed	closed			
cb OWS BUS 2 FEEDERS 5	closed	closed	closed			
cb OWS BUS 2 FEEDERS 6	closed	closed	closed			
cb OWS BUS 2 FEEDERS 7	closed	closed	closed			
cb OWS BUS 2 FEEDERS 8	closed	closed	closed			
cb OWS BUS 2 FEEDERS 9	closed	closed	closed			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 616						
Control Panel						
C/W RAPID ΔP lt	off	off	off			
C/W MDA/STS FIRE lt	off	off	off			
C/W AM AFT FIRE lt	off	off	off			
C/W OWS FWD FIRE lt	off	off	off			
C/W OWS EXP FIRE lt	off	off	off			
C/W OWS CREW QTRS FIRE lt	off	off	off			
C/W CREW ALERT lt	off	off	off			
C/W OWS BUS 1 LO lt	off	off	off			
C/W OWS BUS 2 LO lt	off	off	off			
C/W CLSTR PRESS LO lt	off	off	off			
C/W MASTER ALARM pb/lt	off	off	off			
LTG UPPER WALL +Z SAL [1•2•10] sw	OFF	1•2•10	OFF			
LTG UPPER WALL +Y [3•4] sw	OFF	3•4	OFF			
LTG UPPER WALL -Z SAL [5•6•7] sw	OFF	5•6•7	OFF			
LTG UPPER WALL -Y [8•9] sw	OFF	8•9	OFF			
LTG DOME [1•3•5] sw	OFF	1•3•5	OFF			
LTG DOME [2•4•6] sw	OFF	2•4•6	OFF			
LTG DOME [7•8] sw	OFF	7•8	OFF			
LTG EXP COMPT [1•3•5] sw	OFF	1•3•5	OFF			
LTG EXP COMPT [2•4•6] sw	OFF	2•4•6	OFF			
LTG EXP COMPT [13•14] sw	OFF	13•14	OFF			
LTG EXP COMPT [7•9•11] sw	OFF	7•9•11	OFF			
LTG EXP COMPT [8•10•12] sw	OFF	8•10•12	OFF			
LTG [SLEEP COMPT] sw	OFF	SLEEP COMPT	OFF			
RS TEMP freezer ind	OSL	OSL	OSL			
RS TEMP chiller ind	OSL	OSL	OSL			
RS freezer DISP SEL	OFF	OFF	OFF			
RS chiller DISP SEL	OFF	OFF	OFF			
RS PRI LOOP TEMP FREEZER HI lt	off	off	off			
RS PRI LOOP TEMP CHILLER LO lt	off	off	off			
RS PRI LOOP ACCUM LO lt	off	off	off			
RS PRI LOOP PUMP LO ΔP lt	off	off	off			
RS STATUS RESET sw	down (off)	down (off)	down (off)			
RS SEC LOOP TEMP FREEZER HI lt	off	off	off			
RS SEC LOOP TEMP CHILLER LO lt	off	off	off			
RS SEC LOOP ACCUM LO lt	off	off	off			
RS SEC LOOP PUMP LO ΔP lt	off	off	off			
RS PRI LOOP PUMPS 1 sw (SL-3,4)	AUTO (on)	AUTO (on) AUTO (off)	AUTO (off)			
RS PRI LOOP PUMPS 2 sw (SL-3,4)	AUTO (off)	AUTO (off)	AUTO (on) AUTO (off)			
RS PRI LOOP PUMPS 3 sw (SL-3)	AUTO (off)	AUTO (off) AUTO (on)	AUTO (off)			
RS PRI LOOP PUMPS 4 sw (SL-3) (SL-4)	AUTO (off)	AUTO (off) AUTO (on)	AUTO (off) AUTO (on) AUTO (on)			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 616 (cont'd)						
RS SEC LOOP PUMPS 1 sw	AUTO (off)	AUTO (off)	AUTO (off)			
RS SEC LOOP PUMPS 2 sw	AUTO (off)	AUTO (off)	AUTO (off)			
RS SEC LOOP PUMPS 3 sw	AUTO (off)	AUTO (off)	AUTO (off)			
RS SEC LOOP PUMPS 4 sw	AUTO (off)	AUTO (off)	AUTO (off)			
OWS Floodlight Integral Switches						
OWS upper wall lt 1 sw	HI (off)	as required	HI (off)			
OWS upper wall lt 2 sw	HI (off)	as required	HI (off)			
OWS upper wall lt 3 sw	HI (off)	as required	HI (off)			
OWS upper wall lt 4 sw	HI (off)	as required	HI (off)			
OWS upper wall lt 5 sw	HI (off)	as required	HI (off)			
OWS upper wall lt 6 sw	HI (off)	as required	HI (off)			
OWS upper wall lt 7 sw	HI (off)	as required	HI (off)			
OWS upper wall lt 8 sw	HI (off)	as required	HI (off)			
OWS upper wall lt 9 sw	HI (off)	as required	HI (off)			
OWS upper wall lt 10 sw	HI (off)	as required	HI (off)			
OWS dome lt 1 sw	HI (off)	as required	HI (off)			
OWS dome lt 2 sw	HI (off)	as required	HI (off)			
OWS dome lt 3 sw	HI (off)	as required	HI (off)			
OWS dome lt 4 sw	HI (off)	as required	HI (off)			
OWS dome lt 5 sw	HI (off)	as required	HI (off)			
OWS dome lt 6 sw	HI (off)	as required	HI (off)			
OWS dome lt 7 sw	HI (off)	as required	HI (off)			
OWS dome lt 8 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 1 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 2 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 3 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 4 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 5 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 6 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 7 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 8 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 9 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 10 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 11 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 12 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 13 sw	HI (off)	as required	HI (off)			
OWS exp compt lt 14 sw	HI (off)	as required	HI (off)			
OWS sleep compt lt 1 sw	HI (off)	as required	HI (off)			
OWS sleep compt lt 2 sw	HI (off)	as required	HI (off)			
OWS sleep compt lt 3 sw	HI (off)	as required	HI (off)			
Panel 617						
Control Panel						
EPS OWS BUS 1 VOLTS ind	24.8 to 30.0	24.8 to 30.0	24.8 to 30.0			
EPS OWS BUS 2 VOLTS ind	24.8 to 30.0	24.8 to 30.0	24.8 to 30.0			
EPS OWS BUS 1 AMPS ind	OSL	18 to 30	OSL			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 617 (cont'd)						
EPS OWS BUS 2 AMPS ind	OSL	18 to 30	OSL			
EPS OWS BUS 1 sw	ctr (on)	ctr (on)	ctr (on)			
EPS OWS BUS 2 sw	ctr (on)	ctr (on)	ctr (on)			
DUMP HTR lt	off	[redacted] or	off			
DUCT 3 FANS BUS SEL 1 sw	BUS 1	BUS 1	BUS 1			
DUCT 3 FANS BUS SEL 2 sw	BUS 1	BUS 2	BUS 2			
DUCT 3 FANS BUS SEL 3 sw	BUS 1	BUS 1	BUS 1			
DUCT 3 FANS BUS SEL 4 sw	BUS 1	BUS 2	BUS 2			
LAMP TEST sw	ctr (off)	ctr (off)	ctr (off)			
WASTE PROCESSORS BUS SEL 1 sw	BUS 1	BUS 1	BUS 1			
WASTE PROCESSORS BUS SEL 2 sw	BUS 2	BUS 2	BUS 2			
WASTE PROCESSORS BUS SEL 3 sw	BUS 1	BUS 1	BUS 1			
WASTE PROCESSORS BUS SEL 4 sw	BUS 2	BUS 2	BUS 2			
WASTE PROCESSORS BUS SEL 5 sw	BUS 1	BUS 1	BUS 1			
WASTE PROCESSORS BUS SEL 6 sw	BUS 2	BUS 2	BUS 2			
INSTR SYS MODE SEL EXP 1	E	E	E			
INSTR SYS MODE SEL EXP 2	H	H	H			
INSTR SYS TAPE RCDRS EXP 1 lt	off	off	off			
INSTR SYS TAPE RCDRS EXP 2 lt	off	off	off			
INSTR SYS TAPE RCDRS EXP 1 sw	ctr (off)	ctr (off)	ctr (off)			
INSTR SYS TAPE RCDRS EXP 2 sw	ctr (off)	ctr (off)	ctr (off)			
TCS OWS TEMP ind	OSL	60° to 80°F	OSL			
TCS OWS PRESS ind	OSL	4.8 to 5.2 psia	OSL			
TCS DUCT AIR FLOW 1 ind	OSL	550 to 620 cfm	OSL			
TCS DUCT AIR FLOW 2 ind	OSL	550 to 620 cfm	OSL			
TCS DUCT AIR FLOW 3 ind	OSL	550 to 620 cfm	OSL			
TCS TEMP SEL	75°F	75°F	75°F			
TCS HTRS DUCT 3 [1•3] sw	OFF	as required	OFF			
TCS HTRS DUCT 3 [2•4] sw	OFF	as required	OFF			
TCS HTRS DUCT 1 [1•3] sw	OFF	AUTO	OFF			
TCS HTRS DUCT 1 [2•4] sw	OFF	AUTO	OFF			
TCS HTRS DUCT 2 [1•3] sw	OFF	AUTO	OFF			
TCS HTRS DUCT 2 [2•4] sw	OFF	AUTO	OFF			
TCS HT EXCH FANS 1 sw	OFF	AUTO	OFF			
TCS HT EXCH FANS 2 sw	OFF	AUTO	OFF			
TCS HT EXCH FANS 3 sw	OFF	AUTO	OFF			
TCS HT EXCH FANS 4 sw	OFF	AUTO	OFF			
Panel 618						
Fire Sensor Control Panel	----------	See Panel 120	----------			
Panel 619						
Fire Sensor Control Panel	----------	See Panel 530	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 620						
ESS Exp M171 N2 Panel						
ESS SUP vlv	CLOSE	as required	CLOSE			
M171 SUP vlv	CLOSE	as required	CLOSE			
Panel 621						
Experiment M092	----------	Ref SLEOH	----------			
Panel 622						
Metabolic Analyzer	----------	Ref SLEOH	----------			
Panel 623						
Experiment Support System	----------	Ref SLEOH	----------			
Panel 624						
Experiment M171	----------	Ref SLEOH	----------			
Panel 625						
Exp M092 Vent Valve						
M092 LBNP VACUUM VENT vlv	CLOSE	CLOSE	CLOSE			
Panel 626	----------	Unassigned	----------			
Panel 627						
Intercom Box	----------	See Panel 102	----------			
Panel 628						
Power Outlet						
UTIL OUTLETS 3	capped	capped	capped			
UTIL OUTLETS 4	capped	capped	capped			
Panel 629	----------	Unassigned	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 630						
Control Panel						
LTS WARDRM [1•3] sw	OFF	1•3	OFF			
LTS WARDRM [2•4] sw	OFF	2•4	OFF			
LTS [WMC]	OFF	WMC	OFF			
OWS Floodlight Integral Switches						
Wardrm lt 1 sw	HI (off)	as required	HI (off)			
Wardrm lt 2 sw	HI (off)	as required	HI (off)			
Wardrm lt 3 sw	HI (off)	as required	HI (off)			
Wardrm lt 4 sw	HI (off)	as required	HI (off)			
WMC lt 1 sw	HI (off)	as required	HI (off)			
WMC lt 2 sw	HI (off)	as required	HI (off)			
WMC lt 3 sw	HI (off)	as required	HI (off)			
Panel 631						
Power Outlet						
HI PWR ACC OUTLETS 1	capped	capped	capped			
HI PWR ACC OUTLETS 2	capped	capped	capped			
UTIL OUTLETS 5	capped	capped	capped			
UTIL OUTLETS 6	capped	capped	capped			
Panel 632						
Experiment M131	----------	Ref SLEOH	----------			
Panel 633						
Fire Sensor Control Panel	----------	See Panel 120	----------			
Panel 634						
Trash Airlock						
LID LOCK handle	lock	lock	lock			
EJECTOR handle	RETRACT	RETRACT	RETRACT			
VLV/OUTER DOOR handle	CLOSE/VENT	CLOSE/VENT	CLOSE/VENT			
VACUUM SHUTOFF vlv	OPEN	OPEN	OPEN			
press gage	14.7 psia	0.0 psia	0.0 psia			
Panel 635 - 637	----------	Unassigned	----------			
Panel 638						
Fire Sensor Control Panel	----------	See Panel 120	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 639						
Fire Sensor Control Panel	----------	See Panel 120	----------			
Panel 640						
Dosimeter Panel						
VAN ALLEN BELT DOSIMETER sw	ON	ON	ON			
Panel 641	----------	Unassigned	----------			
Panel 642						
Television Station	----------	See Panel 133	----------			
Panel 643 - 699	----------	Unassigned	----------			
Panel 700						
Control Panel						
H2O DUMP PRESS ind	OSL	0 to 0.2 psia	OSL			
H2O DUMP HTR lt	off	off	off			
H2O DUMP HTR sw	OFF	OFF	OFF			
WINDOW HTR sw	OFF	BUS 1	OFF			
LAMP TEST sw	ctr (off)	ctr (off)	ctr (off)			
Panel 701						
Experiment S063 UV SYNC Outlet	----------	Ref SLEOH	----------			
Panel 702						
Intercom Box	----------	See Panel 102	----------			
Panel 703						
Experiment M074	----------	Ref SLEOH	----------			
Panel 704	----------	Unassigned	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 705						
Food Preparation Table						
WATER CHILLER OUTLET VLV	OPEN	OPEN	OPEN			
WATER HEATER OUTLET VLV	OPEN	OPEN	OPEN			
HOT WATER [DISPENSE/CHARGE] vlv	DISPENSE	DISPENSE	DISPENSE			
COLD WATER [DISPENSE/CHARGE] vlv	DISPENSE	DISPENSE	DISPENSE			
HOT WATER volume select	LOCK	LOCK	LOCK			
COLD WATER volume select	LOCK	LOCK	LOCK			
H2O gun 1 trigger	released	released	released			
H2O gun 2 trigger	released	released	released			
H2O gun 3 trigger	released	released	released			
Panel 706						
Water Dump Vlv						
WATER DUMP vlv	CLOSE	CLOSE	CLOSE			
Panel 707						
Food Tray 1 Outlet						
FOOD TRAY 1 OUTLET BUS 1	capped	connected	capped			
FOOD TRAY 1 OUTLET BUS 2	capped	capped	capped			
Panel 708						
Food Tray 2 Outlet						
FOOD TRAY 2 OUTLET BUS 1	capped	connected	capped			
FOOD TRAY 2 OUTLET BUS 2	capped	capped	capped			
Panel 709						
Food Tray 3 Outlet						
FOOD TRAY 3 OUTLET BUS 1	capped	connected	capped			
FOOD TRAY 3 OUTLET BUS 2	capped	capped	capped			
Panel 710	----------	Unassigned	----------			
Panel 711						
Power Outlet						
UTIL OUTLETS 1	capped	capped	capped			
UTIL OUTLETS 2	capped	capped	capped			
Panel 712 - 799	----------	Unassigned	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Waste Management Compartment						
Panel 800						
Control Panel						
H2O DUMP PRESS ind	OSL	0.0 to 0.2 psia	OSL			
WASTE PROCESSOR EXHAUST PRESS ind	OSL	0.0 to 0.2 psia	OSL			
DUMP HTRS H2O lt	off	off	off			
DUMP HTRS URINE lt	off	off	off			
DUMP HTRS H2O sw	OFF	OFF	OFF			
DUMP HTRS URINE sw	OFF	OFF	OFF			
FAN sw	OFF	OFF	OFF			
LAMP TEST sw	ctr (off)	ctr (off)	ctr (off)			
Panel 801						
Intercom Box	----------	See Panel 102	----------			
Panel 802	----------	Unassigned	----------			
Panel 803						
Power Outlet						
UTIL OUTLETS 1	capped	capped	capped			
UTIL OUTLETS 2	capped	capped	capped			
HI PWR ACC OUTLETS 1	capped	capped	capped			
HI PWR ACC OUTLETS 2	capped	capped	capped			
Panel 804 - 816	----------	Unassigned	----------			
Panel 817						
Waste Processor Circuit Breaker Panel						
cb PROCESSOR 1	OPEN	close	OPEN			
cb PROCESSOR 2	OPEN	close	OPEN			
cb PROCESSOR 3	OPEN	close	OPEN			
cb PROCESSOR 4	OPEN	close	OPEN			
cb PROCESSOR 5	OPEN	close	OPEN			
cb PROCESSOR 6	OPEN	close	OPEN			
Panel 818						
Waste Processor Vent Valve/Urine Dump						
URINE DUMP vlv	CLOSE	CLOSE	CLOSE			
WASTE PROCESSOR VACUUM VENT vlv	CLOSE	OPEN	CLOSE			
Panel 819 - 821	----------	Unassigned	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Panel 822						
Experiment M074	----------	Ref SLEOH	----------			
Panel 823 - 824	----------	Unassigned	----------			
Panel 825						
Fecal/Urine Collector						
BLWR/SEPARATOR BUS 1 PWR - 1 sw	OFF	OFF	OFF			
BLWR/SEPARATOR BUS 1 PWR - 2 sw	OFF	OFF	OFF			
BLWR/SEPARATOR BUS 1 PWR - 3 sw	OFF	OFF	OFF			
BLWR/SEPARATOR BUS 2 PWR - 1 sw	OFF	OFF	OFF			
BLWR/SEPARATOR BUS 2 PWR - 2 sw	OFF	OFF	OFF			
BLWR/SEPARATOR BUS 2 PWR - 3 sw	OFF	OFF	OFF			
cb bus 1 pwr - 1 (behind door)	OPEN	closed	OPEN			
cb bus 1 pwr - 2 (behind door)	OPEN	closed	OPEN			
cb bus 1 pwr - 3 (behind door)	OPEN	closed	OPEN			
cb bus 2 pwr - 1 (behind door)	OPEN	OPEN	OPEN			
cb bus 2 pwr - 2 (behind door)	OPEN	OPEN	OPEN			
cb bus 2 pwr - 3 (behind door)	OPEN	OPEN	OPEN			
drawer 1 VOL ind	0.0	0.0	0.0			
drawer 1 AIRFLOW VLV	CLOSE	CLOSE	CLOSE			
drawer 1 INLET DOOR	closed	closed	closed			
drawer 1 DRAWER locking handle	LOCK	LOCK	LOCK			
drawer 2 VOL ind	0.0	0.0	0.0			
drawer 2 AIRFLOW VLV	CLOSE	CLOSE	CLOSE			
drawer 2 INLET DOOR	closed	closed	closed			
drawer 2 DRAWER locking handle	LOCK	LOCK	LOCK			
drawer 3 VOL ind	0.0	0.0	0.0			
drawer 3 AIRFLOW VLV	CLOSE	CLOSE	CLOSE			
drawer 3 INLET DOOR	closed	closed	closed			
drawer 3 DRAWER locking handle	LOCK	LOCK	LOCK			
Panel 826 - 830	----------	Unassigned	----------			
Panel 831						
Water Dump vlv						
WATER DUMP vlv	CLOSE	CLOSE	CLOSE			
Panel 832 - 899	----------	Unassigned	----------			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Sleep Compartment						
Panel 900	----------	Unassigned	----------			
Panel 901						
Intercom Box	----------	See Panel 102	----------			
Panel 902						
Intercom Box	----------	See Panel 102	----------			
Panel 903						
Intercom Box	----------	See Panel 102	----------			
Panel 904 - 999	----------	Unassigned	----------			
Panel 1000	----------	Unassigned	----------			
Panel 1001						
RS Vacuum Vent Valve						
REFRIG PUMP PACKAGE VACUUM VENT VLV	OPEN	OPEN	OPEN			
Panel 1002 - 1099	----------	Unassigned	----------			
Water Storage Tanks						
PRESS vlv (water tank 1) (SL-3,4)	CLOSE	OPEN CLOSE	CLOSE			
PRESS vlv (water tank 2)	CLOSE	CLOSE	CLOSE			
PRESS vlv (water tank 3) (SL-4)	CLOSE	CLOSE OPEN	CLOSE			
PRESS vlv (water tank 4)	CLOSE	CLOSE	CLOSE			
PRESS vlv (water tank 5)	CLOSE	CLOSE	CLOSE			
PRESS vlv (water tank 6)	CLOSE	OPEN	CLOSE			
PRESS vlv (water tank 7) (SL-4)	CLOSE	OPEN CLOSE	CLOSE			
PRESS vlv (water tank 8) (SL-4)	CLOSE	CLOSE OPEN	CLOSE			
PRESS vlv (water tank 9)	CLOSE	CLOSE	CLOSE			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Water Storage Tanks (cont'd)						
PRESS vlv (water tank 10) (SL-3)	CLOSE	CLOSE OPEN	CLOSE			
WATER OUTLET vlv (water tank 1) (SL-3,4)	CLOSE (capped)	OPEN CLOSE (capped)	CLOSE (capped)			
WATER OUTLET vlv (water tank 2)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
WATER OUTLET vlv (water tank 3) (SL-4)	CLOSE (capped)	CLOSE (capped) OPEN	CLOSE (capped)			
WATER OUTLET vlv (water tank 4)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
WATER OUTLET vlv (water tank 5)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
WATER OUTLET vlv (water tank 6)	CLOSE (capped)	OPEN	CLOSE (capped)			
WATER OUTLET vlv (water tank 7) (SL-4)	CLOSE (capped)	OPEN CLOSE (capped)	CLOSE (capped)			
WATER OUTLET vlv (water tank 8) (SL-4)	CLOSE (capped)	CLOSE (capped) OPEN	CLOSE (capped)			
WATER OUTLET vlv (water tank 9)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
WATER OUTLET vlv (water tank 10) (SL-3)	CLOSE (capped)	CLOSE (capped) OPEN	CLOSE (capped)			
SAMPLE PORT vlv (water tank 1)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
SAMPLE PORT vlv (water tank 2)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
SAMPLE PORT vlv (water tank 3)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
SAMPLE PORT vlv (water tank 4)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
SAMPLE PORT vlv (water tank 5)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
SAMPLE PORT vlv (water tank 6)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
SAMPLE PORT vlv (water tank 7)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
SAMPLE PORT vlv (water tank 8)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
SAMPLE PORT vlv (water tank 9)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
SAMPLE PORT vlv (water tank 10)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 1)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 2)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 3)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 4)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 5)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 6)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 7)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 8)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 9)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ PORT vlv (water tank 10)	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
Water agitator pump handle (water tank 1)	secured	secured	secured			
Water agitator pump handle (water tank 2)	secured	secured	secured			
Water agitator pump handle (water tank 3)	secured	secured	secured			
Water agitator pump handle (water tank 4)	secured	secured	secured			
Water agitator pump handle (water tank 5)	secured	secured	secured			
Water agitator pump handle (water tank 6)	secured	secured	secured			
Water agitator pump handle (water tank 7)	secured	secured	secured			
Water agitator pump handle (water tank 8)	secured	secured	secured			
Water agitator pump handle (water tank 9)	secured	secured	secured			
Water agitator pump handle (water tank 10)	secured	secured	secured			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
Portable Water Tank						
IODINE INJ PORT vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
WATER OUTLET vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
PRESS VLV	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
RELIEF VLV	closed	closed	closed			
N2 PRESS ind	20 to 25 psig [30 to 35 psig]	30 to 35 psig	30 to 35 psig			
(SL-3,4)		18 to 22 psig	18 to 22 psig			
GSE BLEED port	capped	capped	capped			
VENT vlv	released(closed)	released(closed)	released(closed)			
Water Purification Equipment						
NOTE: This panel will not be assigned a control and display number						
IODINE CONTAINER 1 PORT A vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE CONTAINER 1 PORT B vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
REAGENT CONTAINER 1 vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
WATER SAMPLER 1 vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ 1 vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
WASTE SAMPLE CONTAINER vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE CONTAINER 2 PORT A vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE CONTAINER 2 PORT B vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
WATER SAMPLER 2 vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
IODINE INJ 2 vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
REAGENT CONTAINER 2 vlv	CLOSE (capped)	CLOSE (capped)	CLOSE (capped)			
OWS Air Diffusers						
Exp compt diffuser 1	WIDE	as required	N/A			
Exp compt diffuser 1 damper cont knob	OPEN	as required	N/A			
Exp compt diffuser 2	WIDE	as required	N/A			
Exp compt diffuser 2 damper cont knob	OPEN	as required	N/A			
Exp compt diffuser 3	WIDE	as required	N/A			
Exp compt diffuser 3 damper cont knob	OPEN	as required	N/A			
Exp compt diffuser 4	WIDE	as required	N/A			
Exp compt diffuser 4 damper cont knob	OPEN	as required	N/A			
Exp compt diffuser 5	WIDE	as required	N/A			
Exp compt diffuser 5 damper cont knob	OPEN	as required	N/A			
Wardrm diffuser 1	WIDE	as required	N/A			
Wardrm diffuser 1 damper cont knob	OPEN	as required	N/A			
Wardrm diffuser 2	WIDE	as required	N/A			
Wardrm diffuser 2 damper cont knob	OPEN	as required	N/A			
Wardrm diffuser 3	WIDE	as required	N/A			
Wardrm diffuser 3 damper cont knob	OPEN	as required	N/A			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
OWS Air Diffusers (cont'd)						
WMC diffuser	WIDE	as required	N/A			
WMC diffuser damper cont knob	OPEN	as required	N/A			
Sleep compt diffuser 1	open	as required	N/A			
Sleep compt diffuser 2	open	as required	N/A			
Sleep compt diffuser 3	open	as required	N/A			
Waste Processors						
WASTE PROCESSOR 1 DOOR handle	LOCK	LOCK	LOCK			
WASTE PROCESSOR 1 VENT handle	CABIN	CABIN	CABIN			
WASTE PROCESSOR 1 TMR sw	OFF	OFF	OFF			
WASTE PROCESSOR 1 HR REMAINING ind	0	0	0			
WASTE PROCESSOR 1 TMR lt	off	off	off			
WASTE PROCESSOR 1 OVER TEMP lt	off	off	off			
WASTE PROCESSOR 2 DOOR handle	LOCK	LOCK	LOCK			
WASTE PROCESSOR 2 VENT handle	CABIN	CABIN	CABIN			
WASTE PROCESSOR 2 TMR sw	OFF	OFF	OFF			
WASTE PROCESSOR 2 HR REMAINING ind	0	0	0			
WASTE PROCESSOR 2 TMR lt	off	off	off			
WASTE PROCESSOR 2 OVER TEMP lt	off	off	off			
WASTE PROCESSOR 3 DOOR handle	LOCK	LOCK	LOCK			
WASTE PROCESSOR 3 VENT handle	CABIN	CABIN	CABIN			
WASTE PROCESSOR 3 TMR sw	OFF	OFF	OFF			
WASTE PROCESSOR 3 HR REMAINING ind	0	0	0			
WASTE PROCESSOR 3 TMR lt	off	off	off			
WASTE PROCESSOR 3 OVER TEMP lt	off	off	off			
WASTE PROCESSOR 4 DOOR handle	LOCK	LOCK	LOCK			
WASTE PROCESSOR 4 VENT handle	CABIN	CABIN	CABIN			
WASTE PROCESSOR 4 TMR sw	OFF	OFF	OFF			
WASTE PROCESSOR 4 HR REMAINING ind	0	0	0			
WASTE PROCESSOR 4 TMR lt	off	off	off			
WASTE PROCESSOR 4 OVER TEMP lt	off	off	off			
WASTE PROCESSOR 5 DOOR handle	LOCK	LOCK	LOCK			
WASTE PROCESSOR 5 VENT handle	CABIN	CABIN	CABIN			
WASTE PROCESSOR 5 TMR sw	OFF	OFF	OFF			
WASTE PROCESSOR 5 HR REMAINING ind	0	0	0			
WASTE PROCESSOR 5 TMR lt	off	off	off			
WASTE PROCESSOR 5 OVER TEMP lt	off	off	off			
WASTE PROCESSOR 6 DOOR handle	LOCK	LOCK	LOCK			
WASTE PROCESSOR 6 VENT handle	CABIN	CABIN	CABIN			
WASTE PROCESSOR 6 TMR sw	OFF	OFF	OFF			
WASTE PROCESSOR 6 HR REMAINING ind	0	0	0			
WASTE PROCESSOR 6 TMR lt	off	off	off			
WASTE PROCESSOR 6 OVER TEMP lt	off	off	off			

AM/MDA/OWS CONTROL AND DISPLAY CONFIGURATION LIST

NOMENCLATURE	CONTROL POSITION FOR					
	CLOSEOUT	POST ACTIV	STORAGE			
WMC Water Heater						
H2O HTR OUTLET VLV	OPEN	OPEN	OPEN			
WATER HEATER DUMP PORT	capped	capped	capped			
Portable Fan						
[OFF/HI/LOW] sw	OFF	OFF	OFF			
Blower Unit						
[ON/OFF/MOM ON] sw (lever lock)	OFF	OFF	OFF			
cb [OPEN]	closed	closed	closed			
Portable Light						
[OFF/LO/HI] sw	OFF	OFF	OFF			
Food Tray 1						
Food cavity 1 htr sw	OFF	as required	OFF			
Food cavity 2 htr sw	OFF	as required	OFF			
Food cavity 3 htr sw	OFF	as required	OFF			
TIMER SET sw	down (off)	down (off)	down (off)			
HOURS REMAINING ind	0	as required	0			
HEAT lt	off	as required	off			
Cover	installed	installed	installed			
Food Tray 2	----------	See Food Tray 1	----------			
Food Tray 3	----------	See Food Tray 1	----------			
Portable Timers (3)						
TIMER sw	OFF	OFF	OFF			
TONE sw	OFF	OFF	OFF			
HACK lever	released	released	released			

4.1.1 SHORT FORM CALLOUTS

INTRODUCTION

Short-form callouts are TBS for this release. When they are added, they will be used extensively throughout this handbook to simplify and provide more useable system operating procedures. These callouts will not be the same as short-form nomenclature used throughout this handbook release.

SECTION 4.2

SYSTEMS ACTIVATION

4.2.1 MDA/AM ACTIVATION

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.1 INITIAL ENTRY AND CONFIGURATION	
		(04.02.01-00)	
		1. CHECK STATUS (PRE-ENTRY) Record docking angle roll vernier	Roll angle error is used in optional way of computing ATM to IMU Nav base coordinates (P50 option 3)
		(04.02.02-00)	
		NOTE Prior to CSM/MDA pressure equalization, verify the following with MSFN: O2 120 REG P (D204) - 115 to 150 psia N2 150 REG P (D205) - 145 to 185 psia CAB REG P (D256) - 4.8 to 5.2 psia O2 PP1 (D237) - 171 to 202 mmHg O2 PP2 (D239) - 171 to 202 mmHg	Equivalent to 3.3 to 3.9 psia. The sensors for these measurements are covered during launch and may indicate erroneous values
	100	2. EQUALIZE CSM/MDA PRESSURE Remove bayonet cap CSM/MDA▲P ind - monitor initial value PRESS EQUAL VLV - OPEN CSM/MDA▲P ind - 0.0 psid	Cap is restrained by chain
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X (31.17.01-00) X X X - Excessive CSM/MDA▲P -	
		NOTE See tool matrix for tool requirements (Appendix C). Tools must be available in CSM. Prior to performance of this procedure, verify the following with MSFN:	
	CSM 2	PRESS CABIN ind = FWD/AMB P (D207) ± 0.4 psia	
		Remove bayonet cap Look through PRESS EQUAL VLV to verify it is blocked Puncture protective screen and hold butterfly valve open (3/16 screwdriver blade and screwdriver handle)	Cap is restrained by chain
		X Verify flow through valve X X CSM/MDA ▲ P ind - 0.0 psid X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.1 INITIAL ENTRY AND CONFIGURATION (cont'd)	
		(04.02.02-00)	
		3. OPEN MDA TUNNEL HATCH	
		CAUTION Floating debris may exist in AM/MDA	
		Release handle safety trigger - lift and rotate 90° toward hatch Release handle - OPEN Push hatch open Secure hatch in detent lock	
		(31.17.02-00) - MDA Hatch Latches Binding -	
		NOTE See tool matrix for tool requirements (Appendix C). Tools must be available in CSM	
		Remove rings from retaining pins on latches (retaining ring removal tool)	Two pins on each of six latches
		Remove pins from latches (pin removal tool) Manually retract latches Push hatch open	
		Secure hatch in detent lock	
		Attempt repair of hatch	Hatch repair may be attempted at crew convenience
		(31.17.02-00) - MDA Hatch Seal Frozen -	
		NOTE See tool matrix for tool requirements (Appendix C). Tools must be available in CSM	
		Loosen O-ring seal from docking tunnel interface (seal removal tool) Push hatch open Secure hatch in detent lock	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.1 INITIAL ENTRY AND CONFIGURATION (cont'd)	
		(04.02.03-00)	
		4. ACTIVATE MDA LIGHTING AND INSPECT MDA	
	101	INTERIOR LTS sw - ON	Momentary switch
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
		X (31.17.04-00) X	
		X X	
		- Interior Lights Fail to Come On -	
		Obtain penlight from CSM	(TBS)
	207	LTG MDA FWD [1•3] sw - ON	Momentary switches
		LTG MDA FWD [2•4] sw - ON	
X		LTG MDA AFT [1•3] sw - ON X	
X		LTG MDA AFT [2•4] sw - ON X	
X		X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		(04.02.04-00)	
		Inspect MDA	Gross evaluation for launch damage, loose equipment, floating debris, etc.
		(04.02.02-00)	
		5. CONFIGURE HATCH EQUALIZATION VALVE	
	100	PRESS EQUAL VLV - CLOSE	
		WARNING	
		Do not reinstall bayonet cap on CSM side of hatch	Closing hatch with cap installed would preclude egress from SWS in event of CSM pressure degradation
	118	PRESS EQUAL VLV - CLOSE (verify)	
		(04.02.05-00)	
		6. SEAL MDA VENT (SL-2)	
	103	Remove vent sealing device from STOW receptacle (4.3.4.1)	(M106)
		Install vent sealing device in VENT duct (4.3.4.2)	
		(04.02.06-00)	
		7. INSTALL S190 WINDOW PROTECTOR	Unprotected S190 window is a potential single-point failure
		Unlock Multispectral Photographic Facility (MPF), and position to the stowed location	
		Inspect S190 window for damage	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.1 INITIAL ENTRY AND CONFIGURATION (cont'd)	
		Verify S190 window protector mounting surface and tapped holes on S190 window frame are clean	
		CAUTION When installing S190 window protector, be extremely careful not to damage or scratch the S190 window or damage the S190 window protector	
		Obtain S190 window protector	(M116)
		Verify sealing surface of S190 window protector is clean and undamaged	
		Align guide pins with holes and mount S190 window protector over window	
		Turn tension bolts cw in sequence (1-2-3-4) - fingertight	
		(04.02.07-00)	
		8. RELEASE FIRE EXTINGUISHER FROM LAUNCH RESTRAINTS	
		Remove pins (2) from fire extinguisher	Pins are to be reinstalled during deactivation
		Release retaining clamp and remove (SL-2)	
		Stow pins and clamp	
		NOTE Pins and clamp may be stowed temporarily in pocket. At crew convenience, transfer pins and clamp to launch pin bag	(F527)
		(04.02.08-00)	
		9. REMOVE SOP DOCKING LOAD STRAPS	
		Remove pip pins (2) at end of SOP nearest ECS duct, and stow in holes provided	
		Rotate fitting handles (2) ccw TBS revolutions to the stop	
		Remove pip pin from one strap handle	
		Pull handle out and reinstall pip pin	
		Rotate handle ccw 90 degrees, and push handle through to form a T-handle	
		Rotate T-handle ccw two full revolutions	
		Pull handle down and out to release strap	
		Repeat for second docking strap	
		Install docking load straps (2) under cover (next to SOP)	
		Lift SOP away from stowage location and remove fittings (2) from end of SOP	
		SOP press gage - 6000 psia (verify)	
		10. INSTALL SOMA ON SOP	
		Remove SOMA from stowage and connect hose to SOP	(M157)
		Stow SOP/SOMA and secure with strap	(M165)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.1 INITIAL ENTRY AND CONFIGURATION (cont'd)	
		(04.02.09-00)	
		11. ACTIVATE STS AND PANEL LIGHTING AND INSPECT AM	
	207	LTG PNL sel - as required LTG METER sel - as required LTG STS FWD sel - as required LTG STS AFT sel - as required	
		(04.02.10-00)	
		Inspect AM	Gross evaluation for launch damage, loose equipment, floating debris, etc.
		(04.02.11-00)	
		12. VERIFY PPO2 Loosen Calfax fastener and open sensor cover	Sensors are covered for launch. After activation, cover will remain open except for sensor calibration
	225	O2/N2 CONTR PPO2 1 ind - 3.3 to 3.9 psia O2/N2 CONTR PPO2 2 ind - 3.3 to 3.9 psia	
		(04.02.12-00)	
		13. INITIATE DEBRIS FILTERING	
	203	MOL SV A FANS PWR sw - PRI MOL SV B FANS PWR sw - SEC	Causes floating debris to be filtered through solids traps and provides cabin ventilation
		(04.02.13-00)	
		14. VERIFY EPS STATUS (4.3.1.11, step 4)	
		15. VERIFY AND CONFIGURE STS CIRCUIT BREAKER PANELS Verify panels 200, 201, 202 per closeout configuration (4.1) (SL-2) Verify panels 200, 201, 202 per storage configuration (4.1)(SL-3,4) Configure panels 200, 201, 202 per post activation configuration (4.1) except:	
	200	cb AUDIO SYSTEM (8) - open	Will be closed during communication system activation
	202	cb DPLY BUS ARM PRI, SEC (2) - closed (SL-2)	Will be opened after safing deploy bus, panel 205
		cb DPLY SEQ BUS ARM PRI, SEC (2) - closed (SL-2)	Will be opened after safing sequential bus, panel 205
		16. CONFIGURE SWITCH PANELS Configure panels 203, 204, 205, 206, 207, 208 per post activation configuration (4.1), except:	
	203	MOL SV A TMRS sw - OFF	Will be actuated during mol sv activation (4.2.1.13)
		MOL SV A VENT HTRS sw - OFF	Will be actuated during mol sv activation (4.2.1.13)
		MOL SV A FANS DISCON sw - OFF	Will be actuated during mol sv activation (4.2.1.13)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.1 INITIAL ENTRY AND CONFIGURATION (cont'd)	
		AM FANS DUCT sw - OFF (SL-2)	Will be actuated subsequent to circulation activation (4.2.1.6)
		MDA FANS CSM sw - OFF	Will be actuated during circulation activation (4.2.1.6)
		ATM CLNT PUMPS A sw - OFF	Will be actuated during ATM C&D coolant loop activation (4.2.1.8)
	206	ELEC GND sw - ctr (AM)	Will be switched during umbilical connection (4.2.1.2)
		C/W PWR sw (3) - OFF	Will be actuated during C/W activation (4.2.1.5)
	207	INHIBIT PANEL sw (76) - inhbt	Will be enabled during C/W activation (4.2.1.5)
	202	cb DPLY BUS ARM PRI, SEC (2) - open (SL-2)	Circuit breakers not required for remainder of mission
		cb DPLY SEQ BUS ARM PRI, SEC (2) - open (SL-2)	
		(27.02.17-00) (27.01.01-00)	
		4.2.1.2 MDA POWER AND CONTROL UMBILICALS CONNECTION (4.19.1, 4.19.2)	
		(04.02.14-00) (04.02.15-00) (04.02.16-00) (04.02.17-00)	
		4.2.1.3 SWS/CSM COMMUNICATION AND CLOCK ACTIVATION (4.19.13)	
		(04.02.18-00)	
		4.2.1.4 VERIFICATION OF SWS POWER TIE TO CSM CAPABILITY (4.19.7)	
		(04.02.19-00)	
		4.2.1.5 CAUTION AND WARNING ACTIVATION	
		1. ACTIVATE CAUTION AND WARNING SYSTEM	
	206	C/W PWR EMER 1, 2 sw (2) - ON	
		C/W PWR CAUT & WARN sw - ON	
		NOTE	
		Wait 60 seconds prior to continuing	Enables electronics to stabilize and preclude transient initiation of parameters (RAPID ▲P, PPCO2, etc.)
	207	All INHIBIT PANEL switches (76) - enable all except CNDSATE TANK ▲P sw - inhibit	Enable position is up toward placards. Inhibiting CNDSATE TANK ▲P precludes its initiation prior to condensate system activation
		2. CHECK CAUTION AND WARNING SYSTEM (4.3.8.1 through 4.3.8.5)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(04.02.34-00)	
		4.2.1.6 SWS/CSM CIRCULATION ACTIVATION	
		NOTE Prior to performance of this procedure, drogue and probe must be relocated from CM to MDA	(M105, M107) Precludes possible damage to CM/MDA interchange duct following its installation
		1. INSTALL CM/MDA INTERCHANGE DUCT Rotate S190 Multispectral Photographic Facility (MPF) to intermediate position	MPF must be moved to enable duct removal
		Release fastener on CM/MDA interchange duct restraining strap and remove strap Route strap under duct and secure against duct stowage surface with fastener Repeat above operation for remaining duct restraining straps (3)	
		Loosen and remove Calfax fastener and temporarily stow for use in attaching the duct to CSM FAN 1 outlet	(M118) Temporarily stow in suit or in hole provided forward of the CSM FAN 1 launch restraint bracket
		Remove fan end of duct from stowage rack Route duct through tunnel and into CSM Connect duct to CSM FAN 1 outlet, and install and tighten Calfax fastener	Tighten fingertight
		Secure duct in CSM with velcro restraint Return MPF to stowed position	
		(04.02.20-00)	
	203	2. ACTIVATE CIRCULATION FAN MDA FANS CSM sw - HI	
		(04.02.21-00)	
		4.2.1.7 O2/N2 CONTROL SYSTEM ACTIVATION	
		1. REMOVE GAS CIRCULATION DUCT CAPS (SL-2) Loosen Calfax fasteners (2) and remove gas circulation duct caps from circulation return air duct outlet	Supply duct cap is secured to return duct outlet along with return duct cap (M303)
		Stow both duct caps next to return duct outlet with Calfax fasteners (2)	
		(04.02.22-00)	
		NOTE The following step will activate C/W OWS GAS INTERCHG indication	
		2. ACTIVATE O2/N2 CONTROL SYSTEM AM FANS DUCT sw - HI (SL-2)	Facilitates mixing of gases between aft compartment, lock compartment, and STS volume before lock hatches are opened

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.7 O2/N2 CONTROL SYSTEM ACTIVATION (cont'd)	
		NOTE Low gas flow will exist (≈50 cfm) until removal of gas supply duct debris plate in aft compartment (4.2.2.1). C/W indication will be maintained until debris plate removal (SL-2)	
		Caution tone - on	
	207	C/W OWS GAS INTERCHG lt - on	
		Respond to C/W alert (4.3.8.18)	
		Set portable timer for 15 minutes (4.3.7.2, steps 1, 2) (SL-2)	
		Open forward hatch (4.6.1.12) (SL-2)	Bayonet cap stowed and pressure equalization valve opened for launch
		Configure panel 225 per post activation configuration (4.1)	
		Verify O2/N2 system pressures and temperatures (4.3.4.17, steps 2, 3, 4)	
		Replace O2 pressure sensors (4.3.4.19) (SL-3,4)	
		Test O2 pressure sensors (4.3.4.20) (SL-2)	
		(04.02.23-00)	
		4.2.1.8 ATM C&D H2O LOOP ACTIVATION	
		Obtain penlight	(TBS)
		Loosen Calfax fasteners (2) on M202 stowage container and rotate toward condensate module	
		Verify reservoir bladder is toward FULL end of reservoir	Reservoir is filled to approximately 75% capacity prior to launch
		Replace ATM C&D H2O filter (4.3.4.29) (SL-3,4)	
	235	ATM CLNT RES PRESS vlv - OPEN (verify) (SL-2)	
		ATM CLNT RES PRESS vlv - OPEN (SL-3,4)	
		Rotate M202 stowage container to normal position and tighten Calfax fasteners (2)	
	135	EREP Coolant vlv - BYPASS (verify)	Coolant will be directed to EREP equipment only during EREP operations
	203	ATM CLNT PUMPS A sw - ON	
		ATM CLNT PUMPS LO Δ P lt - on then off	Light will initially come on then go off as pump speed increases
		(04.02.24-00)	
		4.2.1.9 LOCK COMPARTMENT ACTIVATION	
		WARNING Prior to entering lock compartment, make certain that AM duct fan has been operated for 15 min as indicated by tone from portable timer	
		1. ENTER LOCK COMPARTMENT	
	316	LTG LOCK sw - BRIGHT	Lock lever switch
		LTG METER sw - ON	Lock lever switch

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.9 LOCK COMPARTMENT ACTIVATION (cont'd)	
	319	2. CONFIGURE EVA HATCH (SL-2) EVA hatch handle lock - depress	Prevents inadvertent opening of hatch. Hatch handle is not locked at launch to facilitate ground crew operations
		Remove EVA hatch retainer cover Loosen Calfax fasteners (2) and remove clip and fasteners EVA hatch retainer - engage Temporarily stow clip and fasteners for subsequent disposal	
	319	WINDOW VENT vlv - OPEN (2 turns, ccw) (SL-2) Allow 15 minutes for window to vent (SL-2) WINDOW VENT vlv - SEAL (2 turns, cw) (SL-2)	
		(04.02.25-00)	
		4.2.1.10 AFT COMPARTMENT ACTIVATION	
		1. ENTER AFT COMPARTMENT Open aft hatch (4.6.1.10) (SL-2)	Bayonet cap stowed and pressure equalization valve opened for launch
	390	LTS AFT sw - BRIGHT	
		(04.02.26-00)	
		4.2.1.11 MISCELLANEOUS ACTIVATION	
		1. Configure panels 104, 112, 115, 132, 133, 134, 139, 140, 213, 214, 217, 219, 223, 224, 300, 313, 316 (except for LTG LOCK, METER switches), 317, 318, 320, 323, 390 (except for LTS AFT sw), 391 per post activation configuration (4.1)	
		2. Verify panel 392 (4.3.8.3)	This step may be omitted if OWS activation is to follow immediately
		NOTE The next step should be performed approximately 5 to 6 hours after activating mol sv fans (during OWS activation)	
		3. REPLACE MOL SV A AND B SOLIDS TRAP (4.3.4.12) (SL-2)	
		4. S190 WINDOW HEATER ACTIVATION	
	117	WINDOW HEATER AUTO sw - ON WINDOW HEATER ▲TEMP pb/lt - on	Light will go off after temperature stabilization
		WINDOW HEATER OVER TEMP pb/lt - depress and hold WINDOW HEATER OVER TEMP pb/lt - on	Momentary pushbutton
		WINDOW HEATER OVER TEMP pb/lt - release WINDOW HEATER OVER TEMP pb/lt - off	
		5. VERIFY STATUS LIGHTS ON PANELS 203, 204, 216 (4.3.15.2, step 2)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.11 MISCELLANEOUS ACTIVATION (cont'd)	
		6. REPLACE MOL SV A CO2 FILTER CARTRIDGES (4.3.4.13, 4.3.4.14) (SL-3,4)	Cartridges should be replaced early in activation sequence at crew convenience to insure valid CO2 TM readouts
		7. REPLACE EVA/IVA COOLANT GAS SEPARATOR (4.6.1.18) (SL-3,4)	
		8. VENT STS WINDOWS (SL-2)	
	241-244	WINDOW VENT vlv (4) - OPEN (2 turns, ccw) Allow 15 minutes for windows to vent WINDOW VENT vlv (4) - SEAL (2 turns, cw)	
		(04.02.27-00)	
		4.2.1.12 CONDENSATE SYSTEM ACTIVATION	
		1. CONFIGURE CONDENSATE SYSTEM	
	216	CNDST TANK PRESS vlv - VACUUM CNDST CONT SYS TANK ΔP ind - Monitor for 4.4 to 5.0 psid CNDST TANK PRESS vlv - CLOSED	
		2. INSTALL CONDENSATE LINE (MOL SV A)	
		Loosen Calfax fasteners (2) and open MOL SV A solids trap access door	
		Configure panel 230 per post activation configuration (4.1)	
		Remove condensate line qd from vent fitting	Condensate line qd installed on vent fitting during launch and storage. Vent fittings are hard-mounted to surface of molecular sieve. Condensate line is disconnected from condensing heat exchanger qd to allow venting of condensing heat exchangers during launch and storage
		Mate appropriate condensate line qd to mol sv A condensing heat exchanger A qd	Mol sv condensing heat exchanger B is left connected to vent fitting
	233	CONDENSING HT EXCH AIR FLOW vlv - A (verify)	
		Close MOL SV A solids trap access door and tighten Calfax fasteners (2)	
		3. INSTALL CONDENSATE LINE (MOL SV B)	
		Loosen Calfax fasteners (2) and open MOL SV B solids trap access door	
		Configure panel 232 per post activation configuration (4.1)	
		Repeat condensate line qd installation presented in step 2 for mol sv B	
	239	CONDENSING HT EXCH AIR FLOW vlv - A (verify)	
	218	MOL SV B VENT vlv - CLOSE	
		Configure panels 227, 229 per post activation configuration (4.1)	
		Close MOL SV B solids trap access door and tighten Calfax fasteners (2)	
	207	CNDSATE TANK ΔP sw - enable	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.12 CONDENSATE SYSTEM ACTIVATION (cont'd)	
		NOTE Condensate system activation should not be initiated until molecular sieve dew point reaches 47°F.This point will normally be reached (TBS) hours after initial MDA entry (during OWS activation). However, if OWS activation is delayed, the following step may be necessitated during MDA/AM activation to control MDA/AM humidity	MSFN can provide dew point data - C207 SIV A DEW PT T and C215 SIV B DEW PT T to confirm time of initiation. Onboard indication is provided by MOL SV DEW POINT TEMP indicator, panel 203
		4. INITIATE CONDENSATE REMOVAL	
		NOTE The following operation may activate the C/W CNDST TANK ▲ P indication if condensing heat exchanger H2O separator plates are not sufficiently wetted. If C/W is not triggered, proceed with activation. Operations * applicable only if C/W is triggered	
	216 INTERCOM 207	CNDST TANK H2O vlv - FILL Caution tone - on* C/W CNDST TANK ▲ P lt - on*	C/W indication when ▲P 0.8 to 0.3 psid
		Respond to C/W alert (4.3.8.18)*	
	216	CNDST TANK H2O vlv - DUMP*	
		CNDST TANK PRESS vlv - PRESS*	Applies cabin pressure to gas side of bladder
		CNDST CONT SYS VENT HTRS sw - PRI* CNDST CONT SYS VENT HTRS PRI lt - on* CNDST CONT SYS VENT TEMP ind - 145°F*	9 min required after heater turn on to attain temperature
		CNDST CONT SYS VENT VLV sw - PRI*	
		Terminate condensate dump (4.3.4.4, step 2) *	
		Resume condensate collection (4.3.4.4, step 3 omitting last two operations)*	
		Wait TBS minutes*	
		Repeat step 4 thru condensate dump termination*	
		Resume condensate collection (4.3.4.4, step 3)*	
		(04.02.28-00)	
		4.2.1.13 MOLECULAR SIEVE A ACTIVATION	
		1. CONFIGURE BEDS FOR AUTOMATIC CYCLING	Mol Sv B beds remain in storage position
		Configure panels 220, 221 per post activation configuration (4.1)	
		Loosen Calfax fasteners (2) and open access cover for MOL SV A valve control panel	
		Manual interconnect V1, V2, V3, V4 valves (4) - A (verify)	
	226	SOLENOID SWITCHES S2, S3 sw (2) - OFF (verify	
		SOLENOID SWITCHES S1, S4 sw (2) - AUTO	
	203	MOL SV A FANS DISCON sw - AUTO	Provides auto fan shutoff if both beds are in adsorb position

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.1.13 MOLECULAR SIEVE A ACTIVATION (cont'd)	
		2. INITIATE MOL SIEVE BED CYCLING	
		NOTE The following operation may activate the C/W SV TMR indication. If C/W is not triggered proceed with verification of bed position indicators. Operations * applicable only if C/W is triggered	
		MOL SV A TMRS sw - PRI	Automatically sets bed 1 to ADSORB and bed 2 to DESORB
	102,116 131	Caution tone - on*	
	207	C/W SV TMR lt - on*	
		Respond to C/W alert (4.3.8.18)*	
	207	C/W SV TMR lt - off (verify) *	Light goes off upon initiation of timer operation
	206	C/W [CLEAR] sw - CLEAR*	Momentary switch
		C/W MEM RECALL pb/lt - off*	
	228	BED 1 pos ind - ADSORB (verify)	
		BED 2 pos ind - DESORB (verify)	
		Close access panel for MOL SV A valve control panel and tighten Calfax fasteners (2)	
	203	MOL SV A VENT HTRS sw - ON	
		Verify mol sv A operation (4.3.4.17, step 1)	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
		X (31.17.05-00) X	
		X X	
		X 4.2.1.14 MDA/AM SUITED ACTIVATION (SL-2) X	
		X (MDA/AM 0.5 PSIA, OWS 5.0 PSIA) X	
		1. PREPARE FOR MDA ENTRY	One crewman wearing PCU, SOP, PGA with IVA umbilical connected to IVA station CM603 on EVA high flow. Remaining two crewmen are wearing PGA's and connected to CSM suit loop
		All crewmen don PGA's	
		Perform suit integrity check	
		Prepare for IVA-suited MDA entry	
		2. EQUALIZE CSM/MDA PRESSURE	
	100	Remove bayonet cap	Cap is restrained by chain
		PRESS EQUAL VLV - OPEN	
		CSM/MDA ΔP ind - 0.0 psid	Pressure equalization time may be reduced by opening CSM side hatch CAB PRESS DUMP vlv
		3. OPEN MDA TUNNEL HATCH	
		Release handle safety trigger - lift and rotate 90° toward hatch	
		Release handle - OPEN	
		X Push hatch open X	
		X Secure hatch in detent lock X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.2.1.14 MDA/AM SUITED ACTIVATION (cont'd) X X (MDA/AM 0.5 PSIA, OWS 5.0 PSIA X	
	101	4. ACTIVATE MDA LIGHTING AND INSPECT MDA INTERIOR LTS sw - ON Inspect MDA	Momentary switch Inspect for possible pressure skin penetrations or anomalies in equipment or spacecraft configuration. Other systems and equipment effects must be evaluated. OWS systems unaffected because of closed OWS hatch
		5. SEAL MDA VENT (4.2.1.1, step 6)	
	300	6. ACTIVATE STS AND PANEL LIGHTING AND INSPECT AM (4.2.1.1, step 11) CABIN PRESS RELIEF VLV - CLOSE Open forward hatch (4.6.1.12)	
	313	7. ENTER AND INSPECT LOCK COMPARTMENT (4.2.1.9, ignore WARNING) CABIN PRESS RELIEF VLV - CLOSE Inspect lock compartment	
	391	8. ENTER AND INSPECT AFT COMPARTMENT (4.2.1.10) CABIN PRESS RELIEF VLV - CLOSE Inspect aft compartment	
		NOTE After completion of MDA/AM inspections and repairs if necessary, MSFN may initiate MDA/AM pressurization or it may be initiated manually as shown in following step	
		9. INITIATE MDA/AM PRESSURIZATION	
		WARNING Pressurization must be accomplished within time period 2 hours from start of this procedure	Cryo tank heater operation limits CSM support of suited IVA crewman for period of 2 hours
		NOTE Following operations will result in initially O2-rich atmosphere. PCU SUIT PRESS lt and ALSA audio warning tone will be initiated during pressurization	
	225	O2 FILL PRI, SEC sw (2) - OPEN N2 FILL PRI, SEC sw (2) - OPEN AM FILL PRI, SEC sw (2) - OPEN	Approximately TBS minutes required to pressurize MDA/AM
X		CAB PRESS REG A, B tgl vlv (2) - OPEN X	
X	217	Uncap SUS 1, 2 O2 SUP qd (2) X	
X		X	
XXXX		XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.2.1.14 MDA/AM SUITED ACTIVATION (cont'd) X X (MDA/AM 0.5 PSIA, OWS 5.0 PSIA X	
		SUS 1, 2 O2 SUP vlv (2) - OPEN	
	317	Uncap SUS 1, 2 O2 SUP qd (2)	
		SUS 1, 2 O2 SUP vlv (2) - OPEN	
	323	Uncap SUS 1, 2 O2 SUP qd (2)	
		SUS 1, 2 O2 SUP vlv (2) - OPEN	
		PCU SUIT PRESS lt - on	
		Audio warning tone - on	
		PCU AUDIO RESET - depress	
		Audio warning tone - off	
	225	PRESS FWD, LOCK, AFT ind (3) - monitor for increase to 4.8 to 5.2 psia	CSM cabin pressure relief valves preclude OA over-pressurization. Cabin pressure increase resulting from atmospheric temperature may be ignored
		NOTE When pressure in MDA/AM reaches 3.85 ± .15 psia, PCU will begin venting suit to maintain 2 to 4 inches H2O ▲P above compartment pressure	
		10. TERMINATE MDA/AM PRESSURIZATION	
	225	O2/N2 CONTR PPO2 1, 2 ind (2) - TBS	
		PRESS FWD, LOCK, AFT ind (3) - 4.8 to 5.2 psia	
		AM FILL PRI, SEC sw (2) - CLOSE	
		O2 FILL PRI, SEC sw (2) - CLOSE	
		N2 FILL PRI, SEC sw (2) - CLOSE	
		[PRI/OFF/SEC] N2 vlv sel - PRI	
	217	SUS 1, 2 O2 SUP vlv (2) - CLOSE	
		Cap SUS 1, 2 O2 SUP qd (2)	
	317	SUS 1, 2 O2 SUP vlv (2) - CLOSE	
		Cap SUS 1, 2 O2 SUP qd (2)	
	323	SUS 1, 2 O2 SUP vlv (2) - CLOSE	
		Cap SUS 1, 2 O2 SUP qd (2)	
	203	11. CREWMEN ON CSM SUIT LOOP DOFF HELMETS AND GLOVES	
		12. IVA CREWMAN DEACTIVATE ALSA AND DOFF HELMET AND GLOVES	
		13. PROCEED WITH MDA/AM ACTIVATION	
		Complete activation as follows:	
		X (4.2.1.1, steps 5, 7-10, 12-16, 4.2.1.2 thru 4.2.1.8, X	
		X 4.2.1.11 thru 4.2.1.13) X	
		X X	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X (31.17.06-00) X	
		X 4.2.1.15 SWS SUITED ACTIVATION (SWS 0.0 PSIA) X	
		1. PREPARE FOR MDA ENTRY All crewmen don PGA's Perform suit integrity check Prepare for IVA-suited MDA entry	See remark 4.2.1.14, step 1
	100	2. EQUALIZE CSM/MDA PRESSURE Remove bayonet cap PRESS EQUAL VLV - OPEN CSM/MDA ▲P ind - 0.0 psid	Cap is restrained by chain Pressure equalization time may be reduced by opening CSM side hatch CAB PRESS DUMP vlv
		3. OPEN MDA TUNNEL HATCH Release handle safety trigger - lift and rotate 90° toward hatch Release handle - OPEN Push hatch open Secure in detent lock	
	101	4. ACTIVATE MDA LIGHTING AND INSPECT MDA INTERIOR LTS sw - ON Inspect MDA	Momentary switch Inspect for possible pressure skin penetrations or anomalies in equipment or spacecraft configuration. Other systems and equipment effects must be evaluated
		5. SEAL MDA VENT (4.2.1.1, step 6) (SL-2)	
	300	6. ACTIVATE STS AND PANEL LIGHTING AND INSPECT AM (4.2.1.1, step 11) CABIN PRESS RELIEF VLV - CLOSE	
		7. CAP CIRCULATION DUCTS Loosen Calfax fasteners (2) and remove gas circulation duct caps (2) from circulation return air duct outlet (SL-2) Loosen Calfax fasteners (2) and remove gas circulation duct caps (2) from stowed location next to return duct outlet (SL-3,4) Install gas circulation duct cap on return air duct outlet and tighten Calfax fasteners (2) Loosen Calfax fasteners (2) securing supply gas circulation duct flex fitting Slide flex fitting of supply duct back and install gas circulation duct cap Secure flex fitting and gas circulation duct cap by tightening Calfax fasteners (2) Open forward hatch (4.6.1.12)	Supply duct cap is secured to return duct outlet along with return duct cap Fasteners are captive to duct cap Fasteners are captive to flex fitting
		XXXX	XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.2.1.15 SWS SUITED ACTIVATION (SWS 0.0 PSIA) (cont'd) X X X	
		8. ENTER AND INSPECT LOCK COMPARTMENT (4.2.1.9, ignore WARNING)	
	313	CABIN PRESS RELIEF VLV - CLOSE	
		Inspect lock compartment	
	325	Press Equal vlv - CLOSE	
		Install bayonet cap	
		9. INITIATE MDA/AM PRESSURIZATION (LESS AFT COMPARTMENT) Initiate pressurization (4.2.1.14, step 9)	
		10. TERMINATE MDA/AM PRESSURIZATION (4.2.1.14, step 10, except second operation should read - PRESS FWD, LOCK ind (2) - 4.8 to 5.2 psia)	
		11. CREWMEN TERMINATE SUITED ACTIVITIES (4.2.1.14, steps 11, 12)	
		12. PROCEED WITH MDA/AM ACTIVATION Complete activation by performing the following: (4.2.1.1, steps 5, 7-10, 12-16, 4.2.1.2 thru 4.2.1.6, 4.2.1.8, 4.2.1.11 thru 4.2.1.13)	
		13. SAFE OWS RADIANT HEATERS	
	200	cb OWS RADIANT HTRS (4) - open	
		14. VERIFY O2/N2 SYSTEM (4.6.1.1, step 5)	
		15. PREPARE FOR LSU CONNECTION (4.6.1.27, step 1, except stow LSU container lids in MDA and omit operations to uncap SUS 1, 2 LCG (4))	
		16. CONNECT LSU TO EVA PANELS (4.6.1.27, step 3, except omit operations to connect LCG hoses (4))	
		17. CREWMEN DON SUITS	
		18. CONFIGURE AM FOR EVA AUDIO (4.3.2.17)	CSM must also be configured for EVA audio
		19. ACTIVATE ALSA (4.6.1.28, except omit step 4 and select EVA HI FLOW in step 6)	
		20. ACTIVATE EKG/ZPN BIOMEDICAL RECORDING (4.6.1.30)	
		21. CLOSE FORWARD HATCH (4.6.1.9)	
		X X X 22. CHECK ALSA/PGA PRESSURE INTEGRITY (4.6.1.29) X X X XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.2.1.15 SWS SUITED ACTIVATION (SWS 0.0 PSIA)(cont'd) X X X	
		23. DEPRESSURIZE AIRLOCK (4.6.1.31)	
	318	24. TERMINATE AIRLOCK DEPRESSURIZATION LOCK COMPT DEPRESS VLV - CLOSE	
		25. OPEN AFT HATCH (4.6.1.10)	
	390	26. ACTIVATE LIGHTING FOR OWS ENTRY LTS AFT sw - BRIGHT LTS OWS ENTRY sw - ON	
		27. OPEN OWS HATCH (4.2.2.1, steps 2,3)	
		28. SEAL VENT PORTS (4.2.2.1, steps 4, 7)	
	615 613 617 616 630	29. ACTIVATE OWS LIGHTING AND INSPECT OWS cb (all) - closed (verify) cb (all) - closed EPS OWS BUS 1, 2 VOLTS ind (2) - 24.8 to 30.0 (log) EPS OWS BUS 1, 2 AMPS ind (2) - TBS (log) LTG sw (13) - on LTG sw (3) - on Inspect OWS compartments	
	225 200 203	30. INITIATE OWS PRESSURIZATION O2 FILL PRI, SEC sw (2) - OPEN N2 FILL PRI, SEC sw (2) - OPEN OWS FILL PRI, SEC sw (2) - OPEN PRESS OWS, AFT ind (2) - monitor for increase to 4.8 to 5.2 psia cb OWS RADIANT HTRS (4) - closed OWS RADIANT HTRS 1, 2 sw (2) - ON	Approximately 9.5 hours to pressurize OWS
		31. CLOSE AFT HATCH (4.6.1.6)	
		32. PRESSURIZE AIRLOCK (4.6.1.34 using backup equalization valve operation, and delete last operation)	
		33. OPEN FORWARD HATCH (4.6.1.13)	
		34. DEACTIVATE ALSA (4.6.1.35, omit operations to deactivate SUS PUMP, HX COOLANT FLOW switches)	
		35. DISCONNECT LSU (4.6.1.36, steps 1, 2, except omit operations to disconnect LCG hoses (4)	
		X X X 36. TERMINATE EKG/ZPN RECORDING (4.6.1.37, step 3) X X X XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.2.1.15 SWS SUITED ACTIVATION (SWS 0.0 PSIA) (cont'd) X X X	
	225 203	37. TERMINATE OWS PRESSURIZATION PRESS OWS ind - 4.8 to 5.2 psia O2 FILL PRI, SEC sw - CLOSE N2 FILL PRI, SEC sw - CLOSE OWS FILL PRI, SEC sw - CLOSE OWS RADIANT HTRS 1, 2 sw (2) - OFF	
		38. OPEN AFT HATCH (4.6.1.10)	
		39. REMOVE GAS CIRCULATION DUCT CAPS Loosen Calfax fasteners (2) and remove gas circulation duct cap from circulation return air duct outlet Loosen Calfax fasteners (2) securing supply gas circulation duct fitting and gas circulation duct cap Slide flex fitting back and remove gas circulation duct cap Stow duct caps (2) next to return duct outlet with Calfax fasteners (2) Install flex fitting and tighten Calfax fasteners (2)	
		40. PROCEED WITH SWS ACTIVATION Complete activation by performing the following: X (4.2.1.7, step 2, 4.2.2.1, steps 1-3, 5, 6, 8-12, 4.2.8.2 thru X X 4.2.2.9) X X X XXXX

4.2.2 OWS ACTIVATION

CREWMAN	PANEL	PROCEDURE	REMARKS
		(04.03.01-00)	
		4.2.2.1 INITIAL ENTRY AND CONFIGURATION	
		WARNING Concentrations of N2 may exist in OWS until OWS circulation fans are operated for a minimum of 4 minutes	
		CAUTION Radiant heaters (8) in OWS may be hot to touch	Cooling, following deactivation of heaters, takes TBS hours
		1. ACTIVATE OWS SYSTEMS IN AM AFT COMPARTMENT	
	390	LTS OWS ENTRY sw - ON	Initial entry lighting configuration: Dome lights 1 and 4 - on Upper wall lights 3 and 8 - on Experiment compartment lights 6, 7, 13 and 14 - on
		OWS HT EXCH FANS 1-4 sw (4) - OWS (verify)	Enables automatic control via switches on panel 617
		NOTE AM duct fan is blowing air at approximately 20 fps toward duct plate	
		Loosen Calfax fasteners (4), remove gas circulation supply duct debris plate from supply duct outlet, and stow on VENT PLATE STOWAGE on OWS cooling heat exchanger module door with Calfax fasteners (2) (SL-2)	(M326)
	207	C/W OWS GAS INTERCHG lt - off	OWS INTERCHG light will go off as flow increases
	206	C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off	Momentary switch
		(04.03.02-00)	
		2. EQUALIZE AM/OWS PRESSURE (SL-2)	
	400	RELEASE HANDLE - UNLOCK HATCH HANDLE - EQUALIZE PRESS	
	316	RELEASE HANDLE - LOCK PRESS AFT ind = PRESS OWS ind ± 0.25 psid	
		3. OPEN OWS HATCH	
		CAUTION Floating debris may exist in OWS	
	400	RELEASE HANDLE - UNLOCK HATCH HANDLE - OPEN RELEASE HANDLE - LOCK Push hatch open and secure in opened position with hatch retainer	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.1 INITIAL ENTRY AND CONFIGURATION (cont'd) (31.17.07-00) - OWS Hatch Frozen Shut - NOTE See tool matrix for tool requirements (Appendix C) Remove quick release pin from RELEASE HANDLE Equalize pressure by holding flapper valve down and puncturing screen (No. 2 Phillips screwdriver) Push hatch open and secure in opened position with spring clip - if unable, proceed to next operation Remove external hex head bolts (3) and remove HATCH HANDLE (3/8 standard socket, ratchet handle) Remove flush head screw (1) and remove RELEASE HANDLE (1/8 hex driver bit, spin-type handle) Remove tubular sleeve from RELEASE HANDLE spindle Remove protruding head screws (12) and remove lock mechanism cover (1/8 hex driver bit, spin-type handle) Remove nut holding control arm to linkage arm (5/16 standard socket, ratchet handle) Slide control arm off spindle Remove bolt from linkage arm (1/8 hex driver bit, spin-type handle) Remove tubular spacer from control arm Swing linkage arm to one side Remove flush head screws (2) and remove index plate (1/8 hex driver bit, spin-type handle) Replace HATCH HANDLE, and replace and tighten two of the three external hex head bolts (3/8 standard socket, ratchet handle) Remove nuts (4) and detach index fitting from base plate (1/4 standard socket, ratchet handle) Lift index fitting from hatch Apply cw pressure on compression strut fitting assembly (pinch bar) Push hatch open and secure in opened position with spring clip - if unable, proceed to next operation Remove handle screws (12) and cover screws (8) and remove hatch cover (3/16 hex driver bit, 1/8 hex driver bit, spin type handle) Remove compression linkage roller bolts (12) (TBS) Verify that roller assemblies (12) have released Push hatch open and secure in opened position with spring clip	Hatch repair may be attempted at crew convenience

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.1 INITIAL ENTRY AND CONFIGURATION (cont'd)	
		(04.03.03-00)	
	403	4. SEAL SOLENOID VENT PORT Remove vent sealing device from stowage receptacle (4.3.4.1) Install vent sealing device in SOLENOID VENT PORT (4.3.4.2)	(D493)
		5. RELEASE FIRE EXTINGUISHER FROM LAUNCH RESTRAINTS (SL-2) Remove pins (2) from fire extinguisher in dome Release retaining clamp and remove Stow pins and clamp	
		NOTE Pins and clamp may be stowed temporarily in pocket. At crew convenience, transfer pins and clamp to launch pin bag	(F527)
	401	6. ACTIVATE INTERCOM BOXES COMM CHAN sel - A ON SPKR VOL - adjust as required	
		NOTE One intercom box within audible range must be operational at all times to enable audible C/W tones	
		Record remainder of activation (4.3.2.4, or 4.3.2.8 and 4.3.2.16)	This operation is not part of A.E. 04.03.03-00. Refer to A.E. 25.02.05-00, or 25.02.31-00 and 25.02.11-00
		Activate remaining intercom boxes (9) as required	Panels 520, 540, 600, 627, 702, 801, 901, 902, 903
	405	7. SEAL PNEUMATIC VENT PORT (SL-2) Repeat step 4 for PNEUMATIC VENT PORT	(D491)
		8. INSTALL OWS/AM VCS DUCT (SL-2)	This step is A.E. 04.03.05-00
		NOTE AM duct fan is blowing air toward OWS/AM VCS duct connection. If unable to connect VCS duct, turn fan off, and reactivate after duct is connected	Fan controlled by AM FANS DUCT switch, panel 203. If fan is turned off, and later turned on, C/W OWS GAS INTERCHG alert will be initiated
		Unstow OWS/AM VCS duct Install duct with Calfax fasteners (2) at hatch sill Connect with Calfax fasteners (4) to AM supply duct Connect duct to OWS plenum inlet and tighten cw	(F556) Fasteners are captive to duct Fitting on end of duct is bayonet type
		9. ACTIVATE OWS LIGHTING AND INSPECT OWS Verify panels 611, 612, 613, 614 and 615 per closeout configuration (4.1) (SL-2) Verify panels 611, 612, 613, 614 and 615 per storage configuration (4.1) (SL-3,4)	The first 7 operations are A.E. 04.03.06-00

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.1 INITIAL ENTRY AND CONFIGURATION (cont'd)	
	613	Configure panel 613 to post-activation configuration (4.1)	
	617	EPS OWS BUS 1, 2 VOLTS ind (2) - 24.8 to 30.0 (log)	
		EPS OWS BUS 1, 2 AMPS ind (2) - TBS (log)	
	616	Configure LTG sw (13) per post-activation configuration (4.1)	
	630	Configure LTG sw (3) per post-activation configuration (4.1)	
		Inspect OWS compartments (SL-2)	Gross evaluation for launch damage, loose equipment, floating debris, etc. This operation is A.E. 04.03.07-00
	390	LTS OWS ENTRY sw - OFF	
		10. RELEASE REMAINING FIRE EXTINGUISHERS (3) FROM LAUNCH RESTRAINTS (SL-2)	
		Remove pins (2) from each remaining fire extinguisher	
		Release retaining clamps and remove	
		Stow pins and clamps	
		NOTE	
		Pins and clamp may be stowed temporarily in pocket. At crew convenience, transfer pins and clamp to launch pin bag	(F527)
		11. CONFIGURE CIRCUIT BREAKER PANELS AND MISCELLANEOUS PANELS	This step is A.E. 04.03.08-00
	612	Configure panel 612 per post-activation configuration	Activates all OWS ACC and UTIL outlets
		WARNING	
		To preclude possible equipment damage, do not close the following two water heater circuit breakers until after water system activation: cb HSS WARDRM H2O HTR cb HSS WMC H2O HTR	
	614	Configure panel 614 per post-activation configuration (4.1) except: cb HSS WARDROOM H2O HTR - OPEN (verify) cb HSS WMC H2O HTR - OPEN (verify)	TCS DUCT FANS cb (12) will activate circulation fans
	617	EPS OWS BUS 1, 2 VOLTS ind (2) - 24.8 to 30.0 (log)	
		EPS OWS BUS 1, 2 AMPS ind (2) - (TBS) (log)	
		TCS DUCT AIR FLOW 1-3 ind (3) - 550 to 620 cfm	
	610	DISPLAY sw - ON	
		BRIGHTNESS adj - as required	
		NOTE	
		If day count is in error (4.3.7.4)	
	617	Configure WASTE PROCESSORS BUS SELECT sw (6) to post-activation configuration (4.1)	
	607	FLARE ALERT sw - ON	
	640	VAN ALLEN BELT DOSIMETER sw - ON (verify)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.1 INITIAL ENTRY AND CONFIGURATION (cont'd)	
	617	12. ACTIVATE THERMAL CONTROL SYSTEM DUCT 3 FANS BUS SEL 1, 3 sw (4) - BUS 1 (verify) DUCT 3 FANS BUS SEL 2, 4 sw (2) - BUS 2 TCS DUCT AIR FLOW 3 ind - 550 to 620 cfm	This step is A.E. 04.03.09-00
		NOTE The next operations are a qualitative check of the automatic mode of the TCS	
		TCS TEMP SEL - 90°F EPS OWS BUS 1 AMPS ind - (log) EPS OWS BUS 2 AMPS ind - (log) TCS HTRS DUCT 3 [1•3] sw - BUS 1 EPS OWS BUS 1 AMPS ind - ≈10 increase (log) TCS HTRS DUCT 3 [2•4] sw - BUS 2 EPS OWS BUS 2 AMPS ind - ≈10 increase (log) TCS HTRS DUCT 3 [2•4] sw - OFF TCS HTRS DUCT 3 [1•3] sw - OFF TCS HTRS DUCT 1 [1•3] sw - AUTO EPS OWS BUS 1 AMPS ind - ≈10 increase (log) TCS HTRS DUCT 1 [2•4] sw - AUTO EPS OWS BUS 1 AMPS ind - ≈10 increase (log) TCS HTRS DUCT 2 [1•3] sw - AUTO EPS OWS BUS 2 AMPS ind - ≈10 increase (log) TCS HTRS DUCT 2 [2•4] sw - AUTO EPS OWS BUS 2 AMPS ind - ≈10 increase (log) TCS HT EXCH FANS 1-4 sw (4) - AUTO TCS TEMP SEL - 75°F or as desired TCS OWS TEMP ind - 60° to 80°F	
		NOTE TCS HTRS DUCT 3 [1•3], [2•4] switches (2) may be positioned to ON as desired	
		Experiment compartment diffusers 1-5 (5) - WIDE (verify) Experiment compartment diffusers 1-5 damper control knobs (5) - OPEN (verify) Wardroom diffusers 1-3 (3) - WIDE (verify) Wardroom diffusers 1-3 damper control knobs (3) - OPEN (verify) WMC diffuser - WIDE (verify) WMC diffuser damper control knob - OPEN (verify) Sleep compartment diffusers 1-3 (3) - as required	Circular diffusers and dampers are adjusted prior to launch as indicated. During habitation, rectangular as well as circular diffusers may be adjusted to satisfy comfort requirements

CREWMAN	PANEL	PROCEDURE	REMARKS
		(26.08.01-00) (26.08.02-00) (26.08.03-00) (26.08.07-00)	
		4.2.2.2 OWS CAUTION AND WARNING TEST	
		1. CHECK CAUTION AND WARNING SYSTEM (4.3.8.1 through 4.3.8.5)	
		(04.03.10-00)	
		4.2.2.3 WARDROOM CONTROL PANELS ACTIVATION	
		1. CONFIGURE AND VERIFY	
	700	WINDOW HTR sw - BUS 1	WINDOW HTR switch may be switched off when not required
		H2O DUMP PRESS ind - OSH (verify) (SL-2)	< OSH indicates dump valve leakage
		H2O DUMP PRESS ind - < 0.7 psia (verify) (SL-3, 4)	> 0.7 indicates qd leakage
		(04.03.11-00)	
		4.2.2.4 WMC CONTROL PANELS ACTIVATION	
		1. TEST AND CONFIGURATION	
	800	FAN sw - BUS 1	Leave fan on during WMC activation for debris filtering and O2/N2 mixing
		Verify fan operation	
		LAMP TEST sw - 1	Momentary switch
		DUMP HTRS H2O lt - on	
		DUMP HTRS URINE lt - on	
		WASTE PROCESSOR 1-6 TIMER lt (6) - on	
		WASTE PROCESSOR 1-6 OVERTEMP lt (6) - on	
	800	DUMP HTRS URINE sw - 1	
		DUMP HTRS URINE lt - on	
	617	DUMP HTR lt - on	
	800	DUMP HTRS URINE sw - OFF	
		DUMP HTRS URINE lt - off	
	617	DUMP HTR lt - off	
		H2O DUMP PRESS ind - OSH (verify) (SL-2)	< OSH indicates dump valve leakage
		H2O DUMP PRESS ind - < 0.7 psia (SL-3, 4)	> 0.7 indicates qd leakage
		WASTE PROCESSOR EXHAUST PRESS ind - OSH (verify) (SL-2)	< OSH indicates dump valve leakage
		WASTE PROCESSOR EXHAUST PRESS ind - < 0.2 psia (SL-3, 4)	> 0.2 indicates qd leakage
	800	FAN sw - OFF	
		2. PROCESSOR ACTIVATION	
		WASTE PROCESSOR 1-6 DOOR handle (6) - LOCK (verify)	
		WASTE PROCESSOR 1-6 VENT handle (6) - CABIN (verify)	
		WASTE PROCESSOR 1-6 TMR sw (6) - OFF (verify)	
	817	cb PROCESSOR 1-6 (6) - close	
	818	WASTE PROCESSOR VACUUM VENT valve - OPEN	
	800	WASTE PROCESSOR EXHAUST PRESS ind - decrease	
		URINE DUMP valve - CLOSE (verify)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(04.03.12-00)	
		4.2.2.5 FECAL/URINE COLLECTOR ACTIVATION	
		NOTE Removal of launch restraints is a constraint on the completion of this procedure.	
		1. INSTALL URINE SYSTEM SEPARATOR ASSEMBLY IN DRAWER 1 Install urine system separator and separator motor (4.3.14.13, steps 1-3. Do not close drawer)	
	800	FAN sw - BUS 1	
		2. INSTALL URINE COLLECTION HOSE Obtain urine collection hose	(H823)
	825	Drawer 1 AIRFLOW VLV - OPEN	Permits opening of INLET DOOR
		Drawer 1 INLET DOOR - open	
		Slide urine collection hose down through INLET DOOR opening and around separator	
		Slip urine collection hose over separator URINE INLET	
		Place urine collection hose inside INLET DOOR	
		Drawer 1 INLET DOOR - close	
		Drawer 1 AIRFLOW VLV - CLOSE	
		3. INSTALL URINE BAG Obtain urine bag	(H823) Urine bag consists of bladder and recirculation line with valve
		Pull tab on urine bag, allowing air to inflate urine bag	Inflation is required for subsequent leak test of bag. Urine inlet to urine bag contains a check valve which prevents escape of air from bag
		Install urine bag in urine drawer between urine chiller plate and pressure plate	
		Position urine bag urine inlet boot and urine dump qd in urine chiller slot	
		Slip urine bag urine inlet boot over separator URINE OUTLET	Separator URINE OUTLET protrudes through slot in urine chiller plate
		Drawer 1 RECIRCULATION LINE DOOR - open	
		Draw recirculation line through RECIRCULATION LINE DOOR opening	
		Push drawer closed	
		Push in and rotate drawer 1 DRAWER locking handle - LOCK	Pressure plate is reapplied to urine bag
		4. URINE BAG LEAK TEST Drawer 1 VOL ind - monitor for decay after initial stabilization	Movement of pressure plate against urine bag will initially cause volume indicator to rapidly decay, and then stabilize. If VOLUME indicator decay continues, urine bag is leaking and must be replaced
		Push recirculation line valve - open	Bleeds air from urine bag
		Drawer 1 VOL ind - monitor air bleed-off until indicator stops	
		Release recirculation line valve - closed	
		Place recirculation line inside RECIRCULATION LINE DOOR opening	
		Drawer 1 RECIRCULATION LINE DOOR - close	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.5 FECAL/URINE COLLECTOR ACTIVATION (cont'd)	
		5. CONFIGURE URINE DRAWERS 2 AND 3 Repeat steps 1 through 4 for urine drawers 2 and 3	
		6. INSTALL URINE SAMPLE CONTAINER Obtain sample bag Drawer 1 SAMPLE CONTAINER door - open Place sample container inside SAMPLE CONTAINER door with deformation valve facing slot in SAMPLE CONTAINER door Drawer 1 SAMPLE CONTAINER door - closed Repeat preceding operations for URINE DRAWERS 2 and 3	(H823)
		7. CONFIGURE FECAL COLLECTOR Obtain fecal bag Unlatch seat and lift Insert fecal bag into fecal collector Install fecal bag boot over flange on fecal collector Close seat and latch	(H823)
		8. READY BLOWER UNIT FOR OPERATION Remove lap belt from stowed position and temporarily install the belt into using position Open access door to fecal collector filter/blower unit cb blower unit - closed (verify) Verify vacuum cleaner bag interlock held down by tethered pin inserted in blower unit housing Blower unit power [ON/OFF/MOM ON] sw - ON Verify inlet hose connected to blower unit Verify inlet hose connected to fecal collector filter cb bus 1 pwr - 1 - closed cb bus 1 pwr - 2 - closed cb bus 1 pwr - 3 - closed Close access door to fecal collector filter/blower unit Replace lap belt in stowed position	Lap belt interferes with opening of access door Located in recess on blower unit Pin located on side of blower unit. Holding down interlock enables blower unit electrical circuit for operation Lever Lock switch located on handle of blower unit. Lever lock feature locks switch in the ON position Bus 2 circuit breakers will remain open until required
	825	9. VERIFY BLOWER UNIT/URINE SYSTEM SEPARATOR OPERATION BLWR/SEPARATOR BUS 1 PWR - 1 sw - ON Verify airflow through fecal collector Verify drawer 1 separator operating Drawer 1 AIRFLOW VLV - OPEN Drawer 1 INLET DOOR - open Remove urine collection hose from inside INLET DOOR Extend urine inlet valve plunger and hold	Audible Urine inlet valve is located on urine collection hose and is spring loaded to the closed position. Opening inlet valve will begin airflow to separator

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.5 FECAL/URINE COLLECTOR ACTIVATION (cont'd) Verify airflow through urine collection hose inlet Release urine inlet valve plunger Place urine collection hose inside drawer 1 INLET DOOR Drawer 1 INLET DOOR - closed Drawer 1 AIRFLOW VLV - CLOSE BLWR/SEPARATOR BUS 1 PWR - 1 sw - OFF NOTE Urine system separator will continue to operate for approximately 4 minutes after switch is positioned OFF Repeat preceding operations for urine drawers 2 and 3	
	800	FAN sw - OFF 10. TRANSFER URINE SAMPLES FROM CM TO WMC NOTE Urine sample may be collected at any time following the above sequence of steps if required for scheduled medical activity (04.03.13-00) 4.2.2.6 SINK ACTIVATION NOTE Removal of launch restraints is a constraint on the completion of this procedure 1. INSTALLATION OF SQUEEZER BAG (4.4.14.19) (04.03.14-00) 4.2.2.7 WATER SYSTEM ACTIVATION NOTE Order of water tank usage is as follows: Wardroom - water tank 1 Wardroom - water tank 10 Wardroom - water tank 2 Wardroom - water tank 3 Wardroom - water tank 4 Wardroom - water tank 5 WMC - water tank 7 WMC - water tank 8 Urine Flush - water tank 6 Contingency - water tank 9 Each tank used to depletion. Water tanks activated for each mission will be a real-time decision. For this procedure, water tanks are referenced as (water tank - wardroom) and (water tank - WMC). The following items are required during the performance of this procedure: washcloth, long strap (3), bleed adapter, waste water bag, launch pin bag; see tool matrix for tool requirements (Appendix C)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.7 WATER SYSTEM ACTIVATION (cont'd)	
		1. ACTIVATE WATER PRESSURIZATION SYSTEM	
	620	M171 SUP vlv - CLOSE (verify) (7 1/2 turns, cw)	
		ESS SUP vlv - CLOSE (verify) (7 1/2 turns, cw)	
	500	PRESS BLEED vlv - CLOSE (verify) (7 1/2 turns, cw)	
		150 PSI N2 SUP vlv - OPEN (verify) (7 1/2 turns, ccw)	
	225	OWS N2 vlv - OPEN (7 1/2 turns, ccw)	
		35 PSI REG A tgl vlv - CLOSE (verify) (SL-2)	
	500	35 PSI REG A tgl vlv - OPEN (SL-3,4)	
		35 PSI REG B tgl vlv - CLOSE (verify)	
		WATER OUTLET vlv (water tank - wardroom) - CLOSE (verify)	
		PRESS VLV (water tank - wardroom) - OPEN	
		WATER OUTLET vlv (water tank - WMC) - CLOSE (verify)	
		PRESS vlv (water tank - WMC) - CLOSE (verify)	
		WATER OUTLET vlv (water tank - 6) - CLOSE (verify)	
		PRESS vlv (water tank - 6) - CLOSE (verify)	
		2. CONNECT WARDROOM SUPPLY HOSE	
		Release ends of WARDROOM 1 hose stowed in clamps (SL-2)	Located below water tank 10
		Remove captive caps on WARDROOM 1 hose qd (2), WATER OUTLET qd (water tank - wardroom), and WARDROOM WATER qd (SL-2)	WARDROOM WATER qd located below water tank 2
		Connect WARDROOM 1 hose qd (2) to WATER OUTLET qd (water tank - wardroom) and WARDROOM WATER qd (SL-2)	
		Connect captive caps together (SL-2)	
		Release end of WARDROOM 1 hose with purge fitting from clamp (SL-3, 4)	Wardroom purge fitting installed during deactivation
		Remove purge fitting from WARDROOM 1 hose qd and stow (SL-3, 4)	(D438)
		Remove captive cap on WATER OUTLET qd (water tank - wardroom) (SL-3, 4)	
		Connect WARDROOM 1 hose qd to WATER OUTLET qd (water tank - wardroom) (SL-3, 4)	
		Connect captive caps together (SL-3, 4)	
		3. CONNECT WMC SUPPLYHOSE	
		NOTE Specific hose usage is dependent on water tank selection as shown: Water Tank — Hose — Location 7 — WMC 1 — Below Water Tank 7 8 — WMC 2 — Below Water Tank 8	
		Release ends of WMC hose stowed in clamps (SL-2)	
		Remove captive caps from WMC hose qd (2), WATER OUTLET qd (water tank - WMC) and WMC qd (SL-2)	
		Connect WMC hose qd (2) to WATER OUTLET qd (water tank - WMC) and WMC WATER INLET qd (SL-2)	
		Connect captive caps together (SL-2)	
		Release end of WMC hose with purge fitting from clamp (SL-3, 4)	WMC purge fitting installed during deactivation
		Remove WMC purge fitting from WMC hose qd and stow (SL-3, 4)	(D438)
		Remove captive cap on WATER OUTLET qd (water tank - WMC) (SL-3, 4)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.7 WATER SYSTEM ACTIVATION (cont'd)	
		Connect WMC hose qd to WATER OUTLET qd (water tank - WMC) (SL-3, 4)	
		Connect captive caps together (SL-3, 4)	
		4. CONNECT URINE SYSTEM FLUSH HOSE	
		Release ends of URINE SYSTEM FLUSH hose stowed in clamps (SL-2)	Located below water tank 6
		Remove captive caps on URINE SYSTEM FLUSH hose qd (2) (SL-2)	URINE FLUSH qd located below and between water tanks 6 and 7
		WATER OUTLET qd (water tank - 6), and URINE FLUSH qd	
		Connect URINE SYSTEM FLUSH hose qd (2) to WATER OUTLET qd (SL-2)	
		(water tank - 6) and URINE FLUSH qd	
		Connect captive caps together (SL-2)	
		Release end of URINE SYSTEM FLUSH hose with purge fitting (SL-3, 4)	Urine purge fitting installed during deactivation
		from clamp	
		Remove purge fitting from URINE SYSTEM FLUSH hose qd (SL-3, 4)	(D438)
		and stow	
		Remove captive cap on WATER OUTLET qd (water tank - 6) (SL-3, 4)	
		Connect URINE SYSTEM FLUSH hose qd to WATER OUTLET qd (SL-3, 4)	
		(water tank - 6)	
		Connect captive caps together (SL-3, 4)	
		5. PREHEAT WATER DUMP HEATER PROBES	
	700	H2O DUMP HTR sw - 1	
		H2O DUMP HTR lt - on	
	617	DUMP HTR lt - on	
	800	DUMP HTRS H2O sw - 1	
		DUMP HTRS H2O lt - on	
		Set portable timer for 15 minutes (4.3.7.2, steps 1, 2)	
	705	6. CONNECT DUMP LINES TO WARDROOM WATER SYSTEM	
		Release latches (3) on table top	
		Remove and stow table top overhead on grid	
		Relocate food trays on grid and restrain with long straps (SL-2)	Enables thigh restraints to be elevated
		Elevate thigh restraints (3) to vertical position	
		Open WATER CHILLER and WATER HEATER access doors on food table pedestal	
		Remove captive caps from WATER HEATER DUMP PORT qd and WATER CHILLER DUMP PORT qd	
		Disconnect dump lines qd (2) from DUMP LINE STOWAGE qd (2)	
		Connect dump line qd (2) to WATER HEATER DUMP PORT qd and WATER CHILLER DUMP PORT qd	
		HOT WATER [DISPENSE/CHARGE] vlv - DISPENSE (verify)	
		COLD WATER [DISPENSE/CHARGE] vlv - DISPENSE (verify)	
		WATER HTR OUTLET VLV - OPEN (verify)	
		WATER CHILLER OUTLET VLV - OPEN (verify)	
		7. CONNECT DUMP LINE TO WMC WATER SYSTEM	
		Open WMC WATER HEATER access door	Mirrored door in WMC
		Remove captive cap from WATER HEATER DUMP PORT qd	
		Disconnect WMC dump line qd from DUMP LINE STOWAGE qd	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.7 WATER SYSTEM ACTIVATION (cont'd)	
		Connect WMC dump line qd to WATER HEATER DUMP PORT qd WATER HTR OUTLET VLV - OPEN	
		8. CONNECT DUMP LINE TO URINE FLUSH SYSTEM Open access door below WMC sink Disconnect URINE SYSTEM FLUSH DUMP hose qd (2) from stowage qd (2)	(D831)
		Remove captive cap on URINE SYSTEM FLUSH DUMP line qd Connect URINE SYSTEM FLUSH DUMP hose qd to URINE SYSTEM FLUSH DUMP line qd Open URINE DUMP EQUIPMENT door	(H822)
		Remove captive cap on FLUSH DUMP PORT qd Connect URINE SYSTEM FLUSH DUMP hose qd to FLUSH DUMP PORT qd	Captive caps will be connected in a later step
		NOTE Do not continue with water system activation until water dump lines have been preheated for 15 minutes as indicated by tone from portable timer	
		9. EVACUATE WMC WATER AND URINE FLUSH SYSTEMS	
	831 800	WATER DUMP vlv - OPEN H2O DUMP PRESS ind - $\leq$ 0.2 psia (SL-2) H2O DUMP PRESS ind - $\leq$ 0.7 psia (SL-3, 4)	Pressure decreases from OSH Meter will initially increase to OSH and then decrease to $\leq$ 0.7 psia
	831	WATER DUMP vlv - CLOSE Disconnect WMC dump line qd from WATER HEATER DUMP PORT qd Connect WMC dump line qd to DUMP LINE STOWAGE qd Replace captive cap on WATER HEATER DUMP PORT qd Disconnect URINE SYSTEM FLUSH DUMP hose qd from FLUSH DUMP PORT qd Connect captive caps to URINE SYSTEM FLUSH DUMP hose qd and FLUSH DUMP PORT qd Disconnect URINE SYSTEM FLUSH DUMP hose qd from FLUSH DUMP line qd Connect captive caps to URINE SYSTEM FLUSH DUMP hose qd and FLUSH DUMP line qd Stow URINE SYSTEM FLUSH DUMP hose Close access door below WMC sink	
	800	DUMP HTRS H2O sw - OFF DUMP HTRS H2O lt - off	
		10. EVACUATE WARDROOM WATER SYSTEM (SL-2) Open WATER DUMP VALVE access door	
	700 706 700	H2O DUMP HTR lt - on (verify) H2O DUMP vlv - OPEN H2O DUMP PRESS ind - $\leq$0.2 psia	Pressure decreases from OSH
		11. BLEED WATER PRESSURIZATION SYSTEM (SL-2) Release ends of NITROGEN FILL hose stowed in clamps Remove captive caps on NITROGEN FILL hose qd (2)	Performed during step 14 for SL-3,4 activation
	500	Remove captive cap on 35 PSI N2 PORTABLE WATER TANK PRESS PORT qd PRESS PORT vlv - CLOSED (verify)	Located on portable water tank

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.7 WATER SYSTEM ACTIVATION (cont'd)	
		Remove captive cap on PRESS PORT qd	
		Connect NITROGEN FILL hose qd (2) to 35 PSI N2 PORTABLE WATER TANK PRESS PORT qd and PRESS PORT qd	
		PRESS PORT vlv - OPEN	Located on portable water tank
	500	Loosen and remove threaded cap on gas bleed port	
		PRESS BLEED vlv - OPEN (7 1/2 turns, ccw)	
		Monitor N2 PRESS ind - TBS	Located on portable water tank
	500	PRESS BLEED vlv - CLOSE (7 1/2 turns, cw)	
		Install and tighten threaded cap on gas bleed port	
		PRESS PORT vlv - CLOSE	
		12. FILL WARDROOM WATER SYSTEM (SL-2)	Performed during step 14 for SL-3,4
		Set portable timer for 2 minutes (4.3.7.2, steps 1, 2)	Extended fill time results in excess water loss
		WATER OUTLET vlv (water tank - wardroom) - OPEN	
		Portable timer tone - on	
	706	WATER DUMP vlv - CLOSE	
		13. INSTALL CAT ION CARTRIDGE (SL-2)	Installed during step 14 (SL-3,4) via 100 PPM iodine solution procedure (4.3.13.5, step 11)
		WATER OUTLET vlv (water tank - wardroom) - CLOSE	
		Remove captive caps from cat ion cartridge	Located under LBNP experiment (M092)
		Connect captive caps together	
		Remove bypass hose from clamps	
		Disconnect mated qd (2) on bypass hose	
		Connect bypass hose qd (2) to cat ion cartridge qd (2)	
		14. 100 PPM IODINE SOAK (SL-3,4)	
	700	H2O DUMP HTR lt - on (verify)	
	706	WATER DUMP vlv - OPEN	Evacuates wardroom water system
	700	H2O DUMP PRESS ind - $\leq$0.7 psia	
	706	WATER DUMP vlv - CLOSE	
		Supply 100 PPM iodine solution (4.3.13.5, step 11)	
		15. BLEED WARDROOM WATER SYSTEM	
		WATER OUTLET vlv (water tank - wardroom) - OPEN (SL-3,4)	
		Disconnect dump line qd from WATER CHILLER DUMP PORT qd	
		Replace captive cap on WATER CHILLER DUMP PORT qd	
		Connect dump line qd to DUMP LINE STOWAGE qd	
	700	H2O DUMP HTR lt - on (verify) (SL-2)	
	706	WATER DUMP vlv - OPEN (SL-2)	Removes iodine solution launched in cat ion assembly
		Set portable timer for 14 minutes (4.3.7.2., steps 1, 2) (SL-2)	
		Portable timer tone - on (SL-2)	
	706	WATER DUMP vlv - CLOSE (SL-2)	
	500	35 PSI REG A tgl vlv - OPEN (SL-2)	
	705	Disconnect dump line qd from WATER HEATER DUMP PORT qd	
		Replace captive cap on WATER HEATER DUMP PORT qd	
		Connect dump line qd to DUMP LINE STOWAGE qd	
		Connect H2O gun/dispenser squeezer bag adapter to squeezer bag	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.7 WATER SYSTEM ACTIVATION (cont'd)	
		Connect squeezer bag to HOT wardroom H2O dispenser valve	
		HOT volume select - 1 oz	
		HOT [DISPENSE/CHARGE] vlv - CHARGE	
		HOT [DISPENSE/CHARGE] vlv - DISPENSE	
		HOT wardroom H2O dispenser vlv - depress	
		Repeat preceding operations (3), two more times	
		HOT volume select - LOCK	
		Remove H2O gun/dispenser squeezer bag adapter	
		Connect H2O gun/dispenser squeezer bag adapter to COLD wardroom H2O dispenser valve	
		COLD volume select - 1 oz	
		COLD [DISPENSE/CHARGE] vlv - CHARGE	
		COLD [DISPENSE/CHARGE] vlv - DISPENSE	
		COLD wardroom H2O dispenser vlv - depress	
		Repeat preceding operations (3) - two more times	
		COLD volume select - LOCK	
		Obtain new H2O gun resupply (3) (SL-3,4)	(D438)
		Remove H2O gun from holster (SL-3,4)	
		Screw H2O gun resupply fingertight on H2O gun (SL-3,4)	
		Screw jamnut up against H2O gun resupply and tighten (5/16 open end/box) (SL-3,4)	
		Attach H2O gun/dispenser squeezer bag adapter to H2O gun resupply	
		H2O gun trigger - rotate	
		H2O gun trigger - release	
		Repeat preceding operations (2), three times	
		Remove H2O gun/dispenser squeezer bag adaptor from H2O gun resupply	
		Repeat preceding operations (5) for remaining two H2O guns (SL-2)	
		Repeat preceding operations (9) for remaining two H2O guns (SL-3,4)	
	706	WATER DUMP vlv - OPEN	Dump valve open to bleed water out of dump line
		Wait TBS sec	
		WATER DUMP vlv - CLOSE	
	705	Close WATER CHILLER, WATER HEATER, and WATER DUMP VALVE doors on food table pedestal	
		Return thigh restraints to stowed position	
	700	H2O DUMP HTR sw - OFF	
		H2O DUMP HTR lt - off	
	617	DUMP HTR lt - off	
		16. FILL WMC WATER AND URINE FLUSH SYSTEMS	
		WATER OUTLET vlv (water tank - WMC) - OPEN	
		PRESS vlv (water tank - WMC) - OPEN	
		WATER OUTLET vlv (water tank - 6) - OPEN	
		PRESS vlv (water tank - 6) - OPEN	
		Set portable timer for TBS minutes (4.3.7.2, steps 1, 2)	
		Portable timer tone - on	
		WATER HEATER OUTLET VALVE - OPEN	
		Close WMC WATER HEATER access door	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.7 WATER SYSTEM ACTIVATION (cont'd)	
		17. BLEED WMC WATER SYSTEM Depress dispenser valve and bleed gas and water mixture into washcloth until a steady stream of water is evident Squeeze washcloth in washcloth squeezer and attach to washcloth drying facility in WMC	
		18. BLEED URINE FLUSH SYSTEM Remove urine system flush gun from stowage (Tools TBS) Dispose of bolts and bracket (launch pin bag) Obtain urine system flush gun tip Install tip on gun (5/16 open end/box) Urine system flush gun trigger - rotate Urine system flush gun trigger - release, absorb gas/water mixture in dry washcloth Replace urine system flush gun in stowage Close URINE DUMP EQUIPMENT door Squeeze washcloth in washcloth squeezer and attach to washcloth drying facility in WMC	(H831) Located beside urine dump equipment (D438) Allows flow of 50 cc water (H822)
	614	19. ACTIVATE WATER HEATERS cb WARDROOM H2O HTR - CLOSE cb WMC H2O HTR - CLOSE Return H2O gun/dispenser squeezer bag adapter to stowage	Approximately 90 minutes to heat water to required temperature (D438)
		20. REPRESSURIZE PORTABLE WATER TANK PRESS PORT vlv - OPEN until N2 PRESS ind - 18 to 22 psig PRESS PORT vlv - CLOSE	
		21. RECONFIGURE PORTABLE WATER TANK Disconnect NITROGEN FILL hose from 35 PSI N2 PORTABLE WATER TANK PRESS PORT qd and PRESS PORT qd Install captive caps (4) on NITROGEN FILL hose, 35 PSI N2 PORTABLE WATER TANK PRESS PORT qd and PRESS PORT qd Stow NITROGEN FILL hose in clamps	
		(04.03.15-00)	
		4.2.2.8 FOOD PREPARATION AREA ACTIVATION	
		NOTE The following items are required for the performance of this (SL-2) procedure: High power accessory adapter cables (3)	(D418) (D424)
		1. FOOD TRAY INSTALLATION Remove long strap restraint from food tray 1	(TBS) Stowed on wardroom floor grid. Food tray 1 has red tag
	705	Install food tray 1 on food table (match colors) Secure food tray 1 to food table, using dial latches (2) Repeat preceding operations (3) for food trays 2 and 3 Return long strap restraints (3) to stowage	Food tray 2 has white tag; food tray 3 has blue tag

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.8 FOOD PREPARATION AREA ACTIVATION (cont'd)	
		2. FOOD TRAY CONFIGURATION AND TEST Food tray 3, food cavity 1, 2, 3 htr sw (3) - OFF (verify) Connect high power accessory adapter cable to food tray 3 power receptacle (SL-2)	Power receptacle located on bottom of food tray
	709	Connect other end of adapter cable to FOOD TRAY 3 OUTLET BUS 1 Repeat preceding operations for food trays 1 and 2	
		(04.03.16-00)	
		4.2.2.9 MISCELLANEOUS ACTIVATION	
		1. CONFIGURE SLEEP COMPARTMENT EMERGENCY EXIT (SL-2) Release astro pin and remove emergency exit cover Stow cover on forward compartment floor grid adjacent to exit	
		2. VERIFY EXPERIMENT SUPPLY PANEL	
	620	ESS SUP vlv - CLOSE (verify) (7 1/2 turns, cw) M171 SUP vlv - CLOSE (verify) (7 1/2 turns, cw)	
		3. VERIFY RS STATUS	
	616	RS freezer DISP SEL - HT SINK OUTLETS PRI (SL-2, 4) RS TEMP freezer ind - -40° to 0°F RS freezer DISP SEL - URINE FREEZER RS TEMP freezer ind - -18° to -5°F RS freezer DISP SEL - WARDRM FREEZER 1 RS TEMP freezer ind - -20° to 0°F Repeat two preceding operations for selector position WARDRM FREEZER 2 RS freezer DISP SEL - STOWAGE FREEZER 1 RS TEMP freezer ind - -20° to 0°F Repeat two preceding operations for selector positions STOWAGE FREEZER 2 and 3 RS freezer DISP SEL - OFF RS chiller DISP SEL - CHILLER H2O INLET PRI RS TEMP chiller ind - 33° to 45°F RS chiller DISP SEL - CHILLER FOOD RS TEMP chiller ind - 33° to 45°F RS chiller DISP SEL - URINE CHILLER 1 RS TEMP chiller ind - 33° to 59°F Repeat two preceding operations for selector positions URINE CHILLER 2 and 3 RS chiller DISP SEL - OFF	
		NOTE HT SINK OUTLETS SEC AND CHILLER H2O INLET SEC temperature indications are invalid except when secondary loop is operative and loop temperature is stabilized	
		RS PRI LOOP PUMPS 1-4 sw (4) - AUTO (verify) RS SEC LOOP PUMPS 1-4 sw (4) - AUTO (verify)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.2.2.9 MISCELLANEOUS ACTIVATION (cont'd)	
		4. RECONFIGURE AND VERIFY RS STATUS (SL-3) Deactivate pump 2 and activate pump 3 (4.3.12.2)	
		5. VERIFY STATUS LIGHTS	
	617	LAMP TEST sw - 2 and hold	Momentary switch
		DUMP HTR lt - ON INSTR SYS TAPE RCDRS EXP 1, 2 lt (2) - ON	Lights are powered from OWS bus 2 only
	616	RS PRI, SEC LOOP TEMP FREEZER HI lt (2) - on RS PRI, SEC LOOP TEMP CHILLER LO lt (2) - on RS PRI, SEC LOOP ACCUM LOW lt (2) - on RS PRI, SEC LOOP PUMP LOΔP lt (2) - on	
		LAMP TEST sw - release Above lights (10) - off	
		6. MISCELLANEOUS PANEL CONFIGURATION Configure panels 402, 404, 500, 517, 518, 521, 531, 542, 543, 544, 551, 555, 601, 625, 628, 630, 634, 642, 711, 803 and 818 per post-activation configuration (4.1)	
		7. CONFIGURE OWS FOR CONDENSATE DUMPING (SL-2)	Performed after water system activation complete (TBS)
		Disconnect four foot condensate dump hose from stowage qd in OWS dome Remove hose from coiled position on handrail	
	393	Remove tethered cap on CONDENSATE DUMP PORT Connect condensate dump hose to CONDENSATE DUMP PORT Open access door below WMC sink Disconnect WMC dump line qd from DUMP LINE STOWAGE qd Connect WMC dump line to CONDENSATE DUMP LINE qd	

SECTION 4.3

SYSTEMS OPERATION

4.3.1 ELECTRICAL POWER SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.01.01-00)	
		4.3.1.1 ACTIVATION OF SWS POWER TIE TO CSM (4.19.8)	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.3.1.3 ACTIVATION OF AM POWER TIE TO ATM (REG/XFER TIE OPEN) (cont'd) X X X	
	206	Monitor transfer bus having lower voltage REG ADJ BUS 1 or 2 pot - as required BUS AMPS PCG TOTAL 1 = BUS AMPS PCG TOTAL 2 ± TBS Repeat preceding operations alternating between REG ADJ BUS 1 and 2 potentiometers until BUS VOLTS XFER 1 or 2 ind = BUS VOLTS REG 1 or 2 ind ± 0.2	Cw adjustment increases bus voltage
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	These circuit breakers may open during adjustment of REG ADJ BUS 1, 2 (2) potentiometers
	206	REG/XFER TIE BUS 1, 2 sw (2) - CLOSED REG/XFER TIE BUS 1, 2 OPEN lt (2) - off REG/XFER TIE BUS 1, 2 CLOSED lt (2) - on	Momentary switches
	206	BUS AMPS PCG TOTAL 1, 2 ind (2) ≤ TBS (log) BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log) BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log)	
		Deactivate EPS status lights (4.3.1.11, step 3)	
		3. ADJUST AM/ATM LOAD SHARING (4.3.1.8)	
		X X X 4. SELECT DCS EPS MODE (4.3.1.6, step 2) X X X	
		XXXX

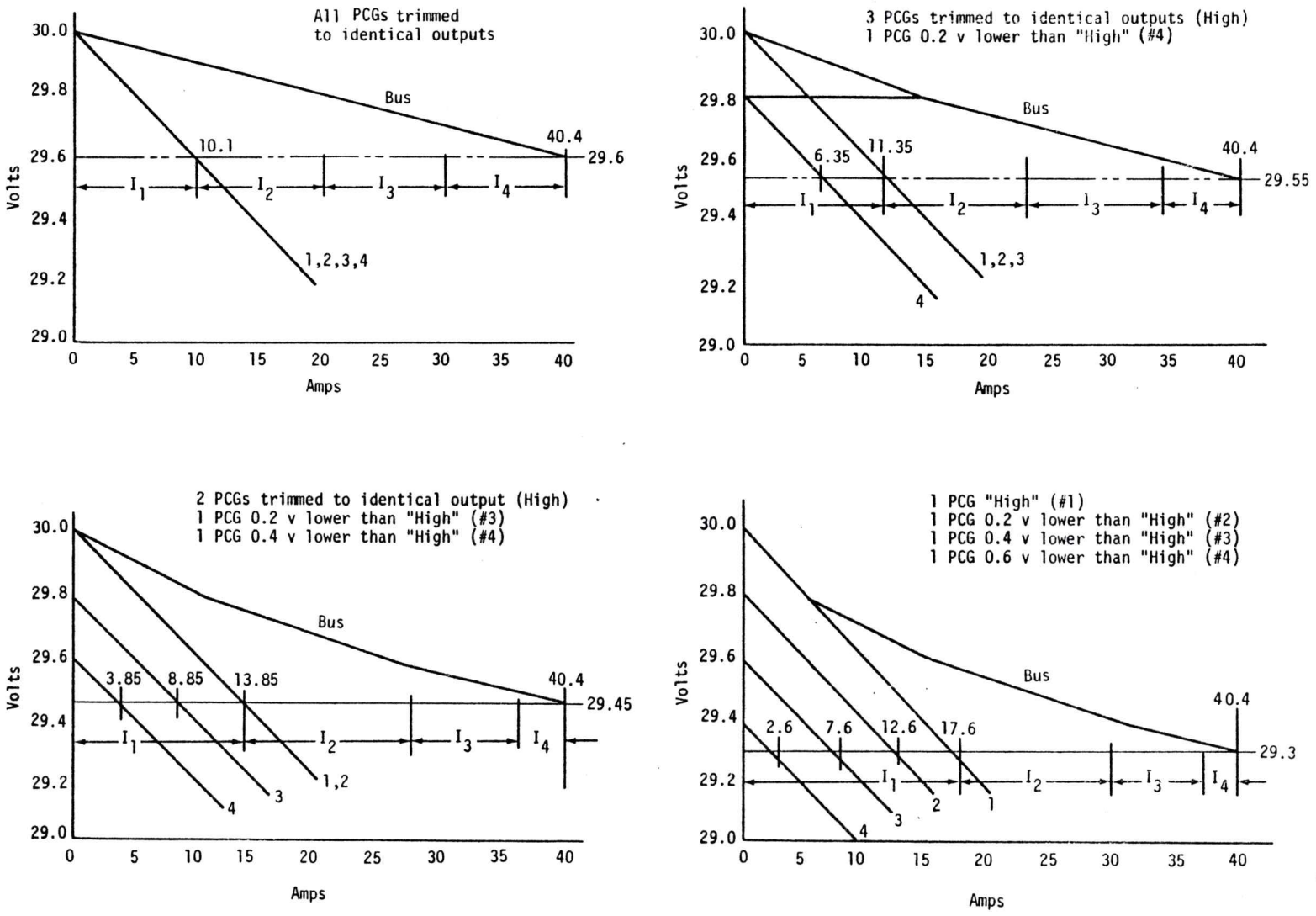
CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.01.08-00)	
		4.3.1.6 CONTROL MODE SELECTION	Selection performed as required
		NOTE The following EPS controls can be operated independent of PWR SYS CONT sw position: Manual control EPS OWS BUS 1, 2 (2) (panel 617) ELEC GND (panel 206) MSFN control ELEC gnd (AM/CSM) Battery charge (norm/cutoff)	
		1. MANUAL CONTROL	
	205	PWR SYS CONT sw - MANUAL Enables manual control and disables MSFN control of the following:	Lever lock switch
	205	SOLAR ARRAY OUTPUT 1-8 sw (8) BATS 1-8 sw (8) CHGR 1-8 sw (8) AH INTEGRATOR 1-8 sw (8)	Manual control exists regardless of switch position
		CHG RATE 1-8 sw (8) CHG MODE 1-8 sw (8) DISCH LIMIT 1-8 sw (8) PCG OUTPUT 1-8 sw (8) PCG OUTPUT 1-8 bus sel sw (8)	No MSFN control regardless of switch position
	206	AM BUS 1, 2 sw (2) OWS BUS 1, 2 sw (2) ATM/XFER TIE BUS 1, 2 sw (2) REG/XFER TIE BUS 1, 2 sw (2) EPS SHUNT REG BUS 1, 2 sw (2)	No MSFN control regardless of switch position
		(25.01.09-00)	
		2. MSFN CONTROL	
		PWR SYS CONT sw - CMD Enables MSFN control of above switch functions except:	Lever lock switch
	205	CHG MODE 1-8 sw (8)	
	206	EPS SHUNT REG BUS 1, 2 sw (2) Man cntl is disabled for all above functions except: BATS 1-8 sw (8)	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX	
		X X	
		X 4.3.1.7 EPS FAILURE BYPASS (MANUAL) (cont'd) X	
		X X	
		- BATTERY CHARGER -	
	205	CHGR 1 (2-8) sw - BYPASS	Momentary switch
		BATS 1 (2-8) sw - OFF	Momentary switch
	201	cb AH INTEGRATOR 1 (2-8) - open	
		cb BAT CONT 1 (2-8) - open	
	206	PWR SYS LTS BUS 1 (2) sw - STATUS	
	205	CHGR 1 (2-8) BYPASS lt - on (verify)	Amber light
		BATS 1 (2-8) OFF lt - on (verify)	Amber light
	206	PWR SYS LTS BUS 1 (2) sw - OFF	
		BAT AMPS 1 (2-8) ind - 0 ± .5 (verify)	
		- SHUNT REGULATOR -	
	206	EPS SHUNT REG BUS 1 (2) sw - DISCON	Momentary switch
		PWR SYS LTS BUS 1 (2) sw - STATUS	
		EPS SHUNT REG BUS 1 (2) DISCON lt - on (verify)	Amber light
		PWR SYS LTS BUS 1 (2) sw - OFF	
		- BATTERY -	
	205	Repeat procedure for Battery Charger Failure Bypass but eliminate operation of CHGR switch and verification of CHGR light	Not bypassing battery charger retains peak power tracking capability
		- VOLTAGE REGULATOR -	
	205	PCG OUTPUT 1 (2-8) sw - OFF	Momentary switch
		BATS 1 (2-8) sw - OFF	Momentary switch
		SOLAR ARRAY OUTPUT 1 (2-4) sw - 2 (3, 4, 1)	Momentary switch
		or	
		SOLAR ARRAY OUTPUT 5 (6-8) sw - 6 (7, 8, 5)	Momentary switch
	201	cb AH INTEGRATOR 1 (2-8) - open	
		cb BAT CONT 1 (2-8) - open	
	206	PWR SYS LTS BUS 1 (2) sw - STATUS	
	205	SOLAR ARRAY OUTPUT 1 (2-4) PCG 2 (3, 4, 1) lt - on (verify)	Amber light
		SOLAR ARRAY OUTPUT 5 (6-8) PCG 6 (7, 8, 5) lt - on (verify)	Amber light
		BATS 1 (2-8) OFF lt - on (verify)	Amber light
		PCG OUTPUT 1 (2-8) OFF lt - on (verify)	Amber light
	206	PWR SYS LTS BUS 1 (2) sw - OFF	
		ARRAY AMPS 1 (2-4) ind = ARRAY AMPS 6 (7, 8, 5) ind ± 10 (verify)	
		X X	
		X 3. SELECT DCS CONTROL MODE (4.3.1.6, step 2) X	
		X X	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.01.05-00)	
		4.3.1.8 AM/ATM LOAD SHARING ADJUSTMENT	After initial adjustment prior to launch, this procedure is used to adjust reg buses to a level compatible with current transfer and voltage requirements when operating in parallel with ATM source of power
		NOTE In preparation for AM/ATM load sharing adjustment, it is required that MSFN relay load sharing information to the crew	Information contains angle and direction of rotation for each potentiometer
		CAUTION Maintain balance between BUS AMPS PCG TOTAL 1 and 2 indicators through alternate incremental adjustments in REG ADJ BUS 1 and 2 potentiometers. BUS AMPS PCG TOTAL 1 and 2 indicators should be maintained within TBS amps of each other	
	201	1. VERIFY BUS TIE CONNECTED cb REG BUS TIE 1, 2 (2) - closed (verify)	
	206	2. PERFORM ADJUSTMENT REG ADJ BUS 1 or 2 pot - per MSFN direction	Cw adjustment increases bus voltage. Bus selected initially must be one furthest from final setting. For normal operation, PCG regulators 1-4 (4) are connected to reg bus 1 and are adjusted simultaneously; PCG regulators 5-8 (4) are connected to reg bus 2 and are adjusted simultaneously. Calibration marks are provided at 30-degree intervals
		BUS AMPS PCG TOTAL 1 = BUS AMPS PCG TOTAL 2 ± TBS amps Repeat adjustment until desired position is attained for both potentiometers	
		3. VERIFY BUS TIE CONNECTED cb REG BUS TIE 1, 2 (2) - closed (verify)	These circuit breakers may open during adjustment of REG ADJ BUS 1, 2 (2) potentiometers
		4. VERIFY EPS STATUS (4.3.1.11, step 4)	
		(25.01.07-00)	
		4.3.1.9 REGULATOR CONTROL FINE ADJUSTMENT	After initial adjustment prior to launch, this procedure is used to achieve proper PCG load sharing by adjusting individual regulators
		NOTE In preparation for regulator fine adjustment, it is required that MSFN relayed regulator adjustment information to the crew	Information contains angle, direction of rotation, and approximate time for adjustment. The adjustment would normally occur close to the end of an orbital daylight period

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.9 REGULATOR CONTROL FINE ADJUSTMENT (cont'd)	
		1. VERIFY BUS TIE CONNECTED	
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	
		2. PERFORM ADJUSTMENT	
		NOTE Use tool mounted in EPS panel 206 to accomplish potentiometer adjustments	Tool restrained by spring-loaded chain
	206	Adjust REG CONT FINE ADJ 1-8 pot (8) per MSFN direction	Rotate cw for an increase in battery discharge current. Calibration marks are provided at 30-degree intervals. Rotating the potentiometer 30 degrees results in approximately 2.3 amp change in battery discharge current. Adjustment allows equal load sharing among PCG's
		BAT AMPS 1-8 ind (8) - (log)	
		(31.01.05-00)	
		4.3.1.10 REGULATOR CONTROL FINE ADJUSTMENT	After initial adjustment prior to launch, this procedure is used to achieve proper PCG load sharing by adjusting individual regulators
		NOTE This procedure is to be used only in event MSFN cannot provide adjustment information and batteries are being discharged unevenly. Perform procedure during orbital dark period	REGULATOR CONTROL FINE ADJUSTMENT curves (Figure 4.3.1.4) provide information regarding voltage output of four regulators connected in parallel. Curves indicate how voltage outputs vary with bus loadings as regulators are trimmed to various combinations of open circuit output voltage
		1. VERIFY BUS TIE CONNECTED	
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	
		2. PERFORM ADJUSTMENT	
		NOTE Use tool mounted in EPS panel 206 to accomplish potentiometer adjustments. Operation requires alternate incremental adjustments in REG CONT FINE ADJ 1-8 (8) potentiometers. Sequence should start by adjusting potentiometer corresponding to BAT AMPS indicator showing greatest differential from the average current reading of all BAT AMPS indicators until its related indicator equals average	Tool restrained by spring-loaded chain
		battery amps discharge current within approximately ± 3.0 amps.	
		Repeat the sequence for all remaining potentiometers	

Figure 4.3.1.4 REGULATOR CONTROL FINE ADJUSTMENT



Note: Trim range = 0.9 volts (340° rotation) = 22.5 amps (15° per amp of reg output current)

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.3.1.10 REGULATOR CONTROL FINE ADJUSTMENT (cont'd) X X X	
	206	Adjust REG CONT FINE ADJ 1-8 pot (8) - per note this step	Rotate cw for increase in battery discharge current. Calibration marks are provided at 30-degree intervals. Rotating potentiometer 30 degrees results in approximately 2.3 amp change in battery discharge current. Adjustment allows equal load sharing among PCG's
		X X X BAT AMPS 1-8 ind (8) - (log) and within ± 3.0 of each other X X X XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.11 AM EPS PERIODIC VERIFICATION (cont'd)	
		PCG OUTPUT 1-8 ON (8)	Indicates PCG output applied to corresponding bus select relay
		PCG OUTPUT 1-4 REG BUS 1 (4)	Indicates PCG's 1 through 4 connected to appropriate reg bus
		PCG OUTPUT 5-8 REG BUS 2 (4)	Indicates PCG's 5 through 8 connected to appropriate reg bus
		3. DEACTIVATE EPS STATUS LIGHTS	
	206	PWR SYS LTS BUS 1, 2 sw (2) - OFF All EPS lights - off	
		4. VERIFY EPS STATUS	
		NOTE EPS values shown for orbital daylight period	
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	
		Verify following readings:	
	206	ARRAY AMPS 1-8 ind (8) - $\leq$ 30.0 (log) and within 2.5 of each other	
		BAT VOLTS 1-8 ind (8) - 36.0 to 48.0 (log) and within 2.5 of each other	
		BUS AMPS PCG TOTAL 1, 2 ind (2) - TBS (log) and within 5.0 of each other	
		BUS AMPS OWS 1, 2 ind (2) - $\leq$ TBS (log)	
		BUS AMPS CSM A, B ind (2) - $\leq$ 36.0 (log)	
		BUS AMPS ATM 1, 2 ind (2) - $\leq$ TBS (log)	
		BAT AMPS 1-8 ind (8) - 0.75 to 50.0 CHARGE (log)	
		BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
		BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
		BAT CHG sel - 1	
		BAT CHG PRI, SEC ind (2) - 50 to 100% (log)	
		Repeat for BAT CHG sel positions 2 through 8	
		NOTE EPS values shown for orbital dark period	
	201	cb REG BUS TIE 1, 2 (2) - closed	
		Verify following readings:	
	206	ARRAY AMPS 1-8 ind (8) - 0.0	
		BAT VOLTS 1-8 ind (8) - 30.0 to 36.0 (log) and within 2.5 of each other	
		BUS AMPS PCG TOTAL 1, 2 inds (2) - $\leq$ TBS (log) and within 5.0 of each other	
		BUS AMPS OWS 1, 2 inds (2) - $\leq$ TBS (log)	
		BUS AMPS CSM A, B inds (2) - $\leq$ 36.0 (log)	
		BUS AMPS ATM 1, 2 inds (2) - $\leq$ TBS (log)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.11 AM EPS PERIODIC VERIFICATION (cont'd)	
		BAT AMPS 1-8 ind (8) - 0.0 to 50 DISCHARGE (log) BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other BAT CHG sel - 1 BAT CHG PRI, SEC ind (2) - 50 to 100% (log) Repeat for BAT CHG sel positions 2 through 8	
		5. VERIFY CIRCUIT BREAKER PANEL CONFIGURATION	
	200	All cb on left side of panel - closed except: AM FANS DUCT 1 - open MDA FANS CSM 2 - open	 Will be closed when bus 1 required Will be closed when bus 2 required
		All cb on right side of panel - closed except: VHF XPNDR - open	
	201	All cb on panel - closed	
	202	All cb on left side of panel - closed except: M512- open S009 - open OWS SOLENOID VENT VLVS CNTL 1, 2 (2) - open OWS SOLENOID VENT VLVS 1, 2 (2) - open	 Will be closed when experiment operating Will be closed when experiment operating
		All cb on right side of panel - closed except: DPLY BUS ARM PRI, SEC (2) - open DPLY SEQ BUS ARM PRI, SEC (2) - open MDA VENT VLVS 1, 2 (2) - open OWS PNEU VENT VLVS 1, 2 (2) - open LNCH TM - open DPLY OWS SW SEL 1, 2 (2) - open DPLY DISCONE ANT BUS 1 CNTL - open DPLY DISCONE ANT BUS 1 PWR 1, 2 (2) - open DPLY DISCONE ANT BUS 2 CNTL - open DPLY DISCONE ANT BUS 2 PWR 1, 2 (2) - open TACS CMD CONT 1 PRI, SEC (2) - open TACS CMD CONT 2 PRI, SEC (2) - open	
		(26.01.03-00)	
		4.3.1.12 OWS EPS PERIODIC VERIFICATION	
		1. VERIFY EPS STATUS	
	617	EPS OWS BUS 1, 2 VOLTS ind (2) - 24.8 to 30.0 (log) EPS OWS BUS 1, 2 AMPS ind (2) - $\leq$ TBS (log)	
		2. VERIFY CIRCUIT BREAKER PANEL CONFIGURATION	
	611	cb panel 611 (all) - closed	
	612	cb panel 612 (all) - closed	
	613	cb panel 613 (all) - closed except: cb EXPS T013 - OPEN cb spare - open	 Will be closed when experiment is operating

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.12 OWS EPS PERIODIC VERIFICATION (cont'd)	
	614	cb panel 614 (all) - closed except: HSS WMC BLWR OUTLET 2 - OPEN HSS BUS 2 FOOD TRAYS 1 - OPEN HSS BUS 2 FOOD TRAYS 2 - OPEN HSS BUS 2 FOOD TRAYS 3 - OPEN	Will be closed when HSS WMC BLWR OUTLET 1 is inoperable Will be closed when HSS BUS 1 FOOD TRAYS 1 is inoperable Will be closed when HSS BUS 1 FOOD TRAYS 2 is inoperable Will be closed when HSS BUS 1 FOOD TRAYS 3 is inoperable
	615	cb panel 615 (all) - closed	
		(31.01.02-00)	
		4.3.1.13 AM EPS POWER DISCONNECT	
		CAUTION Following operation must include actuation of both PWR DISCON 1 and 2 switches to insure total power removal from AM reg buses. Indicator readouts affected by this operation are shown in table	PWR DISCON 1 (2) switch disconnects PCG's 1-4 (5-8) from reg bus(es) and opens BUS 1 (2) REG/XFER tie
	205	PWR DISCON 1, 2 sw (2) - OPEN AM emergency STS panel lts (2) - on AM emergency lock compartment lt - on OWS emergency dome 1, 4 lt (2) - on OWS emergency upper wall 3, 8 lt (2) - on OWS emergency experiment compartment 6, 7, 13, 14 lt (4) - on	Momentary lever lock switches

	INDICATOR	READOUT
203	MOL SV PPCO2 IN, OUT (2)	0
	MOL SV HT EXCH IN, OUT (2)	0°F
	MOL SV DEW PT 1, 2 (2)	0°F
	MOL SV BED 1, 2 (2)	0°F
206	BUS AMPS PCG TOTAL 1, 2 (2)	10
	BUS AMPS OWS 1, 2 (2)	0
	BUS AMPS CSM A, B (2)	36
	BUS AMPS ATM 1, 2 (2)	36
	BUS VOLTS REG 1, 2 (2)	OSL
	BUS VOLTS XFER 1, 2 (2)	OSL
216	CNDST CONT SYS TANK P	0 psid
	CNDST CONT SYS VENT TEMP	0°F
225	O2 BOTTLES (PSI x 10)	0
	O2 BOTTLES (°F)	0
	REG O2, N2 (2)	0 psia
	N2 BOTTLES (PSI x 10)	0
	N2 BOTTLES (°F)	0
	PRESS OWS, FWD, LOCK, AFT (4)	0 psia
	O2/N2 CONTR 1-3 (3)	0 psia
316	PRESS LOCK, AFT, OWS (3)	0 psia
616	RS TEMP freezer, chiller (2)	OSL
617	EPS OWS BUS 1, 2 VOLTS (2)	OSL
	EPS OWS BUS 1, 2 AMPS (2)	OSL
700	H2O DUMP PRESS	0 psia
800	H2O DUMP PRESS	0 psia
	WASTE PROCESSOR EXHAUST PRESS	0 psia

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.13 AM EPS POWER DISCONNECT (cont'd)	
	INTERCOM	Warning tone - on	
	207	C/W PRI, SEC COOL FLOW lt (2) - on	
		C/W REG BUS 1, 2 LOW lt (2) - on	
	207, 616	C/W OWS BUS 1, 2 LOW lt (2) - on	
	207	C/W SV TMR lt - on	
		Respond to C/W alert (4.3.8.18)	INTERCOM MASTER ALARM lights (13) will not be on
		(31.01.03-00)	
		4.3.1.14 AM EPS POWER UP (FOLLOWING POWER DISCONNECT)	
		1. CONFIGURE CIRCUIT BREAKER PANELS	
	200	All cb on left side of panel - open	
		All cb on right side of panel - open except:	
		cb CMD SYS PRI, SEC (2) - closed	
		cb TIME REF SYS ELECT PRI, SEC (2) - closed	
	201	All cb on left side of panel - closed except:	
		cb OWS BUS 1 FEEDERS 1-9 (9) - open	
		cb REG BUS TIE 1, 2 (2) - open	
		All cb on right side of panel - closed except:	
		cb OWS BUS 2 FEEDERS 1-9 (9) - open	
	202	All cb on left side of panel - open except:	
		cb EMER LTS MDA/AM 1, 2 (2) - closed	
		cb EMER LTS OWS 1, 2 (2) - closed	
		All cb on right side of panel - open except:	
		cb C/W CONVS (6) - closed	
		cb C/W SNSRS EMER 1, 2 (2) - closed	
		cb C/W TONE AMP C/W 1, 2 (2) - closed	
	611	All cb on panel - OPEN	
	612	All cb on panel - OPEN	
	613	All cb on panel - OPEN	
	614	All cb on panel - OPEN	
		2. CONFIGURE AM EPS	
		Select manual EPS mode (4.3.1.6, step 1)	
	206	PWR SYS LTS BUS 1, 2 sw (2) - STATUS	
	205	PCG OUTPUT 1-4 bus sel sw (4) - REG BUS 1	Momentary switches
		PCG OUTPUT 5-8 bus sel sw (4) - REG BUS 2	Momentary switches
	206	OWS BUS 1, 2 sw (2) - OFF	Momentary switches
	205	Verify following EPS status lights on:	
		PCG OUTPUT 1-8 OFF lt (8)	
		PCG OUTPUT 1-4 REG BUS 1 lt (4) - on (verify)	
		PCG OUTPUT 5-8 REG BUS 2 lt (4) - on (verify)	
	206	OWS BUS 1, 2 OFF lt (2)	
		REG/XFER TIE BUS 1, 2 OPEN lt (2)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.14 AM EPS POWER UP (FOLLOWING POWER DISCONNECT) (cont'd)	
		3. INITIATE EPS POWER UP Perform following operations one at a time, pausing after each to verify EPS status	
	205	PCG OUTPUT 1 sw - ON PCG OUTPUT 1 ON lt - on BUS VOLTS REG 1 ind - 26.5 to 30.0 (log)	Momentary switch
	207	C/W REG BUS 1 LOW lt - off	
		PCG OUTPUT 2-4 sw (3) - ON PCG OUTPUT 2-4 ON lt (3) - on BUS VOLTS REG 1 ind - 26.5 to 30.0 (log)	Momentary switches
		PCG OUTPUT 5 sw - ON PCG OUTPUT 5 ON lt - on BUS VOLTS REG 2 ind - 26.5 to 30.0 (log) C/W REG BUS 2 LOW lt - off	Momentary switch
		PCG OUTPUT 6-8 sw (3) - ON PCG OUTPUT 6-8 ON lt (3) - on BUS VOLTS REG 2 ind - 26.5 to 30.0 (log)	Momentary switches
	201	cb OWS BUS 1 FEEDERS 1-9 (9) - closed cb OWS BUS 2 FEEDERS 1-9 (9) - closed	
	206	OWS BUS 1, 2 sw (2) - ON OWS BUS 1, 2 ON lt (2) - on	Momentary switches
	207, 616	C/W OWS BUS 1, 2 lt (2) - off	
	617	EPS OWS BUS 1, 2 VOLTS ind (2) - 24.8 to 30.0 (log)	
		4. CONFIGURE COOLANT SYSTEM	
	203	PRI CLNT LOOP INVS sel - 1 A•B	
	200	cb CLNT PUMP CONTS PRI [A•B] - closed cb CLNT PUMP INVS PRI 1 - closed	
		NOTE During pump startup, C/W warning tone may be reinitiated. If activated, perform operations denoted by *	
	203	PRI CLNT LOOP PUMPS A sw - ON	
	207	C/W PRI COOL FLOW lt - off	
	203	SEC CLNT LOOP INVS sel - 1 A•B	
	200	cb CLNT PUMP CONTS SEC [A•B] - closed cb CLNT PUMP INVS SEC 1 - closed	
	203	SEC CLNT LOOP PUMPS A sw - ON C/W SEC COOL FLOW lt - off *Respond to C/W alert (4.3.8.18)	
		5. CONFIGURE ATMOSPHERE CONTROL SYSTEM	
		cb O2/N2 GAS CONTRS [1•3] - closed cb O2/N2 GAS CONTRS 2 - closed	
	200	cb MOL SV A FANS PRI - closed cb AM FANS CIRC 1-3 (3) - closed	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.14 AM EPS POWER UP (FOLLOWING POWER DISCONNECT) (cont'd)	
		NOTE During fans startup, C/W caution tone will be reinitiated	
		cb AM FANS DUCT 2 - closed	
		cb MOL SV B FANS SEC - closed	
		Caution tone - on	
		C/W SV FLOW lt - off	
		C/W OWS GAS INTERCHG lt - off	
		Respond to C/W alert (4.3.8.18)	
		cb MDA FANS 1, 2 (2) - closed	
		cb MDA FANS CSM 1 - closed	
	200	cb MOL SV A TMRS PRI, SEC (2) - closed	
	207	C/W SV TMR lt - off	
	206	C/W [CLEAR] sw - CLEAR	Momentary switch
		C/W MEM RECALL pb/lt - off	
	614	cb TCS DUCT 1 FANS 1-4 (4) - closed	
		cb TCS BUS 1 DUCT 3 FANS [1/2], [3/4] (2) - closed	
		cb TCS DUCT 2 FANS 1-4 (4) - closed	
		cb TCS BUS 2 DUCT 3 FANS [1/2], [3/4] (2) - closed	
		6. CONFIGURE COMMUNICATIONS SYSTEM	
	200	cb AUDIO SYS (8) - closed	
		cb TELEPRINT - closed	
		cb VOICE RCDR LTS - closed	
	202	cb MASTER ALARM STATUS LTS 1, 2 (2) - closed	
		7. CONFIGURE REFRIGERATION SYSTEM	
	611	All cb on panel - closed	
	616	Additional operations TBS	
		8. CONFIGURE INSTRUMENTATION SYSTEM	
	200	cb INSTR SYS CONVS 1-3 (3) - closed	
		cb INSTR SYS XMTRS A-C (3) - closed	
		cb INSTR SYS DISP CONVS INPUT PRI, SEC (2) - closed	
		cb INSTR SYS DISP CONVS +24V, -24V, +5V (3) - closed	
		cb INSTR SYS XDUCER GRP 1-1 - closed	
		cb INSTR SYS XDUCER GRP 1 +24V, -24V, +5V (3) - closed	
		cb INSTR SYS XDUCER GRP 2-2 - closed	
		cb INSTR SYS XDUCER GRP 2 +24V, -24V, +5V (3) - closed	
	203	MOL SV PPCO2 IN ind - 4.4 to 5.5 mmHg	
		MOL SV PPCO2 OUT ind - 2.0 to 3.0 mmHg	
		MOL SV HT EXCH IN ind - 60° to 80°F	
		MOL SV HT EXCH OUT ind - 46° to 50°F	
		MOL SV DEW PT 1, 2 ind (2) - 46° to 51°F	
	225	REG O2 ind - 115 to 135 psia	
		REG N2 ind - 145 to 165 psia	
		PRESS OWS, FWD, LOCK, AFT ind (4) - 4.8 to 5.2 psia	
	316	PRESS LOCK, AFT, OWS ind (4) - 4.8 to 5.2 psia	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.14 AM EPS POWER UP (FOLLOWING POWER DISCONNECT) (cont'd)	
	200	cb INSTR SYS OWS MUX HTRS 1, 2 (2) - closed	
		cb INSTR SYS CONT (9) - closed	
		cb QCM MON - closed	
		cb INSTR SYS SIG CONDG (3) - closed	
	613	cb DISP BUS 1, 2 DISP PWR/RCDR CONT (2) - closed	
	617	EPS OWS BUS 1, 2 AMPS ind (2) - TBS	
		Enables following indicators:	
	616	RS TEMP freezer, chiller ind (2)	
	700, 800	H2O DUMP PRESS ind	
	800	WASTE PROCESSOR EXHAUST PRESS ind	
		9. CONFIGURE AM/MDA SYSTEMS	
	200	Configure panel per post activation configuration (4.1)	
	201	Configure panel per post activation configuration (4.1)	
	202	Configure panel per post activation configuration (4.1)	
		Configure AM/MDA lighting as required	
		10. CONFIGURE OWS SYSTEMS	
	612	Configure panel per post activation configuration (4.1)	
	613	Configure panel per post activation configuration (4.1)	
		Configure OWS lighting as required	
		11. PARALLEL AM/ATM EPS (4.3.1.3)	
		12. VERIFY SWS SYSTEMS	
		Verify AM power distribution (4.3.1.11)	
		Verify OWS power distribution (4.3.1.12)	
		Verify OWS TCS (4.3.4.34)	
		Verify ECS (4.3.4.17)	
		Verify C/W (4.3.8.1, 4.3.8.2, 4.3.8.4, 4.3.8.5)	
		Verify RS (4.3.12.1)	
		Verify status lights (4.3.15.2)	
		13. CONFIGURE FOR MSFN CONTROL	
		After MSFN AOS, coordinate configuration of SWS systems for CMD operation	
		Transfer AM coolant loop control to command (4.3.4.37)	
		Select DCS EPS mode (4.3.1.6, step 2)	
		4.3.1.15 (DELETED)	
		4.3.1.16 (DELETED)	

CREWMAN	PANEL	PROCEDURE	REMARKS

(31.01.10-XX)

4.3.1.17 LIMITED USE CIRCUIT BREAKERS

The following list identifies circuit breakers open during major portions of the mission. Primary considerations are to maintain maximum crew safety, reduce consumable usage, increase equipment reliability, and furnish redundant capabilities

PANEL	NOMENCLATURE	WHEN OPEN	WHEN CLOSED	REMARKS
200	AM FANS DUCT 1	Closeout	When required	
	MDA FANS CSM 2	Closeout	When required	
	VHF XPNDR	Post activation	Closeout & Storage	
202	M512	Closeout	During experiment	
	S009	Closeout	During experiment	
	OWS SOLENOID VENT VLVS CNTL 1	Post activation	Closeout & storage	
	OWS SOLENOID VENT VLVS CNTL 2	Post activation	Closeout & storage	
	OWS SOLENOID VENT VLVS 1	Post activation	Closeout & storage	
	OWS SOLENOID VENT VLVS 2	Post activation	Closeout & storage	
	DPLY BUS ARM PRI	Post activation	Closeout	
	DPLY BUS ARM SEC	Post activation	Closeout	
	DPLY SEQ BUS ARM PRI	Post activation	Closeout	
	DPLY SEQ BUS ARM SEC	Post activation	Closeout	
	MDA VENT VLVS 1	Post activation	Closeout	
	MDA VENT VLVS 2	Post activation	Closeout	
	OWS PNEU VENT VLVS 1	Post activation	Closeout	
	OWN PHEU VENT VLVS 2	Post activation	Closeout	
	LNCH TM	Post activation	Closeout	
	DPLY OWS SW SEL 1	Post activation	Closeout	
	DPLY OWS SW SEL 2	Post activation	Closeout	
	DPLY DISCONE ANT BUS 1 CNTL	Post activation	Closeout	
	DPLY DISCONE ANT BUS 1 PWR 1	Post activation	Closeout	
	DPLY DISCONE ANT BUS 1 PWR 2	Post activation	Closeout	
	DPLY DISCONE ANT BUS 2 CNTL	Post activation	Closeout	
	DPLY DISCONE ANT BUS 2 PWR 1	Post activation	Closeout	
	DPLY DISCONE ANT BUS 2 PWR 2	Post activation	Closeout	
	TACS CMD CONT 1 PRI	Post activation	Closeout & storage	
	TACS CMD CONT 1 SEC	Post activation	Closeout & storage	
	TACS CMD CONT 2 PRI	Post activation	Closeout & storage	
	TACS CMD CONT 2 SEC	Post activation	Closeout & storage	
613	EXPS T013	Closeout	During experiment	
	spare	Entire mission	Never	Circuit breaker wired but has no load termination
614	HSS WMC BLWR OUTLET 2	Closeout	When required	
	HSS BUS 2 FOOD TRAYS 1	Closeout	When required	
	HSS BUS 2 FOOD TRAYS 2	Closeout	When required	
	HSS BUS 2 FOOD TRAYS 3	Closeout	When required	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.18 EPS POWER DOWN TBS	
		(31.01.13-00)	
		4.3.1.19 ACTIVATION OF AM POWER TIE TO ATM (ATM/XFER TIE OPEN)	
		1. PREPARE FOR AM/ATM EPS POWER TIE	
	201	cb ATM 1/XFER 1 FEEDERS 1-18 (18) - closed (verify) cb ATM 2/XFER 2 FEEDERS 1-18 (18) - closed (verify) cb REG BUS TIE 1, 2 (2) - closed (verify)	
	206	BUS AMPS PCG TOTAL 1, 2 ind (2) - ≤TBS (log) and within 5.0 of each other BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
	130	Power Monitor sel - BUS 1, then BUS 2 REG/BUS/BAT ind - 26.5 to 30.0v (log) and BUS 1 within 0.5 of BUS 2	
	205	PWR SYS CONT sw - MANUAL Perform AM EPS periodic verification (4.3.1.20, step 2) Verify ATM power distribution (TBS)	
		2. PERFORM AM/ATM EPS POWER TIE	
		NOTE If ATM bus voltages are greater than TBS volts prior to performing power tie, reconfiguration of the ATM power system is required to obtain appropriate AM and ATM bus voltage relationships	
		CAUTION Operations enclosed by black border require maintaining balance between BUS AMPS PCG TOTAL 1 and 2 indicators through alternate incremental adjustments in REG ADJ BUS 1 and 2 potentiometers. Sequence should start by adjusting potentiometer corresponding to BUS AMPS PCG TOTAL indicator that indicates lower output current. BUS AMPS PCG TOTAL 1 and 2 indicators should be maintained within TBS amps of each other	
	130	Monitor ATM bus having lower voltage Power Monitor sel - BUS 1 or 2 (Bus selected must be one having lower voltage)	
	206	REG ADJ BUS 1 or 2 pot - as required BUS AMPS PCG TOTAL 1 = BUS AMPS PCG TOTAL 2 ± TBS Repeat preceding operations alternating between REG ADJ BUS 1 and 2 potentiometers until BUS VOLTS XFER 1 or 2 ind = REG/BUS/BAT ind (BUS 1 or 2) ± 0.5	Cw adjustment increases bus voltage
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	These circuit breakers may open during adjustment of REG ADJ BUS 1, 2 (2) potentiometers

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.1.19 ACTIVATION OF AM POWER TIE TO ATM (ATM/XFER TIE OPEN) (cont'd)	
	206	ATM/XFER TIE BUS 1, 2 sw (2) - CLOSED ATM/XFER TIE BUS 1, 2 OPEN lt (2) - off ATM/XFER TIE BUS 1, 2 CLOSED lt (2) - on	Momentary switch
	130	REG/BUS/BAT ind - 26.5 to 30.0v (log)	
	206	BUS AMPS PCG TOTAL 1, 2 ind (2) - $\leq$ TBS (log) BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log)	
		Deactivate EPS status lights (4.3.1.11, step 3)	
		3. ADJUST AM/ATM LOAD SHARING (4.3.1.8)	
		4. SELECT DCS EPS MODE (4.3.1.6, step 2)	
		(31.01.07-00)	
		4.3.1.20 AM EPS PERIODIC VERIFICATION (AM/ATM UNPARALLELED)	
		1. VERIFY EPS STATUS LIGHTS (4.3.15.2, step 3)	
		2. VERIFY EPS CONFIGURATION	
	206	PWR SYS LTS BUS 1, 2 sw (2) - STATUS Verify following green status lights on:	
		AM BUS 1 REG BUS 1	Indicates AM bus 1 connected to reg bus 1
		AM BUS 2 REG BUS 2	Indicates AM bus 2 connected to reg bus 2
		OWS BUS 1, 2 ON (2)	Indicates power ties between reg buses and OWS buses closed
		ELEC GND CSM	Indicates SPG located in CSM
		ATM/XFER TIE BUS 1, 2 OPEN (2)	Indicates power ties between AM transfer buses and ATM buses open
		REG/XFER TIE BUS 1, 2 CLOSED (2)	Indicates power ties between AM reg buses and transfer buses closed
		EPS SHUNT REG BUS 1, 2 CONN (2)	Indicates shunt regulators 1 and 2 connected to EPS control buses 1 and 2, respectively
		SOLAR ARRAY OUTPUT 1 PCG 1 - SOLAR OUTPUT 8 PCG 8 (8)	Indicates array groups 1-8 connected to respective PCGs
		BATS 1-8 ON (8)	Indicates batteries connected to battery chargers
		CHGR 1-8 NORM (8)	Indicates array group power being delivered to corresponding chargers
		AH INTEGRATOR 1-8 PRI (8)	Indicates primary ampere-hour integrator controlling battery charging

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.3.1.20 AM EPS PERIODIC VERIFICATION (AM/ATM UNPARALLELED) (cont'd) X X X	
		CHG RATE 1-8 AUTO (8)	Indicates batteries will be charged per variable current-voltage limited or constant current-terminal charging modes as required by battery state-of-charge
		CHG MODE 1-8 AUTO (8)	Indicates battery charger in normal operating mode
		DISCH LIMIT 1-8 AUTO (8)	Indicates batteries will be removed from load sharing automatically when they reach 70% depth of discharge and will resume load sharing when they reach 50% state-of-charge
		PCG OUTPUT 1-8 ON (8)	Indicates PCG output applied to corresponding bus select relay
		PCG OUTPUT 1-4 REG BUS 1 (4)	Indicates PCGs 1-4 connected to appropriate reg bus
		PCG OUTPUT 5-8 REG BUS 2 (4)	Indicates PCGs 5-8 connected to appropriate reg bus
		3. DEACTIVATE EPS STATUS LIGHTS	
	206	PWR SYS LTS BUS 1, 2 sw (2) - OFF All lights in step 2 off	
		4. VERIFY EPS STATUS	
		NOTE EPS values shown for orbital daylight period	
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	
		Verify following reading:	
	206	ARRAY AMPS 1-8 ind (8) - $\leq$ 30.0 (log) and within 2.5 of each other	
		BAT VOLTS 1-8 ind (8) - 36.0 to 48.0 (log) and within 2.5 of each other	
		BUS AMPS PCG TOTAL 1, 2 ind (2) - TBS (log) and within 5.0 of each other	
		BUS AMPS OWS 1, 2 ind (2) - $\leq$ TBS (log)	
		BUS AMPS CSM A, B ind (2) - $\leq$ 36.0 (log)	
		BUS AMPS ATM 1, 2 ind (2) - 0 (log)	
		BAT AMPS 1-8 ind (8) - 0.75 to 50.0 CHARGE (log)	
		BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
		BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
		BAT CHG sel - 1	
		X BAT CHG PRI, SEC ind (2) - 50 to 100% (log) X	
		X Repeat for BAT CHG sel positions 2-8 X	
		X X XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX	
		X X	
		X 4.3.1.20 AM EPS PERIODIC VERIFICATION (AM/ATM UNPARALLELED) (cont'd) X	
		X X	
		NOTE	
		EPS values shown for orbital night period	
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	
		Verify following reading:	
	206	ARRAY AMPS 1-8 ind (8) - 0	
		BAT VOLTS 1-8 ind (8) - 30.0 to 36.0 (log) and within 2.5 of each other	
		BUS AMPS PCG TOTAL 1, 2 ind (2) - $\leq$ TBS (log) and within 5.0 of each other	
		BUS AMPS OWS 1, 2 ind (2) - $\leq$ TBS (log)	
		BUS AMPS CSM A, B ind (2) - $\leq$ 36.0 (log)	
		BUS AMPS ATM 1, 2 ind (2) - $\leq$ TBS (log)	
		BAT AMPS 1-8 ind (8) - 0 to 50.0 DISCHARGE (log)	
		BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
		BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
		BAT CHG sel - 1	
		BAT CHG PRI, SEC ind (2) - 50 to 100% (log)	
		Repeat for BAT CHG sel positions 2-8	
		5. VERIFY CIRCUIT BREAKER PANEL CONFIGURATION	
	200	All cb on left side of panel - closed except:	
		AM FANS DUCT 1 - open	Will be closed when bus 1 required
		MDA FANS CSM 2 - open	Will be closed when bus 2 required
		All cb on right side of panel - closed except:	
		VHF XPNDR - open	
	201	All cb on panel - closed except:	
		ATM 1/XFER 1 FEEDERS 1-9 (9) - open	
		ATM 2/XFER 2 FEEDERS 1-9 (9) - open	
	202	All cb on left side of panel - closed except:	
		M512 - open	Will be closed when experiment operating
		S009 - open	Will be closed when experiment operating
		OWS SOLENOID VENT VLVS CNTL 1, 2 (2) - open	
		OWS SOLENOID VENT VLVS 1, 2 (2) - open	
		All cb on right side of panel - closed except:	
		DPLY BUS ARM PRI, SEC (2) - open	
		DPLY SEQ BUS ARM PRI, SEC (2) - open	
		MDA VENT VLVS 1, 2 (2) - open	
		OWS PNEU VENT VLVS 1, 2 (2) - open	
		LNCH TM - open	
	X	DPLY OWS SW SEL 1, 2 (2) - open X	
	X	DPLY DISCONE ANT BUS 1 CNTL - open X	
	X	X	
	XXXX	XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.3.1.20 AM EPS PERIODIC VERIFICATION (AM/ATM UNPARALLELED) (cont'd) X X X DPLY DISCONE ANT BUS 1 PWR 1, 2 (2) - open DPLY DISCONE ANT BUS 2 CNTL - open DPLY DISCONE ANT BUS 2 PWR 1, 2 (2) - open X TACS CMD CONT 1 PRI, SEC (2) - open X X TACS CMD CONT 2 PRI, SEC (2) - open X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX (27.01.02-00) 4.3.1.21 MDA POWER UMBILICAL REMOVAL (4.19.3) XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X (25.01.06-00) X X X X 4.3.1.22 AM/ATM EPS UNPARALLELING X X X 1. PREPARE FOR AM/ATM EPS UNPARALLELING Select manual EPS mode (4.3.1.6, step 1) 130 Power Monitor sel - BUS 1 REG/BUS/BAT ind - 26.5 to 30.0V (log) 206 REG ADJ BUS 1 pot - as required for BUS AMPS ATM 1 ind = 0 (+0, -5) REG ADJ BUS 2 pot - as required for BUS AMPS ATM 2 ind = 0 (+0, -5) BUS AMPS ATM 1 = 0 (+0, -5) (verify) 201 cb REG BUS TIE 1, 2 (2) - closed (verify) 206 PWR SYS LTS BUS 1, 2 sw (2) - STATUS 2. UNPARALLEL AM/ATM EPS 206 ATM/XFER TIE BUS 1, 2 sw (2) - OPEN ATM XFER TIE BUS 1, 2 CLOSED lt (2) - off ATM XFER TIE BUS 1, 2 OPEN lt (2) - on 3. VERIFY AM POWER DISTRIBUTION (4.3.1.20, steps 2 and 3) X X X 4. SELECT DCS EPS MODE (4.3.1.6, step 2) X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Momentary switches

TABLE 4.3.1-1

HIGH POWER ACCESSORY CABLE/UTILITY CABLE APPLICATIONS											
	QUANTITY & STOWAGE		LENGTH	M133-CREWMAN SLEEP MONITOR	HI-INTENSITY LIGHT	VACUUM CLEANER	SUIT DRYING STATION	PORTABLE FAN	PORTABLE LIGHT	M151 CAMERA	FOOD TRAYS
HIGH POWER ACCESSORY CABLE	3 1	D418 D424	180"	X		X					
HIGH POWER ACCESSORY ADAPTER CABLE	5 1	D418 D424	23"	X	X	X	X				X
UTILITY CABLE	8	D418	180"					X	X	X	

NOTES:

1. Utility cables may be mated for added length
2. Combinations of HI POWER ACCESSORY CABLES may be mated for added length
3. X denotes applications

4.3.2 COMMUNICATION SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.02.02-00)	
		4.3.2.1 INTERCOM BOX INTERVEHICLE COMMUNICATION	
	INTERCOM	COMM CHAN sel - A ON	Selects channel A and enables speaker. Channel A is normally used for all CSM/SWS intercommunication and MSFN communication.
		[ICOM/XMIT] sw - ICOM and hold while talking	Momentary switch. Provides simplex (enables microphone and disables speaker at initiating intercom box) intervehicle communication on selected channel
		NOTE Speaker volume, on listening intercoms only, may be adjusted to a desired listening level; cw rotation of SPKR VOL increases speaker volume	
		(25.02.03-00)	
		4.3.2.2 INTERCOM BOX TRANSMISSION TO MSFN	
	INTERCOM	COMM CHAN sel - A ON [ICOM/XMIT] sw - XMIT and hold while talking	Refer to remark in procedure 4.3.2.1 Momentary switch. Enables real-time simplex transmission to MSFN in addition to providing simplex intervehicle communication on selected channel
		NOTE Speaker volume, on listening intercoms only, may be adjusted to a desired listening level; cw rotation of SPKR VOL increases speaker volume	
		(25.02.04-00)	
		4.3.2.3 INTERCOM BOX CALL	
	INTERCOM	[CALL] sw - CALL and hold while talking	Momentary switch. Provides simplex intervehicle communication on both channels simultaneously by paralleling microphone signal lines. Overrides intercom box SLEEP mode and volume control. It is assumed that when a CALL is initiated, all crewmen will use CALL sw for subsequent communication
		(25.02.05-00)	
		4.3.2.4 INTERCOM BOX VOICE RECORDING	
	204 INTERCOM	INSTR SYS RCDR AUDIO sw - B COMM CHAN sel - B ON [RCD/OFF] sw - RCD	Channel B is normally used for voice recording Momentary switch. Initiates voice and DATA recording on AM DATA tape recorder. Enables AM EXP 1 and/or AM EXP 2 tape recorder to record voice when activated via TAPE RECORDERS switches on panel 204, 542, or 617.

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.2.4 INTERCOM BOX VOICE RECORDING (cont'd)	
		Rcd lt - on	Comes on when voice is being recorded on AM DATA tape recorder. After recording has been initiated, Rcd lt may go off because end of AM DATA recorder tape has been reached or because of an AM DATA tape recorder fast forward or dump command. In this event, voice recording will be terminated on AM DATA tape recorder but will continue on activated AM EXP 1 and/or AM EXP 2 tape recorders. If Rcd lt goes off because of another intercom box [RCD/OFF] sw or panel 316 VOICE sw, voice recording will terminate on all tape recorders
		[ICOM/XMIT] sw - ICOM and hold while talking	Activates microphone on selected channel for voice recording. With normal CSM switch configuration, voice will not be transmitted to MSFN when XMIT position is used on channel B
		(25.02.06-00)	
		[RCD/OFF] sw - OFF Rcd lt - off	Momentary switch. Terminates voice recording If light comes back on, it indicates that recording has been reinitiated from another intercom box
		(25.02.01-00)	
		4.3.2.5 INTERCOM BOX SLEEP	
	INTERCOM	COMM CHAN sel - A SLEEP (B SLEEP)	Disables speaker output except when a crew alert from MSFN or a CALL signal is received. The Rcd lt is also disabled unless either CHAN A or CHAN B selectors are in a mode other than SLEEP or OFF
		(25.02.07-00)	
		4.3.2.6 CCU CONNECTION	
		Obtain lightweight headset or Obtain comm cap	(M157) (In helmet stowage bag on TO13 structure panel)
		Obtain CWG harness	(E610)
		Connect CWG harness to comm cap or to lightweight headset	
		Obtain CCU	(LHFE-B or M157)
		Connect CCU to CWG harness	
	INTERCOM	CHAN A or CHAN B sel - OFF	
		Connect CCU to intercom box	Channel A or Channel B is selected by connecting CCU to connector on side of intercom box

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.02.12-00)	
		4.3.2.7 CCU DISCONNECTION	
	INTERCOM	CHAN A or CHAN B sel - OFF	
		Disconnect CCU from intercom box	
		Disconnect CCU from CWG harness	
		Stow CCU	(LHFE-B or M157)
		Disconnect CWG harness from comm cap or from lightweight headset	
		Stow CWG harness	(E610)
		Stow comm cap	(In helmet stowage bag on TO13 structure panel)
		or	
		Stow lightweight headset	(M157)
		(25.02.21-00)	
		4.3.2.8 LCCU CONNECTION	
		Obtain lightweight headset	(M157)
		or	
		Obtain comm cap	(In helmet stowage bag on TO13 structure panel)
		Obtain control head	(M157)
		Connect control head to comm cap or to lightweight headset	
		Obtain LCCU	(M157)
		Connect LCCU to control head	
	INTERCOM	CHAN A or CHAN B sel - OFF	
		Connect LCCU to intercom box	Channel A or Channel B is selected by connecting LCCU to respective connector on side of intercom box
		(25.02.22-00)	
		4.3.2.9 LCCU DISCONNECTION	
	INTERCOM	CHAN A or CHAN B sel - OFF	
		Disconnect LCCU from intercom box	
		Disconnect LCCU from control head	
		Stow LCCU	(M157)
		Disconnect control head from comm cap or from lightweight headset	
		Stow control head	(M157)
		Stow comm cap	(In helmet stowage bag on TO13 structure panel)
		or	
		Stow lightweight headset	(M157)

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.02.09-00)	
		4.3.2.10 HEADSET INTERVEHICLE COMMUNICATION	
	INTERCOM CCU/LCCU	CHAN A sel - PTT [ICOM/XMIT] sw - ICOM and hold while talking	Momentary switch. Provides duplex intervehicle communication capability
		NOTE Earphone volume may be adjusted to desired listening level by rotation of knob on CCU/LCCU control head	
		(25.02.08-00)	
		4.3.2.11 HEADSET INTERVEHICLE HOT MIKE COMMUNICATION	
	INTERCOM	CHAN A sel - ICOM/PTT	
		NOTE Earphone volume may be adjusted to desired listening level by rotation of knob on CCU/LCCU control head	
		(25.02.19-00)	
		4.3.2.12 HEADSET TRANSMISSION TO MSFN	
	INTERCOM CCU/LCCU	CHAN A sel - PTT [ICOM/XMIT] sw - XMIT and hold while talking	Momentary switch. Provides simplex communication with MSFN
		NOTE Earphone volume may be adjusted to desired listening level by rotation of knob on CCU/LCCU control head	
		(25.02.27-00)	
		4.3.2.13 HEADSET TRANSMISSION TO MSFN WITH INTERVEHICLE HOT MIKE COMMUNICATION	
	INTERCOM CCU/LCCU	CHAN A sel - ICOM/PTT [ICOM/XMIT] sw - XMIT and hold while talking	Provides hot mike output to the selected channel Provides simplex communication with MSFN
		NOTE Earphone volume may be adjusted to desired listening level by rotation of knob on CCU/LCCU control head	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.02.20-00)	
		4.3.2.14 HEADSET VOX TRANSMISSION TO MSFN	
	INTERCOM CSM 6	CHAN A sel - ICOM/PTT MODE - VOX	Provides hot mike output to selected channel Enables CSM transmission circuits for transmission to MSFN when actuated by audio input from selected channel
		VOX SENS tw - as required	Adjusts sensitivity of VOX circuitry. Determines amplitude of audio signal required to trigger VOX keying circuit
		NOTE Earphone volume may be adjusted to desired listening level by rotation of knob on CCU/LCCU control head	
		(25.02.10-00)	
		4.3.2.15 HEADSET SLEEP	
	INTERCOM	CHAN A sel - SLEEP	Disables headset output except when a crew alert or a CALL signal is received. Operational biomed power to CCU is provided during SLEEP mode
		(25.02.11-00)	
		4.3.2.16 HEADSET VOICE RECORDING	
	204	INSTR SYS RCDR AUDIO sw - B Verify that CCU or LCCU is connected to channel B receptacle	
	INTERCOM	[RCD/OFF] sw - RCD Rcd lt - on CHAN B sel - ICOM/PTT	Refer to second remark in 4.3.2.4 Refer to third remark in 4.3.2.4 ICOM/PTT position provides a CCU hot mike without activation of CCU [ICOM/XMIT] sw
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X CHAN B sel - PTT X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	PTT position requires that integral CCU [ICOM/XMIT] sw be activated to ICOM or XMIT position in order to enable voice recording
		(25.02.06-00)	
		[RCD/OFF] sw - OFF Rcd lt - off	Terminates voice recording If light comes back on, it indicates that recording has been initiated from another intercom

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.02.23-00)	
		4.3.2.17 EVA AUDIO CONFIGURATION	
		1. CONFIGURE CSM AUDIO SYSTEM FOR EVA (CSMOH 4.5.8.7)	
	102,116, 131	2. CONFIGURE SWS FOR EVA AUDIO COMM CHAN sel - B ON	
	131	Connect CCU with comm cap to CHAN B connector (4.3.2.6)	Used to provide ambient noise background to EVA crewmen as integrity check of LSU umbilical
		NOTE Do not use this headset for communications with suited crewmen.	
		(31.02.04-00)	
		4.3.2.18 VOICE RECORD CHANNEL SELECTION	
		1. PERFORM SELECTION	
	204	RECORDER AUDIO sw - A	Selects COMM CHANNEL A as source for voice recording operations on AM tape recorders
		(31.02.05-00)	
		4.3.2.19 VOICE RECORDING ON EXPERIMENT TAPE RECORDER	
		NOTE This procedure may be used when suspected failure precludes normal voice recording on data recorder	
		1. INITIATE INTERCOM VOICE RECORD Perform first four operations of paragraph 4.3.2.4	
		NOTE Record light may not operate if related to suspected failure	
		2. ACTIVATE EXP 1 RECORDER (4.3.6.1, step 1)	
		NOTE Inform MSFN at earliest opportunity of recording process	MSFN can determine recorder dump sequence
		3. TERMINATE RECORDING Deactivate voice recording (4.3.6.1, step 2, and 4.3.2.4, last operation)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.2.20 (DELETED)	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X (31.02.07-00) X X X	
		4.3.2.21 AUDIO COMMUNICATION (LOSS OF AUDIO CHANNEL)	
	INTERCOM	1. CONFIGURE INTERCOMS TO OPERATIONAL CHANNEL COMM CHAN sel - A (B) ON	
	203	2. CONFIGURE VOICE RECORDING SYSTEM TO OPERATIONAL CHANNEL INSTR SYS RCDR AUDIO sw - A (B)	
		NOTE Voice recording (if required) must be performed on time sharing basis with normal audio communications	
	INTERCOM 217, 317, 323	3. CONFIGURE FOR CCU USE ON OPERATIONAL CHANNEL If CCU, LCCU, or LSU use required: CHAN A (B) sel - OFF SUS SYS 1 (2) LSU POWER sw (2) - OFF	
	INTERCOM 217, 317, 323	Connect CCU, LCCU, or LSU to operational AUDIO CHAN A (B) connector CHAN A (B) sel - SLEEP, ICOM/PTT, or PTT as required SUS SYS 1 (2) LSU POWER sw - ON	
		X X X X X 4. CONFIGURE CSM AUDIO CENTER (TBS) X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		(25.02.15-00)	
		4.3.2.22 TELEVISION OPERATION	
		NOTE See tool matrix for tool requirements (Appendix C)	
	CSM 3	1. CSM PREPARATION S BD AUX TAPE - ctr S BD AUX TV - TV TV SOURCE - SWS	Turns on FM transmitter

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.2.22 TELEVISION OPERATION (cont'd)	
		2. SWS PREPARATION	
	132	VIDEO sel - TV	
		Obtain TV camera bracket	(A5)
		Obtain TV camera and TV monitor	(A5)
		Install TV camera and TV monitor in bracket	
		Obtain TV zoom lens	(A5)
		Attach TV zoom lens to camera	
	133,320 404,555 642	TV PWR sw - OFF	
	TV CAM	[XMIT/STANDBY] sw - STANDBY	
		AUTO LIGHT CONTROL - AVG	
		Adjust camera	
		Focus - 4 ft	
		Zoom - 25 mm	
		Aperture - f/44	
	TV MON	[ON/OFF] sw - OFF	
		Obtain TV cable (SWS) and TV monitor cable	(F523) (A5) TV Cable (SWS) is stowed in F523
		Connect TV monitor cable between TV camera and TV monitor	
		Connect TV cable (SWS) between TV camera and TV station	
		Adjust cabin lighting to maximum	
		3. ACTIVATE TV CAMERA	
	133,320, 404,555, 642	TV PWR sw - ON	
	TV MON	[ON/OFF] sw - ON	Power amplifier warmup time is 90 sec
		Adjust monitor controls for best image (VER, HOR, BRT, CONT)	
	TV CAM	Using monitor, adjust camera controls as required	
		Lens aperture	
		Zoom control	
		Focus control	
		4. TRANSMISSION TO MSFN	
	TV CAM	[XMIT/STANDBY] sw - XMIT	Transmission will begin immediately if power amplifier warmup time has been satisfied
	133,320, 404,555, 642	Adjust gain as required (3/32 screwdriver)	
	TV CAM	[AVERAGE/PEAK] sw - as required	
		(25.02.16.00)	
		5. DEACTIVATE TV	
	TV CAM	[XMIT/STANDBY] sw - STANDBY	
	TV MON	[ON/OFF] sw - OFF	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.2.22 TELEVISION OPERATION (cont'd)	
	133,320, 404,555, 642, CSM 3	TV PWR sw - OFF	
		S BD AUX TV - OFF (ctr)	
		Disassemble and stow camera, cables, monitor, bracket and lens	(F523) (A5) TV cable (SWS) is stowed in F523
		Adjust cabin lighting as desired	
		(31.02.01-00)	
		4.3.2.23 STUB ANTENNA SELECTION (MANUAL)	
	204	ANT [(DISC 1/STUB)/DISC 2/CMD] sw - DISC 1/STUB	Switch is normally in CMD position
		ANT [DISC 1/STUB/CMD] sw - STUB	Switch is normally in CMD position
		(31.02.01-00)	
		4.3.2.24 DISCONE 1 ANTENNA SELECTION (MANUAL)	
	204	ANT [(DISC 1/STUB)/DISC 2/CMD] sw - DISC 1/STUB	Switch is normally in CMD position
		ANT [DISC 1/STUB/CMD] sw - DISC 1	Switch is normally in CMD position
		(31.02.01-00)	
		4.3.2.25 DISCONE 2 ANTENNA SELECTION (MANUAL)	
	204	ANT [(DISC 1/STUB)/DISC 2/CMD] sw - DISC 2	Switch is normally in CMD position

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.02.03-00)	
		4.3.2.26 DISCONE ANTENNA DEPLOY (MANUAL)	
		NOTE The following procedure, if required, must be performed during MDA/AM activation prior to configuration of STS circuit breaker panels	
	205	ANT sw - DEPLOY	Momentary lever lock switch
		(25.02.17-00)	
		4.3.2.27 TELEPRINTER OPERATION	
		NOTE Opening the teleprinter acoustical cover is not required to operate the TELEPRINT sw	
	209	TELEPRINT sw - CMD	Normal system operating mode. Provides MSFN control of teleprinting system power
		(31.02.02-00)	
		4.3.2.28 TELEPRINTER OPERATION (MANUAL)	
		NOTE Opening the teleprinter acoustical cover is not required to operate the TELEPRINT sw	
	209	TELEPRINT sw - ON	Provides teleprinting system power if MSFN power control fails
		(25.02.25-00)	
		TELEPRINT sw - OFF	Removes teleprinting system power
		(27.02.11-00)	
		4.3.2.29 TELEPRINTER PAPER ADVANCE/MESSAGE REMOVAL	
		CAUTION Do not depress SLEW pushbutton during MSFN transmission or message will be destroyed. Sufficient amount of paper is advanced by MSFN to facilitate message removal from teleprinter	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.2.29 TELEPRINTER PAPER ADVANCE/MESSAGE REMOVAL (cont'd)	
		1. PAPER ADVANCE	
	209	TELEPRINT sw - CMD or ON	
		Loosen Calfax fastener on acoustical cover	
		Open acoustical cover	
		Unsnap paper takeup cover	
		SLEW pb - Depress until sufficient amount of paper advances to facilitate removing teleprinter message	Advise MSFN of approximate amount of paper advance
		2. MESSAGE REMOVAL	
		Tear message from teleprinter with abrupt diagonal pull on paper against cutting edge	
		SLEW pb - depress until sufficient amount of paper advances to facilitate routing through paper takeup device	Advise MSFN of approximate amount of paper advance
		Determine need for paper replacement	Red stripe indicates need
		3. RECONFIGURE TELEPRINTER	
		Snap on paper takeup cover	
		Close acoustical cover	
		Tighten Calfax fastener on acoustical cover	
		(27.02.08-00)	
		4.3.2.30 TELEPRINTER PAPER CARTRIDGE REFILL	
		1. OBTAIN EMPTY TELEPRINTER PAPER CARTRIDGE	
		Remove empty cartridge	(M202)
		2. REMOVE EXPENDED TELEPRINTER PAPER ROLL	
		Push in on black (spring-loaded) end of paper spool and lift paper roll out of sockets	
		Pull black spool end out of expended paper roll, and temporarily stow	Black spool end is integral to teleprinter paper spool and must be used in new paper roll
		Dispose of white spool end in trash bag	White spool end is integral to each paper roll and is expendable
		3. OBTAIN TELEPRINTER PAPER ROLL	
		NOTE Teleprinter paper stowage canister caps should be only handtight. If not, loosen all canister caps (4.3.2.32)	
		Unscrew cap on teleprinter paper stowage canister	(M201)
		Pull cap to extract bag from canister	(M201) Bag attached to cap by cord
		Open bag by separating velcro strips	
		Remove one paper roll	Each bag contains six paper rolls
		Mate velcro strips and insert bag into canister	(M201)
		Replace cap and handtighten	(M201)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.2.30 TELEPRINTER PAPER CARTRIDGE REFILL (cont'd)	
		4. INSTALL NEW TELEPRINTER PAPER ROLL Insert black spool end into new paper roll Align pins on black spool end with slots on new paper roll Orient new paper roll so that black spool end aligns with large socket on decal end of cartridge	Proper orientation of paper roll before threading is necessary to insure correct direction of paper unwinding and correct surface contacting the print head. A decal on the side of the cartridge indicates proper threading
		Fold back paper 3/8 inch from leading edge, and insert between platen roll and preview window, with fold flap toward platen roll Grasp fold and guide paper around idler roll and on top of pressure roll Grasp paper with fingers and pull through another 3 inches Rewind all excess paper onto roll and insert into cartridge by depressing black spool end and guiding it into the sockets	
		5. STOW SPARE TELEPRINTER PAPER CARTRIDGE (27.02.09-00)	(M202)
		4.3.2.31 TELEPRINTER PAPER CARTRIDGE REPLACEMENT	
		NOTE A "low paper" indication occurs on TM when there is between 6 to 15 feet of paper left. The last 3 feet of paper will have a red strip 1/4 inch wide on the sides of the paper	Diameter of paper roll approximately equal to 1 inch (15 feet remaining)
	209	1. DEACTIVATE TELEPRINTING SYSTEM TELEPRINT sw - OFF	Removes power from the teleprinting system
		2. REMOVE EXPENDED CARTRIDGE Loosen Calfax fastener on acoustical cover Open hinged acoustical cover Snap off paper takeup cover Loosen Calfax fasteners (4) on cartridge Carefully pull cartridge from panel by grasping heads of diagonal Calfax fastener (2)	
		3. OBTAIN SPARE TELEPRINTER PAPER CARTRIDGE	(M202) The spare cartridge is loaded with a full roll of paper at the crew's leisure per TELEPRINTER PAPER CARTRIDGE REFILL procedure 4.3.2.30 so that teleprinter down-time is minimized by replacing the cartridge with the spare cartridge alternately when paper resupply becomes necessary
		Obtain spare cartridge	(M202)
		Stow empty cartridge	(M202)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.2.31 TELEPRINTER PAPER CARTRIDGE REPLACEMENT (cont'd)	
		4. INSTALL SPARE TELEPRINTER PAPER CARTRIDGE Carefully install spare cartridge and tighten Calfax fasteners (4) Handtight Snap on paper takeup cover Close acoustical cover Tighten Calfax fastener on acoustical cover handtight	
	209	5. ACTIVATE TELEPRINTING SYSTEM TELEPRINT sw - CMD	Provides MSFN control of teleprinting system power
		NOTE The removed cartridge may be supplied with a new roll of paper per TELEPRINTER PAPER CARTRIDGE REFILL procedure 4.3.2.30 at this time. Otherwise stow spare cartridge	
		(25.02.26-00)	
		4.3.2.32 TELEPRINTER PAPER STOWAGE CANISTER PRESSURE EQUALIZATION	
	242	1. OBTAIN WINDOW CRANK Depress pip pin on window crank and hold Pull crank from shaft and release pip pin	
		2. EQUALIZE CANISTER PRESSURE TO CABIN ATMOSPHERE	
		NOTE Differential pressure exists between the cabin and canister. Do not completely remove cap during this procedure.	
		Depress pip pin on window crank and hold Place crank over nut on paper canister cap and release pip pin Rotate crank (approximately 6 1/2 turns, ccw) Depress pip pin, remove crank from cap and release pip pin Repeat preceding operations for all 26 canisters	(M201) (M201) (M201)
	242	3. REPLACE WINDOW CRANK Depress pip pin and attach window crank to crank shaft	Replace crank at this time to allow sufficient time for pressure to equalize
		4. SECURE CANISTER CAPS Screw caps on handtight on all 26 canisters	(M201)
		4.3.2.33 (DELETED)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.02.18-00)	
		4.3.2.34 COMMUNICATIONS POWER DOWN	POWER(WATTS) 26.0V 30.0V
		1. CONFIGURE CIRCUIT BREAKER PANELS	
	200	cb AUDIO SYS BUFFER AMPS 1, 2 (2) - open	12 14.4
		cb AUDIO SYS INTERCOM A, B (2) - open	8.6 9.8
		cb AUDIO SYS CCU A, B (2) - open	4.8 5.8
		cb VHF XPNDR - open (verify)	32.7 33.5
	202	cb TELEPRINT - closed (verify)	32.4 33.5
		cb TV ATM VIDEO	TBS TBS
		cb TV PWR AM, MDA (2) - open	TBS TBS
		2. CONFIGURE CONTROL PANELS	
	209	TELEPRINT sw - CMD (verify)	
		(25.02.25-00)	
		4.3.2.35 TELEPRINTER DEACTIVATION	
	209	TELEPRINT sw - OFF	

4.3.3 THRUSTER ATTITUDE CONTROL SYSTEM

4.3.3.1 (DELETED)

4.3.4 ENVIRONMENTAL CONTROL SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.04.10-00)	
		4.3.4.1 VENT SEALING DEVICE REMOVAL	
		NOTE Vent sealing device removal is performed during SL-2,-3, and -4 activation and deactivation	
	103 403 405	1. REMOVE VENT SEALING DEVICE	
		Depress and hold vent sealing device semi-circular handle trigger Depress vent sealing device [OPEN/CLOSED] handle Vent sealing device [OPEN/CLOSED] handle - OPEN Release vent sealing device semi-circular handle trigger Depress spring latch	Push along axis of [OPEN/CLOSED] handle Spring latch is located on vent duct and stowage receptacle
		Rotate vent sealing device ccw Pull vent sealing device straight out	
		(25.04.11-00)	
		4.3.4.2 VENT SEALING DEVICE INSTALLATION	
		NOTE Vent sealing device installation is performed during SL-2,-3, and -4 activation and deactivation	
	103 403 405	1. INSTALL VENT SEALING DEVICE	
		Insert vent sealing device into vent duct or stowage receptacle Rotate vent sealing device cw to stop Depress vent sealing device [OPEN/CLOSED] handle Vent sealing device [OPEN/CLOSED] handle - CLOSED	Sealing device is rotated approximately 20 degrees Push along axis of [OPEN/CLOSED] handle
		(25.04.01-00)	
		4.3.4.3 CONDENSATE SYSTEM DUMP (WASTE TANK)	
		1. DUMP CONDENSATE TANK Pull back velcro flap on condensate tank cover to expose tank	
	216	CNDST TANK H2O vlv - DUMP	
		NOTE Following operation will activate C/W CNDST TANK ΔP indication	
	INTERCOM 207	CNDST TANK PRESS vlv - PRESS Caution tone - on C/W CNDST TANK ΔP lt - on Respond to C/W alert (4.3.8.18)	C/W indication ΔP 0.8 to 0.3 psid

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.3 CONDENSATE SYSTEM DUMP (WASTE TANK) (cont'd)	
	B00	DUMP HTRS H2O sw - 1	
		DUMP HTRS H2O lt - on	
	617	DUMP HTR lt - on	
		NOTE Bladder should be observed during dump cycle and dump terminated prior to bladder bottoming out against tank	
	B31	WATER DUMP vlv - OPEN	Approximately 20 minutes required for dump
	B00	H2O DUMP PRESS ind - $\leq$ 0.7 psia	
		2. TERMINATE CONDENSATE DUMP	
	B31	WATER DUMP vlv - CLOSE	
	B00	DUMP HTRS H2O sw - OFF	
		DUMP HTRS H2O lt - off	
	617	DUMP HTR lt - off	
		3. RESUME CONDENSATE COLLECTION	
	216	CNDST TANK PRESS vlv - VACUUM	
		CNDST CONT SYS TANK ΔP ind - Monitor for 4.4 to 5.0 psid	
	207	C/W CNDST TANK ΔP lt - off	Light off ΔP $\geq$ 0.8 psid
	206	C/W [CLEAR] sw - CLEAR	Momentary switch
		C/W MEM RECALL pb/lt - off	
	216	CNDST TANK PRESS vlv - CLOSED	
		CNDST TANK H2O vlv - FILL	
		Close velcro flap on condensate tank cover	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX	
		X X	
		X 4.3.4.4 CONDENSATE SYSTEM DUMP (AM) (cont'd) X	
		X X	
		NOTE	
		Observe bladder during dump cycle. Bladder should not be allowed to bottom against tank	
		CNDST CONT SYS VENT VLV sw - PRI	Dump takes 10-15 minutes. CONDST CONT SYS VENT TEMP decreases during dump
		2. TERMINATE CONDENSATE DUMP	
		CAUTION	
		Condensate dump heater should not be deactivated until CNDST CONT SYS VENT TEMP increases above 120°F to preclude water freezeup between vent valve and exit port	
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CNDST CONT SYS VENT HTRS sw - OFF	
		CNDST CONT SYS VENT HTRS PRI lt - off	
		3. RESUME CONDENSATE COLLECTION	
	216	CNDST TANK PRESS vlv - VACUUM	
		CNDST CONT SYS TANK ΔP indicator - Monitor for 4.4 to 5.0 psid	
	207	C/W CNDST TANK ΔP lt - off	Light off ΔP ≥ 0.8 psid
	206	C/W [CLEAR] sw - CLEAR	Momentary switch
		C/W MEM RECALL pb/lt - off	
	216	CNDST TANK PRESS vlv - CLOSED	
	X	CNDST TANK H2O vlv - FILL X	
	X	Close velcro flap on condensate tank cover X	
	X	X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		4.3.4.5 (DELETED)	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
		X (31.04.03-00) X	
		X X	
		X 4.3.4.6 CONDENSATE TANK MANUAL PUMP OPERATION X	Pump used to "unclog" condensate dump line
		X X	
		1. PREPARE FOR MANUAL PUMP USAGE	
	216	CNDST TANK PRESS vlv - CLOSED (verify)	
		Disconnect condensate tank vacuum line qd	Smallest qd on side of condensate module
		Obtain condensate tank manual pump	(M202)
		Turn/verify sleeve on manual pump hose - VENT CLOSED	
		Connect manual pump hose qd to vacuum qd on side of condensate module	
	216	X CNDST TANK PRESS vlv - VACUUM X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX	
		X X	
		X 4.3.4.6 CONDENSATE TANK MANUAL PUMP OPERATION (cont'd) X	
		X X	
		2. MANUAL PUMP OPERATION	
	216	CNDST TANK H2O vlv - DUMP	
		Squeeze bulb on manual pump several times to build up pressure in condensate tank	
		Pull back velcro flap on condensate tank cover to expose tank	
		NOTE	
		Bladder should be observed during dump cycle. Allowing bladder to bottom out against tank is undesirable and unnecessary	
		Continue to squeeze bulb on manual pump as tank empties	
		3. TERMINATE MANUAL PUMP USAGE	
		NOTE	
		Sleeve on pump hose may require turning to relieve pressure in hose	
		Disconnect manual pump hose qd from vacuum line qd	
		Connect condensate tank vacuum line qd	
		Stow condensate tank manual pump	(M202)
		4. RESUME CONDENSATE COLLECTION	
	216	CNDST TANK PRESS vlv - VACUUM	
	207	C/W CNDST TANK ΔP lt - off	
	206	C/W [CLEAR] sw - CLEAR	Momentary switch
		C/W MEM RECALL pb/lt - off	
		CNDST CONT SYS TANK ΔP ind - Monitor for 4.4 to 5.0 psid	
	216	CNDST TANK PRESS vlv - CLOSED	
	X	CNDST TANK H2O vlv - FILL X	
	X	Close velcro flap on condensate tank cover X	
	X	X	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.7 MOLECULAR SIEVE BAKEOUT (cont'd)	
		2. PREPARE MOL SV A (B) BED 1 FOR BAKEOUT	
	207	SV A (B) PPCO2 sw - inhibit	Precludes C/W alarm. If not inhibited, C/W alarm will cycle as bed 2 (1) cycles
		Loosen Calfax fasteners (2) and open access cover for MOL SV A (B) valve control panel	
	226(227)	SOLENOID SWITCHES S1 sw - OFF	
		SOLENOID SWITCHES S2 sw - OFF (verify)	Solenoid switch configuration prevents timer from cycling beds
		SOLENOID SWITCHES S3 sw - OFF (verify)	
		SOLENOID SWITCHES S4 sw - OFF	
		Unstow "T" handle from clamp mounting on panel	
	228(229)	BED 1 man vlv - DESORB ("T" handle)	Isolates pneumatic lines controlled by solenoid switches S1 and S4 from pneumatic lines controlled by solenoid switches S2 and S3
		BED 1 pos ind - DESORB (verify)	
		Man interconnect V1-V4 vlv (4) - C ("T" handle)	
		SOLENOID SWITCHES S2 sw - AUTO	Allows normal cycling of bed 2
		SOLENOID SWITCHES S3 sw - AUTO	
	228(229)	BED 1 pos ind - DESORB (verify)	
	226(227)	Stow "T" handle on panel	
		Close access cover for valve control panel and tighten Calfax fasteners (2)	
		3. PERFORM MOL SV A (B) BED 1 BAKEOUT	
	203	MOL SV DISP sw - SV A (B)	
		MOL SV A (B) BAKEOUT HTRS sw - BED 1	Approximately TBS min are required for bed to heat up
		MOL SV BED 1 ind - 375° to 410°F	
		NOTE Allow 5 hr bakeout time for bed 1	
		MOL SV A (B) BAKEOUT HTRS sw - OFF	
		WARNING Wait 15 min for cool-down of bed 1	Precludes fire hazard in bed
		Loosen Calfax fasteners (2) and open access cover for MOL SV A (B) valve control panel	
	226(227)	SOLENOID SWITCHES S2 sw - OFF	Prevents timer from cycling bed 2
		SOLENOID SWITCHES S3 sw - OFF	
		SOLENOID SWITCHES S1 sw - OFF (verify)	
		SOLENOID SWITCHES S4 sw - OFF (verify)	
	226(227)	Unstow "T" handle from clamp mounting on panel	
	228(229)	BED 1 man vlv - STORAGE (1 3/4 turns) (Deactivation)	
		BED 2 man vlv - DESORB ("T" handle) (SL-3,4)	
		BED 2 pos ind - DESORB (verify)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.7 MOLECULAR SIEVE BAKEOUT (cont'd)	
		4. PREPARE MOL SV A (B) BED 2 FOR BAKEOUT	
	203	MOL SV A (B) TMRS sw - OFF (Deactivation)	
		MOL SV A (B) FANS DISCON sw - OFF	
	228(229)	BED 2 pos ind - DESORB (verify)	
	226(227)	Stow "T" handle on panel	
		Close access cover for valve control panel and tighten Calfax fasteners (2)	
	221(219)	MOL SV A (B) BED CYCLE N2 SUP vlv - CLOSE (Deactivation) (7 1/2 turns, cw)	
		5. PERFORM MOL SV A (B) BED 2 BAKEOUT	
	203	MOL SV A (B) BAKEOUT HTRS sw - BED 2	Approximately TBS minutes are required for bed to heat up
		MOL SV BED 2 ind - 375° to 410°F	
		NOTE	
		Allow 5 hr bakeout time for bed 2	
		MOL SV A (B) BAKEOUT HTRS sw - OFF	
		WARNING	
		Wait 15 min for cool-down of bed 2	Precludes fire hazard in bed
		6. CONCLUDE DEACTIVATION OF MOL SV A (B) (Deactivation)	
		Loosen Calfax fasteners (2) and open access cover for MOL SV A (B) valve control panel	
	226(227)	Unstow "T" handle from clamp mounting on panel	
	228(229)	BED 2 man vlv - STORAGE (1 turn)	
	226(227)	Man interconnect V1, V2, V3, V4 vlv (4) - A	
		Stow "T" handle on panel	
		Close access cover for valve control panel and tighten Calfax fasteners (2)	
	220(218)	MOL SV A (B) VENT vlv - CLOSE	
		7. RETURN MOL SV A (B) TO NORMAL SERVICE (SL-3,4)	
		Loosen Calfax fasteners (2) and open access cover for MOL SV A (B) valve control panel	
	226(227)	SOLENOID SWITCHES S1 sw - OFF	
		SOLENOID SWITCHES S2 sw - OFF (verify)	
		SOLENOID SWITCHES S3 sw - OFF (verify)	
		SOLENOID SWITCHES S4 sw - OFF	
		Unstow "T" handle from clamp mounting on panel	
		Man interconnect V1-V4 vlv (4) - A ("T" handle)	
		SOLENOID SWITCHES S1, S4 (2) - AUTO	
		BED 1 pos ind - ADSORB (verify)	
		BED 2 pos ind - DESORB (verify)	
		Verify mol sv operation (4.3.4.17, step 1)	
		Stow "T" handle on panel	
		Close access cover for MOL SV A (B) valve control panel and tighten Calfax fasteners (2)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.8 (DELETED)	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X (31.04.12-00) X	
		X 4.3.4.9 MOLECULAR SIEVE B ACTIVATION X	
		1. ROTATE CO2 DUMMY FILTER CARTRIDGES(4.3.4.16)	
		2. CONFIGURE BEDS FOR AUTOMATIC CYCLING	
	218	MOL SV B VENT vlv - OPEN	
	219	MOL SV B BED CYCLE N2 SUP vlv - OPEN	
		Loosen Calfax fasteners (2) and open access panel for MOL SV B valve control panel	Not required if mol sv activation performed during 4.2.1.12
		Manual interconnect V1, V2, V3, V4 valves (4) - A (verify)	
	227	SOLENOID SWITCHES S2, S3 sw (2) - OFF (verify)	
	227	SOLENOID SWITCHES S1, S4 sw (2) - AUTO	
	203	MOL SV B FANS DISCON sw - AUTO	Provides auto fan shutoff if both beds are in adsorb position
		3. INITIATE MOL SIEVE BED CYCLING	
		NOTE The following operation may activate the C/W SV TMR indication. If C/W is not triggered, proceed with verification of bed position indicators. Operations * applicable only if C/W is triggered	
	203	MOL SV B TMRS sw - PRI	Automatically sets bed 1 to ADSORB and bed 2 to DESORB
	INTERCOM	Caution tone - on*	
	207	C/W SV TMR lt - on*	
		Respond to C/W alert (4.3.8.18)*	
	207	C/W SV TMR lt - off (verify)*	Light goes off upon initiation of timer operation
	206	C/W [CLEAR] sw - CLEAR*	Momentary switch
		C/W MEM RECALL pb/lt - off*	
	228	BED 1 pos ind - ADSORB (verify)	
		BED 2 pos ind - DESORB (verify)	
		Close access panel for MOL SV B valve control panel and tighten Calfax fasteners (2)	Not required if mol sieve activation performed during 4.2.1.12
	203	X MOL SV B VENT HTRS sw - ON X	
		X Verify mol sv B operation (4.3.4.17, step 1) X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		4.3.4.10 (DELETED)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.06.04-00)	
		4.3.4.11 MOLECULAR SIEVE CHARCOAL CANISTER REPLACEMENT	This procedure applies to mol sv A and B. Panel numbers for mol sv B are shown in parentheses
		NOTE Mol sv charcoal canister is replaced every 28 days. See tool matrix for tool requirements (Appendix C)	
	203	1. DEACTIVATE MOL SV A (B) FAN MOL SV A (B) FANS PWR sw - OFF	This step is A.E. 27.16.01-00
		2. REMOVE USED MOL SV CHARCOAL CANISTER Loosen yellow Calfax fasteners (4) and remove MOL SV A (B) cover Maneuver cover clear of equipment and restrain Loosen T-handles (2) on launch restraint clamps (2) (SL-2)	The next 3 steps are A.E. 27.06.03-00 Restraint clamps are used during launch only and are not required on orbit
		Rotate restraint clamps (2) aside (SL-2) Disconnect qd from each end of used canister and remove canister	
		3. OBTAIN REPLACEMENT MOL SV CHARCOAL CANISTER Identify used canister (1-inch red tape, scissors) Obtain replacement canister Stow used canister	(D436), (D438) or (D440) (D436), (D438) or (D440) Stowage location should be that vacated by replacement canister
		4. INSTALL REPLACEMENT MOL SV CHARCOAL CANISTER Align flange on replacement canister and slotted clamp and install in mol sv A (B) Connect qd to each end of canister Replace MOL SV A (B) cover and tighten yellow Calfax fasteners (4)	
		5. ACTIVATE MOL SV A (B) FAN	This step is A.E. 27.16.03-00
		NOTE The following operation will activate C/W SV FLOW indication	
	203 INTERCOM 207	MOL SV A (B) FANS PWR sw - PRI (SEC) Caution tone - on C/W SV FLOW lt - on	
		Respond to C/W alert (4.3.8.18)	
	207 206	C/W SV FLOW lt - off C/W MEM RECALL pb/lt - off	Light will go off as gas flow rate increases

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.05.02-00)	
		4.3.4.12 SOLIDS TRAP REPLACEMENT	This procedure applies to mol sv A and B. Panel numbers for mol sv B are shown in parentheses
		NOTE Solids trap is normally replaced every 10 days and 5-6 hours after turn-on of mol sv fan during activation. See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE MOL SV A (B) FAN	
	203	MOL SV A (B) FANS PWR sw - OFF	
		2. REMOVE USED SOLIDS TRAP	The next 3 steps are A.E. 27.05.01-00
		Loosen Calfax fasteners (2) and open MOL SV A (B) solids trap access door	
		Loosen (ccw) tethered knob and remove	
		Close solids trap lid and secure with velcro strap	
		Remove used solids trap	
		3. OBTAIN REPLACEMENT SOLIDS TRAP	
		Identify used solids trap (1-inch red tape, scissors)	
		Obtain replacement solids trap	(M168)
		Dispose of used solids trap in trash bag	(M168)
		4. INSTALL REPLACEMENT SOLIDS TRAP	
		Open solids trap lid and secure with velcro strap	
		Position solids trap over mol sv A (B) fan manifold	
		Install tethered knob and tighten (cw)	
		Close MOL SV A (B) solids trap access door and tighten Calfax fasteners (2)	
		5. ACTIVATE MOL SV A (B) FAN	
		NOTE The following operation will activate C/W SV FLOW indication	
	203 INTERCOM 207	MOL SV A (B) FANS PWR sw - PRI (SEC) Caution tone - on C/W SV FLOW lt - on	
		Respond to C/W alert (4.3.8.18)	
	207	C/W SV FLOW lt - off	Light will go off as gas flow rate increases
	206	C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.07.05-00)	
		4.3.4.13 INLET CO2 FILTER CARTRIDGES REPLACEMENT	This procedure applies to mol sv A and B
		NOTE Inlet CO2 filter cartridges are replaced every 10 days and at the beginning of the SL-3 and SL-4 missions. See tool matrix for tool requirements (Appendix C)	
		1. REMOVE USED INLET CO2 FILTER CARTRIDGES	The next 3 steps are A.E. 27.07.01-00
		NOTE The following operation will interrupt TM parameter SIV A (B) PCO2 IN P (D209 or D213) and display MOL SV PPCO2 IN (D906)	
		Loosen (ccw) knurled knob on blue inlet CO2 detector endplate and remove Rotate (ccw) and remove passive filter cartridge from endplate Rotate (ccw) and remove active filter cartridge from endplate	
		2. OBTAIN REPLACEMENT INLET CO2 FILTER CARTRIDGES Obtain replacement filter cartridges (active and passive)	(M202) Replacement filter cartridges are stowed in plastic vials. Passive cartridge vial is labled with a blue P and active cartridge vial is labeled with blue A
		Stow used filter cartridges Identify used filter cartridges (1-inch red tape, scissors)	(M202)
		3. INSTALL REPLACEMENT CO2 FILTER CARTRIDGES Align and insert passive filter cartridge in endplate and rotate (cw) Align and insert active filter cartridge in endplate and rotate (cw) Install inlet CO2 detector endplate and tighten (cw) knurled knob	
	203	4. VERIFY INLET CO2 IS WITHIN LIMITS MOL SV DISP sw - SV A (B) MOL SV PPCO2 IN ind - 0.0 to 5.5 mmHg	This step is A.E. 27.07.02-00
		(27.07.06-00)	
		4.3.4.14 OUTLET CO2 FILTER CARTRIDGES REPLACEMENT	This procedure applies to mol sv A and B
		NOTE Outlet CO2 filter cartridges are replaced at the beginning of SL-3 and SL-4 missions. See tool matrix for tool requirements (Appendix C)	
		1. REMOVE USED OUTLET CO2 FILTER CARTRIDGES	The next 3 steps are A.E. 27.07.03-00

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.14 OUTLET CO2 FILTER CARTRIDGES REPLACEMENT (cont'd)	
		NOTE The following operation will interrupt TM parameter SIV A (B) PCO2 OUT P (D210 or D214), display parameter MOL SV PPCO2 OUT (D907) and C/W parameter SV OUT PPCO2 HI	
		Loosen (ccw) knurled knob on red outlet CO2 detector endplate and remove Rotate (ccw) and remove passive filter cartridge from endplate Rotate (ccw) and remove active filter cartridge from endplate	
		2. OBTAIN REPLACEMENT OUTLET CO2 FILTER CARTRIDGES Obtain replacement filter cartridges (active and passive)	(M202) Replacement filter cartridges are stowed in plastic vials. Passive cartridge vial is labeled with a red P and active cartridge vial is labeled with a red A
		Stow used filter cartridges Identify used filter cartridges (1-inch red tape, scissors)	(M202)
		3. INSTALL REPLACEMENT OUTLET CO2 FILTER CARTRIDGES Align and insert passive filter cartridge in end plate and rotate (cw) Align and insert active filter cartridge in endplate and rotate (cw) Install outlet CO2 detector endplate and tighten (cw) knurled knob	
	203	4. VERIFY OUTLET CO2 IS WITHIN LIMITS MOL SV DISP sw - SV A (B) MOL SV PPCO2 OUT ind - 0.0 to 3.0 mmHg	This step is A.E. 27.07.04-00
		(26.04.06-00)	
		4.3.4.15 PPCO2 SENSOR DRIFT CHECK	
		1. PREPARE INSTRUMENTATION FOR DRIFT CHECK	Schedule frequency may coincide with inlet and outlet CO2 replacement
		NOTE MSFN should configure AM instrumentation system for data recording prior to this procedure or crew should initiate data recording manually. Manual initiation is shown	
	204	TAPE RECORDING DATA sw - RECORD TAPE RECORDING DATA lt - on	
		2. REMOVE INLET CO2 FILTER CARTRIDGES (4.3.4.13, step 1)	
		3. REMOVE OUTLET CO2 FILTER CARTRIDGES (4.3.4.14, step 1)	
		4. INSTALL INLET AND OUTLET CO2 DETECTOR ENDPLATES Install inlet blue CO2 detector endplate and tighten (cw) knurled knob Repeat for outlet red CO2 detector endplate (2)	Drift check lasts for approximately one orbit

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.15 PPCO2 SENSOR DRIFT CHECK (cont'd)	
	204	5. TERMINATE DRIFT CHECK TAPE RECORDING DATA sw - CMD TAPE RECORDING DATA lt - off Install replacement inlet CO2 filter cartridges (4.3.4.13, steps 2-4) Install replacement outlet CO2 filter cartridges (4.3.4.14, steps 2-4)	
		(31.04.13-00)	
		4.3.4.16 PPCO2 DUMMY FILTER CARTRIDGE ROTATION	
		1. REMOVE PPCO2 DUMMY FILTER CARTRIDGE(S) Loosen (ccw) knurled knob on blue inlet CO2 detector endplate and remove Rotate and remove dummy filter cartridges (2) from endplate Repeat preceding two operations for red outlet PPCO2 detector endplates (2)	
		2. OBTAIN REPLACEMENT INLET PPCO2 FILTER CARTRIDGES Temporarily stow dummy filter cartridges (2) Obtain replacement filter cartridges (active and passive)	(M202) See remark, 4.3.4.13, step 2
		3. INSTALL REPLACEMENT INLET PPCO2 FILTER CARTRIDGES (4.3.4.13, step 3)	
		4. VERIFY INLET PPCO2 IS WITHIN LIMITS (4.3.4.13, step 4)	
		5. OBTAIN REPLACEMENT OUTLET PPCO2 FILTER CARTRIDGES Obtain replacement filter cartridges (active and passive)	(M202) See remark, 4.3.4.14, step 2
		6. INSTALL REPLACEMENT OUTLET PPCO2 FILTER CARTRIDGES (4.3.4.14, step 3)	
		7. VERIFY OUTLET PPCO2 IS WITHIN LIMITS (4.3.4.14, step 4)	
		8. INSTALL PPCO2 DUMMY FILTER CARTRIDGES IN MDL SV TO BE PASSIVATED Repeat steps 1-3, 5, and 6, substituting PPCO2 dummy filter cartridges for operational units	
		Stow used inlet and outlet PPCO2 filter cartridges	(M202)
		Identify used filter cartridges (Method TBS)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.17 ECS PERIODIC VERIFICATION	
		NOTE Frequency of periodic check TBS	
		(26.04.01-00)	
		1. VERIFY MOL SV OPERATION	
	203	MOL SV DISP sw - SV A (B)	
		MOL SV PPCO2 IN ind - 4.4 to 5.5 mmHg	PPCO2 level is lower during activation operations
		MOL SV PPCO2 OUT ind - 2.0 to 3.0 mmHg	PPCO2 level is lower during activation operations
		MOL SV HT EXCH IN ind - 60° to 80°F	
		MOL SV DEW PT ind - 46° to 51°F	Dew Point is lower during activation operations
		MOL SV HT EXCH OUT ind - 46° to 60°F	
		MOL SV DISP sw - SV B (A)	
		MOL SV PPCO2 IN ind - 0 mmHg	Dummy CO2 filter cartridges are installed on inlet CO2 detector endplate
		MOL SV PPCO2 OUT ind - 0 mmHg	Dummy CO2 filter cartridges are installed on outlet CO2 detector endplate
		MOL SV HT EXCH IN ind - 60° to 80° F	
		MOL SV DEW PT ind - 46° to 51°F	Dew point is lower during activation operations
		MOL SV HT EXCH OUT ind - 46° to 60° F	
		(26.04.02-00)	
		2. VERIFY N2 BOTTLE PRESSURE AND TEMPERATURE	
	225	N2 BOTTLES ind sel - 1	
		N2 BOTTLES (PSI X 10) ind - 30 to 300 (log)	Pressure reading of N2 bottles 1 and 2 will differ from 3, 4, 5, and 6 since bottles are isolated by valves located on panel 390
		N2 BOTTLES (°F) ind - 30 to 100 (log)	
		Repeat above sequence for selector positions 2 through 6	
		(26.04.03-00)	
		3. VERIFY O2 BOTTLE PRESSURE AND TEMPERATURE	
	225	O2 BOTTLES ind sel - 1	
		O2 BOTTLES (PSI X 10) ind - 30 to 300 (log)	
		O2 BOTTLES (°F) ind - -20 to 120 (log)	
		Repeat above sequence for selector positions 2 through 6	
		(26.04.04-00)	
		4. VERIFY SWS PRESSURE	
	225	REG O2 ind - 115 to 135 psia	
		REG N2 ind - 145 to 165 psia	
	225	PRESS OWS ind - 4.8 to 5.2 psia	
		PRESS FWD ind - 4.8 to 5.2 psia	
		PRESS LOCK ind - 4.8 to 5.2 psia	
		PRESS AFT ind - 4.8 to 5.2 psia	
		O2/N2 CONTR PPO2 1, 2 ind (2) - 3.3 to 3.9 psia	
		4.3.4.18 (DELETED)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.04.34-00)	
		4.3.4.19 O2 PRESSURE SENSORS (3) REPLACEMENT	
		NOTE O2 pressure sensors (3) are replaced at the beginning of SL-3 and SL-4 missions. See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE O2 PRESSURE SENSORS	This step is A.E. 25.04.14-00
		NOTE The next two operations will interrupt TM parameters O2 PP 1 (D237) and O2 PP 2 (D239), display parameters O2/N2 CONTR PPO2 1 (D922) and O2/N2 CONTR PPO2 2 (D923) and activate C/W PPO2 LO indication. See tool matrix for tool requirements (Appendix C)	
	225	O2/N2 CONTR sel - OFF O2/N2 CONTR MON sel - OFF	
	INTERCOM 207	Warning tone - on C/W PPO2 LO lt - on Respond to C/W alert (4.3.8.18)	
		2. REMOVE USED O2 PRESSURE SENSORS	The next 3 steps are A.E. 25.04.15-00. Sensor cover is assumed open
	225	Rotate and remove each used sensor from side of O2/N2 control panel	
		3. OBTAIN REPLACEMENT O2 PRESSURE SENSORS Obtain replacement O2 pressure sensors (3) and canisters (3) Stow used sensors (3) and canisters (3) Identify used sensors (3) (1-inch red tape, scissors)	 (M202) (M202)
		4. INSTALL REPLACEMENT O2 PRESSURE SENSORS Install replacement sensors (3) on side of O2/N2 control panel and rotate	
		5. ACTIVATE REPLACEMENT O2 PRESSURE SENSORS	This step is A.E. 25.04.16-00
	225	O2/N2 CONTR sel - 1 O2/N2 CONTR PPO2 1 ind - 3.3 to 3.9 psia O2/N2 CONTR MON sel - 2 O2/N2 CONTR PPO2 2 ind - 3.3 to 3.9 psia C/W PPO2 LO lt - off	 Light goes off as controller and controller monitor sensor are powered
	206	C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off Test O2 pressure sensors (4.3.4.20)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(26.04.05-00)	
		4.3.4.20 O2 PRESSURE SENSOR FUNCTIONAL TEST	
		1. VERIFY/SELECT SENSORS	
	225	O2/N2 CONTR sel - 1 (verify) O2/N2 CONTR MON sel - 2 (verify) CAL vlv - OPEN (7 1/2 turns, cw) Close sensor cover and fingertighten Calfax fastener	
		NOTE Following step will activate C/W PPO2 LO indication	
		2. FLOOD PPO2 SENSORS WITH N2	
	225 INTERCOM 207	N2 FILL PRI sw - OPEN Warning tone - on C/W PPO2 LO lt - on	C/W PPO2 LO will trigger when PPO2 is $\leq$ 3.0 psia
		Respond to C/W Alert (4.3.8.18)	
		NOTE Warning tone may reinitiate after MASTER ALARM reset because of tolerances in redundant sensors	
		NOTE Allow N2 to purge sensor for 3 min before reading PPO2 inds	
	225	O2/N2 CONTR PPO2 1 ind - 0.0 psia O2/N2 CONTR PPO2 2 ind - 0.0 psia	
		3. VERIFY SENSOR 3 OPERATION	
	225	O2/N2 CONTR MON sel - 3 O2/N2 CONTR PPO2 3 ind - 0.0 psia N2 FILL PRI sw - CLOSE Loosen Calfax fastener and open sensor cover	Cover is friction hinged to stay open
		NOTE Allow three (3) min for cabin atmosphere to return sensor environment to a normal gas mixture	
		O2/N2 CONTR PPO2 1 ind - 3.3 to 3.9 psia O2/N2 CONTR PPO2 3 ind - 3.3 to 3.9 psia	
	207	C/W PPO2 LO lt - off	Light goes off as sensor environment returns to normal
	206	C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off	
		4. FLOOD PPO2 SENSORS WITH O2	
		Close sensor cover	
	225	O2 FILL PRI sw - OPEN	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.20 O2 PRESSURE SENSOR FUNCTIONAL TEST (cont'd)	
		NOTE Allow O2 to purge sensors for 3 min before reading PPO2 indicators	
		O2/N2 CONTR PPO2 1 ind - 4.8 to 5.2 psia O2/N2 CONTR PPO2 3 ind - 4.8 to 5.2 psia	
		5. VERIFY SENSOR 2 OPERATION	
	225	O2/N2 CONTR MON sel - 2	
		NOTE Wait 1 minute for sensor to stabilize	
	225	O2/N2 CONTR PPO2 2 ind - 4.8 to 5.2 psia	
		6. RETURN SYSTEM TO NORMAL OPERATION	
	225	O2 FILL PRI sw - CLOSE CAL vlv - CLOSE (7 1/2 turns, ccw) Open sensor cover	Cover is friction hinged to stay open
		(25.04.17-00)	
		4.3.4.21 PORTABLE FAN OPERATION	
		NOTE Steps 1 and 2 apply to attaching portable fans to grid	
		1. REMOVE PORTABLE FAN FROM GRID Rotate Astropin locking knob and press to release Remove portable fan from grid	
		2. INSTALL PORTABLE FAN TO GRID Engage Astropin in circular hold and turn locking knob	
		NOTE Steps 3 and 4 apply to attaching portable fans to handrails	
		3. REMOVE PORTABLE FAN FROM HANDRAIL Pull hinged locking devices (2) upward toward fan Rotate and remove portable fan from handrail	Ccw rotation is required for oval handrails common to AM. Cw rotation is required for hexagonal handrails common to OWS
		4. INSTALL PORTABLE FAN TO HANDRAIL Pull hinged locking devices (2) upward toward fan Place portable fan on handrail and rotate Release hinge locks	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.21 PORTABLE FAN OPERATION (cont'd)	
		(25.04.18-00)	
		5. CONNECT PORTABLE FAN POWER CABLE TO UTILITY OUTLET Remove zero g connector from dummy receptacle Remove power cable from portable fan	
	UTIL	UTIL OUTLET (UTIL PWR) sw - OFF	UTIL OUTLET applies to panels 104, 112, 134, 140, and UTIL PWR applies to pnls 213, 214, 219, 221, 316, 390. Panels 402, 521, 531, 551, 601, 628, 631, 711 and 803 do not contain switches
		Connect portable fan zero g connector to utility outlet	
		(25.04.19-00)	
		UTIL OUTLET (UTIL PWR) sw - ON Portable fan [OFF/HI/LOW] sw - ON	
		6. DEACTIVATE PORTABLE FAN Portable fan [OFF/HI/LOW] sw - OFF	
	UTIL	UTIL OUTLET sw - OFF	
		(25.04.20-00)	
		Disconnect portable fan zero g connector from utility outlet Stow power cable on portable fan Connect zero g connector to dummy receptacle	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X (31.04.06-00) X X 4.3.4.22 CSM DUCT FAN POWER OUTLET SELECTION X	
		1. SELECT CSM DUCT FAN OUTLET	
	203	MDA FANS CSM sw - OFF Disconnect bus 1 zero g connector from PLV fan Disconnect bus 2 zero g connector from dummy receptacle Connect bus 1 zero g connector to dummy receptacle Connect bus 2 zero g connector to PLV fan	
	200	cb MDA FANS CSM 1 - open	
		X cb MDA FANS CSM 2 - close X	
	203	X MDA FANS CSM sw - HI or LO X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.04.02-00)	
		4.3.4.23 AM DUCT FAN POWER OUTLET SELECTION	
		1. SELECT AM DUCT FAN OUTLET	
	203	AM FANS DUCT sw - OFF	
		Disconnect BUS 2 zero g connector from PLV fan	
		Disconnect BUS 1 zero g connector from dummy receptacle	
		Connect BUS 2 zero g connector to dummy receptacle	
		Connect BUS 1 zero g connector to PLV fan	
	200	cb AM FANS DUCT 2 - open	
		cb AM FANS DUCT 1 - close	
		NOTE	
		The following operation will activate the C/W OWS GAS INTERCHG indication	
	203	AM FANS DUCT sw - HI	HI position required to provide adequate ventilation to OWS
	INTERCOM	Caution tone - on	
	207	C/W OWS GAS INTERCHG lt - on	
		Respond to C/W alert (4.3.8.18)	
	207	C/W OWS GAS INTERCHG lt - off (verify)	Light goes out as fan speed increases
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	
		(31.04.07-00)	
		4.3.4.24 MDA HEATER OPERATION	
		1. MANUAL OPERATION (ACTIVATION)	
		NOTE	
		Following operation enables switches shown	
	203	MDA HTRS [MAN/CMD] sw - MANUAL	
		MDA HTRS WALL sw - PRI (SEC)	Normal mode is primary, thermostatically controlled
		MDA HTRS TUNL sw - PRI (SEC)	Normal mode is primary, thermostatically controlled
		MDA HTRS PORT CSM sw - PRI (SEC)	Normal mode is primary, thermostatically controlled
		MDA HTRS PORT SPARE sw - SEC (PRI)	Normal mode is secondary, thermostatically controlled

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.24 MDA HEATER OPERATION (cont'd)	
		2. MANUAL OPERATION (DEACTIVATION)	
	203	MDA HTRS [MAN/CMD] sw - MANUAL	
		MDA HTRS WALL sw - OFF	
		MDA HTRS TUNL sw - OFF	
		MDA HTRS PORT CSM sw - OFF	
		MDA HTRS PORT SPARE sw - OFF	
		3. TRANSFER MDA HEATER CONTROL FROM MANUAL TO COMMAND	
	203	MDA HTRS [MAN/CMD] sw - CMD	Heater operation reverts to last commanded mode. See remarks in step 1
		MDA HTRS WALL sw - OFF	
		MDA HTRS TUNL sw - OFF	
		MDA HTRS PORT CSM sw - OFF	
		MDA HTRS PORT SPARE sw - OFF	
		(31.04.08-00)	
		4.3.4.25 AM WALL HEATER OPERATION	
		1. MANUAL OPERATION (ACTIVATION)	
	203	AM WALL HTRS [ON/OFF/CMD] sw - ON	
		AM WALL HTRS [HI/LO] sw - as required, see below	
		HI position = 90°F	Heaters thermostatically controlled
		LO position = 60°F	Heaters thermostatically controlled
		2. MANUAL OPERATION (DEACTIVATION)	
	203	AM WALL HTRS [ON/OFF/CMD] sw - OFF	
		3. TRANSFER AM HEATER CONTROL FROM MANUAL TO COMMAND	
	203	AM WALL HTRS [ON/OFF/CMD] sw - CMD	Heater operation reverts to last commanded mode (OFF/40°/60°). Normal mode is 60°F thermostatically controlled
		AM WALL HTRS [HI/LO] sw - LO	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.04.09-00)	
		4.3.4.26 OWS RADIANT HEATER OPERATION	
		1. MANUAL OPERATION (ACTIVATION)	
		WARNING Protective covers over radiant heaters will attain a touch temperature of TBS °F after TBS hours. All crewmen should be alerted that radiant heaters are active	
	203	OWS RADIANT HTRS 1, 2 sw (2) - ON	
		2. MANUAL OPERATION (DEACTIVATION)	
	203	OWS RADIANT HTRS 1, 2 sw (2) - OFF	
X		3. TRANSFER OWS RADIANT HEATER CONTROL FROM MANUAL TO COMMAND X	
	203	OWS RADIANT HTRS 1, 2 sw (2) - CMD	
		(31.04.11-00)	
		4.3.4.27 MANUAL OPERATION OF AM COOLANT LOOP	
		1. MANUAL PUMP SELECTION	
		NOTE The following PRI (SEC) CLNT LOOP PUMP switch operation(s) may activate C/W PRI (SEC) COOL FLOW indication	
	203	PRI CLNT LOOP INVS sel - position as required (see table)	
		PRI CLNT LOOP PUMPS A, B, C sw (3) - position as shown in table	
		SEC CLNT LOOP INVS sel - position as required (see table)	
		SEC CLNT LOOP PUMPS A, B, C sw (3) - position as shown in table	
	INTERCOM	Warning tone - on	
	207	C/W PRI (SEC) COOL FLOW lt - on	
		Respond to C/W alert (4.3.8.18)	
	207	C/W PRI (SEC) COOL FLOW lt - off	Light goes off as pump speed increases
	206	C/W [CLEAR] sw - CLEAR	Momentary switch
		C/W MEM RECALL pb/lt - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX X X 4.3.4.27 MANUAL OPERATION OF AM COOLANT LOOP (cont'd) X	XXXX X X X
		COOL LOOP INV SELECTOR / COOL LOOP PUMPS SWITCHES A B C OFF — OFF OFF OFF 1 — ON OFF OFF 1 — OFF ON OFF 1 — ON ON OFF 2 — OFF ON OFF 2 — OFF OFF ON 2 — OFF ON ON 3 — OFF OFF ON 3 — ON OFF OFF 3 — ON OFF ON	
		X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	X X X
		4.3.4.28 (DELETED) (25.04.35-00)	
		4.3.4.29 ATM C&D H2O FILTER REPLACEMENT NOTE ATM C&D H2O filter is replaced at the beginning of SL-3 and SL-4 missions	
		1. VERIFY ATM C&D PANEL COOLANT PUMPS DEACTIVATED	This step is A.E. 25.04.22-00. No pumps assumed operating because replacement takes place during activation operations only
	203	ATM CLNT PUMPS A sw - OFF (verify) ATM CLNT PUMPS B sw - OFF (verify) ATM CLNT PUMPS C sw - OFF (verify)	
		2. REMOVED USED ATM C&D H2O FILTER Loosen Calfax fasteners (2) on M202 stowage container and rotate toward condensate module Disconnect C&D panel H2O line qd (2) from filter Loosen Calfax fasteners (3) and remove filter	The next 3 steps are A.E. 25.04.23-00
		Dispose of used filter in trash bag	Use general purpose tissue to absorb any water that may have leaked from qd

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.29 ATM C&D H2O FILTER REPLACEMENT (cont'd)	
		3. OBTAIN REPLACEMENT ATM C&D H2O FILTER Obtain replacement filter Remove qd sealing caps (2) from replacement filter Dispose of caps in trash bag	(A8)
		4. INSTALL REPLACEMENT ATM C&D H2O FILTER Position filter in place and tighten Calfax fasteners (3) Connect C&D panel H2O line qd (2) to filter Rotate M202 stowage container to normal position and tighten Calfax fasteners (2)	
	203	5. ACTIVATE C&D PANEL COOLANT PUMP (Except during AM/MDA activation) ATM CLNT PUMPS A sw - ON ATM CLNT PUMPS LO ΔP lt - on then off	This step is A.E. 25.04.24-00 Light will initially come on then go off as pump speed increases
		(25.04.36-00)	
		4.3.4.30 WMC VENT FILTER REPLACEMENT	
		NOTE WMC vent filter is replaced every 28 days. See tool matrix for tool requirements (Appendix C)	
	800	1. DEACTIVATE WMC FAN FAN sw - OFF	This step is A.E. 25.04.25-00
		2. REMOVE ACOUSTIC COVER	This step is A.E. 25.04.26-00
		NOTE Following three operations are required first time cover removal only	
		Obtain launch pin bag Loosen grid attachment bolts (3) (7/16 open/end box) Remove bolts, washers and bushings and place in launch pin bag	(F527)
		NOTE Following operation is required for all subsequent acoustic cover removals	
		Release Astropins (3) and secure in holes in acoustic cover Loosen Calfax fasteners (3) securing acoustic cover to base plate Remove cover and secure to floor grid with Astropins (3)	Astropins are installed in holes in acoustic cover for launch

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.30 WMC VENT FILTER REPLACEMENT (cont'd)	
		3. REMOVE USED WMC VENT FILTER Loosen Calfax fasteners (11) around top of filter canister Loosen hinge restraining knob and rotate fan/muffler assembly clear Tighten hinge restraining knob Loosen Calfax fasteners (6) on filter canister lugs, rotate lugs and remove filter Dispose of filter in disposal bag	The next 3 steps are A.E. 25.04.27-00
		4. OBTAIN REPLACEMENT WMC VENT FILTER	(D430), (D432) or (D434)
		5. INSTALL REPLACEMENT WMC VENT FILTER Position replacement filter in filter canister, rotate lugs and tighten Calfax fasteners (6) Loosen hinge restraining knob and rotate fan/muffler assembly to normal position Tighten Calfax fasteners (11) around top of filter canister	
		6. VERIFY WMC FAN OPERATION FAN sw - BUS 1 Verify fan operation FAN sw - OFF	This step is A.E. 25.04.28-00
		7. INSTALL ACOUSTIC COVER Release Astropins (3) securing acoustic cover to floor grid Position cover in place Attach cover to floor grid with Astropins (3) Tighten Calfax fasteners (3)	This step is A.E. 25.04.29-00
		(27.09.01-00)	
		4.3.4.31 WMC DEBRIS COARSE AND FINE FILTER REPLACEMENT	
		NOTE WMC debris fine filter is replaced every 7 days and WMC debris coarse filter is replaced at the beginning of the SL-3 and SL-4 missions	
	800	1. ACTIVATE WMC FAN FAN sw - BUS 1	
		2. REMOVE USED WMC DEBRIS COARSE AND FINE FILTERS Close WMC door Loosen Calfax fasteners (4) on filter retaining ring and fully retract Remove ring and filters from WMC fan inlet port Dispose of used filters in trash bag	
	800	3. DEACTIVATE WMC FAN FAN sw - OFF	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.31 WMC DEBRIS COARSE AND FINE FILTER REPLACEMENT (cont'd)	
		4. OBTAIN REPLACEMENT WMC DEBRIS COARSE AND FINE FILTERS Open WMC door Obtain debris coarse filter (if required) Obtain debris fine filter	 (D434) (D432)
		5. INSTALL REPLACEMENT WMC DEBRIS COARSE AND FINE FILTERS Position fine filter over coarse filter Position filters and retaining ring on fan inlet port and tighten Calfax fasteners (4)	
		(27.09.02-00)	
		4.3.4.32 WMC DEBRIS COARSE AND FINE FILTER CLEANING	
		NOTE Coarse filter cleaned once a week. The following items are required for the performance of this procedure: vacuum cleaner	
		1. PREPARE VACUUM CLEANER FOR USE (4.3.14.1, steps 1 through 3)	
	800	2. ACTIVATE WMC FAN FAN sw - BUS 1	WMC fan is operated to aid in controlling any loose particles
		3. REMOVE WMC DEBRIS COARSE AND FINE FILTERS Loosen Calfax fasteners (4) on filter retaining ring and fully retract Remove ring and filters from WMC fan inlet port	
		4. CLEAN WMC DEBRIS COARSE AND FINE FILTERS Utilize vacuum cleaner (4.3.14.1, step 4) Vacuum outside of filters Separate filters and vacuum inside	
		5. INSTALL CLEANED WMC DEBRIS COARSE AND FINE FILTERS Position fine filter over coarse filter Position filters and filter retaining ring over WMC fan inlet and tighten Calfax fasteners (4)	
	800	6. DEACTIVATE WMC FAN FAN sw - OFF	
		7. REPLACE VACUUM CLEANER (4.3.14.1, steps 5 and 6)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X (31.04.10-00) X X X X 4.3.4.33 MANUAL CONTROL OF BAKEOUT TEMPERATURE X X X X TBS X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX (26.04.07-00) 4.3.4.34 OWS TCS PERIODIC VERIFICATION NOTE Frequency of periodic check TBS 1. VERIFY OWS PRESSURE AND TEMPERATURE 617 TCS OWS TEMP ind - 60.0 to 80.0°F TCS OWS PRESS ind - 4.8 to 5.2°F (26.04.08-00) 2. VERIFY DUCT AIR FLOW 617 TCS DUCT AIR FLOW 1-3 ind (3) - 550 to 620 cfm (26.04.09-00) 3. VERIFY TCS HEATER OPERATION TCS OWS TEMP ind - monitor TCS TEMP SEL - momentarily set 6° below OWS temperature TCS TEMP SEL - set to OWS temperature EPS OWS BUS 1 AMPS ind - monitor (log) EPS OWS BUS 2 AMPS ind - monitor (log) TCS HTRS DUCT 3 [1•3] sw - BUS 2 EPS OWS BUS 2 AMPS ind - ≈10 amp increase TCS HTRS DUCT 3 [1•3] sw - BUS 1 EPS OWS BUS 2 AMPS ind - returned to logged value EPS OWS BUS 1 AMPS ind - ≈10 amp increase TCS HTRS DUCT 3 [1•3] sw - OFF EPS OWS BUS 1 AMPS ind - returned to logged value Repeat above 7 operations for TCS HTRS DUCT 3 [2 4] sw TCS HTRS DUCT 1 [1•3], [2•4] sw (2) - OFF TCS HTRS DUCT 2 [1•3], [2•4] sw (2) - OFF EPS OWS BUS 1 AMPS ind - monitor (log) EPS OWS BUS 2 AMPS ind - monitor (log) TCS HTRS DUCT 1 [1•3] sw - ON EPS OWS BUS 1 AMPS ind - ≈10 amp increase (log) TCS HTRS DUCT 1 [2•4] sw - ON EPS OWS BUS 1 AMPS ind - ≈10 amp increase TCS HTRS DUCT 1 [1•3], [2•4] sw (2) - AUTO	Places TCS logic in cooling mode

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.4.34 OWS TCS PERIODIC VERIFICATION (cont'd)	
		TCS HTRS DUCT 2 [1•3] sw - ON EPS OWS BUS 2 AMPS ind - ≈10 amp increase (log) TCS HTRS DUCT 2 [2•4] sw - ON EPS OWS BUS 2 AMPS ind - ≈10 amp increase TCS HTRS DUCT 2 [1•3], [2•4] sw (2) - AUTO	
		NOTE Verification of AM ht exch fans is not performed in this procedure	
		(25.04.31-00)	
		4.3.4.35 ECS POWER DOWN	POWER(WATTS) 26.0V 30.0V
		1. CONFIGURE CIRCUIT BREAKER PANELS	
	614	cb TCS DUCT 1 FANS 1-4 (4) - OPEN	TBS TBS
		cb TCS BUS 1 DUCT 3 FANS [1/2], [3/4] (2) - OPEN	TBS TBS
		cb TCS DUCT 2 FANS 1-4 (4) - OPEN	TBS TBS
		cb TCS BUS 2 DUCT 3 FANS [1/2], [3/4] (2) - OPEN	TBS TBS
		2. CONFIGURE CONTROL PANELS	
	203	MOL SV B FANS PWR sw - OFF	TBS TBS
		AM FANS CIRC 1-3 sw (3) - OFF	
		AM FANS DUCT sw - OFF	
		MDA FANS 1, 2 CSM sw (3) - OFF	
		SEC CLNT LOOP INVS sel - OFF	
		NOTE The following 7 operations (heaters power down) place the OA in a cool down mode that can be maintained for only 4 to 6 hours	
		MDA HTRS [MAN/CMD] sw - MAN	
		MDA HTRS WALL sw - OFF	
		MDA HTRS TUNL sw - OFF	
		MDA HTRS PORT CSM sw - OFF	
		MDA HTRS PORT SPARE sw - OFF	
		AM WALL HTRS [ON/OFF/CMD] sw - OFF	
		OWS RADIANT HTRS 1, 2 sw (2) - OFF (verify)	
	232	Loosen Calfax fasteners (2) and open MOL SV B solids trap access door	
		Ht Exch A Cndst Isolation vlv - CLOSE (2 1/2 turns cw)	
	390	OWS HT EXCH FANS 1-4 sw (4) - OFF	TBS TBS
	800	DUMP HTRS H2O sw - OFF	TBS TBS

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.04.33-00)	
		4.3.4.36 OWS/AM VCS DUCT REMOVAL	
	203	1. DEACTIVATE AM DUCT FAN AM FANS DUCT sw - OFF	
		2. DEACTIVATE OWS COOLING HEAT EXCHANGER FANS (4.6.1.1, step 9)	
		3. REMOVE OWS/AM VCS DUCT Loosen duct connection at OWS plenum inlet by turning bayonet fitting ccw Loosen Calfax fasteners (4) at AM supply duct connection Loosen Calfax fasteners (2) at hatch sill Remove duct	Fasteners are captive to duct
		4. STOW OWS/AM VCS DUCT	(F556)
		(31.04.04-00)	
		4.3.4.37 TRANSFER AM COOLANT LOOP CONTROL FROM MANUAL TO COMMAND	
		WARNING Next operation must be performed after MSFN AOS. Operation deactivates coolant loop and re-activation may be accomplished only by MSFN	
	203	PRI (SEC) CLNT LOOP INVS sel - CMD	Loop(s) are deactivated as selector passes through OFF position
		PRI (SEC) CLNT LOOP PUMPS A, B, C sw (3 or 6) - OFF	

4.3.5 CREW SYSTEMS

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.05.01-00)	
		4.3.5.1 STS WINDOW COVER OPERATION	
		NOTE Relocation of spare condensate module to OWS required before (SL-2) step 1 can be performed for window crank 243	
	241-244	1. OPEN STS WINDOW COVER Remove launch lockpin and stow in hole provided in left side (SL-2) of crank shaft mounting bracket Rotate STS window crank (2 1/4 turns, cw)	Window cover is closed and locked for launch. Lockpin is required only for launch
		(25.05.02-00)	
		2. CLOSE STS WINDOW COVER Rotate STS window crank (2 1/4 turns, ccw)	
		(25.05.03-00)	
		4.3.5.2 FIRE EXTINGUISHER OPERATION	
		1. OBTAIN FIRE EXTINGUISHER	(M180), (D498), (E632), (E670), (F587). Sixth extinguisher in CSM
		2. CONFIGURE FIRE EXTINGUISHER	SWS extinguishers have rigid delivery tube and removeable nozzle. Nozzle retained for fires in open areas and removed for use with access ports
		Remove nozzle if required	
		3. ACTIVATE FIRE EXTINGUISHER	
		WARNING Handle of extinguisher insulated for shock hazard; bottle not insulated	
		Insert delivery tube in fire access port	Access ports identified by 1/2-inch circular red stripe around port. OWS heat exchanger port closed by pip pin. Other ports are bifurcated rubber diaphragms
		Remove safety pin from extinguisher Press button on extinguisher to discharge foam	
		4. STOW EXPENDED EXTINGUISHER(S) AND IDENTIFY	
		4.3.5.3 ENTERTAINMENT CENTER OPERATION	
		TBS	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.05.01-00)	
		4.3.5.4 STS WINDOW CRANK SEAL INSTALLATION	
		NOTE Install window crank seal if crank housing leaks. Seal must be removed for subsequent use of window crank	
	241-244	Depress pip pin on window crank and hold Pull crank from shaft and release pip pin Depress pip pin and hold Attach crank over nut on window crank seal and release pip pin	Window crank seal (one for each window crank housing) is stored adjacent to window
		Rotate crank (approximately TBS turns, ccw) Remove seal from storage location Attach seal to shaft	
X		Rotate crank (approximately TBS turns, cw)	X
X		Handtighten window crank seal	X Crank remains stowed on window crank seal
		(31.05.02-00)	
		4.3.5.5 STS WINDOW CRANK SEAL REMOVAL	
	241-244	Rotate window crank (approximately TBS turns, ccw)	Crank remains stowed on window crank seal after initial seal installation
		Remove window crank seal from shaft Attach seal to storage location Rotate crank (approximately TBS turns, cw) Depress pip pin on window crank and hold Remove crank from seal and release pip pin Depress pip pin Attach crank to crank shaft	
X		Operate STS window (4.3.5.1)	X
X		Reinstall window crank seal (4.3.5.4)	X

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.05.05-00)	
		4.3.5.6 CREW SYSTEMS POWER DOWN	POWER(WATTS) 26.0V 30.0V
		1. CONFIGURE CIRCUIT BREAKER PANELS	
	612	cb UTIL OUTLETS WARDRM 1 - OPEN	TBS TBS
		cb UTIL OUTLETS WARDRM 2 - OPEN	TBS TBS
		2. CONFIGURE CONTROL PANELS	
	640	VAN ALLEN BELT DOSIMETER sw - OFF	TBS TBS
	700	WINDOW HTR sw - OFF	TBS TBS

4.3.6 INSTRUMENTATION SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.06.01-00)	
		4.3.6.1 EXPERIMENT 1 & 2 RECORDING	
		1. INITIATE RECORDING	
		NOTE EXP 1 and/or EXP 2 recording may be initiated from the STS or OWS	EXP 1 and EXP 2 can be recorded separately or simultaneously
	204	TAPE RECORDING EXP 1 and/or EXP 2 sw - RECORD	Momentary switches. Turns on AM tape recorders selected for EXP 1 VOICE and/or EXP 2 recording. Does not intiate voice recording
		TAPE RECORDING EXP 1 and/or EXP 2 lt - on	Indicates AM tape recorders running. Does not go off during dumping or fast forward operations of the AM tape recorders
	542	TAPE RCDRS EXP 1 and/or EXP 2 sw - RECORD	Momentary switches. Turns on AM tape recorders selected for EXP 1 VOICE and/or EXP 2 recording. Does not initiate voice recording
		TAPE RCDRS EXP 1 and/or EXP 2 lt - ON	Indicates AM tape recorders running and EKG/ZPN is not being recorded. Does not go off during dumping or fast forward operations of the AM tape recorders
	617	INSTR SYS TAPE RCDRS EXP 1 and/or EXP 2 sw - RECORD	Momentary switches. Turns on AM tape recorders selected for EXP 1 VOICE and/or EXP 2 recording. Does not initiate voice recording
		INSTR SYS TAPE RCDRS EXP 1 and/or EXP 2 lt - ON	Indicates AM tape recorders running and EKG/ZPN is not being recorded. Does not go off during dumping or fast forward operations of the AM tape recorders
		(25.06.02-00)	
		2. TERMINATE RECORDING	
		NOTE If EXP 1 and/or EXP 2 recording was initiated from the STS, it must be terminated from the STS. If EXP 1 and/or EXP 2 recording was initiated from the OWS it must be terminated from either OWS location	
	204	TAPE RECORDING EXP 1 and/or EXP 2 sw - OFF	Momentary switches. Turns off tape recording of EXP 1 and/or EXP 2. Does not terminate voice recording
		TAPE RECORDING EXP 1 and/or EXP 2 lt - off	Indicates EXP 1 and/or EXP 2 not recording
	542	TAPE RCDRS EXP 1 and/or EXP 2 sw - OFF	Momentary switches. Turns off tape recording of EXP 1 and/or EXP 2. Does not terminate voice recording
		TAPE RCDRS EXP 1 and/or EXP 2 lt - off	Indicates EXP 1 and/or EXP 2 not recording
	617	INSTR SYS TAPE RCDRS EXP 1 and/or EXP 2 sw - OFF	Momentary switches. Turns off tape recording of EXP 1 and/or EXP 2. Does not terminate voice recording
		INSTR SYS TAPE RCDRS EXP 1 and/or EXP 2 lt - off	Indicates EXP 1 and/or EXP 2 not recording

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.06.01-00)	
		4.3.6.2 DATA RECORDING (MANUAL)	
		1. INITIATE RECORDING	
	204	TAPE RECORDING DATA sw - RECORD	Turns on AM tape recorder selected for DATA VOICE recording. Does not initiate voice recording. Switch is normally in CMD position
		TAPE RECORDING DATA lt - on	Indicates AM tape recorder running by manual data recording initiation only. Does not come on for a MSFN initiation of DATA 2 RECORD or a crew initiation of voice recording. Does not go off during dumping or fast forward operations of the AM tape recorders
		(31.06.02-00)	
		2. TERMINATE RECORDING	
		TAPE RECORDING DATA sw - OFF	Turns off the tape recording of DATA and DATA 2. Does not terminate voice recording
		TAPE RECORDING DATA lt - off	Indicates manual data recording terminated
		(31.06.03-00)	
		4.3.6.3 AM TAPE RECORDER SELECTION (MANUAL)	
		1. PERFORM SELECTION	
		WARNING No two TAPE RCDRS selectors should be positioned to the same mode of operation except OFF	Subsequent initiation of AM tape recorders in this mode may damage converter
	204	TAPE RCDRS 1-3 sel (3) - DATA VOICE or EXP 1 VOICE or EXP 2	The normal operating modes for TAPE RCDRS 1-3 sel are DATA VOICE, EXP 1 VOICE, and EXP 2, respectively
		TAPE RCDRS CONT sw - MANUAL SELECT	Enables manual selection of AM tape recorders. Switch is normally in the CMD position
		(31.06.09-00)	
		4.3.6.4 TRANSMISSION (MANUAL)	
		1. CONFIGURE SYSTEM FOR TRANSMISSION	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.6.4 TRANSMISSION (MANUAL) (cont'd)	
		NOTE No two XMTR INPUT selectors should be positioned to the same mode of operation except OFF	An unnecessary duplication of transmission would be initiated with possible loss of information
	204	XMTR INPUT A, B, and C sel (3) - R/T, DATA, VOICE EXP 1, EXP VOICE or EXP 2 XMTRS sw - ON	Both modulations on an AM tape recorder should be transmitted simultaneously Initiates all equipment required for transmissions, including AM tape recorders in a record mode of operation. Switch is normally in CMD position
		(31.06.04-00)	
		2. INITIATE DUMP MAN DUMP sw - ON	Initiates AM tape recorders in a dump mode of operation. Contact MSFN via real-time voice before actuating switch. Switch is normally in the OFF position
		(31.06.05-00)	
		4.3.6.5 PROGRAMMER SELECTION (MANUAL)	
		1. PERFORM SELECTION	
	204	INSTR SYS PROG sw - PRI or SEC	Removes MSFN capability and enables either primary or secondary programmer. Switch is normally in The CMD position
		(31.06.06-00)	
		4.3.6.6 ELECTRONICS SELECTION (MANUAL)	
		1. PERFORM SELECTION	
	204	INSTR SYS ELECT sw - PRI or SEC	Removes MSFN capability and enables either primary or secondary electronics in interface box. Switch is normally in the CMD position

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.06.07-00) 4.3.6.7 DISPLAY CONVERTER SELECTION (MANUAL) 1. PERFORM SELECTION	
	204	INSTR SYS DISP CONV sw - SEC	Selects secondary display converter for indicator display power. Primary display converter is normally used. Primary or secondary display converter supplies display power only when instrumentation system is off. If switch is positioned to OFF, display power will be available only when instrumentation system is on
		(31.06.08-00) 4.3.6.8 CONVERTERS SELECTION (MANUAL) 1. PERFORM SELECTION	
	204	INSTR SYS CONVS sel - 1 & 2, 2 & 1, 1 & 3, or 3 & 2	Removes MSFN capability and connects instrumentation buses A & B with selected converters. First converter listed is connected to bus A, and second converter listed is connected to bus B. Selector is normally in CMD position, which allows MSFN to select combinations of two of three converters to connect to instrumentation buses A & B. Combinations 3 & 1 and 2 & 3 are not available
		(27.32.01-00) 4.3.6.9 AM TAPE RECORDER REPLACEMENT NOTE One AM tape recorder is replaced at the beginning of the SL-3 and SL-4 missions. Before initiating this procedure, verify with MSFN that AM tape recorders are not dumping to a ground station. See tool matrix for tool requirements (Appendix C)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.6.9 AM TAPE RECORDER REPLACEMENT (cont'd)	
	204	1. CONFIGURE CONTROLS FOR REPLACEMENT TAPE RCDRS 1-3 sel (3) - (positions selected as shown in table)	

Recorder being replaced	TAPE RCDRS sel		
	1	2	3
1	OFF	EXP 1 VOICE	DATA VOICE
2	DATA VOICE	OFF	EXP 1 VOICE
3	DATA VOICE	EXP 1 VOICE	OFF

TAPE RCDRS CONT sw - MANUAL SELECT	Initiates manual selection of AM tape recorders
2. REMOVE AM TAPE RECORDER ASSEMBLY	
WARNING Exercise extreme care when in area of cold plates and coolant lines to prevent damage	Cold plate may attain approximately 50°F and be cold to touch
Unscrew Calfax fasteners (6) on AM tape recorder access panel (First replacement) Unscrew yellow Calfax fasteners (2) on AM tape recorder access panel (2nd and subsequent replacements)	Captive fasteners
Open hinged cover Disconnect electrical cable at bracket	Connector equipped with assist handle. Electrical cable remains with assembly
Unscrew Calfax fasteners (4) on AM tape recorder (3/16 screwdriver)	Captive fasteners. The AM tape recorder is an assembly containing a pan, an AM tape recorder, and an electrical cable
Remove AM tape recorder	
3. OBTAIN REPLACEMENT RECORDER Identify used AM tape recorder (1-inch red tape, scissors) Remove replacement AM tape recorder from storage location Place used AM tape recorder in location vacated by replacement	(D438)
4. INSTALL REPLACEMENT AM TAPE RECORDER ASSEMBLY Install AM tape recorder Tighten Calfax fasteners (4) on AM tape recorder Connect electrical cable at bracket Close access panel cover Tighten yellow Calfax fasteners (2) on access panel	Only yellow fasteners needed to retain access panel

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.6.9 AM TAPE RECORDER REPLACEMENT (cont'd)	
	204	5. CONFIGURE CONTROLS FOR NORMAL OPERATION TAPE RCDRS CONT sw - CMD	Enables MSFN selection of AM tape recorders
		NOTE Verify to MSFN that AM tape recorder replacement has been completed, and provide MSFN with setting of TAPE RCDRS 1-3 sels (3) utilized while in MANUAL SELECT of TAPE RCDRS CONT sw	Aids MSFN in recovering information recorded during replacement
		Configure TAPE RCDRS 1-3 sel (3) to the MSFN-commanded configuration	
		(25.06.10-00)	
		4.3.6.10 EKG/ZPN RECORDING	
		1. OBTAIN OBS BIO BELT AND OBS TEMP PROBE	(D422 or E610)
		2. DON OBS BIO BELT AND OBS TEMP PROBE	
		3. OBTAIN CCU AND CWG	(LHFE-B or M157) (E610)
		4. CONNECT CCU, CWG AND OBS BIO BELT Connect CCU to CWG harness Connect CWG harness to OBS BIO BELT CHAN A (B) sel - OFF (verify) Connect CCU to intercom box	Channel A or B is selected by connecting CCU to appropriate connector on side of intercom box
		CHAN A (B) sel - ON	
		NOTE A maximum of two crewmen may record EKG/ZPN simultaneously, one each associated with audio channels A and B on the intercom boxes	
		5. CONFIGURE CONTROLS	
		NOTE Inform MSFN EKG/ZPN has been enabled	
	204	TAPE RECORDING EKG/ZPN sw - ENABLE	Inhibits recording of experiments M092, M093, M171, M131, S073, T027, S149, S183, M509 and T013. Inhibits TAPE RCDRS EXP 1 lt and TAPE RCDRS EXP 2 lt on panels 542 and 617. Transfers EKG/ZPN telemetry channels from real-time only format to recordable formats
		6. INITIATE RECORDING TAPE RECORDING EXP 1 sw - RECORD	Momentary switch. Turns on AM tape recorder selected for EXP 1 recording and initiates recording of EKG/ZPN from crewman connected to an intercom box channel A CCU. Does not initiate voice recording

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.6.10 EKG/ZPN RECORDING (cont'd)	
		TAPE RECORDING EXP 1 lt - on	Indicates EXP 1 AM tape recorder is running
		TAPE RECORDING EXP 2 sw - RECORD	Momentary switch. Turns on AM tape recorder selected for EXP 2 recording and initiates recording of EKG/ZPN from crewman connected to an intercom box channel B CCU. Does not initiate voice recording
		TAPE RECORDING EXP 2 lt - on	Indicates EXP 2 AM tape recorder is running
		TAPE RECORDING DATA sw - RECORD	Turns on AM tape recorder selected for DATA recording and initiates recording of crew identification, body temperature and heart rate from both crewmen
		TAPE RECORDING DATA lt - on	Indicates DATA AM tape recorder is running
		NOTE TAPE RCDRS EXP 1 sw and TAPE RCDRS EXP 2 sw on panels 542 and 617 will activate recording the same as tape recording switches on panel 204; however, associated lights on panel 542 and 617 will not come on for EKG/ZPN recording	
		7. TERMINATE RECORDING	
	204	TAPE RECORDING DATA sw - CMD	Terminates manual data recording
		TAPE RECORDING DATA lt - off	Indicates manual data recording terminated
		TAPE RECORDING EXP 1 sw - OFF	Momentary switch. Turns off tape recording of EKG/ZPN on EXP 1 AM tape recorder. Does not terminate voice recording
		TAPE RECORDING EXP 1 lt - off	Indicates EXP 1 not recording
		TAPE RECORDING EXP 2 sw - OFF	Momentary switch. Turns off tape recording of EKG/ZPN on EXP 2 AM tape recorder. Does not terminate voice recording
		TAPE RECORDING EXP 2 lt - off	Indicates EXP 2 not recording
		8. CONFIGURE CONTROLS TAPE RECORDING EKG/ZPN sw - OFF	
		NOTE Inform MSFN EKG/ZPN has been disabled	
		9. DISCONNECT CCU, CWG AND OBS BIO BELT CHAN A (B) sel - OFF Disconnect CCU from intercom box Disconnect CWG harness from OBS BIO BELT Disconnect CCU from CWG harness	
		10. STOW CCU AND CWG	(LHFE-B or M157) (E610)
		11. DOFF OBS BIO BELT AND OBS TEMP PROBE	
		12. STOW OBS BIO BELT AND OBS TEMP PROBE	(D422 or E610)

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
		X (31.06.10-00) X	
		X X	
		X 4.3.6.11 DISPLAY POWER ISOLATION X	
		X X	
		NOTE Procedure enables displays, normally powered from instrumentation converter, to be isolated from instrumentation converter and powered independently from display converter. Does not preclude normal instrumentation system transducer operation except during display power isolation	
		1. DEACTIVATE INSTRUMENTATION SYSTEM	
		NOTE MSFN deactivation of instrumentation system is preferred. Following two operations may be performed by MSFN. Manual operations are presented for "out-of-range" activity.	
	204	XMTRS sw - OFF TAPE RECORDING DATA sw - OFF INSTR SYS DISP CONV sw - OFF TAPE RECORDING EXP 1, 2 sw (2) - OFF Verify TAPE RECORDING EXP 1, 2 lt (2) - off	Momentary switch
		NOTE If TAPE RECORDING EXP 1, 2 lights remain on, terminate recording at panel 542 or 617	
	542,617	TAPE RECORDING EXP 1, 2 sw (2) - OFF Verify TAPE RECORDING EXP 1, 2 lt (2) - off	Momentary switch
	131	[RCD/OFF] sw - OFF Verify rcd lt - off	Momentary switch
	203	MOL SV PPCO2 IN ind - 0.0 mmHg (verify) MOL SV HT EXCH IN, OUT ind (2) - 0.0°F (verify)	Provides assurance of instrumentation system power down
		2. ISOLATE DISPLAY POWER	
	204	INSTR SYS DISP CONV sw - PRI	
	203	MOL SV PPCO2 IN ind - 0.0 to 5.5 mmHg (verify) MOL SV HT EXCH IN ind - 60° to 80°F (verify) MOL SV HT EXCH OUT ind - 46° to 55°F (verify)	Confirms display power isolation
		NOTE Next operation precludes automatic display power switchover when instrumentation system re-activated. Operation eliminates capability for manual operation of INSTR SYS CONV selector	
		X X	
	200	X cb INSTR SYS CONT CONV - open X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.3.6.11 DISPLAY POWER ISOLATION (cont'd) X X X 3. ACTIVATE INSTRUMENTATION SYSTEM	
		NOTE If MSFN deactivated instrumentation system, following two operations are not required	
	204	XMTRS sw - CMD	Returns system to operational configuration existing prior to step 1
		TAPE RECORDING DATA sw - CMD	
		X NOTE X X If required, EXP 1, EXP 2 and/or voice recording may be reinitiated X X X XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.6.12 INSTRUMENTATION SYSTEM POWER DOWN (cont'd)	
	542, 617	TAPE RECORDING EXP 1, 2 sw (2) - OFF	Momentary switches
	131	Verify TAPE RECORDING EXP 1, 2 lt (2) - off [RCD/OFF] sw - OFF	Momentary switch
	203	Verify rcd lt - off MOL SV PPCO2 IN ind - 0.0 mmHg (verify) MOL SV HT EXCH IN, OUT ind (2) - 0.0°F (verify)	165.2 182.4 Provides assurance of instrumentation system power down
		3. ACTIVATE DISPLAY POWER	
	204	INSTR SYS DISP CONV sw - PRI	
	203	MOL SV PPCO2 IN ind - 0.0 to 5.5 mmHg (verify) MOL SV HT EXCH IN ind - 60° to 80°F (verify) MOL SV HT EXCH OUT ind - 46° to 55°F (verify)	

4.3.7 TIME REFERENCE AND DIGITAL COMMAND SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.07.02-XX)	
		4.3.7.3 EVENT TIMER OPERATION	
		NOTE The [DECR/INCR] selector allows the event timer to count up, at normal rate, in the center position. The positions either side of center vary the counting rate and the DECR positions also reverse the counting direction to display any desired time. The positions from farthest to nearest the center count at 25, 4, and 0.3 times the normal rate, respectively	
		(25.07.03-00)	
	206	1. SET TIMER Timer [DECR/INCR] sel - position for desired rate in note above Update timer to desired display	Timer [DECR/INCR] selector position may be revised as desired display is approached
		Timer [DECR/INCR] sel - center position	Display update stops
		2. INITIATE TIMING CYCLE Timer [STRT/STOP] sw - STRT	
		(25.07.04-00)	
		3. STOP TIMING CYCLE Timer [STRT/STOP] sw - STOP	
		(25.07.06-00)	
		4.3.7.4 CLOCK OPERATION	
	212,610	1. DISPLAY sw - ON	Starts clock and illuminates digital display. Clock will indicate day:hr:min:sec as determined by electronic timer elapsed-time register. Day count may require manual update
		2. BRIGHTNESS sw - DECR or INCR	Adjust to desired illumination
	212	3. DAY COUNT 1, 10, 100 sw (3) - INCREASE Pulse switch until desired numeral appears in respective column	Momentary switches. Switches are spring-loaded to center position and may also be actuated in direction opposite of INCREASE. This, however, is an inactive position

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.07.02-00)	
		4.3.7.5 SECONDARY TIME CORRELATION BUFFER SELECTION	
	212	TIME REF SYS BUFFER sw - SEC	Switch is normally in PRI position. Clock will display day:hr:min:sec as determined by electronic timer elapsed-time register plus days stored in secondary time correlation buffer. Day count may therefore require manual update
		(31.07.03-00)	
		4.3.7.6 ELECTRONIC TIMER ELAPSED TIME REGISTER RESET	Reset is normally accomplished by the TRS via the DCS
	212	TIME REF SYS 24 HR sw - ZERO RESET Hr:min:sec display - 00:00:00	Momentary switch. Switch activation resets electronic timer elapsed-time register to zero. Day display will remain unchanged
		(25.07.05-00)	
		4.3.7.7 TIMER REFERENCE SYSTEM POWER DOWN	POWER(WATTS) 26.0V 30.0V
		1. CONFIGURE CIRCUIT BREAKER PANELS	
	200	cb TIME REF SYS EVENT TMR - open	5.8 7.4
		2. CONFIGURE CONTROL PANELS	
	212	DISPLAY sw - OFF	9.0 9.0
		TIME REF SYS BUFFER sw - OFF	15.0 15.0
	610	DISPLAY sw - OFF	9.0 9.0
		(25.07.07-00)	
		4.3.7.8 CLOCK DEACTIVATION	
	212,610	DISPLAY sw - OFF	
		(25.07.08-00)	
		4.3.7.9 TRS BUFFER ACTIVATION	
	212	TIME REF SYS BUFFER sw - PRI (SEC)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.07.10-00)	
		4.3.7.10 TRS BUFFER DEACTIVATION	
	212	TIME REF SYS BUFFER sw - OFF	

4.3.8 CAUTION AND WARNING SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		Table 4.3.8-1	
	207, 616	C/W FIRE PARAMETERS	
		C/W MDA/STS FIRE lt	
		C/W AM AFT FIRE lt	
		C/W OWS FWD FIRE lt	
		C/W OWS EXP FIRE lt	
		C/W OWS CREW QTRS FIRE lt	
		Table 4.3.8-2	
		C/W WARNING PARAMETERS	
	207	C/W REG BUS 1, 2 HI lt (2)	
		C/W PRI, SEC COOL FLOW lt (2)	
		C/W CSM lt	
		C/W REG BUS 1, 2 LO lt (2)	
		C/W PPO2 LO lt	
		C/W CREW ALERT lt	
		C/W EVA 1, 2 lt (2)	
		C/W CLSTR ATT lt	
		C/W ATM BUS 1, 2 LO lt (2)	
		C/W CLSTR PRESS LO lt	
	616	C/W CREW ALERT lt	
		C/W CLSTR PRESS LO lt	
		Table 4.3.8-3	
		C/W CAUTION PARAMETERS	
	207	C/W EMER SNSR PWR lt	
		C/W EMER PWR lt	
		C/W SV TEMP HI lt	
		C/W PRI, SEC COOL TEMP HI lt (2)	
		C/W BAT CHG LO lt	
		C/W SV OUT PPCO2 HI lt	
		C/W SV FLOW lt	
		C/W PRI, SEC COOL TEMP LO lt (2)	
		C/W OWS GAS INTERCHG lt	
		C/W CNDST TANK ΔP lt	
		C/W SV TMR lt	
		C/W OWS BUS L, 2 LO lt (2)	
		C/W C/W PWR lt	
		C/W ACS MALF lt	
		C/W CMPTR MALF lt	
		C/W ATM CNST THERM lt	
	616	C/W OWS BUS 1, 2 LO lt (2)	

CREWMAN	PANEL	PROCEDURE	REMARKS

Table 4.3.8-4

FIRE SYSTEM TEST CONDITIONS
(USE IN CONJUNCTION WITH 4.3.8.8, FIRE SYSTEM VERIFICATION)

TEST CONDITION	1	2	3	4	5	6	7	8	9	10
PANEL 207										
EMER PWR 1 sw	i	i	i	i	i	i	i	i	i	i
EMER PWR 2 sw	i	i	i	i	i	i	i	i	i	i
OWS FWD FIRE 1 sw	E	i	i	i	i	i	i	i	i	i
OWS FWD FIRE 2 sw	i	E	i	i	i	i	i	i	i	i
MDA/STS FIRE 1 sw	i	i	E	i	i	i	i	i	i	i
MDA/STS FIRE 2 sw	i	i	i	E	i	i	i	i	i	i
OWS EXP FIRE 1 sw	i	i	i	i	E	i	i	i	i	i
OWS EXP FIRE 2 sw	i	i	i	i	i	E	i	i	i	i
AM AFT FIRE 1 sw	i	i	i	i	i	i	E	i	i	i
AM AFT FIRE 2 sw	i	i	i	i	i	i	i	E	i	i
OWS QTRS FIRE 1 sw	i	i	i	i	i	i	i	i	E	i
OWS QTRS FIRE 2 sw	i	i	i	i	i	i	i	i	i	E
PANEL 206										
C/W TEST FIRE sw	1	2	1	2	1	2	1	2	1	2
LIGHT TO BE MONITORED										
PANEL 207, 616										
C/W OWS FWD FIRE lt	x	x								
C/W MDA/STS FIRE lt			x	x						
C/W OWS EXP FIRE lt					x	x				
C/W AM AFT FIRE lt							x	x		
C/W OWS CREW QTRS FIRE lt									x	x

i = inhibit
E = enable

CREWMAN	PANEL	PROCEDURE	REMARKS
		(26.08.03-00)	
		4.3.8.1 PERIODIC RAPID ΔP SYSTEM TEST	
		NOTE For the following procedure, it is assumed that one crewman is on a headset at panel 131, a second crewman is on a headset at panel 600, and the third crewman is available to verify tones	When this procedure is performed during MDA/AM activation procedures, OWS panel lights and tones will not be verified. When it is performed during OWS activation procedure, MDA/AM panel lights and tones need not be verified
		1. PERFORM RAPIDΔP SYSTEM 1 MEMORY CAPABILITY TEST	
	206	C/W TESTΔP sw - 1	
	INTERCOM	Caution tone - on	
	207	C/W EMERG PWR lt - on	Caution parameter that functions during emergency test
	206	C/W MEM RECALL pb/lt - on	
	INTERCOM	MASTER ALARM lt - on	
	206, 616	C/W MASTER ALARM pb/lt - on	
		NOTE The following occur 5-15 seconds after positioning C/W TEST ΔP sw - 1	
		Emergency klaxons (2)ΔP tone - on	
	INTERCOM	Caution tone - off	Warning tone inhibits caution tone
		Warning tone - on	
	207, 616	C/W RAPIDΔP lt - on	
		Wait 40 seconds	Test signal will disappear after 40 seconds
		Emergency klaxons (2) ΔP tone - on (verify)	If tones and lights are still on after 40 seconds, memory capability of system has been verified
	INTERCOM	Warning tone - on (verify)	
	207, 616	C/W RapidΔP lt - on (verify)	
	207	C/W EMER PWR lt - on (verify)	
	206	C/W MEM RECALL pb/lt - on (verify)	
	INTERCOM	MASTER ALARM lt - on (verify)	
	206, 616	C/W MASTER ALARM pb/lt - on (verify)	
	206	C/W TESTΔP sw - OFF	This operation retriggers rapidΔP function, however, no change in system status is noticeable by crew except C/W EMER PWR lt off
		C/W EMER PWR lt - off	
		C/W MASTER ALARM pb/lt - depress	Momentary pushbutton. During MDA/AM activation procedures, actuate C/W MASTER ALARM pb/lt on panel 206. During OWS activation procedures actuate C/W MASTER ALARM pb/lt on panel 616
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
	FSCP	X [MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET X	Momentary switch
		X X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.1 PERIODIC RAPID ΔP SYSTEM TEST (cont'd)	
		Emergency klaxons (2) P tone - off	
	INTERCOM	Warning tone - off	
	207, 616	C/W RAPIDΔP lt - off	Light goes off as a result of loss of rapid ΔP test signal and resetting the master alarm
	INTERCOM	MASTER ALARM lt - off	
	206, 616	C/W MASTER ALARM pb/lt - off	
	206	C/W [CLEAR] sw - CLEAR	Momentary switch
		C/W MEM RECALL pb/lt - off	
		2. PERFORM RAPIDΔP SYSTEM 1 TRACKING CAPABILITY TEST	
	206	C/W TESTΔP sw - 1	
	INTERCOM	Caution tone - on	
	207	C/W EMER PWR lt - on	Caution parameter that functions during emergency test
	206	C/W MEM RECALL pb/lt - on	
	INTERCOM	MASTER ALARM lt - on	
	206, 616	C/W MASTER ALARM pb/lt - on	
		NOTE The following occur 5-15 seconds after positioning C/W TEST P sw - 1	
		Emergency klaxons (2)ΔP tone - on	
	INTERCOM	Caution tone - off	Warning tone inhibits caution tone
		Warning tone - on	
	207, 616	C/W RAPIDΔP lt - on	
		NOTE The following operation must be actuated within 20 seconds after RAPIDΔP lights and tones come on	
		C/W MASTER ALARM pb/lt - depress	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X [MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
	FSCP		
		NOTE Light and tone status should be verified within 20 to 25 seconds after their initiation and after depressing C/W MASTER ALARM pb/lt	
		Emergency klaxons (2)ΔP tone - off	
	INTERCOM	Warning tone - off	
	207, 616	C/W RAPIDΔP lt - on (verify)	
	207	C/W EMER PWR lt - on (verify)	
	206	C/W MEM RECALL pb/lt - on (verify)	
	INTERCOM	MASTER ALARM lt - off	
	206, 616	C/W MASTER ALARM pb/lt - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.1 PERIODIC RAPID Δ P SYSTEM TEST (cont'd)	
	207	C/W RAPIDΔP lt - off	Light will go off when RAPIDΔP test signal stops. This will occur approximately 20 to 25 seconds after all associated lights and tones initially come on.
		NOTE Following operation may cause switching transient and activate C/W RAPIDΔP indication. Operations * applicable only if C/W triggered	
		C/W TESTΔP sw - OFF	
	INTERCOM	Emergency klaxons (2)ΔP tone - on*	
	207, 616	Warning tone - on*	
	207	C/W RAPIDΔP lt - on*	
	206	C/W EMER PWR lt - off	
	INTERCOM	C/W MEM RECALL pb/lt - on	
	206, 616	MASTER ALARM lt - on*	
	206	C/W MASTER ALARM pb/lt - on*	
		C/W [CLEAR] sw - CLEAR	
	206, 616	C/W MEM RECALL pb/lt - off	
		C/W MASTER ALARM pb/lt - depress*	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
	FSCP	X [MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET* X	
		X X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		Emergency klaxons (2)ΔP tone - off*	
	INTERCOM	Warning tone - off*	
	207, 616	C/W RAPIDΔP lt - off*	
	INTERCOM	MASTER ALARM lt - off*	
	206, 616	C/W MASTER ALARM pb/lt - off*	
		3. PERFORM RAPIDΔP SYSTEM 2 TESTS Repeat steps 1 and 2 for C/W TESTΔP sw - 2	
		(26.08.03-00)	
		4.3.8.2 PERIODIC FIRE SYSTEM TEST	
		1. RECONFIGURE SYSTEM	
	207	EMER PWR 1, 2 sw (2) - inhibit	Inhibit position is down. Function inhibited because function previously tested in 4.3.8.1
		2. PERFORM FIRE SYSTEM 1 MEMORY CAPABILITY TEST	
	206	C/W TEST FIRE sw - 1	
		Emergency klaxons (2) fire tone - on	
	INTERCOM	Warning tone - on	
	207, 616	Verify all parameter lights in table 4.3.8-1 - on	
	INTERCOM	MASTER ALARM lt - on	
	206, 616	C/W MASTER ALARM pb/lt - on	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.2 PERIODIC FIRE SYSTEM TEST (cont'd)	
	206	C/W TEST FIRE sw - OFF	
		Emergency klaxons (2) fire tone - on (verify)	
	INTERCOM	Warning tone - on (verify)	
	207, 616	Verify all parameter lights in table 4.3.8-1 - on	
	INTERCOM	MASTER ALARM lt - on (verify)	
	206, 616	C/W MASTER ALARM pb/lt - on (verify)	
	206, 616	C/W MASTER ALARM pb/lt - depress	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
	FSCP	X [MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET X	
		X X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		Emergency klaxons (2) fire tone - off	
	INTERCOM	Warning tone - off	
		Verify all parameter lights in table 4.3.8-1 - off	
		MASTER ALARM lt - off	
	206, 616	C/W MASTER ALARM pb/lt - off	
		3. PERFORM FIRE SYSTEM 1 TRACKING CAPABILITY TEST	
	206	C/W TEST FIRE sw - 1	
		Emergency klaxons (2) fire tone - on	
	INTERCOM	Warning tone - on	
	207, 616	Verify all parameter lights in table 4.3.8-1 - on	
	INTERCOM	MASTER ALARM lt - on	
	206, 616	C/W MASTER ALARM pb/lt - on	
	206, 616	C/W MASTER ALARM pb/lt - depress	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
	FSCP	X [MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET X	
		X X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		Emergency klaxons (2) fire tone - off	
	INTERCOM	Warning tone - off	
		Verify all parameter lights in table 4.3.8-1 - on	
		MASTER ALARM lt - off	
	206, 616	C/W MASTER ALARM pb/lt - off	
	206	C/W TEST FIRE sw - OFF	
		Verify all parameter lights in table 4.3.8-1 - off	
		4. PERFORM FIRE SYSTEM 2 MEMORY CAPABILITY TEST	
		Repeat steps 2 and 3 with C/W TEST FIRE sw - 2	
		5. RECONFIGURE SYSTEM	
	207	EMER PWR 1, 2 sw (2) - enable	Enable position is up

CREWMAN	PANEL	PROCEDURE	REMARKS
		(26.08.07-00)	
		4.3.8.3 PERIODIC FIRE SENSOR TEST	
	120	SNSR 2 sw - OFF	
		[MASTER ALARM RESET/TEST] sw - TEST	
		SNSR 1 lt - on	
		Emergency klaxons (2) fire tone - on	
	INTERCOM	Warning tone - on	
	207, 616	C/W MDA/STS FIRE lt - on	When this procedure is repeated for other FSCP appropriate FIRE light will come on as shown below: FSCP — C/W FIRE light 236, 237, 238 — C/W MDA/STS FIRE 392 — C/W AM AFT FIRE 529, 530 — C/W OWS FWD FIRE 618, 619 — C/W OWS EXP FIRE 633, 638, 639 — C/W OWS CREW QTRS FIRE
	INTERCOM	MASTER ALARM lt - on	
	206, 616	C/W MASTER ALARM pb/lt - on	
	120	[MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET	Momentary switch
		Emergency klaxons (2) fire tone - off	
	INTERCOM	Warning tone - off	
	207, 616	C/W MDA/STS FIRE lt - off	
	INTERCOM	MASTER ALARM lt - off	
	206, 616	C/W MASTER ALARM pb/lt - off	
	120	SNSR 1 sw - OFF	
		SNSR 1 lt - off	
		SNSR 2 sw - BUS 2	
		Repeat preceding operations (boxed in) for SNSR 2	
		SNSR 1 sw - BUS 1	
		SNSR 2 sw - BUS 2	
		Repeat entire procedure for following panels 236, 237, 238, 392, 529, 530, 618, 619, 633, 638, 639	Panels 530 and 619 have only one sensor. During MDA/AM activation, repeat this procedure for FSCP 120, 236, 237, 238. During OWS activation, repeat this procedure for FSCP 392, 529, 530, 618, 619, 633, 638, 639
		(26.08.02-00)	
		4.3.8.4 PERIODIC WARNING SYSTEM TEST	
		1. PERFORM WARNING SYSTEM 1 TEST	
	206	C/W TEST WARN sw - 1	
	INTERCOM	Warning tone - on	
	207, 616	Verify all parameter lights in table 4.3.8-2 - on	
	207	C/W C/W PWR lt - on	Caution parameter that functions during warning test
		Respond to C/W alert (4.3.8.18)	
	206	C/W TEST WARN sw - OFF	
	207, 616	Verify all parameter lights in table 4.3.8-2 - off	
	207	C/W C/W PWR lt - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.4 PERIODIC WARNING SYSTEM TEST (cont'd)	
	206	C/W MEM RECALL pb/lt - depress and hold	
	207, 616	Verify all parameter lights in table 4.3.8-2 - on	
	207	C/W C/W PWR lt - on	
	206	C/W MEM RECALL pb/lt - release	
	207, 616	Verify all parameter lights in table 4.3.8-2 - off	
	207	C/W C/W PWR lt - off	
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	
		2. PERFORM WARNING SYSTEM 2 TEST	
		Repeat step 1 for C/W TEST WARN sw - 2	
		(26.08.01-00)	
		4.3.8.5 PERIODIC CAUTION SYSTEM TEST	
		1. PERFORM CAUTION SYSTEM 1 TEST	
	206	C/W TEST CAUT sw - 1	
	INTERCOM	Caution tone - on	
	207, 616	Verify all parameter lights in table 4.3.8-3 - on	
		Respond to C/W alert (4.3.8.18)	
	206	C/W TEST CAUT sw - OFF	
	207, 616	Verify all parameter lights in table 4.3.8-3 - off	
	206	C/W MEM RECALL pb/lt - depress and hold	
	207, 616	Verify all parameter lights in table 4.3.8-3 - on	
	207	C/W MEM RECALL pb/lt - release	
	207, 616	Verify all parameter lights in table 4.3.8-3 - off	
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	
		2. PERFORM CAUTION SYSTEM 2 TEST	
		Repeat step 1 for C/W TEST CAUT sw - 2	
		(25.08.01-00)	
		4.3.8.6 VOLUME ADJUSTMENT	
		NOTE Panel lights and nonapplicable tones are not verified in this procedure	
		1. EMERGENCY TONE VOLUME ADJUST	
	206	C/W TEST FIRE sw - 1	
		Emergency klaxons (2) fire tone - on	
		Using adjustment tool on panel, adjust TONE VOL EMER potentiometer	Increase volume by cw rotation
	206, 616	C/W MASTER ALARM pb/lt - depress	Momentary switch
		Emergency klaxons (2) fire tone - off	
	206	C/W TEST FIRE sw - OFF	
	206	C/W [CLEAR] sw - CLEAR	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.6 VOLUME ADJUSTMENT (cont'd)	
		(25.08.04-00)	
		2. WARNING TONE VOLUME ADJUST	
	206	C/W TEST WARN sw - 1	
	INTERCOM	Warning tone - on	
		Using adjustment tool on panel, adjust TONE VOL WARN potentiometer	Increase volume by cw rotation
	206, 616	C/W MASTER ALARM pb/lt - depress	
	INTERCOM	Warning tone - off	
	206	C/W TEST WARN sw - OFF	
		C/W [CLEAR] sw - CLEAR	
		(25.08.03-00)	
		3. CAUTION TONE VOLUME ADJUST	
	206	C/W TEST CAUT sw - 1	
	INTERCOM	Caution tone - on	
		Using adjustment tool on panel, adjust TONE VOL CAUT potentiometer	Increase volume by cw rotation
	206, 616	C/W MASTER ALARM pb/lt - depress	
	INTERCOM	Caution tone - off	
	206	C/W TEST CAUT sw - OFF	
		C/W [CLEAR] - CLEAR	
		(26.08.06-00)	
		4.3.8.7 RAPID ΔP SYSTEM VERIFICATION	
		1. CONFIGURE SYSTEM FOR RAPIDΔP SENSOR 1 TEST	
	207	RAPIDΔP 2 sw - inhibit	Function inhibited to check sensor redundancy
		2. PERFORM RAPIDΔP SYSTEM 1 MEMORY CAPABILITY TEST WITH SENSOR 1	
		Test rapidΔP system (4.3.8.1, step 1)	
		3. PERFORM RAPIDΔP SYSTEM 1 TRACKING CAPABILITY TEST WITH SENSOR 1	
		Test rapidΔP system (4.3.8.1, step 2)	
		4. PERFORM RAPIDΔP SYSTEM 2 TESTS WITH SENSOR 1	
		Repeat steps 2 and 3 for C/W TESTΔP sw - 2	
		5. RECONFIGURE SYSTEM	
		RAPIDΔP 2 sw - enable	
		RAPIDΔP 1 sw - inhibit	
		6. PERFORM RAPIDΔP SYSTEM 1 TESTS WITH SENSOR 2	
		Repeat steps 2 and 3 for C/W TESTΔP sw - 1	
		7. PERFORM RAPIDΔP SYSTEM 2 TESTS WITH SENSOR 2	
		Repeat steps 2 and 3 for C/W TESTΔP sw - 2	
		8. RECONFIGURE SYSTEM FOR NORMAL OPERATION	
		RAPIDΔP 1 sw - enable	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(26.08.12-00)	
		4.3.8.8 FIRE SYSTEM VERIFICATION	
		NOTE Perform the following two steps for each test condition in table 4.3.8-4. Preceeding each test condition configure inhibit switches as called out in the table. The table also calls out the test position for the C/W TEST FIRE sw and appropriate parameter lights that come on	
		1. PERFORM FIRE SYSTEM 1 (2) MEMORY CAPABILITY TEST	
	206	C/W TEST FIRE sw - 1 (2)	
		Emergency klaxons (2) fire tone - on	
	INTERCOM	Warning tone - on	
	207, 616	Appropriate FIRE light - on	
	INTERCOM	MASTER ALARM lt - on	
	206, 616	C/W MASTER ALARM pb/lt - on	
	206	C/W TEST FIRE sw - OFF	
		Emergency klaxons (2) fire tone - on (verify)	
	INTERCOM	Warning tone - on (verify)	
	207, 616	Appropriate FIRE light - on (verify)	
	INTERCOM	MASTER ALARM lt - on (verify)	
	206, 616	C/W MASTER ALARM pb/lt - on (verify)	
	206, 616	C/W MASTER ALARM Pb/lt - depress	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X [MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
FSCP			
		Emergency klaxons (2) fire tone - off	
	INTERCOM	Warning tone - off	
		Appropriate FIRE light - off	
		MASTER ALARM lt - off	
	206, 616	C/W MASTER ALARM pb/lt - off	
		2. PERFORM FIRE SYSTEM 1 (2) TRACKING CAPABILITY TEST	
	206	C/W TEST FIRE sw - 1 (2)	
		Emergency klaxons (2) fire tone - on	
	INTERCOM	Warning tone - on	
	207, 616	Appropriate FIRE light - on	
	INTERCOM	MASTER ALARM lt - on	
	206, 616	C/W MASTER ALARM pb/lt - on	
	206, 616	C/W MASTER ALARM pb/lt - depress	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X [MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
FSCP			

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.8 FIRE SYSTEM VERIFICATION (cont'd)	
		Emergency klaxons (2) fire tone - off	
	INTERCOM	Warning tone - off	
		Appropriate FIRE light - on (verify)	
		MASTER ALARM lt - off	
	206, 616	C/W MASTER ALARM pb/lt - off	
	206	C/W TEST FIRE sw - OFF	
		Appropriate FIRE light - off	
		(26.08.15-00)	
		4.3.8.9 FIRE SENSOR SYSTEM VERIFICATION	
	120	SNSR 2 sw - OFF	
		[MASTER ALARM RESET/TEST] sw - TEST	Momentary switch
		SNSR 1 lt - on	
		Emergency klaxons (2) fire tone - on	
	INTERCOM	Warning tone - on	
	207, 616	C/W MDA/STS FIRE lt - on	When this procedure is repeated for other FSCP's, appropriate FIRE light will come on
		MASTER ALARM lt - on	
	206, 616	C/W MASTER ALARM pb/lt - on	
	120	[MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET	
		Emergency klaxons (2) fire tone - off	
	INTERCOM	Warning tone - off	
	207, 616	C/W MDA/STS FIRE lt - off	
	INTERCOM	MASTER ALARM lt - off	
	206, 616	C/W MASTER ALARM pb/lt - off	
		SNSR 1 sw - OFF	
		SNSR 1 lt - off	
	120	SNSR 1 sw - BUS 2	
		[MASTER ALARM RESET/TEST] sw - TEST	
		SNSR 1 lt - on	
		Emergency klaxons (2) fire tone - on	
	INTERCOM	Warning tone - on	
	207, 616	C/W MDA/STS FIRE lt - on	
	INTERCOM	MASTER ALARM lt - on	
	206, 616	C/W MASTER ALARM pb/lt - on	
	120	[MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET	
		Emergency klaxons (2) fire tone - off	
	INTERCOM	Warning tone - off	
	207, 616	C/W MDA/STS FIRE lt - off	
	INTERCOM	MASTER ALARM lt - off	
	206, 616	C/W MASTER ALARM pb/lt - off	
	120	SNSR 1 sw - OFF	
		SNSR 1 lt - off	
		SNSR 2 sw - BUS 1	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.9 FIRE SENSOR SYSTEM VERIFICATION (cont'd)	
		[MASTER ALARM RESET/TEST] sw - TEST	
		SNSR 2 lt - on	
		Emergency klaxons (2) fire tone - on	
	INTERCOM 207, 616	Warning tone - on	
		C/W MDA/STS Fire lt - on	
	INTERCOM 206, 616	MASTER ALARM lt - on	
		C/W MASTER ALARM pb/lt - on	
	120	[MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET	
		Emergency klaxons (2) fire tone - off	
	INTERCOM 207, 616	Warning tone - off	
		C/W MDA/STS FIRE lt - off	
	INTERCOM 206, 616	MASTER ALARM lt - off	
		C/W MASTER ALARM pb/lt - off	
	120	SNSR 2 sw - OFF	
		SNSR 2 lt - off	
		SNSR 2 sw - BUS 2	
		[MASTER ALARM RESET/TEST] sw - TEST	
		SNSR 2 lt - on	
		Emergency klaxons (2) fire tone - on	
	INTERCOM 207, 616	Warning tone - on	
		C/W MDA/STS FIRE lt - on	
	INTERCOM 206, 616	MASTER ALARM lt - on	
		C/W MASTER ALARM pb/lt - on	
	120	[MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET	
		Emergency klaxons (2) fire tone - off	
	INTERCOM 207, 616	Warning tone - off	
		C/W MDA/STS FIRE lt - off	
	INTERCOM 206, 616	MASTER ALARM lt - off	
		C/W MASTER ALARM pb/lt - off	
	120	SNSR 2 sw - OFF	
		SNSR 2 lt - off	
		SNSR 1 sw - BUS 1	
		SNSR 2 sw - BUS 2	
		Repeat entire procedure for panels 236, 237, 238, 392, 529, 530, 618, 619, 633, 638, and 639 and appropriate FIRE lights	Panels 530 and 619 have only one sensor functional
		(26.08.05-00)	
		4.3.8.10 WARNING SYSTEM VERIFICATION	
		1. PERFORM WARNING SYSTEM 1 TEST	
	206	C/W TEST WARN sw - 1	
	INTERCOM 207, 616	Warning tone - on	
		Verify all parameter lights in table 4.3.8-2 - on	
	207	C/W C/W PWR lt - on	
		Respond to C/W alert (4.3.8.18)	Caution parameter that functions during a warning test
	207	REG BUS 1 HI sw - inhibit	
		C/W REG BUS 1 HI lt - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.10 WARNING SYSTEM VERIFICATION (cont'd)	
		REG BUS 2 HI sw - inhibit	
		C/W REG BUS 2 HI lt - off	
		PRI COOL PUMP A, B, C, sw (3) - inhibit	
		C/W PRI COOL FLOW lt - off	
		SEC COOL PUMP A, B, C sw (3) - inhibit	
		C/W SEC COOL FLOW lt - off	
		CSM 1, 2 sw (2) - inhibit	
		C/W CSM lt - off	
		REG BUS 1 LO sw - inhibit	
		C/W REG BUS 1 LO lt - off	
		REG BUS 2 LO sw - inhibit	
		C/W REG BUS 2 LO lt - off	
		PPO2 CONT sw - inhibit	
		PPO2 MON sw - inhibit	
		C/W PPO2 LO lt - off	
		CREW ALERT 1, 2 sw (2) - inhibit	
	207, 616	C/W CREW ALERT lt - off	
	207	EVA 1 PUMP ΔP sw - inhibit	
		EVA 1 H2O IN TEMP sw - inhibit	
		C/W EVA 1 lt - off	
		EVA 2 PUMP ΔP sw - inhibit	
		EVA 2 H2O IN TEMP sw - inhibit	
		C/W EVA 2 lt - off	
	207	CLSTR PRESS sw - inhibit	
	207, 616	C/W CLSTR PRESS LO lt - off	
	207	CLSTR ATT HI RATE sw - inhibit	
		CLSTR ATT THRUSTER STUCK sw - inhibit	
		C/W CLSTR ATT lt - off	
		ATM BUS 1 LO sw - inhibit	
		C/W ATM BUS 1 LO lt - off	
		ATM BUS 2 LO sw - inhibit	
		C/W ATM BUS 2 LO lt - off	
	206	C/W TEST WARN sw - OFF	
		C/W MEM RECALL pb/lt - depress and hold	
		Verify all parameter lights in table 4.3.8-2 - on	
	207	C/W C/W PWR lt - on	
	207	C/W MEM RECALL pb/lt - release	
	207, 616	Verify all parameter lights in table 4.3.8-2 - off	
	207	C/W C/W PWR lt - off	
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	
		2. RECONFIGURE INHIBIT SWITCHES	
	207	All INHIBIT PANEL switches inhibited in step 1 - enable	
		3. PERFORM WARNING SYSTEM 2 TEST	
		Repeat steps 1 and 2 for C/W TEST WARN sw - 2	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(26.08.04-00)	
		4.3.8.11 CAUTION SYSTEM VERIFICATION	
		1. PERFORM CAUTION SYSTEM 1 TEST	
	206	C/W TEST CAUT sw - 1	
		Caution tone - on	
		Verify all parameter lights in Table 4.4.8-3 - on	
		Respond to C/W alert (4.3.8.18)	
	207	EMER SNSR 1, 2 sw (2) - inhibit	
		C/W EMER SNSR PWR lt - off	
		EMER PWR 1, 2 sw (2) - inhibit	
		C/W EMER PWR lt - off	
		SV A, B TEMP sw (2) - inhibit	
		C/W SV TEMP HI lt - off	
		PRI COOL TEMP HI sw - inhibit	
		C/W PRI COOL TEMP HI lt - off	
		SEC COOL TEMP HI sw - inhibit	
		C/W SEC COOL TEMP HI lt - off	
		BAT CHG LO 1-8 sw (8) - inhibit	
		C/W BAT CHG LO lt - off	
		SV A, B PPCO2 sw (2) - inhibit	
		C/W SV OUT PPCO2 HI lt - off	
		SV A, B GAS FLW sw (2) - inhibit	
		C/W SV FLOW lt - off	
		PRI COOL TEMP LO sw - inhibit	
		C/W PRI COOL TEMP LO lt - off	
		SEC COOL TEMP LO sw - inhibit	
		C/W SEC COOL TEMP LO lt - off	
		OWS BUS 1 LO sw - inhibit	
		C/W OWS BUS 1 LO lt - off	
		OWS BUS 2 LO sw - inhibit	
		C/W OWS BUS 2 LO lt - off	
		OWS GAS INTERCHG sw - inhibit	
		C/W OWS GAS INTERCHG lt - off	
	207	CNDSATE TANK ΔP sw - inhibit	
		C/W CNDST TANK P lt - off	
		SV A, B TMR sw (2) - inhibit	
		C/W SV TMR lt - off	
		C/W PWR 1, 2 sw (2) - inhibit	
		C/W SIG COND sw - inhibit	
		C/W C/W PWR lt - off	
		ACS MALF CMG SAT sw - inhibit	
		ACS MALF TACS ONLY sw - inhibit	
		ACS MALF RATE GYRO sw - inhibit	
		C/W ACS MALF lt - off	
		CMPTR XOVER sw - inhibit	
		CMPTR SELF TEST sw - inhibit	
		C/W CMPTR MALF lt - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.11 CAUTION SYSTEM VERIFICATION (cont'd)	
		ATM CNST PUMP ΔP sw - inhibit	
		ATM CNST CLNT TEMP sw - inhibit	
		ATM CNST HTR TEMP sw - inhibit	
		C/W ATM CNST THERM lt - off	
	206	C/W TEST CAUT sw - OFF	
		C/W MEM RECALL pb/lt - depress and hold	
		Verify all parameter lights in table 4.3.8-3 - on	
	207	C/W MEM RECALL pb/lt - release	
	207, 616	Verify all parameter lights in table 4.3.8-3 - off	
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	
		2. RECONFIGURE INHIBIT SWITCHES	
	207	All INHIBIT PANEL switches inhibited in previous step (1) - enable	
		3. PERFORM CAUTION SYSTEM 2 TEST	
		Repeat steps 1 and 2 for C/W TEST CAUT sw - 2	
		(26.08.08-00)	
		4.3.8.12 CREW ALERT WARNING TEST	
		MSFN uplink C/W SIG 1 CREW ALERT	
		Warning tone - on	
	207, 616	C/W CREW ALERT lt - on	
	131	COMM CHAN sel - A ON	
	102	COMM CHAN sel - B ON	
		Verify comm channels tied together	Two crewmen required for this verification
		Respond to C/W alert (4.3.8.18)	
	207, 616	C/W CREW ALERT lt - off	
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	
		Repeat preceding operations for MSFN uplink of C/W SIG 2 CREW ALERT	
		(26.08.11-00)	
		4.3.8.13 CSM WARNING TEST (4.19.11)	
		(26.08.09-00)	
		4.3.8.14 EMERGENCY SENSOR POWER CAUTION TEST	
	202	cb C/W SNSRS EMER 1 - open	
		Caution tone - on	
	207	C/W EMER SNSR PWR lt - on	
		Respond to C/W alert (4.3.8.18)	
	202	cb C/W SNSR EMER 1 - close	
	207	C/W EMER SNSR PWR lt - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.14 EMERGENCY SENSOR POWER CAUTION TEST (cont'd)	
	206	C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off Repeat preceding operations for cb C/W SNSRS EMER 2 - open	
		(26.08.10-00)	
		4.3.8.15 SIGNAL CONDITIONING POWER CAUTION TEST	
	202	cb C/W CONVS SIG COND 1 - open	
		Caution tone - on	
	207	C/W C/W PWR lt - on	
		Respond to C/W alert (4.3.8.18)	
	202	cb C/W CONVS SIG COND 1 - close	
	207	C/W C/W PWR lt - off	
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	
		Repeat preceding operations for cb C/W CONVS SIG COND 2 - open	
		(26.08.13-00)	
		4.3.8.16 SIEVE FLOW CAUTION TEST	
		NOTE No adverse effects result from momentary power down of mol sv fan(s) to permit C/W test. Avoid power down periods $\geq$ TBS to preclude CO2 buildup.	
		1. DEACTIVATE MOL SV FANS	
	200	cb MOL SV A (B) FANS PRI (SEC) - open	Open circuit breaker for fan in operation
	INTERCOM	Caution tone - on	Alarm initiated when flow $\leq$ 21.1 $\pm$ 3.8 cfm
	207	C/W SV FLOW lt - on	TM Parameters: F210 SIV A GAS FLOW F211 SIV B GAS FLOW K224 SIV A COMPR 1 K225 SIV A COMPR 2 K226 SIV B COMPR 1 K227 SIV B COMPR 2
		Respond to C/W alert (4.3.8.18)	
		2. ACTIVATE MOL SV FAN	
	200	cb MOL SV A (B) FANS PRI (SEC) - closed	Close circuit breaker used in step 1
	207	C/W SV FLOW lt - off	Light goes off when flow $\geq$ 21.1 $\pm$ 3.8 cfm (Approximately 5 seconds)
		3. CLEAR C/W SYSTEM	
	206	C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off	Momentary switch

CREWMAN	PANEL	PROCEDURE	REMARKS
		(26.08.14-00)	
		4.3.8.17 OWS GAS INTERCHANGE CAUTION TEST	
		1. DEACTIVATE AM DUCT FAN	
	200 INTERCOM	cb AM FANS DUCT 2 (1) - open Caution tone - on C/W OWS GAS INTERCHG lt - on	Open circuit breaker for fan outlet in use Alarm initiated when flow $\leq$ 78 $\pm$ 10.4 cfm TM Parameter: F205 XFER DUCT FLOW
		Respond to C/W alert (4.3.8.18)	
		2. ACTIVATE AM DUCT FAN	
	200	cb AM FANS DUCT 2 (1) - closed C/W OWS GAS INTERCHG lt - off	Closed circuit breaker used in step 1 Lights goes out when flow $\geq$ 78 $\pm$ 10.4 cfm
		3. CLEAR C/W SYSTEM	
	206	C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off	Momentary switch
		(25.08.01-00)	
		4.3.8.18 C/W ALERT RESPONSE	
	206 INTERCOM 206, 616	C/W MEM RECALL pb/lt - on MASTER ALARM lt - on C/W MASTER ALARM pb/lt - on C/W MASTER ALARM pb/lt - depress	Momentary pushbutton. During MDA/AM activation procedures, depress C/W MASTER ALARM pb/lt on panel 206. During OWS activation procedures, depress C/W MASTER ALARM pb/lt on panel 616
	FSCP	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X [MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Momentary switch
	INTERCOM 206,616 INTERCOM	Appropriate Caution or Warning tone - off C/W MASTER ALARM pb/lt - off MASTER ALARM lt - off	
		(25.08.06-00)	
		4.3.8.19 FIRE ALERT RESPONSE	
	INTERCOM 206,616	MASTER ALARM lt - on C/W MASTER ALARM pb/lt - on	
		WARNING Do not operate MASTER ALARM pb/lt or MASTER ALARM RESET switch until fire parameter identification light has been observed for fire location	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.8.19 FIRE ALERT RESPONSE (cont'd)	
		C/W MASTER ALARM pb/lt - depress	Momentary pushbutton
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.3.8.21 FIRE SENSOR SENSITIVITY ADJUSTMENT (cont'd) X X X	
		CAUTION GAIN ADJUST pot should not be rotated above 5 or below 0	
	FSA	GAIN ADJUST pot - ccw to lower number, until alert is terminated (3/32 screwdriver)	5 is most sensitive setting and 0 least sensitive. 4 is normal setting
	FSCP	[MASTER ALARM RESET/TEST] sw - MASTER ALARM RESET	Momentary switch
		or	
	206, 616 INTERCOM	C/W MASTER ALARM pb/lt - depress	Momentary pushbutton
		Warning tone - off	
	206, 616 INTERCOM	Emergency klaxon (2) fire tone - off	
		C/W MASTER ALARM pb/lt - off	
		MASTER ALARM lt - off	
	FSCP	SNSR 1 (2) sw - OFF	
		SNSR 1 (2) lt - off	
		SNSR 1 (2) sw - BUS 1 (2)	
		X X X 2. TEST FIRE SENSOR (4.3.8.3) X X X	
		XXXX

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C & W DISPLAY TITLE (PNL 207 &*616)	C & W INHIBIT SWITCH TITLE (PNL 207)	C&W DETECTORS	C & W SENSOR PWR										C&W DETECTION MODULE POWER								NOMINAL RANGE	TRIGGER LIMITS	CORRESPONDING INDICATORS (R) TM SENSOR REDUNDANT TO C&W (S) M SENSOR SAME AS TM		REMARKS
			$V_{C\&W}$ 1+24	$V_{C\&W}$ 1-24	$V_{C\&W}$ 1+5	$V_{C\&W}$ 2+24	$V_{C\&W}$ 2-24	$V_{C\&W}$ 2+5	V_{ECS1}	V_{ECS2}			$V_{C\&W}$ 1+24	$V_{C\&W}$ 1-24	$V_{C\&W}$ 1+5	$V_{C\&W}$ 2+24	$V_{C\&W}$ 2-24	$V_{C\&W}$ 2+5	$V_{C\&W}$ 1+28	$V_{C\&W}$ 2+28			TM MEASUREMENTS	ON DISPLAY BOARDS	
EMERG SENSOR POWER (CAUTION)	EMERG SENSOR 1	DETECTOR 1											X	X					X		26 TO 30 VDC	V ≤ 25 ± 0.5 VDC	NONE	NONE	DETECTORS ACTIVE WHEN C&W SUBSYSTEM ENABLED
		DETECTOR 2														X	X			X					
	EMERG SENSOR 2	DETECTOR 1											X	X					X		26 TO 30 VDC	V ≤ 25 ± 0.5 VDC	NONE	NONE	
		DETECTOR 2														X	X			X					
EMERG POWER (CAUTION)	EMERG POWER 1	SEE REMARKS																			26 TO 30 VDC 4.8 TO 5.8 VDC	V ≤ 24 + 1.0 VDC V ≤ 4 ± 0.3 VDC	M308 (R) M306(R)	NONE	DETECTORS LOCATED INTERNALLY TO THE CAUTION AND WARNING UNIT AND ARE ACTIVE WHEN C&W SUBSYSTEM IS ENABLED
	EMERG POWER 2	SEE REMARKS																			26 TO 30 VDC 4.8 TO 5.8 VDC	V ≤ 24 + 1.0 VDC V ≤ 4 ± 0.3 VDC	M309 (R) M307 (R)	NONE	
C&W POWER (CAUTION)	C&W POWER 1	SEE REMARKS																			26 TO 30 VDC 4.8 TO 5.2 VDC	V ≤ 24 + 1.0 VDC V ≤ 4 ± 0.3 VDC	M312(R) M310 (R)	NONE	C&W DC/DC CONVERTER 1 AND 2 DETECTORS LOCATED INTERNAL TO THE CAUTION AND WARNING UNIT
	C&W POWER 2	SEE REMARKS																			26 TO 30 VDC 4.8 TO 5.2 VDC	V ≤ 24 + 1.0 VDC V ≤ 4 ± 0.3 VDC	M313 (R) M311(R)	NONE	
	C&W SIG COND	SEE REMARKS																		X	+24 + .3 VDC -24 ± .3 VDC + 5 ± .075 VDC	26 ≤ V ≤ 22 VDC -26 ≥ V ≥ -22 VDC 4.8 ≥ V ≥ 5.2 VDC	NONE	NONE	C&W SIGNAL COND DISPLAY CONV DETECTORS LOCATED INTERNAL TO THE C&W DETECTOR MODULES DETECTORS ARE ACTIVE WHEN C&W SUBSYSTEM IS ENABLED
		SEE REMARKS																	X						
REG BUS 1 HIGH (WARNING)	REG BUS 1 HIGH	DETECTOR 1											X	X					X		26 TO 30 VDC	V ≥ 31.0 ± .62 VDC	M161 (R)	METER (R) PNL 206	DETECTORS ACTIVE WHEN C&W SUBSYSTEM ENABLED
		DETECTOR 2														X	X			X					
REG BUS 2 HIGH (WARNING)	REG BUS 2 HIGH	DETECTOR 1											X	X					X		26 TO 30 VDC	V ≥ 31.0 ± .62 VDC	M162 (R)	METER (R) PNL 206	DETECTORS ACTIVE WHEN C&W SUBSYSTEM ENABLED
		DETECTOR 2														X	X			X					
BAT CHARGE LOW (CAUTION)	BATTERY CHARGE LOW 1	DETECTOR 1											X	X					X		SOC > 30% (SEE REMARKS)	SOC ≤ 30%	M117 - PRI M125 - SEC	METER (S) PNL 206	THE SELECTED PRIMARY OR SECONDARY AMP HOUR INTEGRATOR PROVIDES A DISCRETE 10 VDC SIGNAL TO C&W DETECTOR AT SOC ≤ 30% THE PRIMARY OR SECONDARY AH INTEGRATOR IS SELECTABLE BY EITHER MANUAL OR DCS CMD. DETECTORS ACTIVE WHEN C&W SUBSYSTEM ENABLED. NOMINAL SOC IS A FUNCTION OF MISSION TIME. REF AM BATTERY SOC VS MISSION TIME CURVES.
		DETECTOR 2														X	X			X					
	BATTERY CHARGE LOW 2	DETECTOR 1											X	X					X		SOC > 30% (SEE REMARKS)	SOC ≤ 30%	M118 - PRI M126 - SEC	METER (S) PNL 206	
		DETECTOR 2														X	X			X					
	BATTERY CHARGE LOW 3	DETECTOR 1											X	X					X		SOC > 30% (SEE REMARKS)	SOC ≤ 30%	M119 - PRI M127 - SEC	METER (S) PNL 206	
		DETECTOR 2														X	X			X					
	BATTERY CHARGE LOW 4	DETECTOR 1											X	X					X		SOC > 30% (SEE REMARKS)	SOC ≤ 30%	M120 - PRI M128 - SEC	METER (S) PNL 206	
		DETECTOR 2														X	X			X					
	BATTERY CHARGE LOW 5	DETECTOR 1											X	X					X		SOC > 30% (SEE REMARKS)	SOC ≤ 30%	M121 - PRI M129 - SEC	METER (S) PNL 206	
		DETECTOR 2														X	X			X					
	BATTERY CHARGE LOW 6	DETECTOR 1											X	X					X		SOC > 30% (SEE REMARKS)	SOC ≤ 30%	M122 - PRI M130 - SEC	METER (S) PNL 206	
		DETECTOR 2														X	X			X					
	BATTERY CHARGE LOW 7	DETECTOR 1											X	X					X		SOC > 30% (SEE REMARKS)	SOC ≤ 30%	M123 - PRI M131 - SEC	METER (S) PNL 206	
		DETECTOR 2														X	X			X					
	BATTERY CHARGE LOW 8	DETECTOR 1											X	X					X		SOC > 30% (SEE REMARKS)	SOC ≤ 30%	M124 - PRI M132 - SEC	METER (S) PNL 206	
		DETECTOR 2														X	X			X					

Figure 4.3.8-1 C/W Identification Matrix (Sheet 1)

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C&W DISPLAY PANEL (PNL 207 & *616)	C&W INHIBIT SWITCH TITLE (PNL 207)	C&W DETECTORS	C&W SENSOR PWR										C&W DETECTION MODULE POWER								NOMINAL RANGE	TRIGGER LIMITS	CORRESPONDING INDICATORS (R) TM SENSOR REDUNDANT TO C&W (S) M SENSOR SAME AS TM		REMARKS
			$V_{C\&W}$ 1+24	$V_{C\&W}$ 1-24	$V_{C\&W}$ 1+5	$V_{C\&W}$ 2+24	$V_{C\&W}$ 2-24	$V_{C\&W}$ 2+5	$V_{ECS\ 1}$	$V_{ECS\ 2}$			$V_{C\&W}$ 1+24	$V_{C\&W}$ 1-24	$V_{C\&W}$ 1+5	$V_{C\&W}$ 2+24	$V_{C\&W}$ 2-24	$V_{C\&W}$ 2+5	$V_{C\&W}$ 1+28	$V_{C\&W}$ 2+28			TM MEASUREMENTS	ON BOARD DISPLAYS	
REG BUS 1 LOW (WARNING)	REG BUS 1 LOW	DETECTOR 1											X	X					X		26 TO 30 VDC	V ≤ 25 ± 0.5 VDC	M161 (R)	METER PNL 206	DETECTORS ACTIVE WHEN C&W SUBSYSTEM ENABLED
		DETECTOR 2														X	X			X					
REG BUS 2 LOW (WARNING)	REG BUS 2 LOW	DETECTOR 1											X	X					X		26 TO 30 VDC	V ≤ 25 ± 0.5 VDC	M162 (R)	METER PNL 206	DETECTORS ACTIVE WHEN C&W SUBSYSTEM ENABLED
		DETECTOR 2														X	X			X					
* OWS BUS 1 LOW (CAUTION)	OWS BUS 1 LOW	DETECTOR 1											X	X					X		25 TO 30 VDC	V ≤ 23.5 ± .47 VDC	M7002 (R)	METER PNL 617	DETECTORS ACTIVE WHEN C&W SUBSYSTEM ENABLED, C&W LOW VOLTAGE SENSE 1 CB (PNL 613) & C&W LOW VOLTAGE SENSE 2 CB (PNL 613) PROVIDES MEASUREMENT SIGNALS.
		DETECTOR 2														X	X			X					
* OWS BUS 2 LOW (CAUTION)	OWS BUS 2 LOW	DETECTOR 1											X	X					X		25 TO 30 VDC	V ≤ 23.5 ± .47 VDC	M7003 (R)	METER PNL 617	
		DETECTOR 2														X	X			X					
SIEVE TEMP HIGH (CAUTION)	SIEVE A TEMP	DETECTOR (SEE REMARKS)																			375 TO 410°F	T ≥ 440 ± 10°F	NONE	METER PNL 203	DETECTOR IS INTEGRAL TO ECS, AND IS ENABLED BY THE RESPECTIVE SIEVE A AND SIEVE B BAKEOUT HEATER SW'S (PNL 203). C&W SIGNALS AND METER SIGNALS ARE OBTAINED FROM OVERHEAT TEMP SENSOR CIRCUIT IN THE RESPECTIVE HEATER TEMP CONTROLLER.
	SIEVE B TEMP	DETECTOR (SEE REMARKS)																			375 TO 410°F	T ≥ 440 ± 10°F	NONE	METER PNL 203	
PRI COOL FLOW (WARNING)	PRI COOL PUMP A	DETECTOR (REED SW) (SEE REMARKS)																			230 LBS/HR (1 PUMP)	N/A	D224(R) D222(R)	NONE	SINGLE DETECTOR (REED SWITCH) FOR EACH PUMP. REED SWITCH ACTUATED BY MECHANICAL MOVEMENT OF CHECK VLV ON RESPECTIVE PUMP OUTLET. THE RESPECTIVE C&W REED SWITCH CONTACTS ARE ARMED WHEN THE PUMP IS TURNED ON.
	PRI COOL PUMP B	DETECTOR (REED SW) (SEE REMARKS)																			230 LBS/HR	N/A	D224(R) D222(R)	NONE	
	PRI COOL PUMP C	DETECTOR (REED SW) (SEE REMARKS)																			230 LBS/HR	N/A	D224(R) D222 (R)	NONE	
SEC COOL FLOW (WARNING)	SEC COOL PUMP A	DETECTOR (REED SW) (SEE REMARKS)																			230 LBS/ HR	N/A	D225 (R) D223(R)	NONE	(SAME AS PRI) REMARKS
	SEC COOL PUMP B	DETECTORS (REED SW) (SEE REMARKS)																			230 LBS/HR	N/A	D225 (R) D223(R)	NONE	
	SEC COOL PUMP C	DETECTORS (REED SW) (SEE REMARKS)																			230 LBS/HR (1 PUMP)	N/A	D225 (R) D223(R)	NONE	
PRI COOL TEMP HIGH (CAUTION)	PRI COOL TEMP HIGH	DETECTOR 1			X								X	X					X		60 TO 100°F	T ≥ 120 ± 5.8°F	C225 (R)	NONE	DETECTORS ACTIVE WHEN C&W SUBSYSTEM IS ENABLED
		DETECTOR 2						X								X	X			X					
SEC COOL TEMP HIGH (CAUTION)	SEC COOL TEMP HIGH	DETECTOR 1			X								X	X					X		60 TO 100°F	T ≥ 120 ± 5.8°F	C226 (R)	NONE	DETECTORS ACTIVE WHEN C&W SUBSYSTEM IS ENABLED
		DETECTOR 2						X								X	X			X					
PRI COOL TEMP LOW (CAUTION)	PRI COOL TEMP LOW	DETECTOR 1			X								X	X					X		45 TO 49°F	T ≤ 40 ± 2.9°F	C209(R) C217(R)	NONE	DETECTORS ACTIVE WHEN C&W SUBSYSTEM IS ENABLED
		DETECTOR 2						X								X	X			X					
SEC COOL TEMP LOW (CAUTION)	SEC COOL TEMP LOW	DETECTOR 1			X								X	X					X		45 TO 49°F	T ≤ 40 ± 2.9°F	C210(R) C218(R)	NONE	DETECTORS ACTIVE WHEN C&W SUBSYSTEM IS ENABLED
		DETECTOR 2						X								X	X			X					
PPO_2 LOW (WARNING)	PPO_2 MONITOR	MONITOR SENSOR (SEE REMARKS)																	X		171 TO 202 MMHg	$PPO_2 \leq 157.4 \pm 18.8$ MMHg	D237 D239 D240	METER (PNL 225) (S)	TWO OF THREE PPO_2 SENSORS IN THE ECS SYSTEM PROVIDE PPO_2 SIGNALS TO C&W DETECTORS. ANY ONE OF THE THREE SENSORS CAN BE SELECTED BY THE O_2/N_2 CONTROLLER SW OR BY THE O_2/N_2 MONITOR SW (PNL 225).
	PPO_2 CONTROL	CONTROL SENSOR (SEE REMARKS)																		X	171 TO 202 MMHg	$PPO_2 \leq 157.4 \pm 18.8$ MMHg	D237 D239 D240	METER (PNL 225) (S)	

Figure 4.3.8-1 C/W Identification Matrix (Sheet 2)

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C & W DISPLAY TITLE (PNL 207 &*616)	C & W INHIBIT SWITCH TITLE (PNL 207)	C&W DETECTORS	C & W SENSOR PWR										C&W DETECTION MODULE POWER										NOMINAL RANGE	TRIGGER LIMITS	CORRESPONDING INDICATORS (R) TM SENSOR REDUNDANT TO C&W (S) M SENSOR SAME AS TM		REMARKS
			$V_{C\&W1+24}$	$V_{C\&W1-24}$	$V_{C\&W1+5}$	$V_{C\&W2+24}$	$V_{C\&W2-24}$	$V_{C\&W2+5}$	V_{ECS1}	V_{ECS2}			$V_{C\&W1+24}$	$V_{C\&W1-24}$	$V_{C\&W1+5}$	$V_{C\&W2+24}$	$V_{C\&W2-24}$	$V_{C\&W2+5}$	$V_{C\&W1+28}$	$V_{C\&W2+28}$					TM MEASUREMENTS	ON DISPLAY BOARDS	
SIEVE OUT $PPCO_2$ HIGH (CAUTION)	SIEVE A $PPCO_2$	DETECTOR 1	X	X									X	X					X				1.7 TO 3.1 MMHg	$PPCO_2 \geq 4.4 \pm 1.5$ MMHg	D210	METER (PNL 203) (S)	2 $PPCO_2$ SENSORS AT EACH MOL SIEVE OUTLET (A AND B) PROVIDE $PPCO_2$ MONITORING. DETECTORS (INCLUDING SENSORS) ARE ACTIVE WHEN C&W SUBSYSTEM IS ENABLED.
		DETECTOR 2				X	X									X	X			X						
	SIEVE B $PPCO_2$	DETECTOR 1	X	X									X	X					X				1.7 TO 3.1 MMHg	$PPCO_2 \geq 4.4 \pm 1.5$ MMHg	D214	METER (PNL 203) (S)	
		DETECTOR 2				X	X									X	X			X						
SIEVE FLOW (CAUTION)	SIEVE A GAS FLOW	DETECTOR 1 (SEE REMARKS)							X	OR X													F ≈ 33 CFM	F ≤ 21.1 ± 3.8 CFM	F210	NONE	ONE DETECTOR (FLOW SENSOR) IN EACH MOL SIEVE OUTLET PROVIDES A TRIGGER SIGNAL TO BOTH C&W SUB-UNITS. PWR IS SUPPLIED BY SIEVE A OR B FANS PWR SW (PNL 204). PRI SELECTS V_{ECS} 1 AND SEC SELECTS V_{ECS} 2.
	SIEVE B GAS FLOW	DETECTOR 1 (SEE REMARKS)							X	OR X													F ≈ 33 CFM	F ≤ 21.1 ± 3.8 CFM	F211	NONE	
OWS GAS INTER CHG (CAUTION)	OWS GAS INTERCHG	DETECTOR 1 (SEE REMARKS)							X														F ≈ 112-155 CFM PLV FAN ON HIGH	F ≤ 78 ± 10.4 CFM	F205	NONE	DETECTOR (FLOW METER) ACTIVATES BY AM FANS DUCT SW. (PNL 204)
*CLUSTER PRESS LOW (WARNING)	CLUSTER PRESS	DETECTOR 1							X														4.8 TO 5.2 PSIA	P ≤ 4.6 ± .1 PSIA	D207 (R)	METERS (PNL 225, 316, 617) R	DETECTORS ACTIVE WHEN C&W SUB-SYSTEM ACTIVATED. DETECTOR RETURNS TO NORMAL @ P ≥ 4.7 PSID
		DETECTOR 2								X																	
CNDST TANK ΔP (CAUTION)	CNDSATE TANK ΔP	DETECTOR 1 (SEE REMARKS)							X														0.5 TO 5.2 PSIA BELOW CLUSTER AMBIENT	$\Delta P \leq 0.4 \pm^{0.4}_{0.1}$ PSID	D208 (R)	METER (PNL 216)	DETECTOR ACTIVE WHEN C&W SUB-SYSTEM ACTIVATED. DETECTOR RETURNS TO NORMAL AT ΔP ≥ 0.8 PSID
SIEVE TIMER (CAUTION)	SIEVE A TIMER	DETECTOR (SEE REMARKS)																					N/A	TIMER POWER INTERRUPTS ≤20 ± 12 ms	NONE	NONE	EACH MOL SIEVE CYCLE TIMER PROVIDES A CONTACT CLOSURE TO THE C&W UPON POWER INTERRUPTS. CONTROL OF THE RESPECTIVE CYCLE TIMER IS PROVIDED BY MOL SIEVE SIEVE A OR B TIMERS SWS (PNL 203).
		DETECTOR (SEE REMARKS)																					N/A	TIMER POWER INTERRUPTS ≤20 ± 12 ms	NONE	NONE	
	SIEVE B TIMER	DETECTOR (SEE REMARKS)																					N/A	TIMER POWER INTERRUPTS ≤20 ± 12 ms	NONE	NONE	
		DETECTOR (SEE REMARKS)																					N/A	TIMER POWER INTERRUPTS 20 ± 12 ms	NONE	NONE	
CLUSTER ATT (WARNING)	CLSTR ATT HI RATE	DETECTOR (LOCATED IN ATM) SEE REMARKS																					*	K *	K 382-702 (50 BIT ATM WORD)	PNL 130 DAS	ATM PROVIDES CONTACT CLOSURES TO THE C&W *ATM COMPUTER SOFTWARE FUNCTIONS (FOR DETAILS REF ATM AOH)
	CLSTR ATT THRUSTER STUCK	DETECTOR (LOCATED IN ATM) SEE REMARKS																					N/A *	K *	K 382-702	PNL 130 DAS	
ACS MALF (CAUTION)	ACS MALF CMG SAT	DETECTOR (LOCATED IN ATM) SEE REMARKS																					N/A *	K *	K 382-702	PNL 130 DAS	
	ACS MALF TACS ONLY	DETECTOR (LOCATED IN ATM) SEE REMARKS																					N/A *	K N/A *	K 382-702	PNL 130 DAS	
	ACS MALF RATE GYRO	DETECTOR (LOCATED IN ATM) SEE REMARKS																					N/A *	K N/A *	K 382-702	PNL 130 DAS	
COMPUTER MALF (CAUTION)	COMPUTER XOVER	DETECTOR (LOCATED IN ATM) SEE REMARKS																					N/A *	K N/A *	K 382-702	NONE	ATM COMPUTER SWITCHING SIGNAL FUNCTION
	COMPUTER SELF TEST	DETECTOR (LOCATED IN ATM) SEE REMARKS																					N/A *	N/A *	K 382-702	PNL 130 DAS	ATM COMPUTER SOFTWARE FUNCTION

Figure 4.3.8-1 C/W Identification Matrix (Sheet 3)

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C & W DISPLAY TITLE (PNL 207 & * 616)	C & W INHIBIT SWITCH TITLE (PNL 207)	C&W DETECTORS	C & W SENSOR PWR										C&W DETECTION MODULE POWER										NOMINAL RANGE	TRIGGER LIMITS	CORRESPONDING INDICATORS (R) TM SENSOR REDUNDANT TO C&W (S) M SENSOR SAME AS TM		REMARKS
			$V_{C\&W\ 1+24}$	$V_{C\&W\ 1-24}$	$V_{C\&W\ 1+5}$	$V_{C\&W\ 2+24}$	$V_{C\&W\ 2-24}$	$V_{C\&W\ 2+5}$	$V_{ECS\ 1}$	$V_{ECS\ 2}$			$V_{C\&W\ 1+24}$	$V_{C\&W\ 1-24}$	$V_{C\&W\ 1+5}$	$V_{C\&W\ 2+24}$	$V_{C\&W\ 2-24}$	$V_{C\&W\ 2+5}$	$V_{C\&W\ 1+28}$	$V_{C\&W\ 2+28}$					TM MEASUREMENTS	ON BOARD DISPLAYS	
ATM BUS 1 LOW (WARNING)	ATM BUS 1 LOW	DETECTOR (LOCATED IN ATM) SEE REMARKS																					28 TO 30 VDC	V ≤25 ± .5 VDC	M019 (R)	METER PNL 130	ATM PROVIDES CONTACT CLOSURES TO C&W (FOR DETAILS SEE ATM SOH)
ATM BUS 2 LOW (WARNING)	ATM BUS 2 LOW	DETECTOR (LOCATED IN ATM) SEE REMARKS																					28 TO 30 VDC	V ≤25 ± .5 VDC	M020 (R)	METER PNL 130	"
ATM CNST THERM (CAUTION)	ATM CNST PUMP ΔP	DETECTOR (LOCATED IN ATM) SEE REMARKS																					31 PSID	ΔP ≤ 26 ± 1 PSID	D006 (R)	METER PNL 130 (S)	ATM PROVIDES CONTACT CLOSURE TO C&W (FOR DETAILS SEE ATM SOH)
	ATM CNST COOLANT TEMP	DETECTOR (LOCATED IN ATM) SEE REMARKS																					49 TO 51°F	45 ≥T ≥ 55°F ± .1 °F	C286 (R)	ATM C&D (S)	
	ATM CNST HEATER TEMP	DETECTOR (LOCATED IN ATM) SEE REMARKS																					40 TO 60°F	T ≥ 150 ± .36°F	C295 (R)	ATM C&D	
EVA 1 (WARNING)	EVA 1 PUMP ΔP	DETECTOR (MECHANICAL ΔP SWITCH) (SEE REMARKS)																					15 TO 22 PSID	ΔP ≤ 4±1 PSID	D201 R	NONE	ΔP SW RETURNS TO NORMAL @ ΔP ≥ 5.0 PSID ΔP SW IS ARMED VIA SUIT UMB SYS 1 PUMP SW PNL 317
	EVA 1 H_2O IN TEMP	DETECTOR 1			X								X	X					X				-41 TO 49°F	T ≤ 33.5 ± 1.5 °F	C407 R	NONE	
		DETECTOR 2						X								X	X			X							
EVA 2 (WARNING)	EVA 2 PUMP ΔP	DETECTOR (MECHANICAL ΔP sw) SEE REMARKS																					15 TO 22 PSID	ΔP ≤ 4±1 PSID	D202 R	NONE	ΔP SW RETURNS TO NORMAL @ ΔP ≥ 5.0 PSID ΔP SW IS ARMED VIA SUIT UMB SYS 2 PUMP SW PNL 317
	EVA 2 H_2O IN TEMP	DETECTOR 1			X								X	X					X				41 TO 49°F	T ≤ 33.5 ± 1.5 °F	C408 R	NONE	
		DETECTOR 2						X								X	X			X							
* CREW ALERT (WARNING)	CREW ALERT 1	RELAY IN CREW ALERT MODULE 1																					N/A	DISCRETE VIA CRDU	K301 TO K311	NONE	CREW ALERT 1 AND ALERT 2 SIGNALS ARE PROVIDED BY GROUND COMMAND VIA THE AM DCS SYSTEM
	CREW ALERT 2	RELAY IN CREW ALERT MODULE 2																					N/A	DISCRETE VIA CRDU	K301 TO K311	NONE	
CSM (WARNING)	CSM 1	DETECTOR (NONE) RELAY CLOSURE IN CSM C&WS																					N/A	N/A		CSM C&W DISPLAYS	CSM C&W SYSTEM UPON DETECTING ANY OUT-OF-LIMIT CONDITION PROVIDES REDUNDANT CSM 1& CSM 2 CONTACT CLOSURES TO THE C&W.
	CSM 2	DETECTOR (NONE) RELAY CLOSURE IN CSM C&WS																					N/A	N/A		CSM C&W DISPLAYS	

Figure 4.3.8-1 C/W Identification Matrix (Sheet 4)

FIRE DETECTOR NAME	FIRE DETECTOR PANEL		INHIBIT SW TITLES PNL 207	GROUP INDICATOR TITLE PNL 207, 616
MDA FIRE SENSOR 1	SENSOR 1	PNL 120	MDA/STS FIRE 1	MDA/STS FIRE
MDA FIRE SENSOR 2	SENSOR 2			
MOLE SIEVE A FIRE SENSOR 1	SENSOR 1	PNL 236	MDA/STS FIRE 2	
MOL SIEVE A FIRE SENSOR 2	SENSOR 2			
MOLE SIEVE B FIRE SENSOR 1	SENSOR 1	PNL 237		
MOLE SIEVE B FIRE SENSOR 2	SENSOR 2			
STS HT EXC MOD FIRE SENSOR 1	SENSOR 1	PNL 238		
STS HT EXC MOD FIRE SENSOR 2	SENSOR 2			
OWS COOLING MOD FIRE SENSOR 1	SENSOR 1	PNL 392	AM AFT FIRE 1	AM AFT FIRE
OWS COOLING MOD FIRE SENSOR 2	SENSOR 2		AM AFT FIRE 2	
OWS FWD FIRE SENSOR 1	SENSOR 1	PNL 529	OWS FWD FIRE 1	OWS FWD FIRE
OWS FWD FIRE SENSOR 2	SENSOR 2			
OWS FWD FIRE SENSOR 3	SENSOR 1	PNL 530	OWS FWD FIRE 2	
NOT USED	NOT USED			
EXP COMP FIRE SENSOR 1	SENSOR 1	PNL 618	OWS EXP FIRE 1	OWS EXP FIRE
EXP COMP FIRE SENSOR 2	SENSOR 2			
EXP COMP FIRE SENSOR 3	SENSOR 1	PNL 619	OWS EXP FIRE 2	
NOT USED	NOT USED			
WARD ROOM FIRE SENSOR 1	SENSOR 1	PNL 633	OWS QTRS FIRE 1	OWS CREW QTRS FIRE
WARD ROOM FIRE SENSOR 2	SENSOR 2			
WASTE MGMT AREA FIRE SENSOR	SENSOR 1	PNL 638	OWS QTRS FIRE 2	
SLEEP COMPARTMENT FIRE SENSOR 1	SENSOR 2			
SLEEP COMPARTMENT FIRE SENSOR 2	SENSOR 1	PNL 639		
SLEEP COMPARTMENT FIRE SENSOR 3	SENSOR 2			

RAPID ΔP DETECTOR	INHIBIT SW TITLES PNL 207	INDICATOR TITLE (PNL 207, 616)
ΔP DETECTOR 1	RAPID ΔP 1	RAPID ΔP
ΔP DETECTOR 2	RAPID ΔP 2	

Figure 4.3.8-1 C/W Identification Matrix (Sheet 5)

4.3.9 CSM/MDA INTERFACE

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.9.1 PREPARATION FOR CSM JETTISON FROM MDA AXIAL PORT (4.19.15)	
		4.3.9.2 PREPARATION FOR CSM DOCKING AT MDA RADIAL PORT (4.19.16)	
		4.3.9.3 PREPARATION FOR CSM SEPARATION FROM RADIAL PORT (4.19.17)	
		4.3.9.4 CSM JETTISON	Total time 2 to 2 1/2 hours
		1. ADD MECHANICAL RELEASE TO PROBE	
		2. RELEASE 9 OF 12 DOCKING LATCHES	
		3. INSTALL PROBE AND MODIFIED DROGUE	Stowed in OWS at launch
		4. PRELOAD PROBE	
		5. RELEASE LAST 3 LATCHES (suited)	
		6. DEPRESSURIZE CSM/TUNNEL/MDA (EVA Vent - 30 min)	Vents CM, tunnel, MDA and STS
		7. JETTISON CSM AT CORRECT ORBITAL POSITION USING PROBE SPRING FOR V (hard suited)	Solar Inertial Orbit Noon
		8. CREWMEN REMAIN IN MDA	
		9. REPLACE MODIFIED DROGUE WITH USUAL FLIGHT DROGUE (hard suited)	
		10. CLOSE HATCHES AND REPRESSURIZE (1.7 hours)	

4.3.10 EXPERIMENTS INTERFACE

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.10.07-00)	
		4.3.10.1 S190 WINDOW COVER OPERATION	Window cover is closed at launch and remains closed except when window is in use
		WARNING If the S190 window cover is to be opened for crew observation and not in support of the S190 experiment, verify the S190 window protector is installed	
		1. OPEN WINDOW	
	107	[LOCK] latch - pull to unlock	Latch unlock is required to turn knob at base of window cover latch. Latch located on opposite side of window from S190 control panel
		[LATCH/UNLATCH] knob ccw - UNLATCH	
	108	[LOCK/UNLOCK] handle - UNLOCK	Lock handle for window cover control crank located beside S190 control panel
		[OPEN/CLOSE] knob ccw - OPEN	
	117	WINDOW HEATER AUTO HEAT sw - ON	
		(25.10.08-00)	
		2. CLOSE WINDOW	
	108	[OPEN/CLOSE] knob ccw - CLOSE [LOCK/UNLOCK] handle - LOCK	
	107	[LOCK/UNLATCH] knob cw - LATCH [LOCK] latch - LOCK	
		(25.10.11-00)	
		4.3.10.2 M509 BOTTLE RECHARGE	Flexible umbilical and PSS qd may attain approximately 120°F during and after recharge operations
		WARNING Use of the following procedural sequence is very important in order to preclude disconnecting qd that have 3000 psig of nitrogen	
		1. ERECT RECHARGE SUPPORT ASSEMBLY Remove pip pins (3) Loosen Calfax fastener and rotate aft support assembly A-frame to erect position Repeat preceding operation for forward A-frame Insert pip pins (2), and temporarily stow third pin	This step is A.E. 25.10.01-00
		2. CONNECT PROPELLANT SUPPLY SUBSYSTEM TO RECHARGE SUPPORT ASSEMBLY Open Calfax fasteners (2) on recharge support assembly Position propellant supply subsystem assembly in clamps Tighten Calfax fasteners (regulator side first)	This step is A.E. 25.10.02-00 Bottle fits in recharge support assembly with regulator portion pointing in direction of MDA

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.10.2 M509 BOTTLE RECHARGE (cont'd)	
		Verify:	
	PSS	SUPPLY VALVE - CLOSE	
	390	M509 BOTTLE RECHG FILL vlv - CLOSE (7 1/2 turns, cw)	
		M509 BOTTLE RECHG N2 supply 1-2 vlv - CLOSE (7 1/2 turns, cw)	Precludes loss of N2
		M509 BOTTLE RECHG N2 supply 3-6 vlv - CLOSE (7 1/2 turns, cw)	
		M509 BOTTLE RECHG UMB VENT vlv - OPEN (7 1/2 turns, cw)	Umbilical vent valve must be open to ensure that high-pressure nitrogen does not exist in flexible line
		Remove recharge qd dust cap and attach to Velcro patch on PSS regulator	
	390	Disconnect flexible umbilical from dummy qd	
	PSS	Connect flexible umbilical to propellant supply subsystem recharge qd	
		Restrain umbilical with chained clevis	
		Insert pip pin in clevis	
		3. RECHARGE PROPELLANT SUPPLY SUBSYSTEM M509 BOTTLE	This step is A.E. 25.10.03-00. All pressure valves on panel 390 require 7 1/2 turns to go from full open (close) to full close (open)
	390	M509 BOTTLE RECHG UMB VENT vlv - CLOSE (7 1/2 turns, cw)	
	PSS	SUPPLY VALVE - OPEN	
	390	M509 BOTTLE RECHG N2 supply 3-6 vlv - OPEN (7 1/2 turns, ccw)	
		M509 BOTTLE RECHG FILL vlv - OPEN (7 1/2 turns, ccw)	
		Wait TBS minutes before continuing with procedure	
		M509 BOTTLE RECHG N2 supply 3-6 vlv - CLOSE (7 1/2 turns, cw)	
	PSS	SUPPLY VALVE - CLOSE	
	390	M509 BOTTLE RECHG UMB VENT vlv - OPEN (7 1/2 turns, ccw)	
		M509 BOTTLE RECHG FILL vlv - CLOSE (7 1/2 turns, cw)	
		4. DISCONNECT PROPELLANT SUPPLY SUBSYSTEM	This step is A.E. 25.10.04-00
		NOTE	
		This step allows cool-down of M509 bottle prior to top-off. Re-installation on OWS rack enables recharge of second bottle if required	(F585)
		Remove pip pin from clevis and temporarily stow	
		Release umbilical from chained clevis	
		Disconnect flexible umbilical from propellant supply subsystem recharge qd	
		Connect flexible umbilical to dummy qd	
		Replace recharge qd dust cap	
		CAUTION	
		EVA gloves may be required for handling of the PSS. M509 bottle temperature may exceed 128°F	
		Loosen Calfax fasteners (2) on propellant supply subsystem	
		Remove propellant supply subsystem from recharge support assembly, and stow in OWS propellant supply subsystem stowage rack	(F585)
		Close and tighten Calfax fasteners (2) on recharge station rack	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.10.2 M509 BOTTLE RECHARGE (cont'd)	
		5. COLLAPSE RECHARGE SUPPORT ASSEMBLY Remove pip pins (2) Rotate forward support assembly A-frame to collapsed position Repeat preceding operation for aft A-frame Insert pip pins (3) Tighten Calfax fasteners (2) Wait TBS hour before continuing with procedure	This step is A.E. 25.10.05-00
		6. REPEAT STEP 1	
		7. REPEAT STEP 2	
	390 PSS 390 PSS 390	8. TOP-OFF PROPELLANT SUPPLY SUBSYSTEM M509 BOTTLE M509 BOTTLE RECHG UMB VENT vlv - CLOSE (7 1/2 turns, cw) SUPPLY VALVE - OPEN M509 BOTTLE RECHG N2 supply 1-2 vlv - OPEN (7 1/2 turns, ccw) M509 BOTTLE RECHG FILL vlv - OPEN (7 1/2 turns, cw) Wait TBS minutes before continuing with procedure M509 BOTTLE RECHG N2 supply 1-2 vlv - CLOSE (7 1/2 turns, cw) SUPPLY VALVE - CLOSE M509 BOTTLE RECHG UMB VENT vlv - OPEN (7 1/2 turns, ccw) M509 BOTTLE RECHG FILL vlv - CLOSE (7 1/2 turns, cw)	This step is A.E. 25.10.06-00
		9. REPEAT STEP 4	
		10. REPEAT STEP 5	
		4.3.10.3 (DELETED)	

CREWMAN	PANEL	PROCEDURE		REMARKS
		(25.10.12-00)		
		4.3.10.4 EXPERIMENTS INTERFACE CONTROL AND DISPLAY CONFIGURATION LIST		
		The configuration list defines control and display status for spacecraft C&D elements prior to initiation of experiment operations and subsequent to termination of experiment operations. The nomenclature and abbreviations are consistent with section 4.1, and the positions of the C&D elements are consistent with those defined by the POST ACTIV column in section 4.1.		
	D024	N/A	N/A	N/A
	M071, M073, M074	Panel 613 Circuit Breaker Panel		
		cb EXPS WMC SMMD	closed	closed
		cb EXPS WARDRM SMMD	closed	closed
		cb EXPS M172 BMMD	closed	closed
		Panels 702, 801 Intercom Box		
		Rcd lt	off	off
		CHAN A, B sel (2)	OFF	OFF
		CHAN A, B receptacles (2)	capped	capped
		Panel 825 Fecal/Urine Collector		
		BLWR/SEPARATOR BUS 1 (2) PWR - 1-3 sw (6)	OFF	OFF
		drawer 1-3 AIRFLOW vlv (3)	CLOSE	CLOSE
		drawer 1-3 INLET DOOR (3)	closed	closed
		drawer 1-3 DRAWER locking handle (3)	LOCK	LOCK
	M092	Panel 613 Circuit Breaker Panel		
		cb EXPS BUS 1, 2 ESS (2)	closed	closed
		Panel 617 Control Panel		
		INSTR SYS MODE SEL EXP 1	E	E
		INSTR SYS MODE SEL EXP 2	H	H
		INSTR TAPE RCDRS EXP 1, 2 lts (2)	off	off
		Panel 620 ESS Exp M171 N2 Panel		
		ESS SUP vlv	CLOSE	CLOSE
		Panel 625 Exp M092 Vent Valve		
		M092 LBNP VACUUM VENT vlv	CLOSE	CLOSE

CREWMAN	PANEL	PROCEDURE		REMARKS
		4.3.10.4 EXPERIMENTS INTERFACE CONTROL AND DISPLAY CONFIGURATION LIST (cont'd)		
	M093	Panels 613, 617, 620	See M092	See M092
	M131	Panel 613		
		Circuit Breaker Panel		
		cb EXPS M131 CHAIR	closed	closed
		Panel 617	See M092	See M092
	M133	Panel 551		
		Power Outlet		
		HI PWR ACC OUTLETS 5, 6 (2)	capped	capped
		Panel 901		
		Intercom Box		
		Rcd lt	off	off
		CHAN A, B sel (2)	OFF	OFF
		CHAN A, B receptacles (2)	capped	capped
	M151	Panels 104, 112, 134, 140		
		Utility Outlet		
		UTIL OUTLET 1-4 sw (4)	OFF	OFF
		UTIL OUTLET 1-4 (4)	capped	capped
		Panels 213, 214, 219, 221, 316, 390		
		Utility Outlet		
		UTIL PWR 1-6 sw (6)	OFF	OFF
		UTIL PWR outlet 1-6 (6)	capped	capped
		Panels 402, 521, 803		
		Power Outlet		
		UTIL OUTLETS 1, 2 (6)	capped	capped
		HI PWR ACC OUTLETS 1, 2 (6)	capped	capped
		Panel 531		
		Power Outlet		
		UTIL OUTLETS 3, 4 (2)	capped	capped
		HI PWR ACC OUTLETS 3, 4 (2)	capped	capped
		Panel 551		
		Power Outlet		
		UTIL OUTLETS 5, 6 (2)	capped	capped
		HI PWR ACC OUTLETS 5, 6 (2)	capped	capped
		Panels 601, 711		
		Power Outlet		
		UTIL OUTLETS 1, 2 (4)	capped	capped

CREWMAN	PANEL	PROCEDURE		REMARKS
		4.3.10.4 EXPERIMENTS INTERFACE CONTROL AND DISPLAY CONFIGURATION LIST (cont'd)		
		Panel 628 Power Outlet		
		UTIL OUTLETS 3, 4 (2)	capped	capped
		Panel 631 Power Outlet		
		UTIL OUTLETS 5, 6 (2)	capped	capped
		HI PWR ACC OUTLETS 1, 2 (2)	capped	capped
	M171	Panels 613, 617	See M092	See M092
		Panel 620 ESS Exp M171 N2 Panel		
		ESS SUP vlv	CLOSE	CLOSE
		M171 SUP vlv	CLOSE	CLOSE
		Panel 625	See M092	See M092
	M172	Panel 613 Circuit Breaker Panel		
		cb EXPS M172 BMMD	closed	closed
		Panel 702	See M071	See M071
	M479	Panel 103 Vent Panel		
		M512 BAT VENT VLV	OPEN	OPEN
		Panel 115 High Power Accessory Outlet		
		HI PWR ACC OUTLET 1 sw	OFF	OFF
		HI PWR ACC OUTLET 1	capped	capped
		Panel 116 Intercom Box		
		Rcd lt	off	off
		CHAN A, B sel (2)	OFF	OFF
		CHAN A, B receptacles (2)	capped	capped
		Panel 202 Circuit Breaker Panel		
		cb M512	open	open
	M509	Panel 540 Intercom Box		
		Rcd lt	off	off
		CHAN A, B sel (2)	OFF	OFF
		CHAN A, B receptacles (2)	capped	capped

CREWMAN	PANEL	PROCEDURE		REMARKS
		4.3.10.4 EXPERIMENTS INTERFACE CONTROL AND DISPLAY CONFIGURATION LIST (cont'd)		
		Panel 542 Control Panel		
		TAPE RCDRS EXP 1, 2 lt (2)	off	off
		Panel 613 Circuit Breaker Panel		
		cb EXPS M509	closed	closed
		Panel 617	See M092	See M092
	M512	Panels 103, 115, 116, 202	See M479	See M479
	S009	Panel 202 Circuit Breaker Panel		
		cb S009	open	open
	S019	Panel 540	See M509	See M509
		Panel 543 Scientific Airlock (-Z)		
		SAL PRESS vlv	CLOSE VENT (SL-3,4)	CLOSE VENT (SL-3,4)
		HANDLE RELEASE	EXP LOCK	EXP LOCK
		door crank lock	LOCKED	LOCKED
		DOOR crank	CLOSE OPEN (SL-3,4)	CLOSE OPEN (SL-3,4)
		Panel 613 Control Panel		
		cb LTG (all)	closed	closed
	S020	Panel 517 Scientific Airlock (+Z)		
		SAL PRESS vlv	CLOSE	CLOSE
		HANDLE RELEASE	EXP LOCK	EXP LOCK
		door crank lock	LOCKED	LOCKED
		DOOR crank	CLOSE	CLOSE
		Panel 520 Intercom Box		
		Rcd lt	off	off
		CHAN A, B sel (2)	OFF	OFF
		CHAN A, B receptacles (2)	capped	capped
	S052	TBS		
	S054	TBS		
	S055A	TBS		

CREWMAN	PANEL	PROCEDURE		REMARKS
		4.3.10.4 EXPERIMENTS INTERFACE CONTROL AND DISPLAY CONFIGURATION LIST (cont'd)		
	S056	TBS		
	S063	Panels 517, 520	See S020	See S020
		Panel 540	See M509	See M509
		Panel 543	See S019	See S019
		Panel 544 Power Outlet		
		-Z SAL OUTLETS S063 UV SYNC	capped	capped
		Panel 613 Circuit Breaker Panel		
		cb LTG (all)	closed	closed
		Panel 701 Experiment S063 UV		
		SYNC OUTLET	capped	capped
	S073	Panel 517	See S020	See S020
		Panel 518 Power Outlet		
		+Z SAL OUTLETS PWR 1, 2 (2)	capped	capped
		+Z SAL OUTLETS INST	capped	capped
		Panel 520	See S020	See S020
		Panels 540, 542	See M509	See M509
		Panel 543	See S019	See S019
		Panel 544 Power Outlet		
		-Z SAL OUTLETS PWR 1, 2 (2)	capped	capped
		-Z SAL OUTLETS INST	capped	capped
		Panel 613 Circuit Breaker Panel		
		cb EXPS SAL -Z, +Z OUTLET 1 (2)	closed	closed
		cb EXPS SAL -Z, +Z OUTLET 2 (2)	closed	closed
		Panel 617	See M092	See M092
	S082A	TBS		
	S082B	TBS		

CREWMAN	PANEL	PROCEDURE		REMARKS
		4.3.10.4 EXPERIMENTS INTERFACE CONTROL AND DISPLAY CONFIGURATION LIST (cont'd)		
	S149	Panel 202		
		Circuit Breaker Panel		
		cb SAL 1 CNTL 1	closed	closed
		cb SAL 2 CNTL 2	closed	closed
		Panel 540	See M509	See M509
		Panel 543	See S019	See S019
		Panels 544, 613	See S073	See S073
		Panel 617	See M092	See M092
	S183	Panels 540, 542, 543	See M509	See M509
		Panels 544, 613	See S073	See S073
		Panel 617	See M092	See M092
	S190	Panel 117		
		Window Heater		
		WINDOW HEATER AUTO HEAT sw	ON	ON
		Panel 135		
		EREP Coolant Valve	BYPASS	BYPASS
		Panel 202		
		Circuit Breaker Panel		
		cb EREP PWR CNTL 1, 2 (2)	closed	closed
		cb EREP PNL PWR	closed	closed
		cb ER S190 1-3 (3)	closed	closed
		cb ER WINDW HTR	closed	closed
	S191	Panel 135	See S190	See S190
		Panel 202		
		Circuit Breaker Panel		
		cb EREP PWR CNTL 1, 2 (2)	closed	closed
		cb EREP PNL PWR	closed	closed
		cb ER S191 VTS	closed	closed
		cb ER S191 SPECT	closed	closed
	S192	Panel 135	See S190	See S190

CREWMAN	PANEL	PROCEDURE		REMARKS
		4.3.10.4 EXPERIMENTS INTERFACE CONTROL AND DISPLAY CONFIGURATION LIST (cont'd)		
		Panel 202 Circuit Breaker Panel		
		cb EREP PWR CNTL 1, 2 (2)	closed	closed
		cb EREP PNL PWR	closed	closed
		cb ER S192	closed	closed
	S193	Panel 135	See S190	See S190
		Panel 202 Circuit Breaker Panel		
		cb EREP PWR CNTL 1, 2 (2)	closed	closed
		cb EREP PNL PWR	closed	closed
		cb ER S193 1	closed	closed
		cb ER S193 HTR	closed	closed
	S194	Panel 135	See S190	See S190
		Panel 202 Circuit Breaker Panel		
		cb ER S194 HTR	closed	closed
		Panel 520	See S020	See S020
	T002	Panel 630 Control Panel		
		LTS WARDRM [1•3] sw	1•3	1•3
		LTS WARDRM [2•4] sw	2•4	2•4
		Panel 702	See M071	See M071
	T013	Panel 521	See M151	See M151
		Panels 540, 542	See M509	See M509
		Panel 613 Circuit Breaker Panel		
		cb EXPS T013	OPEN	OPEN
		Panel 617	See M092	See M092
	T020	Panel 540	See M509	See M509
	T025	Panels 517, 520	See S020	See S020
	T027	Panel 517	See S020	See S020

CREWMAN	PANEL	PROCEDURE	REMARKS	POWER (WATTS) 26.0V	POWER (WATTS) 30.0V
		4.3.10.4 EXPERIMENTS INTERFACE CONTROL AND DISPLAY CONFIGURATION LIST (cont'd)			
		Panel 518 See S073	See S073		
		Panel 520 See S020	See S020		
		Panels 540, 542 See M509	See M509		
		Panel 543 See S019	See S019		
		Panel 544 See S073	See S073		
		Panel 617 See M092	See M092		
		(25.10.10-00)			
		4.3.10.5 EXPERIMENTS INTERFACE POWER DOWN			
		1. CONFIGURE CIRCUIT BREAKER PANELS			
	202	cb M512 - open		TBS	TBS
		cb NOISE BURST ANT - open		TBS	TBS
		cb PROT SPECT - open		TBS	TBS
		cb S009 - open (verify)		TBS	TBS
		cb ER EREP PWR CNTL 1, 2 (2) - open		TBS	TBS
		cb ER PNL PWR - open		TBS	TBS
		cb ER RCDR 1, 2 (2) - open		TBS	TBS
		cb ER S190 1-3 (3) - open		TBS	TBS
		cb ER WINDW HTR - open		TBS	TBS
		cb ER S191 VTS, SPECT (2) - open		TBS	TBS
		cb ER S192 - open		TBS	TBS
		cb ER S193 1, HTR (2) - open		TBS	TBS
		cb ER S194 HTR - open		TBS	TBS
	613	cb EXPS (all) (12) - OPEN		TBS	TBS
		2. CONFIGURE CONTROL PANELS			
	607	FLARE ALERT sw - OFF		TBS	TBS
	617	INSTR SYS MODE SEL EXP 1 - E		TBS	TBS
		INSTR SYS MODE SEL EXP 2 - H		TBS	TBS
		INSTR SYS TAPE RCDRS EXP 1, 2 sw (2) - OFF Verify INSTR SYS TAPE RCDRS EXP 1, 2 lt (2) - off	Momentary switches	TBS	TBS
	204	Repeat preceding operation if INSTR SYS TAPE RCDRS EXP 1, 2 lt (2) not off			

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.10.13-00)	
		4.3.10.6 M512 WATER QUENCH	
		1. OBTAIN WET 60-FOOT WATER SERVICE UMBILICAL AND WATER RELIEF VALVE	(TBS), (TBS)
		2. CONFIGURE QUENCH WATER SUPPLY SYSTEM Connect WATER RELIEF VALVE to WATER SERVICE UMBILICAL qd Remove captive cap from WATER OUTLET qd (water tank TBS) Connect WATER SERVICE UMBILICAL qd to WATER OUTLET qd (water tank TBS)	
		3. CONFIGURE M512 FACILITY	(TBS)
		4. SUPPLY WATER FOR M512 QUENCH WATER OUTLET vlv (water tank TBS) - OPEN WATER SERVICE UMBILICAL vlv - OPEN Configure M512 facility for water supply	
		5. TERMINATE WATER SUPPLY FOR M512 QUENCH Configure M512 facility to terminate water supply WATER SERVICE UMBILICAL vlv - CLOSE WATER OUTLET vlv (water tank TBS) - CLOSE	
		6. RECONFIGURE QUENCH WATER SUPPLY SYSTEM Disconnect WATER SERVICE UMBILICAL qd from WATER OUTLET qd Replace captive cap on WATER OUTLET qd Disconnect WATER RELIEF VALVE from WATER SERVICE UMBILICAL	
		7. STOW WATER SERVICE UMBILICAL AND WATER RELIEF VALVE	(TBS), (TBS)

4.3.11 (DELETED)

4.3.12 REFRIGERATION SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(26.12.01-00) 4.3.12.1 RS PERIODIC CHECK 1. PERFORM RS PERIODIC CHECK RS FREEZER DISP SEL - HT SINK OUTLETS PRI RS TEMP freezer ind - -40 to 0°F RS freezer DISP SEL - URINE FREEZER RS TEMP freezer ind - -18 to -5°F RS freezer DISP SEL - WARDRM FREEZER 1 RS TEMP freezer ind - -20 to 0°F Repeat two preceding operations for WARDROOM FREEZER 2 selector position RS freezer DISP SEL - STOWAGE FREEZER 1 RS TEMP freezer ind - -20 to 0°F Repeat two preceding operations for STOWAGE FREEZER 2 and 3 selector positions RS freezer DISP SEL - OFF RS chiller DISP SEL - WATER CHILLER PRI RS TEMP chiller ind - 33 to 45°F RS chiller DISP SEL - FOOD CHILLER RS TEMP chiller ind - 33 to 45° F RS chiller DISP ind - URINE CHILLER 1 RS TEMP chiller ind - 33 to 59°F Repeat two preceding operations for URINE CHILLER 2 and 3 selector position RS chiller DISP SEL - OFF NOTE HEAT SINK OUTLETS secondary and WATER CHILLER secondary temperature indications are invalid except when secondary loop is operative and loop temperature is stabilized RS PRI LOOP PUMPS 1-4 sw (4) - AUTO (verify) RS SEC LOOP PUMPS 1-4 sw (4) - AUTO (verify) (25.12.01-00) 4.3.12.2 PUMP SELECTION NOTE Pump selection will be performed at following times: SL-2 Deactivation - Pump 1 off SL-3 Activation - Pump 2 off SL-3 Deactivation - Pump 3 off	When a pump is switched off, the next pump in sequence automatically switches on

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.12.2 PUMP SELECTION (cont'd)	
	616	1. CONFIGURE REFRIGERATION SYSTEM RS PRI LOOP PUMPS 1-4 sw (4) - AUTO (verify) RS SEC LOOP PUMPS 1-2 sw (4) - AUTO (verify) RS PRI LOOP PUMPS 1, 2, or 3 sw - OFF (as required) RS PRI LOOP PUMP LO Δ P lt - on RS STATUS RESET sw - reset RS PRI LOOP PUMP LO Δ P lt - off RS PRI LOOP PUMPS 1 (2,3) sw - AUTO	Pump selection per activation/deactivation requirements At first opportunity, ground will verify proper pump configuration Return deactivated pump to auto
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X MANUAL OPERATION X X X	
		NOTE To disable the automatic control of the RS, it is necessary to switch desired pump to the "ON" position	This will disable all automatic switching of pumps, but automatic switching control sensors will still track operation of RS and flag any anomalies
	616	RS PRI LOOP PUMPS 1, 2, 3, or 4 sw - ON or RS SEC LOOP PUMPS 1, 2, 3, or 4 sw - ON Perform RS check (4.3.12.1)	Switch desired pump to the "ON" position
		NOTE To return RS to the automatic mode, the "ON" pump is switched to the "OFF" position, allowing the following numbered pump to activate in the automatic mode	
		RS PRI LOOP PUMPS 1, 2, 3, or 4 sw - OFF or RS SEC LOOP PUMPS 1, 2, 3, or 4 sw - OFF RS PRI (SEC) LOOP PUMP LO Δ P lt - on X RS STATUS RESET sw - reset X X RS PRI (SEC) LOOP PUMP LO Δ P lt - off X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Switch "ON" pump to "OFF" position
		NOTE Wait TBS minutes before proceeding to allow the system to stabilize	
		2. RS VERIFICATION Perform RS check (4.3.12.1)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.12.01-00) 4.3.12.3 REFRIGERATION SYSTEM VENT VALVE OPERATION NOTE REFRIG PUMP PKG VACUUM VENT VLV is normally open. If a need arises to shut or reopen valve, the following procedure should be performed. See tool matrix for tool requirements (Appendix C). The following items are required during the performance of this procedure: utility cable, portable light, universal mount	(D418) (D418) (E621)
	803	1. ACCESS TO VENT VALVE Unscrew screws (15) in access cover located in sleep compartment (spin-type handle and 5/32 hex driver bit) Remove access cover Obtain portable light and utility cable Perform portable light operation (4.3.15.1, steps 3, 4) using UTILITY OUTLETS 1 on panel 803 Don bump helmet Translate to plenum area below crew quarters	For protection of head while in plenum area below crew quarters
		CAUTION Take care in placing hands and feet on waste tank bulkhead surfaces so as not to damage sensors and equipment in adjacant areas. Restrain all items in aft compartment securely since air turbulence may move parts to remote areas of plenum area Attach portable light universal mount to plenum area handrail	
	1001	2. CLOSE (REOPEN) VENT VALVE REFRIG PUMP PKG VACUUM VENT VLV - CLOSE (OPEN) Remove portable light universal mount Return to sleep compartment Perform portable light operation (4.3.15.1, steps 5, 6) Close access cover in sleep compartment Screw screws (15) in access cover (spin-type handle and 5/32 hex driver bit)	
		(25.12.02-00) 4.3.12.4 REFRIGERATION SYSTEM POWER DOWN CAUTION This procedure should not be performed unless OA is in solar inertial attitude	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.12.4 REFRIGERATION SYSTEM POWER DOWN (cont'd)	
			POWER (WATTS) 26.0V 30.0V
		1. CONFIGURE CIRCUIT BREAKER PANELS	
	611	cb RS SEC LOOP PWR FEEDERS 1-4 (4) - OPEN	28.3 37.7
		cb RS PRI LOOP CONTRS REGEN HTR - OPEN	7.8 10.3
	614	cb HSS WARDROOM H2O HTR - OPEN	
		2. CONFIGURE CONTROL PANEL	
		Verify with MSFN which pump operational	
	616	Operational RS PRI (SEC) LOOP PUMP sw - ON	
		NOTE	
		If power down period for extended time (> TBS) perform steps 3-6; otherwise perform step 7	
		3. DEACTIVATE WARDROOM WATER SYSTEM	
		TBS	
		4. ACTIVATE PORTABLE WATER TANK FOR WARDROOM WATER SUPPLY	
		Fill portable water tank (4.3.13.5, step 3)	
		Supply water to wardroom (4.3.13.5, step 5)	
		5. DEACTIVATE URINE SYSTEM	
		Sample urine and process (4.3.14.7, steps 1-5)	
		Remove and dispose of urine bags (4.3.14.7, steps 6, 8)	
		6. UTILIZE CONTINGENCY URINE COLLECTION SYSTEM	
		Obtain urine bag(s) and receiver-adapters	(TBS)
		Utilize urine collection bags as required	
		Dispose of urine collection bags (4.3.14.3)	
		7. MONITOR SYSTEM FOR DEGRADATION	
	616	RS chiller DISP SEL - PRI (SEC) WATER INLETS	
		RS TEMP chiller ind - monitor for ≥ 32.5°F (perform if steps 3-6 bypassed)	
	611	If < 32.5°F - cb RS PRI LOOP CONTRS REGEN HTR - close	
		Monitor RS TEMP chiller ind - > 36°F, then cb RS PRI LOOP CONTRS REGEN HTR - OPEN	
	616	Monitor status lights periodically	
		If PUMP LOW ΔP - on, switch next RS PUMPS sw - ON	
		If ACCUM LOW - on, switch to secondary loop	

4.3.13 FOOD AND POTABLE WATER SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.1 WATER PURIFICATION	
		NOTE The following items are required during the performance of this procedure: utility wipe	Utility wipe is used to absorb any residual water/iodine solution upon separation of connectors
		(25.13.01-00)	
	F505	1. BLEED AIR FROM WATER PURIFICATION EQUIPMENT (INITIAL USE ONLY) H2O PURIFICATION EQUIP container BREATHER VLV - depress Unlatch dial latches (3) on H2O PURIFICATION EQUIP container and open door Unscrew WATER SAMPLER 1 WATER SAMPLER 1 vlv - OPEN	All valves used in this procedure have integral latches that must be depressed prior to opening only
		WATER SAMPLER 1 vlv - CLOSE Return WATER SAMPLER 1 to stowage Repeat four preceding operations for WATER SAMPLER 2 Unscrew IODINE INJ 1 IODINE INJ 1 vlv - OPEN IODINE INJ 1 vlv - CLOSE Return IODINE INJ 1 to stowage Repeat four preceding operations for IODINE INJ 2 Remove captive cap on WASTE SAMPLE CONTAINER vlv WASTE SAMPLE CONTAINER vlv - OPEN WASTE SAMPLE CONTAINER vlv - CLOSE Replace captive cap on WASTE SAMPLE CONTAINER vlv	
		(25.13.02-00)	
		2. OBTAIN WATER SAMPLE Unlatch dial latches (3) on H2O PURIFICATION EQUIP container and open door (if required) Unscrew WATER SAMPLER 1	Time at which sampling is to be performed TBS
		Water tank SAMPLE PORT vlv - CLOSE (verify) Remove captive cap from SAMPLE PORT on water tank to be tested Screw WATER SAMPLER 1 onto water tank SAMPLE PORT WATER SAMPLER 1 vlv - OPEN	Water tank to be tested All valves used in this procedure have integral latches that must be depressed prior to opening only
		Water tank SAMPLE PORT vlv - OPEN WATER SAMPLER 1 plunger - withdraw until bottomed out Water tank SAMPLE PORT vlv - CLOSE WATER SAMPLER 1 vlv - CLOSE Unscrew WATER SAMPLER 1 from water tank SAMPLE PORT Replace captive cap on water tank SAMPLE PORT	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.1 WATER PURIFICATION (cont'd)	
		3. OBTAIN REAGENT SOLUTION	
		REAGENT CONTAINER 1 vlv - CLOSE (verify)	
		Remove captive cap from REAGENT CONTAINER 1 outlet port in H2O PURIFICATION EQUIP container	
		Screw WATER SAMPLER 1 onto REAGENT CONTAINER 1 outlet port	
		WATER SAMPLER 1 vlv - OPEN	
		REAGENT CONTAINER 1 vlv - OPEN	
		Rotate plunger ccw to stop while restraining body of WATER SAMPLER 1	Allows appropriate amount of reagent to enter sampler
		REAGENT CONTAINER 1 vlv - CLOSE	
		WATER SAMPLER 1 vlv - CLOSE	
		Wait 10 minutes	
		Unstow COLOR COMPARATOR from H2O PURIFICATION EQUIP container and temporily stow in jacket pocket	Held in place by Calfax fastener
		Unscrew WATER SAMPLER 1 from REAGENT CONTAINER 1 port	
		Replace captive cap on REAGENT CONTAINER 1 outlet port	
		4. PERFORM COLOR COMPARISON	
		Maneuver to general illumination floodlight	
		Unstow COLOR COMPARATOR from jacket pocket	
		Align window in WATER SAMPLER with corresponding portion of COLOR COMPARATOR	Color comparator has seven windows and eight color standards. By aligning comparator with sampler windows, crewman can see which color on comparator most closely corresponds with color of solution
		Make color comparison to determine iodine concentration of water tank	
		Record iodine concentration	
		Determine if water tank requires injection of iodine	A chart is provided on H2O PURIFICATION EQUIP container door that will indicate appropriate amount of iodine to be injected for various tank volumes and levels of concentration. Level of iodine should be maintained between TBS to 6 ppm
		Stow COLOR COMPARATOR in H2O PURIFICATION EQUIP container	
		WASTE SAMPLE CONTAINER vlv - CLOSE (verify)	
		Remove captive cap from WASTE SAMPLE CONTAINER inlet port on H2O PURIFICATION EQUIP container	
		Screw WATER SAMPLER 1 onto WASTE SAMPLE CONTAINER inlet port	
		WATER SAMPLER 1 vlv - OPEN	
		WASTE SAMPLE CONTAINER vlv - OPEN	
		Rotate plunger cw until threads disengage	
		Push plunger to stop and hold	
		WATER SAMPLER 1 vlv - CLOSE	Injects water/reagent solution into waste sample container
		Release plunger	
		WASTE SAMPLE CONTAINER vlv - CLOSE	
		Unscrew WATER SAMPLER 1 from WASTE SAMPLE CONTAINER inlet port	
		Replace captive cap on WASTE SAMPLE CONTAINER inlet port	
		Stow WATER SAMPLER 1 in H2O PURIFICATION EQUIP container	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.1 WATER PURIFICATION (cont'd)	
		NOTE If iodine injection is not required, this completes procedure. If iodine injection is required, continue to step 5	
		(25.13.03-00)	
		5. OBTAIN IODINE IN INJECTOR	When used for 100 ppm soak, 40 units of iodine is required
		Unscrew IODINE INJECTOR 1 from stowage IODINE CONTAINER 1 PORT A vlv - CLOSE (verify) Remove captive cap from IODINE CONTAINER 1 PORT A outlet Screw empty IODINE INJECTOR onto IODINE CONTAINER 1 PORT A outlet IODINE INJECTOR 1 - "o" (zero) units (verify) IODINE INJECTOR 1 vlv - OPEN IODINE CONTAINER 1 PORT A vlv - OPEN Rotate IODINE INJECTOR rear cap ccw to iodine units to be injected	Scale on outside of injector indicates amount of iodine within injector
		IODINE CONTAINER 1 PORT A vlv - CLOSE IODINE INJ 1 vlv - CLOSE Remove IODINE INJ 1 from IODINE CONTAINER PORT A and replace captive cap on IODINE CONTAINER 1 PORT A outlet	
		6. INJECT IODINE Water tank tested IODINE INJ PORT vlv - CLOSE (verify) Remove captive cap from IODINE INJ PORT Screw IODINE INJECTOR 1 on to water tank IODINE INJ PORT IODINE INJECTOR vlv - OPEN Water tank IODINE INJ PORT vlv - OPEN Rotate IODINE INJECTOR 1 rear cap cw to inject iodine into water tank Water tank IODINE INJ PORT vlv - CLOSE IODINE INJECTOR 1 vlv - CLOSE Release water agitator pump handle	To release water agitator, push agitator pump handle down and turn 180 degrees to release slot
		Pump water agitator handle vigorously eight times Restore water agitator pump handle to secured position Unscrew IODINE INJECTOR 1 from water tank INJ PORT Replace captive cap on water tank IODINE INJ PORT Stow IODINE INJ 1 in H2O PURIFICATION EQUIP container Close H2O PURIFICATION EQUIP door and secure three dial latches	
		(25.13.04-00)	
		4.3.13.2 H2O GUN OPERATION	
		NOTE Each astronaut will use only his own designated H2O gun	
	705	1. DISPENSE WATER FROM H2O GUN Open H2O gun access door Remove H2O gun from holster and place H2O gun resupply in mouth	

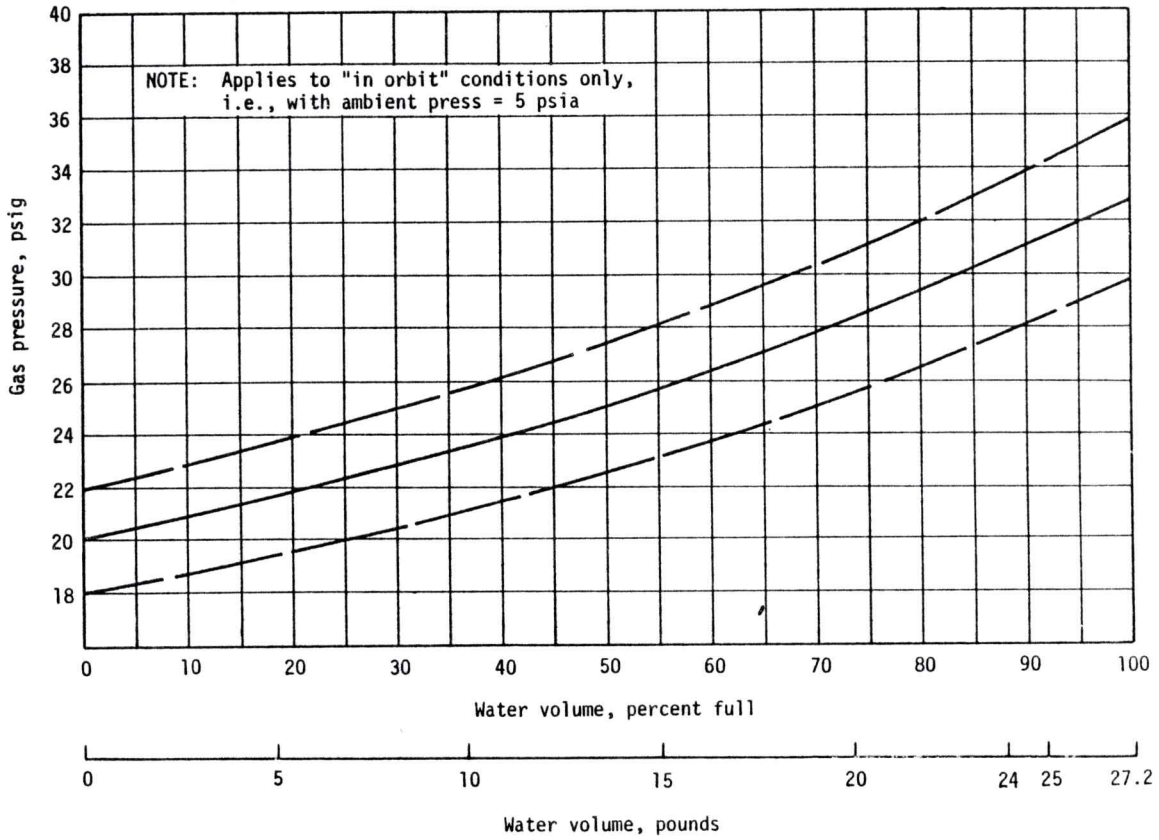
CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.2 H2O GUN OPERATION (cont'd)	
	705	H2O gun trigger - rotate	Dispenser fills with half oz of water
		H2O gun trigger - release	Water flows into mouth
		Replace H2O gun in holster	Record data from 3-digit counter mounted on dispenser handle once every 24 hours
		Close H2O gun access door	
		(25.13.26-00)	
		4.3.13.3 H2O GUN RESUPPLY REPLACEMENT	
		NOTE H2O gun resupplys are replaced at the beginning of the SL-3 and SL-4 missions. See tool matrix for tool requirements (Appendix C)	
		1. REMOVE H2O GUN RESUPPLY	This step is A.E. 25.13.20-00
	705	Open H2O gun access door	
		Remove H2O gun from holster	
		Loosen jamnut from H2O gun resupply (5/16 open end/box)	
		Unscrew H2O gun resupply from H2O gun	
		Dispose of H2O gun resupply in trash bag	
		2. REPLACE H2O GUN RESUPPLY	This step is A.E. 25.13.21-00 (D438)
		Obtain replacement H2O gun resupply	
		Screw H2O gun resupply onto H2O gun	
		Tighten jamnut against H2O gun resupply (5/16 open end/box)	
		Replace H2O gun in holster	
	705	Close H2O gun access door	
		(25.13.05-00)	
		4.3.13.4 WARDROOM H2O DISPENSER VALVE OPERATION	
		1. FILL AND DISPENSE WARDROOM H2O DISPENSER VALVE	
		Obtain food package from galley	
		Set HOT (COLD) H2O volume select to appropriate level	Each food package contains instructions on amount of water to be used for hydration. Record amount water used only if crewman deviates from directions.
		HOT (COLD) [DISPENSE/CHARGE] vlv - CHARGE	Observe volume indicator until H2O dispenser is filled to appropriate level
		Attach food package to wardroom H2O dispenser valve tip	
		HOT (COLD) [DISPENSE/CHARGE] vlv - DISPENSE	
		HOT (COLD) wardroom H2O dispenser vlv - depress	Observe volume indicator as water is dispensed into food package. When H2O dispenser has emptied, remove food package
		Detach food package from wardroom H2O dispenser valve tip	
		HOT (COLD) volume select - LOCK	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.13.05-XX)	
		4.3.13.5 PORTABLE WATER TANK OPERATION	
		NOTE Removal of launch restraints is a constraint on the performance of this procedure. Perform the following steps as required.	
		(25.13.06-00)	
		1. UNSTOW PORTABLE WATER TANK Verify launch restraints removed Release astropin and remove tank from bracket Temporarily stow at desired location and secure with astropin	
		(25.13.07-00)	
		2. PORTABLE WATER TANK N2 PRESSURE VERIFICATION N2 PRESS ind - 20 ± 2 psig	Normal operating range for dry (empty) portable water tank
		NOTE N2 pressure must be relieved to attain 20 ± 2 psig prior to initial water filling. Thereafter, pressure greater than 22 psig indicates water in tank	
		N2 PRESS ind > 22 psig VENT vlv - PUSH TO VENT until N2 PRESS ind pressure decreases to 20 ± 2 psig	Observe N2 PRESS indicator until pressure decreases to 20 ± 2 psig
		VENT vlv - release After TBS minutes, verify N2 pressure - 20 ± 2 psig	
		NOTE The following items are required during the performance of this procedure: NITROGEN FILL hose	(TBS)
		Obtain NITROGEN FILL hose	(TBS)
		Remove captive caps on NITROGEN FILL hose PRESS VLV - CLOSED (verify) Remove captive cap on PRESS PORT qd Connect NITROGEN FILL hose to PRESS PORT qd	Located on portable water tank

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
		XXXX XXXX	
		X X	
	500	X Remove captive cap from 35 PSI N2 PORTABLE WATER TANK PRESS qd X	
		X Connect NITORGEN FILL hose remaining qd to 35 PSI N2 PORTABLE WATER TANK PRESS qd X	
		PRESS VLV - OPEN until N2 PRESS ind pressure is 20 ± 2 psig	
		PRESS VLV - CLOSE	
		Disconnect NITROGEN FILL hose from 35 PSI N2 PORTABLE WATER TANK PRESS qd	
		Disconnect NITROGEN FILL hose from PRESS PORT qd	
		Replace captive caps on NITROGEN FILL hose, 35 PSI N2 PORTABLE	
		X WATER TANK PRESS qd and PRESS PORT qd X	
		X Stow NITROGEN FILL hose X	(TBS)
		X X	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
		XXXX XXXX X X X CAUTION X X Do not continue until water dump lines have been preheated for 15 X minutes as indicated by tone portable timer	
		Open WATER DUMP VALVE access door	
	706	WATER DUMP vlv - OPEN	Evacuates CAT ION (CONTINGENCY) hose
	700	H2O DUMP PRESS ind- $\leq$ 0.7 psia	
	706	WATER DUMP vlv - CLOSE	
	700	H2O DUMP HTR sw - OFF	
		H2O DUMP HTR lt - off	
	617	DUMP HTR lt - off	
		Disconnect CAT ION (CONTINGENCY) hose qd from dump line qd	
		Connect dump line qd to DUMP LINE STOWAGE qd	
		Replace captive cap on CAT ION (CONTINGENCY) hose qd	
	705	Close WATER HEATER and WATER DUMP VALVE access door	
		Return thigh restraints to vertical down position	
		Return food tray to food table and latch (2) in position	
		Connect CAT ION (CONTINGENCY) hose female qd to male qd on cat ion cartridge qd	
		Remove captive cap on WATER OUTLET qd	Located on portable water tank
		Disconnect wardroom hose qd from WARDROOM WATER qd	
		Replace captive cap on WARDROOM WATER qd	
		Connect WARDROOM 1 hose male qd to cat ion assembly qd	
		Connect released captive caps together	
		NOTE	
		If continued refilling of portable water tank for wardroom backup use is required, start refill procedure at this point	Previous tasks need not be performed for refill if above configuration is maintained
		Connect male qd of CAT ION (CONTINGENCY) hose to WATER OUTLET qd	Portable water tank
		WATER OUTLET vlv (water tank 1) - OPEN	
		WATER OUTLET vlv - OPEN	Portable water tank
		Monitor N2 PRESS ind to determine when portable water tank is full (30-40 psig)	See Figure 4.3.13.4
		WATER OUTLET vlv (water tank 1) - CLOSE	
		WATER OUTLET vlv - CLOSE	Portable water tank
		Disconnect mated captive caps of CAT ION (CONTINGENCY) hose qd from cat ion cartridge qd	
		Disconnect CAT ION (CONTINGENCY) hose qd from cat ion cartridge qd	
		X Replace captive caps on CAT ION (CONTINGENCY) hose qd and X X cat ion cartridge qd X X X XXXX XXXX	Portable water tank is filled and ready for use in wardroom

Figure 4.3.13.5 PORTABLE WATER TANK % FULL



CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
		XXXX XXXX X X X NOTE X X Continue to step 4 only if this is a one-time fill or no require- X ment for a continuous wardroom backup exists. Otherwise, bypass step 4 and maintain above configuration for refilling portable water tank	
		4. RETURN WARDROOM WATER SYSTEM TO NORMAL CONFIGURATION Disconnect WARDROOM 1 hose qd from cat ion qd Remove captive cap on WARDROOM WATER qd Connect WARDROOM 1 hose qd to WARDROOM WATER qd Return cat ion cartridge to brackets located under LBNP assembly Disconnect cat ion cartridge bypass hose qd Connect demated bypass hose qd to cat ion cartridge qd WATER OUTLET vlv (water tank 1) - OPEN (25.13.10-00)	
		5. SUPPLY WATER TO WARDROOM NOTE The following items are required during the performance of this procedure: Portable tank/H2O gun adapter, H2O gun and washcloth Obtain full portable water tank (step 3) and secure to forward compartment grid floor above center of food preparation table Obtain portable tank/H2O gun adapter Pass CAT ION (CONTINGENCY) hose female qd through grid into wardroom Remove captive cap on CAT ION (CONTINGENCY) hose female qd Connect H2O gun qd to portable tank/H2O gun adapter qd Connect portable tank/H2O gun adapter qd to CAT ION (CONTINGENCY) hose female qd WATER OUTLET vlv - OPEN H2O gun trigger - rotate H2O gun trigger - release Bleed H2O gun into washcloth by discharging H2O gun two additional times Squeeze washcloth in washcloth squeezer Hang washcloth in WMC to dry	(D438) Cat ion contingency hose male qd is connected to portable water tank WATER OUTLET qd Located on portable water tank
		NOTE X Perform the following operations if refill of portable water tank is X X required. If not, continue to step 6 X X X XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
XXXX		XXXX	
X		X	
X		WATER OUTLET vlv - CLOSE X	Located on portable water tank
X		Disconnect CAT ION (CONTINGENCY) hose female qd from portable tank/H2O adapter qd X	
		Return to step 3	
		(25.13.13-00)	
		6. DUMP PORTABLE WATER TANK (WARDROOM)	
		NOTE The following items are required during the performance of this procedure: sterilization fitting, wardroom purge fitting, WARDROOM 2 hose	
		Obtain sterilization fitting	(D438)
		Remove captive caps on sterilization fitting	
	700	H2O DUMP HTR sw - 1	
		H2O DUMP HTR lt - ON	
	617	DUMP HEATER lt - ON	
		Set portable timer for 15 minutes (4.3.7.2, steps 1, 2)	
		WATER OUTLET vlv - CLOSE	Located on portable water tank
		Disconnect portable tank/H2O gun adapter qd from CAT ION (CONTINGENCY)hose qd	Removes H2O gun from portable water tank configuration
		Replace captive cap on CAT ION (CONTINGENCY) hose qd	
		Unlatch dial latches (2) on food tray	Food tray located above water heater
		Remove food tray from food table	
		Place thigh restraints in vertical up position	
		Open WATER HEATER access door	
		Connect sterilization fitting qd to portable tank/H2O gun adapter qd	
		Disconnect dump line qd from DUMP LINE STOWAGE qd	
		Connect sterilization fitting qd to dump line qd	Portable tank/H2O gun adapter and H2O gun are attached to dump line
		CAUTION Do not continue until water dump lines have been preheated 15 minutes as indicated by tone from portable timer	
		Open WATER DUMP VALVE access door	
	706	WATER DUMP vlv - OPEN	
	700	H2O DUMP PRESS ind $\leq$ 0.7 psia	
		H2O gun trigger - rotate	Purge H2O gun
		H2O gun trigger - release	
		Repeat two preceding operations five more times	
	706	X WATER DUMP vlv - CLOSE X	
		X Disconnect portable tank/H2O gun adapter qd from sterilization qd X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
		XXXX XXXX	
		X X	
		X Disconnect H2O gun qd from portable tank/H2O gun adapter qd X	Ready to dump portable water tank
		X Stow H2O gun and portable tank/H2O gun adapter X	(D438) (D438)
		Obtain WARDROOM 2 hose	Located below water tank 3
		Remove captive caps on WARDROOM 2 hose qd	
		Connect WARDROOM 2 hose qd to CAT ION (CONTINGENCY) hose qd	
		Connect remaining qd of WARDROOM 2 hose to sterilization fitting qd	This connects the portable water tank to the dump line
		WATER OUTLET vlv - OPEN	Located on portable water tank
	700	H2O DUMP HTR lt - ON (verify)	
	706	WATER DUMP vlv - OPEN	As soon as pressure drops to 2.0 psia, shut WATER OUTLET vlv - CLOSE, since portable water tank is empty
	700	H2O DUMP PRESS ind $\leq$ 2.0 psia	Water tank is empty
		WATER OUTLET vlv - CLOSE	Located on portable water tank
	706	WATER DUMP vlv - CLOSE	
		NOTE	
		N2 PRESS ind on portable water tank should read 20 $\pm$ 2 psig	
		Disconnect CAT ION (CONTINGENCY) hose qd from WATER OUTLET qd	Located on portable water tank
		Pull CAT ION (CONTINGENCY) hose into wardroom through grid	
		Disconnect sterilization fitting qd from dump line qd	Sterilization fitting must be removed so that purge fitting will mate with WARDROOM 2 hose female qd
		Stow sterilization fitting	(TBS)
		Connect CAT ION (CONTINGENCY) hose male qd to dump line qd	
	706	WATER DUMP vlv - OPEN	
		Obtain wardroom purge fitting	
		Connect purge fitting to female qd on WARDROOM 2 hose	Purges CAT ION (CONTINGENCY) hose and WARDROOM 2 hose
		Purge for TBS time	
		Remove purge fitting from WARDROOM 2 hose qd	Remove purge fitting prior to closing dump valve to vacuumize hoses
		Wait TBS minutes	
	706	WATER DUMP vlv - CLOSE	
		Close WATER DUMP VALVE access door	
		Disconnect CAT ION (CONTINGENCY) hose qd from dump line qd	
		Connect dump line qd to DUMP LINE STOWAGE qd	
	700	H2O DUMP HTR sw - OFF	
		H2O DUMP HTR lt - off	
	617	DUMP HEATER lt - off	
		Disconnect WARDROOM 2 hose qd from CAT ION (CONTINGENCY) hose qd	
		Replace captive caps on WARDROOM 2 hose qd, CAT ION (CONTINGENCY) hose qd and purge fitting	
		X Stow WARDROOM 2 hose, CAT ION (CONTINGENCY) hose, and purge X	(TBS) (TBS)
		X fitting X	
		X X	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
		(25.13.09-00)	
		7. FILL PORTABLE WATER TANK FROM WATER STORAGE TANK FOR WMC BACKUP	
		NOTE The following step uses water tank 7 to fill the portable water tank. Water tank 8 is capable of filling portable water tank for WMC purposes	
		Obtain portable water tank and secure near water tank 7	
		WATER OUTLET vlv (water tank 7) - CLOSE	
		Disconnect WMC hose qd from WMC WATER qd	
		Replace captive cap on WMC WATER qd	
		NOTE The WMC 2 hose is required to perform this step. If the WMC 2 hose is not in the WMC water system configuration, pull vacuum on hose (4.3.13.5, step 4)	
		Vacuumize WMC 2 hose (if required) (4.3.13.5, step 4)	
		Connect WMC 2 hose female qd to WMC 1 hose qd (if required)	If WMC 1 hose is being used
		Remove captive cap on WATER OUTLET qd	Located on portable water tank
		Connect WMC hose qd to WATER OUTLET qd	
		WATER OUTLET vlv (water tank 7) - OPEN	
		Monitor N2 PRESS ind to determine when portable water tank is full (30-40 psig)	See Figure 4.3.13.4
		WATER OUTLET vlv (water tank 7) - CLOSE	
		Disconnect WMC hose qd from WATER OUTLET qd (water tank 7)	
		Replace captive caps on WMC hose qd and WATER OUTLET qd (water tank 7)	Portable water tank is filled and ready for use in WMC
		(25.13.11-00)	
		8. SUPPLY WATER TO WMC	
		NOTE The following items are required during the performance of this procedure: portable tank/H2O gun adapter, H2O gun and washcloth	
		Secure full portable water tank (per step 7) to forward compartment grid floor near PORT TANK/WMC H2O CONNECTOR	WMC hose male qd connected to WATER OUTLET qd on portable water tank
		Remove captive caps on the WMC hose qd and PORT TANK/WMC H2O CONNECTOR qd	
		Connect WMC hose female qd to the PORT TANK/WMC H2O CONNECTOR qd	
		Obtain H2O gun and portable tank/H2O gun adapter	(D438)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
XXXX		XXXX	
X		X	
X		Connect H2O gun qd to portable tank/H2O gun adapter qd X	
X		Open WMC WATER HEATER access door X	
	800	DUMP HTRS H2O sw - 1	
		DUMP HTRS H2O lt - ON	
	617	DUMP HEATER lt - ON	
		Set portable timer for 15 minutes (4.3.7.2, steps 1, 2)	
		Disconnect dump line qd from CONDENSATE DUMP LINE qd	
		Connect portable tank/H2O gun adapter qd to dump line qd	
		CAUTION	
		Do not continue until water dump lines have been preheated 15 minutes as indicated by tone from portable timer	
	831	WATER DUMP vlv - OPEN	
	800	H2O DUMP PRESS ind $\leq$ 0.7 psia	
	831	WATER DUMP vlv - CLOSE	
		Close WMC WATER HEATER access door	
		WATER OUTLET vlv - CLOSE	Located on portable water tank
		Disconnect dump line qd from portable tank/H2O gun adapter qd	
		Connect dump line qd to CONDENSATE DUMP LINE qd	
	800	DUMP HTRS H2O sw - OFF	
		DUMP HTRS H2O lt - off	
	617	DUMP HEATER lt - off	
		Connect remaining portable tank/H2O gun adapter qd to the PORT TANK/WMC H2O CONNECTOR qd	The contingency line qd in WMC is in locker with water heater
		WATER OUTLET vlv - OPEN	Located on portable water tank
		H2O gun trigger - rotate	
		H2O gun trigger - release	
		Repeat two preceding operations two more times	
		Squeeze washcloth in washcloth squeezer	
		Hang washcloth in WMC to dry	
		NOTE	
		Perform the following operations if refill of portable water tank is required. If not, continue to step 9	
		WATER OUTLET vlv - CLOSE	Located on portable water tank
		Disconnect WMC hose qd from PORT TANK/WMC H2O CONNECTOR qd	
		Return to step 7	
		(25.13.14-00)	
		9. DUMP PORTABLE WATER TANK (WMC)	
X		NOTE X	
X		The following items are required during the performance of this X	
X		procedure: sterilization fitting X	(D438)
XXXX		XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
		XXXX XXXX	
		X X	
		X Obtain sterilization fitting X	(D438)
		X Remove captive caps on sterilization fitting qd X	
		WATER OUTLET vlv - CLOSE	Located on portable water tank
	800	DUMP HTR H2O sw - 1	
		DUMP HTRS H2O lt - on	
	617	DUMP HTR lt - on	
		Set portable timer for 15 minutes (4.3.7.2, steps 1, 2)	
		Disconnect portable tank/H2O gun adapter qd from PORT TANK/WMC H2O CONNECTOR qd	PORT TANK/WMC H2O CONNECTOR located in locker above WMC H2O dispenser valve
		Disconnect WMC dump line qd from CONDENSATE DUMP LINE qd	
		Connect sterilization fitting to portable tank/H2O gun adapter qd	
		Connect sterilization fitting qd to dump line qd	H2O gun is ready to be dumped
		CAUTION	
		Do not continue until dump heaters have been on for a period of 15 minutes as indicated by tone from portable timer	
		Open WMC WATER HEATER access door	
	831	WATER DUMP vlv - OPEN	
	800	H2O DUMP PRESS ind $\leq$ 0.7 psia	
		H2O gun trigger - rotate	
		H2O gun trigger - release	
		Repeat two preceding operations five times	
	831	WATER DUMP vlv - CLOSE	
		Disconnect portable tank/H2O gun adapter qd from sterilization fitting qd	
		Connect sterilization fitting qd to PORT TANK/WMC H2O CONNECTOR qd	
		WATER OUTLET vlv - OPEN	Located on portable water tank
	831	WATER DUMP vlv - OPEN	As soon as pressure drops to 2.0 psig, shut WATER DUMP vlv off because portable water tank is empty
		H2O DUMP PRESS ind $\leq$ 2.0 psia	
		NOTE	
		N2 PRESS ind on portable water tank should read 20 $\pm$ 2 psig	
		WATER OUTLET vlv - CLOSE	
		Disconnect WARDROOM 2 hose qd from WATER OUTLET qd	
		Replace captive cap on WATER OUTLET qd and WARDROOM 2 hose qd	
		Stow portable water tank	
		Wait TBS minutes	To vaporize water in hoses
	831	WATER DUMP vlv - CLOSE	
		Close WMC WATER HEATER access door	
		Disconnect dump line qd from sterilization fitting qd	
		Connect dump line qd to CONDENSATE DUMP LINE qd	
		X Disconnect sterilization fitting qd from PORT TANK/WMC H2O X	
		X CONNECTOR X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
		XXXX X X X X	(D438)
		Stow sterilization fitting Disconnect WMC 2 hose qd from PORT TANK/WMC H2O CONNECTOR qd Replace captive caps on WMC 2 hose qd and PORT TANK/WMC H2O CONNECTOR qd Stow WMC 2 hose	Below water tank 8
		10. RETURN WMC WATER SYSTEM TO NORMAL CONFIGURATION Remove captive caps from WMC hose qd Connect WMC hose female qd to WATER OUTLET qd (water tank 7)	
		X Connect WMC hose male qd to WMC WATER qd X X WATER OUTLET vlv (water tank 7) - OPEN X X X	WMC water system is in normal configuration
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd)	
		WATER OUTLET vlv - OPEN	
		Monitor N2 PRESS ind on portable water tank to 25 psig	Partial fill
		WATER OUTLET vlv - CLOSE	
		WATER OUTLET vlv - (water tank 10) - CLOSE	
		Disconnect WARDROOM 1 hose from WATER OUTLET qd (water tank 10)	
		Replace captive cap on WATER OUTLET qd (water tank 10)	
		Obtain sterilization fitting from storage	(D438)
		Remove captive caps on sterilization fitting	
		Connect sterilization fitting qd to the WARDROOM 1 hose qd	
		Connect remaining end of the sterilization fitting to WARDROOM WATER qd	
		Connect captive caps together	
	700	H2O DUMP HTR sw - 1 (verify)	Should be activated during activation procedures
		H2O DUMP HTR lt - on (verify)	
	617	DUMP HEATER lt - on	
		CAUTION	
		Do not continue until water dump lines have been preheated for 15 minutes as indicated by tone from portable timer	
		Open WATER DUMP VALVE access door	
	706	WATER DUMP vlv - OPEN	
	700	H2O DUMP PRESS ind $\leq$ 0.7 psia	An increase in pressure indicates a system leak
	706	WATER DUMP vlv - CLOSE	
		WATER OUTLET vlv - OPEN	The 100 PPM iodine solution is drained into the wardroom water system
		Remove captive caps on cat ion cartridge qd	The cat ion cartridge is inserted into the wardroom water distribution system
		Remove bypass flex hoses from restraining clamp	
		Disconnect bypass flex hose qd that are mated together	
		Connect demated bypass hose qd to cat ion assembly qd	The cat ion cartridge has a female qd on the inlet and a male qd for outlet
		Connect captive caps of cat ion cartridge together	
		PUSH TO VENT vlv - push until N2 PRESS ind TBS psig	Located on portable water tank. Bleeds N2 from tank
		PUSH TO VENT vlv - release	
		NOTE	
		The 100-PPM iodine soak should last for 1 hour	
	700	H2O DUMP HTR sw - 1 (verify)	
		H2O DUMP HTR lt - on (verify)	
		NOTE	
		During dump, monitor H2O DUMP PRESS ind and as soon as pressure drops to 2.0 psia close the dump valve	Portable water tank is to be completely drained
	706	WATER DUMP vlv - OPEN	
	700	H2O DUMP PRESS ind - 2.0 psia	
	706	WATER DUMP vlv - CLOSE	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.5 PORTABLE WATER TANK OPERATION (cont'd) Disconnect sterilization fitting qd from both WARDROOM WATER qd and WARDROOM 1 hose qd Replace captive caps on sterilization fitting qd Remove captive cap on WATER OUTLET qd (water tank 10) Connect WARDROOM 1 hose female qd to the WATER OUTLET qd (water tank 10) Disconnect WARDROOM 1 hose qd from WATER OUTLET qd Connect WARDROOM 1 hose qd to WARDROOM WATER qd Replace captive cap on WATER OUTLET qd Stow sterilization fitting Bleed water pressurization system (4.2.2.7, step 11) Fill and bleed wardroom water system (4.2.2.7, step 12, except set portable timer for 30 minutes) Close WATER DUMP VALVE access door (25.13.12-XX) 4.3.13.6 WATER SOURCE SELECTION NOTE Water tank sequence/usage: Tank number — sequence/usage 1 — 1/wardroom 2 — 3/wardroom 3 — 4/wardroom 4 — 5/wardroom 5 — 6/wardroom 6 — flush 7 — 1/WMC 8 — 2/WMC 9 — contingency 10 — 2/wardroom (25.13.15-00) 1. DEACTIVATE DEPLETED WATER TANK Depleted water tank PRESS VLV - CLOSE Depleted water tank WATER OUTLET valve - CLOSE Disconnect wardroom (WMC) hose captive cap from depleted water tank WATER OUTLET captive cap Disconnect wardroom (WMC) hose qd from depleted water tank WATER OUTLET qd Connect captive cap to depleted water tank WATER OUTLET qd	Located on portable water tank

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.6 WATER SOURCE SELECTION (cont'd)	
		NOTE Selection of water tanks for wardroom water system - steps 2 and 3 are to be followed. Steps 4 and 5 are to be used for WMC water system. Contingency water tank selection for wardroom usage - step 6, and WMC usage - step 7	
		(25.13.16-00)	
		2. ACTIVATE WATER TANK 1, 2, 3, OR 10 FOR WARDROOM WATER SYSTEM	This step assumes that the WARDROOM 1 hose was initially used for activation
		Disconnect captive cap from WATER OUTLET qd (water tank 1, 2, 3, or 10) Connect WARDROOM 1 hose qd to WATER OUTLET qd (water tank 1, 2, 3, or 10) Connect released captive caps together PRESS VLV (water tank 1, 2, 3, or 10) - OPEN	PRESS VLV (water tank 9) - OPEN if using contingency water tank
		WATER OUTLET valve (water tank 1, 2, 3, or 10) - OPEN	
		(25.13.17-00)	
		3. ACTIVATE WATER TANK 4 OR 5 FOR WARDROOM WATER SYSTEM	Wardroom 2 hose must be vacuumized to remove possibility of gas bubbles
		NOTE This procedure should be followed if WARDROOM 2 hose has not been used. If WARDROOM 2 hose is in use with WARDROOM 1 hose, then perform step 2 but hook up to water tank 4 or 5	
		Remove WARDROOM 2 hose from restraining clamps	Located below water tank 3
	700	H2O DUMP HTR sw - 1	
		H2O DUMP HTR lt - on	
	617	DUMP HEATER lt - on	
	705	Set portable timer for 15 minutes (4.3.7.2, steps 1, 2)	
		Unlatch dial latches (2) on food tray	Remove food tray located above WATER HEATER access door
		Remove food tray from food table	
		Place thigh restraint in vertical up position	
		Open WATER HEATER access door	Located in food table pedestal
		Remove captive cap on WARDROOM 2 hose male qd	
		Disconnect dump line qd from DUMP LINE STOWAGE qd	
		Connect WARDROOM 2 hose male qd to dump line qd	
		NOTE Do not continue until water dump line has been preheated for 15 minutes as indicated by tone from portable timer	
		Open WATER DUMP VALVE access door	
	706	WATER DUMP vlv - OPEN	
	700	H2O DUMP PRESS ind $\leq$ 0.7 psia	Initially OSH

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.6 WATER SOURCE SELECTION (cont'd)	
	706	WATER DUMP vlv - CLOSE	
		Close WATER DUMP VALVE access door	
	700	H2O DUMP HTR sw - OFF	
		H2O DUMP Htr lt - off	
	617	DUMP HEATER lt - off	
		Disconnect WARDROOM 2 hose qd from dump line qd	
		Connect dump line qd to DUMP LINE STOWAGE qd	
		Replace captive cap on WARDROOM 2 hose	
	705	Close WATER HEATER access door	
		Return thigh restraints to vertical down position	
		Return food tray to food table and latch (2)	
		Remove captive caps on WARDROOM 2 hose qd	
		Connect WARDROOM 2 hose male qd to the WARDROOM 1 hose qd	
		Connect released captive caps of hoses	
		Remove captive cap on WATER OUTLET qd (water tank 4 or 5)	Full water tank
		Connect WARDROOM 2 hose female qd to WATER OUTLET qd (water tank 4 or 5)	
		Connect released captive caps of WARDROOM 2 hose and WATER OUTLET (water tank 4 or 5)	
		WATER OUTLET vlv (water tank 4 or 5) - OPEN	
		Place WARDROOM hose in restraining clamps	Located below water tanks
		PRESS VLV (water tank 4 or 5) - OPEN	PRESS VLV (water tank 9) - OPEN if using contingency water tank
		(25.13.18-00)	
		4. PREPARE WMC 2 (1) HOSE FOR USE	
		NOTE	
		A hose not being used must be vacuumized before use	Either hose can be vacuumized
		Remove WMC 2 (1) hose from restraining clamps	Located below water tank 8
	800	DUMP HTR H2O sw - BUS 1	
		DUMP HTRS H2O lt - on	
		DUMP HEATER lt - on	
		Set portable timer for 15 minutes (4.3.7.2, steps 1, 2)	
		Open WMC WATER HEATER access door	Located above sink in WMC
		Disconnect dump line qd from CONDENSATE DUMP LINE qd	
		Remove captive cap on WMC 2 (1) hose male qd	
		Connect WMC 2 (1) hose male qd to dump line qd	
		NOTE	
		Do not continue until dump lines have been preheated for 15 minutes as indicated by tone from portable timer	
	831	WATER DUMP vlv - OPEN	
	800	H2O DUMP PRESS ind $\leq$ 0.7 psia	
	831	WATER DUMP vlv - CLOSE	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.6 WATER SOURCE SELECTION (cont'd)	
	800 617	H2O DUMP HTR sw - OFF H2O DUMP HTR lt - off DUMP HEATER lt - off Disconnect WMC 2 (1) hose qd from dump line qd Connect dump line qd to CONDENSATE DUMP LINE qd Replace captive cap on WMC 2 (1) hose Close WMC WATER HEATER access door	
		(25.13.19-00)	
		5. ACTIVATE REPLACEMENT WMC WATER TANK 7 or 8	
		NOTE Water tank 7 with WMC 1 hose are initially used. If water tank 8 with WMC 2 hose were used, perform same step but use water tank 7 and WMC 1 hose	
		Remove captive caps on WMC 2 (1) hose qd Connect male qd of WMC 2 (1) hose to the WMC 1 (2) hose qd Connect released captive caps of hose Remove captive cap on WATER OUTLET qd (water tank 8 (7)) Connect WMC 2 (1) hose female qd to WATER OUTLET qd (water tank 8 (7)) Connect released captive caps of WMC 2 (1) hose and WATER OUTLET (water tank 8 (7)) WATER OUTLET vlv (water tank 8 (7)) - OPEN Place WMC hose in restraining clamps PRESS VLV (water tank 8 (7)) - OPEN	Located below water tanks PRESS VLV (water tank 9) - OPEN if using contingency water tank
		(31.13.01-00)	
		6. ACTIVATE CONTINGENCY WATER TANK 9 FOR WARDROOM USE Perform step 2 if activated wardroom water system uses both WARDROOM hoses Perform step 3 if only one WARDROOM hose is in use	 Connect the WARDROOM hose to water tank 9 Connect the WARDROOM hose to water tank 9
		(31.13.02-00)	
		7. ACTIVATE CONTINGENCY WATER TANKS FOR WMC USE Perform steps 4 and 5 using both WMC 1 and WMC 2 hoses	 Connect the WMC hose to water tank 9

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.13.22-00)	
		4.3.13.7 FOOD TRAY OPERATION	
		1. FOOD PREPARATION	
		Consult menu to determine food and beverages for next meal	
		Obtain appropriate food and beverages and place in food tray cavities	Food trays will remain located at food table
		Remove food can lids and dispose in nearby trash bag	Flexible diaphragms retain food in cans after lid removal. Pudding cans do not contain diaphragms
		Obtain utensils and place on food tray	(W769) Utensils are color coded and are retained on food trays on magnetic surfaces
	705	Position appropriate food cavity (1, 2, 3) htr sw - AUTO	Select AUTO position for those cavities requiring heat. Three switches located on each food tray control individual cavities. AUTO position provides timer power
		TIMER SET sw - up and hold until HOURS REMAINING ind reaches appropriate time, then release	Momentary switch. Timer has delayed heating time capability of 12 hours. Frozen food must thaw 130 minutes and heat for 130 minutes. Heaters activate upon expiration of timer
		Obtain food tray lid from lid stowage area in galley and latch into place on food tray	(TBS) Lid color codes must match food tray color codes
		(25.13.23-00)	
		2. FOOD CONSUMPTION	
	705	At mealtime, verify heater operation	HOURS REMAINING tmr indicates 0 and HEAT light indicates on
		Configure all food cavity (1, 2, 3) htr sw (3) - OFF	HEAT light goes off. AUTO or ON position will maintain heater on
		Depress pushbutton lid lock on food tray lid and remove lid	
		Stow lid in lid stowage area in galley	
		Reconstitute dehydrated food and beverages (4.3.13.4)	(TBS) Record all deviations from water usage instructions in mission log
		Slit food can flexible diaphragms, using pointed tip of knife	
		Consume food	
		Record all food consumed in excess of pre-planned menu in mission log	
		Weigh cans containing unconsumed food and beverages on SMMD and record data in mission log	
		Place food cans and beverage dispensers in appropriate food can disposal wells in galley	
		Clean food tray and utensils	Clean with disinfectant-moistened wipes
		Dispose of wipes in nearby trash bag	
		Replace utensils on food tray	Use magnetic surfaces
		Perform step 1 for next meal	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.13.03-00)	
		4.3.13.8 FOOD TRAY OUTLET SELECTION	
		NOTE Procedure uses food tray 1 for outlet selection, but applies to other two food trays	
		1. POWER OUTLET SELECTION Food tray 1 (2, 3) food cavity 1, 2, 3 htr sw - OFF (verify)	Food tray 1 has a red tag, food tray 2 has a white tag, food tray 3 has a blue tag
	614	cb HSS BUS 1 FOOD TRAYS 1 (2, 3) - OPEN cb HSS BUS 2 FOOD TRAYS 1 (2, 3) - OPEN (verify)	Leave cb OPEN during food tray connection to prevent arcing
	707 708,709	Remove receptacle cover on FOOD TRAY OUTLET 1 (2, 3) BUS 2 outlet Disconnect food tray 1 (2, 3) high-power accessory adapter cable from FOOD TRAY OUTLET 1 (2, 3) BUS 1 Connect food tray 1 (2, 3) high-power accessory adapter cable to FOOD TRAY OUTLET 1 (2, 3) BUS 2	FOOD TRAY 2 receptacle located on panel 708 FOOD TRAY 3 receptacle located on panel 709
	614	Replace receptacle cover on FOOD TRAY OUTLET 1 (2, 3) BUS 1 outlet cb HSS BUS 2 FOOD TRAYS 1 (2, 3) - close	
		(25.13.24-00)	
		4.3.13.9 FOOD AND POTABLE WATER SYSTEM POWER DOWN	POWER(WATTS) 26.0V 30.0V
	614	1. CONFIGURE CIRCUIT BREAKER PANELS cb HSS BUS 1 WATER TANK HTRS 1-10 (10) - OPEN cb HSS BUS 2 WATER TANK HTRS 1-10 (10) - OPEN	TBS TBS TBS TBS
		NOTE Following power down of WARDRM H2O heater, a 1 1/2 hour warmup time is required for hot water usage	
		cb HSS WARDRM H2O HTR - OPEN	TBS TBS
		2. CONFIGURE CONTROL PANELS Food tray 1 cavity 1-3 htr sw (3) - OFF Food tray 2 cavity 1-3 htr sw (3) - OFF Food tray 3 cavity 1-3 htr sw (3) - OFF	TBS TBS TBS TBS TBS TBS

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.13.04-00)	
		4.3.13.10 H2O GUN FOOD HYDRATION	Cold food hydration capability only
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN EQUIPMENT FOR BACKUP FOOD HYDRATION Obtain spare H2O gun and H2O gun/food bag adapter	(D438)
		2. PREPARE SPARE H2O GUN FOR FOOD HYDRATION Loosen jamnut from H2O gun resupply (5/16 open end/box) Unscrew H2O gun resupply from H2O gun Screw H2O gun/food bag adapter onto H2O gun Tighten jamnut against H2O gun/food bag adapter (5/16 open end/box) Return H2O gun resupply to stowage	(D438)
		3. REMOVE H2O GUN 1 (2, 3) Open H2O gun access door Disconnect H2O gun hose qd from H2O gun port qd Remove H2O gun from holster Return H2O gun to stowage	(D438)
		4. INSTALL FOOD HYDRATION H2O GUN Connect H2O gun hose qd to H2O gun port qd	
		5. PURGE FOOD HYDRATION H2O GUN (4.4.13.2, step 4)	
		6. H2O GUN FOOD HYDRATION Obtain food bag from galley Note instructions on water quantity to be used for hydration H2O gun trigger - rotate H2O gun trigger - release Repeat above operations as required for water quantity shown on food package	
		7. RECORD WATER QUANTITY USED FOR FOOD HYDRATION Record data from 3-digit counter on H2O gun handle	
		(25.13.25-00)	
		4.3.13.11 FILL DEORBIT WATER BAGS	Six pounds water/day/crewman minimum requirement
		1. OBTAIN DEORBIT WATER BAG EQUIPMENT Obtain deorbit water bags (3) Obtain deorbit water bag adapter	(F507) (F507)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.13.11 FILL DEORBIT WATER BAGS (cont'd)	
		2. FILL DEORBIT WATER BAGS Assemble deorbit water bag and adapter Attach deorbit water bag adapter to COLD wardroom H2O dispenser valve Set COLD volume select to 6 oz COLD [DISPENSE/CHARGE] vlv - CHARGE COLD [DISPENSE/CHARGE] vlv - DISPENSE COLD wardroom H2O dispenser valve - depress Observe volume select indicator as water is dispensed into deorbit water bag. When 6 oz has been dispensed, repeat charge/dispense operations 16-22 times for 6-8 pounds of water capacity Detach deorbit water bag from wardroom H2O dispenser valve and detach water bag adapter Repeat above operations for remaining water bags (2)	Transfer of six pounds water takes approximately 5 minutes
		3. STOW DEORBIT WATER BAG EQUIPMENT Detach deorbit water bag adapter from deorbit water bag Stow deorbit water bags (3) in CSM Stow deorbit water bag adapter for subsequent backup use	(A9) (F507)

4.3.14 WASTE SYSTEM (INCLUDING NON-POTABLE WATER)

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.13.24-XX)	
		4.3.14.1 VACUUM CLEANER OPERATION	
		NOTE When vacuum cleaner is moved about while in operation, it will display small gyroscopic forces. The following items are required for the performance of this procedure: high-power accessory cable and long strap	High-power accessory cable is obtained for initial use of vacuum cleaner, and is thereafter stowed with vacuum cleaner
		Removal of launch restraints is a constraint upon the completion of this procedure	
		(25.14.01-00)	
		1. UNSTOW VACUUM CLEANER - INITIAL USAGE	
		NOTE This step will be performed only for initial use of vacuum cleaner on SL-2, SL-3 and SL-4 missions. Vacuum cleaner is not returned to stowage compartment during habitation, but is secured to grid in vicinity of vacuum cleaner stowage compartment	
		Open vacuum cleaner stowage compartment door Depress bracket lockpin Remove vacuum cleaner from bracket restraining pins Release bracket lockpin Close vacuum cleaner stowage compartment door	(F522)
		NOTE Proceed to step 3 upon initial removal of the vacuum cleaner from its stowage compartment	
		2. UNSTOW VACUUM CLEANER - SUBSEQUENT USAGE	
		NOTE This step to be performed for each subsequent vacuum cleaner usage	Vacuum cleaner assembly is stowed outside of stowage compartment during habitation for ease of access
		Remove vacuum cleaner from long strap	
		(25.14.02-00)	
		3. CONFIGURE VACUUM CLEANER Verify vacuum cleaner bag is not full	Vacuum cleaner bag interlock in vacuum cleaner inhibits blower operation is bag is not installed

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.1 VACUUM CLEANER OPERATION (cont'd)	
		Replace vacuum cleaner bag (4.3.14.2) if required	
		Transport vacuum cleaner and high-power accessory cable to work area	
		Temporarily restrain vacuum cleaner to convenient grid or handhold, using hook on the vacuum cleaner caddy	
		Connect high-power accessory cable to vacuum cleaner receptacle	Cable is initially connected to vacuum cleaner during first use on SL-2. Cable will remain attached to vacuum cleaner for subsequent use
		Vacuum cleaner cb [OPEN] - close (verify)	Circuit breaker located on side of vacuum cleaner in recess
		Vacuum cleaner [ON/OFF/MOM ON] sw - OFF (verify)	Switch located on carrying handle. To prevent arcing, switch must be OFF before connecting to power
	ACC	HI PWR ACC OUTLET sw - OFF (verify)	Applies to panels 115 and 139 only. To prevent arcing, switch must be off before connecting to power
	ACC	Remove tethered receptacle cap from selected HI PWR ACC OUTLET	
		Connect high-power accessory cable to selected HI PWR ACC OUTLET	Applies to panels 115 and 139
		HI PWR ACC OUTLET sw - ON	
		Remove vacuum cleaner hose from vacuum cleaner caddy	Four-foot extension hose is stowed in inboard velcro-lined pocket of caddy
		Connect vacuum cleaner hose to vacuum cleaner inlet fitting	Connection is a slip-fit
		Remove desired nozzle from vacuum cleaner caddy	Three nozzles are stowed in outboard velcro-lined pocket of caddy: vacuum cleaner crevice nozzle, surface tool, brush attachment
		Connect nozzle to vacuum cleaner hose	Connection is a slip-fit. If desired, nozzle may be attached directly to vacuum cleaner without utilization of extension hose
		Unwrap waist tether from around vacuum cleaner caddy	
		Attach waist tether to vacuum cleaner with spring clip	
		Don waist tether and adjust with velcro-lined strap	Vacuum may be performed with vacuum cleaner attached to waist, hand carried, or restrained to structure
		(25.14.03-00)	
		4. PERFORM VACUUMING OPERATION	
		Vacuum cleaner [ON/OFF/MOM ON] sw - ON (MOM ON)	ON position locks switch in ON position. If hand carried, MOM ON position may be preferred
		Vacuum debris as required	
		Vacuum cleaner [ON/OFF/MOM ON] sw - OFF	
		(25.14.04-00)	
		5. DISCONNECT VACUUM CLEANER	
		Temporarily restrain vacuum cleaner to convenient grid or handhold, using hook on vacuum cleaner caddy	
	ACC	HI PWR ACC OUTLET sw - OFF	Applies to panels 115 and 139 only
		Disconnect high-power accessory cable from HI PWR ACC OUTLET	
		Install captive cap to HI PWR ACC OUTLET	
		Disconnect vacuum cleaner hose and nozzle from vacuum cleaner	
		Return vacuum cleaner hose and nozzle to vacuum cleaner caddy pockets	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.1 VACUUM CLEANER OPERATION (cont'd)	
		Wrap high-power accessory cable and waist tether around vacuum cleaner caddy	
		6. STOW VACUUM CLEANER	
		Remove vacuum cleaner caddy hook from restraining surface	
		Transport vacuum cleaner to vacuum cleaner stowage compartment	(F522)
		Locate vacuum cleaner on floor grid in front of vacuum cleaner stowage compartment door	Vacuum cleaner location must not block the opening envelope of adjacent stowage compartment doors
		Restrain vacuum cleaner to grid with long strap	
		(27.40.01-00)	
		4.3.14.2 VACUUM CLEANER BAG REPLACEMENT	
		1. RETURN VACUUM CLEANER	
		NOTE If vacuum cleaner bag is found to be unusable after vacuum cleaner has been transported to a using location, perform following step	
		Return vacuum cleaner to OWS forward compartment floor grid in front of vacuum cleaner stowage compartment	(F522)
		Secure vacuum cleaner to grid with long strap located on grid	
		2. REMOVE VACUUM CLEANER BAG	
		Loosen as required one end of long strap that restrains vacuum cleaner to grid to permit sufficient access to forward end of vacuum cleaner	Upon initial removal of vacuum cleaner on SL-2, vacuum cleaner is stowed on OWS forward compartment floor grid in front of vacuum cleaner stowage compartment
		Separate as required velcro liner on vacuum cleaner caddy to permit access to latch on vacuum cleaner bag access door	
		Release latch on vacuum cleaner bag access door	Access door is hinged and is located at forward end of vacuum cleaner
		Open vacuum cleaner bag access door	
		Remove vacuum cleaner bag from behind access door	
		Seal vacuum cleaner bag	
		Dispose of vacuum cleaner bag in nearby trash bag	
		3. INSTALL VACUUM CLEANER BAG	
		Obtain new vacuum cleaner bag	(E623)
		Insert new vacuum cleaner bag into access door opening	
		Close vacuum cleaner bag access door	
		Secure latch on vacuum cleaner bag access door	
		Remate velcro liner on vacuum cleaner caddy	Vacuum cleaner ready for use

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.3 TRASH LOCK OPERATION	
		NOTE Removal of launch restraints is a constraint upon the performance of this procedure. The following item is required for the performance of this procedure: bungee	
		1. CONFIGURE TRASH LOCK Obtain filled trash bag or item to be disposed Restrain item to be disposed on floor grid near trash lock with bungee EJECTOR Handle - RETRACT (verify) VACUUM SHUTOFF vlv - OPEN (verify)	(TBS) If ejector is not fully retracted, lid cannot open This valve is launched in open position and normally left open. Valve is used to seal off trash lock vent line to waste tank for maintenance purposes
		VLV/OUTER DOOR handle - PRESS Press gage - 5.0 ± 0.2 psia	Trash lock equalizes to cabin pressure
		2. LOAD TRASH LOCK LID LOCK handle - open Open lid	Releases latch securing lid Interlock on lid engages and provides a second lock on VLV/OUTER DOOR handle
		Place trash bag in trash lock	Interlock on lid disengages and removes second lock from VLV/OUTER DOOR handle
		Close lid LID LOCK handle - close	Latches the lid closed and unlocks VLV/OUTER DOOR handle
		3. TRASH DISPOSAL VLV/OUTER DOOR handle - CLOSE/VENT Press gage 0.5 psia	Trash lock vents to the waste tank
		VLV/OUTER DOOR handle - OPEN	Outer door opens and exposes trash to waste tank trash disposal area
		EJECTOR handle - EJECT	Trash is expelled into waste tank trash disposal airlock with extendable scissors ejector mechanism stowed in lid
		EJECTOR handle - CLOSE	Ejector partially retracts into a position that prohibits disposed trash from migrating back into trash lock yet provides sufficient clearance to allow closure of outer door
		VLV/OUTER DOOR handle - CLOSE/VENT	Outer door closes and seals off waste tank trash disposal area from trash lock. When not in use trash lock will remain vented to waste tank to inhibit microbiological growth.
		EJECTOR handle - RETRACT Return bungee to stowage	Fully retracts ejector into stowed position in lid Bungee may be left attached to grid for use during subsequent trash disposal operations

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.14.29-00)	
		4.3.14.4 PROCESSOR MODULE OPERATION	
		NOTE This procedure applies to any of the six (6) processor chambers; waste processor 1 is used in this procedure	
		1. DETERMINE FECES/VOMIT MASS Obtain collection bag containing vomit or feces Determine specimen mass, utilizing the SMMD Record specimen mass and required information on data entry tab on collection bag Determine processing time based on specimen mass	This step is A.E. 25.14.07-00 (H821) Note time for future use
	818	2. PREPARE PROCESSOR CHAMBER FOR USE WASTE PROCESSOR VACUUM VENT vlv - OPEN (verify) WASTE PROCESSOR 1 TMR sw - OFF (verify) WASTE PROCESSOR 1 VENT handle - CABIN (verify)	This step is A.E. 25.14.06-00 Normally open during habitation. Valve vents all six (6) chambers waste processor chambers to the tank Cabin position equalizes waste processor chamber pressure with cabin atmosphere. Valve normally left in CABIN position when chamber is not in use to minimize amount of cabin air vented to tank while preparing process chambers for use. VENT HANDLE and DOOR HANDLE can be manually interlocked to permit simultaneous movement of both handles
		WASTE PROCESSOR 1 DOOR handle - UNLOCK Waste processor chamber door - open Insert bag into chamber with bag filter toward perforated pressure plate Waste processor chamber door - close	Pressure plate is simultaneously retracted Allows vapor to escape from bag into waste processor chamber Pressure plate force is simultaneously applied to bag, deflating the bag
		3. PROCESS FECES/VOMIT WASTE PROCESSOR 1 DOOR handle - LOCK	This step is A.E. 25.14.08-00 VENT handle and DOOR handle can be manually interlocked to permit simultaneous movements of both handles
		WASTE PROCESSOR 1 VENT handle - VACUUM WASTE PROCESSOR 1 TMR sw - TIMER SET and hold	Evacuates processor chamber to the tank Momentary switch. Actuation to TIMER SET or AUTO position initiates delay timer, which inhibits heater element activation for 15 minutes
		WASTE PROCESSOR 1 HR REMAINING ind - monitor for required drying time WASTE PROCESSOR 1 TMR sw - release when required drying time is indicated	Zero to 20 hour timer calibrated in half-hour increments WASTE PROCESSOR 1 TIMER switch is spring loaded to AUTO position
		NOTE Upon completion of the processing time, proceed to following steps	Processing is complete when HR REMAINING timer indicates 0 and timer light goes off. Heater power is removed upon expiration of HR REMAINING timer

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.4 PROCESSOR MODULE OPERATION (cont'd)	
		4. PROCESSING COMPLETED WASTE PROCESSOR 1 TMR lt - off (verify) WASTE PROCESSOR 1 TMR sw - OFF WASTE PROCESSOR 1 VENT handle - CABIN	This step is A.E. 25.14.09-00 Equalizes processor chamber with cabin pressure. VENT handle and DOOR handle can be manually interlocked to permit simultaneous movement of both handles
		WASTE PROCESSOR 1 DOOR handle - UNLOCK WASTE PROCESSOR 1 TIMER sw - AUTO WASTE PROCESSOR 1 OVERTEMP lt ind - OFF (verify)	If amber OVERTEMP light indicates on, waste processor chamber is inoperative
		WARNING Waste processor chamber may be hot to touch	
		Waste processor chamber door - open Remove processed bag Waste processor chamber door - close Stow bag in WMC Stowage Compartment	Pressure plate is simultaneously retracted
		(25.14.18-00)	(H805)
		4.3.14.5 PROCESSOR POWER SOURCE SELECTION	
		NOTE Procedure provides waste processor power source selection for power distribution and load sharing	
		Processors 1, 3 and 5 are normally powered from bus 1 and 2, 4 and 6 from bus 2	
		Perform individual waste processor power source selection as required	
	617	WASTE PROCESSORS BUS SEL 1 sw - BUS 2 (BUS 1) WASTE PROCESSORS BUS SEL 2 sw - BUS 1 (BUS 2) WASTE PROCESSORS BUS SEL 3 sw - BUS 2 (BUS 1) WASTE PROCESSORS BUS SEL 4 sw - BUS 1 (BUS 2) WASTE PROCESSORS BUS SEL 5 sw - BUS 1 (BUS 1) WASTE PROCESSORS BUS SEL 6 sw - BUS 2 (BUS 2)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.6 FECAL/URINE COLLECTOR MODULE OPERATION	
		NOTE If only urination is to be accomplished, proceed to step 2. The following items are required for the performance of this procedure if defecation is desired: fecal bag and utility wipes	
		(25.14.13-00)	
		1. CONFIGURE FECAL COLLECTOR FOR DEFECATION	
	800	FAN sw - BUS 1	
		Verify fecal bag installed in fecal collector	New fecal bags are installed immediately following each defecation
	825	BLWR/SEPARATOR BUS 1 PWR - 1 (2,3) sw - ON	Blower unit and separator begin operating. Each crewman should utilize his assigned BLWR/SEPARATOR switch for defecation-only operations to prevent excessive use of any one separator
		NOTE If defecation only is desired, proceed to step 3	
		(25.14.10-00)	
		2. CONFIGURE URINE DRAWER FOR URINATION	
		NOTE Each urine drawer is assigned to a specific crewman for use throughout the mission. The following step references urine drawer 1 but is applicable to all urine drawers	
		Drawer 1 AIRFLOW VLV - OPEN	Opens airflow path between separator and blower unit and permits opening of INLET DOOR
		Drawer 1 INLET DOOR - open	
		Remove urine collection hose from inside INLET DOOR opening	
		Lock urine inlet valve plunger in the extended position in slot under urine receptacle	Extending urine inlet valve plunger opens flow path in urine collection hose to separator
		Position urine receiver on urine receptacle	
	825	BLWR/SEPARATOR BUS 1 PWR - 1 sw - ON (if step 1 was bypassed)	Blower unit and separator begin operating
		NOTE If standing urination is to be performed, proceed to step 5. Otherwise, continue with step 3	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.6 FECAL/URINE COLLECTOR MODULE OPERATION (cont'd) (25.14.11-00) 3. CONDUCT DEFACATION AND/OR URINATION Push urine receptacle into rearward-most position for seated urination (if urine collector is active) Remove lap belt from stowed position Position buttocks on fecal collector seat Attach lap belt in using position and adjust belt to body envelope Defecate into fecal bag Urinate into urine receiver (if urine collector is active) Obtain utility wipes as required Perform wiping function Dispose of wipes in fecal bag 4. TERMINATE SEATED ACTIVITIES Remove lap belt from using position Dismount from fecal collector seat Attach lap belt into stowed position Unlatch fecal collector seat and elevate	Velcro liner permits adjustment to each crewman's body Blower unit suction contains feces within fecal bag Blower unit suction draws air/urine into separator. Separator then routes urine to urine bag and air to blower unit Lap belt construction permits crewman to lift buttocks adequately off seat while remaining restrained Wipes will be processed with feces
	825	BLWR/SEPARATOR BUS 1 PWR - 1 sw - OFF Remove fecal bag boot from flange on fecal collector NOTE If any fecal material is smeared on seat or on exterior of fecal bag, clean with disinfectant-moistened wipe and dispose of wipe in fecal bag Seal fecal bag Process fecal bag (4.3.14.4) Obtain new fecal bag from stowage Insert new fecal bag in fecal collector Install fecal bag boot over flange on fecal collector Clean seat with a wipe, moistened with water Dispose of wipe in a nearby trash bag Close seat and latch NOTE Continue to step 6 if urine collector is activated, otherwise, procedure is completed	Blower unit is turned off at last possible moment to insure against migration of feces out of fecal bag (H833, F527, F564, F565, F566, and F567)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.6 FECAL/URINE COLLECTOR MODULE OPERATION (cont'd)	
		5. CONDUCT URINATION WHILE STANDING Pull urine receptacle into forward-most position for standing urination Urinate into urine receiver	Blower unit suction draws air/urine into separator. Separator then routes urine to urine bag and air to blower unit
		(25.14.12-00)	
		6. RECONFIGURE URINE DRAWER AFTER URINATION	
		NOTE The following step references urine drawer 1 but is applicable to all urine drawers	
	825	BLWR/SEPARATOR BUS 1 PWR-1 sw - OFF (verify only, if step 5 was accomplished)	Separator will continue to receive power and operate for approximately 4 minutes after switch is positioned off to expell residual urine from separator into urine bag
	800	FAN sw - OFF Remove urine receiver from urine receptacle Remove urine inlet valve plunger from slot below urine receptacle	Urine inlet valve plunger is spring loaded to the closed position
		Replace urine collection hose inside INLET DOOR	
		NOTE If urine spillage occurs, clean with disinfectant-moistened wipe and dry with clean wipe	
		Drawer 1 INLET DOOR - close Drawer 1 AIRFLOW VLV - CLOSE	Seals off airflow path between separator and blower unit
		NOTE If this urination completes 24-hour urine pooling period, perform following operation	The 24-hour urine pooling period is complete after first urination in morning
		Perform URINE SAMPLING AND PROCESSING (4.3.14.5)	
		(25.14.30-00)	
		4.3.14.7 URINE SAMPLING AND PROCESSING	
		NOTE This procedure is performed once in a 24-hour period and is accomplished after first urination upon awaking. Urine drawers will be sampled consecutively at this time per the flight plan	
		The following steps reference urine drawer 1, but are also applicable to urine drawers 2 and 3	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.7 URINE SAMPLING AND PROCESSING (cont'd)	
		The following items are required for the performance of this procedure: disposal bag, urine collection hose (3), urine sample container (3), and urine bag (3)	
		1. URINE VOLUME MEASUREMENT	
	825	Drawer 1 AIRFLOW VLV - OPEN	This and the next 4 steps are A.E. 25.14.14-00 Opens airflow path between separator and blower and permits opening of INLET DOOR
		Drawer 1 INLET DOOR - open	Provides access to urine inlet line
		Remove urine collection hose from inside INLET DOOR opening	
		Lock urine inlet valve plunger in the extended position in slot under urine receptacle	Locking urine inlet valve plunger in extended position opens flow path between separator and urine inlet. Urine inlet valve is located on urine collection hose
		Position urine receiver on the urine receptacle	Urine receiver is ready to accept urine
		Drawer 1 VOLUME ind - note	Indicates in units the amount of urine in urine bag
		SAMPLE CONTAINER door - open	
		Record volume indication on sample container data entry tab	
		SAMPLE CONTAINER door - closed	
		2. URINE RECIRCULATION	
	800	FAN sw - BUS 1	Switch activates both blower and separator
		BLWR/SEPARATOR BUS 1 PWR 1 sw - ON	
		Open RECIRCULATION LINE DOOR	Provides access to recirculation line
		Remove recirculation line from stowage inside RECIRCULATION LINE DOOR	One end of recirculation line is attached to urine bag and the other end contains a recirculation valve
		Insert valve end of recirculation line into urine receiver	Urine will be recirculated into urine bag in this configuration
		Recirculation valve - open	Opening recirculation valve allows urine to flow in a closed loop from/to urine bag. Recirculation valve is located on recirculation line
		Recirculate urine for 10 seconds	Recirculated urine mixes 24-hour pool into homogeneous solution for sampling
		Recirculation valve - close	
		Wait 30 seconds for separator to empty of urine	Residual urine in separator is expelled into urine bag
		Recirculation valve - open	
		Wait 2 seconds	
		Recirculation valve - close	Cycling of recirculation valve clears line of trapped urine
		3. URINE SAMPLING	
		Remove valve end of recirculation line from urine receiver	
		Insert valve end of recirculation line into sample container through slot on SAMPLE CONTAINER door	
		Recirculation valve - open	
		Wait 6 seconds	Sample container behind SAMPLE CONTAINER door expands until 128-milliliter sample is obtained
		Recirculation valve - close	
		Remove valve end of recirculation line from slot on SAMPLE CONTAINER door	Sample containers will be removed and stowed after separator flushing
		Stow recirculation line in RECIRCULATION LINE DOOR opening	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.7 URINE SAMPLING AND PROCESSING (cont'd)	
		4. SEPARATOR FLUSHING	
		Open URINE DUMP EQUIPMENT door	(H822)
		Obtain urine flush gun	
		Direct urine flush gun into urine collector	50 cc of water are expelled for each trigger actuation. Water flow flushes residual urine in separator into the urine bag
		Urine flush gun trigger - rotate	
		Urine flush gun trigger - release	
		Repeat preceding two operations three more times	
		Return urine flush gun to stowage	
		Close URINE DUMP EQUIPMENT door	Door may be left opened until all separators are flushed
		BLWR/SEPARATOR BUS 1 PWR 1 sw - OFF	Blower is turned off but separator continues to run for 4 minutes
	800	FAN sw - OFF	
		5. PERFORM DRAWER 2 AND DRAWER 3 OPERATION	
		Repeat steps 1 through 4 for drawers 2 and 3	
		6. REMOVAL OF URINE BAGS FROM URINE DRAWERS	This step is A.E. 25.14.15-00
		Install disposal bag on snaps in convenient location near fecal/urine collector	
		Drawer 1 DRAWER locking handle - UNLOCK	Pressure plate is removed from urine bag
		Pull drawer 1 out to stops on track	
		Remove urine bag urine inlet boot from separator URINE OUTLET	Recirculation line remains attached to urine bag
		Remove urine bag from urine drawer	
		Dispose of urine bag in disposal bag	
		Repeat preceding operations for urine bags in drawers 2 and 3	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.7 URINE SAMPLING AND PROCESSING (cont'd)	
		XXXX XXXX X X X Connect vacuum line qd to dump disconnect on urine bag X X Slide urine bag into one tier of the urine holding compartment X Repeat the preceding operation for the two remaining urine bags	
		CAUTION Do not continue with the following steps until portable timer tone sound	
	818	URINE DUMP vlv - OPEN	Contents of three urine bags are simultaneously dumped into waste tank through heated probe
		URINE DUMP vlv remains open for TBS URINE DUMP vlv - CLOSE	Urine bags may be observed deflating
	800	DUMP HTRS URINE sw - OFF	
		DUMP HTR URINE lt - off	
	617	DUMP HTR lt - off	Panel 617 DUMP HTR light goes off
		Disconnect vacuum line qd from urine bag dump disconnect qd in urine holding compartment Remove tethered plug from urine inlet port on urine bag Remove urine bag from urine holding compartment Dispose of urine bag in disposal bag	
		X Repeat four preceding operations for two remaining urine bags X X Close URINE DUMP EQUIPMENT door X X X XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.7 URINE SAMPLING AND PROCESSING (cont'd)	
		Obtain urine collection hose Slide urine collection hose down through INLET DOOR opening and around separator Slip urine collection hose over separator URINE INLET Place urine collection hose inside INLET DOOR opening Drawer 1 INLET DOOR - close Drawer 1 AIRFLOW VLV - CLOSE	(H823)
		10. INSTALL URINE BAG Obtain urine bag	This step is A.E. 25.14.17-00 (H823) Urine bag consists of bladder and recirculation line with valve
		Pull tab on urine bag, allowing air to inflate urine	Inflation is required for subsequent leak test of bag. Urine inlet to urine bag contains a check valve that prevents escape of air from bag
		Install urine bag in urine drawer between urine chiller plate and pressure plate Position urine bag urine inlet boot and urine dump qd in urine chiller slot Slip urine bag urine inlet boot over centrifugal separator urine outlet line Drawer 1 RECIRCULATION LINE DOOR - open Remove recirculation line through RECIRCULATION LINE DOOR opening Push drawer closed Push in and rotate drawer 1 DRAWER locking handle - LOCK	Separator urine outlet line protrudes through slot in urine chiller plate Pressure plate is reapplied to urine bag
		11. URINE BAG LEAK TEST Drawer 1 VOL ind - monitor for decay after initial stabilization	This step is A.E. 25.14.21-00 Movement of pressure plate against urine bag will initially cause volume indicator to rapidly decay, and then stabilize. If VOLUME indicator decay continues, urine bag is leaking and must be replaced
		Push recirculation line valve - open Drawer 1 VOL ind - monitor air bleed-off until indicator stops Release recirculation line valve - closed Place recirculation line inside RECIRCULATION LINE DOOR opening Drawer 1 RECIRCULATION LINE DOOR - close	Bleeds air from urine bag
		12. CONFIGURE URINE DRAWERS 2 AND 3 Repeat steps 9 through 11 for remaining urine drawers	
		13. REMOVE AND REPLACE URINE SAMPLE CONTAINER Drawer 1 SAMPLE CONTAINER door - open Remove urine sample container Stow urine sample container in urine freezer Install new urine sample container in SAMPLE CONTAINER door SAMPLE CONTAINER door - close Repeat step for drawers 2 and 3	This step is A.E. 25.14.22-00

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.14.26-00)	
		4.3.14.8 FECAL COLLECTOR FILTER REPLACEMENT	
		NOTE The fecal collector filter will be replaced every 28 days	
		The following item is required for the completion of this procedure: disposal bag	
		1. PREPARE FECAL COLLECTOR FILTER FOR REMOVAL	
		Obtain replacement fecal collector filter	(D436)
		Place replacement fecal collector filter in disposal bag	Disposal bag is used for temporary stowage of part
		Attach disposal bag with snaps to a convenient location adjacent to fecal/urine collector	
	825	BLWR/SEPARATOR BUS 1 PWR - 1, 2, 3 sw - OFF (verify)	
		Remove lap belt from its stowed position and temporarily install belt into using position	Lap belt interferes with opening of access door
		Open access door to fecal collector filter/blower unit	
		2. REMOVE FAILED FECAL COLLECTOR FILTER	
		Remove duct from fecal collector filter outlet	Elastic boot slips off filter outlet
		Remove astropin from fecal collector filter structural mount	
		Rotate odor filter ccw and remove from bracket assembly	
		Remove replacement fecal collector filter from disposal bag	
		Place failed fecal collector filter in disposal bag	
		Close disposal bag opening	Prevents odors and contaminants from escaping into WMC atmosphere
		3. INSTALL REPLACEMENT FECAL COLLECTOR FILTER	
		Position replacement fecal collector filter on structural mount and rotate cw	
		Install astropin in fecal collector filter structural mount	
		Install duct to fecal collector filter outlet	Elastic boot slips over filter outlet
		Close access door to fecal collector filter/blower unit	
		Remove lap belt from its using position and attach to bracket in stowage position	
		Seal disposal bag and dispose (4.3.14.3)	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X 4.3.14.9 WMC BLOWER UNIT POWER OUTLET SELECTION (cont'd) X X X X 2. POWER OUTLET SELECTION X Open access door to fecal collector filter/blower unit Disconnect power cable connector from blower unit receptacle Disconnect stowed power cable connector from dummy receptacle Connect stowed power cable connector to blower unit receptacle Close access door	
	825	Drawer 1 DRAWER locking handle - UNLOCK Pull drawer 1 out to stops on track Disconnect urine system separator power cable from bus 1 receptacle Connect separator power cable to bus 2 receptacle Push drawer 1 closed Push in and rotate drawer 1 DRAWER locking handle - LOCK Repeat above six operations for drawers 2 and 3	
		3. VERIFY WMC BLOWER UNIT AND URINE SYSTEM SEPARATOR	
	614	cb HSS WMC BLWR OUTLET 2 - closed	
	825	BLWR/SEPARATOR BUS 2 - 1 sw - ON Verify blower unit and separator on	
		NOTE Urine system separator will continue to operate for 4 minutes after following operation	
		X X X BLWR/SEPARATOR BUS 2 - 1 sw - OFF X X Repeat above operations for BLWR/SEPARATOR BUS 2 - 2, 3 sw (2) X XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.11 WASTE SYSTEM POWER DOWN (cont'd)	
		2. CONFIGURE CONTROL PANELS	
	800	DUMP HTRS URINE sw - OFF (verify)	TBS TBS
		FAN sw - OFF (verify)	TBS TBS
	825	BLWR/SEPARATOR BUS 1 (2) PWR - 1-3 sw (6) - OFF (verify)	TBS TBS
		(25.14.28-00)	
		4.3.14.12 URINE SYSTEM SEPARATOR ASSEMBLY REMOVAL	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. CONFIGURE URINE SYSTEM FOR SEPARATOR ASSEMBLY REMOVAL (4.4.14.13, step 2)	
		2. REMOVE URINE SYSTEM SEPARATOR ASSEMBLY	
		Disconnect hose from separator URINE INLET	
		Disconnect urine bag inlet boot from separator URINE OUTLET	
		Disconnect hose from separator GAS OUTLET	
		Remove urine system motor (4.4.14.12, step 2)	
		Remove captive bolts (4) holding separator in place (Spin type handle, 3/16 hex driver bit)	Bolts are captivated by lanyards
		Remove separator assembly from drawer	
		3. DISPOSE OF FAILED SEPARATOR (4.3.14.3) (IFM only)	
		4. STOW USED SEPARATOR MOTOR (Deactivation only)	(D426)
		(27.40.21-00)	
		4.3.14.13 URINE SYSTEM SEPARATOR INSTALLATION	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN URINE SYSTEM SEPARATOR	
		Open stowage compartment door (SL-2 activation)	(D426)
		Open stowage compartment door (IFM, SL-3, 4)	(D428)
		Remove captive bolts (4) retaining stowed separator assembly (Spin type handle, 3/16 hex driver bit) (SL-2 activation)	
		Remove captive bolts (4) retaining stowed separator (Spin type handle, 3/16 hex driver bit) (IFM, SL-3, 4)	
		Remove unit from stowage	
		Close compartment door (SL-2 activation)	(D426)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.14.13 URINE SYSTEM SEPARATOR INSTALLATION (cont'd) 2. INSTALL URINE SYSTEM SEPARATOR Configure for separator installation (4.4.14.13, step 2) Remove protective covers (3) from separator ports Align separator (separator assembly) in position in drawer Install bolts (4) and tighten (Spin type handle, 3/16 hex driver bit) Connect hose to separator URINE OUTLET Connect urine bag inlet boot to GAS OUTLET Connect hose to URINE INLET Connect zero-g connector to motor filter (SL-2 activation) Push drawer closed (SL-2 activation) Drawer 1 (2, 3) DRAWER locking handle - LOCK (SL-2 activation) 3. INSTALL SEPARATOR MOTOR (IFM, SL-3, 4) Open stowage compartment door Remove stowed separator motor (SL-3, 4) Obtain separator motor from temporary stowage (IFM) Remove protective gear cover from motor (SL-3, 4) Mate motor to separator by meshing gears Install bolts (2) attaching motor to separator and tighten (Spin type handle, 3/16 hex driver bit) Connect zero-g connector to motor filter Push drawer closed Drawer 1 (2, 3) DRAWER locking handle - LOCK 4. VERIFY SEPARATOR OPERATION (4.4.14.14, step 5)	(D428) Bolts are captivated by lanyards

4.3.15 LIGHTING SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.15.01-00)	
		4.3.15.1 PORTABLE LIGHT OPERATION	
		NOTE The following items are required for the performance of this procedure: short strap universal mount utility cable	(W736) (E621) (D418)
		1. OBTAIN PORTABLE LIGHT	(D418)
		2. ASSEMBLE PORTABLE LIGHT AND ACCESSORIES	This step is A.E. 25.15.15-00. Once accessories are assembled to portable light during its initial use on SL-2, portable light will be stowed on forward compartment floor grid in convenient location
		Attach universal mount to portable light	Bracket located on side of portable light housing, accepts universal mount
		Attach universal mount to floor grid in OWS forward compartment	Portable light location must not block the opening of adjacent stowage compartment doors
		Restrain utility cable to floor grid, adjacent to portable light, with short strap Connect utility cable receptacle to pigtail connector on portable light Release dial latches (2) on portable light housing and open housing Inspect light bulb for launch damage Close portable light housing and secure dial latches (2)	
		3. PREPARE PORTABLE LIGHT FOR USE Remove utility cable from short strap Detach universal mount from floor grid Transport portable light and accessories to using location Attach universal mount to convenient grid or handhold Portable light sw - OFF (verify)	To prevent arcing during connection to power, light switch located on end of portable light housing should be OFF
	UTIL	UTIL OUTLET (UTIL PWR) sw - OFF (verify)	UTIL OUTLET applies to panels 104, 112, 134, 140, and UTIL PWR applies to panel 213, 214, 219, 221, 316, 390. Panels 402, 521, 531, 551, 601, 628, 631, 711 and 803 do not contain switches.
		Remove tethered receptacle cap from UTIL OUTLET or UTIL PWR outlet (as applicable) Connect utility cable connector to UTIL OUTLET or UTIL PWR outlet (as applicable) UTIL OUTLET (UTIL PWR) sw - ON	
		4. USE PORTABLE LIGHT Portable light sw - LO or HI as required	If additional portability is required, universal mount may be detached and portable light may be safely carried by integral handle

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.1 PORTABLE LIGHT OPERATION (cont'd)	
		5. DISCONNECT PORTABLE LIGHT	
		Portable light sw - OFF	
	UTIL	UTIL OUTLET (UTIL PWR) sw - OFF	This switch not present on OWS panels
		Disconnect utility cable connector from UTIL OUTLET or UTIL PWR outlet (as applicable)	
		Reinstall tethered receptacle cap on UTIL OUTLET or UTIL PWR outlet (as applicable)	
		6. RETURN PORTABLE LIGHT TO STOWAGE	
		Detach universal mount from grid or handhold	
		Transport portable light and accessories to OWS forward compartment floor grid	Mount portable light outside of opening envelopes of adjacent stowage compartment doors
		Attach universal mount to floor grid in convenient location near short strap	Portable light location must not block opening of adjacent stowage compartment doors
		Secure utility cable to floor grid with short strap	
		(26.15.04-00)	
		4.3.15.2 MDA AND STS STATUS LIGHTS TEST	
		1. VERIFY MDA STATUS LIGHTS OPERATIONAL	
	117	WINDOW HEATER ΔTEMP pb/lt - depress and hold	Momentary pushbutton
		WINDOW HEATER Δ TEMP pb/lt -on	
		WINDOW HEATER ΔTEMP pb/lt - release	
		WINDOW HEATER ΔTEMP pb/lt - off	
		WINDOW HEATER OVERTEMP pb/lt - depress and hold	Momentary pushbutton
		WINDOW HEATER OVERTEMP pb/lt - on	
		WINDOW HEATER OVERTEMP pb/lt - release	
		WINDOW HEATER OVERTEMP pb/lt - off	
		(26.15.01-00)	
		2. VERIFY STS STATUS LIGHTS OPERATIONAL	
	207	LTG STATUS sw - TEST and hold	Momentary switch
	203	Verify the following lts - on	
		ATM CLNT PUMPS LO ΔP	
		PRI CLNT LOOP RES LO	
		SEC CLNT LOOP RES LO	
	204	TAPE RCDRS 1 STOP	
		TAPE RCDRS 2 STOP	
		TAPE RCDRS 3 STOP	
		TAPE RECORDING DATA	
		TAPE RECORDING EXP 1	
		TAPE RECORDING EXP 2	
	216	CNDST CONT SYS VENT HTRS PRI	
		CNDST CONT SYS VENT HTRS SEC	
	207	LTG STATUS sw - release	
		All above lights - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.2 MDA AND STS STATUS LIGHTS TEST (cont'd)	
		(26.15.02-00)	
		3. VERIFY EPS STATUS LIGHTS OPERATIONAL	
	206	PWR SYS LTS BUS 1 sw - TEST and hold	Momentary switch
		Verify the following lights - on	
		AM BUS 1 REG BUS 1	
		AM BUS 1 REG BUS 2	
		OWS BUS 1 ON	
		OWS BUS 1 OFF	
		ELEC GND CSM	
		ELEC GND AIRLOCK	
		ATM/XFER TIE BUS 1 CLOSED	
		ATM/XFER TIE BUS 1 OPEN	
		REG/XFER TIE BUS 1 CLOSED	
		REG/XFER TIE BUS 1 OPEN	
		EPS SHUNT REG BUS 1 CONN	
		EPS SHUNT REG BUS 1 DISCON	
	205	SOLAR ARRAY OUTPUT 1 PCG 1	
		SOLAR ARRAY OUTPUT 1 PCG 2	
		SOLAR ARRAY OUTPUT 2 PCG 2	
		SOLAR ARRAY OUTPUT 2 PCG 3	
		SOLAR ARRAY OUTPUT 3 PCG 3	
		SOLAR ARRAY OUTPUT 3 PCG 4	
		SOLAR ARRAY OUTPUT 4 PCG 4	
		SOLAR ARRAY OUTPUT 4 PCG 1	
		BATS 1 ON	
		BATS 1 OFF	
		BATS 2 ON	
		BATS 2 OFF	
		BATS 3 ON	
		BATS 3 OFF	
		BATS 4 ON	
		BATS 4 OFF	
		CHGR 1 NORM	
		CHGR 1 BYPASS	
		CHGR 2 NORM	
		CHGR 2 BYPASS	
		CHGR 3 NORM	
		CHGR 3 BYPASS	
		CHGR 4 NORM	
		CHGR 4 BYPASS	
		AH INTEGRATOR 1 PRI	
		AH INTEGRATOR 1 SEC	
		AH INTEGRATOR 2 PRI	
		AH INTEGRATOR 2 SEC	
		AH INTEGRATOR 3 PRI	
		AH INTEGRATOR 3 SEC	
		AH INTEGRATOR 4 PRI	
		AH INTEGRATOR 4 SEC	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.2 MDA AND STATUS LIGHTS TEST (cont'd)	
		CHG RATE 1 AUTO	
		CHG RATE 1 LO	
		CHG RATE 2 AUTO	
		CHG RATE 2 LO	
		CHG RATE 3 AUTO	
		CHG RATE 3 LO	
		CHG RATE 4 AUTO	
		CHG RATE 4 LO	
		CHG MODE 1 AUTO	
		CHG MODE 1 TEMP LMTD	
		CHG MODE 2 AUTO	
		CHG MODE 2 TEMP LMTD	
		CHG MODE 3 AUTO	
		CHG MODE 3 TEMP LMTD	
		CHG MODE 4 AUTO	
		CHG MODE 4 TEMP LMTD	
		DISCH LIMIT 1 AUTO	
		DISCH LIMIT 1 INHBT	
		DISCH LIMIT 2 AUTO	
		DISCH LIMIT 2 INHBT	
		DISCH LIMIT 3 AUTO	
		DISCH LIMIT 3 INHBT	
		DISCH LIMIT 4 AUTO	
		DISCH LIMIT 4 INHBT	
		PCG OUTPUT 1 ON	
		PCG OUTPUT 1 OFF	
		PCG OUTPUT 2 ON	
		PCG OUTPUT 2 OFF	
		PCG OUTPUT 3 ON	
		PCG OUTPUT 3 OFF	
		PCG OUTPUT 4 ON	
		PCG OUTPUT 4 OFF	
		PCG OUTPUT 1 REG BUS 1	
		PCG OUTPUT 1 REG BUS 2	
		PCG OUTPUT 2 REG BUS 1	
		PCG OUTPUT 2 REG BUS 2	
		PCG OUTPUT 3 REG BUS 1	
		PCG OUTPUT 3 REG BUS 2	
		PCG OUTPUT 4 REG BUS 1	
		PCG OUTPUT 4 REG BUS 2	
	206	PWR SYS LTS BUS 1 sw - release	
		All above lights - off	
	206	PWR SYS LTS BUS 2 sw - TEST and hold	Momentary switch
		Verify the following lights - on	
		AM BUS 2 REG BUS 2	
		AM BUS 2 REG BUS 1	
		OWS BUS 2 ON	
		OWS BUS 2 OFF	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.2 MDA AND STATUS LIGHTS TEST (cont'd)	
	205	ATM/XFER TIE BUS 2 CLOSED ATM/XFER TIE BUS 2 OPEN REG/XFER TIE BUS 2 CLOSED REG/XFER TIE BUS 2 OPEN EPS SHUNT REG BUS 2 CONN EPS SHUNT REG BUS 2 DISCON SOLAR ARRAY OUTPUT 5 PCG 5 SOLAR ARRAY OUTPUT 5 PCG 6 SOLAR ARRAY OUTPUT 6 PCG 6 SOLAR ARRAY OUTPUT 6 PCG 7 SOLAR ARRAY OUTPUT 7 PCG 7 SOLAR ARRAY OUTPUT 7 PCG 8 SOLAR ARRAY OUTPUT 8 PCG 8 SOLAR ARRAY OUTPUT 8 PCG 5 BATS 5 ON BATS 5 OFF BATS 6 ON BATS 6 OFF BATS 7 ON BATS 7 OFF BATS 8 ON BATS 8 OFF CHGR 5 NORM CHGR 5 BYPASS CHGR 6 NORM CHGR 6 BYPASS CHGR 7 NORM CHGR 7 BYPASS CHGR 8 NORM CHGR 8 BYPASS AH INTEGRATOR 5 PRI AH INTEGRATOR 5 SEC AH INTEGRATOR 6 PRI AH INTEGRATOR 6 SEC AH INTEGRATOR 7 PRI AH INTEGRATOR 7 SEC AH INTEGRATOR 8 PRI AH INTEGRATOR 8 SEC CHG RATE 5 AUTO CHG RATE 5 LO CHG RATE 6 AUTO CHG RATE 6 LO CHG RATE 7 AUTO CHG RATE 7 LO CHG RATE 8 AUTO CHG RATE 8 LO	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.2 MDA AND STATUS LIGHTS TEST (cont'd)	
		CHG MODE 5 AUTO CHG MODE 5 TEMP LMTD CHG MODE 6 AUTO CHG MODE 6 TEMP LMTD CHG MODE 7 AUTO CHG MODE 7 TEMP LMTD CHG MODE 8 AUTO CHG MODE 8 TEMP LMTD DISCH LIMIT 5 AUTO DISCH LIMIT 5 INHBT DISCH LIMIT 6 AUTO DISCH LIMIT 6 INHBT DISCH LIMIT 7 AUTO DISCH LIMIT 7 INHBT DISCH LIMIT 8 AUTO DISCH LIMIT 8 INHBT PCG OUTPUT 5 ON PCG OUTPUT 5 OFF PCG OUTPUT 6 ON PCG OUTPUT 6 OFF PCG OUTPUT 7 ON PCG OUTPUT 7 OFF PCG OUTPUT 8 ON PCG OUTPUT 8 OFF PCG OUTPUT 5 REG BUS 2 PCG OUTPUT 5 REG BUS 1 PCG OUTPUT 6 REG BUS 2 PCG OUTPUT 6 REG BUS 1 PCG OUTPUT 7 REG BUS 2 PCG OUTPUT 7 REG BUS 1 PCG OUTPUT 8 REG BUS 2 PCG OUTPUT 8 REG BUS 1	
	206	PWR SYS LTS BUS 2 sw - release All above lights - off	
		(26.15.03-00)	
		4.3.15.3 OWS STATUS LIGHTS TEST	
	542	1. VERIFY FORWARD COMPARTMENT STATUS LIGHTS OPERATIONAL LAMP TEST sw - TEST and hold TAPE RCDRS EXP 1, 2 lt (2) - ON LAMP TEST sw - release TAPE RCDRS EXP 1, 2 lt (2) - off	Momentary switch
	617 616	2. VERIFY EXPERIMENT COMPARTMENT STATUS LIGHTS OPERATIONAL LAMP TEST sw - 1 and hold DUMP HTR lt - ON RS PRI LOOP TEMP FREEZER HI lt - on	Momentary switch

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.3 OWS STATUS LIGHTS TEST (cont'd)	
		RS PRI LOOP TEMP CHILLER LO lt - on	
		RS PRI LOOP ACCUM LO lt - on	
		RS PRI LOOP PUMP LO Δ P lt - on	
	617	LAMP TEST sw - release	
		All above lights - off	
	617	LAMP TEST sw - 2 and hold	Momentary switch
		DUMP HTR lt - ON	
		INST SYS TAPE RCDRS EXP 1 lt - ON	
		INST SYS TAPE RCDRS EXP 2 lt - ON	
	616	RS SEC LOOP TEMP FREEZER HI lt - on	
		RS SEC LOOP TEMP CHILLER LO lt - on	
		RS SEC LOOP ACCUM LO lt - on	
		RS SEC LOOP PUMP LO Δ P lt - on	
	617	LAMP TEST sw - release	
		All above lights - off	
		3. VERIFY WARDROOM STATUS LIGHTS OPERATIONAL	
	700	LAMP TEST sw - 1 and hold	Momentary switch
		H2O DUMP HTR lt - ON	
	617	DUMP HTR lt - ON	Light normally verified with panel 617 test switch
	700	LAMP TEST sw - release	
		All above lights - off	
	700	LAMP TEST sw - 2 and hold	Momentary switch
		H2O DUMP HTR lt - ON	
	617	DUMP HTR lt - ON	Light normally verified with panel 617 test switch
	700	LAMP TEST sw - release	
		All above lights - off	
		4. VERIFY WMC STATUS LIGHTS OPERATIONAL	
	800	LAMP TEST sw - 1 and hold	Momentary switch
		DUMP HTRS H2O lt - ON	
		DUMP HTRS URINE lt - ON	
	617	DUMP HTR lt - ON	Light normally verified with panel 617 test switch
		WASTE PROCESSOR 1-6 TMR lts (6) - on	Status lights located on panel adjacent to each waste processor
		WASTE PROCESSOR 1-6 OVERTEMP lts (6) - on	
	800	LAMP TEST sw - release	
		All above lights - off	
	800	LAMP TEST sw - 2 and hold	Momentary switch
		Lights (15) tested above - on	
	800	LAMP TEST sw - release	
		Lights (15) tested above - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.15.02-00)	
		4.3.15.4 HI-INTENSITY LIGHT OPERATION	
		1. ASSEMBLE HI-INTENSITY LIGHT AND ACCESSORIES Obtain universal mount Obtain high-power accessory adapter cable Obtain hi-intensity light Inspect lamp for damage Attach universal mount to hi-intensity light (if required) Connect high-power accessory adapter cable to hi-intensity light	(F523) or (E621) (D418) or (D424) (F521) Light has 1-foot pigtail cable
	115, 139 ACC 115, 139	2. PREPARE HI-INTENSITY LIGHT FOR USE Attach universal mount to grid or handhold at using location POWER sw - OFF (verify) HI PWR ACC OUTLET sw - OFF (verify) Remove tethered receptacle cap from HI PWR ACC OUTLET Connect high-power accessory adapter cable to HI PWR ACC OUTLET HI PWR ACC OUTLET sw - ON	 Required if operation from MDA outlets Zero-g connector Required if operation from MDA outlets
		3. USE HI-INTENSITY LIGHT POWER sw - ON SYS 1 sw - HI If lowest light output desired and after waiting for lamp warmup, perform following: SYS 1 sw - LOW	 Outer pair of lamps illuminate. Lamps attain 3/4 brightness < 2 min and full brightness 4 to 5 min (75 watts) 40 watts of light
		NOTE If desired, SYS 2 may be activated in addition to SYS 1 in HIGH position. Dual system LOW operation not recommended due to electrical inefficiency	
		CAUTION Lamp operation > 30 minutes may cause switches on light to become hot (approximately 125°F)	
		4. TERMINATE USE OF HIGH INTENSITY LIGHT POWER sw - OFF	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X SYS 1, 2 sw (2) - STNBY X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	For subsequent lamp usage

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.4 HI-INTENSITY LIGHT OPERATION (cont'd)	
	115, 139	5. DISCONNECT HI-INTENSITY LIGHT POWER sw - OFF (verify) HI PWR ACC OUTLET sw - OFF Disconnect high-power accessory adapter cable from HI PWR ACC OUTLET Install tethered receptacle cap on HI PWR ACC OUTLET	
		6. DISASSEMBLE HI-INTENSITY LIGHT AND ACCESSORIES Disconnect high-power accessory adapter cable from hi-intensity light Detach universal mount from hi-intensity light Stow universal mount Stow high-power accessory adapter cable Stow hi-intensity light	(E621) or (F523) (D418) or (D424) (F521)
		(26.01.06-00)	
		4.3.15.5 OWS EMERGENCY LIGHTING PERIODIC VERIFICATION	
	613	1. DEACTIVATE NORMAL POWER TO EMERGENCY LIGHTS cb LTG UPPER WALL 3, 8 (2) - OPEN cb LTG DOME 1, 4 (2) - OPEN cb LTG EXP COMPT 6, 7, 13, 14 (4) - OPEN Verify the following floodlights - off Upper wall 3, 8 (2) Dome 1, 4 (2) Experiment compartment 6, 7, 13, 14 (4)	
		2. VERIFY EMERGENCY LIGHTING cb LTG BUS 1 EMER LT VOLTAGE SNSR - OPEN Verify lights listed in step 1 - off cb LTG BUS 2 EMER LT VOLTAGE SNSR - OPEN Verify lights listed in step 1 - on cb LTG BUS 1 EMER LT VOLTAGE SNSR - CLOSED Verify lights listed in step 1 - off cb LTG BUS 2 EMER LT VOLTAGE SNSR - CLOSED	Both circuit breakers must be open for lights to come on in a simulated emergency
		3. ACTIVATE NORMAL POWER TO EMERGENCY LIGHTS cb LTG UPPER WALL 3, 8 (2) - closed cb LTG DOME 1, 4 (2) - closed cb LTG EXP COMPT 6, 7, 13, 14 (4) - closed NOTE The three preceding operations return lights to configuration existing prior to this procedure	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.15.04-00)	
		4.3.15.6 EXTERNAL LIGHTING	
		1. TURN LIGHTS ON	
		NOTE The following switches are to be positioned on as required	
	207	LTG TRACKING sw - ON (as required) LTG DKG sw - ON (as required)	Both primary and secondary tracking lights will turn on Docking lights on MDA and AM and discone antenna lights 1 and 2 will turn on
		NOTE The below operations are turned on for EVA	
	316	LTG EVA AM sw - ON (as required)	Four EVA hatch lights plus the AM white docking light will turn on
		LTG EVA DA sw - ON (as required)	Eight lights located on FAS and DA
		LTG EVA ATM sw - ON (as required)	Twelve lights on ATM will turn on if MSFN has sent ATM DCS enable command and ATM relay logic bus in powered up
		TURN LIGHTS OFF	
	207	LTG TRACKING sw - OFF	
		LTG DKG sw - OFF	
		LTG EVA AM sw - OFF	Lever lock switch
		LTG EVA DA sw - OFF	Lever lock switch
		LTG EVA ATM sw - OFF	Lever lock switch
		(25.15.05-00)	
		4.3.15.7 MDA LIGHTING	
		1. TURN LIGHTS ON	
		NOTE All integral light switches are initially in HI position. Turn on the following lights as required	
	207	LTG MDA FWD [1•3] sw - ON	Momentary switch
		MDA forward 1, 3 floodlights (2) - on	
		Fwd lt 1, 3 sw (2) - as required	May also be positioned to LO or OFF
	207	LTG MDA FWD [2•4] sw - ON	Momentary switch
		MDA forward 2, 4 floodlights (2) - on	
		Fwd lt 2, 4 sw (2) - as required	May also be positioned to LO or OFF
	207	LTG MDA AFT [1•3] sw - ON	Momentary switch
		MDA aft 1, 3 floodlights (2) - on	
		Aft lt 1, 3 sw (2) - as required	May also be positioned to LO or OFF
	207	LTG MDA AFT [2•4] sw - ON	Momentary switch
		MDA aft 2, 4 floodlights (2) - on	
		Aft lt 2, 4 sw (2) - as required	May also be positioned to LO or OFF

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.7 MDA LIGHTING (cont'd)	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
	101	X INTERIOR LTS sw - ON X	During MDA/AM activation this switch is used to initiate MDA lighting
		X X	
		MDA forward 1-4 (4) - on	
		MDA aft 1-4 (4) - on	
		X Fwd lt 1-4 sw (4) - as required X	
		X Aft lt 1-4 sw (4) - as required X	
		X X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		2. TURN LIGHTS OFF	
		NOTE	
		Turn off the following lights as required	
		Fwd lt 1, 3 sw (2) HI	
	207	LTG MDA FWD [1•3] sw - OFF	Momentary switch
		MDA forward 1, 3 floodlights (2) - off	
		Fwd lt 2, 4 sw (2) - HI	
	207	LTG MDA FWD [2•4] sw - OFF	Momentary switch
		MDA forward 2, 4 floodlights (2) - off	
		Aft lt 1, 3 sw (2) - HI	
	207	LTG MAD AFT [1•3] sw - OFF	Momentary switch
		MDA aft 1, 3 floodlights (2) - off	
		Aft lt 2, 4 sw (2) - HI	
	207	LTG MDA AFT [2•4] sw - OFF	Momentary switch
		MDA aft 2, 4 floodlights - off	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
		X Fwd lt 1-4 sw (4) - HI X	
		X Aft lt 1-4 sw (4) - HI X	
	101	INTERIOR LTS sw - OFF	Momentary switch
		X MDA forward 1-4 floodlights (4) - off X	
		X MDA aft 1-4 floodlights (4) - off X	
		X X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		(25.15.06-00)	
		4.3.15.8 STS LIGHTING	Lighting selectors provide illumination that is barely visible (setting of 0) to 99% illumination (setting of 9). Positioning the selector to FIXED provides 100% illumination
		1. TURN LIGHTS ON	
		NOTE	
		Turn on the following lights as required	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.8 STS LIGHTING (cont'd)	
	207	LTG PNL sel - as required Panel lights (6) - on	Light housings will attain approximately 131°F in FIXED position
		LTG METER sel - as required Meter lights (31) - on LTG STS FWD sel - as required STS forward lights (4) - on LTG STS AFT sel - as required STS aft lights (4) - on	
		2. TURN LIGHTS OFF	
	207	LTG PNL sel - OFF Panel lights (6) - off LTG METER sel - OFF Meter lights (31) - off LTG STS FWD sel - OFF STS forward lights (4) - off LTG STS AFT sel - OFF STS aft lights (4) - off	
		(25.15.07-00)	
		4.3.15.9 LOCK COMPARTMENT LIGHTING	
		1. TURN LIGHTS ON	Light housings will attain approximately 120°F
		NOTE Turn on the following lights as required	
	316	LTG LOCK sw - BRIGHT Lock lights (4) - on	Lever lock switch
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X LTG LOCK sw - DIM X X Lock lights (2) - on X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Lever lock switch
		LTG METER sw - ON Meter lights (2) - on	Lever lock switch
		2. TURN LIGHTS OFF	
	316	LTG LOCK sw - OFF Lock lights (4) - off	Lever lock switch
		LTG METER sw - OFF Meter lights (2) - off	Lever lock switch

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.15.08-00)	
		4.3.15.10 AFT COMPARTMENT LIGHTING	
		1. TURN LIGHTS ON	Light housings will attain approximately 133°F
		NOTE Turn on the following lights as required	
	390	LTS AFT sw - BRIGHT Aft compartment lights (6) - on	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X LTS AFT sw - DIM X X Aft compartment lights (3) - on X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		2. TURN LIGHTS OFF LTS AFT sw - OFF Aft compartment lights (6) - off	
		(25.15.09-00)	
		4.3.15.11 OWS INITIAL ENTRY LIGHTING	
		1. TURN LIGHTS ON	
	390	LTS OWS ENTRY - ON	The following lights will turn on: Dome lights 1 and 4 Upper wall lights 3 and 8 Exp compt lights 6, 7, 13 and 14 The above lights are also the emergency lights
		2. TURN LIGHTS OFF	
	390	LTS OWS ENTRY - OFF	Above lights will turn off if they have not been turned on in OWS
		(25.15.10-00)	
		4.3.15.12 OWS FORWARD COMPARTMENT LIGHTING	
		NOTE All light integral switches are initially positioned to HI	
		1. TURN LIGHTS ON Turn on the following lights as required:	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.12 OWS FORWARD COMPARTMENT LIGHTING (cont'd)	
		Lighting Dome Area	
	616	LTG DOME [1•3•5] sw - 1•3•5	
		OWS dome floodlights 1, 3, 5 (3) - on	
		OWS dome lt 1, 3, 5 (3) sw - as required	May be positioned to "LO" or "OFF"
	616	LTG DOME [2•4•6] sw - 2•4•6	
		OWS dome floodlights 2, 4, 6 (3) - on	
		OWS dome lt 2, 4, 6 sw - as required	
	616	LTG DOME [7•8] sw - 7•8	
		OWS dome floodlights 7, 8 (2) - on	
		OWS dome lt 7, 8 (2) sw - as required	
		Lighting Upper Wall	
	616	LTG UPPER WALL +Z SAL [1•2•10] sw - 1•2•10	
		OWS upper wall floodlight 1, 2, 10 (3) - on	
		OWS upper wall lt 1, 2, 10 (3) sw - as required	
	616	LTG UPPER WALL +Y [3•4] sw - 3•4	
		OWS upper wall floodlights 3, 4 (2) - on	
		OWS upper wall lt 3, 4 (2) sw - as required	
	616	LTG UPPER WALL - Z SAL [5•6•7] sw - 5•6•7	
		OWS upper wall floodlights 5, 6, 7 (3) - on	
		OWS upper wall lt 5, 6, 7 (3) sw - as required	
	616	LTG UPPER WALL -Y [8•9] sw - 8•9	
		OWS upper wall floodlights 8, 9 (2) - on	
		OWS upper wall lt 8, 9 (2) sw - as required	
		2. TURN LIGHTS OFF	
		Turn off the lights illuminated in step 1 as required	
		Lighting Dome Area	
		OWS dome lt 1, 3, 5 (3) sw - HI (verify)	All light integral switches positioned HI
	616	LTG DOME [1•3•5] sw - OFF	
		OWS dome floodlights 1, 3, 5 (3) - off	
		OWS dome lt 2, 4, 6 (3) sw - HI (verify)	
	616	LTG DOME [2•4•6] sw - OFF	
		OWS dome floodlights 2, 4, 6 (3) - off	
		OWS dome lt 7, 8 (2) sw - HI (verify)	
	616	LTG DOME [7•8] sw - OFF	
		OWS dome floodlights 7, 8 (2) - off	
		Lighting Upper Wall	
		OWS upper wall lt 1, 2, 10 (3) sw - HI (verify)	
	616	LTG UPPER WALL +Z SAL [1•2•10] sw - OFF	
		OWS upper wall floodlights 1, 2, 10 (3) - off	
		OWS upper wall lt 3, 4 (2) sw - HI (verify)	
	616	LTG UPPER WALL +Y [3•4] sw - OFF	
		OWS upper wall floodlights 3, 4 (2) - off	
		OWS upper wall 1 + 5, 6, 7 (3) sw - HI (verify)	
	616	LTG UPPER WALL -Z SAL [5•6•7] sw - OFF	
		OWS upper wall floodlights 5, 6, 7 (3) - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.3.15.12 OWS FORWARD COMPARTMENT LIGHTING (cont'd)	
	616	OWS upper wall lt 8, 9 (2) sw - HI (verify) LTG UPPER WALL -Y [8•9] sw - OFF OWS upper wall floodlights 8, 9 (2) - off	
		(25.15.11-00)	
		4.3.15.13 OWS EXPERIMENT COMPARTMENT LIGHTING	
		NOTE All light integral switches are initially positioned to HI .	
		1. TURN LIGHTS ON Turn on the following lights as required	
	616	LTG EXP COMPT [1•3•5] sw - 1•3•5 OWS experiment compartment floodlights 1, 3, 5 (3) - on OWS exp compt lt 1, 3, 5 (3) sw - as required	
	616	LTG EXP COMPT [2•4•6] sw - 2•4•6 OWS experiment compartment floodlights 2, 4, 6 (3) - on OWS exp compt lt 2, 4, 6 (3) sw - as required	
	616	LTG EXP COMPT [7•9•11] sw - 7•9•11 OWS experiment compartment floodlights 7, 9, 11 (3) - on OWS exp compt lt 7, 9, 11 (3) sw - as required	
	616	LTG EXP COMPT [8•10 • 12] sw - 8•10•12 OWS experiment compartment floodlights 8, 10, 12 (3) - on OWS exp compt lt 8, 10, 12 (3) sw - as required	
	616	LTG EXP COMPT [13•14] sw - 13•14 OWS experiment compartment floodlights 13, 14 (2) - on OWS exp compt lt 13, 14 (2) sw - as required	
		2. TURN LIGHTS OFF	
		NOTE Turn off the lights illuminated in step 1 as required	
		OWS exp compt lt 1, 3, 5 (3) sw - HI (verify)	All light integral switches will be in the HI position while off
	616	LTG EXP COMPT [1•3•5] sw - OFF OWS experiment compartment floodlights - 1, 3, 5 (3) - off OWS exp compt lt 2, 4, 6 (3) sw - HI (verify	
	616	LTG EXP COMPT [2•4•6] sw - OFF OWS experiment compartment floodlights 2, 4, 6 (3) - off OWS exp compt lt 7, 9, 11 (3) sw - HI (verify)	
	616	LTG EXP COMPT [7•9•11] sw - OFF OWS experiment compartment floodlights 7, 9, 11 (3) - off OWS exp compt lt 8, 10, 12 (3) sw - HI (verify)	
	616	LTG EXP COMPT [8•10•12] sw - OFF OWS experiment co mpartment floodlights 8, 10, 12 (3) - off OWS exp compt lt 13, 14 (2) sw - HI (verify)	
	616	LTG EXP COMPT [13•14] sw - OFF OWS experiment compartment floodlights 13, 14 (2) - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.15.12-00)	
		4.3.15.14 OWS WARDROOM COMPARTMENT LIGHTING	
		NOTE All light integral switches are initially positioned to HI	
		1. TURN LIGHTS ON Turn on the following lights as required	
	630	LTS WARDROOM [1•3] sw - 1•3 Wardroom floodlights 1, 3 (2) - on	
		Wardroom lt 1, 3 (2) sw - as required	May be positioned to LO or OFF
	630	LTS WARDROOM [2•4] sw - 2•4 Wardroom floodlights 2, 4 (2) - on	
		Wardroom lt 2, 4 (2) sw - as required	
		2. TURN LIGHTS OFF	
		NOTE Turn off the lights illuminated in step 1 as required	
		Wardroom lt 1, 3 (2) sw - HI (verify)	
	630	LTS WARDROOM [1•3] sw - OFF Wardroom floodlights 1, 3 (2) - off	All light integral switches positioned HI
		Wardroom lt 2, 4 (2) sw - HI (verify)	
	630	LTS WARDROOM [2•4] sw - OFF Wardroom floodlights 2, 4 (2) - off	
		(25.15.13-00)	
		4.3.15.15 OWS SLEEP COMPARTMENT LIGHTING	
		NOTE The LTG [SLEEP COMPT] sw will normally be positioned ton to provide the astronaut individual control in his sleep compartment	
		1. TURN LIGHTS ON	
	630	OWS sleep compt lt 1, 2, 3 (3) sw - HI or LO OWS sleep compartment floodlights 1, 2, 3 - on (if integral switch is positioned either HI or LO)	As required. One light in each sleep compartment
		2. TURN LIGHTS OFF OWS sleep compt lt 1, 2, 3 (3) sw - OFF (As required) OWS sleep compartment floodlights 1, 2, 3 (3) - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.15.14-00)	
		4.3.15.16 OWS WMC LIGHTING	
		NOTE All light integral switches are initially positioned to HI	
	630	1. TURN LIGHTS ON LTS [WMC] sw - WMC WMC floodlights 1, 2, 3(3) - on WMC lt 1, 2, 3 (3) sw - as required	May be positioned to "LO" or "OFF"
	630	2. TURN LIGHTS OFF WMC lt 1, 2, 3 (3) sw - HI LTS [WMC] sw - OFF WMC floodlights 1, 2, 3 (3) - off	All light integral switches positioned HI
		4.3.15.17 (DELETED)	

SECTION 4.4

INFLIGHT MAINTENANCE

4.4.1 ELECTRICAL POWER SYSTEM

4.4.1.1 MDA POWER UMBILICAL INSTALLATION (4.19.2)

4.4.1.2 CONTINGENCY POWER CABLE REMOVAL (4.19.6)

4.4.2 COMMUNICATION SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.15.03-XX)	
		4.4.2.1. INTERCOM BOX REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		CAUTION Except for intercom box 116 or 131, minimal use of all other intercom boxes and CCU's is recommended, to minimize electrical current flow through connectors of intercom box being replaced.	
		(27.02.01-00)	
	INTERCOM	1. REMOVE FAILED INTERCOM BOX Verify CCU's disconnected and CCU CHAN A, B sels (2) - OFF Loosen Calfax fasteners and remove access cover to intercom box and restrain (required only if intercom box 702 or 801 is to be replaced COMM CHAN sel - A SLEEP Disconnect cables from intercom box Identify failed intercom box (tape, scissors) Loosen Calfax fasteners (4) (spin-type handle, 5/32 hex driver bit) Remove intercom box from mounting interface Exchange failed intercom box for replacement	(D430)
		(27.02.02-00)	
		2. INSTALL NEW INTERCOM BOX Position new intercom box on mounting interface Hand tighten Calfax fasteners (4) COMM CHAN sel - B SLEEP Connect cables to intercom box	Receptacle J1 is outlined in blue on all intercom boxes. J1 mating connector for intercom box 131 has a blue backshell ring
		COMM CHAN sel - as required Replace access cover to intercom box and handtighten Calfax fasteners (required only if intercom box 702 or 801 was replaced)	
		(27.02.19-00)	
		4.4.2.2 MDA/OWS TELEVISION STATION REPLACEMENT	
		NOTE Typical for panels 133, 404, 555, and 642, See tool matrix for tool requirements (Appendix C)	
		1. REMOVE POWER FROM TV STATION Use appropriate cb for failed station, verify power switches on other stations are off. Unplug TV Camera. (Connector J3 on TV input station)	This step is A.E. 27.02.03-00

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.2.2 MDA/OWS TELEVISION STATION REPLACEMENT (cont'd)	
	202 612	cb TV PWR MDA - Open cb TV OUTLETS FWD COMPT - OPEN cb TV OUTLETS EXP COMPT - OPEN cb TV OUTLETS DOME - OPEN	For panel 133 For panel 404 For panel 642 For panel 555
		2. REMOVE FAILED TV STATION Cut and remove safetywire from electrical connectors J1 and J2 (diagonal cutters) Disconnect electrical connectors J1, J2, and J4 (3) (connector pliers, 9/16 open end box) Identify failed TV station (scissors, 1-inch red tape) Remove mounting bolts (4) from failed input station (1/4" 12 point standard socket, 3/8" open end box, 4" extension, and ratchet handle. Socket, extension and ratchet handle are used to replace panel 133 only	This step is A.E. 27.02.04-00 J1 and J2 are threaded coaxial connectors
		NOTE For panel 133, use 3/8" open end box to restrain bolt from turning while using socket, extension, and ratchet handle to remove nut from STS side of bolt	
		Remove failed station from mounting Exchange failed station for replacement spare (tools TBD) Remove bag from spare, dispose of bag in STS trash bag	(M124)
		3. INSTALL REPLACEMENT STATION Install station on bracket and replace (4) bolts (Ref. removal procedure for tools) Connect and hand tighten electrical connectors J1, J2, and J4 Connect camera cable to J3 on TV input station	This step is A.E. 27.02.05-00
	133, 404 555, 642 202, 612	4. APPLY POWER TO TV STATION Replacement station TV PWR sw - ON cb used in step 1 - closed	This step is A.E. 27.02.06-00
		5. ACTIVATE AND CHECKOUT TV STATION Adjust gain of spare station per values shown (3/32" screwdriver)	This step is A.E. 27.02.07-00

STATION LOCATION	133	404	555	642
GAIN ADJUSTMENT	TBS	TBS	TBS	TBS

CREWMAN	PANEL	PROCEDURE	REMARKS
		(25.02.XX-00)	
		4.4.2.3 VIDEO SWITCH REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. REMOVE POWER FROM VIDEO SWITCH	This step is A.E. 27.02.13-00
		NOTE The next operation will interrupt TM parameters: K0026-ATM 1 TV, K0027-ATM 2 TV, K0028-PORT TV	
	202 130	cb TV ATM VIDEO - open SYNC GEN sw - OFF	
		CAUTION All stations must be turned off to preclude current to VIDEO sw from TV station amplifiers	
	TV	TV PWR sw - OFF (verify)	
		(27.02.14-00)	
		2. REMOVE FAILED VIDEO SWITCH	This step is A.E. 27.02.14-00
	132	Cut and remove safetywire for following electrical cable connectors (diagonal cutter): 807W51P4 807W52P4 807W16P2 807W6 P1	Safetywire required for launch only Cable run identification numbers
		Disconnect electrical connectors (6) from J1 through J6 (5/16 open end/box wrench, 11/32 open end/box wrench, 9/16 open end/box wrench, connector pliers)	J1 through J4 are coaxial connectors and J5 and J6 are bayonet connectors
		Remove switch mounting bolts (4) (4 inch extension, ratchet handle, 7/16 standard socket)	
		NOTE Tools in this step are also used to remove spare switch from film vault, stow failed switch in vault, and mount spare switch at ATM C&D panel	
		Remove switch from mounting	
		3. OBTAIN REPLACEMENT SWITCH	The next 2 steps are A.E. 27.02.15-00
		Remove replacement switch from stowage (same tools used for failed switch removal)	(M124)
		Tag and stow failed switch in spot vacated by spare (same tools)	(M124)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.2.3 VIDEO SWITCH REPLACEMENT (cont'd)	
	132	4. INSTALL REPLACEMENT SWITCH Install replacement switch at mounting and replace bolts (4) (same tools) Connect electrical connectors (6) as follows: 807W51P4 to J1 807W52P4 to J2 807W6 P1 to J3 807W16P2 to J4 807W3 P5 to J5 807W3 P6 to J6	Fingertight
	202	5. VIDEO SWITCH VERIFICATION cb TV ATM VIDEO - closed	This step is A.E. 27.02.16-00
		NOTE The next operation will restore TM parameters: K0026-ATM 1 TV, K0027-ATM 2 TV, K0028-PORT TV	
	130 132	Activate ATM TV monitor (SLOH/ATM 4.3.2.3) VIDEO sel - ATM1 then ATM2 Verify video signals received properly by ground VIDEO sel - TV Operate portable TV camera (4.3.2.22) Verify video signal received properly by ground	Coordinate with MSFN Coordinate with MSFN
		(27.02.12-00)	
		4.4.2.4 TELEPRINTER REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
	209	1. DEACTIVATE TELEPRINTING SYSTEM TELEPRINT sw - OFF	Removes power from teleprinting system
	209	2. REMOVE FAILED TELEPRINTER Unsnap stowage bag snaps (2) Loosen Calfax fasteners (2) on connector access door located under panel 209 Open hinged access door Disconnect electrical connector at teleprinter Loosen Calfax fastener on acoustical cover Open hinged acoustical cover Loosen Calfax fasteners (2) on paper takeup device plate Remove plate Restrain plate with one Calfax fastener to left of teleprinter	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.2.4 TELEPRINTER REPLACEMENT (cont'd)	
		Loosen Calfax fasteners (6) on teleprinter (spin type handle, 5/32 hex driver bit)	
		Carefully lift teleprinter out of panel using diagonal Calfax fasteners	
		3. OBTAIN REPLACEMENT TELEPRINTER	
		Identify failed teleprinter (1 inch red tape, scissors)	
		Obtain replacement teleprinter	(M202)
		Stow failed teleprinter	(M202)
		4. INSTALL REPLACEMENT TELEPRINTER	
	209	Carefully install teleprinter in panel	
		Tighten Calfax fasteners (6) (spin-type handle, 5/32 hex driver bit)	
		Loosen Calfax fastener and replace paper takeup device plate	
		Handtighten Calfax fasteners (2)	
	209	Close acoustical cover	
		Handtighten Calfax fastener on acoustical cover	
		Connect electrical connector at teleprinter through connector access door under panel 209	
		Close door	
		Handtighten Calfax fasteners (2) on door	
		5. ACTIVATE TELEPRINTING SYSTEM	
	209	TELEPRINT sw - CMD	Provides MSFN control of teleprinting system power
		(27.02.10-00)	
		4.4.2.5 TELEPRINTER PAPER ROLL END SPOOL REPLACEMENT	
		NOTE Procedure applicable after end spool failure or loss of part has been established	
		1. DISPOSE OF FAILED PAPER ROLL END SPOOL	
		Stow paper roll end spool in trash bag	
		2. OBTAIN TELEPRINTER PAPER ROLL END SPOOL	(M202)
		3. INSTALL NEW TELEPRINTER PAPER ROLL AND STOW (4.3.2.30, steps 3-5)	
		(27.02.17-00)	
		4.4.2.6 MDA CONTROL UMBILICALS INSTALLATION (4.19.1)	
		(27.02.18-00)	
		4.4.2.7 MDA CONTROL UMBILICALS REMOVAL (4.19.4)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.02.22-00)	
		4.4.2.8 AM TELEVISION STATION REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. REMOVE POWER FROM TV STATION	
	202	cb TV PWR AM - Open	
		Verify power switches on other stations are off	
		Unplug TV camera (Connector J3 on TV input station)	
		2. REMOVE FAILED TV STATION	
	320	Loosen screws (2) on connector access cover (No. 3 hi-torque screwdriver bit, ratchet handle)	
		Remove screws and cover	
		Loosen screws (4) on cover assembly (No. 3 hi-torque screwdriver bit, ratchet handle)	
		Position cover assembly for tool access to connectors	Cover assembly is captive while connectors are mated
		Cut and remove safetywire from electrical connectors J1 and J2 (diagonal cutters)	J1 and J2 are threaded coaxial connectors
		Disconnect electrical connectors J1, J2 and J4 (connector pliers, 9/16 open end/box)	
		Remove screws and cover assembly	Removal of cover assembly provides access to TV station mounting screws
		Identify failed TV station (scissors, 1-inch red tape)	
		Remove mounting screws (4) from failed input station (No. 3 hi-torque screwdriver bit, ratchet handle)	
		Remove failed station from mounting	
		Exchange failed station for replacement spare (tools TBD)	(M124) Remove bag from spare, dispose of bag in STS trash bag
		3. INSTALL REPLACEMENT STATION	
		Install station on bracket and tighten screws (4) (No. 3 hi-torque screwdriver bit, ratchet handle)	
		Position cover assembly but do not tighten mounting screws	
		Connect and handtighten electrical connectors J1, J2, J4	
		Tighten cover assembly screws (4) (No. 3 hi-torque screwdriver bit, ratchet handle)	
		Position connector access cover and tighten screws (12) (No. 3 hi-torque screwdriver bit, ratchet handle)	
		Connect camera cable to J3 on TV input station	
		4. APPLY POWER TO TV STATION	
	320	TV PWR sw - OFF	
	202	cb TV PWR AM - closed	
		5. ACTIVATE AND CHECKOUT TV STATION	
		Adjust gain of TV station to TBS	

4.4.3 THRUSTER ATTITUDE CONTROL SYSTEM

(TBS)

4.4.4 ENVIRONMENTAL CONTROL SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.11.04-00)	
		4.4.4.1 DUCT HEATER REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE HEATER ASSEMBLY	This step is A.E. 27.11.01-00
		NOTE Isolate failed heater assembly by opening appropriate circuit breakers and switches	
		If a duct 1 heater has failed,	
	617	TCS HTRS DUCT 1 [1•3] sw - OFF	
		TCS HTRS DUCT 1 [2•4] sw - OFF	
	614	cb TCS DUCT 1 FANS 1-4 (4) - OPEN	
		or	
		If a duct 2 heater has failed,	
	617	TCS HTRS DUCT 2 [1•3] sw - OFF	
		TCS HTRS DUCT 2 [2•4] sw - OFF	
	614	cb TCS DUCT 2 FANS 1-4 (4) - OPEN	
		or	
		If a duct 3 heater has failed,	
	617	TCS HTRS DUCT 3 [1•3] sw - OFF	
		TCS HTRS DUCT 3 [2•4] sw - OFF	
	614	cb TCS BUS 1 DUCT 3 FANS [1/2], [3/4] (2) - OPEN	
		cb TCS BUS 2 DUCT 3 FANS [1/2], [3/4] (2) - OPEN	
		2. REMOVE DUCT HEATER ASSEMBLY	The next 3 steps are A.E. 27.11.02-00
		Disconnect zero g connectors (2)	
		Release and open Marmon clamp bolt-cover assembly spring clips (2)	Cover is secured to Marmon clamp
		Loosen T-bolt nut 6 to 8 turns (5/16 deepwell socket, ratchet handle)	
		Rotate quick-release coupler off T-bolt	
		Repeat two preceding operations for remaining clamp	
		Rotate Marmon clamps away from circulation duct	Clamps are hinged on surface of circulation duct
		Remove duct heater assembly	
		3. OBTAIN REPLACEMENT	
		Obtain replacement heater assembly	(D442)
		Identify failed heater assembly and stow (1 inch red tape, scissors)	(D442)
		4. INSTALL REPLACEMENT HEATER ASSEMBLY	
		Position base of heater assembly on circulation duct	
		Connect zero g connectors (2)	
		Rotate Marmon clamps around circulation duct	
		Rotate quick-release coupler over T-bolt	
		Tighten T-bolt nut 6 to 8 turns (5/16 deepwell socket, ratchet handle	
		Repeat two preceding operations to secure remaining Marmon clamp	
		Rotate and close Marmon clamp bolt-cover assembly spring clips (2)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.1 DUCT HEATER REPLACEMENT (cont'd)	
		5. VERIFY HEATER ELEMENT OPERATION AND ACTIVATE HEATER ASSEMBLY	This step is A.E. 27.11.03-00
		NOTE Activate heater assembly by performing one of the three following sets of operations corresponding to the duct heater replaced	
		If a duct 1 heater was replaced,	
	614	cb TCS DUCT 1 FANS 1-4 (4) - close	Activates fans
		EPS OWS BUS 1 AMPS ind - monitor (log)	
	617	TCS HTRS DUCT 1 [1•3] sw - ON	
		EPS OWS BUS 1 AMPS ind - ≈10 increase	Verifies duct heater 1•3 elements operation
		TCS HTRS DUCT [1•3] sw - OFF	
		EPS OWS BUS 1 AMPS ind - returned to logged value	
		TCS HTRS DUCT 1 [2•4] sw - ON	
		EPS OWS BUS 1 AMPS ind - ≈10 increase	Verifies duct heater 2•4 elements operation
		TCS HTRS DUCT 1 [2•4] sw - AUTO	
		TCS HTRS DUCT 1 [1•3] sw - AUTO	
		or	
		If a duct 2 heater was replaced,	
	614	cb TCS DUCT 2 FANS 1-4 (4) - close	Activates fans
		EPS OWS BUS 2 AMPS ind - monitor (log)	
	617	TCS HTRS DUCT 2 [1•3] sw - ON	
		EPS OWS BUS 2 AMPS ind - ≈10 increase	Verifies duct heater 1•3 elements operation
		TCS HTRS DUCT 2 [1•3] sw - OFF	
		EPS OWS BUS 2 AMPS ind - returned to logged value	
		TCS HTRS DUCT 2 [2•4] sw - ON	
		EPS OWS BUS 2 AMPS ind - ≈ 10 increase	Verifies duct heater 2•4 elements operation
		TCS HTRS DUCT 2 [2•4] sw - AUTO	
		TCS HTRS DUCT 2 [1•3] sw - AUTO	
		or	
		If a duct 3 heater was replaced,	
	614	cb TCS BUS 1 DUCT 3 FANS [1/2], [3/4] (2) - close	Activates fans
		cb TCS BUS 2 DUCT 3 FANS [1/2], [3/4] (2) - close	
		EPS OWS BUS 1 AMPS ind - monitor (log)	
		EPS OWS BUS 2 AMPS ind - monitor (log)	
	617	TCS HTRS DUCT 3 [1•3] sw - BUS 1	
		EPS OWS BUS 1 AMPS ind - ≈10 increase	Verifies duct heater 1•3 elements operation
		TCS HTRS DUCT 3 [1•3] sw - OFF	
		TCS HTRS DUCT 3 [2•4] sw - BUS 2	
		EPS OWS BUS 2 AMPS ind - ≈10 increase	Verifies duct heater 2•4 elements operation
		TCS HTRS DUCT 3 [2•4] sw - OFF	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.12.05-00)	
		4.4.4.2 OWS DUCT FAN REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE OWS DUCT FANS	This step is A.E. 27.12.01-00
		NOTE Open appropriate circuit breakers isolating all fans in duct which failed fan is located	
	614	cb TCS DUCT 1 FANS 1-4 (4) - OPEN or cb TCS DUCT 2 FANS 1-4 (4) - OPEN or cb TCS BUS 1 DUCT 3 FANS [1/2], [3/4] (2) - OPEN cb TCS BUS 2 DUCT 3 FANS [1/2], [3/4] (2) - OPEN	
		NOTE The following step is used only during an initial fan exchange from any one fan cluster	
		2. LOOSEN LAUNCH RESTRAINT Loosen fan cluster launch restraint knobs	This step is A.E. 27.12.02-00 Fan cluster restraint knobs are not to be retightened after fan replacement
		3. REMOVE OWS DUCT FAN	The next 3 steps are A.E. 27.12.03-00
		NOTE Replacement of fan 2 in duct 2 require fan 1 to be removed first	
		Disconnect zero g connector Simultaneously release lock device and squeeze fan handle Retract overcenter locking pin Pull fan free from fan cluster	
		4. OBTAIN REPLACEMENT OWS DUCT FAN Obtain PLV fan Identify and stow failed fan (1-inch red tape,. scissors)	 (D442) or (D432) (D442) or (D432)
		5. INSTALL REPLACEMENT OWS DUCT FAN Position fan in fan cluster Simultaneously release lock device and squeeze fan handle Extend overcenter locking pin, release fan handle and position lock device to lock position Connect zero g connector	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.2 OWS DUCT FAN REPLACEMENT (cont'd)	
	614	6. ACTIVATE OWS DUCT FAN Close circuit breakers opened in step 1	This step is A.E. 27.12.04-00
	617	7. VERIFY REPLACEMENT OWS DUCT FAN OPERATION TCS DUCT AIR FLOW 1, 2, and 3 ind - 550 to 620 cfm	This step is A.E. 26.04.08-00
		(27.13.04-00)	
		4.4.4.3 AM DUCT FAN REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
	203	1. DEACTIVATE AM DUCT FAN AM FANS DUCT sw - OFF	This step is A.E. 27.13.01-00
		2. REMOVE AM DUCT FAN Disconnect BUS 2 zero g connector Loosen Calfax fasteners (2) on AM duct fan muffler Slide muffler and fan back from AM duct Simultaneously release lock device and squeeze fan handle Pull AM duct fan free from muffler assembly	The next 3 steps are A.E. 27.13.02-00
		3. OBTAIN REPLACEMENT AM DUCT FAN Obtain PLV fan Identify and stow failed fan (1-inch red tape, scissors)	(D442) or (D432) (D442) or (D432)
		4. INSTALL REPLACEMENT AM DUCT FAN Simultaneously release lock device and squeeze fan handle Position AM duct fan on muffler assembly, release fan handle and position lock device to lock position Slide muffler and fan against muffler and tighen Calfax fasteners (2) Connect BUS 2 zero g connector	
		5. ACTIVATE AM DUCT FAN	This step is A.E. 27.13.03-00
		NOTE Following operation will activate C/W OWS GAS INTERCHG indication	
	203 INTERCOM 207	AM FANS DUCT sw - HI Caution tone - on C/W OWS GAS INTERCHG lt - on	
		Respond to C/W alert (4.3.8.18)	
	207 206	C/W OWS GAS INTERCHG lt - off C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off	Light goes off as gas flow increases Momentary switch

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.15.04-00)	
		4.4.4.4 CSM FAN 1 REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
	203	1. DEACTIVATE CSM FAN 1 MDA FANS CSM sw - OFF	This step is A.E. 27.15.01-00
		2. REMOVE CSM FAN 1 Disconnect zero-g connector Disconnect temperature probe connector from inlet muffler Remove Calfax fasteners (4) from launch restraint on inlet muffler and stow receptacles on muffler structure (5/32 square driver bit, 8 inch extension, ratchet handle) Remove lockpin Unlatch latches (2) Remove inlet muffler and restrain TBD Simultaneously release lock device and squeeze fan handle Pull fan free from outlet muffler	The next 3 steps are A.E. 27.15.02-00
		3. OBTAIN REPLACEMENT CSM FAN 1 Obtain PLV fan Identify and stow failed fan (1-inch red tape, scissors)	(D442) or (D432) (D442) or (D432)
		4. INSTALL REPLACEMENT CSM FAN 1 Simultaneously release lock device and squeeze fan handle Position fan on lower restraints flush with outlet muffler, release fan handle and position lock device to lock position Remove inlet muffler from temporary restraint Position inlet muffler and insert lockpin into clevis Latch latches (2) Tighten two of the four launch restraint Calfax fasteners (5/32 square driver, bit 8 inch extension, ratchet handle) Connector zero-g connector Connect temperature probe connector to inlet muffler	
	203	5. ACTIVATE CSM FAN 1 MDA FANS CSM sw - HI Verify fan operation	This step is A.E. 27.13.03-00
		(27.14.04-00)	
		4.4.4.5 MDA FAN REPLACEMENT	
		NOTE This procedure applies to MDA FANS 1 and 2. See tool matrix for tool requirements (Appendix C)	
	203	1. DEACTIVATE MDA FAN MDA FANS 1 (2) sw - OFF	This step is A.E. 27.14.01-00

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.5 MDA FAN REPLACEMENT (cont'd)	
		2. REMOVE MDA FAN Disconnect zero g connector Remove Calfax fasteners (4) from launch restraint on inlet muffler and stow in receptacles on muffler structure (5/32 square driver bit, 8 inch extension, ratchet handle) Remove lockpin Unlatch latches (2) Remove inlet muffler and restrain Simultaneously release lock device and squeeze fan handle Pull fan free from muffler assembly	The next 3 steps are A.E. 27.14.02-00
		3. OBTAIN REPLACEMENT MDA FAN Obtain PLV fan Identify and stow failed fan (1-inch red tape, scissors)	(D442) or (D432) (D442) or (D432)
		4. INSTALL REPLACEMENT MDA FAN Simultaneously release lock device and squeeze fan handle Position fan on lower restraints and flush with outlet muffler, release fan handle and position lock device to lock position Position inlet muffler and insert lockpin into clevis Latch latches (2) Tighten two of the four launch restraint Calfax fasteners (5/32 square driver bit, 8 inch extension, ratchet handle) Connect zero g connector	
	203	5. ACTIVATE MDA FAN MDA FANS 1 (2) sw - HI Verify fan operation	This step is A.E. 27.14.03-00
		(27.16.05-00)	
		4.4.4.6 MOLECULAR SIEVE FAN REPLACEMENT	
		NOTE This procedure applies to mol sv A and B. See tool matrix for tool requirements (Appendix C)	
	203	1. DEACTIVATE MOL SV FAN MOL SV A (B) FANS PWR sw - OFF	This step is A.E. 27.16.01-00
		2. REMOVE MOL SV FAN Loosen yellow Calfax fasteners (4) and remove MOL SV A (B) cover Maneuver cover clear of equipment and restrain Loosen (ccw) tethered knob and pull out Close solids trap lid and secure with Velcro strap Remove solids trap Restrain solids trap Disconnect PPCO2 qd on side of fan inlet manifold	The next 3 steps are A.E. 27.16.02-00

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.6 MOLECULAR SIEVE FAN REPLACEMENT (cont'd)	
		CAUTION 5 VDC exists on lines and connectors are not zero g	
		Disconnect dew point transducer connector Disconnect temperature transducer connectors (2) Disconnect connector from failed fan Loosen knobs (2) from manifold and swing manifold back from two fans Depress spring clip adjacent to failed fan and pull fan out	
		3. OBTAIN REPLACEMENT FAN Obtain mol sieve fan Identify and stow failed fan (1-inch red tape, scissors)	(M202) (M202)
		4. REPLACE MOL SV FAN Position replacement fan onto outlet manifold by depressing spring clip and pushing fan in Note alignment pin and electrical connector orientation and verify fan positioned properly on outlet manifold Swing manifold over fans, engage (2) and tighten knobs (cw) Connect connector to fan Connect dew point transducer connector Connect connectors (2) to temperature transducer Connect PPCO2 qd on side of fan manifold Open solids trap lid and secure with Velcro strap Position solids trap over fan manifold Install tethered knob and tighten (cw) Replace MOL SV A (B) cover and tighten yellow Calfax fasteners (4)	
		NOTE Following step will activate C/W SV FLOW indication	
	203 INTERCOM 207 207 206 203	5. ACTIVATE MOL SV FAN MOL SV A (B) FANS PWR sw - PRI (SEC) Caution tone - on C/W SV FLOW lt - on Respond to C/W alert (4.3.8.18) C/W SV FLOW lt - off C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off 6. VERIFY PPCO2 AND HEAT EXCHANGER IN TEMPERATURE TRANSDUCER OPERATION MOL SV DISP sw - SV A (B) MOL SV PPCO2 IN ind - 4.4 to 5.5 mmHg MOL SV HT EXCH IN ind - 60° to 80°F	This step is A.E. 27.16.03-00 Light goes off as gas flow increases Momentary switch This step is A.E. 27.16.04-00

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.17.04-00)	
		4.4.4.7 AM HEAT EXCHANGER FAN REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE AM HEAT EXCHANGER FANS	This step is A.E. 27.17.01-00. All fans deactivated due to noise level; noise muffler removed as door is opened
	203	AM FANS CIRC 1-3 sw (3) - OFF	
		2. REMOVE AM HEAT EXCHANGER FAN	The next 3 steps are A.E. 27.17.02-00
		Loosen Calfax fasteners (5) and open heat exchanger module access door	
		Simultaneously release lock device and squeeze fan handle	
		Slide fan from installed position	
		Disconnect zero g connector from failed fan and pull fan from heat exchanger module	
		Unlatch latches (2) and remove inlet diffuser (spin type handle, 3/8 standard screwdriver bit)	Slot head must rotate 180 degrees ccw
		3. OBTAIN REPLACEMENT FAN	
		Obtain PLV fan	(D442) or (D432)
		Identify and stow failed fan (1-inch red tape, scissors)	(D442) or (D432)
		4. INSTALL REPLACEMENT FAN	
		Position inlet diffuser on fan	
		Latch both latches securing inlet diffuser (spin type handle, 3/8 standard screwdriver bit)	Slot head must rotate 180 degrees cw
		Connect zero g connector to fan	
		Simultaneously release lock device and squeeze fan handle	
		Position fan in heat exchanger, module relase fan handle and position lock device to lock position	
		Close heat exchanger module access door and tighten Calfax fasteners (5)	
		5. ACTIVATE AM HEAT EXCHANGER FANS	
	203	AM FANS CIRC 1, 2 or 3 sw - HI	This step is A.E. 27.17.03-00
		Verify replacement fan operation	
		AM FANS CIRC 1, 2 or 3 sw - LO	
		Verify replacement fan operation	
		Position AM FANS CIRC 1-3 sw (3) in original position or as required for comfort	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.18.04-00)	
		4.4.4.8 OWS COOLING HEAT EXCHANGER FAN REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE OWS COOLING HEAT EXCHANGER FANS	This step is A.E. 27.18.01-00. All fans deactivated due to noise level; noise muffler removed as door is opened
	390	OWS HT EXCH FANS 1-4 sw (4) - OFF	
		2. REMOVE OWS HEAT EXCHANGER FAN Loosen Calfax fasteners (4) and open heat exchanger module access door Simultaneously release lock device and squeeze fan handle Slide fan from installed position Disconnect zero g connector from failed fan and pull fan from heat exchanger module Unlatch latches (2) and remove inlet diffuser (spin type handle, 3/8 standard screwdriver bit)	The next 3 steps are A.E. 27.18.02-00 Slot head must rotate 180 degrees ccw
		3. OBTAIN REPLACEMENT FAN Obtain PLV fan Identify and stow failed fan (1-inch red tape, scissors)	(D442) or (D432) (D442) or (D432)
		4. INSTALL REPLACEMENT FAN Position inlet diffuser on fan Latch both latches securing inlet diffuser (spin type handle, 3/8 standard screwdriver bit) Simultaneously release lock device and squeeze fan handle Position fan in heat exchanger module, release fan handle and position lock device to lock position Connect zero g connector Close cooling module access door and tighten Calfax fasteners (4)	Slot head must rotate 180 degrees cw
	390	5. ACTIVATE OWS COOLING HEAT EXCHANGER FANS OWS HT EXCH FANS 1, 2, 3 or 4 sw - ON Verify replacement fan operation OWS HT EXCH FANS 1-4 sw (4) - OWS	This step is A.E. 27.18.03-00
		(27.19.02-00)	
		4.4.4.9 WMC VENTILATION FAN REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
	800	1. DEACTIVATE WMC FAN FAN sw - OFF	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.9 WMC VENTILATION FAN REPLACEMENT (cont'd)	
		2. REMOVE ACOUSTIC COVER	
		NOTE Following three operations are required first time cover removal only	
		Obtain launch pin bag	
		Loosen grid attachment bolts (3) (7/16 open end/box)	(F527)
		Remove bolts, washers and bushings and place in launch pin bag	
		Loosen Calfax fasteners (3) securing acoustic cover to base plate	
		Remove cover and secure to floor grid with Astropins (3)	Astropins are installed in holes in acoustic cover for launch
		NOTE Following operation is required for all subsequent acoustic cover removals	
		Release Astropins (3) and secure in holes in acoustic cover	
		3. REMOVE FAILED WMC FAN	
		Disconnect zero g connector from fan	The next 3 steps are A.E. 27.19.01-00
		Unlatch latches (2) to disconnect fan/muffler assembly from WMC charcoal filter	
		Position lockpin device to open position and squeeze fan handle assembly	
		Separate muffler from fan and restrain muffler	
		Remove fan	
		4. OBTAIN REPLACEMENT FAN	
		Obtain replacement fan	(D432) or (D442)
		Identify failed fan (1-inch red tape, scissors)	
		Stow failed fan	(D432) or (D442)
		5. INSTALL REPLACEMENT FAN	
		Remove muffler from restraint	
		Simultaneously release lockpin device and squeeze fan handle assembly	
		Install fan on muffler and release fan handle assembly	
		Position lockpin device to locked position	
		Install fan/muffler assembly on WMC charcoal filter and secure with latches (2)	
		Connect zero g connector to fan	
	800	6. VERIFY WMC FAN OPERATION FAN sw - BUS 1, verify fan operation FAN sw - OFF	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.9 WMC VENTILATION FAN REPLACEMENT (cont'd)	
		7. INSTALL ACOUSTIC COVER Release Astropins (3) securing acoustic cover to floor grid Position cover in place Attach cover to floor grid with Astropins (3) Tighten Calfax fasteners (3)	
		(27.20.03-00)	
		4.4.4.10 PORTABLE FAN UNIT FAN REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C) Following step is necessary only if fan is connected to utility outlet	
	UTIL	1. DEACTIVATE FAILED PORTABLE FAN Portable fan [OFF/HI/LOW] sw - OFF UTIL OUTLET (UTIL PWR) sw - OFF Disconnect portable fan zero g connector from utility outlet Stow power cable on portable fan Connect power cable zero g connector to dummy receptacle	This step is A.E. 27.20.01-00 See remark (4.3.4.21)
		2. POSITION PORTABLE FAN UNIT FOR FAN REPLACEMENT (4.3.4.21, steps 1-4 as required)	
		3. REMOVE FAILED FAN FROM PORTABLE FAN UNIT Disconnect zero g electrical connector from fan Unlatch latches (3) from outlet muffler assembly Pull outlet muffler away from fan Slide fan out of fan cradle	The next 3 steps are A.E. 27.20.02-00
		4. OBTAIN REPLACEMENT FAN Obtain replacement fan Identify failed fan (1-inch red tape, scissors) Stow failed fan	(D432) or (D442) (D432) or (D442)
		5. INSTALL REPLACEMENT FAN Slide fan into fan cradle Push outlet muffler firmly against fan Secure latches (3) for outlet muffler assembly Connect zero g electrical connector to fan	
		6. VERIFY PORTABLE FAN OPERATION (4.3.4.21)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.10.04-00)	
		4.4.4.11 CONDENSATE TANK MODULE REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE CONDENSATE TANK MODULE	
	200	cb CNDST DUMP PRI, SEC (2) - open	This step is A.E. 27.10.01-00
		NOTE Next two operations remove power from MOL SV DISP sw, panel 203 and disable TM parameters and on-board indicators shown in table	

TM	INDICATORS
C207-SIV A DEW PT T C215-SIV B DEW PT T D208-CND TANK Δ P D209-SIV A PCO2 IN P J212-SIV A COMPR Δ P D213-SIV B PCO2 IN P D216-SIV B COMPR Δ P F209-AFT HX GAS FLOW	Panel 203-MOL SV PPCO2 IN MOL SV HT EXCH IN MOL SV HT EXCH OUT MOL SV DEW PT 216-CNDST CONT SYS VENT TEMP CNDST CONT SYS TANK Δ P 225-02 BOTTLES (PSI x 10) N2 BOTTLES (PSI x 10) PRESS OWS 316-PRESS OWS

		cb INSTR SYS DISP CONVS INPUT PRI, SEC (2) - open cb INSTR SYS DISP CONVS OUTPUT + 24V - open
		CAUTION Next operation disables half of redundant C/W CLSTR PRESS LO monitoring capability, half of redundant lamps in INTERCOM MASTER ALARM STATUS lights, C/W OWS GAS INTERCHG and C/W CNDST TANK P monitoring capability, and C/W SV FLOW if mol sv A secondary fan used
	202	cb C/W SNSRS C/W 1 - open
	207	LTG METER sel - OFF LTG STATUS sw - down (verify)
	216	CNDST TANK H20 vlv - OFF CNDST TANK PRESS vlv - CLOSED (verify) Loosen Calfax fasteners (2) and open MOL SV A solids trap access door
	230	Ht Exch A Cndst Isolation vlv - CLOSE Ht Exch B Cndst Isolation vlv - CLOSE (verify) Close MOL SV A solids trap access door and tighten one Calfax fastener Loosen Calfax fasteners (2) and open MOL SV B solids trap door
	232	Ht Exch A Cndst Isolation vlv - CLOSE

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.11 CONDENSATE TANK MODULE REPLACEMENT (cont'd)	
		Ht Exch B Cndst Isolation vlv - CLOSE (verify)	
		Close MOL SV B solids trap access door and tighten one Calfax fastener	
		2. REMOVE FAILED CONDENSATE TANK MODULE	The next 3 steps are A.E. 27.10.02-00
		Disconnect electrical connectors (4)	
		Disconnect module qd (3)	
		Install protective caps on electrical connectors (4) and qd (3)	
		Loosen Calfax fasteners (4) securing condensate tank module (spin-type handle, 8-inch extension, 3/8 standard screwdriver bit)	
		Remove failed condensate tank module	
		3. OBTAIN REPLACEMENT CONDENSATE TANK MODULE	
		Obtain replacement condensate tank module	(E641)
		Identify failed condensate tank module (1-inch red tape, scissors)	
		Stow failed condensate tank module	(E641)
		4. INSTALL REPLACEMENT CONDENSATE TANK MODULE	
		Position condensate tank module on mounting brackets	
		Tighten Calfax fasteners (4) (spin-type handle, 8-inch extension, 3/8 standard screwdriver bit)	
		Remove protective caps (3) from qd	
		Connect module qd (3)	
		Remove protective caps (4) from electrical connectors	
		Connect electrical connectors (4)	
		5. VERIFY AND ACTIVATE REPLACEMENT CONDENSATE TANK MODULE	This step is A.E. 27.10.03-00
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CNDST CONT SYS VENT HTRS sw - OFF	
		CNDST TANK H2O vlv - OFF	
		CNDST TANK PRESS vlv - CLOSED	
	200	cb CNDST DUMP PRI, SEC (2) - closed	
		cb INSTR SYS DISP CONVS INPUT PRI, SEC (2) - closed	
		cb INSTR SYS DISP CONVS OUTPUT +24V - closed	
	207	LTG METER sel - as required	
		LTG STATUS sw - TEST and hold	Momentary switch
	216	Verify CNDST CONT SYS VENT HTRS PRI, SEC lt (2) - on	
	217	LTG STATUS sw - release	
	216	CNDST CONT SYS VENT HTRS PRI, SEC lt (2) - off	
		Pull velcro flap on condensate tank cover back to expose tank	
		CNDST TANK H2O vlv - DUMP	
		CNDST TANK PRESS vlv - PRESS	
		CNDST CONT SYS VENT HTRS sw - PRI	
		CNDST CONT SYS VENT HTRS PRI lt - on	
		CNDST CONT SYS VENT TEMP ind - 145°F	9 minutes required after heater turn-on to attain temperature

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.11 CONDENSATE TANK MODULE REPLACEMENT (cont'd)	
		NOTE Observe bladder during dump cycle. Bladder should not be allowed to bottom against tank	
		CNDST CONT SYS VENT VLV sw - PRI	
		Terminate condensate dump (4.3.4.4, step 2)	
		CNDST TANK PRESS vlv - VACUUM	
		CNDST CONT SYS TANK ΔP ind - Monitor for 4.4 to 5.0 psid	
		CNDST TANK PRESS vlv - CLOSED	
		CNDST TANK H2O vlv - FILL	
		Loosen Calfax fastener and open MOL SV A solids trap access door	
	230	Disconnect condensate line qd from mol sv A condensate heat exchanger A qd and attach to vent fitting	
		NOTE Next two operations will activate C/W CNDST TANK ΔP indication	
	202	cb C/W SNSRS C/W 1 - closed	
	230	Ht Exch A Cndst Isolation vlv - OPEN	
	216	Verify CNDST CONT SYS TANK ΔP ind - $\leq$ 0.3 psid	
	INTERCOM	Caution tone - on	
	207	C/W CNDST TANK ΔP lt - on	
		Respond to C/W alert (4.3.8.18)	
	207	C/W CNDST TANK ΔP lt - off	
	206	C/W [CLEAR] sw - CLEAR	Momentary switch
		C/W MEM RECALL pb/lt - off	
	230	Disconnect condensate line qd from vent fitting and attach to mol sv A condensate heat exchanger A qd	
		Close MOL SV A solids trap access door and tighten Calfax fasteners (2)	
		Loosen Calfax fastener and open MOL SV B solids trap access door	
	232	Ht Exch A Cndst Isolation vlv - OPEN	
		Close MOL SV B solids trap access door and tighten Calfax fasteners (2)	
	207	CNDST TANK ΔP sw - inhibit	
	216	CNDST TANK H2O vlv - DUMP	
		CNDST TANK PRESS vlv - PRESS	
		CNDST CONT SYS VENT HTRS sw - SEC	
		CNDST CONT SYS VENT HTRS SEC lt - on	
		CNDST CONT SYS VENT TEMP ind - 145°F	9 minutes for heater to obtain temperature
		CNDST CONT SYS VENT VLV sw - SEC	
		Observe bladder	
		CNDST COND SYS TANK ΔP ind - $\geq$ 4.8 psid	
		CNDST TANK PRESS vlv - VACUUM	
		CNDST CONT SYS ΔP ind - monitor for 4.4 to 5.0 psid	
		CNDST TANK PRESS vlv - CLOSED	
		CNDST CONT SYS VENT VLV sw - OFF	
		CNDST CONT SYS VENT HTRS sw - OFF	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.11 CONDENSATE TANK MODULE REPLACEMENT (cont'd)	
	207	CNDST CONT SYS VENT HTRS SEC lt - off CNDST TANK H2O vlv - FILL CNDST TANK ▲P sw - enable	
		(27.21.01-00)	
		4.4.4.12 VENT SEALING DEVICE O-RING REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN SPARE VENT SEALING DEVICE REPAIR EQUIPMENT Obtain spare vent sealing device (If not previously used) Obtain spare vent sealing device O-ring	 (D440) (D440)
		2. REMOVE VENT SEALING DEVICE WITH FAILED O-RING (4.3.4.1)	
		3. INSTALL SPARE VENT SEALING DEVICE IN VENT DUCT (4.3.4.2)	If spare available
		4. REMOVE USED O-RING (O-ring extractor)	
		5. INSTALL SPARE O-RING (O-ring extractor)	
		6. RECONFIGURE FOR CONTINUED OPERATIONS Return repaired vent sealing device to stowage (If spare was available in step 1) Install repaired vent sealing device in vent duct (If spare not available in step 1) (4.3.4.2)	 (D440)
		7. DISPOSE OF USED O-RING IN TRASH BAG	
		4.4.4.13 METEOROID PENETRATION REPAIR	
		TBS	
		(27.23.01-00)	
		4.4.4.14 ATM C&D H2O LOOP SERVICING	Unscheduled IFM performed only if excessive water quantity depletion
		1. OBTAIN DRY WATER SERVICE UMBILICAL AND WATER/RELIEF VALVE	(TBS), (TBS)
		2. PREPARE WATER SUPPLY SYSTEM Connect straight end of WATER RELIEF VALVE to WATER SERVICE UMBILICAL qd Remove captive cap from WATER OUTLET qd (water tank TBS) Connect WATER SERVICE UMBILICAL qd to WATER OUTLET qd WATER SERVICE UMBILICAL vlv - OPEN (2 1/2 turns, ccw)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.14 ATM C&D H2O LOOP SERVICING (cont'd)	
	316	Remove captive cap on VACUUM SOURCE	
		Connect WATER RELIEF VALVE to VACUUM SOURCE	
	216	CNDST CONT SYS VENT HTRS sw - PRI	
		CNDST CONT SYS VENT HTRS PRI lt - on	
		CNDST CONT SYS VENT TEMP ind - 145°F	Nine minutes required after heater turn-on to attain temperature
		CCNDST CONT SYS VENT VLV sw - PRI	
	316	VACUUM SOURCE VLV - OPEN	TBS seconds required for evacuation
		VACUUM SOURCE VLV - CLOSE	
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CAUTION Condensate dump heater should not be de-activated until CNDST CONT SYS VENT TEMP increases above 120°F to preclude water freezeup between valve and exit port	
		CNDST CONT SYS VENT HTRS sw - OFF	
		CNDST CONT SYS VENT HTRS PRI lt - off	
		Disconnect WATER RELIEF VALVE from VACUUM SOURCE	
		Replace captive cap on VACUUM SOURCE	
		WATER OUTLET vlv (water tank TBS) - OPEN	TBS seconds required to fill service umbilical and relief valve
		Fill INJECTOR with K2HPO4 (4.6.1.24)	
		Connect full K2HPO4 INJECTOR to WATER SERVICE UMBILICAL K2HPO4 INJECTOR MANIFOLD	
		K2HPO4 INJECTOR vlv - OPEN	
		WATER SERVICE UMBILICAL vlv - CLOSE (2 1/2 turns, cw)	
		3. SERVICE ATM H2O LOOP	
		ATM CLNT PUMPS A (B, C) sw - OFF	
		Loosen Calfax fasteners (2) on M202 stowage container and rotate toward condensate module	
		Disconnect C&D panel cooling loop qd from ATM C&D H2O filter inlet	Inlet side of filter is furthest from ATM CLNT RES PRESS valve (panel 235)
		Connect WATER RELIEF VALVE qd to ATM C&D H2O filter inlet	
	235	ATM CLNT RES PRESS vlv - OPEN (verify)	
		WATER SERVICE UMBILICAL vlv - OPEN	
		Rotate K2HPO4 INJECTOR rear cap cw immediately to inject K2HPO4	TBS seconds required to inject K2HPO4
		Observe reservoir diaphragm as reservoir fills	Fill rate 2 pounds/min
		CAUTION Do not allow reservoir diaphragm to bottom out. Precludes water discharge into cabin until water service umbilical valve shutoff possible and precludes potential tank rupture later due to thermal expansion	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.14 ATM C&D H2O LOOP SERVICING (cont'd)	
		When reservoir 3/4 full, WATER SERVICE UMBILICAL vlv - CLOSE	Reservoir capacity 16 pounds
		WATER OUTLET vlv (water tank TBS) - CLOSE (2 1/2 turns, cw)	
		Disconnect WATER SERVICE UMBILICAL from WATER OUTLET	
		Replace captive cap on WATER OUTLET	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
		X WATER REMOVAL IF RESERVOIR DIAPHRAGM BOTTOMED OUT X	
		X X	
		K2HPO4 INJECTOR vlv - CLOSE	
		Disconnect K2HPO4 INJECTOR from WATER SERVICE UMBILICAL and stow	(TBS)
		Disconnect WATER RELIEF VALVE from ATM C&D H2O filter inlet	
		WATER SERVICE UMBILICAL vlv - OPEN	
	316	Remove captive cap on VACUUM SOURCE	
		*Connect WATER RELIEF VALVE qd to VACUUM SOURCE	
	216	CNDST CONT SYS VENT HTRS sw - PRI	
		CNDST CONT SYS VENT HTRS PRI lt - on	
		CNDST CONT SYS VENT TEMP ind - 145°F	Nine minutes required after heater turn-on to attain temperature
		CNDST CONT SYS VENT VLV sw - PRI	
	316	*VACUUM SOURCE VLV - OPEN	TBS seconds required for evacuation
		*VACUUM SOURCE VLV - CLOSE	
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CAUTION	
		Condensate dump heater should not be de-activated until CNDST CONT SYS VENT TEMP increase above 120°F to preclude water freezeup between valve and exit port	
		CNDST CONT SYS VENT HTRS sw - OFF	
		CNDST CONT SYS VENT HTRS PRI lt - off	
		*Disconnect WATER DESERVICING ADAPTER	
		CNDST CONT SYS VENT HTRS sw - PRI	
		CNDST CONT SYS VENT HTRS PRI lt - on	
		CNDST CONT SYS VENT TEMP ind - 145°F	Nine minutes required after heater turn-on to attain temperature
		CNDST CONT SYS VENT VLV sw - PRI	
	316	*VACUUM SOURCE VLV - OPEN	TBS seconds (TBS)
		Obtain WATER DESERVICING ADAPTER	
		*Connect WATER DESERVICING ADAPTER to WATER SERVICE UMBILICAL	
	316	*VACUUM SOURCE VLV - CLOSE	
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CAUTION	
		Condensate dump heater should not be de-activated until CNDST CONT	
		X SYS VENT TEMP increase above 120°F to preclude water freezeup X	
		X between valve and exit port X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.14 ATM C&D H2O LOOP SERVICING (cont'd)	
		XXXX XXXX X X X CNDST CONT SYS VENT HTRS sw - OFF X X CNDST CONT SYS VENT HTRS PRI lt - off X	
	316	*Disconnect WATER RELIEF VALVE qd from VACUUM SOURCE *Connect WATER RELIEF VALVE to ATM C&D H2O filter inlet *Wait TBS seconds, disconnect WATER RELIEF VALVE from ATM C&D H2O filter inlet Repeat preceding operations denoted by *	Drains 1.5 pounds water from reservoir Reservoir quantity reduced by approximately 3/4 full (13 pounds)
	316	X Replace captive cap on VACUUM SOURCE X X Stow WATER DESERVICING ADAPTER X X X XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.04.00-00)	
		4.4.4.16 H2O SEPARATOR PLATE REPLACEMENT	There are two separator plates per condensing heat exchanger and two condensing heat exchangers per mol sv. This procedure is written for removal of heat exchangers A and B separator plates in mol sv A and B. Panel numbers for mol sv B are shown in parentheses
		NOTE See tool matrix for tool requirements (Appendix C)	
		CAUTION H2O separator plates are fragile. Extreme care should be used during replacement of plates nearest solids trap	
		1. DEACTIVATE FAILED H2O SEPARATOR PLATE	This step is A.E. 27.04.01-00
		Loosen yellow Calfax fasteners (4) and remove MOL SV A (B) cover	
		Maneuver cover clear of equipment and restrain	
	230(232)	Ht Exch A (A) Cndst Isolation vlv - CLOSE (2 1/2 turns, cw)	
	203	MOL SV A (B) FANS PWR sw - OFF	
		2. REMOVE FAILED H2O SEPARATOR PLATE	The next 3 steps are A.E. 27.04.02-00. Separator plates attain approximately 50°F and may be cold to touch
		Disconnect condensate line qd from failed plate	
		Loosen Calfax fasteners (6) on failed plate and remove plate	
		3. OBTAIN REPLACEMENT H2O SEPARATOR PLATE	
		Identify failed plate (1-inch red tape, scissors)	(M202)
		Obtain replacement plate	(M202)
		Stow failed plate	
		4. INSTALL REPLACEMENT H2O SEPARATOR PLATE	
		Position H2O separator plate on condensing ht exchanger and tighten Calfax fasteners (6)	
		Connect condensate line qd to replacement plate	
		Replace MOL SV A (B) cover and tighten yellow Calfax fasteners (4)	
		5. ACTIVATE REPLACEMENT H2O SEPARATOR PLATE	This step is A.E. 27.04.03-00
		NOTE The following operation will activate C/W SV FLOW indication	
	203 INTERCOM 207	MOL SV A (B) FANS PWR sw - PRI (SEC) Caution tone - on C/W SV FLOW lt - on	
		Respond to C/W alert (4.3.8.18)	
	207	C/W SV FLOW lt - off	Light will go off as gas flow rate increases
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.16 H2O SEPARATOR PLATE REPLACEMENT (cont'd)	
		NOTE Allow time for H2O separator to become wetted. The following operation may activate the C/W CNDST TANK ΔP indication if condensing heat exchanger H2O separator plates are not sufficiently wetted to hold a ΔP. If C/W is not triggered, proceed with normal activities. Operations * applicable only if C/W is triggered	Time required for plate to become sufficiently wetted is dependent upon cluster atmosphere dew point at time of replacement operation
	230(232) INTERCOM	Loosen Calfax fasteners (2) and open MOL SV A (B) solids trap access door Ht Exch A (A) Cndst Isolation vlv - OPEN (2 1/2 turns, ccw) Caution tone - on*	
	207	C/W CNDST TANK ΔP lt - on*	
	216	Respond to C/W alert (4.3.8.18)* CNDST TANK H2O vlv - DUMP* CNDST TANK PRESS vlv - PRESS* Terminate condensate dump (4.3.4.3, step 2)* Resume condensate collection (4.3.4.3, step 3)* Wait TBS minutes* Repeat step 5*	Applies cabin pressure to gas side bladder
		(27.08.04-00)	
		4.4.4.17 O2 PRESSURE SENSOR REPLACEMENT	
		1. DEACTIVATE FAILED O2 PRESSURE SENSOR	This step is A.E. 27.08.01-00
		NOTE The next operation will interrupt TM parameter O2 PP 1 (D237), O2 PP2 (D239) or O2 PP3 (D240) depending on which O2 pressure sensor is being replaced. See tool matrix for tool requirements (Appendix C)	
	225	O2/N2 CONTR sel - (to one of the two sensors that is not being replaced) 1, 2, or 3 O2/N2 CONTR MON sel - (to the remaining sensor that is not selected by O2/N2 CONTR selector and is not being replaced) 1, 2, or 3	
		2. REMOVE FAILED O2 PRESSURE SENSOR	The next 3 steps are A.E. 27.08.02-00
	225	Loosen Calfax fastener and open cover over sensor (if closed) Rotate (ccw) and remove failed sensor from side of O2/N2 control panel	
		3. OBTAIN REPLACEMENT O2 PRESSURE SENSOR	
		Obtain replacement O2 pressure sensor and canister	(M202)
		Stow failed sensor and canister	(M202)
		Identify failed sensor (1-inch red tape, scissors)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.4.17 O2 PRESSURE SENSOR REPLACEMENT (cont'd)	
		4. INSTALL REPLACEMENT O2 PRESSURE SENSOR Install replacement sensor on side of O2/N2 control panel and rotate (cw)	
	225	5. ACTIVATE REPLACEMENT O2 PRESSURE SENSOR O2/N2 CONTR sel - (to the replacement sensor) - 1, 2 or 3 or O2/N2 CONTR MON sel (to the replacement sensor) - 1, 2 or 3 O2/N2 CONTR PPO2 1, 2 or 3 ind - 3.3 to 3.9 psia	This step is A.E. 27.08.03-00
		4.4.4.18 CM/MDA INTERCHANGE DUCT REPAIR	This procedure assumes that a hole or tear has been discovered in the duct
		NOTE The duct may be repaired with the CSM fan on or off. If possible the duct should be repaired without removing it from the tunnel	
		Obtain Cluster Leak Repair Kit Wrap tape radially around duct at point of tear or hole	(TBS)
		NOTE There are two rolls of tape in the kit, 2 inch and 3/4 inch. Each roll of tape is aluminum-foil backed and pressure sensitive	
		Cut tape with scissors Verify leak stopped Stow Cluster Leak Repair Kit	(TBS)

4.4.5 CREW SYSTEMS

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.31.01-00)	
		4.4.5.1 VAN ALLEN BELT DOSIMETER REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
	640	1. REMOVE FAILED VABD VAN ALLEN BELT DOSIMETER sw - OFF Disconnect electrical connector from VABD Loosen mounting screws (6) (Spin-Type Handle and 3/8 standard screwdriver bit)	
		2. INSTALL REPLACEMENT VABD Obtain replacement VABD Position VABD on mounting interface and tighten fasteners (6) (Spin-Type Handle and 3/8 standard screwdriver bit) Connect electrical connector to VABD VAN ALLEN BELT DOSIMETER sw - ON Identify failed VABD (1-inch red tape and scissors) Stow VABD	(D436) (D436)

4.4.6 INSTRUMENTATION SYSTEM (TBS)

4.4.7 TIME REFERENCE AND DIGITAL COMMAND SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.33.01-00)	
		4.4.7.1 PORTABLE TIMER BATTERY REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE TIMER TIMER sw - OFF TONE sw - OFF	
		2. REMOVE EXPENDED BATTERY Remove battery access cover	Note on cover indicates TIMER BATTERY UNDER PLATE Screwdriver may be required to pry up snap fit cover
		Lift retainer lock Unscrew retainer (3/16 screwdriver) Gently tap front of timer until battery is free Remove expended battery	
		3. OBTAIN REPLACEMENT BATTERY Dispose of expended battery in trash bag Obtain replacement battery	(M202)
		4. INSTALL REPLACEMENT BATTERY Place battery in timer Replace battery retainer (3/16 screwdriver) Depress lock Replace battery access cover	
		5. ACTIVATE TIMER Set and use timer (4.3.7.2) as required	
		(27.33.02-00)	
		4.4.7.2 TONE GENERATOR BATTERY REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE TIMER TIMER sw - OFF TONE sw - OFF	
		2. REMOVE EXPENDED BATTERY Remove screws (4) from battery access cover (3/32 screwdriver) Remove access cover Remove expended battery from clips	Timer operating instructions on access cover
		3. OBTAIN REPLACEMENT BATTERY Dispose of expended battery in trash bag Obtain replacement battery	(M202)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.7.2 TONE GENERATOR BATTERY REPLACEMENT (cont'd)	
		4. INSTALL REPLACEMENT BATTERY Place battery in timer Replace battery access cover Tighten access cover screws (4) (3/32 screwdriver)	
		5. ACTIVATE TIMER Set and use timer (4.3.7.2) as required	
		(27.33.03-00)	
		4.4.7.3 CLOCK REPLACEMENT	
		NOTE Verify EREP experiment not in progress before performing procedure to assure proper time correlation for EREP	
		See tool matrix for tool requirements (Appendix C)	
		1. REMOVE POWER FROM CLOCK Utilize appropriate circuit breaker	
	200	TRS CLOCK - open	Used for replacement of control and display panel 212 clock
	613	DISP GMT CLOCK - OPEN	Used for replacement of control and display panel 610 clock
	212	TRS BUFFER sw - OFF	Disables time correlation buffer outputs to insure replacement clock connector is totally deadfaced. All clock displays and EREP timing are deactivated
	212, 610	2. REMOVE FAILED CLOCK Loosen Calfax fasteners (4) (spin-type handle, 5/32 hex driver bit) Pull clock straight out from panel Disconnect electric connector	
		3. OBTAIN REPLACEMENT CLOCK Identify failed clock (1-inch red tape, scissors) Obtain replacement clock Stow failed clock	(M305) (M305)
	212,610	4. INSTALL REPLACEMENT CLOCK Clock DISPLAY sw - OFF (verify) Connect electric connector Insert clock into panel Tighten Calfax fasteners (4) (spin-type handle, 5/32 hex driver bit)	
	212	5. ACTIVATE CLOCK TRS BUFFER sw - ON	Except for replacement clock, displays and EREP timing are activated. Displays will indicate time as determined by electronic timer on elapsed-time register

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.7.3 CLOCK REPLACEMENT (cont'd)	
	200 613 212 610	Close circuit breaker utilized in step 1 DISPLAY sw - ON BRIGHTNESS adj - DECR OR INCR Adjust to desired illumination	Starts replacement clock and illuminates display

4.4.8 CAUTION AND WARNING SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.34.01-00)	
		4.4.8.1 FIRE SENSOR REPLACEMENT	
		1. REMOVE FAILED FIRE SENSOR ASSEMBLY SNSR 1 sw (or) SNSR 2 sw - OFF Remove electrical connector from failed FSA Loosen Calfax fastener	
		WARNING Quartz lens is fragile and could shatter. If lens is broken, the hazard of free floating quartz chips exists. Gas inside the lens is inert	
		Remove failed FSA from mounting interface	
		2. INSTALL NEW FIRE SENSOR ASSEMBLY Identify failed fire sensor (1 inch red tape, scissors) Exchange failed fire sensor for replacement Position sensor on mounting interface Tighten Calfax fastener Install electrical connector	(F520) Tape and scissors are located in F520 (TBS)
	FSCP	SNSR 1 (2) sw - BUS 1 (2)	
		3. TEST NEW SENSOR	
		NOTE Following step will activate C/W FIRE indication and apply to FSCP associated with failed FSA	
		Test fire sensor (4.3.8.9)	
		(27.34.02-00)	
		4.4.8.2 FIRE SENSOR CONTROL PANEL REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. RECONFIGURE ALL FSCP TO BUS 2	Applies to all but replacement FSCP
	FSCP	SNSR 1 sw - BUS 2 SNSR 2 sw - BUS 2	Does not apply to panels 530 or 619
		2. TURN OFF EMERGENCY POWER	
		NOTE Following step will activate C/W EMER PWR and C/W EMER SNSR PWR indication	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.8.2 FIRE SENSOR CONTROL PANEL REPLACEMENT (cont'd)	
	206 INTERCOM 207	C/W PWR EMER 1 sw - OFF Caution tone - on C/W EMER PWR lt - on C/W EMER SNSR PWR lt - on Respond to C/W ALERT (4.3.8.18)	Disables bus 1 power to FSCP
		3. INSTALL NEW FSCP SNSR 1 sw (failed FSCP) - OFF Disconnect electrical connector from J1 of failed unit	To gain access to electrical connector on panels 236 and 392 wire bundle covers must be removed. Wire bundle covers are kept in place by Calfax fasteners (2) and a hinge. After fasteners have been loosened cover can be rotated away from FSCP electrical connector.
		Connect electrical connector to J1 of replacement unit SNSR 1 sw (replacement FSCP) - BUS 1 SNSR 2 sw (replacement FSCP) - OFF Loosen Calfax fasteners (4) of failed FSCP (spin-type handle, 5/32 hex driver bit) Remove failed FSCP and install replacement in its place Handtighten Calfax fasteners (4) of replacement FSCP	Does not apply to panels 530 or 619 Failed FSCP will be restrained by cable connected to J2
	206 207	C/W PWR EMER 1 sw - ON C/W EMER PWR lt - off C/W EMER SNSR PWR lt - off	
	FSCP	4. RECONFIGURE ALL FSCP TO BUS 1 SNSR 1 sw - BUS 1 SNSR 2 sw - BUS 1	Applies to all but replacement FSCP Does not apply to 530 and 619
		NOTE Following step will activate C/W EMER PWR AND C/W EMER SNSR PWR indications	
		5. TURN OFF EMERGENCY POWER Repeat step 2 for C/W PWR EMER 2 sw	
		6. COMPLETE INSTALLATION OF NEW FSCP SNSR 2 sw (failed FSCP) - OFF Disconnect electric connector from J2 to failed FSCP and connect it to replacement unit SNSR 2 sw (replacement FSCP) - BUS 1	
	206 207	C/W PWR EMER 2 sw - ON C/W EMER PWR lt - off C/W EMER SNSR PWR lt - off	
	206	C/W [CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off	
	FSCP	SNSR 1 sw - BUS 1 If replacing panels 530 or 619 snap off clip covering SNSR 2 sw on failed FSCP and install clip covering on replacement unit SNSR 2 sw SNSR 2 sw - BUS 2	Does not apply to FSCP 530 or 619

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.8.2 FIRE SENSOR CONTROL PANEL REPLACEMENT (cont'd)	
		7. PERFORM FSCP TEST Test FSCP (4.3.8.9)	
		(27.34.03-00)	
		4.4.8.3 FIRE SENSOR CONTROL PANEL LAMP/LENS REPLACEMENT	
	FSCP	1. REMOVE FAILED LAMP/LENS ASSEMBLY Unscrew failed lamp/lens assembly and remove from FSCP	Lamp and lens are separable but will be replaced as single assembly
		2. INSTALL NEW LAMP/LENS ASSEMBLY Exchange failed lamp/lens assembly for replacement lamp/lens assembly Screw replacement lamp/lens assembly into FSCP	(TBS)
		NOTE Following step will activate C/W FIRE indication	
		3. TEST NEW FSCP LAMP/LENS ASSEMBLY Test FSCP (4.3.8.9)	

4.4.9 (DELETED)

4.4.10 EXPERIMENTS INTERFACE

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.36.01-00)	
		4.4.10.1 S190 WINDOW HEATER CABLE REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. REMOVE POWER FROM CABLE	
		NOTE The next operation will interrupt TM parameter: C0044-MDA WNDO T	
	117 202	WINDOW HEATER AUTO HEAT sw - OFF cb ER WINDW HTR - open	
		2. DISCONNECT FAILED CABLE	
	117	Remove cable connector guard mounting screws (4) (No. 3 hi-torque screwdriver bit and ratchet handle) Tape connector guard out of the way	One of side cable tray covers must be moved to allow removal of cable connector guard Connector guard cannot be re-installed with new cable in place
	117	Disconnect electrical cable connector P2 from window heater panel connector (connector pliers) Disconnect electrical cable connector P5 from S190 window frame connector (connector pliers) Remove machine screws (2) holding temperature sensor to MDA stringer (3/16 hex driver bit) Tape down ambient sensor	Temporarily stow screws for use in installing new sensor Temperature sensor is part of S190 window heater cable and must be taped back to allow installation of new cable and sensor
		NOTE In taping back old temperature sensor, care must be taken that it does not interfere with MPF positioning	
		3. OBTAIN REPLACEMENT CABLE	
		Obtain replacement S190 window heater cable	(M124)
		4. INSTALL REPLACEMENT CABLE	
		CAUTION Extreme care must be taken when handling new ambient sensor not to hit it against anything or not to pull wire leads out of sensor	
		Connect replacement electrical cable connector P5 to S190 window frame connector	Connector is replaced fingertight
		Install new ambient sensor to MDA stringer using screws removed in step 2	
	117	Connect replacement electrical cable connector P2 to window heater panel connector	Connector is replaced fingertight
		Dress cable along route of failed cable, taping cable to exterior surface of cable ways where possible	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.10.1 S190 WINDOW HEATER CABLE REPLACEMENT (cont'd)	
		5. S190 WINDOW HEATER CABLE VERIFICATION	
	202	cb ER WINDW HTR - closed	
		NOTE The following operation will restore TM parameter: C0044-MDA WNDO T	
	117	WINDOW HEATER AUTO HEAT sw - ON WINDOW HEATER Δ TEMP pb/lt - on	Light will go off after temperature stabilization
		NOTE If temperature differential is in tolerance and WINDOW HEATER Δ TEMP pb/lt does not light, depress WINDOW HEATER Δ TEMP pb/lt and verify light comes on then release and verify light goes off	
		WINDOW HEATER OVERTEMP pb/lt - depress WINDOW HEATER OVERTEMP pb/lt - on WINDOW HEATER OVERTEMP pb/lt - release WINDOW HEATER OVERTEMP pb/lt - off	
		(27.36.02-00)	
		4.4.10.2 S190 WINDOW HEATER PANEL REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. REMOVE POWER FROM PANEL	
		NOTE The next operation will interrupt TM parameter: C0044-MDA WNDO T	
	117	WINDOW HEATER AUTO HEAT sw - OFF	
	110	PANEL POWER DISPLAY sw - OFF	Switch will be on if EREP is operating
	202	cb ER WINDW HTR - open	
		2. REMOVE FAILED PANEL	
		Remove cable plug from CSM FAN DUMMY connector and tie cable back out of way	Tie spare cable out of way to ease panel removal
	117	Remove cable connector guard mounting screws (4) No. 3 hi-torque screwdriver bit and ratchet handle)	
		Remove cable connector guard from around cables and temporarily stow	One of side cable tray covers must be moved to allow removal of cable connector guard
		Disconnect electrical cable connectors (3) from window heater panel connectors (connector pliers)	
		NOTE Tools in this step are also used to remove spare panel from film vault, stow failed panel in vault, and mount spare panel	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.10.2 S190 WINDOW HEATER PANEL REPLACEMENT (cont'd)	
		Remove panel attaching bolts (8) (ratchet handle, 8-inch extension, 5/32 hex driver bit)	
		Remove failed panel	
		3. OBTAIN REPLACEMENT PANEL	
		Remove replacement panel from stowage (same tools used for failed panel removal)	(M124)
		Tag and stow failed panel in spot vacated by spare (same tools)	(M124)
		4. INSTALL REPLACEMENT PANEL	
	117	Install replacement window heater panel on mounting and replace bolts (8)	
		Connect electrical cable connectors (3) to window heater panel as follows: 807W4 P29 to J1 S190 Window Heater Cable P2 to J2 807W1 P16 to J4	Connect electrical connectors fingertight
		Install cable connector guard and replace screws (4) (same tools)	
		Untie spare cable plug	
		Connect spare cable plug to CSM FAN DUMMY connector	
		5. S190 HEATER PANEL VERIFICATION	
	117	WINDOW HEATER AUTO HEAT sw - OFF (verify)	
	202	cb ER WINDW HTR - closed	
		NOTE The next operation will restore TM parameter: C0044-MDA WNDO T	
	117	WINDOW HEATER AUTO HEAT sw - ON	
		WINDOW HEATER △TEMP pb/lt - on	Light will go off after temperature stabilization
		NOTE If temperature differential is in tolerance and WINDOW HEATER △TEMP pb/lt does not light, depress WINDOW HEATER △TEMP pb/lt and verify light comes on; then release and verify light goes off	
		WINDOW HEATER OVERTEMP pb/lt - depress WINDOW HEATER OVERTEMP pb/lt - on WINDOW HEATER OVERTEMP pb/lt - release WINDOW HEATER OVERTEMP pb/lt - off	
	110	PANEL POWER DISPLAY sw - ON	Switch is turned on if required for EREP operation
		4.4.10.3 M512 BATTERY VENT LINE LEAK REPAIR	This procedure is based upon a leak having been found at one of the M512 battery vent line fittings
		NOTE See Appendix C, Tool Matrix for tool requirements	
		1. TIGHTEN FITTING	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.10.3 M512 BATTERY VENT LINE LEAK REPAIR (cont'd) Place wrenches on fitting (9/16" open end/box on B-nut and 11/16 open end/box on adapter) Tighten fitting Verify leak stopped (Leak Detector TBS). If leak not stopped, proceed to step 2 2. PATCH LEAK Patch leak (patching material in Leak Repair Kit) Verify leak stopped (Leak Detector TBS). If leak not stopped, coordinate with MSFN	

4.4.11 (DELETED)

4.4.12 REFRIGERATION SYSTEM (TBS)

4.4.13 FOOD AND POTABLE WATER SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.39.01-00)	
		4.4.13.1 FOOD TRAY REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C). The following items are required for the performance of this procedure: universal mount, long strap (3), and decal kit. This procedure assumes failed food tray contains food and utensils	(TBS)(TBS)(TBS)
		1. FOOD TRAY DEACTIVATION	
	707,708, 709 614	Observe food tray outlet on food table pedestal and note food tray number and bus selection cb HSS BUS 1 (2) FOOD TRAYS 1 (2,3) - OPEN, as applicable	Red food tray 1 panel 707, white food tray 2 panel 708, blue food tray 3 panel 709 Leave circuit breaker open during food tray replacement
		2. FOOD TRAY REMOVAL	
		Obtain replacement food tray	(TBS)
		Install universal mount on replacement food tray Locate replacement food tray on wardroom ceiling grid above failed food tray	Facilitates transfer of items from failed tray to replacement tray
		Tilt replacement food tray to provide convenient access to food cavities Depress push-button lid lock on replacement food tray lid and remove lid Inspect replacement food tray for visual damage Depress push-button lid lock on failed food tray lid and remove lid Restrain lids on grid with long, general-purpose restraint Transfer food cans, beverage dispensers, and utensils from failed food tray to replacement food tray	Place utensils on food tray magnetic surfaces
		Clean failed food tray as required	Clean with disinfectant-moistened wipes to inhibit microbiological growth
		Dispose of wipes in nearby trash bag Obtain lid and latch into place on failed food tray	Lid color code must match food tray color code
		Disconnect failed food tray high-power accessory adapter cable from food tray power receptacle	Power receptacle located on bottom of food tray
		Temporarily stow zero-g connector in H2O gun housing Disengage failed food tray from food table, using dial latches (2) Temporarily restrain failed food tray on grid, using long strap	
		3. FOOD TRAY REPLACEMENT	
		Remove replacement food tray from universal mount Secure replacement food tray to food table using dial latches (2) New food tray food cavity (1, 2, 3) htr sw - OFF (verify) Food tray TIMER SET sw - down (verify) Remove zero-g connector from temporary stowage in H2O gun housing	All switches must be off before connecting to power Momentary switch
		Install high power accessory adapter cable to new food tray power receptacle	Power receptacle located on bottom of food tray

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.13.1 FOOD TRAY REPLACEMENT (cont'd)	
		4. FOOD TRAY CHECKOUT	
	614	cb HSS BUS 1 FOOD TRAYS 1 (2,3) - close, as applicable	Bus power is supplied to food tray
		HOURS REMAINING ind - 0 (verify)	
		New food tray food cavity 1 htr sw - ON	Food cavity 1 heater activates
		HEAT lt ind - ON	
		New food tray food cavity 1 htr sw - OFF	Food cavity 1 heater deactivates
		HEAT lt - off	
		Repeat two preceding operations for food cavity 2 htr sw and food cavity 3 htr sw	
		Identify replacement food tray and lid with color coded decals (2)	Two red, two white, or two blue color-coded decals identical to color code of failed food tray
		Identify failed food tray (1 inch red tape and scissors)	
		Stow failed food tray	
		(27.39.02-00)	
		4.4.13.2 H2O GUN REPLACEMENT	
		NOTE	
		See tool matrix for tool requirements (Appendix C).	(D438)
		1. DEACTIVATE FAILED H2O GUN	
	705	Open gun access door to failed H2O	
		Disconnect failed H2O gun hose qd from H2O gun port qd	H2O gun port is located on food pedestal below failed H2O gun
		Remove failed H2O gun from holster	
		Identify failed H2O gun and stow (1 inch red tape and scissors)	
		2. OBTAIN REPLACEMENT H2O GUN	(D438)
		3. INSTALL REPLACEMENT H2O GUN	
	705	Connect H2O gun hose qd to H2O gun port qd	
		4. PURGE H2O GUN REPLACEMENT	
	705	H2O gun trigger - rotate	
		H2O gun trigger - release	
		Bleed gas/water mixture into washcloth	
		Repeat three preceding operations two more times	
		Record unit value indicated on H2O gun in mission log book	
		Squeeze washcloth in washcloth squeezer	
		Stow washcloth in drying area in WMC	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.39.03-00)	
		4.4.13.3 WARDROOM H2O DISPENSER VALVE REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C). There are two wardroom H2O dispenser valves for food reconstitution. This procedure is written for removal and replacement of HOT wardroom H2O dispenser valve. The procedure is the same for COLD wardroom H2O dispenser valve	
		1. REMOVE FAILED VALVE	
		Unlatch dial latches (2) on food tray	Remove food tray over access door to water heater (chiller)
		Remove food tray from food table	
		Place thigh restraint in vertical up position	
		Open WATER HEATER (CHILLER) access door	Allows access door to be opened
	705	WATER HEATER (CHILLER) OUTLET VLV - CLOSE	
		HOT (COLD) volume select - 1 oz	
		HOT (COLD) [DISPENSE/CHARGE] vlv - CHARGE	
		HOT (COLD) [DISPENSE/CHARGE] vlv - DISPENSE	
		HOT (COLD) wardroom H2O dispenser valve - depress	
		Absorb residual water in washcloth	
		Loosen setscrews (2) in HOT (COLD) [DISPENSE/CHARGE] knob (3/32 allen wrench)	
		Remove HOT (COLD) [DISPENSE/CHARGE] knob and temporarily stow	
		Loosen backup screw located on wardroom H2O dispenser valve flange (3/32 allen wrench)	
		Rotate wardroom H2O dispenser valve ≈180 degrees until backup screw lines up with No. 1	
		Lift wardroom H2O dispenser valve from food table	
		Identify failed wardroom H2O dispenser valve (1 inch red tape and scissors)	
		2. INSTALL REPLACEMENT WARDROOM H2O DISPENSER VALVE	
		Obtain replacement wardroom H2O dispenser valve	(D438)
		Stow failed wardroom H2O dispenser valve	(D438)
		Verify backup screw is loose	
	705	Place replacement wardroom H2O dispenser valve in food table with backup screw pointing to No. 1	
		Rotate replacement wardroom H2O dispenser valve until backup screw is pointing to No. 2	
		Tighten backup screw (3/32 allen wrench)	
		Replace HOT (COLD) [DISPENSE/CHARGE] knob	
		Tighten screws (2) in HOT (COLD) [DISPENSE/CHARGE] knob (3/32 allen wrench)	
		WATER HEATER (CHILLER) OUTLET VLV - OPEN	

CREWMAN	PANEL	PROCEDURE	REMARKS
	705	4.4.13.3 WARDROOM H2O DISPENSER VALVE REPLACEMENT (cont'd) 3. VERIFY REPLACEMENT WARDROOM H2O DISPENSER VALVE OPERATION HOT (COLD) volume select - 1 oz HOT (COLD) [DISPENSE/CHARGE] vlv - CHARGE HOT (COLD) [DISPENSE/CHARGE] vlv - DISPENSE HOT (COLD) wardroom H2O dispenser valve - depress Absorb dispensed water in washcloth Repeat four preceding operations two more times Squeeze washcloth in washcloth squeezer Inspect connection and wardroom H2O dispenser valve for leaks Close WATER HEATER (CHILLER) access door Place thigh restraints in vertical down position Return food tray to food table Latch dial latches (2) on food tray to food table	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.39.04-00)	
		4.4.13.4 WATER SYSTEM QD REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN SPARE WATER SYSTEM QD (See table for applicable item)	(D438)
		2. REMOVE FAILED WATER SYSTEM QD (See table for tool usage)	
		3. INSTALL SPARE WATER SYSTEM QD	
		4. DISPOSE OF FAILED WATER SYSTEM QD IN TRASH BAG	

WATER SYSTEM QD REPLACEMENT

APPLICATION	QD/QUANTITY/STOWAGE			TOOLS
	FEMALE FITTING QD 1 D438	FEMALE HOSE QD 1 D438	MALE HOSE QD 1 D438	
WARDROOM WATER inlet	X	⚠		1 1/4 open end/box 1 1/8 open end/box
WMC WATER inlet	X	⚠		1 1/4 open end/box 1 1/8 open end/box
URINE FLUSH inlet	X	⚠		1 1/4 open end/box 1 1/8 open end/box
WARDROOM 1 hose (2) inlet end			X	1 1/4 open end/box 1 open end/box
WARDROOM 1 hose (2) tank end		X		1 1/8 open end/box 1 1/4 open end/box
WMC 1 hose (2) inlet end			X	1 1/4 open end/box 1 open end/box
WMC 1 hose (2) tank end		X		1 1/8 open end/box 1 1/4 open end/box
URINE SYSTEM FLUSH hose (inlet end)			X	1 1/4 open end/box 1 open end/box
URINE SYSTEM FLUSH hose (tank end)		X		1 1/8 open end/box 1 1/4 open end/box

NOTES: ⚠ FEMALE WATER HOSE QD MAY BE USED AS A BACKUP FOR FEMALE WATER FITTING QD

4.4.14 WASTE SYSTEM (INCLUDING NON-POTABLE WATER)

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.40.02-00)	
		4.4.14.1 VACUUM CLEANER BLOWER UNIT REPLACEMENT	
		NOTE The following items are required for the performance of this procedure: long strap. See tool matrix for tool requirements (Appendix C)	
		1. RETURN VACUUM CLEANER	
		NOTE If vacuum cleaner is found to be unusable after vacuum cleaner has been transported to using location, perform following step	
		Return vacuum cleaner to OWS forward compartment floor grid in front of vacuum cleaner stowage compartment	(F522)
		2. DISASSEMBLE VACUUM CLEANER	
		Separate velcro liner on vacuum cleaner caddy	
		Remove vacuum cleaner from vacuum cleaner caddy	
		Attach vacuum cleaner caddy to floor grid with integral clip	Spring-loaded restraining clip is attached to caddy
		Restrain vacuum cleaner to grid with long strap located on grid in front of vacuum cleaner stowage compartment	Long strap is located on OWS forward compartment floor grid for use in stowing vacuum cleaner where not in use
		Release latches (2) on both sides of bag module	Bag module is located on forward end of vacuum cleaner
		Remove bag module from blower unit	Bag module contains vacuum cleaner bag
		Temporarily stow bag module in vacuum cleaner caddy	
		Remate velcro liner on vacuum cleaner caddy	
		Obtain replacement vacuum cleaner blower unit	(D436)
		3. REASSEMBLE VACUUM CLEANER	
		Restrain replacement blower unit on floor grid adjacent to vacuum cleaner caddy with long strap	Position blower unit handle - up
		Separate velcro liner on vacuum cleaner caddy and remove bag module	
		Install bag module on blower unit	Installation of bag module with bag installed actuates an interlock and enables blower unit operation
		Secure latches (2) on bag module	
		Loosen captive access cover screws (4) on blower unit (spin-type handle, 5/32 hex driver bit)	Four screws used in blower unit for launch restraints must be removed prior to use
		Rotate access cover to open position	
		Remove launch screws (4) (spin-type handle, 5/32 hex driver bit)	
		Rotate access cover to close position	
		Tighten access cover screws (4) (spin-type handle, 5/32 hex driver bit)	
		Remove protective cover from receptacle on blower unit	
		Remove protective covers on inlet and outlet ports of blower unit	
		Detach one end of long strap on reassembled vacuum cleaner from grid	
		Insert vacuum cleaner in vacuum cleaner caddy	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.1 VACUUM CLEANER BLOWER UNIT REPLACEMENT (cont'd)	
		Remate velcro liner on vacuum cleaner caddy Remove high-power accessory cable connector from failed blower unit receptacle Connect high-power accessory cable connector to receptacle on vacuum cleaner	
		4. RETURN FAILED BLOWER UNIT TO STOWAGE Identify failed blower unit (1 inch red tape and scissors) Remove long strap from failed blower unit and return failed blower unit to stowage	(TBS) Long strap left attached to floor grid of OWS forward compartment will be used for subsequent stowage of vacuum cleaner
		5. TEST VACUUM CLEANER Perform vacuum cleaner operation (4.3.14.1) (27.40.08-00)	
		4.4.14.2 WMC H2O DISPENSER VALVE REPLACEMENT NOTE See tool matrix for tool requirements (Appendix C)	(H831)
		1. REMOVE FAILED WMC H2O DISPENSER VALVE Open WMC WATER HEATER access door WATER HEATER OUTLET VLV - CLOSE Depress dispenser to remove residual water Unscrew jam nut that tightens WMC H2O dispenser valve to dispenser housing (3/4 open end/box) Unscrew WMC H2O dispenser valve from dispenser housing Obtain replacement WMC H2O dispenser valve Identify and stow used WMC H2O dispenser valve (1 inch red tape and scissors)	(D438)
		2. REPLACE WMC H2O DISPENSER VALVE Inspect and verify that replacement WMC H2O dispenser valve is clean Position boss up to O-ring Place WMC H2O dispenser valve in dispenser housing, and screw into position Holding jam nut on valve, turn valve 1 1/2 turns and align to proper position Tighten jam nut (3/4 open end/box) WATER HEATER OUTLET VLV - OPEN Depress dispenser and allow water flow into washcloth Inspect connection and dispenser for leaks Squeeze washcloth in washcloth squeezer and stow in drying area in WMC Close WMC WATER HEATER access door	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.40.09-00)	
		4.4.14.3 TRASH LOCK GAGE REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN SPARE GAGE	(D440)
		2 PREPARE TRASH LOCK FOR GAGE REPLACEMENT EJECTOR handle - RETRACT (verify) VLV/OUTER DOOR handle - PRESS Press gage (if operative) - 4.8 to 5.2 psia	
		3. REMOVE GAGE Remove screws (6) (No. 2 Phillips screwdriver) Remove failed gage Remove gage inner and outer O-rings from trash lock lid (O-ring extractor)	
		4. INSTALL SPARE GAGE Obtain spare gage inner and outer O-rings Lubricate spare O-rings (lubricant) Install gage inner and outer O-rings in trash lock lid Install spare gage Install screws (6) and tighten (No. 2 Phillips screwdriver)	(D440)
		5. VERIFY TRASH LOCK GAGE OPERATION (4.3.14.3, step 3)	
		6. STOW FAILED GAGE Identify failed gage (1-inch red tape and scissors) Stow failed gage Dispose of used O-rings in trash bag	(D440)
		(27.40.10-00)	
		4.4.14.4 TRASH LOCK EJECTOR HANDLE O-RINGS REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN SPARE EJECTOR HANDLE O-RINGS Obtain spare TRASH LOCK EJECT HNDL SHAFT and SLEEVE O-rings (one each)	(D440)
		2. PREPARE TRASH LOCK FOR EJECTOR HANDLE REMOVAL EJECTOR handle - RETRACT (verify) VLV/OUTER DOOR handle - PRESS Press gauge - 4.8 to 5.2 psia Lid lock handle - open Open lid	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.4 TRASH LOCK EJECTOR HANDLE O-RINGS REPLACEMENT (cont'd)	
		3. EJECTOR HANDLE REMOVAL Remove bolt and washer attaching ejector handle to torsion bar (3/8 open end/box) Remove ejector handle from torsion bar (being careful to observe handle position) Remove torsion bar sleeve from lid (1 3/8 open end/box) Remove O-ring from torsion bar sleeve (O-ring extractor) Remove O-ring from torsion bar shaft (O-ring extractor)	Handle must be reinstalled in same position as at removal
		4. INSTALL EJECTOR HANDLE Lubricate spare O-rings sparingly Install O-ring on torsion bar shaft (be careful not to damage O-ring on shaft serrations) Install O-ring on torsion bar sleeve Install torsion bar sleeve on lid and tighten Tighten torsion bar sleeve until sealing surface firmly contacts boss (1 3/8 open end/box) Install ejector handle on torsion bar in original position Install bolt and washer for ejector handle and tighten (3/8 open end/box)	Fingertight
		5. VERIFY TRASH LOCK OPERATION (4.3.14.3, step 3)	
		6. USED O-RING DISPOSAL Dispose of used O-rings in trash bag	
		(27.40.04-00)	
		4.4.14.5 TRASH LOCK LID SEAL REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. ACCESS SEAL Obtain trash lock lid seal Restrain replacement trash lock lid seal on grid adjacent to trash lock with a short strap	(D440) (TBS)
	634	VACUUM SHUTOFF vlv - OPEN (verify)	Vacuum shutoff valve is located downstream of VLV/OUTER DOOR handle and seals off trash lock vent line to waste tank
		EJECTOR handle - RETRACT (verify)	If ejector mechanism is only partially retracted, it will impair opening of lid
		VLV/OUTER DOOR handle - PRESS	Trash lock vent valve is closed and pressurization valve is opened to equalize trash lock with cabin pressure
		Press gage - 4.8 to 5.2 psia	Indicates trash lock internal pressure

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.5 TRASH LOCK LID SEAL REPLACEMENT (cont'd)	
		LID LOCK handle - open	Upon opening of lid lock handle, locking pin is driven into VLV/OUTER DOOR handle, locking it in PRESS position. This prevents inadvertent venting of trash lock while lid is open
		Open lid	Plunger in lid drives second lock into VLV/OUTER DOOR handle
		2. REMOVE SEAL Loosen plunger screw (3/16 screwdriver) Rotate lid seal ccw until tabs are aligned with slots on lid	It may be necessary to depress ball detent in order to rotate seal
		Lift seal from groove in lid (O-ring extractor) Inspect sealing surfaces for damage or dirt Identify damaged seal (1 inch red tape and scissors)	Remove dirt with wipe moistened with water
		3. INSTALL REPLACEMENT SEAL Remove replacement seal from short strap Temporarily restrain damaged seal with short strap Place replacement seal in groove in lid Align lid seal tabs with slots on lid Rotate seal cw Tighten plunger screw (3/16 screwdriver)	
		4. CHECK SEAL INTEGRITY Close lid	One of the two VLV/OUTER DOOR handle interlocks is removed when lid contacts plunger on sealing surface
	634	LID LOCK handle - lock	Remaining VLV/OUTER DOOR handle interlock is removed, allowing free movement of VLV/OUTER DOOR handle
		VLV/OUTER DOOR handle - CLOSE/VENT	Opens trash lock vent valve and closes pressurization valve
		Pressure gage - 0.0 to 0.2 psia	
		(27.04.05-00)	
		4.4.14.6 TRASH LOCK VALVE PLUG REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. PREPARE FOR VALVE PLUG REPLACEMENT	
	634	VLV/OUTER DOOR handle - PRESS	Closes trash lock vent valve and opens pressurization valve to equalize trash lock with cabin pressure
		Pressure gage - 4.8 to 5.2 psia	Indicates internal pressure of trash lock
		VACUUM SHUTOFF vlv - CLOSE	Isolates valve plug in VLV/OUTER DOOR handle from vacuum of waste tank

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.6 TRASH LOCK VALVE PLUG REPLACEMENT (cont'd)	
		2. REMOVE VALVE PLUG Loosen set screw in valve end of VLV/OUTER DOOR handle (3/32 in. allen wrench) Pull valve plug out of valve body Identify damaged valve plug (1 inch red tape and scissors) Stow damaged valve plug	(D440)
		3. REPLACE VALVE PLUG Obtain replacement trash lock valve plug Inspect valve plug for apparent damage or dirt Carefully slide valve plug into valve body with double tooth centered at 2-o'clock position Tighten set screw in vlv end of VLV/OUTER DOOR handle (3/32 in. allen wrench)	(D440) Use care during installation so as not to damage O-rings
	634	4. CHECK VALVE PLUG INTEGRITY VACUUM SHUTOFF vlv - OPEN VLV/OUTER DOOR handle - CLOSE/VENT Pressure gage - 0.0 to 0.2 psia VACUUM SHUTOFF vlv - CLOSE Pressure gage ind - monitor for increase in pressure VACUUM SHUTOFF vlv - OPEN	Exposes vent port side of valve plug to vacuum pressure Valve plug rotates to stop trash lock pressurization and vents trash lock to vacuum Closes off vent line to waste tank for pressure check If pressure gage increases in pressure, cabin atmosphere is leaking into trash lock
		NOTE VLV/OUTER DOOR handle will remain in CLOSE/VENT position when trash lock is not in use to inhibit microbiological growth in trash lock	
		(27.40.11-00)	
		4.4.14.7 TRASH LOCK LINER REMOVAL	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. PREPARE TRASH LOCK FOR LINER REMOVAL EJECTOR handle - RETRACT (verify) VLV/OUTER DOOR handle - PRESS Press gage - 4.8 to 5.2 psia LID LOCK handle - open Open lid	Liner is removed for cleaning and debris removal

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.7 TRASH LOCK LINER REMOVAL (cont'd)	
		2. REMOVE TRASH LOCK LINER Remove bolts (18) holding liner in place (Ratchet handle, 3/8 standard socket) Remove liner from trash lock for cleaning	
		3. INSTALL TRASH LOCK LINER Install liner in trash lock Install bolts (18) in liner (Ratchet handle, 3/8 standard socket)	
		4. VERIFY TRASH LOCK OPERATION (4.3.14.3)	
		(27.40.06-00)	
		4.4.14.8 WMC BLOWER UNIT REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C). The following items are required for the completion of this procedure: bungee (2)	
		1. PREPARE BLOWER UNIT FOR REMOVAL Obtain replacement blower unit (spin type handle, 5/32 hex driver bit)	(D436)
		Restrain replacement blower unit on floor grid with bungee, outside entrance to WMC Temporarily stow second bungee on person	
	825	BLWR/SEPARATOR BUS 1 PWR - 1,2,3 (3) sw - OFF (verify)	Power must be off prior to disconnecting blower unit
		Remove lap belt from its stowed position and temporarily install belt into using position	Lap belt interferes with opening of access door
		Open access door to fecal collector filter/blower unit cb blower unit - OPEN	Located in recess on side of blower unit
		2. REMOVE FAILED BLOWER UNIT Remove tethered pin into port in blower unit housing	Tethered pin holds down vacuum cleaner bag interlock, enabling blower unit for operation
		Disconnect power cable connector from blower unit receptacle Remove inlet duct from blower unit	Elastic boot slips off blower unit inlet
		Depress pip pin Pull blower unit bracket handle and remove blower unit from bracket Release pip pin Temporarily stow failed blower unit on grid with bungee outside of WMC Identify failed blower unit (1 inch red tape and scissors)	
		3. INSTALL REPLACEMENT BLOWER UNIT Remove replacement blower unit from bungee stowage on grid Position blower unit on bracket locating pins in fecal/urine collector	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.8 WMC BLOWER UNIT REPLACEMENT (cont'd)	
		Pull bracket handle and rotate blower unit onto bracket Depress pip pin Push bracket handle to secure blower unit Release pip pin Install inlet duct to blower unit cb blower unit - closed	Elastic boot slips over blower unit inlet Circuit breaker is located in recess on side of blower unit
		Blower unit [ON/OFF/MOM ON] sw - OFF	Switch is located on carrying handle of blower unit. Switch must be off prior to connecting blower unit
		Insert tethered pin into port in blower unit housing Connect power cable connector to blower unit receptacle Blower unit [ON/OFF/MOM ON] sw - ON	Switch located on carrying handle of blower unit. When placed in the ON position, lever lock feature of switch locks switch in the ON position. Blower unit switch will be left in ON position while installed in fecal/urine collector
		4. VERIFY BLOWER UNIT OPERATION	
	825	BLWR/SEPARATOR BUS 1 PWR - 1 sw - ON	Only one switch is necessary to verify blower unit operation audible
		Verify blower unit operation BLWR/SEPARATOR BUS 1 PWR - 1 sw - OFF	
		NOTE After BLWR/SEPARATOR sw is positioned OFF, applicable separator will continue to operate for approximately 4 minutes	
		Close access door to fecal collector filter/blower unit Remove lap belt from its using position and attach to bracket in its stowage position Stow failed blower unit	(D436)
		(27.40.12-00)	
		4.4.14.9 PROCESSOR DOOR SEAL REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1 OBTAIN SPARE PROCESSOR DOOR SEAL	(D440)
		2. PREPARE PROCESSOR FOR DOOR SEAL REMOVAL	
	818	WASTE PROCESSOR VACUUM VENT vlv - OPEN (verify) WASTE PROCESSOR 1 (2-6) TMR sw - OFF (verify) WASTE PROCESSOR 1 (2-6) VENT handle - CABIN WASTE PROCESSOR 1 (2-6) DOOR handle - UNLOCK Waste processor chamber door - open	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.9 PROCESSOR DOOR SEAL REPLACEMENT (cont'd)	
		3. REMOVE PROCESSOR DOOR SEAL (O-ring extractor)	
		4. INSTALL SPARE PROCESSOR DOOR SEAL Press seal into slot in door	
		5. STOW USED PROCESSOR DOOR SEAL Identify used processor door seal (1-inch red tape and scissors) Dispose of used processor door seal in trash bag	
		(27.40.13-00)	
		4.4.14.10 PROCESSOR CONTROL PANEL REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN SPARE CONTROL PANEL	(D436)
	817	2. DEACTIVATE PROCESSOR cb PROCESSOR 1 (2-6) - OPEN	Open circuit breaker corresponding to control panel to be replaced
		3. REMOVE FAILED CONTROL PANEL Loosen screw-type, spring-loaded door latch (3/16 screwdriver, spin-type handle) Open control panel door Remove bolts (4) (Spin-type handle, 3/16 hex driver bit) Pull control panel out to expose electrical connection Disconnect electrical connector	
		4. INSTALL SPARE CONTROL PANEL Connect electrical connector Install control panel Install bolts (4) and tighten (3/16 hex driver bit, spin-type handle) Close control panel door Tighten screw-type, spring-loaded door latch (spin-type handle, 3/16 screwdriver)	
	800	5. VERIFY CONTROL PANEL OPERATION LAMP TEST sw - 1 WASTE PROCESSOR 1-6 TMR lt (6) - on WASTE PROCESSOR 1-6 OVERTEMP lt (6) - on WASTE PROCESSOR 1 (2-6) TMR sw - TIMER SET and hold WASTE PROCESSOR 1 (2-6) HR REMAINING ind - verify counting WASTE PROCESSOR 1 (2-6) TMR sw - release when timer returns to 0	Momentary switch Momentary switch
		6. STOW FAILED CONTROL PANEL Identify failed control panel (1-inch red tape and scissors) Stow failed control panel	(D436)

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.40.07-00)	
		4.4.14.11 URINE AND WATER DUMP HEATER PROBE REPLACEMENT	
		NOTE Dump heater probe is composed of soft metallic material and requires careful handling.	
		The following items are required for the performance of this procedure: portable light, utility cable, universal mount, portable timer, bump hat, and disposal bag. See tool matrix for tool requirements (Appendix C)	
		Notify MSFN prior to removing dump heater probe	
		1. PREPARE DUMP HEATER PROBE FOR REMOVAL	
	700 706	H2O DUMP HTR sw - OFF WATER DUMP vlv - CLOSE	
		or	
	800 831	DUMP HTRS H2O sw - OFF WATER DUMP vlv - CLOSE	
		or	
	800 818	DUMP HTRS URINE sw - OFF URINE DUMP vlv - CLOSE	
		Set portable timer for TBS minutes (4.3.7.2, steps 1, 2)	Allow sufficient time for heated probe to cool to touch temperature
		2. SET UP EQUIPMENT FOR DUMP HEATER PROBE REMOVAL	
		Unscrew screws (15) in access cover to plenum area in sleep compartment (spin-type handle and 5/32 hex driver bit)	
		Remove access cover	
		Place access cover on nearby grid	
		Attach disposal bag to utility belt	
		Obtain replacement dump heater probe	(D440)
		Place replacement dump heater probe in disposal bag	Temporary stowage
	803	Perform PORTABLE LIGHT OPERATION (4.3.15.1, step 1) and connect to UTIL OUTLETS 1 on panel 803	
		Portable light sw - HI	
		Don bump hat	Necessary for work in confined space in OWS plenum area below crew quarters to protect head
		Translate into plenum area below crew quarters	
		CAUTION Take care in placing hands and feet on waste tank bulkhead surfaces so as not to damage other sensors and equipment in adjacent areas.	
		Attach portable light universal mount to aft compartment handrail	
		Unsnap and remove insulation segments (2) that cover failed dump heater probe	
		Restrain insulation segments on overhead structure with tape	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.11 URINE AND WATER DUMP HEATER PROBE REPLACEMENT (cont'd)	
		Wait until portable timer tone sounds before dismantling dump heater probe	Timing-out of portable timer indicates that sufficient time has elapsed since dump heater probe power-down to allow safe handling of probe
		3. REMOVE FAILED DUMP HEATER PROBE Disconnect dump heater probe electrical connector (2) from structure-mounted receptacle (2) Remove liquid connector restraining pins (2) and stow in trouser pocket	Only on initial replacement of probe
		Unscrew liquid connector ccw approximately four turns at mounting bracket Remove replacement dump heater probe from disposal bag Carefully restrain replacement dump heater probe to waste tank bulkhead insulation with tape Unscrew failed dump heater probe and remove Immediately place failed dump heater probe into disposal bag Close disposal bag	Prevents contaminants on probe from escaping into atmosphere
		4. INSTALL REPLACEMENT DUMP HEATER PROBE Remove replacement dump heater probe from taped restraint Insert replacement dump heater probe into penetration in waste tank bulkhead	
		NOTE Dump heater probe is delicate and may be damaged if improperly inserted into penetration. If damage does occur during installation, either cover hole with tape or reinstall failed dump heater probe	
		Screw dump heater probe securely into place Screw liquid connector cw approximately four turns at mounting bracket Connect dump heater probe electrical connector (2) to structure-mounted receptacle (2) Remove insulation segments (2) from taped restraint on overhead structure Snap into place the two insulation segments on waste tank bulkhead	
		5. EGRESS FROM OWS AFT COMPARTMENT Remove all tape utilized for temporary restraint and dispose in disposal bag Detach portable light universal mount from handrail Exit from plenum area Portable light sw - OFF	To prevent arcing, switch must be OFF prior to disconnecting from power
		Replace center sleep compartment access cover Screw screws (15) to hold access cover (spin-type handle and 5/32 hex driver bit)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.11 URINE AND WATER DUMP HEATER PROBE REPLACEMENT (cont'd)	
		6. VERIFY DUMP HEATER PROBE OPERATION	
		Temporarily attach universal mount on portable light to floor grid in experiment compartment	
		Seal disposal bag and dispose (4.3.14.2)	
	700 or 800	Appropriate DUMP HTR sw - 1	
		Appropriate DUMP HTR lt - ON	Panel 617 DUMP HTR light comes on
		Appropriate DUMP HTR sw - 2	
		Appropriate DUMP HTR lt - ON	Panel 617 DUMP HTR light comes on
		Appropriate DUMP HTR sw - OFF	
		Appropriate DUMP HTR lt - off	Panel 617 DUMP HTR light goes off
		Disconnect portable light (4.3.15.1, step 2)	
		(27.40.14-00)	
		4.4.14.12 URINE SYSTEM MOTOR REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN SPARE URINE SYSTEM MOTOR	
		Open stowage compartment door	(D428)
		Remove captive bolts (2) retaining spare motor (Spin-type handle, 3/16 hex driver bit)	
		Remove spare motor	
		Close compartment door	
		2. REMOVE FAILED MOTOR	
		Configure separator for motor replacement (4.4.14.13, step 2)	
		Disconnect zero-g connector from motor filter	
		Unscrew bolts (one on each side) holding motor to separator (Spin-type handle, 3/16 hex driver bit)	Bolts are captivated by lanyards
		Remove motor from separator by unmeshing gears	
		3. INSTALL SPARE MOTOR	
		Remove protective gear cover from spare motor	
		Mate spare motor to separator by meshing gears	
		Install bolts (2) attaching motor to separator and tighten (Spin-type handle, 3/16 hex driver bit)	
		Connect zero-g connector to motor filter	
		Push drawer closed	
		Drawer 1 (2, 3) DRAWER locking handle - LOCK	
		4. VERIFY MOTOR OPERATION (4.4.14.14, step 5)	
		5. STOW FAILED MOTOR	
		Identify failed motor (1-inch red tape and scissors)	
		Stow failed motor	(D428)

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.40.15-00)	
		4.4.14.13 URINE SEPARATOR FILTER REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN SPARE SEPARATOR FILTER	(D448)
	825	2. CONFIGURE SEPARATOR FOR FILTER REPLACEMENT BLWR/SEPARATOR BUS 1 (2) PWR - 1 3 sw (6) - OFF (verify) Drawer 1 (2, 3) DRAWER locking handle - UNLOCK Pull drawer open to stops on track	
		3. REMOVE FILTER Loosen captive fasteners (3) on filter assembly cover (3/16 allen wrench, spin-type handle) Pull filter assembly cover free of cup/shield assembly Depress center of release knob and pull cup/shield assembly to expose filter Push and rotate filter ccw approximately 90 degrees Remove filter and dispose in trash bag	
		4. INSTALL SPARE FILTER Install filter, rotate cw approximately 90 degrees Install cup/shield assembly while depressing center of release knob Install filter assembly cover Tighten captive fasteners (3) on filter assembly cover (3/16 allen wrench, spin-type handle) Push drawer closed Drawer 1 (2, 3) DRAWER locking handle - LOCK	
		(27.40.16-00)	
		4.4.14.14 URINE SYSTEM SEPARATOR POWER CABLE REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix)	
		1. REMOVE FAILED POWER CABLE Configure separator for cable replacement (4.4.14.13, step 2) Disconnect zero-g connector from motor filter Disconnect bayonet connector at rear of separator compartment (Connector pliers)	
		2. OBTAIN SPARE POWER CABLE	(D428)
		3. STOW FAILED POWER CABLE Identify failed power cable (1-inch red tape and scissors) Stow failed power cable	(D428)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.14 URINE SYSTEM SEPARATOR POWER CABLE REPLACEMENT (cont'd)	
		4. INSTALL SPARE POWER CABLE Connect bayonet connector at rear of separator compartment (Connector pliers) Connect zero-g connector to motor filter Close drawer Drawer 1 (2, 3) DRAWER lock handle - LOCK	
	825	5. VERIFY REPLACEMENT POWER CABLE BLWR/SEPARATOR BUS 1 (2) PWR 1 (2, 3) sw - ON Verify separator operation BLWR/SEPARATOR BUS 1 (2) PWR 1-3 sw (6) - OFF	Separator will continue to receive power and operate for approximately 4 minutes after switch is positioned off
		(27.40.17-00)	
		4.4.14.15 URINE SYSTEM DUMP HOSE REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN SPARE DUMP HOSE	(D440)
		2. REMOVE FAILED DUMP HOSE Open URINE DUMP EQUIPMENT door Loosen hose clamp to release dump hose (No. 2 Phillips screwdriver) Loosen nut retaining dump hose to compartment feed thru fitting (11/16 open end/box) Remove dump hose	(H822) Three hoses in compartment
		3. INSTALL SPARE DUMP HOSE Feed qd end of dump hose through hose clamp Install other end of dump hose to feed through wall fitting Tighten nut on end of hose (11/16 open end/box) Tighten hose clamp (No. 2 Phillips screwdriver)	
		4. STOW FAILED DUMP HOSE Identify failed dump hose (1-inch red tape and scissors) Stow failed dump hose	(D440)
		(27.40.18-00)	
		4.4.14.16 URINE SYSTEM FLUSH GUN REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN SPARE FLUSH GUN	(D428)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.14.16 URINE SYSTEM FLUSH GUN REPLACEMENT (cont'd)	
		2. REMOVE FAILED FLUSH GUN Open URINE DUMP EQUIPMENT door Disconnect flush gun hose qd at compartment feed thru fitting Remove flush gun Remove flush gun resupply (5/16 open end/box)	(H822)
		3. INSTALL SPARE FLUSH GUN Connect flush gun hose qd to compartment feed thru fitting Install flush gun resupply (5/16 open end/box)	
		4. BLEED FLUSH GUN Obtain washcloth Flush gun trigger - rotate, release, and absorb gas/water mixture in washcloth Stow flush gun in holder Close stowage compartment door Squeeze washcloth in squeezer and attach to drying facility in WMC	(H822)
		5. STOW FAILED FLUSH GUN Identify failed flush gun (1-inch red tape and scissors) Stow failed flush gun	(D428)
		(27.40.03-00)	
		4.4.14.17 SQUEEZER FLAPPER VALVE REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN REPLACEMENT FLAPPER VALVE	(D440)
		2 REMOVE FAILED FLAPPER VALVE Unlatch squeezer Rotate squeezer to open position Remove screw in base of piston (Spin-type handle, 3/8 screwdriver) Remove washer Temporarily stow screw and washer Remove flapper valve (O-ring extractor)	
		3. INSTALL REPLACEMENT FLAPPER VALVE Install flapper valve with domed side facing chamber Install washer Install screw and tighten (Spin-type handle, 3/8 screwdriver) After tightening, back screw off 1/4 turn Close and latch squeezer	
		4. STOW FAILED FLAPPER VALVE Identify failed flapper valve (1-inch red tape and scissors) Stow failed flapper valve	(D440)

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.40.19-00)	
		4.4.14.18 SQUEEZER BAL-SEAL REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	
		1. OBTAIN REPLACEMENT BAL-SEAL	(D440)
		2. REMOVE FAILED BAL-SEAL Unlatch squeezer Rotate squeezer to open position Operate squeezer handle to move piston to accessible position Remove bal-seal by placing extractor tip on side opposite spring (O-ring extractor)	
		3. INSTALL REPLACEMENT BAL-SEAL Release squeezer handle Slip replacement bal-seal in place Close and latch squeezer	
		4. STOW FAILED BAL-SEAL Identify failed bal-seal (1-inch red tape and scissors) Stow failed bal-seal	(D440)
		(27.40.20-00)	
		4.4.14.19 SQUEEZER BAG INSTALLATION	
		1. OBTAIN SQUEEZER BAG	(H820)
		2. INSTALL SQUEEZER BAG Open access door beneath WMC sink Remove used squeezer bag by rotating dog-ear latch on washcloth squeezer outlet port away from rear of compartment (IFM only) Dispose of used squeezer bag (4.3.14.3) (IFM, deactivation only) Insert squeezer bag inlet flange into washcloth squeezer outlet port Rotate dog-ear latch on washcloth squeezer outlet port toward rear of compartment Close access door	Latch mechanism seals bag inlet flange and prevents water leakage into cabin during squeezing operation
		4.4.14.20 URINE SYSTEM SEPARATOR GAS OUTLET REPLACEMENT	
		TBS	

4.4.15 LIGHTING SYSTEM

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.41.01-00)	
		4.4.15.1 MDA AND OWS FLOODLIGHT REPLACEMENT	
		NOTE Eight OWS and two MDA floodlights are emergency lights and are identified by a red stripe on the housing. If one floodlight fails, it should be replaced immediately to maintain adequate emergency lighting capability	
		1. DEACTIVATE FLOODLIGHTS	Floodlight housings are identified by numerical placards that match placards on control switches
	207	Appropriate MDA switch - OFF LTG MDA FWD [1•3] LTG MDA FWD [2•4] LTG MDA AFT [1•3] LTG MDA AFT [2•4]	
		NOTE INTERIOR LTS sw on panel 101 controls power to all eight MDA floodlights. Care should be taken during floodlight replacement operations in area of panel 101 not to activate this switch	
		or	
	616	Appropriate OWS switch - OFF LTG UPPER WALL +Z SAL [1•2•10] LTG UPPER WALL +Y [3•4] LTG UPPER WALL -Z SAL [5•6•7] LTG UPPER WALL -Y [8•9] LTG DOME [1•3•5] LTG DOME [2•4•6] LTG DOME [7•8] LTG EXP COMPT [1•3•5] LTG EXP COMPT [2•4•6] LTG EXP COMPT [13•14] LTG EXP COMPT [7•9•11] LTG EXP COMPT [8•10•12] LTG [SLEEP COMPT]	
	630	LTS WARDROOM [1•3] LTS WARDROOM [2•4] LTS [WMC]	
		NOTE LTS OWS ENTRY sw on panel 390 controls power to eight floodlights in the OWS. Each is identified by a red stripe on the floodlight housing. If one of these floodlights is to be replaced, perform the following operation	
	390	LTS OWS ENTRY sw - OFF (verify)	Switch must be OFF to assure power removed from emergency floodlights

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.15.1 MDA AND OWS FLOODLIGHT REPLACEMENT (cont'd)	
		2. REMOVE FAILED FLOODLIGHT	
		CAUTION Activation of emergency lighting system during floodlight replacement will supply power to emergency floodlight housing regardless of the position of the floodlight switch or circuit breaker	
		Rotate and open dial latches (2) on floodlight housing Open hinged floodlight housing Disconnect floodlight electrical connector from housing receptacle Remove failed floodlight from cradle	
		3. OBTAIN REPLACEMENT FLOODLIGHT Dispose of failed floodlight in disposal bag Obtain replacement floodlight	(D430)
		4. INSTALL REPLACEMENT FLOODLIGHT Floodlight integral sw - OFF (verify) Align floodlight integral switch plate with cutout on end of floodlight housing Place floodlight in cradle Connect floodlight electrical connector to housing receptacle Close hinged floodlight housing Close and rotate dial latches (2) on floodlight housing	
		5. ACTIVATE FLOODLIGHT Appropriate light sw - on	
	207	LTG MDA FWD [1•3]	Floodlight does not come on since floodlight integral switch is in OFF position
		LTG MDA FWD [2•4]	
		LTG MDA AFT [1•3]	
		LTG MDA AFT [2•4]	
	616	LTG UPPER WALL +Z SAL [1•2•10]	
		LTG UPPER WALL +Y [3•4]	
		LTG UPPER WALL -Z SAL [5•6•7]	
		LTG UPPER WALL -Y [8•9]	
		LTG DOME [1•3•5]	
		LTG DOME [2•4•6]	
		LTG DOME [7•8]	
		LTG EXP COMPT [1•3•5]	
		LTG EXP COMPT [2•4•6]	
		LTG EXP COMPT [13•14]	
		LTG EXP COMPT [7•9•11]	
		LTG EXP COMPT [8•10•12]	
		LTG [SLEEP COMPT]	
	630	LTS WARDRM [1•3]	
		LTS WARDRM [2•4]	
		LTS [WMC]	
		Floodlight integral sw - LO	
		Verify floodlight - on	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.15.1 MDA AND OWS FLOODLIGHT REPLACEMENT (cont'd)	
		Floodlight integral sw - HI Verify floodlight - on Floodlight integral sw - as required	
		(27.41.02-00)	
		4.4.15.2 20-WATT LAMP REPLACEMENT	
		NOTE One lock compartment light is an emergency light and is identified by a red stripe on the protective cover. If this light fails, it should be replaced immediately to maintain adequate emergency lighting capability	
		1. DEACTIVATE LOCK COMPARTMENT LIGHTS	
	307	LTS STS FWD sel - FIXED	STS and aft compartment lights provide adequate illumination by which to replace lock compartment lamps
		LTS STS AFT sel - FIXED	
	390	LTS AFT sw - BRIGHT	
	316	LTG LOCK sw - OFF	Switch controls all four lights in lock compartment
		2. REMOVE FAILED 20-WATT LAMP	
		Unscrew Calfax fasteners (2) on light assembly	
		Open hinged housing cover	
		Depress lamp, twist ccw until lamp base is free	Bayonet-type lamp
		Remove lamp from socket	
		3. OBTAIN REPLACEMENT 20-WATT LAMP	
		Dispose of failed lamp in trash bag	
		Obtain replacement lamp	(M301)
		4. INSTALL REPLACEMENT 20-WATT LAMP	
		CAUTION Activation of emergency lighting system during 20-watt lamp replacement will supply power to emergency light lamp socket regardless of the position of light switch or circuit breaker	
		Align lamp locking pins (2) with tracks (2) on side of socket	
		Depress lamp and rotate cw to stops	Lamp will lock into place
		Close hinged housing cover	
		Tighten Calfax fasteners (2)	
		5. ACTIVATE LOCK COMPARTMENT LIGHTS	
	316	LTG LOCK sw - BRIGHT	
		Verify all lights - on	
		LTG LOCK sw - as required	
	390	LTS AFT sw - as required	
	207	LTS STS AFT sel - as required	
		LTS STS FWD sel - as required	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.41.03-00)	
		4.4.15.3 10-WATT LAMP REPLACEMENT	
		NOTE The two STS emergency lights are identified by a red stripe at their attach points to the handrails. If one light fails, it should be replaced immediately to maintain adequate emergency lighting capability	
		1. DEACTIVATE COMPARTMENT LIGHTS Appropriate STS selector - OFF	
	207	LTG PANEL LTG STS FWD LTG STS AFT	
		or	
	316	LTG LOCK sw - BRIGHT	Lever lock switch. Lock compartment lights provide adequate illumination by which to replace aft compartment lamps
	390	LTG AFT sw - OFF	
		2. REMOVE FAILED 10-WATT LAMP Slide lens from over lamp Depress lamp and twist ccw until lamp base is free Remove lamp from socket	Bayonet-type lamp
		3. OBTAIN REPLACEMENT 10-WATT LAMP Dispose of failed lamp in trash bag Obtain replacement lamp	(M301)
		4. INSTALL REPLACEMENT 10-WATT LAMP	
		CAUTION Activation of emergency lighting system during 10-watt lamp replacement will supply power to emergency light lamp socket regardless of the position of the light switch or circuit breaker	
		Align lamp locking pins (2) with tracks (2) on side of socket Depress lamp and rotate cw to stops Slide lens over lamp until lens is against stop	Lamp will lock into place
		5. ACTIVATE COMPARTMENT LIGHTS Appropriate STS selector - FIXED	
	207	LTG PANEL LTG STS FWD LTG STS AFT Verify lights - on LTG PANEL - as required LTG STS FWD - as required LTG STS AFT - as required	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.15.3 10-WATT LAMP REPLACEMENT (cont'd)	
		or	
	390	LTG AFT sw - BRIGHT	
		Verify lights - on	
		LTG AFT sw - as required	
	316	LTG LOCK sw - as required	Lever lock switch
		(27.41.04-00)	
		4.4.15.4 PORTABLE FLOODLIGHT REPLACEMENT	
		1. PREPARE PORTABLE LIGHT FOR REPLACEMENT	
		Attach portable light universal mount to convenient grid or handhold	Universal mount is assembled onto portable light for its initial use and remains with light thereafter
		2. DEACTIVATE PORTABLE LIGHT	
		Portable light [OFF/LO/HI] sw - OFF	
	UTIL	UTIL OUTLET (UTIL PWR) sw - OFF	UTIL OUTLET applies to panels 104, 112, 134, 140 and UTIL PWR applies to panels 213, 214, 219, 221, 316, 390. Panels 402, 521, 531, 551, 601, 628, 631, 711, and 803 do not contain switches
		Disconnect utility cable from UTIL OUTLET (UTIL PWR outlet)	
		Disconnect portable light connector from utility cable	
		Temporarily restrain utility cable to convenient structure	
		3. REMOVE FAILED FLOODLIGHT	
		Rotate and open dial latches (2) on portable light housing	
		Open hinged portable light housing	
		Remove failed floodlight from cradle	
		4. OBTAIN REPLACEMENT FLOODLIGHT	
		Dispose of failed floodlight in disposal bag	
		Obtain replacement floodlight	(D430)
		5. INSTALL REPLACEMENT FLOODLIGHT	
		Floodlight integral sw - OFF (verify)	Floodlight integral sw becomes the portable light [OFF/LO/HI] sw when installed in portable light
		Align floodlight integral switch plate with large cutout end of portable light housing	
		Place floodlight in cradle	
		Close hinged portable light housing	
		Close and rotate dial latches (2) on portable light housing	
		6. ACTIVATE PORTABLE LIGHT	
		Remove utility cable from temporary restraint on structure	
		Connect portable light connector to utility cable	
	UTIL	Connect utility cable to UTIL OUTLET (UTIL PWR outlet)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.4.15.4 PORTABLE FLOODLIGHT REPLACEMENT (cont'd) UTIL OUTLET (UTIL PWR) sw - ON Portable light [OFF/LO/HI] sw - LO Verify floodlight - on Portable light [OFF/LO/HI] sw - HI Verify floodlight - on Portable light [OFF/LO/HI] sw - as required	UTIL OUTLET applies to panels 104, 112, 134, 140 and UTIL PWR applies to panels 213, 214, 219, 221, 316, 390. Panels 402, 521, 531, 551, 601, 628, 631, 711 and 803 do not contain switches

SECTION 4.5

SYSTEMS DEACTIVATION

4.5.1 OWS DEACTIVATION

CREWMAN	PANEL	PROCEDURE	REMARKS
		(14.03.01-00) 4.5.1.1 FECAL/URINE COLLECTOR MODULE CONFIGURATION NOTE Record voice (4.3.2.4, or 4.3.2.8 and 4.3.2.16) throughout deactivation until intercom boxes are deactivated. The following items are required for the performance of this procedure: disposal bag, disinfectant and utility wipes 1. CLEANSE URINE SYSTEM SEPARATOR Each crewman perform urine sampling and processing (4.3.14.7, steps 1 through 8) 2. REMOVE URINE SYSTEM SEPARATOR ASSEMBLIES (3) (4.3.14.12) 3. CLEAN URINE DRAWER Clean urine drawer with disinfectant-moistened wipes and dry with clean wipes Dispose of wipes in trash bag Drawer 1, 2, 3 INLET DOOR - closed Drawer 1, 2, 3 AIRFLOW VLV - CLOSE Drawer 1, 2, 3 RECIRCULATION LINE DOOR - closed Push drawer 1, 2, 3 closed Push in and rotate drawer 1, 2, 3 DRAWER locking handle - LOCK 4. DEACTIVATE FECAL COLLECTOR Unlatch seal and lift Remove fecal bag and dispose of in nearby trash bag Clean fecal collector interior with disinfectant-moistened wipes and dry with clean wipes Clean seat with disinfectant-moistened wipes. Clean disinfectant residue with wipe moistened with water, and dry with clean wipes Dispose of used wipes in trash bag Close seat and latch 5. REPLACE FECAL COLLECTOR FILTER Perform fecal collector filter replacement (4.3.14.8) (SL-2, 3) (14.03.02-00) 4.5.1.2 WMC CONTROL PANEL DEACTIVATION NOTE The H2O DUMP HTR switch and associated indicators will not be checked at this time since the WMC water network is yet to be deactivated. The following item is required for the performance of this procedure: disposal bag	Inhibits microbiological growth during storage Replace after last blower operation to assure a clean filter for next mission

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.1.2 WMC CONTROL PANEL DEACTIVATION (cont'd)	
		1. WASTE PROCESSOR DEACTIVATION	
		WASTE PROCESSOR 1-6 DOOR handle (6) - LOCK (verify)	
		WASTE PROCESSOR 1-6 VENT handle (6) - CABIN (verify)	
		WASTE PROCESSOR 1-6 TMR sw (6) - OFF (verify)	
	817	cb PROCESSOR 1-6 (6) - OPEN	
	818	WASTE PROCESSOR VACUUM VENT vlv - CLOSE	
		URINE DUMP vlv - CLOSE (verify)	
		2. WMC RECONFIGURATION	
		Open stowage compartment door	(H822)
		Clean quick-disconnects, hoses, and any visible spills on compartment surfaces with disinfectant-moistened wipes, and dry with clean wipes	
		Close stowage compartment door	(H822)
	800	DUMP HTRS URINE sw - OFF (verify)	
		Remove all towels, washcloths, and tissues from drying restraints, and dispose of in trash bag	
		Clean exterior and interior surfaces of WMC drying restraints with disinfectant-moistened wipes, and dry with clean wipes	
		Dispose of wipes in trash bag	
		Restrain disposal bag in convenient location near sink	
		Dispose of unused soap bars, towel modules, washcloth modules, and IPHM (3) in disposal bag	
	800	FAN sw - OFF (verify)	
	634	Dispose of WMC trash bag and disposal bag in trash lock (4.3.14.3)	
		(14.03.03-00)	
		4.5.1.3 WARDROOM CONTROL PANEL DEACTIVATION	
		NOTE The H2O DUMP HTR switch and associated indicators will not be checked at this time, since the wardroom water network is yet to be deactivated. The following item is required for the performance of this procedure: disposal bag	
		1. RECONFIGURE WARDROOM	
	700	WINDOW HTR sw - OFF	
		Open WATER CHILLER access door	(W754)
		Dispose of food cans and beverages in trash bag	
		Dry all condensate from chiller compartment with a wipe	Use dry wipes as required
		Close WATER CHILLER access door	
		Remove all items being retained in wardroom drying restraints, and dispose of in trash bag	
		Clean exterior and interior surfaces of wardroom drying restraints with disinfectant-moistened wipes, and dry with a clean wipe	
		Dispose of galley food cans and beverages in empty food overcans	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.1.3 WARDROOM CONTROL PANEL DEACTIVATION (cont'd)	
		Restrain disposal bag with snaps in a convenient location adjacent to the galley	
		Dispose of galley stowed food overcans in disposal bag	
		Clean residue from galley with wipes moistened with water, and dry with clean wipes	
		Dispose of wipes in trash bag	
	705	Open H2O gun access doors (3)	
		Dispose of toothpaste (3) and toothbrushes (3) in trash bag	
		Close H2O gun access doors (3)	
	634	Dispose of wardroom trash bags (2), experiment compartment trash bag, fwd compartment trash bag, and disposal bag in trash lock (4.3.14.3)	
		Wardroom window shade - close	
		(14.03.04-00)	
		4.5.1.4 FOOD PREPARATION AREA DEACTIVATION	
		NOTE The following items are required for the performance of this procedure: long straps (3)	
		1. FOOD TRAY DEACTIVATION	
		Food tray 3 food cavity 1, 2, 3 htr sw (3) - OFF (verify)	
		Food tray 2 food cavity 1, 2, 3 htr sw (3) - OFF (verify)	
		Food tray 1 food cavity 1, 2, 3 htr sw (3) - OFF (verify)	
	705	Dispose of utensils in trash bag	
		Clean food trays and food tray lids with disinfectant-moistened wipes, and dry with clean wipes	
		Dispose of wipes in trash bag	
		Obtain food tray lids (3) from lid stowage area in galley and latch into place on food trays (3)	(TBS)
		NOTE Food tray lids and food tray color codes must match	
		2. FOOD TRAY REMOVAL	
	707	Remove high-power accessory adapter cable from FOOD TRAY 1 OUTLET 1 - BUS 1	Cable remains attached to food tray
	705	Disengage food tray 1 from food table using dial latches (2)	
		Restrain food tray 1 and high-power accessory adapter cable to wardroom floor grid using long strap	Food tray location must not interfere with opening of food table access door
		Connect cap to FOOD TRAY 1 OUTLET BUS 1	
		Repeat four preceding operations for food trays 2 and 3	
		Elevate thigh restraints (3) to vertical position	Allows for food table access door opening during water distribution system deactivation

CREWMAN	PANEL	PROCEDURE	REMARKS
		(14.03.05-00)	
		4.5.1.5 WATER SYSTEM DEACTIVATION	
		NOTE The following items are required during the performance of this procedure: wardroom and WMC purge fittings, and washcloth: See tool matrix for tool requirements (Appendix C)	
		1. DEACTIVATE WATER PRESSURIZATION SYSTEM WATER OUTLET VLV (water tank-wardroom) - CLOSE PRESS vlv (water tank-wardroom) - CLOSE WATER OUTLET vlv (water tank - WMC) - CLOSE PRESS vlv (water tank-WMC) - CLOSE WATER OUTLET vlv (water tank 6) - CLOSE PRESS vlv (water tank 6) - CLOSE	
	500	M171/ESS SUPPLY vlv - CLOSE (verify) (7 1/2 turns, cw) PRESS BLEED vlv - CLOSE (verify) (7 1/2 turns, cw) 35 PSI REG A tgl vlv - CLOSE 35 PSI REG B tgl vlv - CLOSE (verify) 150 PSI N2 SUP vlv - OPEN (verify) (7 1/2 turns, ccw)	Will be left open to prevent a single-point failure
	614	2. DEACTIVATE WATER HEATERS cb HSS WARDRM H2O HTR - OPEN cb HSS WMC H2O HTR - OPEN	
		3. REMOVAL OF CAT ION CARTRIDGE Obtain TBS units of iodine concentrate in the IODINE INJ 1 (4.3.13.1, step 5) Remove captive cap from INJ PORT on cat ion cartridge Screw IODINE INJ 1 on to iodine INJ PORT	
		NOTE Cat ion cartridge must be removed from wardroom water system immediately after iodine is injected	
		IODINE INJ 1 vlv - OPEN INJ PORT vlv - OPEN Rotate IODINE INJ 1 rear cap cw to zero units Disconnect bypass hose qd (2) from cat ion cartridge qd (2) Connect bypass hose qd (2) together Install bypass hose in restraining clamp Replace captive caps on cat ion cartridges qd (2) IODINE INJ 1 vlv - CLOSE INJ PORT vlv - CLOSE Unscrew IODINE INJ 1 from INJ PORT Return IODINE INJ 1 to stowage	Injects iodine into cartridge (F505)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.1.5 WATER SYSTEM DEACTIVATION (cont'd)	
		4. PREHEAT WATER DUMP HEATER PROBES	
	700	H2O DUMP HTR sw - BUS 1	
		H2O DUMP HTR lt - on	
	617	DUMP HEATER lt - on	
	800	DUMP HTRS H2O sw - BUS 1	
		DUMP HTRS H2O lt - on	
		Set portable timer for 15 minutes (4.3.7.2, steps 1, 2)	
		5. CONNECT DUMP LINES TO WARDROOM WATER SYSTEM	
	705	Open WATER CHILLER WATER HEATER access doors on food table pedestal	
		Remove captive caps from WATER HEATER DUMP PORT qd and WATER CHILLER DUMP PORT qd	
		Disconnect dump line qd (2) from DUMP LINE STOWAGE qd (2)	
		CONNECT dump line qd (2) to WATER HEATER DUMP PORT qd and WATER CHILLER DUMP PORT qd	
		HOT WATER [DISPENSE/CHARGE] vlv - DISPENSE (verify)	
		COLD WATER [DISPENSE/CHARGE] vlv - DISPENSE (verify)	
		WATER HEATER OUTLET VLV - OPEN (verify)	
		WATER CHILLER OUTLET VLV - OPEN (verify)	
		Open access cover to H2O gun	
		Remove H2O gun from holster	
		Loosen jamnut against H2O gun resupply (5/16 open end/box)	
		Unscrew H2O gun resupply from H2O gun	
		Dispose of H2O gun resupply in trash bag	
		Return H2O gun to holster	
		Repeat five preceding operations for remaining H2O guns	
		6. CONNECT DUMP LINE TO WMC WATER SYSTEM	
		Open WMC WATER HEATER access door	Mirrored door in WMC
		Remove captive cap from WATER HEATER DUMP PORT qd	
		Disconnect WMC dump line qd from CONDENSATE DUMP LINE qd	
		Connect WMC dump line qd to WATER HEATER DUMP PORT qd	
		WATER HEATER OUTLET VALVE - CLOSE (verify)	
		7. CONNECT DUMP LINE TO URINE FLUSH SYSTEM	
		Open access door below WMC sink	
		Obtain URINE SYSTEM FLUSH DUMP hose	(H831)
		Remove captive caps on URINE SYSTEM FLUSH DUMP hose qd (2)	
		Remove captive cap on FLUSH DUMP line qd	
		Connect URINE SYSTEM FLUSH DUMP hose qd to FLUSH DUMP line qd	
		Open URINE DUMP EQUIPMENT access door	(H822)
		Remove captive cap on FLUSH DUMP PORT qd	
		Connect URINE SYSTEM FLUSH DUMP hose qd to FLUSH DUMP PORT qd	
		8. PERFORM WARDROOM WATER SYSTEM PURGE	
		NOTE	
		Do not continue until dump heaters have been activated for a period of 15 minutes as indicated by tone from portable timer	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.1.5 WATER SYSTEM DEACTIVATION (cont'd)	
	706	Open WATER DUMP VALVE access door WATER DUMP vlv - OPEN Obtain purge fitting Disconnect mated captive caps of WARDROOM 1 hose and WATER OUTLET qd (water tank-wardroom)	(D438)
		Disconnect WARDROOM 1 hose qd from WATER OUTLET qd (water tank-wardroom) Install WATER purge fitting in WARDROOM 1 hose qd Place end of WARDROOM 1 hose with WATER purge fitting in restraining clamp Purge for TBS minutes	Cabin pressure will force wardroom water system to drain
		Disconnect dump line qd from WATER HEATER DUMP PORT qd Connect dump line qd to DUMP LINE STOWAGE qd Continue purge for TBS minutes	Allows dumping of residue water in water chiller
		Remove purge fitting from WARDROOM 1 hose qd Temporarily stow purge fitting Replace captive cap on WARDROOM 1 hose qd	Wardroom water system is now exposed to a vacuum
		Remove H2O gun from holster H2O gun trigger - rotate H2O gun trigger - release Repeat preceding operations (2) 5 times Return H2O gun to holster Repeat five preceding operations for remaining H2O guns Set HOT volume selector - 1 oz HOT [DISPENSE/CHARGE] vlv - CHARGE HOT [DISPENSE/CHARGE] vlv - DISPENSE HOT wardroom H2O dispenser valve - depress Repeat three preceding operations 3 more times Repeat four preceding operations for COLD wardroom H2O dispenser valve	Purges water in H2O gun and hose
		NOTE The wardroom water system is exposed to a vacuum at this time. Retain this configuration for TBS minutes minimum. Continue to step 9 to purge and configure the WMC water system	
		9. PERFORM WMC AND URINE FLUSH WATER SYSTEMS PURGE	
	831	WATER DUMP vlv - OPEN Disconnect mated captive caps of the WMC hose and WATER OUTLET qd (water tank-WMC)	
		Disconnect WMC hose qd from WATER OUTLET qd (water tank-WMC) Obtain purge fitting Install purge fitting in WMC hose qd Place end of WMC hose with purge fitting in restraining clamp	(D438) Cabin pressure will force WMC water system to drain
		Disconnect mated captive caps of the URINE SYSTEM FLUSH hose and WATER OUTLET qd (water tank-6) Disconnect URINE SYSTEM FLUSH hose qd from WATER OUTLET qd (water tank 6) Obtain purge fitting	(D438)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.1.5 WATER SYSTEM DEACTIVATION (cont'd)	
		Install purge fitting to URINE SYSTEM FLUSH hose	
		Place end of URINE SYSTEM FLUSH hose with purge fitting in restraining clamp	Cabin pressure will force urine flush system to drain
		Purge for TBS minutes	
		Disconnect URINE SYSTEM FLUSH DUMP hose qd from FLUSH DUMP line qd	
		Continue to purge for TBS minutes	WMC water system will continue to purge
		Connect URINE SYSTEM FLUSH DUMP hose qd to FLUSH DUMP line qd	
		Remove purge fittings from WMC hose qd and URINE SYSTEM FLUSH hose qd	Both WMC water and urine flush systems are exposed to vacuum
		Stow purge fittings (2)	(D438)
		WMC H2O dispenser valve - depress and hold for 5 seconds	
		Obtain urine flush H2O gun	(H822)
		Loosen jamnut from urine flush gun resupply (5/16 open end/box)	
		Unscrew urine flush gun resupply	
		Dispose of resupply in trash bag	
		Urine flush gun trigger - rotate	
		Urine flush gun trigger - release	
		Repeat two preceding operations	
		Stow urine flush gun	(H822)
		NOTE The WMC and urine flush water systems are exposed to vacuum. Retain this configuration for TBS minutes minimum and then perform step 10	
		10. DEACTIVATE WARDROOM WATER DUMP SYSTEM	
	700	H2O DUMP PRESS ind- ≤0.7 psia	
	706	WATER DUMP vlv - CLOSE	
	705	Disconnect dump line qd from WATER HEATER DUMP PORT qd	Located in pedestal of food table
		Connect dump line qd to DUMP LINE STOWAGE qd	
		Replace captive cap on WATER HEATER DUMP PORT qd	
		Disconnect dump line qd from WATER CHILLER DUMP PORT qd	
		Connect dump line qd to second DUMP LINE STOWAGE qd	
		Replace captive cap on WATER CHILLER DUMP PORT qd	
	700	H2O DUMP HTR sw - OFF	
		H2O DUMP HTR lt - off	
	617	DUMP HTR lt - off	
		Close WATER HEATER, WATER CHILLER, and WATER DUMP VALVE access doors (3)	
		Close access doors to H2O guns (3)	
		Drop thigh restraints (3) to down position	
		11. DEACTIVATE WMC AND URINE FLUSH WATER DUMP SYSTEMS	
	800	H2O DUMP PRESS ind- ≤0.7 psia	
	831	WATER DUMP vlv - CLOSE	
		Disconnect URINE SYSTEM FLUSH DUMP hose qd from FLUSH DUMP PORT qd	
		Disconnect URINE SYSTEM FLUSH DUMP hose qd from FLUSH DUMP line qd	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.1.5 WATER SYSTEM DEACTIVATION (cont'd)	
		Replace captive caps on URINE SYSTEM FLUSH DUMP hose qd, FLUSH DUMP PORT qd, FLUSH DUMP line qd	
		Stow URINE SYSTEM FLUSH DUMP hose	(H831)
		WATER HTR OUTLET VLV - OPEN	
		Close WMC WATER HEATER access door and access door below WMC sink	
	800	DUMP HTRS H2O sw - OFF	
		DUMP HTRS H2O lt - off	
		12. INSTALL PURGE FITTING	
		NOTE All water systems will be vented to the cabin during stowage	
		Install wardroom purge fitting to female qd of WARDROOM 1 hose	
		Install WMC purge fitting to female qd of WMC hose	
		Install urine flush purge fitting to female qd of URINE SYSTEM FLUSH hose	
		(14.03.06-00)	
		4.5.1.6 REFRIGERATION SYSTEM STORAGE CONFIGURATION	
		Deactivate pump 1 and activate pump 2 (4.3.12.2) (SL-2)	
		Deactivate pump 3 and activate pump 4 (4.3.12.2) (SL-3)	
		(14.03.07-00)	
		4.5.1.7 THERMAL CONTROL SYSTEM DEACTIVATION	
	617	TCS HTRS DUCT 3 [1•3], [2•4] sw (2) - OFF (verify)	
		TCS HTRS DUCT 1 [1•3], [2•4] sw (2) - OFF	
		TCS HTRS DUCT 2 [1•3], [2•4] sw (2) - OFF	
		TCS HT EXCH FANS 1-4 sw (4) - OFF	Inhibits control of AM aft compartment heat exchanger circulation fans and valves by OWS TCS logic
		NOTE Circulation duct fans are deactivated during reconfiguration of OWS circuit breaker panels	
		(14.03.08-00)	
		4.5.1.8 INTERCOM BOX DEACTIVATION	
		1. DEACTIVATE OWS INTERCOM BOXES	
		Configure panels 520, 540, 627, 702, 801, 901, 902, and 903 per storage configuration (4.1)	
		NOTE Panels 401 and 600 will be deactivated during OWS egress	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(14.03.09-00)	
		4.5.1.9 OWS LIGHTING STORAGE CONFIGURATION	
		Configure OWS floodlight integral switches (42) per storage configuration (4.1)	All switches configured to HI. Forty-two switches consist of: OWS upper wall (10) OWS dome (8) OWS exp compt (14) OWS sleep compt (3) Wardroom (4) WMC (3)
		4.5.1.10 FINAL SYSTEM RECONFIGURATION AND OWS EGRESS	This procedure title and following NOTE are not part of A.E. 14.03.09-00
		NOTE The following tasks are a constraint on the completion of OWS deactivation: Earth return stowage transfer and disposal of all trash bags	
		(14.03.10-00)*	
	S910 S922 S932	1. DEACTIVATE SLEEP COMPARTMENT Remove sleep restraint comfort restraints, pillows and blankets Remove trash bags Dispose of noted items in trash lock (4.3.14.3)	
		(14.03.11-00)	
	403	2. UNSEAL SOLENOID VENT PORT Remove vent sealing device from SOLENOID VENT PORT (4.3.4.1) Install vent sealing device in stowage receptacle (4.3.4.2)	
		(14.03.12-00)	
		3. MISCELLANEOUS PANEL CONFIGURATION Configure panels 402, 404, 405, 517, 518, 521, 529, 530, 531, 542, 543, 544, 551, 555, 601, 607, 610, 617, 618, 619, 625, 628, 631, 633, 638, 639, 640, 642, 711 and 803 per storage configuration (4.1)	
	600	4. TERMINATE VOICE RECORDING [RCD/OFF] sw - OFF Rcd lt - off	This step is not part of A.E. 14.03.12-00 Momentary switch
		NOTE If voice recording was via LCCU, perform disconnection (4.3.2.9)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.1.10 FINAL SYSTEM RECONFIGURATION AND OWS EGRESS	
		(14.03.13-00)	
		5. DEACTIVATE REMAINING OWS INTERCOM BOXES Configure panels 401 and 600 per storage configuration (4.1)	
		(14.03.14-00)	
		6. VERIFY AND CONFIGURE CIRCUIT BREAKER PANELS Verify panels 611, 612, 613, 614, and 615 per post-activation configuration (4.1) except for the following:	
	614	cb HSS WARDRM H2O HTR - OPEN (verify) cb HSS WMC H2O HTR - OPEN (verify)	
		Configure panels 611, 612, 613, 614, and 615 per storage configuration (4.1)	
		(14.03.15-00)	
		7. CONFIGURE LIGHTING	
	390	LTS OWS ENTRY sw - ON	
	630	Configure LTG sw (3) per storage configuration (4.1)	
	616	Configure LTG sw (13) per storage configuration (4.1)	

4.5.2 AM/MDA DEACTIVATION

CREWMAN	PANEL	PROCEDURE	REMARKS
		(14.05.01-00)	
		4.5.2.1 CONDENSATE SYSTEM DEACTIVATION	
		CAUTION Condensate system deactivation must occur early in the overall deactivation sequence (during OWS deactivation) to allow the SWS dew point temperature to increase to 50°F. High dew point precludes dry-out of the CSM CO2 removal system	
		NOTE Record voice (4.3.2.4, or 4.3.2.8 and 4.3.2.16) throughout deactivation until the intercom system is deactivated	
		1. PERFORM DUMP	
	207	CNDSATE TANK ΔP sw - inhbt	Prevents C/W Alert for following steps
		Dump condensate (4.3.4.3, step 1)	
		2. DISCONNECT CONDENSATE LINE (MOL SV A)	
		Loosen Calfax fasteners (2) and open MOL SV A solids trap access door	
	233	CONDENSING HT EXCH AIR FLOW vlv - B	Routes airflow thru inactive condensing heat exchanger, preventing normal condensate removal. The mol sv beds will continue to absorb some water
		Disconnect condensate line qd from mol sv condensing heat exchanger A qd	
		Connect condensate line qd to vent fittings	
	230	Heat Exch A Cndst Isolation vlv - OPEN (2 1/2 turns, ccw)	Allows condensate tank venting to cabin during storage
		Heat Exch B Cndst Isolation vlv - OPEN (2 1/2 turns, ccw)	
		Close MOL SV A solids trap access door and tighten Calfax fasteners (2)	
		3. DISCONNECT CONDENSATE LINES (MOL SV B)	
	239,232	Repeat step 2 for mol sv B	
		4. PURGE CONDENSATE DUMP LINES	
	216	CNDST TANK H2O vlv - FILL	
		CNDST TANK PRESS vlv - VACUUM	Causes water in the condensate lines to be evacuated to the condensate tank
		CNDST CONT SYS TANK ΔP ind - monitor until $<$ 0.8 psid	
		CNDST TANK H2O vlv - DUMP	
		CNDST TANK PRESS vlv - PRESS	
		CNDST CONT SYS TANK ΔP ind - monitor until $>$ 4.0 psid	
		Repeat preceding operations	Insures complete purge
		5. DEACTIVATE CONDENSATE SYSTEM	
	216	CNDST TANK H2O vlv - FILL	Allows venting of water side of tank to cabin during storage
		CNDST TANK PRESS vlv - PRESS	Allows venting of gas side of tank to cabin during storage
		CNDST CONT SYS VENT VLV sw - OFF	
		CNDST CONT SYS VENT HTRS sw - OFF	
		CNDST CONT SYS VENT HTRS PRI lt - off	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(14.05.02-00)	
		4.5.2.2 SWS OVERPRESSURIZATION	
		NOTE This procedure is required only if SWS pressure is < 5.2 psia	Overpressurization by SWS O2/N2 system minimizes use of CSM consumables when CSM CO2 removal is initiated. If initial SWS pressure is 4.8 psia, the overpressurization cycle will require approximately 1.2 hours
	225	1. INITIATE OVERPRESSURIZATION O2 FILL PRI, SEC sw (2) - OPEN AM FILL PRI, SEC sw (2) - OPEN	Initiates O2 flow rate of approximately 22 lb/hour into vehicle
		PRESS FWD ind - monitor for pressure increase to 5.2 psid	Indicator displays differential pressure, internal STS to ambient
	225	2. TERMINATE OVERPRESSURIZATION PRESS FWD ind - 5.2 psid AM FILL PRI, SEC sw (2) - CLOSE O2 FILL PRI, SEC sw (2) - CLOSE	Terminates high rate O2 flow
		(14.05.03-00)	
		4.5.2.3 MOLECULAR SIEVE DEACTIVATION	
		1. BAKEOUT MOL SV BEDS (4.3.4.7)	
		2. PERFORM SECHEDULED MOL SV MAINTENANCE Replace solids traps (4.3.4.12)	
		CAUTION Mol sv sorbent canister housing and ducts at outlet attain ≈400°F during bakeout. Exercise care or delay charcoal canister replacement until cooldown occurs	
		Replace mol sv charcoal canisters (4.3.4.11)	
		(14.05.04-00)	
		4.5.2.4 LOCK AND AFT COMPARTMENT DEACTIVATION	
		Configure panels 311, 312, 313, 316, 317, 318, 319, 320, 323, 325, 390, 391, and 392 per storage configuration (4.1)	No further operations are required at these panels

CREWMAN	PANEL	PROCEDURE	REMARKS
		(14.05.12-00)	
		4.5.2.5 O2/N2 CONTROL SYSTEM DEACTIVATION	
	225	Configure panel 225 per storage configuration (4.1)	The CSM will supply gas as required. Panel 225 should not be deactivated until OA overpressurization complete (4.5.2.2)
		(14.05.05-00)	
		4.5.2.6 DEACTIVATION OF SWS POWER TIE TO CSM (4.19.12)	
		(14.05.06-00)	
		4.5.2.7 CAUTION AND WARNING SYSTEM DEACTIVATION	
	207 206	Configure inhibit sw (76) per storage configuration (4.1) C/W PWR CAUT & WARN sw - OFF C/W PWR EMER 1, 2 sw (2) - OFF	
		(14.05.07-00 and 14.05.08-00)	
		4.5.2.8 SWS/CSM COMMUNICATIONS AND CLOCK DEACTIVATION (4.19.14)	
		(14.05.09-00)	
		4.5.2.9 ATM C&D H2O LOOP DEACTIVATION	
	135 203 235	EREP Coolant vlv - BYPASS (verify) ATM CLNT PUMPS A sw - OFF ATM CLNT RES PRESS vlv - CLOSE	
		(14.05.10-00)	
		4.5.2.10 SWS/CSM CIRCULATION DEACTIVATION	
	203	1. DEACTIVATE CIRCULATION FANS MOL SV A FANS PWR sw - OFF MOL SV B FANS PWR sw - OFF AM FANS sw (4) - OFF MDA FANS sw (3) - OFF	Terminates all SWS fan operation
		2. DISCONNECT CM/MDA INTERCHANGE DUCT Rotate S190 Multispectral Photographic Facility (MPF) to intermediate position Remove velcro restraint in CSM from CM/MDA interchange duct Loosen and remove Calfax fastener, and temporarily stow for use in attaching the duct to stowage rack Route duct through tunnel into MDA Disconnect duct from CSM FAN 1 outlet	MPF must be moved to enable CM/MDA interchange duct removal Temporarily stow in suit or in hole provided forward of the CSM FAN 1 launch restraint bracket

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.2.10 SWS/CSM CIRCULATION DEACTIVATION (cont'd)	
		Connect fan end of duct to stowage rack, and install and tighten Calfax fastener	(M118) Tighten finger tight
		Release fastener securing restraining strap and remove strap from under duct	
		Wrap restraining strap around duct and secure with fastener	
		Repeat two preceding operations for other restraining straps (3)	Secures duct in stowage trough
		Return MPF to stowed location	
		(27.01.02-00, 27.02.18-00)	
		4.5.2.11 POWER AND CONTROL UMBILICAL DISCONNECT (4.19.3, 4.19.4)	
		(14.05.12-00)	
		4.5.2.12 FINAL RECONFIGURATION AND EGRESS	
		1. CONFIGURE SWITCH PANELS	
		Configure switch panels 203, 204, 205, and 206 per storage configuration (4.1)	
		(14.05.13-00)	
		2. VERIFY AND CONFIGURE CIRCUIT BREAKER PANELS	
		Verify panels 200, 201, and 202 per post activation configuration (4.1)	
		Configure panels 200, 201, and 202 per storage configuration (4.1)	
		(14.05.12-00)	
		3. MISCELLANEOUS PANEL CONFIGURATION	
		Configure panels 103, 104, 112, 115, 117, 118, 120, 132, 133, 134 139, 140, 208, 213, 214, 217, 218, 219, 220, 221, 223, 224, 236, 237, and 238 per storage configuration (4.1)	
	241,242, 243,244	Verify that STS window covers (4) are closed and WINDOW VENT vlv (4) are in SEAL position	Prevents excessive heat loss during storage
	107,108	Configure panels 107 and 108 per storage configuration (4.1)	
		(14.05.14-00)	
		4. CONFIGURE LIGHTING	
	101	INTERIOR LTS sw - ON	Momentary Switch
		Configure MDA Floodlight Integral sw (8) - HI	
	207	LTG PNL sel - OFF	
		LTG METER sel - OFF	
		LTG STS FWD sel - OFF	
		LTG STS AFT sel - OFF	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.2.12 FINAL RECONFIGURATION AND EGRESS (cont'd)	
		(14.05.15-00)	
		5. HARD MOUNT SOP	
		Loosen strap restraining SOP/SOMA and remove SOP/SOMA	(M165)
		Disconnect hose from SOP	
		Remove SOMA from SOP and stow	(M157)
		Install SOP in launch restraints	
		Remove docking load straps from stowage and secure the strap ends that don't have a T-handle to fittings on CSM side of SOP	(M165)
		Place one strap over SOP and slide into fitting	
		Rotate T-handle cw two revolutions	Strap secured
		Repeat two preceding operations for second strap	
		(14.05.16-00)	
		6. REMOVE S190 WINDOW PROTECTOR	
		WARNING When removing S190 window protector, be extremely careful not to damage or scratch the S190 window or damage S190 window protector. Unprotected, the S190 window is a potential single-point failure	
		Turn tension bolts ccw	
		Remove S190 window protector and stow	(M116)
		Rotate MPF to launch position and lock	
		(14.05.17-00)	
		7. RESTRAIN FIRE EXTINGUISHER	
		Obtain pins (2)	(TBS)
		Install pins (2) in fire extinguisher	
		(14.05.18-00)	
		8. RELOCATE DROGUE AND PROBE	
		Obtain probe and transfer to CSM for temporary stowage	(M107)
		Obtain drogue and transfer to CSM for temporary stowage	(M105)
		9. EGRESS FROM MDA	
	100	Release MDA hatch from detent lock	
	101	INTERIOR LTS sw - OFF	Momentary switch
	100	Close MDA hatch	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.5.2.12 FINAL RECONFIGURATION AND EGRESS (cont'd)	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
		X - MDA Hatch Latches Binding - X	
		X X	
		NOTE	
		See tool matrix for tool requirements (Appendix C). Tools must be available in CSM	
		Remove rings from retaining pins on binding latch(es) (retaining ring removal tool)	Two pins on each of six latches
		Remove pins from latch(es) (pin removal tool)	
		X Manually retract latch(es) X	
		X Close MDA hatch X	
		X X	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		Release handle safety trigger - Lift and rotate 90° away from hatch	
		Release handle - CLOSE	
		PRESS EQUAL VLV - CLOSE (verify)	
		Install bayonet cap	

SECTION 4.6

EVA/IVA

4.6.1 EVA/IVA OPERATIONS

CREWMAN	PANEL	PROCEDURE	REMARKS
		(21.01.21-00)	
		4.6.1.1 MDA/STS COMPARTMENT PREPARATION FOR EVA	Transfer of TBS quantity of LiOH canisters to CSM should occur as part of this preparation to facilitate use of CSM CO2 removal system subsequent to (4.6.1.15) and for possible mission termination
		1. CONFIGURE COMPARTMENT AND PANEL LIGHTING	
	207	LTG PNL sel - as required	
		LTG METER sel - as required	
		LTG STS FWD sel - as required	
		LTG STS AFT sel - as required	
		LTG MDA FWD [1•3] sw - ON	LTG MDA switches are momentary
		LTG MDA FWD [2•4] sw - ON	
		LTG MDA AFT [1•3] sw - ON	
		LTG MDA AFT [2•4] sw - ON	
		LTG TRACKING sw - OFF (verify)	
		LTG DKG sw - OFF (verify)	
		Test status lights on panels 203, 204, and 216 (4.3.15.2, step 2)	
	316	LTG METER sw - ON	Lever lock switch
		LTG LOCK sw - BRIGHT	Lever lock switch
		NOTE At earliest convenience prior to EVA, crew should verify AM coolant loop configuration with MSFN. Loop configuration should be logged onboard if contingency loop switching required during EVA	
		2. DEACTIVATE ATM C&D H2O LOOP (4.3.4.29, step 1)	Minimizes radiator heat loads during EVA
		3. PERFORM CONDENSATE SYSTEM DUMP (4.3.4.3)	
		4. VERIFY SUS WATER RESERVOIR	
		Obtain penlight	TBS
		Loosen Calfax fasteners (2) and open access panels on either end of IVA station and verify both water tanks contain water	Mirrors mounted on inside of access panels facilitates water reservoir inspection
	223	SYS 1 LCG RES PRESS vlv - OPEN (verify)	
	224	SYS 2 LCG RES PRESS vlv - OPEN (verify)	
		5. VERIFY O2/N2 SYSTEM	
	225	O2 BOTTLES PRI SEC sw (2) - OPEN (verify)	
		120 PSI REG A, B tgl vlv (2) - OPEN (verify)	
		N2 BOTTLES PRI, SEC sw (2) - OPEN (verify)	
		150 PSI REG A, B tgl vlv (2) - OPEN (verify)	
		5 PSI REG A, B tgl vlv (2) - OPEN (verify)	
		REG O2 ind - 115 to 135 psia	
	316	PRESS O2 ind - 115 to 135 psia	
	225	120 PSI REG A, B tlg vlv (2) - CLOSE	
	317	Uncap SUS 1 O2 SUP qd	
		SUS 1 O2 SUP vlv - OPEN	
	316	PRESS O2 ind - 5 to 10 psia	
	225	REG O2 ind - 5 to 10 psia	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.1 MDA/STS COMPARTMENT PREPARATION FOR EVA (cont'd)	
	317	SUS 1 02 SUP vlv - CLOSE	
		Cap SUS 1 02 SUP qd	
	225	120 PSI REG A, B tgl vlv (2) - OPEN	
		REG 02 ind - 115 to 135 psia	
	316	PRESS 02 ind - 115 to 135 psia	
	225	02 BOTTLES ind sel - 1	
		02 BOTTLES (PSI x 10) ind - as required (log)	
		02 BOTTLES (°F) ind - as required (log)	
		Repeat preceding three operations for selector positions 2 through 6	
		6. CONFIGURE AM FOR EVA AUDIO (4.3.2.17)	
		7. VERIFY M509 RECHARGE STATION STOWED	
		(21.01.22-00)	
		4.6.1.2 OWS PREPARATION FOR EVA	
		1. CONFIGURE OWS SUPPORT PANELS IN AM FOR EVA	OWS crew activities must be complete prior to lighting deactivation
	390	LTS OWS ENTRY sw - ON	
		OWS HT EXCH FANS 1-4 sw (4) - OFF	Minimizes total radiator heat loads
		2. CONFIGURE OWS PANELS FOR EVA	
	403	Remove vent sealing device from SOLENOID VENT PORT (4.3.4.1)	
		Install vent sealing device in stowage receptacle (4.3.4.2)	
	617	TCS HTRS DUCT 1 [1•3] sw - AUTO (verify)	
		TCS HTRS DUCT 1 [2•4] sw - AUTO (verify)	
		TCS HTRS DUCT 2 [1•3] sw - AUTO (verify)	
		TCS HTRS DUCT 2 [2•4] sw - OFF	
		TCS OWS TEMP ind - monitor	
		TCS TEMP SEL - momentarily set 6°F below OWS temperature indication	Places TCS in cooling mode
		TCS TEMP SEL - 68°F	OWS temperature must decay to 64°F before 750 watts of duct heaters will be activated. TCS will maintain thermal conditioning during EVA and will reachieve crew comfort criteria within 1 hour following EVA
	616	LTG EXP COMPT [1•3•5] sw - OFF	The following initial entry lights remain on:
		LTG EXP COMPT [2•4•6] sw - OFF	Dome lights 1 and 4 - on
		LTG EXP COMPT [13•14] sw - OFF	Upper wall lights 3 and 8 - on
		LTG EXP COMPT [7•9•11] sw - OFF	Experiment compartment lights 6, 7, 13, and 14 - on
		LTG EXP COMPT [8•10•12] sw - OFF	
		LTG [SLEEP COMPT] sw - OFF	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(21.01.23-00)	
		4.6.1.3 FINAL AM PREPARATION FOR EVA	
		1. CONFIGURE FOR ATMOSPHERE CONTROL DURING EVA	
	203	AM FANS CIRC 1, 2, 3 sw (3) - OFF	Minimizes total radiator heat loads during EVA
	234	[OWS/BOTH/MDA] vlv - MDA	Directs return air from mol sv towards MDA for comfort of non-EVA crewman
		2. ACTIVATE EVA LIGHTING	
		Notify ground to enable ATM EVA lighting	This must be accomplished before ATM EVA lights can be turned on from panel 316
	316	LTG EVA ATM sw - ON	Lever lock switch
		LTG EVA DA sw - ON	Lever lock switch
		LTG EVA AM sw - ON	Lever lock switch
		4.6.1.4 (DELETED)	
		(21.02.17-00)	
		4.6.1.5 OWS POST EVA ACTIVITY	
		1. RECONFIGURE COMPARTMENT LIGHTING	
	616	LTG EXP COMPT [1•3•5] sw - 1•3•5	
		LTG EXP COMPT [2•4•6] sw - 2•4•6	
		LTG EXP COMPT [13•14] sw - 13•14	
		LTG EXP COMPT [7•9•11] sw - 7•9•11	
		LTG EXP COMPT [8•10•12] sw - 8•10•12	
		LTG [SLEEP COMPT] sw - SLEEP COMPT	
	390	LTS OWS ENTRY sw - OFF	
		2. RECONFIGURE OWS PANELS	
	617	TCS HTRS DUCT 2 [2•4] sw - AUTO	
		TCS TEMP SEL - 75°F	
	403	Remove vent sealing device from stowage receptacle (4.3.4.1)	
		Install vent sealing device in SOLENOID VENT PORT (4.3.4.2)	
		(21.01.24-00)	
		4.6.1.6 CLOSE AFT HATCH (LOCK SIDE)	
		Bayonet cap - stowed (verify)	
		Inspect hatch seal for obstructions	
	325	Pull hatch closed	
	326	Aft hatch handle (cw) - CLOSE	Requires approximately 30-pound load to rotate handle. Load may be countered by utilizing handle in center of hatch

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		(31.21.03-00)	
		4.6.1.11 OPEN AFT HATCH (AFT SIDE)	
	326	Aft hatch handle (cw) - OPEN	Requires approximately 30-pound load to rotate handle. Load may be countered by utilizing handle in center of hatch
	325	Pull hatch open and secure in opened position with velcro straps	
		(21.02.19-00)	
		4.6.1.12 OPEN FORWARD HATCH (STS SIDE)	
	312	Forward hatch handle (ccw) - OPEN	Requires approximately 30-pound load to rotate handle. Load may be countered by utilizing handle in center of hatch
	311	Pull hatch open and secure in opened position with velcro straps	
		(31.21.04-00)	
		4.6.1.13 OPEN FORWARD HATCH (LOCK SIDE)	
	312	Forward hatch handle (cw) - OPEN	Requires approximately 30-pound load to rotate handle. Load may be countered by utilizing handle in center of hatch
	311	Push hatch open and secure in opened position with velcro straps	
		(21.01.19-00)	
		4.6.1.14 AFT HATCH RELOCATION	
		1. REMOVE OWS/AM VCS DUCT (4.3.4.36)	
		2. CONFIGURE AFT COMPARTMENT	
	390	Verify M509 recharge support assembly-stowed Disconnect Condensate Dump Flex Hose qd from outlet on panel Connect Condensate Dump Flex Hose to stowage qd in OWS dome	
		3. CONFIGURE HATCH	
	325	Press Equal vlv - uncapped (verify)	Cap on OWS side of hatch when hatch relocated

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.14 AFT HATCH RELOCATION (cont'd)	
		XXXX XXXX	
		X 4. REMOVE HATCH X	
		X Remove pip-pins (2) holding hatch to hinge X	
		X Stow pip-pins (2) in lock stowage bag X	(TBS)
		5. INSTALL HATCH IN ALTERNATE LOCATION	
		Move hatch and place over aft bulkhead	
		Remove velcro straps from over-center latches (3) on aft bulkhead	
		Swing aft bulkhead latches (3) over hatch outer edge	
		X Center hatch so circumferential indentor on hatch mates bulkhead X	Smooth side of hatch against bulkhead
		X rubber channel seal X	
		X Engage latches (3) by pushing latch knobs to over-center position X	20 to 30 pound force required
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX	
		X X	
		X 4.6.1.15 SUITED TRANSFER FROM LOCK COMPARTMENT TO STS (cont'd) X	
		X X	
	230	Loosen Calfax fasteners (2) and open MOL SV A solids traps access door	
		Ht Exch A Cndst Isolation vlv - CLOSE (2 1/2 turns, cw)	Prevent backflow from condensate tank
		Disconnect condensate line qd from mol sv condensing heat exchanger A qd	
		Disconnect condensate line qd from mol sv condensing heat exchanger B qd	
		Connect condensate line qd (2) to vent fitting (2)	
		Close MOL SV A solids trap access door and tighten Calfax fasteners (2)	
	232	Repeat preceding six operations for mol sv B	
Cmn 3		2. ACTIVATE CSM CO2 REMOVAL	
		NOTE If dew point temperature is > 50°F, possibility of dry-out of H2O separator plates in CSM suit loop exists upon activation of CSM CO2 removal. Remedial action TBS	
Cmn 3		3. REMOVE CM/MDA INTERCHANGE DUCT (4.5.2.10, step 2) Crewman ingress CSM	
Cmn 3		4. INSTALL CSM FORWARD HATCH	
Cmn 2		5. PREPARE LOCK COMPARTMENT FOR DEPRESSURIZATION If possible, close EVA hatch until hatch retainer is engaged	
		NOTE If hatch retainer cannot be engaged, secure hatch in fully opened position with hatch hold-open rod assembly to preclude having hatch swing free	
Cmn 1	316	LTG EVA AM sw - OFF	Lock lever switch
		LTG EVA DA sw - OFF	Lock lever switch
		LTG EVA ATM sw - OFF	Lock lever switch
		NOTE Notify MSFN at first opportunity to disable EVA ATM lighting	
		6. DEPRESSURIZE LOCK COMPARTMENT/MDA/STS	
Cmn 3	CSM 12	MDA TUNNEL VENT sel - MDA ΔP	Allows crewman 3 to monitor CM/MDA ΔP
		Notify crewmen 1 and 2 ready to commence depressurization	
Cmn 1	311	Bayonet cap - stowed (verify)	
		Press Equal vlv - OPEN	STS/MDA depressurization will require 15 to 20 minutes
Cmn 3	CSM 12	X MDA PRESS DIFFERENTIAL ind - monitor for ΔP increase X	
		X Notify crewmen 1 and 2 when depressurization approaches completion X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX	
		X X	
		X 4.6.1.15 SUITED TRANSFER FROM LOCK COMPARTMENT TO STS (cont'd) X	
		X X	
Cmn 1		7. OPEN LOCK COMPARTMENT FORWARD HATCH (4.6.1.13)	Hatch cannot be opened completely with center work station film tree mounted in lock compartment film tree shoe
		8. EVA CREWMEN ENTER STS/MDA	
Cmn 1	217	Take up station at STS IVA panel	
Cmn 2	317	SUS 1 LSU PWR sw - OFF	Lock lever switch
		SUS 1 PUMP sw - OFF	Lock lever switch
		SUS 1 O2 SUP vlv - CLOSE	Crewman 1 SOP flow is initiated
Cmn 1	PCU	Disconnect LSU (wet) from PCU	
		Connect LSU (dry) connected to SUS 1 to PCU	
	217	SUS 1 O2 SUP vlv - OPEN	Crewman 1 SOP flow is terminated and AM O2 flow is reinitiated
		SUS 1 LSU PWR sw - ON	Lock lever switch
		Audio warning tone - on	
		PCU AUDIO RESET	
		Audio warning tone - off	
Cmn 2		Maneuver crewman 1 LSU (wet) into lock compartment and restrain	
	217	Take up station at STS IVA panel	
Cmn 1	323	SUS 2 LSU PWR sw - OFF	Lock lever switch
		SUS 2 PUMP sw - OFF	Lock lever switch
		SUS 2 O2 SUP vlv - CLOSE	Crewman 2 SOP flow is initiated
Cmn 2	PCU	Disconnect LSU (wet) from PCU	
		Connect LSU (dry) connected to SUS 2 to PCU	
	217	SUS 2 O2 SUP vlv - OPEN	Crewman 2 SOP flow is terminated and AM O2 flow is reinitiated
		SUS 2 LSU PWR sw - ON	Lock lever switch
		Audio warning tone - on	
		PCU AUDIO RESET	
		Audio warning tone - off	
Cmn 1		Maneuver crewman 2 LSU (wet) into lock compartment and restrain	
		NOTE	
		After transfer of suited crewmen from EVA panel to STS panel is completed, real-time decision will be required to determine whether lock compartment forward hatch should be closed or OWS depressurization should be initiated to allow suited crew entry for acquisition of consumables and earth return samples	
		9. DEACTIVATE LOCK COMPARTMENT LIGHTING	
Cmn 1	316	LTG METER sw - OFF	Lock lever switch
		LTG LOCK sw - OFF	Lock lever switch
		X X	
Cmn 1		X 10. CLOSE FORWARD HATCH (4.6.1.8) X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX X X X 4.6.1.15 SUITED TRANSFER FROM LOCK COMPARTMENT TO STS (cont'd) X X X	
		11. PRESSURIZE MDA/STS	
Cmn 1	311	Press Equal vlv - CLOSE Notify crewman 3 MDA/STS ready for pressurization	
		NOTE PCU SUIT PRESS lt and PCU audio warning tone will be initiated during pressurization	
	225	O2 FILL PRI, SEC sw (2) - OPEN N2 FILL PRI, SEC sw (2) - OPEN AM FILL PRI, SEC sw (2) - OPEN CAB PRESS REG A, B tgl vlv (2) - OPEN PCU SUIT PRESS lt - on Audio warning tone - on PCU AUDIO RESET - depress Audio warning tone - off	Approximately 90 minutes required to pressurize MDA/STS
	225	PRESS FWD ind - monitor for pressure increase	
Cmn 3	CSM 12	MDA PRESS DIFFERENTIAL ind - monitor for ΔP decrease	
		NOTE When pressure in MDA/STS reaches 3.85 ±.15 psia PCU will begin venting suit pressure to maintain 2 to 4 inches H2OΔP above compartment pressure	
Cmn 1	225	O2/N2 CONTR PPO2 1 ind - 3.3 to 3.9 psia PRESS FWD ind - 4.8 to 5.2 psia Verify with crewman 3 that pressurization has been completed O2 FILL PRI, SEC sw (2) - CLOSE N2 FILL PRI, SEC sw (2) - CLOSE AM FILL PRI, SEC sw (2) - CLOSE	
Cmn 1,2		12. DEACTIVATE ALSA (4.6.1.35, omit operations to deactivate SUS PUMP, HX COOLANT FLOW switches)	
Cmn 1		13. TERMINATE RECORDING (4.6.1.37, step 3)	
Cmn 3		14. OPEN CSM FORWARD HATCH	
Cmn 3		15. INSTALL CM/MDA INTERCHANGE DUCT (4.2.1.6, step 1)	
		16. ACTIVATE MDA/STS FANS	
Cmn 1	203	AM FANS CIRC 1, 2, 3 sw (3) - HI MDA FANS 1, 2, sw (2) - HI MDA FANS CSM sw - HI	
		X X X NOTE X X The following operation will activate C/W SV FLOW indication X XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX	
		X X	
		X 4.6.1.15 SUITED TRANSFER FROM LOCK COMPARTMENT TO STS (cont'd) X	
		X X	
		MOL SV A FANS PWR sw - PRI	
	INTERCOM	Caution tone - on	
	207	C/W SV FLOW lt - on	
		Respond to C/W alert (4.3.8.18)	
	207	C/W SV FLOW lt - off (verify)	Light goes off as fan speed increase
	206	C/W [CLEAR] sw - CLEAR	Momentary push button
		C/W MEM RECALL pb/lt - off	
		Repeat preceding seven operations except:	
	203	MOL SV B FANS PWR sw - SEC	
		17. ENABLE C/W PARAMETERS	
	207	RAPID ΔP 1, 2 sw (2) - enable	
		PPO2 CONT sw - enable	
		PPO2 MON sw - enable	
		CLSTR PRESS sw - enable	
		18. INSTALL CONDENSATE LINES	
Cmn 1	216	CNDST TANK H2O vlv - OFF	
	230	Loosen Calfax fasteners (2) and open MOL SV A solids trap access door	
		Remove condensate line qd (2) from vent fittings (2)	
		Mate condensate line qd to mol sv condensing heat exchanger A qd	
		Mate condensate line qd to mol sv condensing heat exchanger B qd	
	230	Ht Exch A Cndst Isolation vlv - OPEN (2 1/2 turns, ccw)	
		Close MOL SV A solids trap access door and tighten Calfax fasteners (2)	
		Repeat preceding six operations for mol sv B	
		NOTE	
		Initiation of condensate removal should not be attempted until mol sv dew point reaches 47°F	As a result of repressurization, MDA/STS atmosphere has a low dew point temperature. As gas flow is resumed across condensing heat exchangers, H2O separator plates may, for a time, act as humidifiers and become dried out to extent where they are unable to hold a ΔP (See remark preceding 4.2.1.12, step 4)
		19. INITIATE CONDENSATE REMOVAL	
		NOTE	
		The following operation may activate the C/W CNDST TANK ΔP indication if condensing heat exchanger H2O separator plates are not	Sensor trip point is 0.8 to 0.3 psid
		X sufficiently wetted. If C/W is not triggered, proceed with normal X	
		X operations. Operations * applicable only if C/W is triggered X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		XXXX XXXX	
		X X	
		X 4.6.1.15 SUITED TRANSFER FROM LOCK COMPARTMENT TO STS (cont'd) X	
		X X	
Cmn 2	216 INTERCOM	CNDST TANK H2O vlv - FILL	
	207	Caution tone - on*	
		C/W CNDST TANK ▲ P lt - on*	
		Respond to C/W alert (4.3.8.18)*	
	216	CNDST TANK H2O vlv - DUMP*	
		CNDST TANK PRESS vlv - PRESS*	Applies cabin pressure to gas side of bladder
		Terminate condensate dump (4.3.4.4, step 2)*	
		Resume condensate collection (4.3.4.4, step 3)*	
		Wait TBS minutes	
		Repeat step 19*	
		X X	
Cmn 3		X 20. DEACTIVATE CSM CO2 REMOVAL X	
		X X	
		XXXX

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.16 SUIT DRYING OPERATION (cont'd)	
		Remove suit drying hose from PGA O2 inlet	
		Attach hose to dummy hose connector in compartment	(D424)
		Repeat preceding two operations for second PGA	
		Close stowage compartment door	(D424)
		(21.03.22-00)	
		4.6.1.17 EXTENDIBLE BOOM OPERATION	
		NOTE	
		This procedure for operation of extendible booms for VS and VC work stations	Suited operation
		1. EXTENDIBLE BOOM EXTENSION	
	321	EXTENDIBLE BOOM SUN END (CTR) sw - EXTEND	Extension rate 5 ± 1 inches per second
		EXTENDIBLE BOOM SUN END (CTR) sw - OFF	
		MANUAL EXTENSION	
		NOTE	
		Crewman should be in EVA replacement work station	
		EXTENDIBLE BOOM SUN END (CTR) sw - OFF (verify)	
		Turn manual select lever on side of boom (ccw) to - MANUAL EXTEND	
		Operate crank handle back and forth to extend boom element	Boom element extends 6 inches for each 45 degrees of operation in either direction
		Return manual select lever to - AUTO	
		2. EXTENDIBLE BOOM RETRACTION	
	321	EXTENDIBLE BOOM SUN END (CTR) sw - RETRACT	Retraction rate 5 ± 1 inches per second. Limit switch cuts off power at full retraction
		EXTENDIBLE BOOM SUN END (CTR) sw - OFF	
		MANUAL RETRACTION	
		NOTE	
		Crewman should be in EVA replacement work station	
	321	EXTENDIBLE BOOM SUN END (CTR) sw - OFF (verify)	
		Turn manual select lever on side of boom (cw) to - MANUAL RETRACT	
		Operate crank handle back and forth to retract boom element	Boom element retracts 6 inches for each 45 degrees of operation in either direction
		Return manual select lever to - AUTO	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(21.01.26-00)	
		4.6.1.18 EVA/IVA COOLANT GAS SEPARATOR REPLACEMENT	
		NOTE EVA/IVA coolant gas separator is replaced at the beginning of SL-3 and SL-4 missions. See tool matrix for tool requirements (Appendix C)	
		1. VERIFY SUS DEACTIVATED	
	317	SUS 1 PUMP sw - OFF (verify)	Lever lock switch
	323	SUS 2 PUMP sw - OFF (verify)	Lever lock switch
	217	SUS 1 PUMP sw - OFF (verify)	Lever lock switch
		SUS 2 PUMP sw - OFF (verify)	Lever lock switch
		2. REMOVE USED COOLANT GAS SEPARATOR	Separator attains approximately 40°F during EVA, and shortly after EVA may be cold to touch
	217	Loosen Calfax fasteners (2) and open coolant gas separator access panel	Access panel is located in center of panel 217
		Disconnect suit cooling loop qd (4) and gas line qd from coolant gas separator	Coolant gas separators for systems 1 and 2 are paired in one assembly
		Loosen Calfax fasteners (3) on coolant gas separator and remove separator	
		3. OBTAIN REPLACEMENT COOLANT GAS SEPARATOR	
		Identify used separator (1-inch red tape, scissors)	
		Obtain replacement separator	(M305)
		Remove qd sealing caps (5) from replacement separator and install on used separator	
		Stow used separator	(M305)
		4. INSTALL REPLACEMENT COOLANT GAS SEPARATOR	
	217	Align replacement separator with alignment marks and tighten Calfax fasteners (3)	Spare separators are stowed dry
		Connect gas line qd to coolant gas separator	
		Dump condensate system (4.3.4.3)	
		Connect SUS inlet qd (2) to coolant gas separator	SUS qd on side of separator nearest SUS 2 panel. SUS 2 qd (2) color coded yellow
		Wait 1 minute	
		Connect SUS outlet qd (2) to coolant gas separator	
		Close gas separator access panel and tighten Calfax fasteners (2)	
		(23.01.22-00)	
		4.6.1.19 DRY LSU/PCU SERVICING (SL-3, 4)	Frequency of performance TBS times (SL-3), TBS times (SL-4)
		1. FILL K2HPO4 INJECTOR (4.6.1.24)	(23.01.13-00)
		2. OBTAIN DRY LSU AND PCU	(TBS), (TBS)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.19 DRY LSU/PCU SERVICING (cont'd)	
		3. SERVICE LSU/PCU	
		Remove protective caps (3) from both ends of LSU and temporarily stow	
		Remove protective cap from composite disconnect on PCU and temporarily stow	
		Connect LSU composite disconnect to PCU	
		Configure PCU for LCG bypass	
		Obtain 60-foot dry WATER SERVICE UMBILICAL	(TBS)
		CAUTION Prior to next operations, verify with MSFN TM parameter D7133 -H2O MANF P ≤ 37 psia	
		Remove captive cap from WATER OUTLET (water tank TBS)	
		Connect WATER SERVICE UMBILICAL qd to WATER OUTLET	
		Connect WATER SERVICE UMBILICAL qd to blue LSU inlet qd	
		WATER SERVICE UMBILICAL vlv - OPEN (2 1/2 turns ccw)	
	316	Remove captive cap on VACUUM SOURCE	
		Connect red LSU outlet qd to VACUUM SOURCE	
	216	CNDST CONT SYS VENT HTRS sw - PRI	
		CNDST CONT SYS VENT HTRS PRI lt - on	
		CNDST CONT SYS VENT TEMP ind - 145°F	Nine minutes required after heater turn-on to attain temperature
		CNDST CONT SYS VENT VLV sw - PRI	
	316	VACUUM SOURCE VLV - OPEN	(TBS) seconds required for evacuation
		VACUUM SOURCE VLV - CLOSE	
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CAUTION Condensate dump heater should not be de-activated until CNDST CONT SYS VENT TEMP increases above 120°F to preclude water freezeup between valve and exit port	
		CNDST CONT SYS VENT HTRS sw - OFF	
		CNDST CONT SYS VENT HTRS PRI lt - off	
		WATER SERVICE UMBILICAL vlv - CLOSE (2 1/2 turns cw)	
		WATER OUTLET vlv (water tank TBS) - OPEN	(TBS) seconds required to fill service umbilical
		Obtain full K2HPO4 INJECTOR from stowage	(TBS)
		Connect full K2HPO4 INJECTOR to WATER SERVICE UMBILICAL K2HPO4 INJECTOR MANIFOLD	
		K2HPO4 INJECTOR vlv - OPEN	
		WATER SERVICE UMBILICAL vlv - OPEN (2 1/2 turns ccw)	
		Rotate K2HPO4 INJECTOR rear cap cw immediately to inject K2HPO4	(TBS) seconds required to inject K2HPO4
		WATER OUTLET vlv (water tank TBS) - CLOSE	
		Disconnect WATER SERVICE UMBILICAL qd from WATER OUTLET qd	
		Replace captive cap on WATER OUTLET qd	
		K2HPO4 INJECTOR vlv - CLOSE	
		Disconnect K2HPO4 INJECTOR	
		Stow K2HPO4 INJECTOR	(TBS)
		Disconnect WATER SERVICE UMBILICAL from blue LSU inlet qd	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.19 DRY LSU/PCU SERVICING (cont'd)	
		Stow WATER SERVICE UMBILICAL	(TBS)
	316	Disconnect red LSU outlet qd from VACUUM SOURCE Replace captive cap on VACUUM SOURCE Disconnect LSU from PCU Replace stowed caps (4) on LSU and PCU	
		Stow LSU and PCU	(TBS)
		(23.01.23-00)	
		4.6.1.20 SUIT UMBILICAL SYSTEM 1 (2) WATER LOOP SERVICING	Unscheduled IFM performed only if excessive water quantity depletion
		1. OBTAIN 60-FOOT DRY WATER SERVICE UMBILICAL AND WATER RELIEF VALVE	(TBS), (TBS)
		2. PREPARE WATER SUPPLY SYSTEM Connect straight end of WATER RELIEF VALVE to WATER SERVICE UMBILICAL qd Remove captive cap from WATER OUTLET qd (water tank TBS) Connect WATER SERVICE UMBILICAL qd to WATER OUTLET qd WATER SERVICE UMBILICAL vlv - OPEN (2 1/2 turns ccw)	
	316	Remove captive cap on VACUUM SOURCE Connect WATER RELIEF VALVE to VACUUM SOURCE	
	216	CNDST CONT SYS VENT HTRS sw - PRI CNDST CONT SYS VENT HTRS PRI lt - on CNDST CONT SYS VENT TEMP ind - 145°F	Nine minutes required after heater turn-on to attain temperature
		CNDST CONT SYS VENT VLV sw - PRI	
	316	VACUUM SOURCE VLV - OPEN	(TBS) seconds required for evacuation
		VACUUM SOURCE VLV - CLOSE	
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CAUTION Condensate dump heater should not be de-activated until CNDST CONT SYS VENT TEMP increases above 120°F to preclude water freezeup between valve and exit port	
		CNDST CONT SYS VENT HTRS sw - OFF CNDST CONT SYS VENT HTRS PRI lt - off	
	316	Disconnect WATER RELIEF VALVE from VACUUM SOURCE Replace captive cap on VACUUM SOURCE	
		WATER OUTLET vlv (water tank TBS) - OPEN	(TBS) seconds required to fill service umbilical and relief valve
		Fill INJECTOR with K2HPO4 (4.6.1.24)	(23.01.13-00)
		Connect full K2HPO4 INJECTOR to WATER SERVICE UMBILICAL K2HPO4 INJECTOR MANIFOLD K2HPO4 INJECTOR vlv - OPEN WATER SERVICE UMBILICAL vlv - CLOSE (2 1/2 turns cw)	
		3. DUMP CONDENSATE SYSTEM (4.3.4.4)	(25.04.01-00)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.20 SUIT UMBILICAL SYSTEM 1 (2) WATER LOOP SERVICING (cont'd)	
		4. SERVICE SUS WATER LOOP	
	217, 317 (323)	SUS 1 (2) PUMP sw (2) - OFF (verify)	
	217	Loosen Calfax fasteners (2) and open coolant gas separator access panel	
		Disconnect SUS 1 (2) inlet qd from side of coolant gas separator	SUS 1 and SUS 2 inlet qd on side of separator nearest SUS 2 panel. SUS 2 qd color coded yellow
		Connect WATER RELIEF VALVE to SUS 1 (2) inlet qd on coolant gas separator	
		Obtain penlight	
	223 (224)	Loosen Calfax fasteners (2) and open access panel on SUS 1 (2) end of IVA panel	
	223 (224)	SYS 1 (2) LCG RES PRESS vlv - OPEN (verify)	
		WATER SERVICE UMBILICAL vlv - OPEN (2 1/2 turns, ccw)	
		Rotate K2HPO4 INJECTOR rear cap cw immediately to inject K2HPO4	(TBS) seconds required to inject K2HPO4
		Observe reservoir diaphragm as reservoir fills	Fill rate 2 pounds/min
		CAUTION	
		Do not allow reservoir diaphragm to bottom out. (Precludes water discharge into cabin until WATER SERVICE UMBILICAL valve shutoff possible and precludes potential tank rupture later due to thermal expansion)	
		When reservoir 3/4 full, WATER SERVICE UMBILICAL vlv - CLOSE (2 1/2 turns, cw)	Reservoir capacity 16 pounds
		WATER OUTLET vlv (water tank TBS) - CLOSE	
		Disconnect WATER SERVICE UMBILICAL from WATER OUTLET	
		Replace captive cap on WATER OUTLET	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
		X X	
		X - WATER REMOVAL IF RESERVOIR DIAPHRAGM BOTTOMED OUT - X	
		X X	
		K2HPO4 INJECTOR vlv - CLOSE	
		Disconnect K2HPO4 INJECTOR from WATER SERVICE UMBILICAL and stow	(TBS)
		Disconnect WATER RELIEF VALVE from SUS 1 (2) inlet qd on coolant gas separator	
		WATER SERVICE UMBILICAL vlv - OPEN (2 1/2 turns, ccw)	
	316	Remove captive cap on VACUUM SOURCE	(TBS)
		*Connect WATER RELIEF VALVE qd to VACUUM SOURCE	
	216	CNDST CONT SYS VENT HTRS sw - PRI	
		CNDST CONT SYS VENT HTRS PRI lt - on	
		CNDST CONT SYS VENT TEMP ind - 145°F	Nine minutes required after heater turn-on to attain temperature
		CNDST CONT SYS VENT VLV sw - PRI	
	316	*VACUUM SOURCE VLV - OPEN	(TBS) seconds required for evacuation
	X	*VACUUM SOURCE VLV - CLOSE X	
	216	X CNDST CONT SYS VENT VLV sw - OFF X	
		X X	
		XXXX XXXX	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.20 SUIT UMBILICAL SYSTEM 1 (2) WATER LOOP SERVICING (cont'd)	
		XXXX XXXX X CAUTION X X Condensate dump heater should not be de-activated until CNDST CONT X X SYS VENT TEMP increases above 120°F to preclude water freezeup X between valve and exit port	
		CNDST CONT SYS VENT HTRS sw - OFF CNDST CONT SYS VENT HTRS PRI lt - off *Disconnect WATER DESERVICING ADAPTER	
	216	CNDST CONT SYS VENT HTRS sw - PRI CNDST CONT SYS VENT HTRS PRI lt - on CNDST CONT SYS VENT TEMP ind - 145°F	Nine minutes required after heater turn-on to attain temperature
		CNDST CONT SYS VENT VLV sw - PRI	
	316	*VACUUM SOURCE VLV - OPEN Obtain WATER DESERVICING ADAPTER *Connect WATER DESERVICING ADAPTER to WATER SERVICE UMBILICAL *VACUUM SOURCE VLV - CLOSE	(TBS) seconds (TBS)
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CAUTION Condensate dump heater should not be de-activated until CNDST CONT SYS VENT TEMP increases above 120°F to preclude water freezeup between valve and exit port	
		CNDST CONT SYS VENT HTRS sw - OFF CNDST CONT SYS VENT HTRS PRI lt - off	
	316	*Disconnect WATER RELIEF VALVE qd from VACUUM SOURCE *Connect WATER RELIEF VALVE to SUS 1 (2) inlet qd on coolant gas separator	Drains 1.5 pounds water from reservoir
		*Wait TBS seconds, disconnect WATER RELIEF VALVE from SUS 1 (2) inlet qd on coolant gas separator Repeat preceding operations denoted by *	Reservoir quantity reduced to approximately 3/4 full (13 pounds)
	316	X Replace captive cap on VACUUM SOURCE X X Stow WATER DESERVICING ADAPTER X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	(TBS)
		5. TERMINATE SUS WATER LOOP SERVICING Disconnect WATER REFIEF VALVE from SUS 1 (2) inlet qd on coolant gas separator	Not necessary if backup procedure performed
		Connect SUS 1 (2) inlet qd to coolant gas separator	
	217	Close coolant gas separator access panel and tighten Calfax fasteners (2)	
	223 (224)	Close access panel on SUS 1 (2) end of IVA panel and tighten Calfax fasteners (2)	
		K2HP04 INJECTOR vlv - CLOSE Disconnect K2HP04 INJECTOR from WATER SERVICE UMBILICAL	Not necessary if backup procedure performed

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.20 SUIT UMBILICAL SYSTEM 1 (2) WATER LOOP SERVICING (cont'd)	
		Stow K2HPO4 INJECTOR	(TBS)
		Disconnect WATER RELIEF VALVE qd from WATER SERVICE UMBILICAL	
		Stow WATER RELIEF VALVE and WATER SERVICE UMBILICAL	(TBS), (TBS)
		(21.02.20-00)	
		4.6.1.21 RECONFIGURATION OF EVA COMMUNICATIONS	
		1. RECONFIGURE CSM AUDIO FOR POST EVA COMMUNICATIONS	
		2. RECONFIGURE SWS FOR POST EVA COMMUNICATIONS	
	131	Disconnect CCU with comm cap from CHAN B connector (4.3.2.7)	
		Stow CCU	(TBS)
		Stow comm cap	(TBS)
	102,116, 131	COMM CHAN sel - as required	
		(21.02.24-00)	
		4.6.1.22 EVA/IVA OPERATIONS POWER DOWN	POWER (WATTS) 26.0V 30.0V
		1. CONFIGURE CIRCUIT BREAKER PANELS	
	202	cb EVA LTS 1 (2) - open	74.0 92.0
		cb TV PWR AM - open	48.1 55.5
		cb SUS 1 LCG PUMPS PRI (SEC) - open	18.1 22.1
		cb SUS 2 LCG PUMPS PRI (SEC) - open	18.1 22.1
		2. CONFIGURE CONTROL PANELS	
	203	PRI (SEC) COOL LOOP INV - OFF	85.5 82.8
		(21.01.18-00)	
		4.6.1.23 CLOSE OWS HATCH (AM SIDE)	
		1. REMOVE OWS/AM VCS DUCT (4.3.4.36)	
		2. REMOVE CONDENSATE DUMP FLEX HOSE	
	390	Disconnect condensate dump flex hose from outlet on panel	
		Connect condensate dump flex hose to stowage qd in OWS dome	
		3. CLOSE HATCH	
		Inspect hatch seal for obstructions	
		Release hatch from hatch retainer	
		Pull hatch closed	
	400	RELEASE HANDLE - UNLOCK	
		HATCH HANDLE - EQUALIZE PRESSURE	
		HATCH HANDLE - CLOSE	
		RELEASE HANDLE - LOCK	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(23.01.19-00)	
		4.6.1.24 FILL INJECTOR WITH K2HPO4	
		1. OBTAIN K2HPO4 INJECTOR AND K2HPO4 CONTAINER	(TBS)
		2. FILL INJECTOR WITH K2HPO4	
		K2HPO4 CONTAINER PORT A vlv - CLOSE (verify)	
		Remove captive cap from PORT A outlet	
		K2HPO4 INJECTOR - "0" (zero) units (verify)	
		Connect K2HPO4 INJECTOR to PORT A outlet	
		K2HPO4 INJECTOR vlv - OPEN (ccw)	
		K2HPO4 CONTAINER PORT A vlv - OPEN (ccw)	
		Rotate K2HPO4 INJECTOR rear cap fully ccw to fill	(approximately 77 units)
		K2HPO4 CONTAINER PORT A vlv - CLOSE (cw)	
		K2HPO4 INJECTOR vlv - CLOSE (cw)	
		Disconnect K2HPO4 INJECTOR from PORT A outlet	
		Replace captive cap on PORT A outlet	
		3. STOW K2HPO4 INJECTOR AND K2HPO4 CONTAINER	(TBS)
		(23.01.24-00)	
		4.6.1.25 WATER SERVICE UMBILICAL DESERVICING	
		1. OBTAIN WET 60-FOOT WATER SERVICE UMBILICAL	(TBS)
		2. DESERVICE WATER SERVICE UMBILICAL	
		Obtain WATER DESERVICING ADAPTER	(TBS)
		Connect WATER DESERVICING ADAPTER to WATER SERVICE UMBILICAL qd	
		Obtain WATER RELIEF VALVE	(TBS)
		Connect straight end of WATER RELIEF VALVE to WATER SERVICE UMBILICAL qd	
	316	Remove captive cap on VACUUM SOURCE	
		WATER SERVICE UMBILICAL vlv - OPEN (2 1/2 turns ccw)	
		Connect WATER RELIEF VALVE to VACUUM SOURCE	
	216	CNDST CONT SYS VENT HTRS sw - PRI	
		CNDST CONT SYS VENT HTRS PRI lt - on	
		CNDST CONT SYS VENT TEMP ind - 145°F	Nine minutes required after heater turn-on to attain temperature
		CNDST CONT SYS VENT VLV sw - PRI	
	316	VACUUM SOURCE VLV - OPEN	(TBS) seconds required for evacuation
		VACUUM SOURCE VLV - CLOSE	
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CAUTION Condensate dump heater should not be de-activated until CNDST CONT SYS VENT TEMP increases above 120°F to preclude water freezeup between valve and exit port	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.25 WATER SERVICE UMBILICAL DESERVICING (cont'd)	
		CNDST CONT SYS VENT HTRS sw - OFF	
		CNDST CONT SYS VENT HTRS PRI lt - off	
	316	Disconnect WATER RELIEF VALVE from VACUUM SOURCE	
		Replace captive cap on VACUUM SOURCE	
		Disconnect WATER RELIEF VALVE from WATER SERVICE UMBILICAL qd	
		Stow WATER RELIEF VALVE	(TBS)
		Disconnect WATER DESERVICING ADAPTER from WATER SERVICE UMBILICAL	
		Stow WATER DESERVICING ADAPTER and WATER SERVICE UMBILICAL	(TBS), (TBS)
		(23.01.25-00)	
		4.6.1.26 LSU/PCU/H2O SERVICE UMBILICAL DESERVICING	LSU/PCU/WATER service umbilicals are deserviced prior to stowage
		1. OBTAIN WET LSU/PCU	(TBS), (TBS)
		2. DESERVICE LSU/PCU AND WATER SERVICE UMBILICAL	
		Perform first five operations (4.6.1.19, step 3)	
		Obtain WATER DESERVICING ADAPTER	(TBS)
		Connect WATER DESERVICING ADAPTER to WATER SERVICE UMBILICAL qd	
		Connect WATER SERVICE UMBILICAL qd to blue LSU inlet qd	
		WATER SERVICE UMBILICAL vlv - OPEN (2 1/2 turns,ccw)	
	316	Remove captive cap on VACUUM SOURCE	
		Connect red LSU outlet qd to VACUUM SOURCE	
	216	CNDST CONT SYS VENT HTRS sw - PRI	
		CNDST CONT SYS VENT HTRS PRI lt - on	
		CNDST CONT SYS VENT TEMP ind - 145°F	Nine minutes required after heater turn-on to attain temperature
		CNDST CONT SYS VENT VLV sw - PRI	
	316	VACUUM SOURCE VLV - OPEN	(TBS) seconds required for evacuation
		VACUUM SOURCE VLV - CLOSE	
	216	CNDST CONT SYS VENT VLV sw - OFF	
		CAUTION	
		Condensate dump heater should not be de-activated until CNDST CONT SYS VENT TEMP increases above 120°F to preclude water freezeup between valve and exit port	
		CNDST CONT SYS VENT HTRS sw - OFF	
		CNDST CONT SYS VENT HTRS PRI lt - off	
	316	Disconnect red LSU outlet qd from VACUUM SOURCE	
		Replace captive cap on VACUUM SOURCE	
		Disconnect WATER SERVICE UMBILICAL from blue LSU inlet qd	
		Disconnect WATER DESERVICING ADAPTER from WATER SERVICE UMBILICAL qd	
		Stow WATER SERVICE UMBILICAL and WATER DESERVICING ADAPTER	(TBS), (TBS)
		Disconnect LSU from PSU	
		Replace stowed caps (4) on LSU and PCU	
		Identify LSU and PCU as having been deserviced (Method TBS)	
		Stow LSU and PCU	(TBS), (TBS)

CREWMAN	PANEL	PROCEDURE	REMARKS
		(23.01.26-00)	
		4.6.1.27 LSU/EVA PANEL CONNECTION	
		1. PREPARE FOR LSU (WET AND DRY) CONNECTION	
		Loosen Calfax fasteners (4) on LSU container lid and lift lid	
		Disconnect LCG hose (2), O2 hose and electrical connector from back of container lid	
		Release latching handle and disconnect LSU composit disconnect from back of container lid	
		Connect umbilical tether to EVA attach point	
		Restrain loose LSU with snap strap near EVA TETHER attach point	
		Position LSU composite disconnect latching handle out of way	
		Stow LSU container lid on bracket in AM aft compartment with Calfax fasteners (2)	(M310)
		Repeat preceding three operations for remaining LSU container lid	(M311)
	317	SUS 1 LSU PWR sw - OFF (verify)	Lever lock switch
		SUS 1 PUMP sw - OFF (verify)	Lever lock switch
		SUS 1 O2 SUP vlv - CLOSE (verify)	
		Uncap SUS 1 O2 SUP qd, LCG qd (2) and SUS 1 EVA CCU AUDIO CHAN A receptacle	
	323	SUS 2 LSU PWR sw - OFF (verify)	Lever lock switch
		SUS 2 PUMP sw - OFF (verify)	Lever lock switch
		SUS 2 O2 SUP vlv - CLOSE (verify)	
		Uncap SUS 2 O2 SUP qd, LCG qd (2) and SUS 2 EVA CCU AUDIO CHAN A receptacle	
	217	SUS 1 LSU PWR sw - OFF (verify)	
		SUS 1 O2 SUP vlv - CLOSE (verify)	
		Uncap SUS 1 O2 SUP qd and SUS 1 EVA CCU AUDIO CHAN A receptacle	
		SUS 2 LSU PWR sw - OFF (verify)	
		SUS 2 O2 SUP vlv - CLOSE (verify)	
		Uncap SUS 2 O2 SUP qd, and SUS 2 EVA CCU AUDIO CHAN B receptacle	
		2. CONNECT LSU (DRY) TO IVA PANEL	LSU (dry) (2) connected to IVA panel in event vacuum transfer from lock to STS is required subsequent to EVA activities (4.6.1.15) (D400) (D413)
		Unstow LSU (dry) (2)	
		Connect electrical connector to SUS 1 EVA CCU AUDIO CHAN A receptacle	
		Connect O2 hose to SUS 1 O2 SUP qd	
		Repeat preceding two operations for remaining LSU (dry) except: Connect electrical connector to SUS 2 EVA CCU AUDIO CHAN B receptacle	
		3. CONNECT LSU (WET) TO EVA PANEL	
		Connect LCG hose (2) to SUS 1 LCG INLET, OUTLET qd (2)	Inlet qd is blue and outlet qd is red
		Connect O2 hose to SUS 1 O2 SUP qd	
		Connect electrical connector to SUS 1 EVA CCU AUDIO CHAN A receptacle	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.27 LSU/EVA PANEL CONNECTION (cont'd)	
	323	Repeat preceding four operations for remaining LSU (wet) except: Connect electrical connector to SUS 2 EVA CCU AUDIO CHAN A receptacle Route LSU (wet) (2) to suit donning station and restrain	
		(23.01.27-00)	
		4.6.1.28 ALSA ACTIVATION	SOP checkout completed prior to this procedure
		1. VERIFY PCU CONTROLS	
	PCU	PRESS ring sel - OFF (verify) PCU MODE SEL lever - ABS (verify) Umb locking handle closed and locked (verify) LCG FLO lever - 1 (verify) FLOW ring sel - OFF (verify)	
		2. CONNECT LSU TO PCU	
		Conn LSU to PCU/LSU ring (left side) Umb locking handle - unlock and open Conn LSU to PCU Umb locking handle - close and lock Don ALSA	
		3. ACTIVATE SUS COMM	
		NOTE The following steps will activate the PCU warning tone	
	217	SUS 1 LSU PWR sw - ON	
	323	SUS 2 LSU PWR sw - ON	
	PCU	Audio warning tone - on PCU AUDIO RESET - depress Audio warning tone - off	
		4. ACTIVATE SUS SUIT COOLING	
	317	SUS 1 LSU PWR sw - ON	Lever lock switch
		NOTE The following steps will activate the C/W EVA 1 and 2 indications	
		SUS 1 PUMP sw - PRI	
		Warning tone - on	Lever lock switch
	207	C/W EVA 1 lt - on	
		Respond to C/W alert (4.3.8.18)	
	207	C/W EVA 1 lt - off (verify)	Light goes off as pump speed increases
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	
	323	Repeat above sequence for SUS 2 except:	
	207	C/W EVA 2 lt - on	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.28 ALSA ACTIVATION (cont'd)	
	217	SUS 1 HX COOLANT FLOW sw - EVA	
		SWS 1 HX coolant flow EVA lt (2) - on	
		SUS 2 HX COOLANT FLOW sw - EVA	
		SUS 2 HX coolant flow EVA lt (2) - on	
	PCU	Cycle PCU LCG FLO lever	
		Verify cooling	
		PCU LCG FLOW lever - pos as desired	
		5. VERIFY PCU WARN LTS AND PCU PNL LTG	
	PCU	SUIT PRESS lt - on	
		REG 1 LO FLO lt - on	
		SOP FLOW lt - off	
		VENT FLO lt - on	
		Verify PCU pnl ltg	
		6. PERFORM ALSA CHECKOUT	
	317	SUS 1 O2 SUP vlv - OPEN	
	323	SUS 2 O2 SUP vlv - OPEN	
	PCU	PCU MODE SEL lever - ABS	
		PCU FLOW ring sel - EVA NORM	
		Don helmets	
		Don EVA gloves	
		PCU PRESS ring sel - BOTH	
		Verify O2 flow	
		PCU REG 1 LO FLOW lt - off	
		PCU LO VENT FLOW lt - off	
	SOP	SOP hi press shutoff vlv - open	
		SOP FLOW lt - off	
		(23.01.28-00)	
		4.6.1.29 ALSA/PGA PRESSURE INTEGRITY CHECK	ALSA activation complete (4.6.1.28)
		1. TEST PCU O2 FLOW INDICATIONS	
	317	SUS 1 O2 SUP vlv - CLOSE	
	323	SUS 2 O2 SUP vlv - CLOSE	
	PCU	SOP FLOW lt - on	Light and tone on within 10 sec
		Audio warning tone - on	
		PCU AUDIO RESET - depress	
		Audio warning tone - off	
	317	SUS 1 O2 SUP vlv - OPEN	
	323	SUS 2 O2 SUP vlv - OPEN	
	PCU	SOP FLOW lt - off	
		PCU PRESS ring sel - REG 2	
		PCU REG 1 LOW FLOW lt - on	
		Audio warning tone - on	
		PCU AUDIO RESET - depress	
		PCU FLOW ring sel - IVA	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.29 ALSA/PGA PRESSURE INTEGRITY CHECK (cont'd)	
		2. PERFORM PRESS INTEGRITY CHECK	
	PCU	PCU MODE SEL lever - ΔP	
	PGA	PGA press - mon	
	PCU	SUIT PRESS lt - off at 2.9 to 3.2 psid	
	PGA	PGA press - 3.3 to 3.6 psid	
	PCU	PCU PRESS ring sel - BOTH	
		PCU REG 1 LOW FLOW lt - off	
	PGA	PGA press - 3.7 to 4.0 psid	
	PCU	PCU PRESS ring sel - REG 1	
	PGA	PGA press - remains same and not decreasing	
	SOP	SOP hi press shutoff vlv - close	
	PCU	PCU FLOW ring sel - OFF	
		PCU REG 1 LOW FLOW lt - on	
		PCU LO VENT FLOW lt - on	
		Audio warning tone - on	
		Audio warning tone - off	
		PCU AUDIO RESET - depress	
		PCU PRESS ring sel - OFF	
	PGA	PGA press - TBS psi/min	
	PCU	PCU PRESS ring sel - BOTH	
		PCU FLOW ring sel - IVA	
		All warning lts - off	
		(21.01.27-00)	
		4.6.1.30 EKG/ZPN BIOMEDICAL RECORDING	This procedure should be performed after crewmen are suited and connected to EVA panels
		1. INITIATE RECORDING	
	131	[RCD/OFF] sw - RECORD	Momentary switch
		RCD lt - on	
	204	TAPE RECORDING EKG/ZPN sw - ENABLE	Constraints operation of ESS, M509, T013, S073, T027, S149, S183 experiments
		NOTE At first opportunity, notify MSFN that OBS recording has been enabled	
	204	TAPE RECORDING EXP 1 sw - RECORD	Momentary switch
		TAPE RECORDING EXP 1 lt - on	
		TAPE RECORDING EXP 2 sw - RECORD	Momentary switch
		TAPE RECORDING EXP 2 lt - on	Record lights on panels 542 and 617 will not come on, indicating biomed is being recorded in lieu of experiments

CREWMAN	PANEL	PROCEDURE	REMARKS
		(21.01.28-00)	
		4.6.1.31 AIRLOCK DEPRESSURIZATION	
		1. DEPRESSURIZE LOCK	
	325	Press Equal vlv - CLOSE	
		Bayonet cap - stowed (verify)	
	311	Press Equal vlv - CLOSE	
		Bayonet cap - stowed (verify)	
	318	Remove bayonet cap and stow	Stow on dummy receptacle on side of EVA panel
		WARNING If suit press drops below 3.7 psid during the next series of operations position LOCK COMPT DEPRESS VLV - CLOSE and install bayonet cap	
		LOCK COMPT DEPRESS VLV - OPEN	
		2. VERIFY SUIT AND CABIN PRESS	
	316	PRESS LOCK ind - mon for decr in press	
	PGA	PGA press - mon	
	316	When PRESS LOCK ind - 0.5 psia	
	PCU	PCU MODE SEL lever - ABS	
		PCU FLOW ring sel - EVA NORM	
	PGA	PGA press - 3.7 psid and not decreasing	
	SOP	SOP hi press shutoff vlv - open	
		SOP low press gage - 60 psig	
		(21.01.29-00)	
		4.6.1.32 OPEN EVA HATCH	
		WARNING No attempt should be made to open EVA hatch until PRESS LOCK ind $\leq$ 0.25 psid	
		1. OPEN EVA HATCH	During EVA mol sv bed cycling may initiate C/W RAPID ΔP indication. Pressure decay rate during bed cycles is 0.07 to 0.085 psi/min (initially); trip point of RAPID ΔP is 0.1 psi/min
	316	PRESS LOCK ind $\leq$ 0.25 psia	
		EVA hatch retainer - engaged (verify)	
	319	EVA hatch handle lock - unlock	
		EVA hatch handle (cw) - OPEN	
		EVA hatch retainer - disengage	
		Open hatch	
		Release hold-open rod assembly from velcro straps and spring clip	
		Engage hold-open rod assembly	

CREWMAN	PANEL	PROCEDURE	REMARKS
		(21.02.21-00)	
		4.6.1.33 CLOSE EVA HATCH	
		1. CLOSE EVA HATCH Inspect EVA hatch seal area for obstructions Disengage hold-open rod assembly and clamp down Close hatch until hatch retainer is engaged EVA hatch handle (ccw) - CLOSE Verify latches (12) are engaged EVA hatch handle lock - depress	
		(21.02.22-00)	
		4.6.1.34 AIRLOCK REPRESSURIZATION	
	318	REPRESSURIZE LOCK COMPARTMENT LOCK COMPT DEPRESS VLV - CLOSE Install bayonet cap	
		NOTE The following step will activate the C/W RAPIDΔP indication. In addition the PCU SUIT PRESS lt and ALSA audio warning tone will be initiated	
	325 PCU INTERCOM 207, 616 PCU 206, 616 207, 616 206	Press Equal vlv - OPEN PCU SUIT PRESS lt - on Audio warning tone - on Emergency klaxons (2)ΔP tone - on Warning tone - on C/W RAPIDΔP lt - on Respond to RapidΔP alert (4.3.8.20) PCU AUDIO RESET - depress Audio warning tone - off C/W MASTER ALARM pb/lt - off C/W RAPIDΔP lt - off C/W[CLEAR] sw - CLEAR C/W MEM RECALL pb/lt - off	Light will go off as lock and STS pressures equalize
		NOTE When pressure in lock compartment reaches 3.85 $\pm$ 0.15 psia the PCU will begin venting suit compartment to maintain 2 to 4" H2OΔp above the lock compartment pressure	
	316 325 316 325	PRESS LOCK ind - 4.8 to 5.2 psia and decreasing Press Equal vlv - CLOSE PRESS LOCK ind - 4.8 to 5.2 psia and decreasing Press Equal vlv - OPEN	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.34 AIR LOCK REPRESSURIZATION (cont'd)	
		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX X X X If OWS Not Pressurized X X Press Equal vlv - OPEN instead of 325 X X X XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
	311		
	316	PRESS AFT ind = PRESS LOCK ind ± 0.25 psia	Verify lock compartment pressure equalization
		(23.01.29-00)	
		4.6.1.35 ALSA DEACTIVATION	
		1. DEACTIVATE ALSA	
	SOP	SOP hi press shutoff vlv - close	
	PCU	PCU PRESS ring sel - OFF	
		PCU FLOW ring sel - OFF	
		PCU LO VENT FLOW lt - on	
		PCU REG 1 LOW FLOW lt - on	
		PCU SUIT PRESS lt - on	
		Audio warning tone - on	
		PCU AUDIO RESET - depress	
		Audio warning tone - off	
		2. DEACTIVATE SUS SUIT COOLING, O2 FLOW AND COMM	
	217	SUS 1 HX COOLANT FLOW sw - BYPASS	
		SUS 1 HX COOLANT FLOW EVA lt (2) - off	
		SUS 2 HX COOLANT FLOW sw - BYPASS	
		SUS 2 HX COOLANT FLOW EVA lt (2) - off	
	317	SUS 1 LSU PWR sw - OFF	Lever lock switch
		SUS 1 PUMP sw - OFF	Lever lock switch
		SUS 1 O2 SUP vlv - CLOSE	
	323	SUS 2 LSU PWR sw - OFF	Lever lock switch
		SUS 2 PUMP sw - OFF	Lever lock switch
		SUS 2 O2 SUP vlv - CLOSE	
		3. DOFF HELMETS AND GLOVES	
		(21.01.30-00)	
		4.6.1.36 LSU/EVA PANEL DISCONNECT	
		1. DISCONNECT LSU (WET) FROM EVA PANEL	LCG INLET and OUTLET qd attain approximately 40°F during EVA and may be cold to touch
	317	Disconnect LCG hoses (2) from SUS 1 LCG INLET, OUTLET qd (2)	
		Disconnect O2 hose from SUS 1 O2 SUP qd	
		Disconnect electrical connector from SUS 1 EVA CCU AUDIO CHAN A receptacle	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.36 LSU/EVA PANEL DISCONNECT (cont'd)	
		Disconnect umbilical tether from EVA TETHER attach point, wrap strap around LSU and tether, and snap	
		Cap SUS 1 O2 SUP qd, LCG qd (2) and SUS 1 EVA CCU AUDIO CHAN A receptacle	
	323	Repeat preceding five operations for remaining LSU (wet) except:	
		Disconnect electrical connector from SUS 2 EVA CCU AUDIO CHAN A receptacle	
		Cap SUS 2 EVA CCU AUDIO CHAN A receptacle	
		2. STOW LSU (WET)	
		Loosen Calfax fasteners (2) and unstow LSU container lid from bracket in AM aft compartment	
		Stow LSU (wet) in LSU container	EVA 1 and 2 (M310) O2 connector may be connected to back of LSU container lid if desired
		Install LSU container lid and tighten Calfax fasteners (4)	
		Repeat preceding four operations for remaining LSU (wet and LSU container lid	(M311)
		Stow LSU (wet) (2) in OWS (SL-2,3)	(TBS) EVA 1, EVA 3
		3. DISCONNECT LSU (DRY) FROM IVA PANEL	
	217	Disconnect O2 hose from SUS 1 O2 SUP qd	
		Disconnect electrical connector from SUS 1 EVA CCU AUDIO CHAN A receptacle	
		Cap SUS 1 O2 SUP qd, LCG qd (2) and SUS 1 EVA CCU AUDIO CHAN A receptacle	
		Repeat preceding three operations for remaining LSU (dry) except:	
		Disconnect electrical connector from SUS 2 EVA CCU AUDIO CHAN B receptacle	
		Cap SUS 2 EVA CCU AUDIO CHAN B receptacle	
		Restow LSU (dry) (2) in OWS	(D401) D413)
		(21.02.23-00)	
		4.6.1.37 MDA/STS POST EVA CONFIGURATION	
		1. DEACTIVATE EVA LIGHTING	
	316	LTG EVA AM sw - OFF	Lever lock switch
		LTG EVA DA sw - OFF	Lever lock switch
		LTG EVA ATM sw - OFF	Lever lock switch
		NOTE	
		Notify MSFN at first opportunity to disable EVA ATM lighting	
		2. CONFIGURE FOR ATMOSPHERE CONTROL POST EVA	
		NOTE	
		This step should be delayed until LCG coolant flow terminated and ECS coolant temperature returned to normal	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.1.37 MDA/STS POST EVA CONFIGURATION (cont'd)	
	203	AM FANS CIRC 1, 2, 3 sw (3) - HI	
	234	[OWS/BOTH/MDA] vlv - OWS	Directs return air from mol sv towards OWS for crew comfort
	390	OWS HT EXCH FANS 1-4 sw (4) - OWS	
		3. TERMINATE RECORDING	
	131	[RCD/OFF] sw - OFF	Momentary switch
		RCD lt - off	
	204	TAPE RECORDING EXP 1 sw - OFF	Momentary switch
		TAPE RECORDING EXP 1 lt - off	
		TAPE RECORDING EXP 2 sw - OFF	Momentary switch
		TAPE RECORDING EXP 2 lt - off	
		TAPE RECORDING EKG/ZPN sw - OFF	
		NOTE At first opportunity notify MSFN that OBS recording has been terminated	
		4. ACTIVATE ATM C&D H2O LOOP (4.3.4.29, step 5)	
		5. RECONFIGURE COMPARTMENT AND PANEL LIGHTING	
	207	LTG PNL sel - OFF or as required	
		LTG METER sel - OFF or as required	
		LTG STS FWD sel - OFF or as required	
		LTG STS AFT sel - OFF or as required	
		LTG MDA FWD [1•3] sw - OFF or as required	LTG MDA switches are momentary
		LTG MDA FWD [2•4] sw - OFF or as required	
		LTG MDA AFT [1•3] sw - OFF or as required	
		LTG MDA AFT [2•4] sw - OFF or as required	
	316	LTG METER sw - OFF	Lever lock switch
		LTG LOCK sw - OFF or as required	Lever lock switch
		6. RECONFIGURE EVA COMMUNICATIONS (4.6.1.21)	

4.6.2 EVA/IVA INFLIGHT MAINTENANCE

CREWMAN	PANEL	PROCEDURE	REMARKS
		(27.43.01-00)	
		4.6.2.1 EXTENDIBLE BOOM REPLACEMENT	
		NOTE This procedure for replacement of extendible boom for VS and VC work stations. Crewman should be in EVA replacement work station (VR)	Suited operation
		1. PREPARE FOR REPLACEMENT	
		Boom element fully retracted (verify)	
	321	EXTENDIBLE BOOM SUN END (CTR) sw - OFF (verify)	
		Fold back boom hook 90 degrees either direction	Increases crewman's work space
		Disconnect BUS 1 (BUS 2) zero-g connector on side of extendible boom	
		2. REMOVE EXTENDIBLE BOOM	
		Unlock thumb lock on extendible boom latch handle	Thumb lock on front surface of latch handle
		Squeeze release handle and simultaneously pull boom out of installation fixture	Retracts four retaining latches
		Temporarily stow boom on stowage hook adjacent to panel 321	
		3. OBTAIN SPARE BOOM	Adjacent to VC boom
		Repeat first two operations of step 2 for spare boom	
		4. INSTALL EXTENDIBLE BOOM	
		Align boom in installation fixture, using alignment marks	
		Simultaneously squeeze latch handle and push boom into installation fixture	
		Release handle when boom bottoms out	
		Shake boom to assure latches (4) engaged	
		Lock thumb lock on boom latch handle	
		Connect BUS 1 (BUS 2) zero-g connector	
		5. STOW FAILED BOOM	
		Retrieve failed boom from temporary stowage	
		Repeat step 4 for spare boom installation omitting last operation	
		6. VERIFY BOOM OPERATION	
		Extend boom (4.6.1.17, step 1)	(TBS)
		Retract boom (4.6.1.17, step 2)	(TBS)
		EXTENDIBLE BOOM SUN END (CTR) sw - OFF	
		(27.44.01-00)	
		4.6.2.2 SUIT DRYING BLOWER UNIT REPLACEMENT	
		NOTE See tool matrix for tool requirements (Appendix C)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.2.2 SUIT DRYING BLOWER UNIT REPLACEMENT (cont'd)	
		1. OBTAIN SPARE SUIT DRYING BLOWER UNIT	
		Obtain launch pin bag	(F527)
		Obtain blower unit	(D436)
		Remove launch restraint screws (4) and place in launch pin bag (Spin type handle, 5/32 hex driver bit)	
		2. DEACTIVATE SUIT DRYING BLOWER UNIT	
		Open stowage compartment door	(D424)
	531	cb blower unit - OPEN	
		Disconnect high-power accessory cable from HI PWR ACC OUTLET (if required)	
		Disconnect high-power accessory adapter cable from blower unit connector (if required)	
		3. REMOVE FAILED SUIT DRYING BLOWER UNIT	
		Remove tethered pin from port in blower unit housing	
		Remove suit drying hose from blower unit	
		Depress pip pin	
		Pull blower unit bracket handle and remove blower unit from bracket locating pins	
		Release pip pin	
		Remove blower from compartment	
		Remove filter and temporarily stow	
		4. INSTALL SPARE SUIT DRYING BLOWER UNIT	
		Install filter on spare blower unit	
		Position blower unit on bracket locating pins in compartment	
		Pull bracket handle and rotate blower unit onto bracket	
		Depress pip pin	
		Push bracket handle to secure blower unit	
		Release pip pin	
		Install suit drying hose on blower unit	
		Insert tethered pin into port in blower unit housing	
		cb blower unit - closed (verify)	
		Blower unit [ON/OFF/MOM ON] sw - OFF	
		5. VERIFY SUIT DRYING BLOWER UNIT OPERATION	
		Obtain high-power accessory cable and high-power accessory adapter cable (if required)	(D424)
		Connect both cables together	
		Connect high-power accessory adapter cable to blower unit connector	
	531	Connect high-power accessory cable to HI PWR ACC OUTLET	
		Blower unit [ON/OFF/MOM ON] sw - ON	
		Verify blower operation	
		Blower unit [ON/OFF/MOM ON] sw - OFF	
		Disconnect high-power accessory cable from high-power accessory adapter cable	
		Stow both cables	(D424)
		Close compartment door	(D424)

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.6.2.2 SUIT DRYING BLOWER UNIT REPLACEMENT (cont'd)	
		6. STOW FAILED SUIT DRYING BLOWER UNIT Identify failed blower unit (1 inch red tape and scissors) Stow failed blower unit	(D436)

SECTION 4.7

GENERAL DATA

INTRODUCTION

The general data section will contain information of a general nature that closely relates to normal/backup systems management procedures.

SECTIONS 4.8 THROUGH 4.18 NOT USED

SECTION 4.19

ORBITAL ASSEMBLY INTEGRATED PROCEDURES

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.1 MDA CONTROL UMBILICAL(S) INSTALLATION	(27.02.17-00)
		1. PREPARE FOR UMBILICAL(S) INSTALLATION	
	CSM 6,9	POWER - OFF	MSFN comm is available via panel 10 CCU or CSM Speaker/Icom Box only
		VHF AM - OFF	
		AUDIO CONT - NORM	
	CSM 230	CSM/SWS INTERFACE SIGNAL sw - DISCONNECT	Momentary switch
	200	cb AUDIO SYSTEM CREW ALERT CALL 1, 2 (2) - open	
		2. UMBILICAL(S) INSTALLATION	
		Remove dust cap(s) from INSTR A and/or INSTR B connector(s) in MDA tunnel (SWS Activation only)	
		Obtain MDA control umbilical A, V56-410105, and/or MDA control umbilical B, V56-420106, from container	(A8)
		Remove dust cap(s) from MDA control umbilical(s)	
		Stow caps in container	(M157)
		Match orange dot on connector P10 MDA of MDA control umbilical B with orange dot at tunnel connector INSTR A. Connect P10 to INSTR A connector, using white alignment strips as guide	(M103)
		and/or	
		Match green dot on connector P9 MDA of MDA control umbilical A with green dot at tunnel connector INSTR B. Connect P9 to INSTR B connector, using white alignment strips as required.	(M100)
		Open CSM MDA UMB CONN connector fairing(s) J23 and/or J24	
		Connect MDA control umbilical B, V56-420106, to MDA UMB CONN J23 connector and rotate CW to lock.	
		Route umbilical thru slot in back of receptacle assy and close fairing	
		and/or	
		Connect MDA control umbilical A, V56-420105, to MDA UMB CONN J24 connector and rotate CW to lock.	
		Route umbilical thru slotin back of receptacle assy and close fairing	
		4.19.2 MDA POWER UMBILICAL INSTALLATION	(27.01.01-00)
	CSM 230	1. PREPARE FOR UMBILICAL INSTALLATION	
		cb CSM/SWS TUNL MNA & B (10) - open (verify)	
		CSM/SWS INTERFACE PWR MNA, MNB sw (2) - DISCONNECT (AM/MDA activation only)	
		CSM/SWS INTERFACE PWR SAFE tb - gray (verify)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.2 MDA POWER UMBILICAL INSTALLATION (cont'd)	
	201	cb XFER 1/CSM MNA FEEDERS 1-5 (5) - open (verify) (AM/MDA activation only)	
		cb XFER 2/CSM MNB FEEDERS 1-5 (5) - open (verify) (AM/MDA activation only)	
		Verify EPS configuration (4.3.1.11, step 2) except: (AM/MDA activation only)	(26.01.02-00)
		ELEC GND CSM lt - off	
		ELEC GND AIRLOCK lt - on	
		2. UMBILICAL INSTALLATION	
		Remove MDA power umbilical from container	(A8)
		Remove dust cap from POWER TRANSFER connector in MDA tunnel (AM/MDA activation only)	(M101)
		Remove dust caps (2) from umbilical	
		Stow dust caps (3) in container	(M157)
		Connect MDA power umbilical to POWER TRANSFER connector in MDA tunnel.	(M101)
		Open CSM MDA POWER UMB CONN J25 fairing	
		Connect MDA power umbilical to MDA POWER UMB CONN J25 connector.	
		Close CSM MDA POWER UMB CONN J25 fairing	
		3. ESTABLISH CLUSTER SPG IN CSM (AM/MDA activation only)	
	206	ELEC GND sw - CSM	
		ELEC GND AIRLOCK lt - off	
		ELEC GND CSM lt - on	
		4. REMOVE CONTINGENCY POWER CABLE (4.19.6) (Except during AM/MDA activation)	
		4.19.3 MDA POWER UMBILICAL REMOVAL	(27.01.02-00)
		1. INSTALL CONTINGENCY POWER CABLE per 4.19.5 (Except during AM/MDA deactivation)	(31.01.01-00)
		2. ACTIVATE CONTINGENCY POWER CABLE (Except during AM/MDA deactivation)	
	CSM 230	cb CSM/SWS DRAG MNA & B (10) - closed	
		3. PREPARE FOR MDA POWER UMBILICAL REMOVAL	
	CSM 230	CSM/SWS INTERFACE PWR	
		MNA, MNB sw (2) DISCONNECT (AM/MDA deactivation only)	
		CSM/SWS INTERFACE PWR tb - gray (verify)	
		cb CSM/SWS TUNL MNA & B (10) - open	
	201	cb XFER 1/CSM MNA FEEDERS 1-5 (5) - open (AM/MDA deactivation only)	
		cb XFER 2/CSM MNB FEEDERS 1-5 (5) - open (AM/MDA deactivation only	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.3 MDA POWER UMBILICAL REMOVAL (cont'd)	
		4. UMBILICAL REMOVAL	
		Connect SPG in AM (AM/MDA deactivation only)	
	206	PWR SYS LTS BUS 1, 2 sw (2) - ON	
		ELEC GND CSM lt - on	
		ELEC GND sw - AM	CSM and AM single-point grounds are now
		ELEC GND CSM lt - off paralleled.	
		ELEC GND AIRLOCK lt - on	
		PWR SYS LTS BUS 1, 2 sw (2) - OFF	
		Open CSM MDA POWER UMB CONN J25 fairing	
		Disconnect MDA power umbilical from MDA POWER UMB CONN J25 connector.	
		Close CSM MDA POWER UMB CONN J25 fairing	
		Disconnect MDA power umbilical from POWER TRANSFER connector in MDA tunnel	(M101)
		Obtain dust caps and install on power umbilical	(M157)
		Stow power umbilical in container.	(M151)
		Obtain dust cap and install on POWER TRANSFER connector in MDA tunnel (AM/MDA deactivation only)	(M101)
		4.19.4 MDA CONTROL UMBILICAL(S) REMOVAL	(27.02.18-00)
		1. PREPARE FOR UMBILICAL(S) REMOVAL	
	CSM 230	CSM/SWS INTERFACE SIGNAL sw - DISCONNECT	
		CSM/SWS INTERFACE SIGNAL SAFE tb - gray	
	CSM 6,9	POWER - OFF	MSFN comm is available via panel 10 CCU or
		VHF AM - OFF	CSM Speaker/Icom Box only
		AUDIO CONT - NORM	
	200	cb AUDIO SYSTEM CREW ALERT CALL 1, 2 (2) - open	
		2. UMBILICAL(S) REMOVAL	
		Open CSM MDA UMB CONN connector fairing(s) J24 and/or J23	
		Pull A, V56-420105, MDA control and/or B, V56-420106, MDA control umbilical connector shell(s) inboard and rotate CCW to unlock.	
		Pull connector(s) inboard to disengage from receptacle(s)	
		Close CSM connector fairing(s)	
		Disconnect A, V56-420105, MDA control umbilical from INSTR B connector and/or B, V56-420106, MDA control umbilical from INSTR A connector in MDA tunnel	(M100),(M103)
		Obtain dust caps from container and install on INSTR B and/or INSTR A connector(s) in MDA tunnel (SWS deactivation only)	(M157)
		Stow umbilical(s) in container	(M151)
	CSM 6,9	3. REACTIVATE CSM AUDIO CENTERS	
		Configure CSM audio system, SLOH/CSM 4.4.7.1, step 2	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.5 CONTINGENCY POWER CABLE INSTALLATION	(31.01.01-00)
		Remove contingency power cable from container	(M124)
		Remove dust cap from CONTINGENCY POWER TRANSFER connector in MDA tunnel	(M102)
		Remove dust caps (2) from contingency power cable	
		Stow dust caps (3) in umbilical container	(M157)
	CSM 230	cb CSM/SWS DRAG MNA & B (10) - open (verify)	
		Open DRAG THRU RECEPTACLE door	
		Connect contingency power cable to DRAG THRU RECEPTACLE	
		Connect contingency power cable to CONTINGENCY POWER TRANSFER connector in MDA tunnel	(M102)
		4.19.6 CONTINGENCY POWER CABLE REMOVAL	(31.01.04-00)
		1. PREPARE FOR CABLE REMOVAL	
	CSM 230	cb CSM/SWS DRAG MNA & B (10) - open	
		2. CABLE REMOVAL	
	CSM 230	Open DRAG THRU RECEPTACLE door	
		Disconnect contingency power cable from DRAG THRU RECEPTACLE	
		Close DRAG THRU RECEPTACLE door	
		Disconnect contingency power cable from CONTINGENCY POWER TRANSFER connector in MDA tunnel	(M102)
		Obtain dust caps (3) from container	(M157)
		Install dust cap on CONTINGENCY POWER TRANSFER connector in MDA tunnel	(M102)
		Install dust caps (2) on contingency power cable	
		Stow contingency power cable in container	(M124)
		4.19.7 VERIFICATION OF SWS POWER TIE TO CSM CAPABILITY	
		NOTE This procedure includes temporary removal of fuel cells from the CSM buses	
		1. PERFORM ACTIVATION OF SWS POWER TIE TO CSM steps 1, 2 & 3 per 4.19.8	
		2. VERIFY POWER TRANSFER CAPABILITY	
	206	BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log)	
		BUS AMPS CSM A, B ind (2) - $\leq$36.0 (log)	
		3. PERFORM FUEL CELL TO MAIN BUS TRANSFER per SLOH/CSM 4.5.4	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.7 VERIFICATION OF SWS POWER TIE TO CSM CAPABILITY (cont'd)	
		4. DISABLE POWER TRANSFER	
		CAUTION Operations performed in step 4 require a decrease in REG BUS voltage through alternate incremental adjustments in REG ADJ BUS 1 and 2 potentiometers. Sequence should start by decreasing voltage on potentiometer associated with BUS AMPS PCG TOTAL indicator that indicates higher output current. BUS AMPS PCG TOTAL 1 and 2 indications should be maintained within TBS amps of each other	
	206	REG ADJ BUS 1 or 2 pot - ccw Ccw adjustment decreases bus voltage BUS AMPS PCG TOTAL 1 = BUS AMPS PCG TOTAL 2 + TBS AMPS Repeat two preceding operations, alternating between REG ADJ BUS 1 and 2 potentiometers until BUS AMPS CSM A & B inds are ≤5.0 amps	
		5. ISOLATE SWS/CSM EPS	
	CSM 230	CSM/SWS INTERFACE PWR MNA sw - DISCONNECT	
	CSM 3	DC IND sel - MNA	
	CSM 3	DC VOLTS ind - 26.5 to 30.0 (log)	
	206	BUS VOLTS XFER 1 - 26.5 to 30.0 (log) BUS AMPS CSM A ind - 0	
	CSM 230	CSM/SWS INTERFACE PWR MNB sw - DISCONNECT CSM/SWS INTERFACE PWR tb - gray	
	CSM 3	DC IND sel - MNB DC VOLTS ind - 26.5 to 30.0 (log)	
	206	BUS VOLTS XFER 2 ind - 26.5 to 30.0 (log) BUS AMPS CSM B ind - 0	
	CSM 230 201	cb CSM/SWS TUNL MNA & B (10) - open cb XFER 1/CSM MNA FEEDERS 1-5 (5) - open cb XFER 2/CSM MNB FEEDERS 1-5 (5) - open	
		6. PERFORM AM/ATM LOAD SHARING ADJUSTMENT per SLOH 4.3.1.8	
		7. VERIFY EPS CONFIGURATION	
	205	PWR SYS CONT sw - CMD Perform AM EPS PERIODIC VERIFICATION steps 2 & 3 per SLOH 4.3.1.11	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.8 ACTIVATION OF SWS POWER TIE TO CSM	
		1. PREPARE FOR SWS/CSM EPS POWER TIE	
	CSM 230	cb CSM/SWS TUNL MNA & B (10) - open (verify)	
		cb CSM/SWS DRAG MNA & B (10) - open (verify)	
		CSM/SWS INTERFACE PWR MNA, MNB sw (2) - DISCONNECT (verify)	
		CSM/SWS INTERFACE PWR tb - gray (verify)	
	CSM 250	cb MAIN BUS INTERCONNECT (2) - open (verify)	
	CSM 3	DC IND sel-MNA	
		DC VOLTS ind - 26.5 to 30.0 (log)	
		DC IND sel - MNB	
		DC VOLTS ind - 26.5 to 30.0 (log)	
	201	cb XFER 1/CSM MNA FEEDERS 1-5 (5) - open (verify)	
		cb XFER 2/CSM MNB FEEDERS 1-5 (5) - open (verify)	
		cb REG BUS TIE 1, 2 (2) - closed (verify)	
		Perform AM EPS PERIODIC VERIFICATION step 2 per SLOH 4.3.1.11	
	205	PWR SYS CONT sw - MANUAL	Manual control avoids inadvertant reconfiguration of EPS by MSFN
	206	BUS AMPS PCG TOTAL 1, 2 ind (2) - $\leq$ TBS (log) and within 5.0 of each other	
		BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
		BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
	201	cb XFER 1/CSM MNA FEEDERS 1-5 (5) - close	
		cb XFER 2/CSM MNB FEEDERS 1-5 (5) - close	
	CSM 230	cb CSM/SWS TUNL MNA & B (10) - close	
		2. PERFORM SWS/CSM EPS POWER TIE	
		NOTE	
		This step is only valid if AM bus voltages are initially lower than voltages of CSM main buses. If CSM main bus voltages are lower than AM bus voltages or are greater than TBS volts prior to performing power tie, reconfiguration of the CSM power system is required to obtain appropriate SWS and CSM bus voltage relationships	AM bus voltages are increased during this procedure
		CAUTION	
		Operations performed in step 2 require maintaining balance between BUS AMPS PCG TOTAL 1 and 2 indicators through alternate incremental adjustments in REG ADJ BUS 1 and 2 potentiometers. Sequence should start by adjusting potentiometer corresponding to BUS AMPS PCG TOTAL indicator that indicates lower output current. BUS AMPS PCG TOTAL 1 and 2 indicators should be maintained within TBS amps of each other	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.8 ACTIVATION OF SWS POWER TIE TO CSM (cont'd)	
		Monitor CSM main bus having lower voltage	
	CSN 3	DC IND sel - MNA or MNB	
	206	REG ADJ BUS 1 or 2 pot - cw	Cw adjustment increases bus voltage
		BUS AMPS PCG TOTAL 1 = BUS AMPS PCG TOTAL 2 + TBS	
		Repeat preceding operations, alternating between REG ADJ BUS 1 and 2 potentiometers until BUS VOLTS XFER 1 or 2 ind = CSM main bus A or B voltage + 0.5	
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	These circuit breakers may open during adjustment of REG ADJ BUS 1, 2 (2) potentiometers
		Activate tie to CSM main bus having lower voltage	
	CSM 230	CSM/SWS INTERFACE PWR MNA or MNB sw - CONNECT	
		CSM/SWS INTERFACE PWR tb - bp	
	CSM 3	DC VOLTS ind - 26.5 to 30.0 (log)	
	206	BUS AMPS PCG TOTAL 1, 2 ind (2) TBS (log)	
		BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log)	
		BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log)	
		BUS AMPS CSM A or B ind - 0 to ±5.0 (log)	
		WARNING If current is negative (<0), perform alternate incremental adjustments in REG ADJ BUS 1 and 2 potentiometers to increase BUS VOLTS XFER 1 or 2 indicator until BUS AMPS CSM A or B indicator is ≥0	
		Repeat preceding sequence for remaining CSM main bus	
		3. PERFORM FUEL CELL ISOLATION per SLOH/CSM 4.5.4	
		4. PERFORM AM/ATM LOAD SHARING ADJUSTMENT per SLOH 4.3.1.8	
		5. VERIFY EPS CONFIGURATION	
	205	PWR SYS CONT sw - CMD	
		Perform AM EPS PERIODIC VERIFICATION steps 2 & 3 per SLOH 4.3.1.11	
		6. PERFORM H2 VENT OPERATION per SLOH/CSM 4.5.6	
		7. PERFORM FUEL CELL SHUTDOWN per SLOH/CSM 4.5.4	
		4.19.9 ACTIVATION OF AM POWER TIE TO CSM	
		NOTE This procedure is used if the AM EPS and the ATM EPS are not paralleled.	
		1. PREPARE FOR AM/CSM EPS POWER TIE	
	CSM 230	cb CSM/SWS TUNL MNA & B (10) - open (verify)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.9 ACTIVATION OF AM POWER TIE TO CSM (cont'd)	
		cb CSM/SWS DRAG MNA & B (10) - open (verify)	
		CSM/SWS INTERFACE PWR MNA, MNB sw (2) - DISCONNECT (verify)	
		CSM/SWS INTERFACE PWR tb - gray (verify)	
	CSM 250	cb MAIN BUS INTERCONNECT (2) - open (verify)	
	CSM 3	DC IND sel - MNA	
		DC VOLTS ind - 26.5 to 30.0 (log)	
		DC IND sel - MNB	
		DC VOLTS ind - 26.5 to 30.0 (log)	
	201	cb XFER 1/CSM MNA FEEDERS 1-5 (5) - open (verify)	
		cb XFER 2/CSM MNB FEEDERS 1-5 (5) - open (verify)	
		cb REG BUS TIE 1, 2 (2) - closed (verify)	
		Perform AM EPS PERIODIC VERIFICATION step 2 per SLOH 4.3.1.11 except, ATM/XFER TIE 1, 2 (2) CLOSED lt - off ATM/XFER TIE 1, 2 (2) OPEN lt - on	Indicates power ties between AM transfer buses and ATM buses are open
	205	PWR SYS CONT sw - MANUAL	Manual control avoids inadvertent reconfiguration of EPS by MSFN
	206	BUS AMPS PCG TOTAL 1, 2 ind (2) - $\leq$TBS (log) and within 5.0 of each other	
		BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
		BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
	201	cb XFER 1/CSM MNA FEEDERS 1-5 (5) - close	
		cb XFER 2/CSM MNB FEEDERS 1-5 (5) - close	
	CSM 230	cb CSM/SWS TUNL MNA & B (10) - close	
		2. PERFORM AM/CSM EPS POWER TIE	
		NOTE	
		If CSM main bus voltages are greater than TBS volts prior to performing power tie, reconfiguration of the CSM power system is required to obtain appropriate AM and CSM bus voltate relationships	
		CAUTION	
		Operations performed in step 2 require maintaining balance between BUS AMPS PCG TOTAL 1 and 2 indicators through alternate incremental adjustments in REG ADJ BUS 1 and 2 potentiometers. Sequence should start by adjusting potentiometer corresponding to BUS AMPS PCG TOTAL indicator that indicates lower output current. BUS AMPS PCG TOTAL 1 and 2 indicators should be maintained within TBS amps of each other	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.9 ACTIVATION OF AM POWER TIE TO CSM (cont'd)	
		Monitor CSM main bus having lower voltage	
	CSM 3	DC IND sel - MNA & MNB	
	206	REG ADJ BUS 1 or 2 pot - as required	Cw adjustment increases bus voltage
		BUS AMPS PCG TOTAL 1 = BUS AMPS PCG TOTAL 2 ± TBS	
		Repeat preceding operations alternating between REG ADJ BUS 1 and 2 potentiometers until BUS VOLTS XFER 1 or 2 ind = CSM main bus A or B voltage + 0.5	
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	These circuit breakers may open during adjustment of REG ADJ BUS 1, 2 (2) potentiometers
		Activate tie to CSM main bus having lower voltage	
	CSM 230	CSM/SWS INTERFACE PWR MNA or MNB sw - CONNECT	
		CSM/SWS INTERFACE PWR tb - bp	
	CSM 3	DC VOLTS ind - 26.5 to 30.0	
	206	BUS AMPS PCG TOTAL 1, 2 ind (2) ≤ TBS (log)	
		BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log)	
		BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log)	
		BUS AMPS CSM A or B ind - 0 to + 5.0 (log)	
		WARNING	
		If current is negative (<0), perform alternate incremental adjustments in REG ADJ BUS 1 and 2 potentiometers to increase BUS VOLTS XFER 1 or 2 indicator until BUS AMPS CSM A or B indicator is ≥0	
		Repeat preceding sequence for remaining CSM main bus	
		3. PERFORM FUEL CELL ISOLATION per SLOH/CSM 4.5.4	
		4. ADJUST AM REG BUS VOLTAGE	
		CAUTION	
		Maintain a balance between BUS AMPS PCG TOTAL 1 and 2 indicators through alternate incremental adjustments in REG ADJ BUS 1 and 2 potentiometers until BUS VOLTS REG 1, 2 indicators approximately equal value logged in step 1. BUS AMPS PCG TOTAL 1 and 2 indicators should be maintained within TBS amps of each other. Bus selected initially must be the one furthest from the final setting.	
	201	REG BUS TIE 1, 2 (2) - closed (verify)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.9 ACTIVATION OF AM POWER TIE TO CSM (cont'd)	
	206	REG ADJ BUS 1 or 2 pot - as required	CW adjustment increases bus voltage. For normal operation, PCG regulators 1-4 (4) are connected to reg bus 1 and are adjusted simultaneously PCG regulators 5-8 (4) are connected to reg bus 2 and also adjusted simultaneously. Calibration marks are provided at 30-degree intervals
		BUS AMPS PCG TOTAL 1 = BUS AMPS PCG TOTAL 2 ± TBS BUS VOLTS REG 1, 2 ind (2) value logged step 1	
		5. VERIFY EPS CONFIGURATION	
	205	PWR SYS CONT sw - CMD Perform AM EPS PERIODIC VERIFICATION steps 2 & 3 per SLOH 4.3.1.11 except, ATM/XFER TIE 1, 2 (2) CLOSED lt - off ATM/XFER TIE 1, 2 (2) OPEN lt - on	
		6. PERFORM H2 VENT OPERATION per SLOH/CSM 4.5.6	
		7. PERFORM FUEL CELL SHUTDOWN per SLOH/CSM 4.5.4	
		4.19.10 ACTIVATION OF SWS POWER TIE TO CSM WITH CONTINGENCY POWER CABLE	
		1. PREPARE FOR SWS/CSM EPS POWER TIE	
	CSM 230	cb CSM/SWS TUNL MNA & B (10) - open (verify) cb CSM/SWS DRAG MNA & B (10) - open (verify) CSM/SWS INTERFACE PWR MNA, MNB sw (2) - DISCONNECT (verify) CSM/SWS INTERFACE PWR tb - gray (verify)	
	CSM 250	cb MAIN BUS INTERCONNECT (2) - open (verify)	
	CSM 3	DC IND sel - MNA DC VOLTS ind - 26.5 to 30.0 (log) DC IND sel - MNB DC VOLTS ind - 26.5 to 30.0 (log)	
	201	cb XFER 1/CSM MNA FEEDERS 1-5 (5) - open (verify) cb XFER 2/CSM MNB FEEDERS 1-5 (5) - open (verify) cb REG BUS TIE 1, 2 (2) - closed (verify) Perform AM EPS PERIODIC VERIFICATION step 2 per SLOH 4.3.1.11	
	205	PWR SYS CONT sw - MANUAL	Manual control prevents inadvertant reconfiguration of EPS by MSFN
	206	BUS AMPS PCG TOTAL 1, 2 ind (2) - ≤TBS (Log) and within 5.0 of each other BUS VOLTS REG 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.10 ACTIVATION OF SWS POWER TIE TO CSM WITH CONTINGENCY POWER CABLE (cont'd)	
		BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log) and within 0.2 of each other	
	201	cb XFER 1/CSM MNA FEEDERS 1-5 (5) - close	
		cb XFER 2/CSM MNB FEEDERS 1-5 (5) - close	
	CSM 230	cb CSM/SWS DRAG MNA & B (10) - close	
		2. PERFORM ACTIVATION OF SWS POWER TIE TO CSM steps 2, 3,4,5,6 & 7 per 4.19.8	
		4.19.11 CSM WARNING TEST	
	CSM 2	CAUTION/WARNING POWER sw - (CENTER)	Turns off power to CSM C/W
	INTERCOM	Warning tone - on	
	207	C/W CSM lt - on	
		Respond to C/W alert (4.3.8.4)	
	INTERCOM	Warning tone - off	
	CSM 2	CAUTION/WARNING POWER sw - 1 or 2	
	207	C/W CSM lt - off	
	206	C/W MEM RECALL pb/lt - depress	
	207	C/W CSM lt - on	
	206	C/W [CLEAR] sw - CLEAR	
		C/W MEM RECALL pb/lt - off	
		4.19.12 DEACTIVATION OF SWS POWER TIE TO CSM	
		1. VERIFY EPS STATUS	
	201	cb REG BUS TIE 1, 2 (2) - closed (verify)	
	206	BUS VOLTS XFER 1, 2 ind (2) - 26.5 to 30.0 (log)	
		BUS AMPS CSM A, B ind (2) - ≤36.0 (log)	
		BUS AMPS REG TOTAL 1, 2 ind (2) -(log)	
		BUS AMPS ATM 1, 2 ind (2) - (log)	
		Perform AM EPS PERIODIC VERIFICATION step 2 per SLOH 4.3.1.11	
		PWR SYS CONT sw - MANUAL	
		2. PERFORM CSM ENTRY BATTERY to BAT BUS TRANSFER per SLOH/CSM 4.5.4	
		3. PERFORM CSM DESCENT BATTERY to MAIN BUS TRANSFER per SLOH/CSM 4.5.4	
		4. DISABLE POWER TRANSFER per 4.19.7 step 4	
		5. ISOLATE SWS/CSM EPS per 4.19.7 step 5	
		6. PERFORM AM/ATM LOAD SHARING ADJUSTMENT per SLOH 4.3.1.8	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.12 DEACTIVATION OF SWS POWER TIE TO CSM (cont'd)	
	205	7. VERIFY EPS CONFIGURATION PWR SYS CONT sw - CMD Perform AM EPS PERIODIC VERIFICATION steps 2 & 3 per SLOH 4.3.1.11	
		4.19.13 SWS/CSM COMMUNICATION AND CLOCK ACTIVATION	
	131	1. RELOCATE INTERCOM BOX Disconnect cables connected to stowed intercom box (SL-2) Reconnect connector with blue backshell ring to receptacle on intercom box identified by blue plate Reconnect second connector to remaining receptacle Install cables in snap clamp	Intercom box is stowed in STS for launch
		NOTE See tool matrix for tool requirements (Appendix C) (SL-2)	
	102	Loosen Calfax fasteners (4) on stowed intercom box (spin-type handle, 5/32 square dirver bit) Transfer intercom box to location in MDA and handtighten fasteners Unstow cables from dummy receptacles and connect to intercom box Install cables in snap clamp	Intercom box stowed in STS for launch and storage. Tools are required only during SL-2 activation sequence Dummy receptacles located on EREP rack No. 1. Connector and receptacle designators are TBS
	CSM 225 CSM 230	2. CONFIGURE CSM AUDIO SYSTEM Configure CSM audio system (SLOH CSM 4.5.8.1 steps 2, 3 & 4) CSM/SWS INTERFACE SIGNAL sw - CONNECT CSM/SWS INTERFACE SIGNAL SAFT tb - parberpole	Barberpole indicates SWS/CSM call circuit has been connected
	200	3. ENABLE SWS AUDIO SYSTEM cb AUDIO SYSTEM (8) - close	Applies power to SWS audio system
	131,102 116	4. ACTIVATE INTERCOM BOXES COMM CHAN sel - A ON SPKR VOL - adjust as required	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.13 SWS/CSM COMMUNICATION AND CLOCK ACTIVATION	
		NOTE	
		After C/W activation, one intercom box within audible range must be operational at all times to enable audible C/W tones	Crew alert signal from MSFN is not dependent on this constraint
		5. RECORD VOICE FOR REMAINDER OF ACTIVATION Record remainder of activation (4.3.2.4, or 4.3.2.8 and 4.3.2.16)	
	209	6. ACTIVATE TELEPRINTER Loosen Calfax fasteners (4) on spare teleprinter cartridge mounted on spare teleprinter (SL-2) Tighten teleprinter cartridge Calfax fasteners (2) (SL-3,4) TELEPRINT sw - CMD	(TBS)
	212	7. ACTIVATE CLOCK TIME REF SYS BUFFER sw - PRI DISPLAY sw - ON	Starts clock and illuminates digit displays. Clock will indicate hr:min:sec as determined by electronic timer elapsed-time register. Day count may be in error
		BRIGHTNESS adj - as required	Adjust to desired illumination
		NOTE	
		If day count is in error (4.3.7.4)	
		4.19.14 COMMUNICATIONS AND CLOCK DEACTIVATION	
	212	1. DEACTIVATE CLOCK DISPLAY sw - OFF TIME REF SYS BUFFER sw - OFF	
	209	2. DEACTIVATE TELEPRINTER TELEPRINT sw - OFF Partially loosen cartridge Calfax fasteners so cartridge is loose but not completely detached from panel	Precludes press roller indentation damage from occuring during storage
	131	3. TERMINATE VOICE RECORDING [RCD/OFF] sw - OFF Rcd lt - off	Momentary switch
		NOTE	
		If voice recording was via LCCU, perform disconnection (4.3.2.9)	

CREWMAN	PANEL	PROCEDURE	REMARKS
		4.19.14 COMMUNICATIONS AND CLOCK DEACTIVATION (cont'd)	
	CSM 6,9	4. DEACTIVATE INTERCOM SYSTEM POWER - OFF VHF AM - OFF AUDIO CONT - NORM	
		NOTE At this time, the CSM audio center tie to the SWS intercom system is deactivated	
	CSM 230	Configure CSM audio system (SLOH/CSM 4.4.7.1) CSM/SWS INTERFACE SIGNAL sw - DISCONNECT CSM/SWS INTERFACE SIGNAL SAFE tb - gray	Gray indicates SWS/CSM call circuit has been disconnected
	200	cb AUDIO SYSTEM (8) - open Configure panels 102, 116, 131 per storage configuration (4.1)	
	102	5. RELOCATE INTERCOM BOX Remove cables (2) from snap clamp Disconnect connectors from intercom box and connect to dummy receptacles Loosen Calfax fasteners (4) and remove intercom box Transfer intercom box to stowed location in STS and handtighten Calfax fasteners (4)	Dummy receptacles located on EREP rack No. 1
		4.19.15 PREPARATION FOR CSM JETTISON FROM MDA AXIAL PORT - (TBS)	
		4.19.16 PREPARATION FOR CSM DOCKING AT MDA RADIAL PORT - (TBS)	
		4.19.17 PREPARATION FOR CSM SEPARATION FROM RADIAL PORT - (TBS)	
		4.19.18 TRANSFER TO RESCUE CSM IN UNPRESSURIZED MDA - (TBS)	

SECTION 5.0

CONTINGENCY PROCEDURES

INTRODUCTION

Contingency procedures consist of operational analyses for anomalous situations that may exist during manned mission phases. They provide the crew with decision-making criteria, operating sequences for aborting the mission, diagnostic routines, alternate operating techniques for malfunction conditions, and techniques required to safe the spacecraft and crew in an emergency situation. Procedures include the corrective action that must be taken and the limitations that are imposed. Contingency procedures consist of the following:

Abort procedures - May be considered a specialized form of backup procedures involving mission termination

Malfunction procedures - Provide for symptom identification, diagnosis, and corrective action for all contingencies other than abort and emergency

Emergency procedures - For response to contingencies other than abort when the safety of the flight crew and/or spacecraft requires instant action

SECTION 5.1

ABORT PROCEDURES

Abort procedures involve situations that require the termination of a mission. No abort procedures have been identified for the OWS, AM, or MDA systems.

SECTION 5.2

MALFUNCTION PROCEDURES

INTRODUCTION

Malfunction procedures encompass the recognition, diagnosis, and corrective actions necessary to remedy system malfunctions. Procedures are presented in a logic flow diagram format and arranged by symptom routines. The symptom routines contain the primary malfunction procedures and are backed up by special subroutines and system reconfiguration routines where necessary.

Symptom routine logic flow diagrams employ a three-column format:

SYMPTOM COLUMN

The symptom column affords recognition of the existence of a malfunction and provides entry to the procedures. Two types of symptom logic blocks are used: "C/W Status Light" and "Other Symptoms." Both blocks fully explain and qualify each symptom or condition.

All symptoms are arranged by system (EPS, COMM, TACS, ECS, etc.) and sequentially numbered (starting with No. 1 for each system). A subsymptom directly related to a major symptom is identified by the major symptom numeral and a lower-case alphabetical suffix (1a, 1b, 1c, etc). To properly use the procedure, follow the symptom sequence (1 before 1a, 2a before 2b, etc).

PROCEDURE COLUMN

The procedure column presents a step-by-step logic flow of actions, observations, and decisions used to isolate and correct a malfunction. Information is presented in several types of logic blocks containing procedures, decisions, and actions necessary to locate and isolate the failure. In addition, CAUTION and WARNING blocks alert the crew to situations that might, if not corrected, have critical consequences for mission accomplishment or crew safety. Remote event symbols direct the user to other procedural steps in the same or different procedures.

REMARKS COLUMN

This column contains related information as follows:

a. Amplifying remarks related to a symptom that inform the reader of the priority he must assign a particular symptom, ("relief valve vents at _____psia," "burst disc ruptures at _____psia,").

b. Amplifying remarks relating to a decision and/or an action item (the reason a step is taken, the possible system time lag, etc.).

c. Explanation of resultant system status or operational capability after a failure has been identified (how subsystem is degraded, whether degraded subsystem can support primary mission, early termination of mission, etc.).

To assist the reader in better understanding the development of the malfunction procedures contained in this section, the significant ground rules employed in their preparation are briefly described as follows:

a. Only significant single failures were considered in the selection of symptoms. Double failures were considered when necessary to clarify the analysis of a symptom selected for an anomalous condition attributible to a single failure.

b. Generally, a symptom was considered only if it could be physically observed onboard by the crew. (This would include audio/visual alerts by the C/W and various systems operating displays.)

c. Symptoms were considered only if corrective action or alternate operation techniques were available to the crew.

d. Generally, a symptom was considered only if the analysis and corrective action could be accomplished without continuous ground communication capability.

e. Symptoms were considered only if the condition could be attributed to an actual failure. Erroneous control configuration resulting from ground or crew action were not included in symptom consideration. However, misconfiguration of a system was considered in symptom analysis to clarify the procedure or when dictated by system complexity.

f. The initial procedural step was assumed to follow the crew response of system configuration verification and necessary reconfiguration. This includes crew action with the C/W as might be required to silence the alarm, to verify the parameter causing the alert, and to clear the system. Clearing the C/W of the parameter signal that caused the alert was assumed to follow the last procedural step.

When an additional C/W alert occurred as the result of procedural steps, this was identified by a statement indicating that a specific C/W light was on (C/W PPO2 LO lt - on). The "tone-on" indication was omitted for brevity. Master alarm reset was directed following the "light-on" statement; however, since the data is retained in C/W Logic, reset could be accomplished at crew convenience. For alerts triggered by procedural steps, appropriate directions to clear the C/W were included.

g. Procedures include steps to isolate, inhibit, disable, or replace failed components where applicable. If a detailed procedure was required to accomplish these steps, it was included in Section 4.0, Normal/Backup Procedures.

h. Procedures do not specify changes in mission plans or objectives resulting from malfunctions. However, the effect on spacecraft and mission operations was included.

The table on the following page lists the symptoms identified for malfunction procedures.

SYMPTOM	NUMBER	PAGE
5.2.1 ELECTRICAL POWER SYSTEM		
BATTERY AMPS DISCHARGE 1-8 LO	1	5.2.1-1
ARRAY AMPS 1-8 LO	1a	5.2.1-1
BATTERY AMPS DISCHARGE 1-8 HI	2	5.2.1-2
ARRAY AMPS 1-8 HI	2a	5.2.1-2
BATTERY AMPS CHARGE 1-8 HI	3	5.2.1-3
BATTERY CHARGE 1-8 LO	4	5.2.1-4
BATTERY VOLTS 1-8 HI	4a	5.2.1-4
BATTERY STATE OF CHARGE 1-8 LO	5	5.2.1-5
BATTERY VOLTS 1-8 LO	5a	5.2.1-5
BUS AMPS PCG TOTAL 1 (2) HI	6	5.2.1-6
BUS AMPS PCG TOTAL 1 (2) LO	6a	5.2.1-6
BUS AMPS PCG TOTAL 1 (2) 10 DIFFERENTIAL	6b	5.2.1-6
BAT CHARGE LOW	7	5.2.1-7
BUS VOLTS REG 1 (2) ≠ 0.2 OF EACH OTHER	8	5.2.1-8
BUS VOLTS TRANSFER 1 (2) ≠ 0.2 OF EACH OTHER	8a	5.2.1-8
REG BUS 1 (2) LOW	9	5.2.1-9
BUS VOLTS REG 1 (2) LO	9a	5.2.1-9
BUS VOLTS TRANSFER 1 (2) LO	9b	5.2.1-9
OWS BUS 1 (2) LOW	9c	5.2.1-9
EPS OWS BUS VOLTS 1 (2) LO	9d	5.2.1-9
ATM BUS 1 (2) LOW	9e	5.2.1-10
BUS AMPS ATM 1 (2) HI	9f	5.2.1-10
BUS AMPS OWS 1 (2) LO	9g	5.2.1-10
BUS AMPS CSM 1 (2) LO	9h	5.2.1-10
BUS AMPS OWS 1 (2) HI	9i	5.2.1-10
BUS AMPS CSM A (B) HI	9j	5.2.1-10
REG BUS 1 (2) HI	10	5.2.1-12
BUS VOLTS REG 1 (2) HI	10a	5.2.1-12
BUS VOLTS TRANSFER 1 (2) HI	10b	5.2.1-12
LIGHT ANOMALLY DURING EPS STATUS/CONFIGURATION VERIFICATION	11	5.2.1-13
UNABLE TO ADJUST REG BUS 1 (2)	12	5.2.1-14
BUS SHORT ISOLATION	SSR-1	5.2.1-15
5.2.2 COMMUNICATION SYSTEM		
NO RESPONSE TO ATTEMPTED COMM	1	5.2.2-1
EVA CMN DOES NOT RESPOND TO COMM FROM NON-EVA CMN	2	5.2.2-2
EVA CMN LOSES HEADSET NOISE	3	5.2.2-2
AUDIO SYSTEM INTERCOM A (B) CIRCUIT BREAKER WILL NOT REMAIN CLOSED	4	5.2.2-3
AUDIO OUTPUT DISTORTION/LOSS	5	5.2.2-4
LOSS OF VIDEO ON MONITOR	6	5.2.2-5
LOSS OF VIDEO BY MSFN	6a	5.2.2-5
5.2.3 THRUSTER ATTITUDE CONTROL SYSTEM		
No procedures identified		
5.2.4 ENVIRONMENTAL CONTROL SYSTEM		
REGULATED O2 PRESSURE LO	1	5.2.4-1
O2 BOTTLE PRESSURE LO	1a	5.2.4-1
NO O2 FLOW FOR FILL OPERATIONS	2	5.2.4-2
NO O2 FLOW FOR SENSOR CALIBRATION	3	5.2.4-3
NO O2 FLOW FOR EVA	4	5.2.4-4
NO O2 FLOW FOR IVA	4a	5.2.4-4
REGULATED N2 PRESSURE LO	5	5.2.4-5
N2 BOTTLE PRESSURE LO	5a	5.2.4-5
NO N2 FLOW FOR SENSOR CALIBRATION	6	5.2.4-6
NO N2 FLOW FOR ESS	7	5.2.4-6
NO N2 FLOW FOR M171	7a	5.2.4-6
REGULATED N2 PRESSURE HI	8	5.2.4-7
PPO2 LOW	9	5.2.4-8
PPO2 CONTROLLER INDICATOR HI	9a	5.2.4-8
PPO2 MONITOR INDICATOR LO	9b	5.2.4-8
PPO2 CONTROLLER AND MONITOR INDICATOR LO	9c	5.2.4-8
PPO2 CONTROLLER INDICATOR LO	9d	5.2.4-9
PPO2 MONITOR INDICATOR HI	10	5.2.4-10
CLUSTER PRESS LOW	11	5.2.4-11

SYMPTOM	NUMBER	PAGE
CLUSTER PRESSURE LO AND DECREASING	11a	5.2.4-11
CLUSTER PRESS LOW	12	5.2.4-13
CLUSTER PRESSURE HI AND INCREASING	13	5.2.4-14
REGULATED 02 PRESS HI	13a	5.2.4-14
INSUFFICIENT H20 SYSTEM FLOW	13b	5.2.4-14
CREW UNCOMFORTABLE	14	5.2.4-18
ACTIVE (PASSIVE) MOL SV HX AIR INLET TEMP HI	14a	5.2.4-18
TCS OWS TEMP HI	14b	5.2.4-18
CREWMAN FEELS HOT	14c	5.2.4-18
ACTIVE (PASSIVE) MOL SV HX AIR INLET TEMP LO	14d	5.2.4-19
TCS OWS TEMP LO	14e	5.2.4-19
CREWMAN FEELS COLD	14f	5.2.4-19
ACTIVE (PASSIVE) MOL SV DEW PT HI	15	5.2.4-21
ACTIVE (PASSIVE) MOL SV DEW PT LO	16	5.2.4-21
SIEVE OUT PPCO2 HIGH	17	5.2.4-22
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MOL SV BEDS 1 AND 2 IN DESORB	17b	5.2.4-22
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5.2.5 CREW SYSTEM AND MISCELLANEOUS

No procedures identified

5.2.6 INSTRUMENTATION SYSTEM

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VOICE RECORD LIGHT REMAINS ON	3	5.2.6-2
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ABSENCE OF VOICE RECORD LIGHT	6	5.2.6-3
ABSENCE OF TAPE RECORDING DATA LIGHT	7	5.2.6-4
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SYMPTOM	NUMBER	PAGE
5.2.7 TIME REFERENCE AND DIGITAL COMMAND SYSTEM		
INACCURATE CLOCK DISPLAY	1	5.2.7-1
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5.2.8 CAUTION AND WARNING SYSTEM		
CAUTION TEST MALFUNCTION ISOLATION	1	5.2.8-1
WARNING TEST MALFUNCTION ISOLATION	2	5.2.8-2
FIRE TEST MALFUNCTION ISOLATION	3	5.2.8-3
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RAPID P TEST MALFUNCTION ISOLATION	5	5.2.8-7
C/W POWER	6	5.2.8-9
C/W EMER PWR	7	5.2.8-11
C/W EMER SNSR PWR	8	5.2.8-12
C/W TONE ON ONLY	9	5.2.8-13
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5.2.9 CSM/MDA INTERFACE		
No procedures identified		
5.2.10 EXPERIMENTS INTERFACE		
No procedures identified		
5.2.11 MECHANICAL SYSTEMS		
No procedures identified		
5.2.12 REFRIGERATION SYSTEM		
RS PRI (SEC) LOOP TEMP FREEZER HIGH	1	5.2.12-1
RS URINE FREEZER TEMP IND TBS °F	1a	5.2.12-1
RS WARDROOM FREEZER 1 (2) TEMP IND TBS °F	1b	5.2.12-1
RS STOWAGE FREEZER 1 (2, 3) TEMP IND TBS °F	1c	5.2.12-1
RS HEAT SINK OUTLETS PRI (SEC) TEMP IND -14°F	1d	5.2.12-1
RS PRI (SEC) LOOP TEMP CHILLER LOW	2	5.2.12-2
RS CHILLER FOOD TEMP IND 36°F	2a	5.2.12-2
RS URINE CHILLERS 1 (2, 3) TEMP IND 36°F	2b	5.2.12-2
RS CHILLER WATER INLETS PRI (SEC) IND 36°F	2c	5.2.12-2
RS PRI (SEC) LOOP PUMP LOW P	3	5.2.12-3
RS PRI (SEC) LOOP ACCUM LOW	4	5.2.12-3
RS HEAT SINK OUTLETS PRI (SEC) TEMP IND -43°F	5	5.2.12-4
RS URINE FREEZER TEMP IND -20°F	5a	5.2.12-4
RS WARDROOM FREEZER 1 (2) TEMP IND -20°F	5b	5.2.12-4
RS STOWAGE FREEZER 1 (2, 3) TEMP IND -20°F	5c	5.2.12-4
RS URINE CHILLERS 1 (2, 3) TEMP IND 60°F	6	5.2.12-5
RS CHILLER WATER INLETS PRI (SEC) TEMP IND 42°F	6a	5.2.12-5
RS CHILLER FOOD TEMP IND TBS°F	6b	5.2.12-5
5.2.13 FOOD AND POTABLE H2O		
FOOD REMAINS COLD IN FOOD HEATER CAVITY AFTER TIMER EXPIRES	1	5.2.13-1
ABSENCE OF FOOD TRAY HEAT IND AFTER HOURS REMAINING COUNTDOWN COMPLETE	1a	5.2.13-1
ABSENCE OF FOOD TRAY HOURS REMAINING COUNTING	2	5.2.13-1
H2O GUN LOW QUANTITY OR NO FLOW	3	5.2.13-2
WARDROOM H2O DISPENSER LOW QUANTITY OR NO FLOW	3a	5.2.13-2
WARDROOM WATER OVERBOARD DUMP NOT DRAINING	4	5.2.13-3
5.2.14 WASTE SYSTEM (INCLUDING NON-POTABLE H2O)		
UNABLE TO DEPRESS TRASH LOCK	1	5.2.14-1

SYMPTOM	NUMBER	PAGE
TRASH LOCK LID SEAL LEAKING	1a	5.2.14-1
TRASH LOCK VALVE PLUG LEAKING	1b	5.2.14-1
TRASH LOCK TORSION BAR O-RING LEAKING	1c	5.2.14-1
TRASH LOCK PRESSURE GAGE	1d	5.2.14-1
UNABLE TO PRESSURIZE TRASH LOCK	2	5.2.14-2
TRASH LOCK OUTER SEAL LEAKING	2a	5.2.14-2
JAMMED TRASH LOCK EJECTOR	3	5.2.14-3
WASTE PROCESSOR OVERTEMP	4	5.2.14-4
WASTE PROCESSOR TMR LIGHT NOT ON	4a	5.2.14-4
WASTE NOT PROCESSED WHEN TIMER EXPIRES	5	5.2.14-4
LOSS OF AIR FLOW INTO URINE RECEIVER HOSE	6	5.2.14-5
URINE SEPARATOR INOPERATIVE	7	5.2.14-6
FECAL/URINE COLLECTOR BLOWER UNIT INOPERATIVE	8	5.2.14-6
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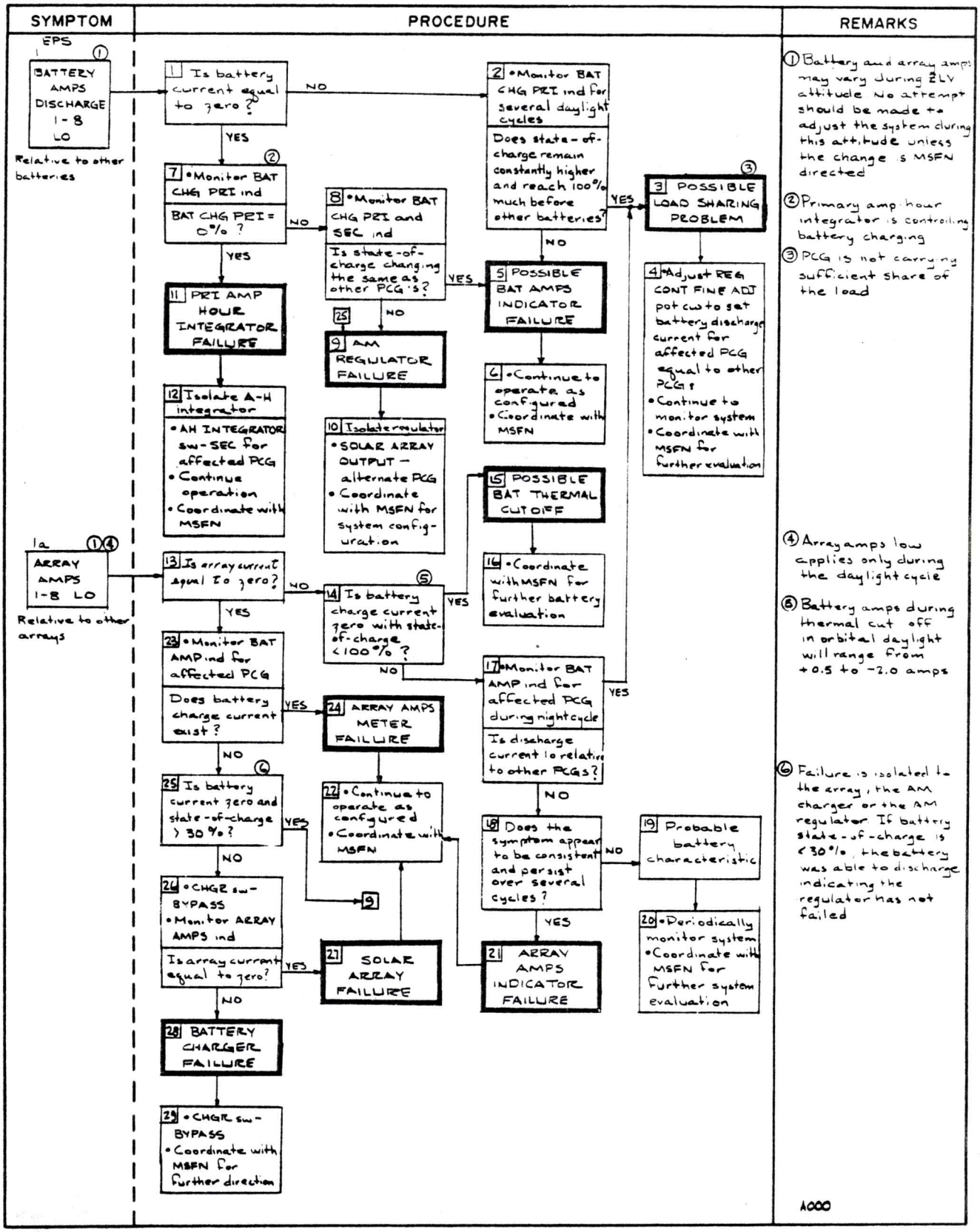
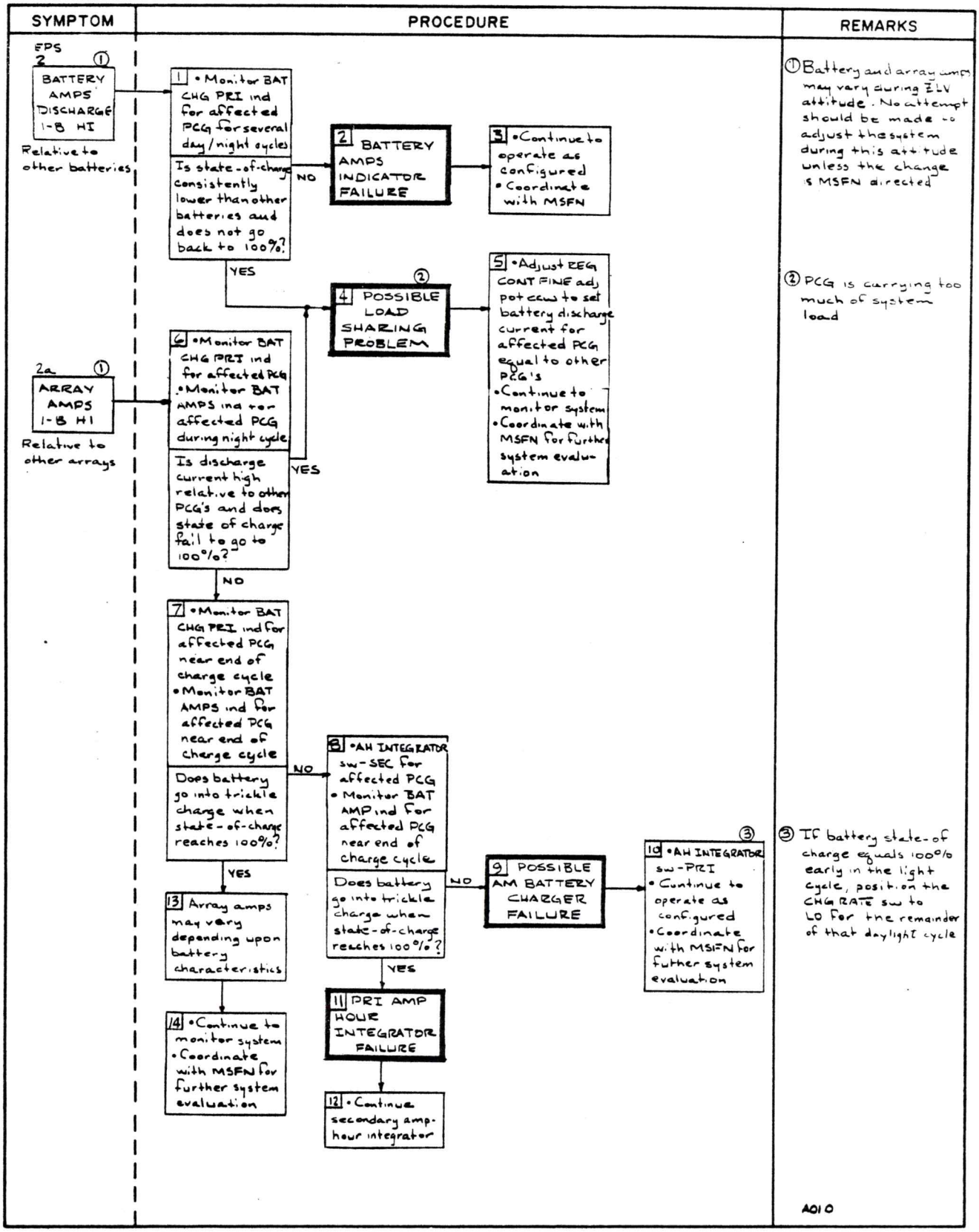
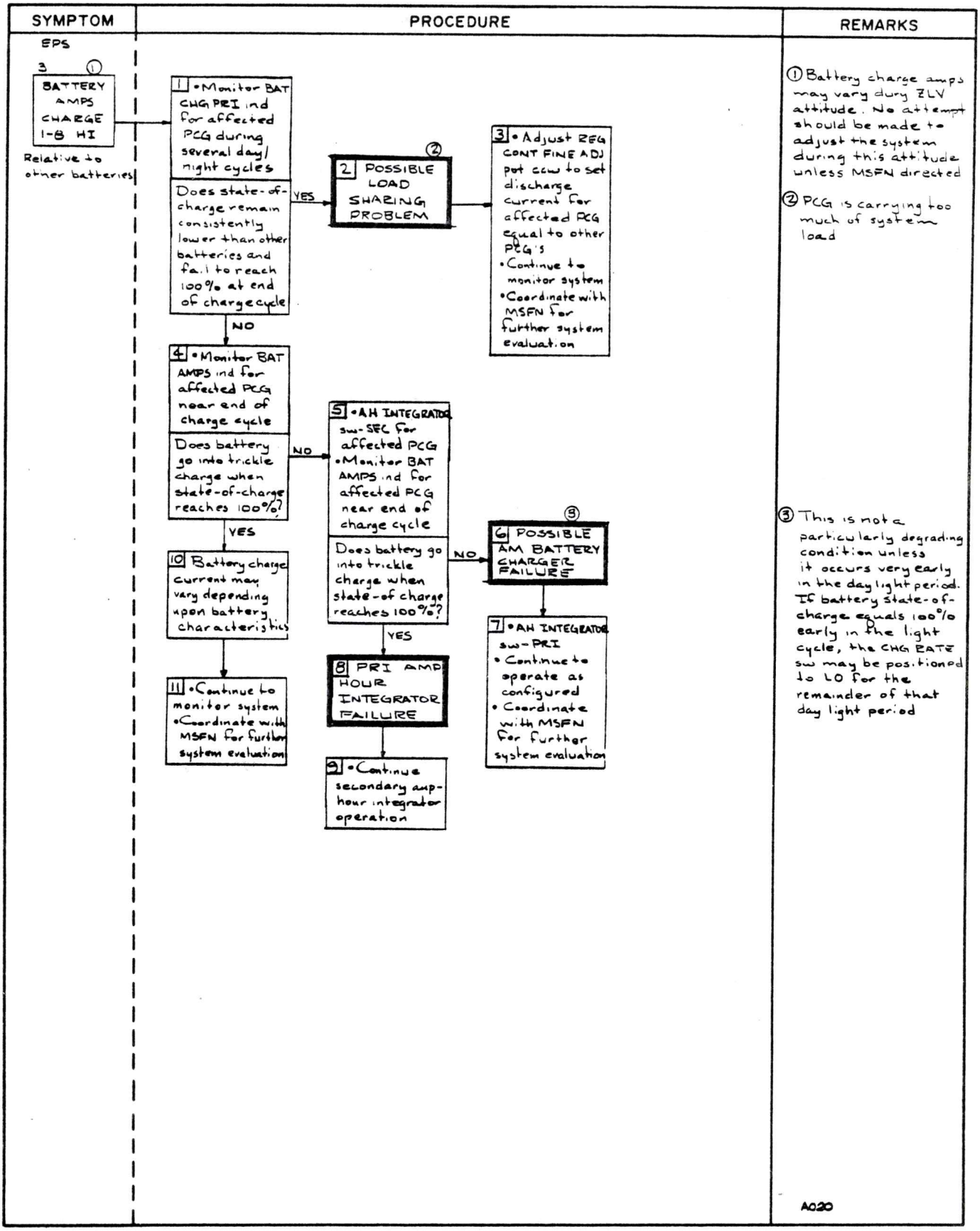
WASTE WATER OVERBOARD DUMP NOT DRAINING	10	5.2.14-7
FAULTY DUMP HEATER INDICATIONS	11	5.2.14-8
WMC WATER DISPENSER LOW OR NO FLOW	12	5.2.14-9
URINE FLUSH GUN LOW QUANTITY OR NO FLOW	12a	5.2.14-9
WATER DROPLETS IN OWS ATMOSPHERE	13	5.2.14-10
LEAKING WMC H2O DISPENSER	13a	5.2.14-10
LEAKING URINE FLUSH GUN	13b	5.2.14-10
LEAKING WARDROOM H2O DISPENSER	13c	5.2.14-10

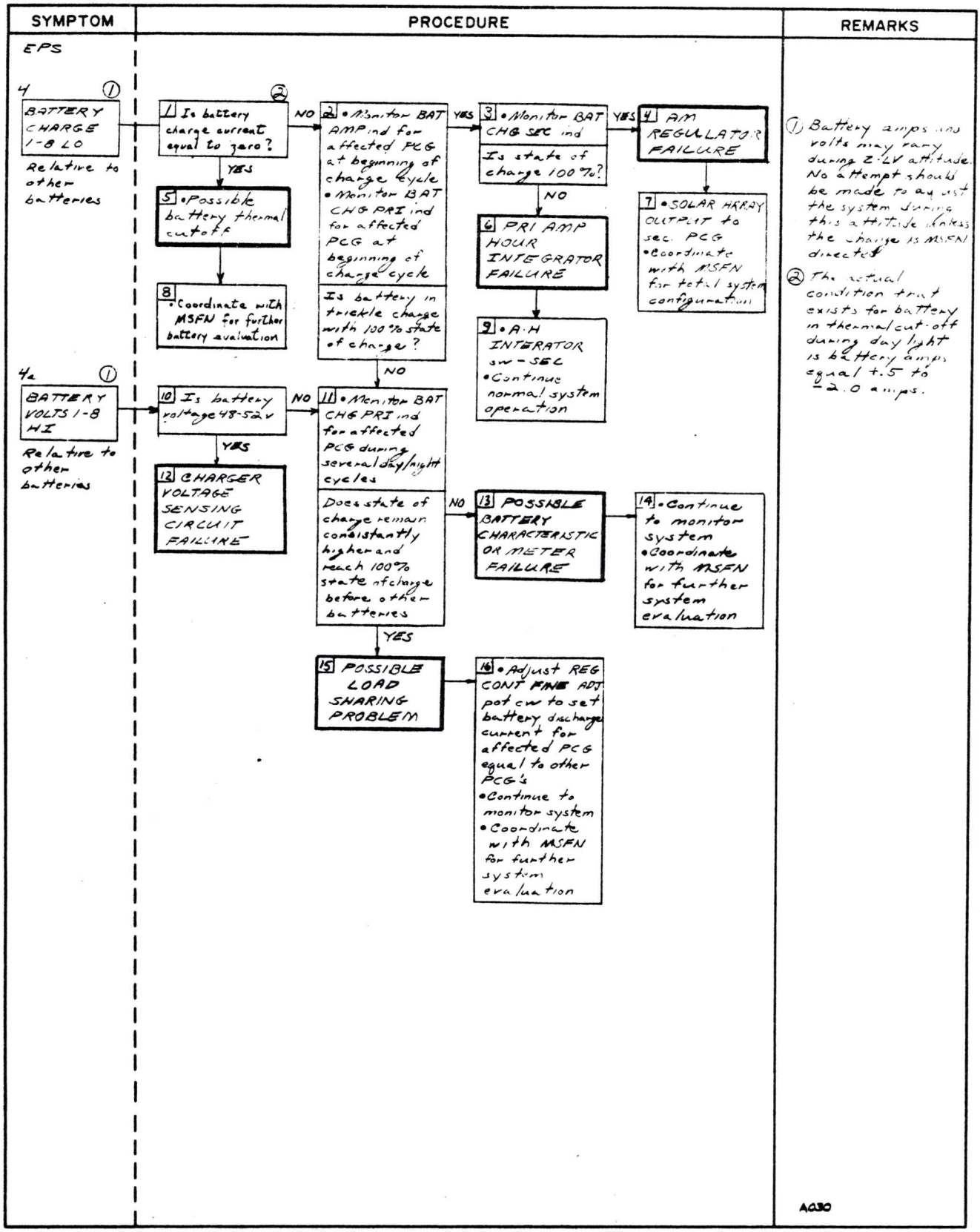
5.2.15 LIGHTING

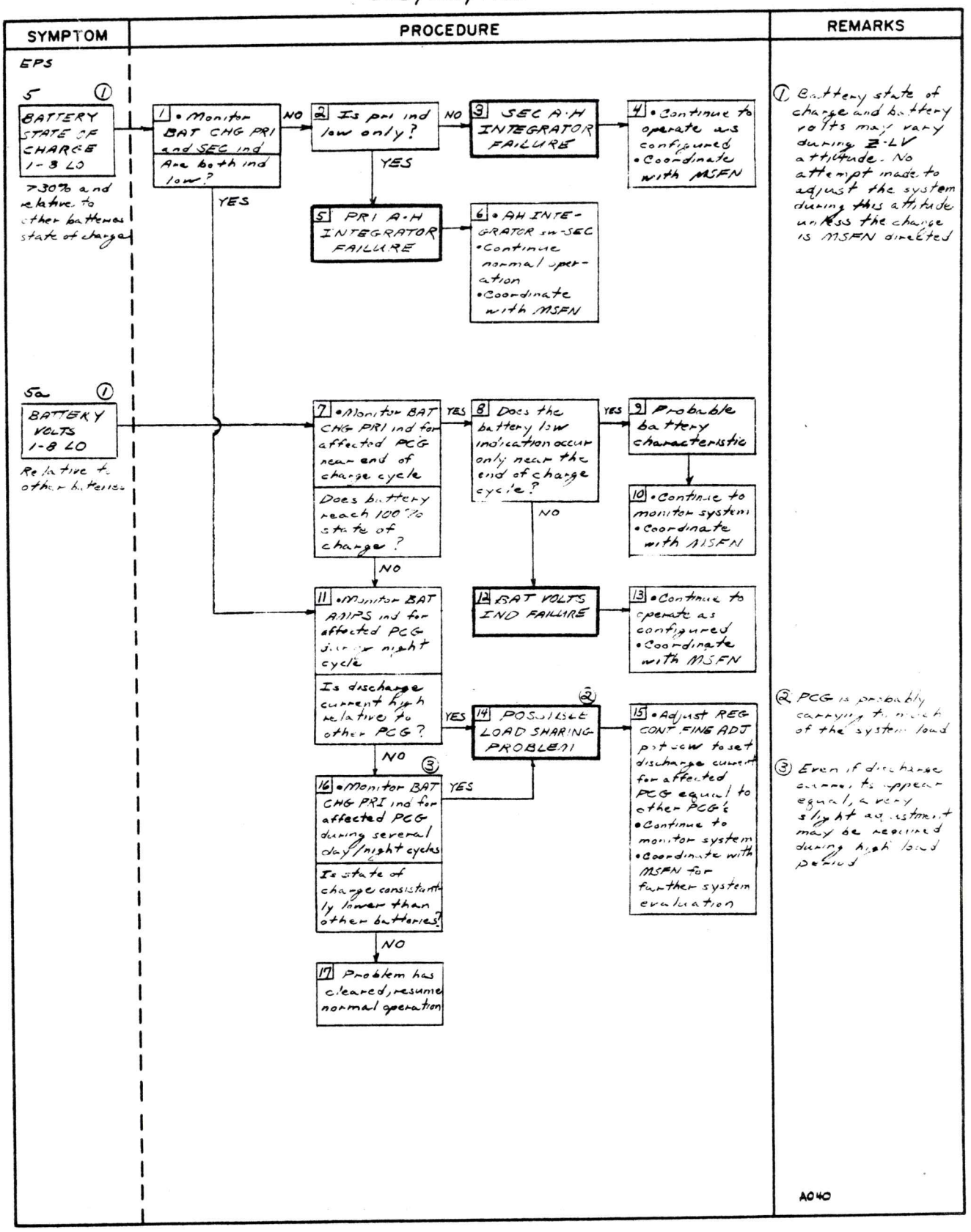
No procedures identified

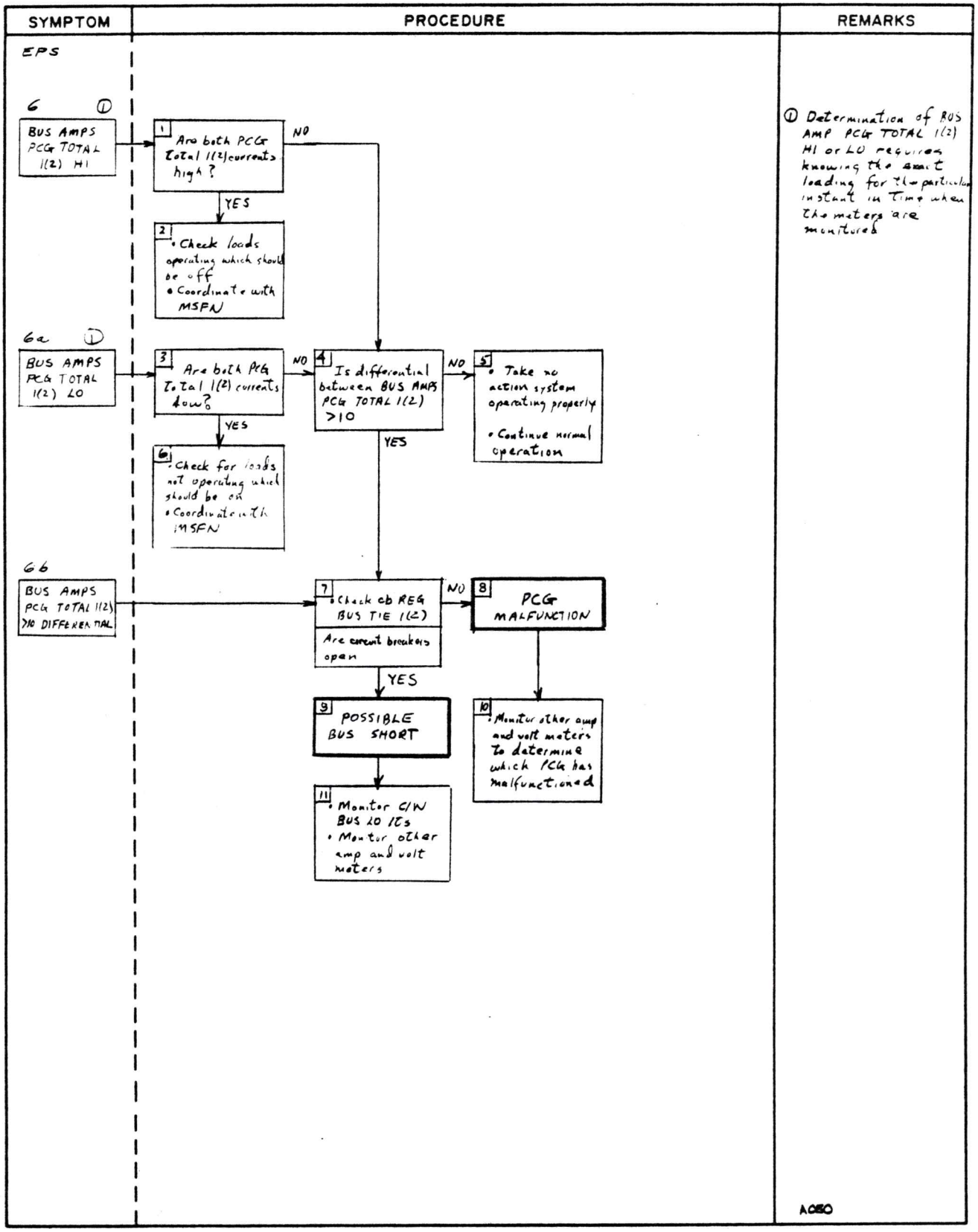

SYMPTOM
PROCEDURE
REMARKS
EPS
1
BATTERY AMPS DISCHARGE 1-8 LO
Relative to other batteries
1a
ARRAY AMPS 1-8 LO
Relative to other arrays
1 Is battery current equal to zero?
NO
YES
2 •Monitor BAT CHG PRI ind for several daylight cycles
Does state-of-charge remain constantly higher and reach 100% much before other batteries?
YES
NO
3 POSSIBLE LOAD SHARING PROBLEM
4 •Adjust REG CONT FINE ADJ pot cw to get battery discharge current for affected PCG equal to other PCGs
•Continue to monitor system
•Coordinate with MSFN for further evaluation
5 POSSIBLE BAT AMPS INDICATOR FAILURE
6 •Continue to operate as configured
•Coordinate with MSFN
7 •Monitor BAT CHG PRI ind
BAT CHG PRI = 0% ?
NO
YES
8 •Monitor BAT CHG PRI and SEC ind
Is state-of-charge changing the same as other PCG's?
YES
NO
9 AM REGULATOR FAILURE
10 Isolate regulator
•SOLAR ARRAY OUTPUT — alternate PCG
•Coordinate with MSFN for system configuration
11 PRI AMP HOUR INTEGRATOR FAILURE
12 Isolate A-H integrator
•AH INTEGRATOR sw-SEC for affected PCG
•Continue operation
•Coordinate with MSFN
13 Is array current equal to zero?
NO
YES
14 Is battery charge current zero with state-of-charge <100% ?
YES
NO
15 POSSIBLE BAT THERMAL CUTOFF
16 •Coordinate with MSFN for further battery evaluation
17 •Monitor BAT AMP ind for affected PCG during night cycle
Is discharge current to relative to other PCGs?
YES
NO
18 Does the symptom appear to be consistent and persist over several cycles?
NO
YES
19 Probable battery characteristic
20 •Periodically monitor system
•Coordinate with MSFN for further system evaluation
21 ARRAY AMPS INDICATOR FAILURE
22 •Continue to operate as configured
•Coordinate with MSFN
23 •Monitor BAT AMP ind for affected PCG
Does battery charge current exist?
YES
NO
24 ARRAY AMPS METER FAILURE
25 Is battery current zero and state-of-charge > 30% ?
YES
NO
26 •CHGR sw-BYPASS
•Monitor ARRAY AMPS ind
Is array current equal to zero?
YES
NO
27 SOLAR ARRAY FAILURE
28 BATTERY CHARGER FAILURE
29 •CHGR sw-BYPASS
•Coordinate with MSFN for further direction
① Battery and array amps may vary during ELV attitude No attempt should be made to adjust the system during this attitude unless the change is MSFN directed
② Primary amp hour integrator is controlling battery charging
③ PCG is not carrying sufficient share of the load
④ Array amps low applies only during the daylight cycle
⑤ Battery amps during thermal cut off in orbital daylight will range from +0.5 to -2.0 amps
⑥ Failure is isolated to the array, the AM charger or the AM regulator If battery state-of-charge is <30%, the battery was able to discharge indicating the regulator has not failed
A000

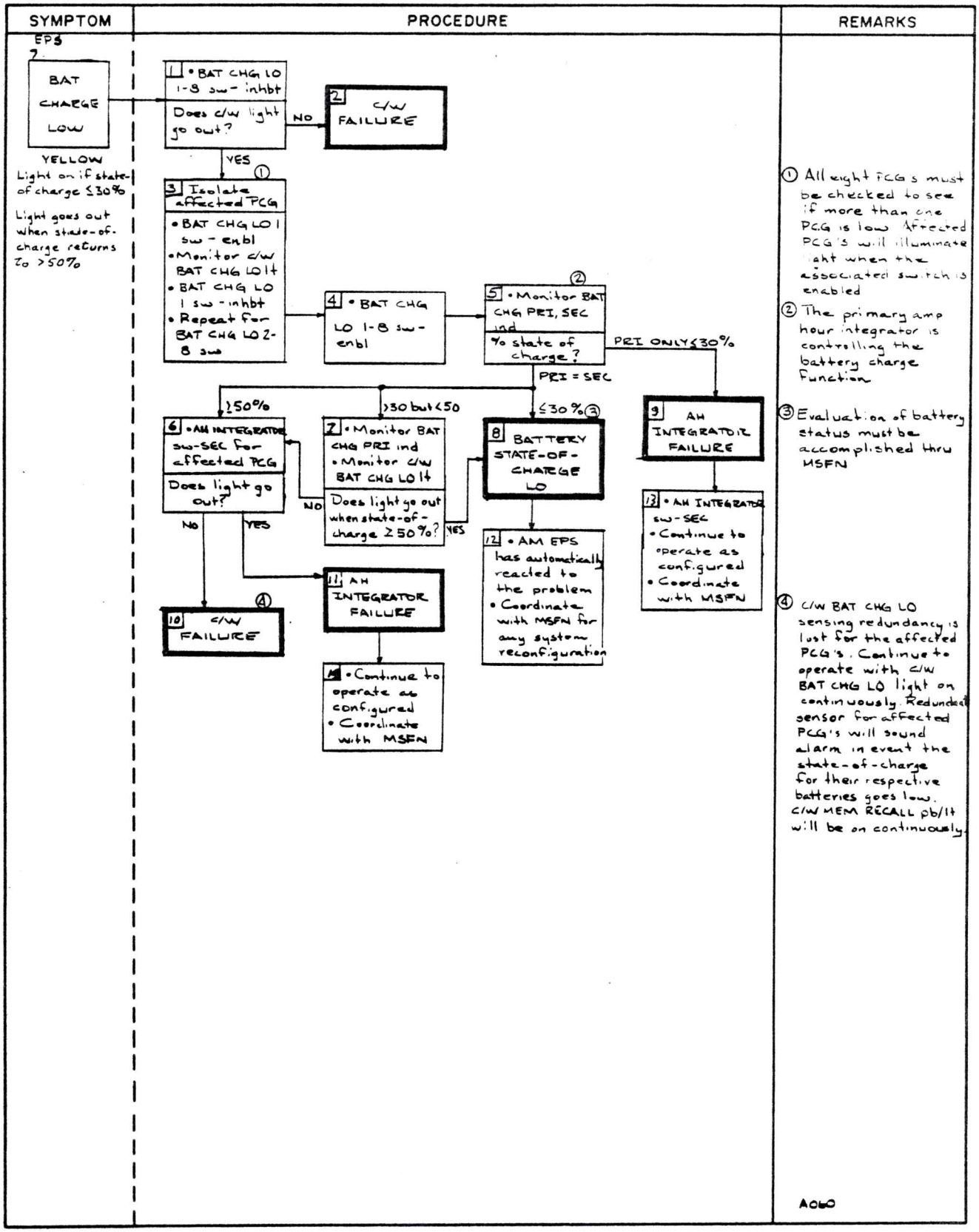

SYMPTOM
PROCEDURE
REMARKS
FPS
2 ①
BATTERY AMPS DISCHARGE 1-B HI
Relative to other batteries
2a ①
ARRAY AMPS 1-B HI
Relative to other arrays
1 • Monitor BAT CHG PRI ind for affected PCG for several day/night cycles
Is state-of-charge consistently lower than other batteries and does not go back to 100%?
NO
YES
2 BATTERY AMPS INDICATOR FAILURE
3 • Continue to operate as configured
• Coordinate with MSFN
② 4 POSSIBLE LOAD SHARING PROBLEM
5 • Adjust REG CONT FINE adj pot ccw to set battery discharge current for affected PCG equal to other PCG's
• Continue to monitor system
• Coordinate with MSFN for further system evaluation
6 • Monitor BAT CHG PRI ind for affected PCG
• Monitor BAT AMPS ind for affected PCG during night cycle
Is discharge current high relative to other PCG's and does state of charge fail to go to 100%?
YES
NO
7 • Monitor BAT CHG PRI ind for affected PCG near end of charge cycle
• Monitor BAT AMPS ind for affected PCG near end of charge cycle
Does battery go into trickle charge when state-of-charge reaches 100%?
NO
YES
8 • AH INTEGRATOR sw-SEC for affected PCG
• Monitor BAT AMP ind for affected PCG near end of charge cycle
Does battery go into trickle charge when state-of-charge reaches 100%?
NO
YES
9 POSSIBLE AM BATTERY CHARGER FAILURE
③ 10 • AH INTEGRATOR sw-PRI
• Continue to operate as configured
• Coordinate with MSFN for further system evaluation
11 PRI AMP HOUR INTEGRATOR FAILURE
12 • Continue secondary amp-hour integrator
13 Array amps may vary depending upon battery characteristics
14 • Continue to monitor system
• Coordinate with MSFN for further system evaluation
① Battery and array amps may vary during ELV attitude. No attempt should be made to adjust the system during this attitude unless the change is MSFN directed
② PCG is carrying too much of system load
③ If battery state-of charge equals 100% early in the light cycle, position the CHG RATE sw to LO for the remainder of that daylight cycle
A010

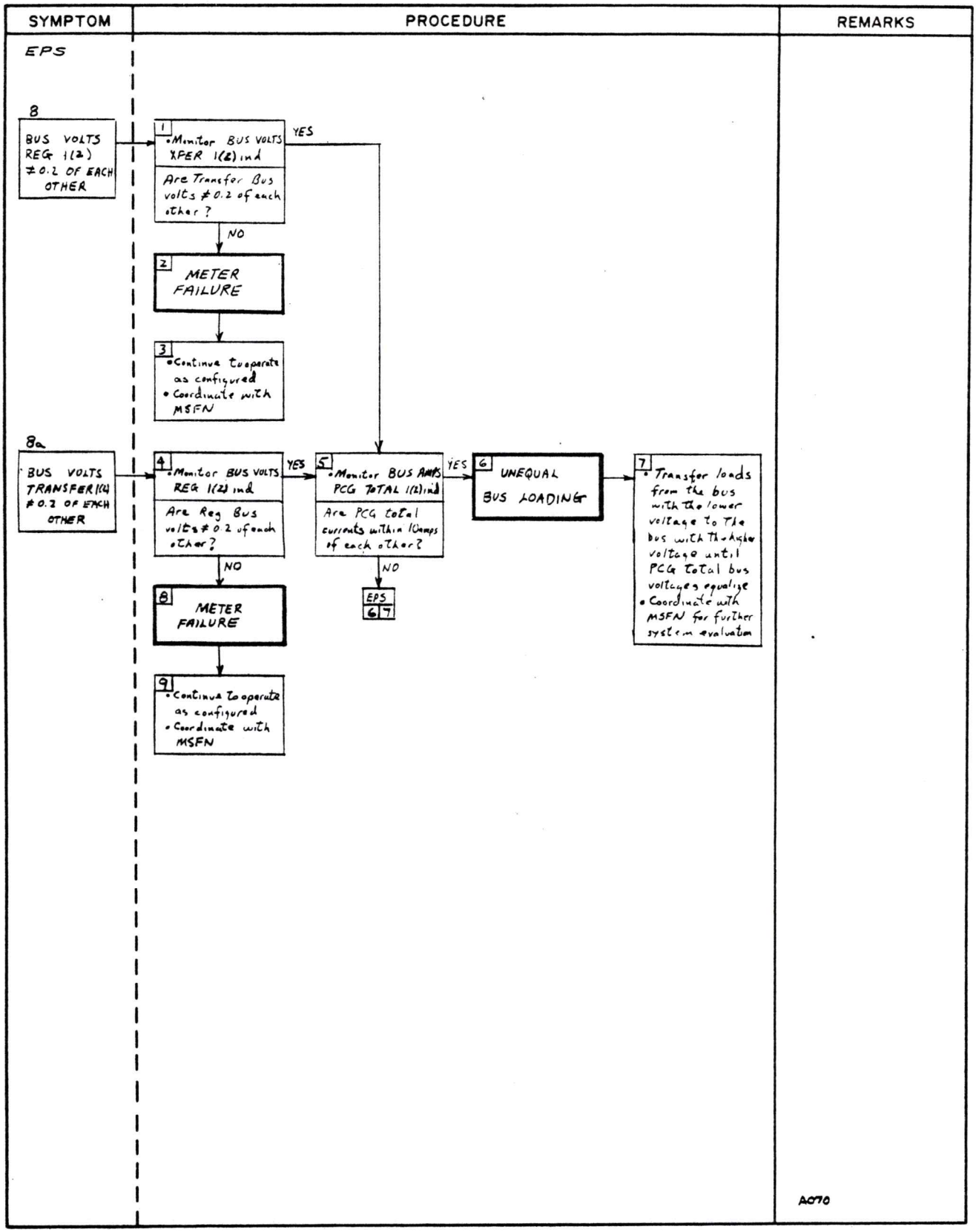

SYMPTOM
PROCEDURE
REMARKS
EPS
3
BATTERY AMPS CHARGE 1-8 HI
Relative to other batteries
1 • Monitor BAT CHG PRI ind for affected PCG during several day/night cycles
Does state-of-charge remain consistently lower than other batteries and fail to reach 100% at end of charge cycle
YES
2 POSSIBLE LOAD SHARING PROBLEM
3 • Adjust REG CONT FINE ADJ pot ccw to set discharge current for affected PCG equal to other PCG's
• Continue to monitor system
• Coordinate with MSFN for further system evaluation
NO
4 • Monitor BAT AMPS ind for affected PCG near end of charge cycle
Does battery go into trickle charge when state-of-charge reaches 100%?
NO
5 • AH INTEGRATOR sw-SEC for affected PCG
• Monitor BAT AMPS ind for affected PCG near end of charge cycle
Does battery go into trickle charge when state-of charge reaches 100%?
NO
6 POSSIBLE AM BATTERY CHARGER FAILURE
7 • AH INTEGRATOR sw-PRI
• Continue to operate as configured
• Coordinate with MSFN for further system evaluation
YES
8 PRI AMP HOUR INTEGRATOR FAILURE
9 • Continue secondary amp-hour integrator operation
YES
10 Battery charge current may vary depending upon battery characteristics
11 • Continue to monitor system
• Coordinate with MSFN for further system evaluation
① Battery charge amps may vary duri ng ZLV attitude. No attempt should be made to adjust the system during this attitude unless MSFN directed
② PCG is carrying too much of system load
③ This is not a particularly degrading condition unless it occurs very early in the daylight period. If battery state-of-charge equals 100% early in the light cycle, the CHG RATE sw may be positioned to LO for the remainder of that day light period
A020

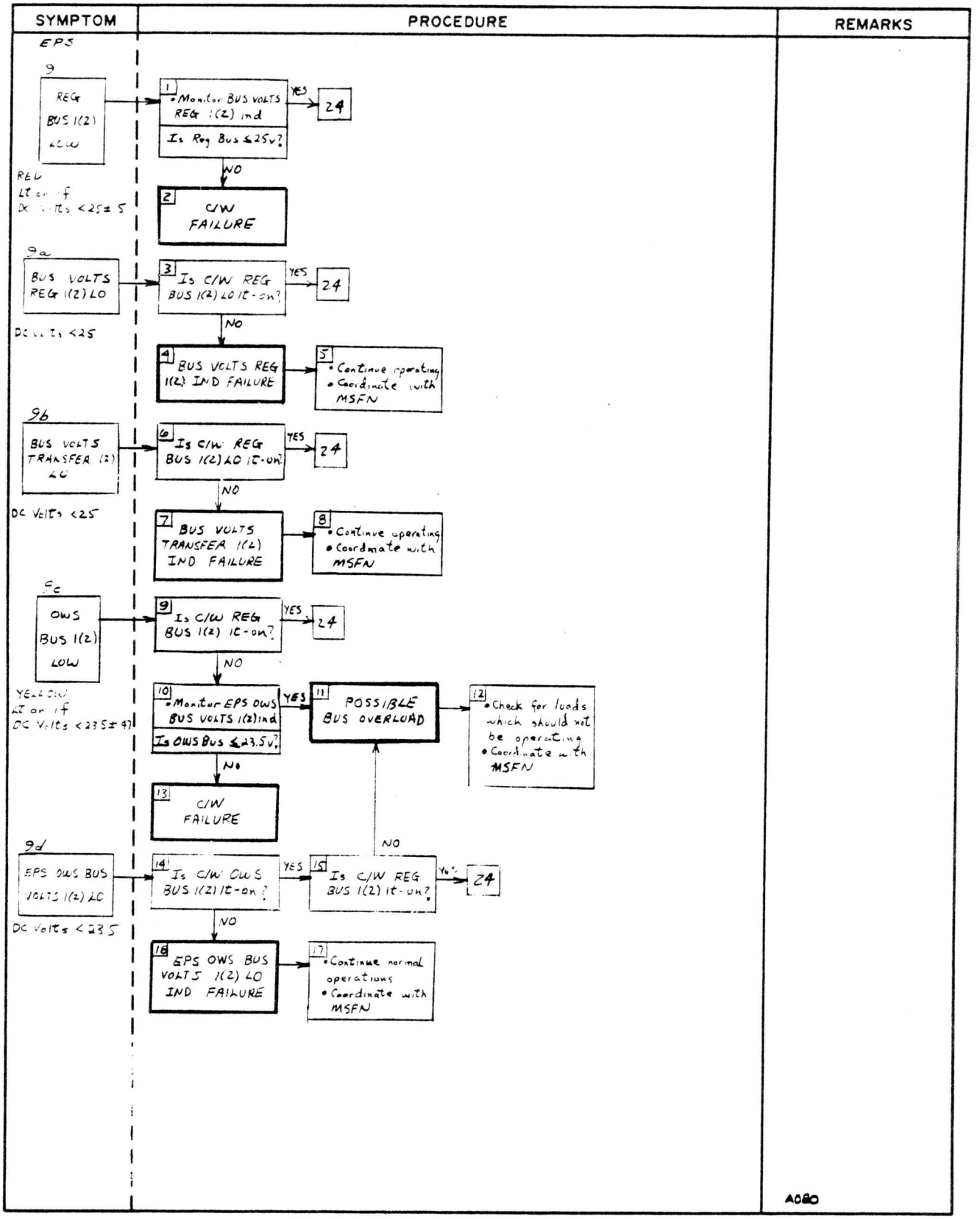

SYMPTOM
PROCEDURE
REMARKS
EPS
4 ①
BATTERY CHARGE 1-8 LO
Relative to other batteries
4a ①
BATTERY VOLTS 1-8 HI
Relative to other batteries
1 Is battery charge current equal to zero? ②
NO
YES
2 • Monitor BAT AMP ind for affected PCG at beginning of charge cycle
• Monitor BAT CHG PRI ind for affected PCG at beginning of charge cycle
Is battery in trickle charge with 100% state of charge?
NO
YES
3 • Monitor BAT CHG SEC ind
Is state of charge 100%?
NO
YES
4 AM REGULATOR FAILURE
5 • Possible battery thermal cutoff
8 • Coordinate with MSFN for further battery evaluation
6 PRI AMP HOUR INTEGRATOR FAILURE
7 • SOLAR ARRAY OUTPUT to sec. PCG
• Coordinate with MSFN for total system configuration
9 • A·H INTEGRATOR sw - SEC
• Continue normal system operation
10 Is battery voltage 48-52 v
NO
YES
11 • Monitor BAT CHG PRI ind for affected PCG during several day/night cycles
Does state of charge remain consistently higher and reach 100% state of charge before other batteries
NO
YES
12 CHARGER VOLTAGE SENSING CIRCUIT FAILURE
13 POSSIBLE BATTERY CHARACTERISTIC OR METER FAILURE
14 • Continue to monitor system
• Coordinate with MSFN for further system evaluation
15 POSSIBLE LOAD SHARING PROBLEM
16 • Adjust REG CONT FINE ADJ pot cw to set battery discharge current for affected PCG equal to other PCG's
• Continue to monitor system
• Coordinate with MSFN for further system evaluation
① Battery amps and volts may vary during 2 LV attitude. No attempt should be made to adjust the system during this attitude unless the change is MSFN directed
② The actual condition that exists for battery in thermal cut-off during day light is battery amps equal +.5 to -2.0 amps.
A030

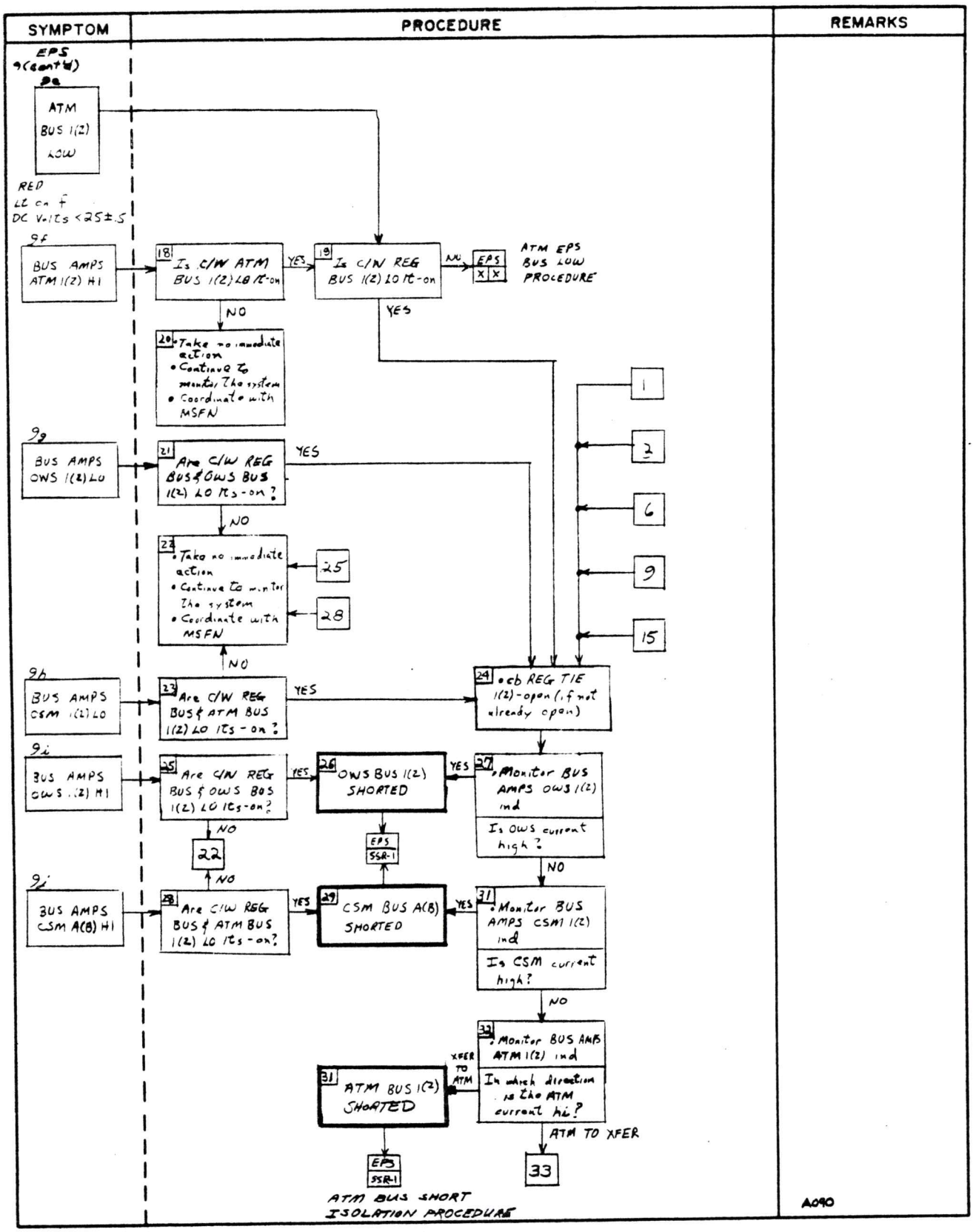

SYMPTOM
PROCEDURE
REMARKS
EPS
5 ①
BATTERY STATE OF CHARGE 1-8 LO
>30% and relative to other batteries state of charge
1 • Monitor BAT CHG PRI and SEC ind
Are both ind low?
NO
2 Is pri ind low only?
NO
3 SEC A-H INTEGRATOR FAILURE
4 • Continue to operate as configured
• Coordinate with MSFN
YES
YES
5 PRI A-H INTEGRATOR FAILURE
6 • AH INTEGRATOR sw-SEC
• Continue normal operation
• Coordinate with MSFN
5a ①
BATTERY VOLTS 1-8 LO
Relative to other batteries
7 • Monitor BAT CHG PRI ind for affected PCG near end of charge cycle
Does battery reach 100% state of charge?
YES
8 Does the battery low indication occur only near the end of charge cycle?
YES
9 Probable battery characteristic
10 • Continue to monitor system
• Coordinate with MSFN
NO
NO
11 • Monitor BAT AMPS ind for affected PCG during day or night cycle
Is discharge current high relative to other PCG?
12 BAT VOLTS IND FAILURE
13 • Continue to operate as configured
• Coordinate with MSFN
YES
②
14 POSSIBLE LOAD SHARING PROBLEM
15 • Adjust REG CONT FINE ADJ pot cw to set discharge current for affected PCG equal to other PCG's
• Continue to monitor system
• Coordinate with MSFN for further system evaluation
NO
③
16 • Monitor BAT CHG PRI ind for affected PCG during several day/night cycles
Is state of charge consistently lower than other batteries?
YES
NO
17 Problem has cleared, resume normal operation
① Battery state of charge and battery volts may vary during Z-LV attitude. No attempt made to adjust the system during this attitude unless the change is MSFN directed
② PCG is probably carrying the most of the system load
③ Even if discharge current is appear equal, a very slight adjustment may be required during high load period
A040

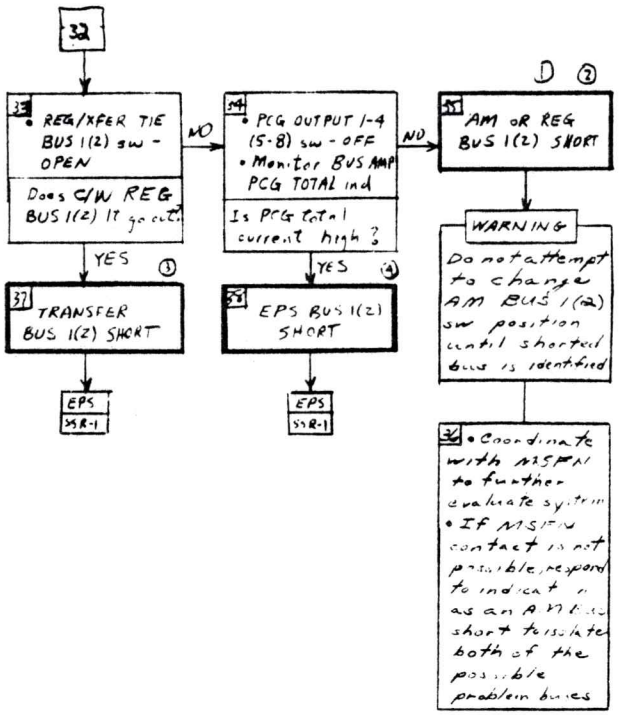

SYMPTOM
PROCEDURE
REMARKS
EPS
6 ①
BUS AMPS PCG TOTAL 1(2) HI
1 Are both PCG Total 1(2) currents high?
NO
YES
2 • Check loads operating which should be off
• Coordinate with MSFN
6a ①
BUS AMPS PCG TOTAL 1(2) LO
3 Are both PCG Total 1(2) currents low?
NO
4 Is differential between BUS AMPS PCG TOTAL 1(2) >10
NO
5 • Take no action system operating properly
• Continue normal operation
YES
6 • Check for loads not operating which should be on
• Coordinate with MSFN
6b
BUS AMPS PCG TOTAL 1(2) >10 DIFFERENTIAL
7 • Check cb REG BUS TIE 1(2)
Are current breakers open
NO
8 PCG MALFUNCTION
YES
9 POSSIBLE BUS SHORT
10 • Monitor other amp and volt meters to determine which PCG has malfunctioned
11 • Monitor C/W BUS LO LTs
• Monitor other amp and volt meters
① Determination of BUS AMP PCG TOTAL 1(2) HI or LO requires knowing the exact loading for the particular instant in time when the meters are monitored
A080


SYMPTOM
PROCEDURE
REMARKS
EPS
7
BAT CHARGE LOW
YELLOW
Light on if state-of-charge ≤30%
Light goes out when state-of-charge returns to >50%
1 • BAT CHG LO 1-8 sw - inhbt
Does c/w light go out?
NO
2 C/W FAILURE
YES
3 Isolate affected PCG
• BAT CHG LO 1 sw - enbl
• Monitor c/w BAT CHG LO lt
• BAT CHG LO 1 sw - inhbt
• Repeat for BAT CHG LO 2-8 sw
4 • BAT CHG LO 1-8 sw - enbl
5 • Monitor BAT CHG PRI, SEC ind
% state of charge?
PRI ONLY ≤30%
PRI = SEC
≥50%
>30 but <50
≤30%
6 • AH INTEGRATOR sw-SEC for affected PCG
Does light go out?
NO
YES
7 • Monitor BAT CHG PRI ind
• Monitor c/w BAT CHG LO lt
Does light go out when state-of-charge ≥50%?
NO
YES
8 BATTERY STATE-OF-CHARGE LO
9 AH INTEGRATOR FAILURE
10 C/W FAILURE
11 AH INTEGRATOR FAILURE
12 • AM EPS has automatically reacted to the problem
• Coordinate with MSFN for any system reconfiguration
13 • AH INTEGRATOR sw-SEC
• Continue to operate as configured
• Coordinate with MSFN
M • Continue to operate as configured
• Coordinate with MSFN
① All eight PCG's must be checked to see if more than one PCG is low. Affected PCG's will illuminate light when the associated switch is enabled
② The primary amp hour integrator is controlling the battery charge function
③ Evaluation of battery status must be accomplished thru MSFN
④ c/w BAT CHG LO sensing redundancy is lost for the affected PCG's. Continue to operate with c/w BAT CHG LO light on continuously. Redundant sensor for affected PCG's will sound alarm in event the state-of-charge for their respective batteries goes low. c/w MEM RECALL pb/lt will be on continuously.
A060

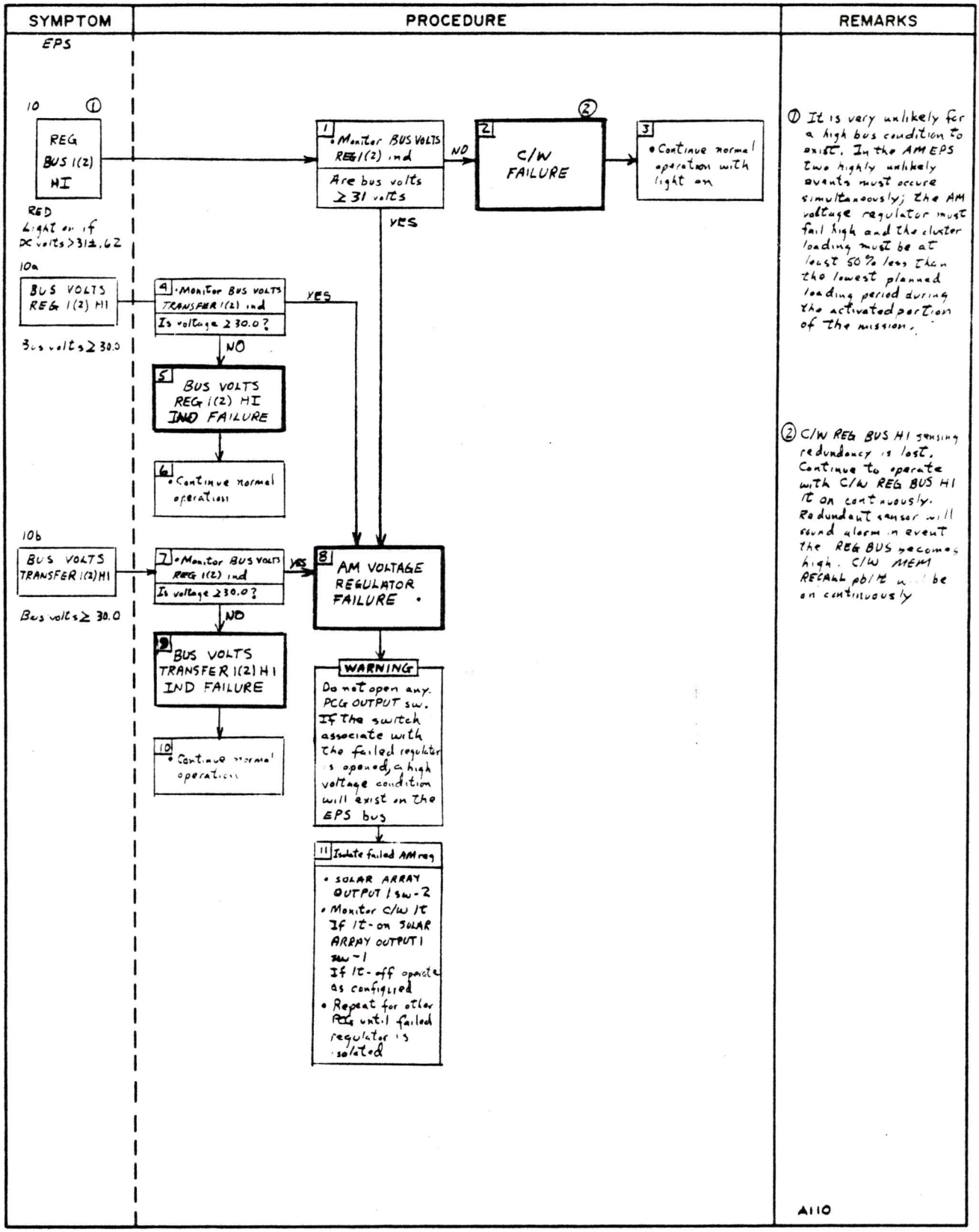

SYMPTOM
PROCEDURE
REMARKS
EPS
8
BUS VOLTS REG 1(2) ≠ 0.2 OF EACH OTHER
1
•Monitor BUS VOLTS XFER 1(2) ind
Are Transfer Bus volts ≠ 0.2 of each other?
YES
NO
2
METER FAILURE
3
•Continue to operate as configured
• Coordinate with MSFN
8a
BUS VOLTS TRANSFER 1(2) ≠ 0.2 OF EACH OTHER
4
•Monitor BUS VOLTS REG 1(2) ind
Are Reg Bus volts ≠ 0.2 of each other?
YES
NO
5
•Monitor BUS AMPS PCG TOTAL 1(2) ind
Are PCG total currents within 10amps of each other?
YES
NO
EPS 6 7
6
UNEQUAL BUS LOADING
7
• Transfer loads from the bus with the lower voltage to the bus with the higher voltage until PCG total bus voltages equalize
• Coordinate with MSFN for further system evaluation
8
METER FAILURE
9
•Continue to operate as configured
• Coordinate with MSFN
A070

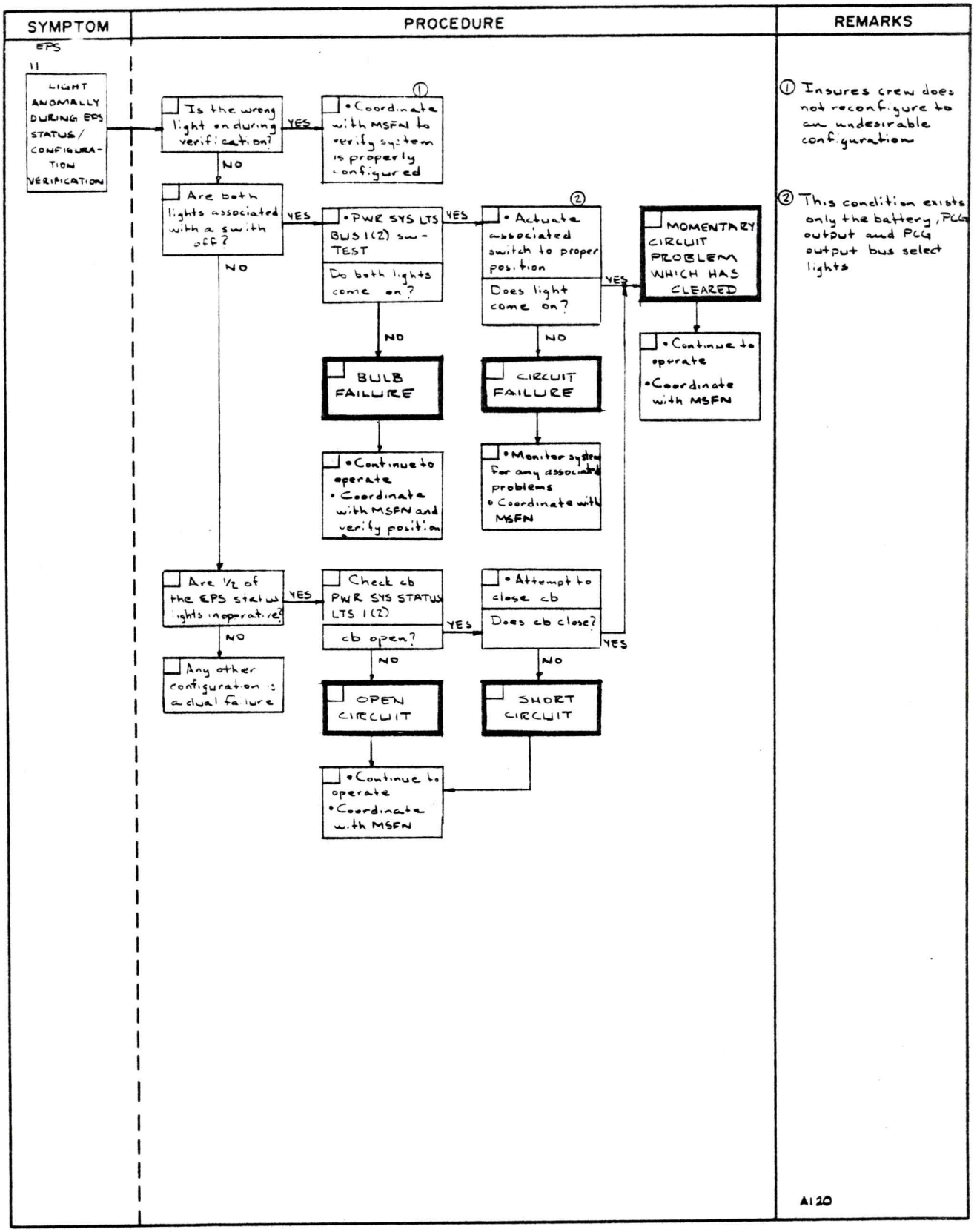

SYMPTOM
PROCEDURE
REMARKS
EPS
9
REG BUS 1(2) LOW
REG LT on if DC Volts < 25 ± 5
1 • Monitor BUS VOLTS REG 1(2) ind
Is Reg Bus ≤ 25v?
YES
24
NO
2 C/W FAILURE
9a
BUS VOLTS REG 1(2) LO
DC Volts < 25
3 Is C/W REG BUS 1(2) LO lt-on?
YES
24
NO
4 BUS VOLTS REG 1(2) IND FAILURE
5 • Continue operating • Coordinate with MSFN
9b
BUS VOLTS TRANSFER (2) LO
DC Volts < 25
6 Is C/W REG BUS 1(2) LO lt-on?
YES
24
NO
7 BUS VOLTS TRANSFER 1(2) IND FAILURE
8 • Continue operating • Coordmate with MSFN
9c
OWS BUS 1(2) LOW
YELLOW LT on if DC Volts < 23.5 ± 9
9 Is C/W REG BUS 1(2) lt-on?
YES
24
NO
10 • Monitor EPS OWS BUS VOLTS 1(2) ind
Is OWS Bus ≤ 23.5v?
YES
11 POSSIBLE BUS OVERLOAD
12 • Check for loads which should not be operating • Coordinate with MSFN
NO
13 C/W FAILURE
9d
EPS OWS BUS VOLTS 1(2) LO
DC Volts < 23.5
14 Is C/W OWS BUS 1(2) lt-on?
YES
15 Is C/W REG BUS 1(2) lt-on?
Yes
24
NO
16 EPS OWS BUS VOLTS 1(2) LO IND FAILURE
17 • Continue normal operations • Coordinate with MSFN
A080


SYMPTOM
PROCEDURE
REMARKS
EPS 9 (cont'd)
9a
ATM BUS 1(2) LOW
RED LT on if DC Volts < 25±.5
9f
BUS AMPS ATM 1(2) HI
18 Is C/W ATM BUS 1(2) LO lt-on
YES
19 Is C/W REG BUS 1(2) LO lt-on
NO
EPS X X
ATM EPS BUS LOW PROCEDURE
NO
YES
20 • Take no immediate action • Continue to monitor the system • Coordinate with MSFN
9g
BUS AMPS OWS 1(2) LO
21 Are C/W REG BUS & OWS BUS 1(2) LO lts-on?
YES
NO
22 • Take no immediate action • Continue to monitor the system • Coordinate with MSFN
25
28
NO
1
2
6
9
15
9h
BUS AMPS CSM 1(2) LO
23 Are C/W REG BUS & ATM BUS 1(2) LO lts-on?
YES
24 • cb REG TIE 1(2)-open (if not already open)
9i
BUS AMPS OWS 1(2) HI
25 Are C/W REG BUS & OWS BUS 1(2) LO lts-on?
YES
26 OWS BUS 1(2) SHORTED
YES
27 • Monitor BUS AMPS OWS 1(2) ind
Is OWS current high?
EPS SSR-1
NO
22
NO
9j
BUS AMPS CSM A(B) HI
28 Are C/W REG BUS & ATM BUS 1(2) LO lts-on?
YES
29 CSM BUS A(B) SHORTED
YES
31 • Monitor BUS AMPS CSM 1(2) ind
Is CSM current high?
NO
32 • Monitor BUS AMPS ATM 1(2) ind
XFER TO ATM
In which direction is the ATM current hi?
31 ATM BUS 1(2) SHORTED
ATM TO XFER
EPS SSR-1
33
ATM BUS SHORT ISOLATION PROCEDURE
A090

SYMPTOM	PROCEDURE	REMARKS
EPS (cont'd)		(1) AM BUS includes the Sequential, Deploy and EREP buses (2) Determination of Reg BUS or AM BUS short requires MSFN monitoring of the Reg and AM bus voltages during the shorted condition (3) Sustained short will cause loss of CSM dual bus feeder capability. CSM must be configured for Bus A or Bus B feeder operation only (4) EPS diodes may open clearing the fault. The above will cause false caution & warning control for the four PCG in the alternate bus.

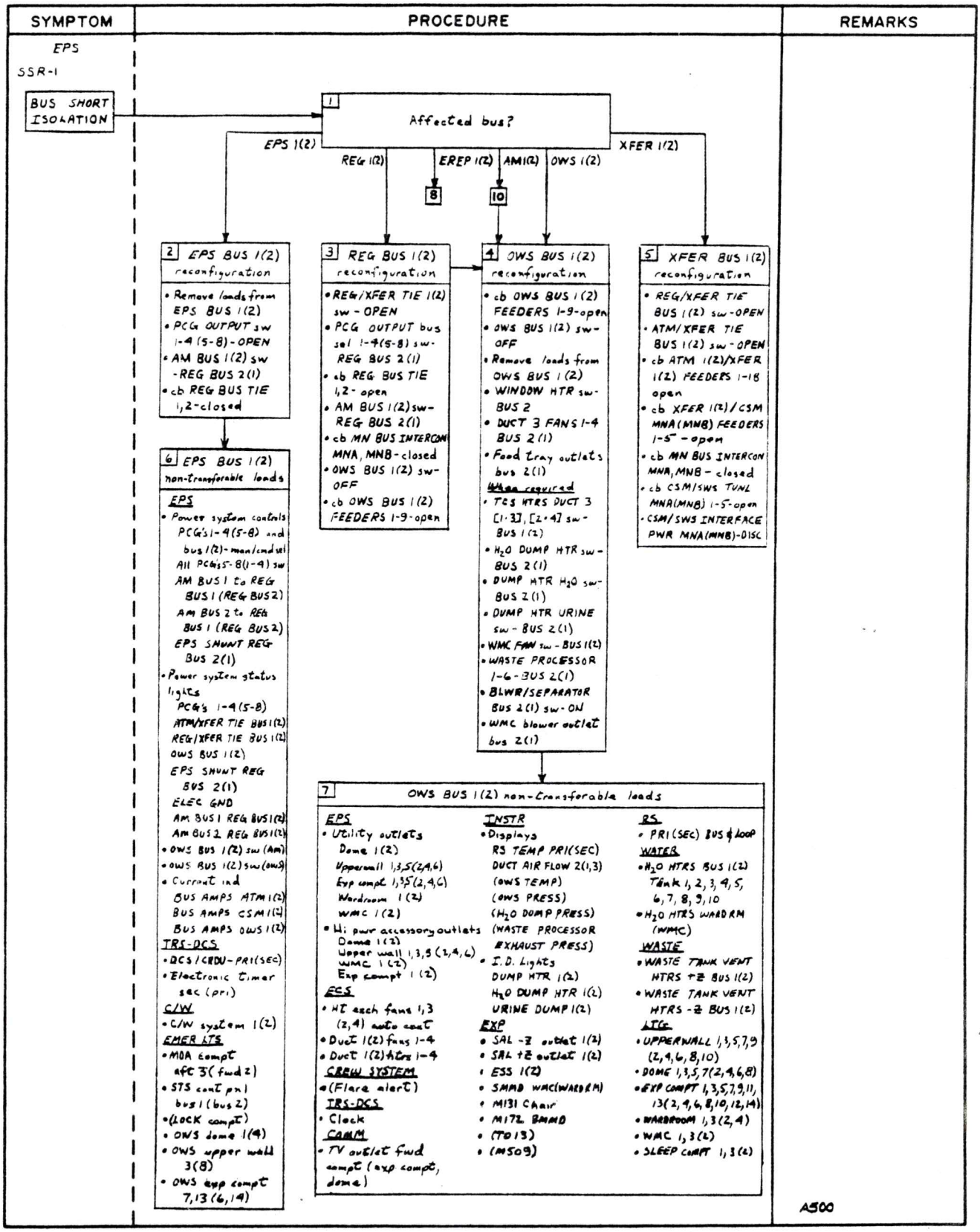
A100


SYMPTOM
PROCEDURE
REMARKS
EPS
10 ①
REG BUS 1(2) HI
RED Light on if DC volts > 31 ± .62
10a
BUS VOLTS REG 1(2) HI
Bus volts ≥ 30.0
10b
BUS VOLTS TRANSFER 1(2) HI
Bus volts ≥ 30.0
1 • Monitor BUS VOLTS REG 1(2) ind
Are bus volts ≥ 31 volts
NO
YES
2 C/W FAILURE
②
3 • Continue normal operation with light on
4 • Monitor BUS VOLTS TRANSFER 1(2) ind
Is voltage ≥ 30.0?
YES
NO
5 BUS VOLTS REG 1(2) HI IND FAILURE
6 • Continue normal operation
7 • Monitor BUS VOLTS REG 1(2) ind
Is voltage ≥ 30.0?
YES
NO
8 AM VOLTAGE REGULATOR FAILURE •
9 BUS VOLTS TRANSFER 1(2) HI IND FAILURE
10 • Continue normal operation
WARNING
Do not open any PCG OUTPUT sw. If the switch associate with the failed regulator is opened, a high voltage condition will exist on the EPS bus
11 Isolate failed AM reg
• SOLAR ARRAY OUTPUT 1 sw-2
• Monitor C/W lt If lt-on SOLAR ARRAY OUTPUT 1 sw-1 If lt-off operate as configured
• Repeat for other REG until failed regulator is isolated
① It is very unlikely for a high bus condition to exist. In the AM EPS two highly unlikely events must occure simultaneously; the AM voltage regulator must fail high and the cluster loading must be at least 50% less than the lowest planned loading period during the activated portion of the mission.
② C/W REG BUS HI sensing redundancy is lost. Continue to operate with C/W REG BUS HI lt on continuously. Redundant sensor will sound alarm in event the REG BUS becomes high. C/W MEM RECALL pb/lt will be on continuously
A110


SYMPTOM
PROCEDURE
REMARKS
EPS
11
LIGHT ANOMALLY DURING EPS STATUS / CONFIGURATION VERIFICATION
Is the wrong light on during verification?
YES
• Coordinate with MSFN to verify system is properly configured
NO
Are both lights associated with a switch off?
YES
• PWR SYS LTS BUS 1(2) sw - TEST
Do both lights come on?
YES
• Actuate associated switch to proper position
Does light come on?
YES
MOMENTARY CIRCUIT PROBLEM WHICH HAS CLEARED
• Continue to operate
• Coordinate with MSFN
NO
BULB FAILURE
• Continue to operate
• Coordinate with MSFN and verify position
NO
CIRCUIT FAILURE
• Monitor system for any associated problems
• Coordinate with MSFN
NO
Are 1/2 of the EPS status lights inoperative?
YES
Check cb PWR SYS STATUS LTS 1(2)
cb open?
YES
• Attempt to close cb
Does cb close?
YES
NO
OPEN CIRCUIT
NO
SHORT CIRCUIT
NO
Any other configuration is a dual failure
• Continue to operate
• Coordinate with MSFN
① Insures crew does not reconfigure to an undesirable configuration
② This condition exists only the battery, PCG output and PCG output bus select lights
A120

SYMPTOM	PROCEDURE	REMARKS
EPS		
12 UNABLE TO ADJUST REG BUS 1(2)	1 Attempt to make needed adjustment using REG CONT FINE ADJ 1-A (5-8) pot ①	① This is the only available action. For either case, adjustment made or not made, contact MSFN for further direction.

A130


SYMPTOM
PROCEDURE
REMARKS
EPS
SSR-1
BUS SHORT ISOLATION
1 Affected bus?
EPS 1(2)
REG 1(2)
EREP 1(2)
AM 1(2)
OWS 1(2)
XFER 1(2)
8
10
2 EPS BUS 1(2) reconfiguration
• Remove loads from EPS BUS 1(2)
• PCG OUTPUT sw 1-4 (5-8) - OPEN
• AM BUS 1(2) sw - REG BUS 2(1)
• cb REG BUS TIE 1,2 - closed
3 REG BUS 1(2) reconfiguration
• REG/XFER TIE 1(2) sw - OPEN
• PCG OUTPUT bus sel 1-4(5-8) sw - REG BUS 2(1)
• cb REG BUS TIE 1,2 - open
• AM BUS 1(2) sw - REG BUS 2(1)
• cb MN BUS INTERCON MNA, MNB - closed
• OWS BUS 1(2) sw - OFF
• cb OWS BUS 1(2) FEEDERS 1-9 - open
4 OWS BUS 1(2) reconfiguration
• cb OWS BUS 1(2) FEEDERS 1-9 - open
• OWS BUS 1(2) sw - OFF
• Remove loads from OWS BUS 1(2)
• WINDOW HTR sw - BUS 2
• DUCT 3 FANS 1-4 BUS 2(1)
• Food tray outlets bus 2(1)
WMA as required
• TCS HTRS DUCT 3 [1-3], [2-4] sw - BUS 1(2)
• H2O DUMP HTR sw - BUS 2(1)
• DUMP HTR H2O sw - BUS 2(1)
• DUMP HTR URINE sw - BUS 2(1)
• WMC FAN sw - BUS 1(2)
• WASTE PROCESSOR 1-6 - BUS 2(1)
• BLWR/SEPARATOR BUS 2(1) sw - ON
• WMC blower outlet bus 2(1)
5 XFER BUS 1(2) reconfiguration
• REG/XFER TIE BUS 1(2) sw - OPEN
• ATM/XFER TIE BUS 1(2) sw - OPEN
• cb ATM 1(2)/XFER 1(2) FEEDERS 1-18 open
• cb XFER 1(2)/CSM MNA(MNB) FEEDERS 1-5 - open
• cb MN BUS INTERCON MNA, MNB - closed
• cb CSM/SWS TUNL MNA(MNB) 1-5 - open
• CSM/SWS INTERFACE PWR MNA(MNB) - DISC
6 EPS BUS 1(2) non-transferable loads
EPS
• Power system controls
PCG's 1-4 (5-8) and bus 1(2) - man/cmd sel
All PCG's 5-8 (1-4) sw
AM BUS 1 to REG BUS 1 (REG BUS 2)
AM BUS 2 to REG BUS 1 (REG BUS 2)
EPS SHUNT REG BUS 2(1)
• Power system status lights
PCG's 1-4 (5-8)
ATM/XFER TIE BUS 1(2)
REG/XFER TIE BUS 1(2)
OWS BUS 1(2)
EPS SHUNT REG BUS 2(1)
ELEC GND
AM BUS 1 REG BUS 1(2)
AM BUS 2 REG BUS 1(2)
• OWS BUS 1(2) sw (AM)
• OWS BUS 1(2) sw (OWS)
• Current ind
BUS AMPS ATM 1(2)
BUS AMPS CSM 1(2)
BUS AMPS OWS 1(2)
TRS-DCS
• DCS / CRDU - PRI(SEC)
• Electronic timer sec (pri)
C/W
• C/W system 1(2)
EMER LTS
• MDA compt aft 3 (fwd 2)
• STS cont pnl bus 1 (bus 2)
• (LOCK compt)
• OWS dome 1(4)
• OWS upper wall 3(8)
• OWS exp compt 7,13 (6,14)
7 OWS BUS 1(2) non-transferable loads
EPS
• Utility outlets
Dome 1(2)
Upper wall 1,3,5 (2,4,6)
Exp compt 1,3,5 (2,4,6)
Wardroom 1(2)
WMC 1(2)
• Hi pwr accessory outlets
Dome 1(2)
Upper wall 1,3,5 (2,4,6)
WMC 1(2)
Exp compt 1(2)
ECS
• HI each fans 1,3 (2,4) auto cont
• Duct 1(2) fans 1-4
• Duct 1(2) htrs 1-4
CREW SYSTEM
• (Flare alert)
TRS-DCS
• Clock
COMM
• TV outlet fwd compt (exp compt, dome)
INSTR
• Displays
RS TEMP PRI(SEC)
DUCT AIR FLOW 2(1,3)
(OWS TEMP)
(OWS PRESS)
(H2O DUMP PRESS)
(WASTE PROCESSOR EXHAUST PRESS)
• I.D. Lights
DUMP HTR 1(2)
H2O DUMP HTR 1(2)
URINE DUMP 1(2)
EXP
• SAL -Z outlet 1(2)
• SAL +Z outlet 1(2)
• ESS 1(2)
• SMMD WMC(WARDRM)
• M131 Chair
• M172 BMMD
• (TD13)
• (M509)
RS
• PRI(SEC) BUS & LOOP
WATER
• H2O HTRS BUS 1(2) Tank 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
• H2O HTRS WARDRM (WMC)
WASTE
• WASTE TANK VENT HTRS +Z BUS 1(2)
• WASTE TANK VENT HTRS -Z BUS 1(2)
LTG
• UPPERWALL 1,3,5,7,9 (2,4,6,8,10)
• DOME 1,3,5,7 (2,4,6,8)
• EXP COMPT 1,3,5,7,9,11, 13 (2,4,6,8,10,12,14)
• WARDROOM 1,3 (2,4)
• WMC 1,3 (2)
• SLEEP COMPT 1,3 (2)
A500

SYMPTOM	PROCEDURE	REMARKS

EPS
SSR-1 (cont'd)

1 → 8 EREP BUS 1(2) reconfiguration
- EREP POWER BUS 1(2) sw - OFF

1 → 9 EREP BUS 1(2) non-transferable loads
- BUS 1
  - EREP recorder 1
  - EXP S191
  - EXP S192
  - EXP S194
- BUS 2
  - EREP recorder 2
  - EXP S190
  - EXP S193

1 → 10 AM BUS 1(2) reconfiguration
- REG/XFER TIE 1(2) sw - OPEN
- PCG OUTPUT bus sel 1-4(5-8) sw - REG BUS 2(1)
- cb REG BUS TIE 1,2 - open
- cb MN BUS INTERCONN MNA, MNB - closed
- Audio system to channel B
- COOL PUMP INVERT sel - PRI 2, SEC 1,3 (PRI 1,3, SEC 2)
- COOL PUMP PRI B,C (SEC B,C) sw - ON
- MDA FANS CSM OUTLET 2(1)
- AM DUCT FANS OUTLET 2(1)

10 → 4

10 → 11 AM BUS 1(2) non-transferable loads

EPS
- Utility outlets AM 1,3,5 (2,4,6) MDA 1,3 (2,4)
- Hi pwr access outlets MDA 1(2)
- EREP pwr cont bus 1(2)

COMM
- Intercom box channel A(B)
- CCU outlets channel A(B)
- Crew alert call 1(2)
- Antenna cont 1(2)
- TV pwr AM (MDA)
- (TV ATM video pwr)
- Teleprinter
- VHF xpndr

ECS
- Fans MDA 1(2) AM 1,3(2) OWS heat exch 1,3(2,4)
- Vent Valves MDA 1(2) OWS solenoid 1(2) OWS pneu 1(2)
- Heaters MDA/OWS cont 1(2) MDA tunnel pri 1(2) MDA tunnel sec 1(2) MDA wall pri 1(2) MDA wall sec 1(2) MDA port pri (sec) AM wall 1(2) OWS radiant 1,3,5,7 (2,4,6,8)

ECS cont'd
- (EREP window)
- I/LCA 1(2)
- Molecular sieve vent pri (sec)
- Molecular sieve A Fans pri (sec) Timers pri (sec) Bad htrs
- Molecular sieve B Fans pri (sec) Timers pri (sec) (Bad htrs)
- ATM cool pumps A,C(B)
- Cool pump inverters Pri 1,3(2) Sec 2(1,3)
- Cool pumps pri A (sec B)
- Sys 1 LCG pumps pri (sec)
- Sys 2 LCG pumps sec (pri)
- Cndst dump sys pri (sec)
- O_2/N_2 fill valves pri (sec)
- O_2/N_2 controllers 1,3(2)

DCS/TRS
- Time correlation buffer pri (sec)
- Event timer
- (Clock)

TACS
- Redundant thruster control

INSTR
- Converters 1(2,3)
- Display converter pri (sec)
- Transmitter A(B,C)
- Pri/sec programmer cmd (man) cont
- Pri/sec electronics cmd (man) cont
- Recorder cmd (man) cont
- Transmitter/data dump cmd (man) cont
- Converter cmd/man control
- (MDA sig cond pwr)
- OWS sig cond pwr 1(2)
- OWS mux htrs 1(2)
- Transducer group 1(2)
- Sys 1 LSU pwr 1(2)
- Sys 2 LSU pwr 1(2)
- Voice record 1t

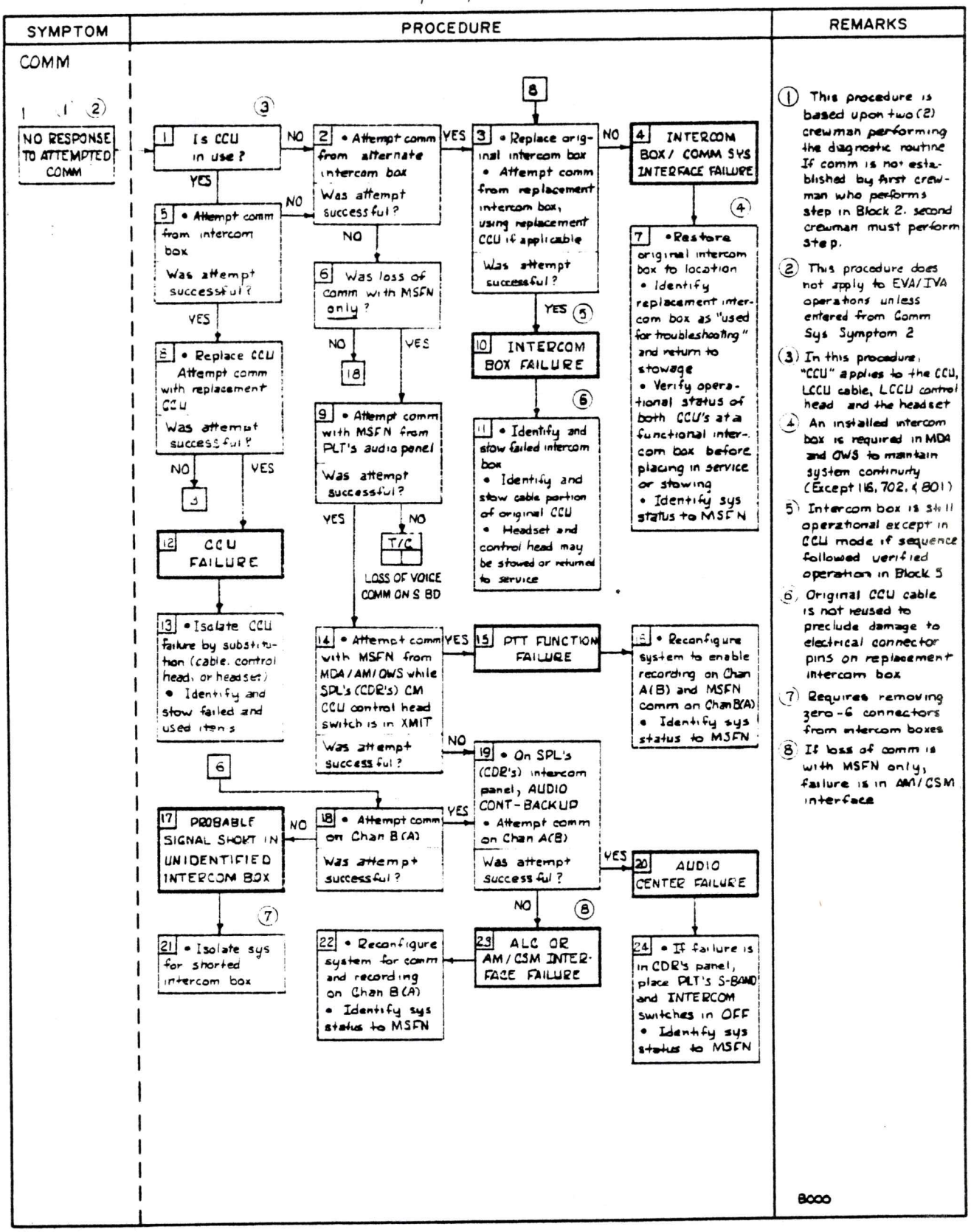
EXP
- SAL CNTL 1(2)
- EREP htr S194 (S193)
- MG12
- Proton spect
- (S009)
- (Noise burst ant)

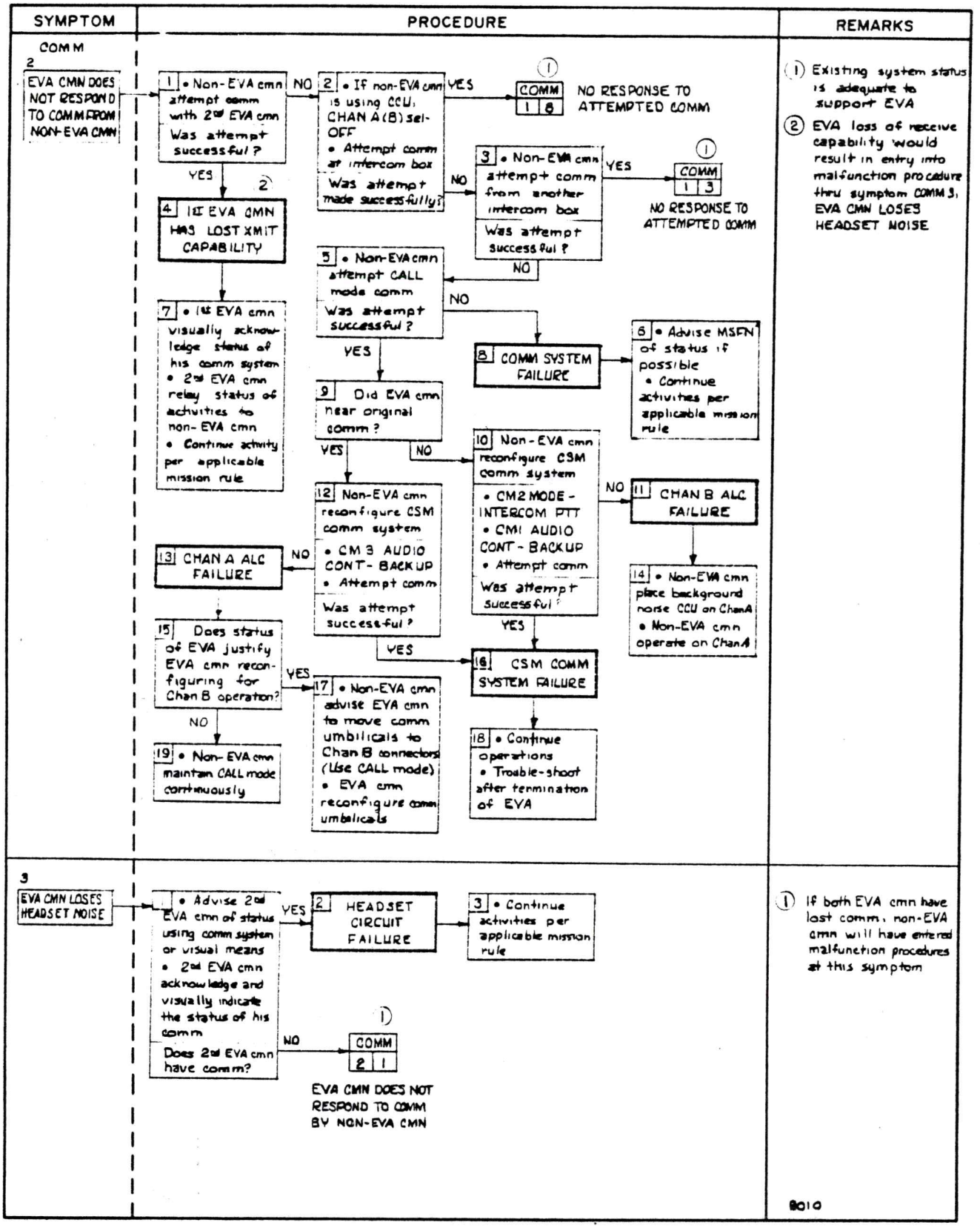
RS
- OWS refrig cont 1(2)

LTG
- Compt lts AM 1(2) MDA 1(2)
- AM meter lts
- (AM status lts)
- (AM inst pnl flood lts)
- EVA lts 1(2)
- Tracking lts control 1(2)
- Tracking lts 1,3 (2,4)
- Docking lts 1(2)

SAN
- Master alarm status lts 1(2)
- Molecular sieve A gas flow sec (pri)
- Molecular sieve B gas flow sec (pri)
- OWS gas flow
- Cndst tank ΔP
- Cluster low press 1(2)
- EVA LCG pump 1(2) ΔP control

A510


SYMPTOM
PROCEDURE
REMARKS
COMM
1 1 2
NO RESPONSE TO ATTEMPTED COMM
3
1 Is CCU in use?
NO
YES
2 • Attempt comm from alternate intercom box
Was attempt successful?
NO
YES
3 • Replace original intercom box
• Attempt comm from replacement intercom box, using replacement CCU if applicable
Was attempt successful?
YES (5)
NO
4 INTERCOM BOX / COMM SYS INTERFACE FAILURE
(4)
7 • Restore original intercom box to location
• Identify replacement intercom box as "used for troubleshooting" and return to stowage
• Verify operational status of both CCU's at a functional intercom box before placing in service or stowing
• Identify sys status to MSFN
5 • Attempt comm from intercom box
Was attempt successful?
YES
8 • Replace CCU
Attempt comm with replacement CCU
Was attempt successful?
NO
YES
J
12 CCU FAILURE
13 • Isolate CCU failure by substitution (cable, control head, or headset)
• Identify and stow failed and used items
6
6 Was loss of comm with MSFN only?
NO
YES
18
9 • Attempt comm with MSFN from PLT's audio panel
Was attempt successful?
YES
NO
T/C
LOSS OF VOICE COMM ON S BD
14 • Attempt comm with MSFN from MDA / AM / OWS while SPL's (CDR's) CM CCU control head switch is in XMIT
Was attempt successful?
YES
15 PTT FUNCTION FAILURE
16 • Reconfigure system to enable recording on Chan A(B) and MSFN comm on Chan B(A)
• Identify sys status to MSFN
NO
19 • On SPL's (CDR's) intercom panel, AUDIO CONT-BACKUP
• Attempt comm on Chan A(B)
Was attempt successful?
YES
20 AUDIO CENTER FAILURE
NO
(8)
24 • If failure is in CDR's panel, place PLT's S-BAND and INTERCOM switches in OFF
• Identify sys status to MSFN
23 ALC OR AM / CSM INTERFACE FAILURE
22 • Reconfigure system for comm and recording on Chan B(A)
• Identify sys status to MSFN
18 • Attempt comm on Chan B(A)
Was attempt successful?
NO
YES
17 PROBABLE SIGNAL SHORT IN UNIDENTIFIED INTERCOM BOX
(7)
21 • Isolate sys for shorted intercom box
(1) This procedure is based upon two (2) crewman performing the diagnostic routine. If comm is not established by first crewman who performs step in Block 2, second crewman must perform step.
(2) This procedure does not apply to EVA / IVA operations unless entered from Comm Sys Symptom 2
(3) In this procedure, "CCU" applies to the CCU, LCCU cable, LCCU control head and the headset
(4) An installed intercom box is required in MDA and OWS to maintain system continuity (Except 116, 702, & 801)
(5) Intercom box is still operational except in CCU mode if sequence followed verified operation in Block 5
(6) Original CCU cable is not reused to preclude damage to electrical connector pins on replacement intercom box
(7) Requires removing zero-G connectors from intercom boxes
(8) If loss of comm is with MSFN only, failure is in AM / CSM interface
B000

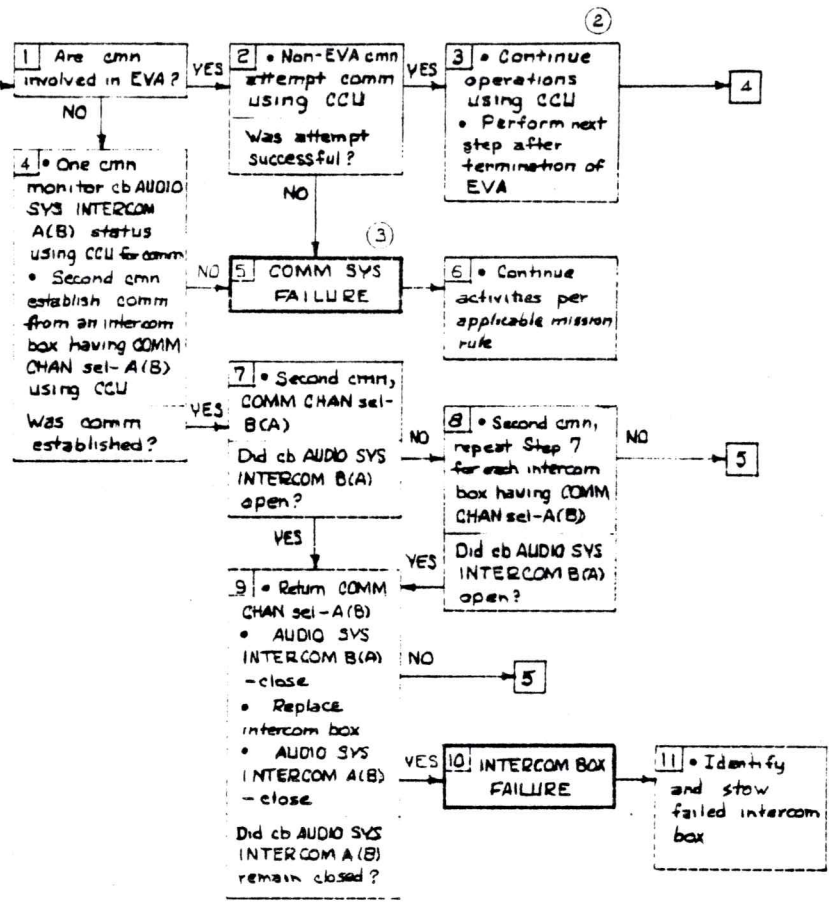

SYMPTOM
PROCEDURE
REMARKS
COMM 2
EVA CMN DOES NOT RESPOND TO COMM FROM NON-EVA CMN
1 • Non-EVA cmn attempt comm with 2nd EVA cmn
Was attempt successful?
NO
YES
2 • If non-EVA cmn is using CCU, CHAN A(B) sel-OFF
• Attempt comm at intercom box
Was attempt made successfully?
YES
NO
(1) COMM 1 6 NO RESPONSE TO ATTEMPTED COMM
3 • Non-EVA cmn attempt comm from another intercom box
Was attempt successful?
YES
NO
(1) COMM 1 3 NO RESPONSE TO ATTEMPTED COMM
2
4 1st EVA CMN HAS LOST XMIT CAPABILITY
5 • Non-EVA cmn attempt CALL mode comm
Was attempt successful?
NO
YES
6 • Advise MSFN of status if possible
• Continue activities per applicable mission rule
7 • 1st EVA cmn visually acknowledge status of his comm system
• 2nd EVA cmn relay status of activities to non-EVA cmn
• Continue activity per applicable mission rule
8 COMM SYSTEM FAILURE
9 Did EVA cmn hear original comm?
YES
NO
10 Non-EVA cmn reconfigure CSM comm system
• CM2 MODE - INTERCOM PTT
• CM1 AUDIO CONT - BACKUP
• Attempt comm
Was attempt successful?
NO
YES
11 CHAN B ALC FAILURE
14 • Non-EVA cmn place background noise CCU on Chan A
• Non-EVA cmn operate on Chan A
12 Non-EVA cmn reconfigure CSM comm system
• CM 3 AUDIO CONT - BACKUP
• Attempt comm
Was attempt successful?
NO
YES
13 CHAN A ALC FAILURE
16 CSM COMM SYSTEM FAILURE
15 Does status of EVA justify EVA cmn reconfiguring for Chan B operation?
YES
NO
17 • Non-EVA cmn advise EVA cmn to move comm umbilicals to Chan B connectors (Use CALL mode)
• EVA cmn reconfigure comm umbilicals
18 • Continue operations
• Trouble-shoot after termination of EVA
19 • Non-EVA cmn maintain CALL mode continuously
(1) Existing system status is adequate to support EVA
(2) EVA loss of receive capability would result in entry into malfunction procedure thru symptom COMM 3, EVA CMN LOSES HEADSET NOISE
3
EVA CMN LOSES HEADSET NOISE
• Advise 2nd EVA cmn of status using comm system or visual means
• 2nd EVA cmn acknowledge and visually indicate the status of his comm
Does 2nd EVA cmn have comm?
YES
NO
2 HEADSET CIRCUIT FAILURE
3 • Continue activities per applicable mission rule
(1) COMM 2 1 EVA CMN DOES NOT RESPOND TO COMM BY NON-EVA CMN
(1) If both EVA cmn have lost comm, non-EVA cmn will have entered malfunction procedures at this symptom
8010

SYMPTOM	PROCEDURE	REMARKS

COMM

4 (1)

AUDIO SYSTEM INTERCOM A(B) CIRCUIT BREAKER WILL NOT REMAIN CLOSED



(1) Provides power for intercom box speaker, microphone, CALL, RECORD, ICOM, and XMIT functions and for Panel 316 RECORD function. (Chan B cb provides RECORD function power only at Panels 131 and 318)

(2) CCU and suit umbilical comm are not affected by this failure

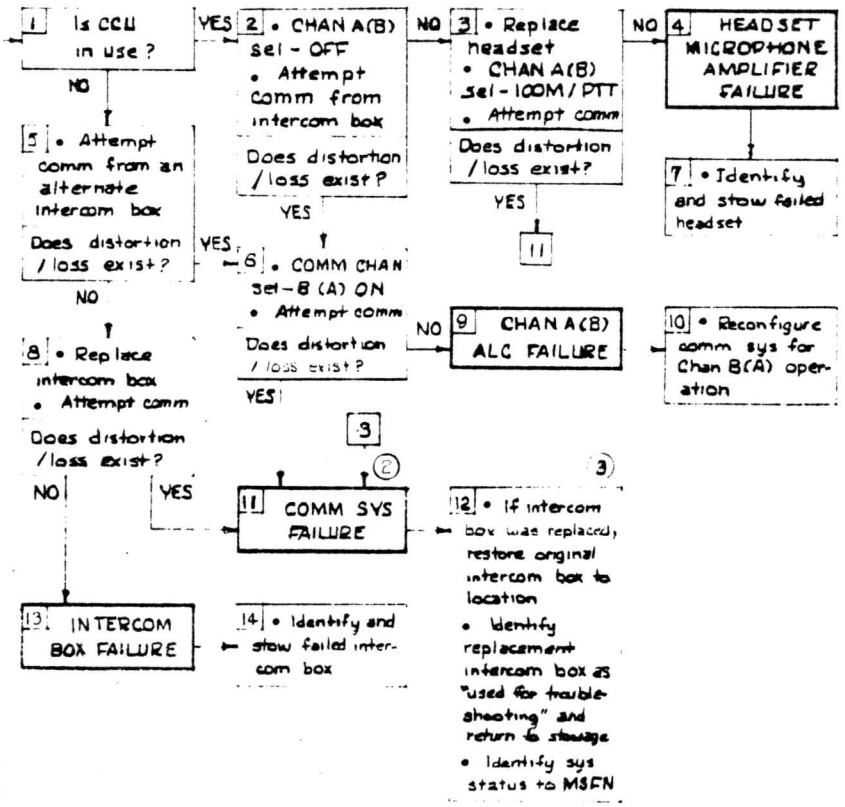
(3) Multiple failures

8020

SYMPTOM	PROCEDURE	REMARKS

COMM

5 (1) AUDIO OUTPUT DISTORTION/ LOSS

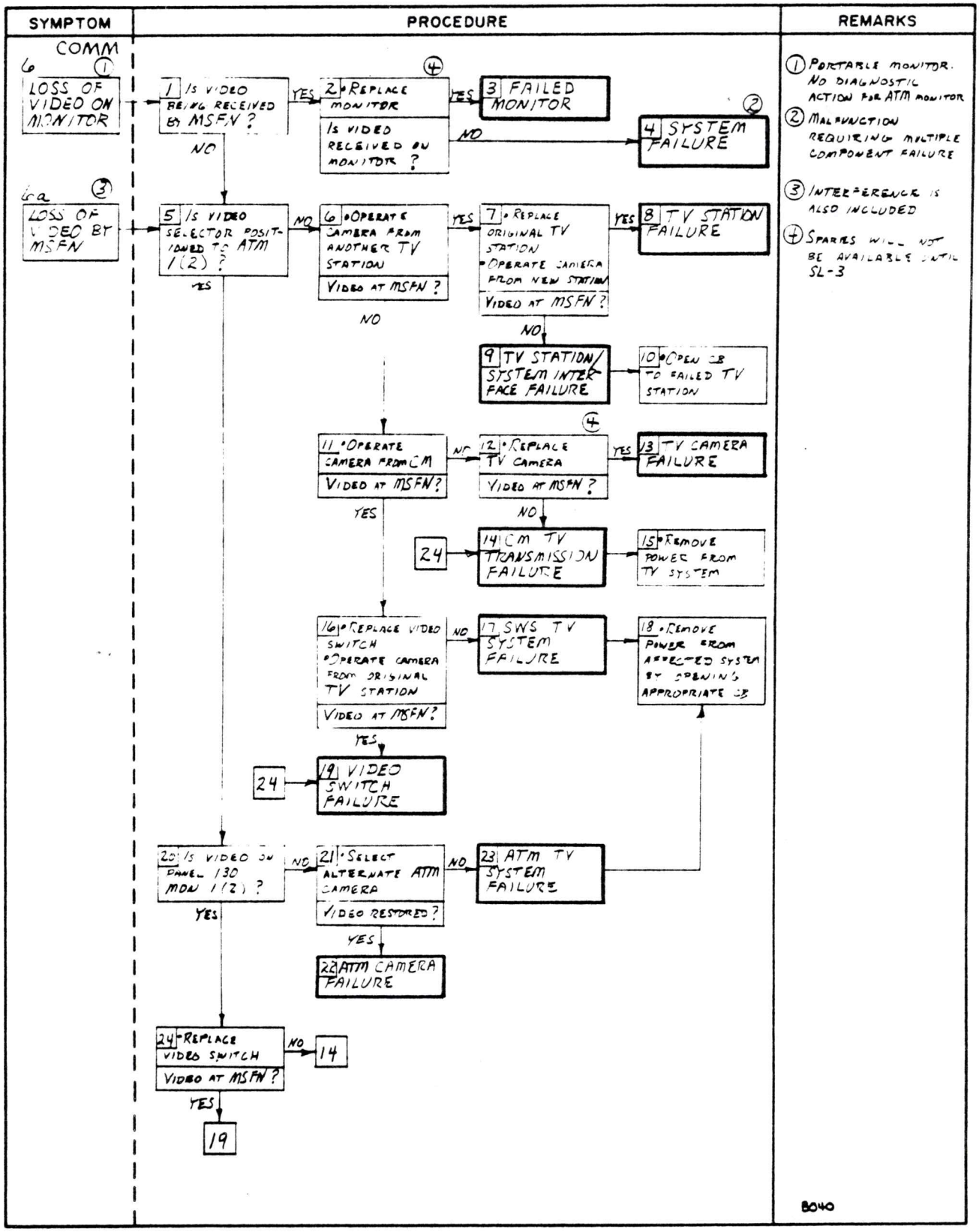


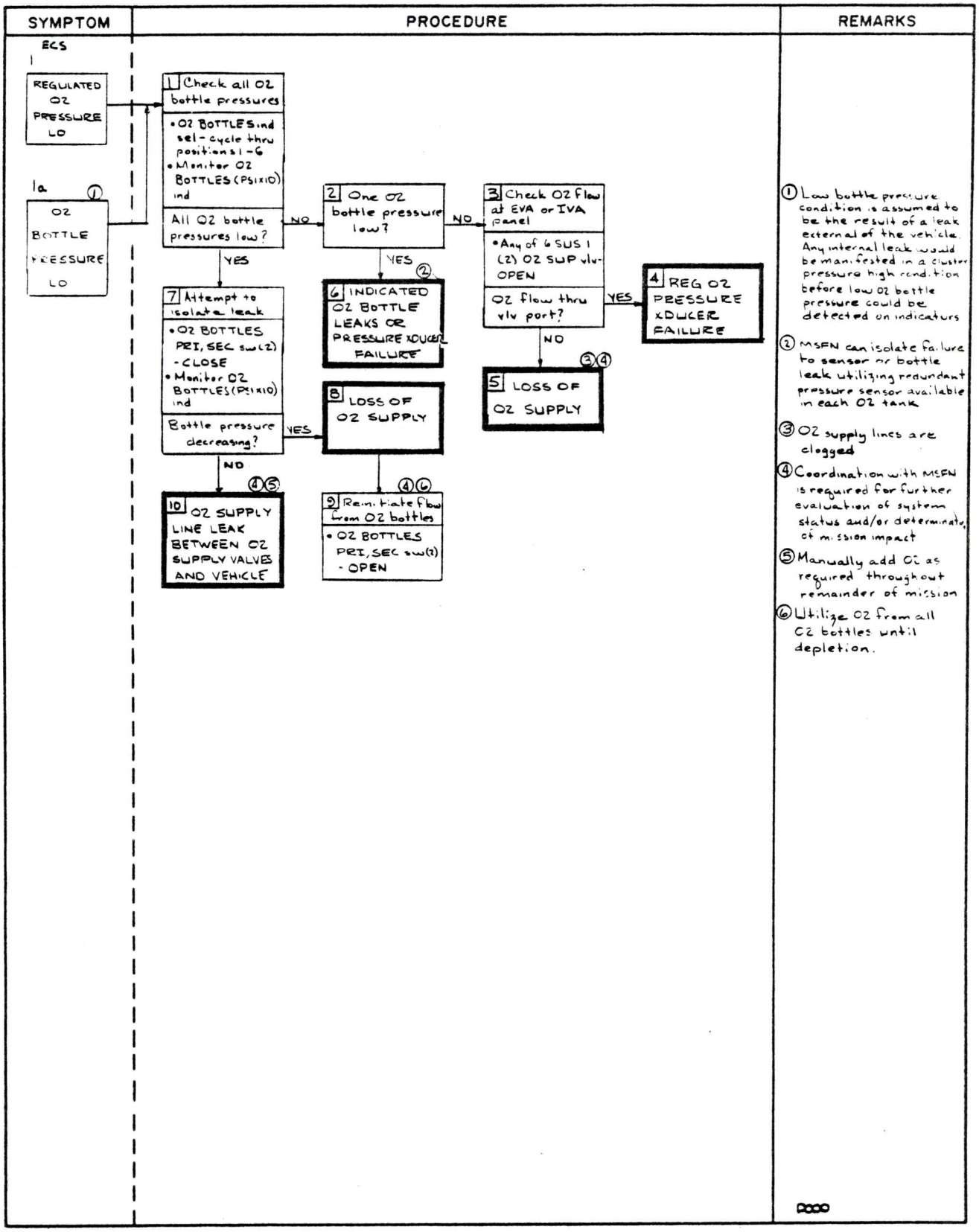
(1) Audio output loss due to excessive distortion

(2) Indicative of multiple failure

(3) Installed intercom box required in MDA and OWS to maintain system continuity (Except 116, 702 & 801)

8030

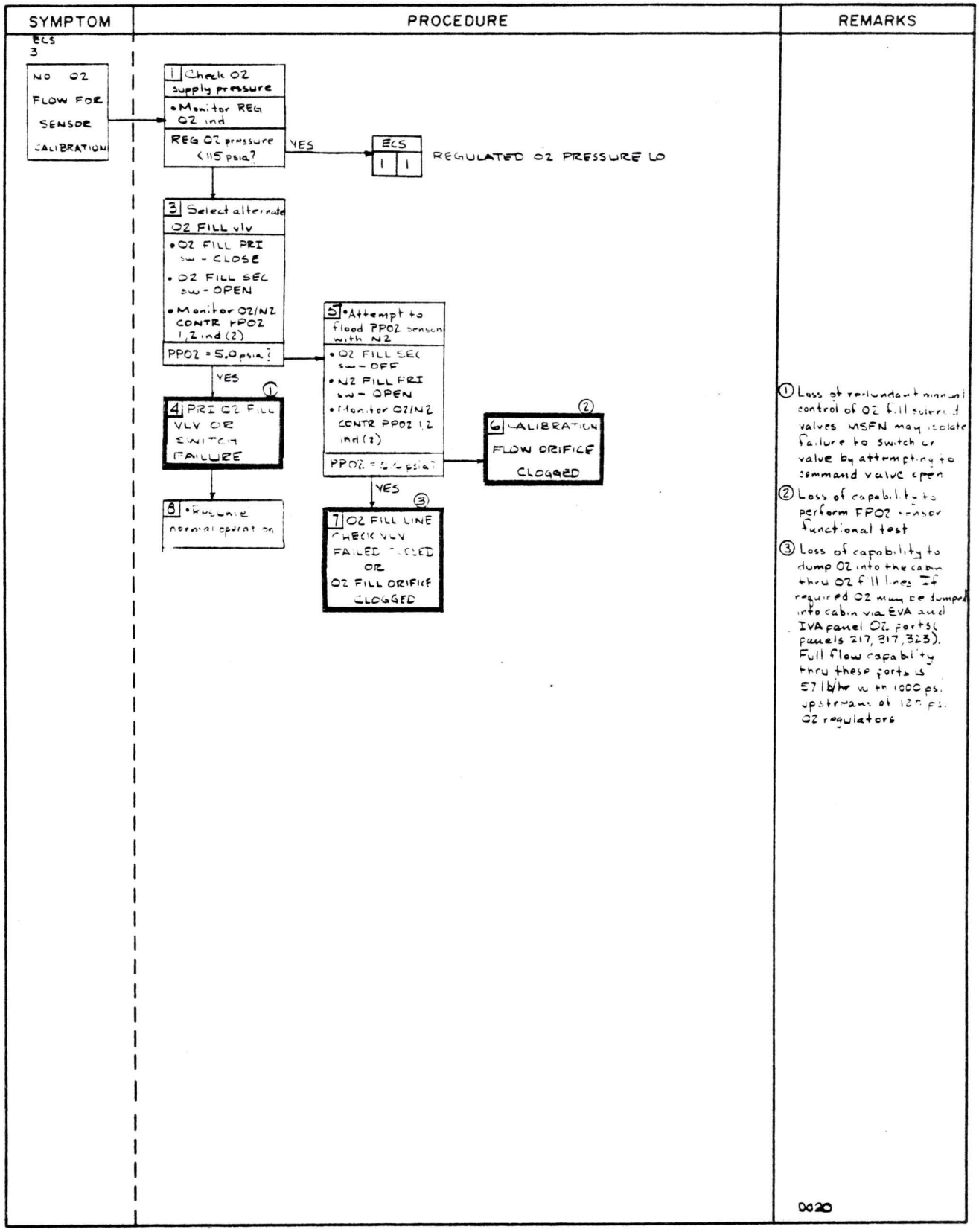

SYMPTOM
PROCEDURE
REMARKS
COMM
6 (1) LOSS OF VIDEO ON MONITOR
6a (3) LOSS OF VIDEO BY MSFN
1 Is video being received by MSFN?
2 •Replace monitor
Is video received on monitor?
3 FAILED MONITOR
4 SYSTEM FAILURE
5 Is video selector positioned to ATM 1(2)?
6 •Operate camera from another TV station
Video at MSFN?
7 •Replace original TV station
•Operate camera from new station
Video at MSFN?
8 TV STATION FAILURE
9 TV STATION/SYSTEM INTERFACE FAILURE
10 •Open CB to failed TV station
11 •Operate camera from CM
Video at MSFN?
12 •Replace TV camera
Video at MSFN?
13 TV CAMERA FAILURE
14 CM TV TRANSMISSION FAILURE
15 •Remove power from TV system
16 •Replace video switch
•Operate camera from original TV station
Video at MSFN?
17 SWS TV SYSTEM FAILURE
18 •Remove power from affected system by opening appropriate CB
19 VIDEO SWITCH FAILURE
20 Is video on panel 130 mon 1(2)?
21 •Select alternate ATM camera
Video restored?
22 ATM CAMERA FAILURE
23 ATM TV SYSTEM FAILURE
24 •Replace video switch
Video at MSFN?
24
(1) PORTABLE MONITOR. NO DIAGNOSTIC ACTION FOR ATM MONITOR
(2) MALFUNCTION REQUIRING MULTIPLE COMPONENT FAILURE
(3) INTERFERENCE IS ALSO INCLUDED
(4) SPARES WILL NOT BE AVAILABLE UNTIL SL-3
B040

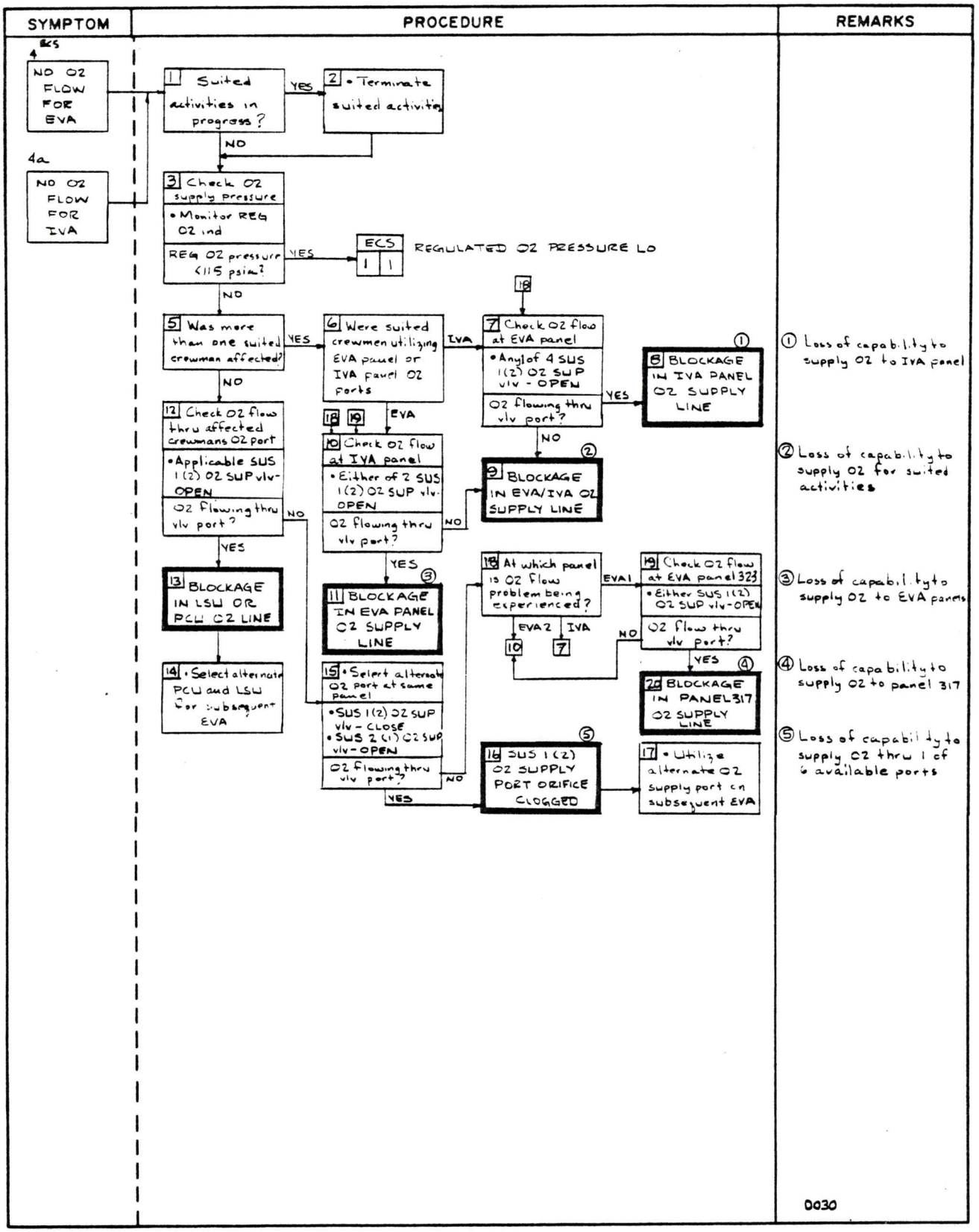

SYMPTOM
PROCEDURE
REMARKS
ECS
1
REGULATED O2 PRESSURE LO
1a
1
O2 BOTTLE PRESSURE LO
1 Check all O2 bottle pressures
• O2 BOTTLES ind sel - cycle thru positions 1-6
• Monitor O2 BOTTLES (PSIX10) ind
All O2 bottle pressures low?
NO
YES
2 One O2 bottle pressure low?
NO
YES
2
3 Check O2 flow at EVA or IVA panel
• Any of 6 SUS 1 (2) O2 SUP vlv - OPEN
O2 flow thru vlv port?
YES
NO
4 REG O2 PRESSURE xDUCER FAILURE
3 4
5 LOSS OF O2 SUPPLY
6 INDICATED O2 BOTTLE LEAKS OR PRESSURE xDUCER FAILURE
7 Attempt to isolate leak
• O2 BOTTLES PRI, SEC sw(2) - CLOSE
• Monitor O2 BOTTLES (PSIX10) ind
Bottle pressure decreasing?
YES
NO
4 5
8 LOSS OF O2 SUPPLY
4 6
9 Reinitiate flow from O2 bottles
• O2 BOTTLES PRI, SEC sw(2) - OPEN
10 O2 SUPPLY LINE LEAK BETWEEN O2 SUPPLY VALVES AND VEHICLE
1 Low bottle pressure condition is assumed to be the result of a leak external of the vehicle. Any internal leak would be manifested in a cluster pressure high condition before low O2 bottle pressure could be detected on indicators
2 MSFN can isolate failure to sensor or bottle leak utilizing redundant pressure sensor available in each O2 tank
3 O2 supply lines are clogged
4 Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact
5 Manually add O2 as required throughout remainder of mission
6 Utilize O2 from all O2 bottles until depletion.

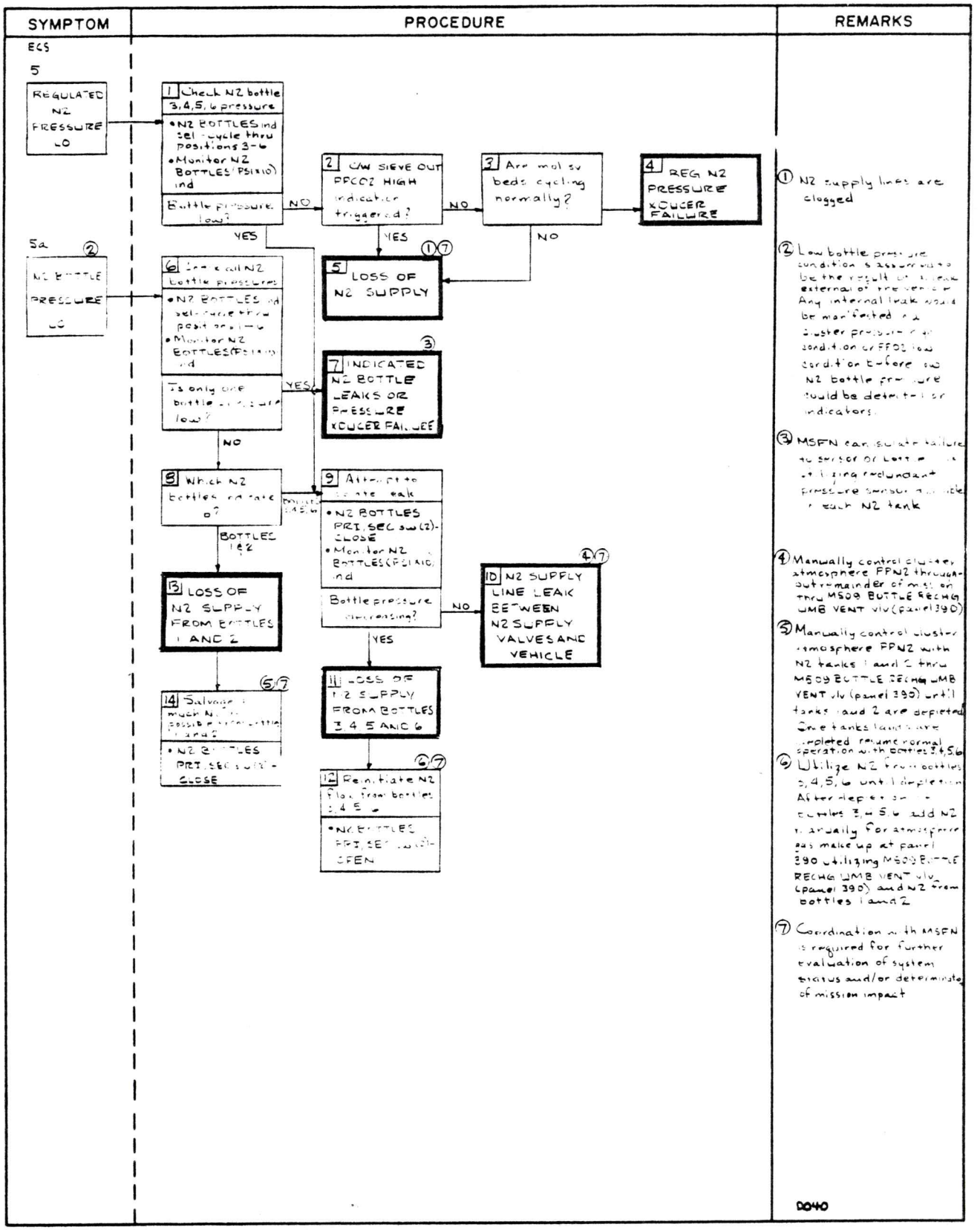
SYMPTOM	PROCEDURE	REMARKS
2 ECS NO O2 FLOW FOR FILL OPERATIONS	1 • Monitor REG O2 ind REG O2 press < 115 psia? NO → 2 O2 FILL LINE CHECK VALVE FAILED CLOSED OR O2 FILL ORIFICE CLOGGED ① YES → ECS 1 1 REGULATED O2 PRESSURE LO	① Loss of capability to dump O2 into the cabin thru O2 fill lines If required, O2 may be dumped into cabin via EVA and IVA panel O2 ports (panels 217, 317, 323). Full flow capability thru these ports (6) is 57 lb/hr with 1000 psi upstream of 120 psi O2 regulators

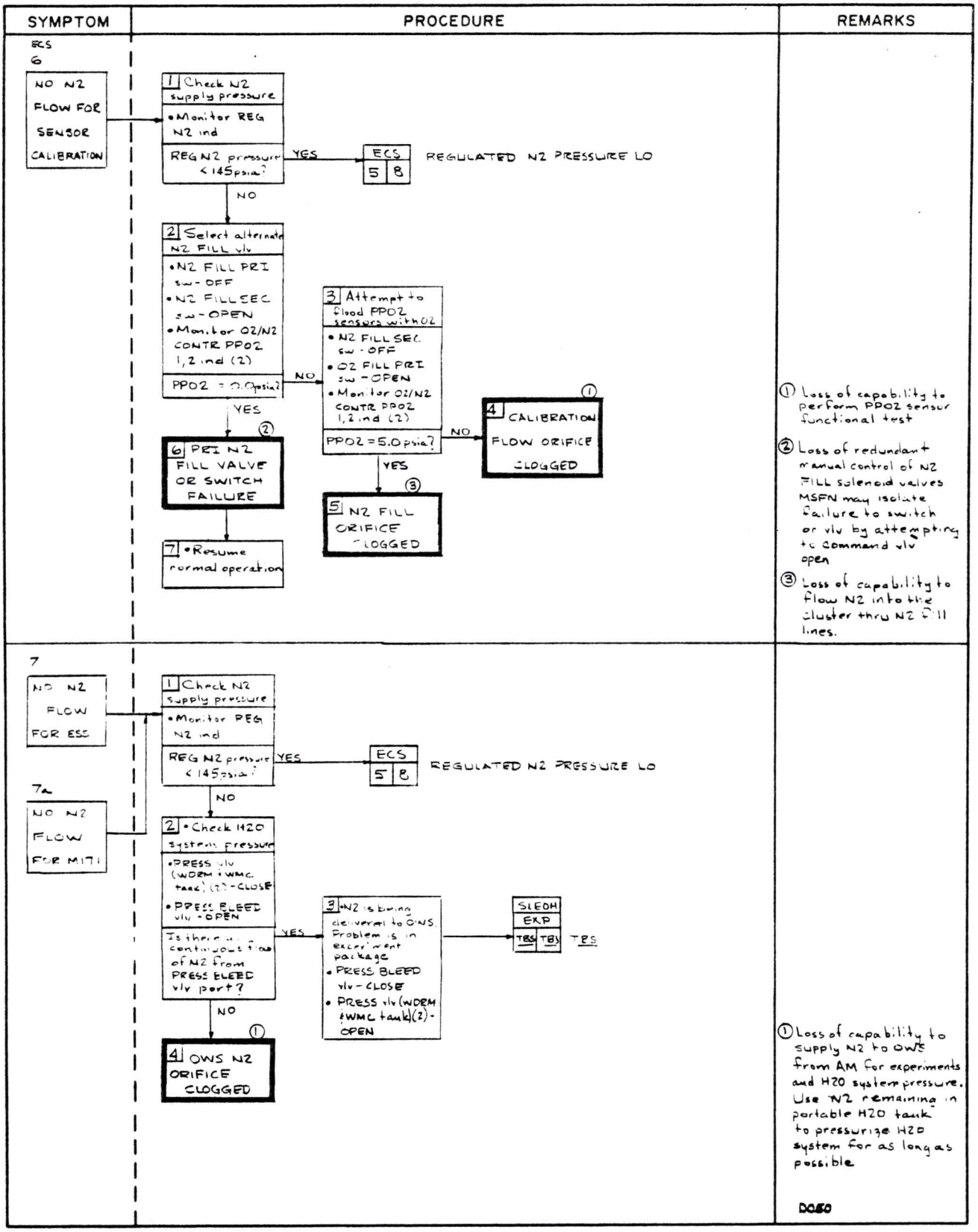
D010

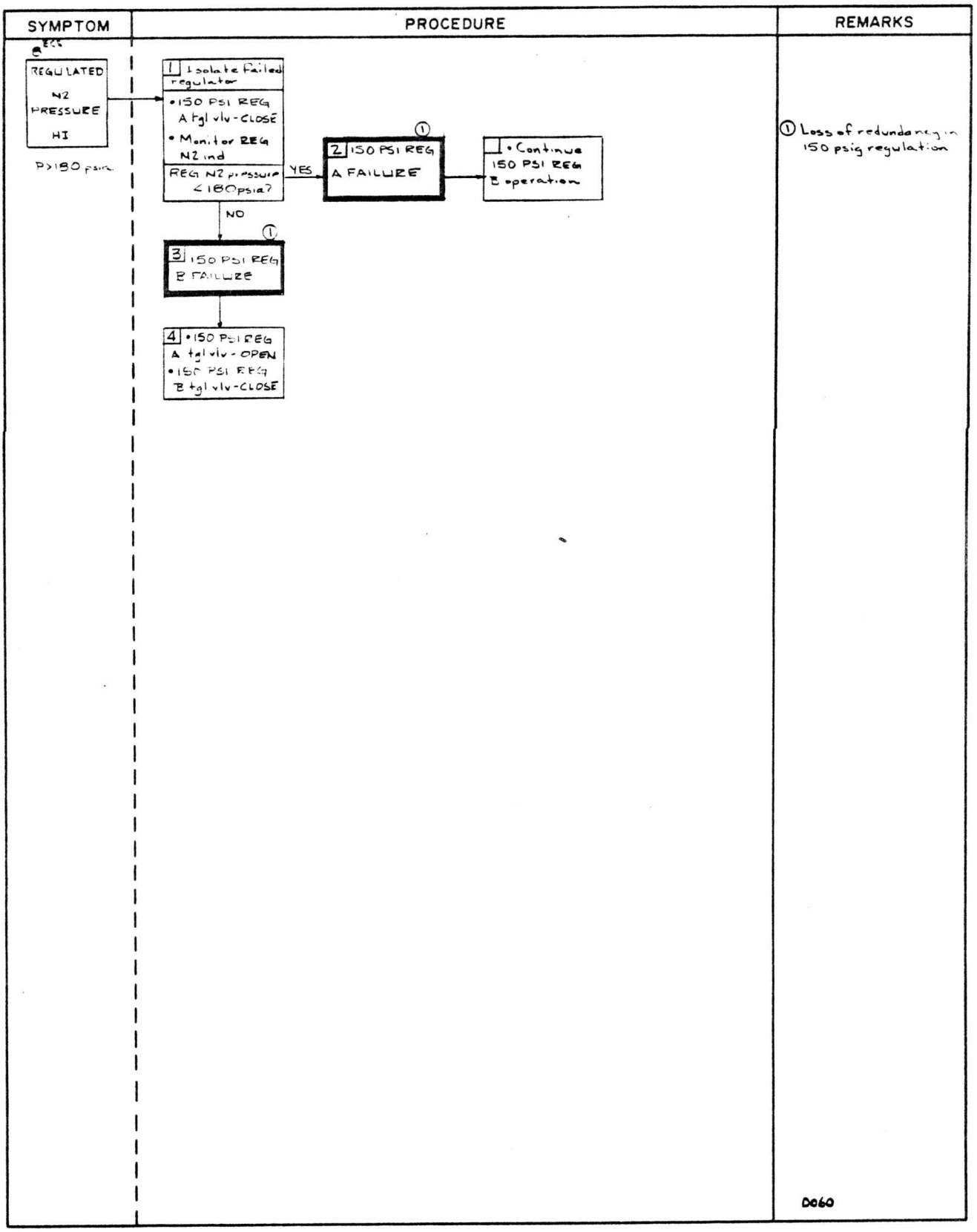
SYMPTOM	PROCEDURE	REMARKS

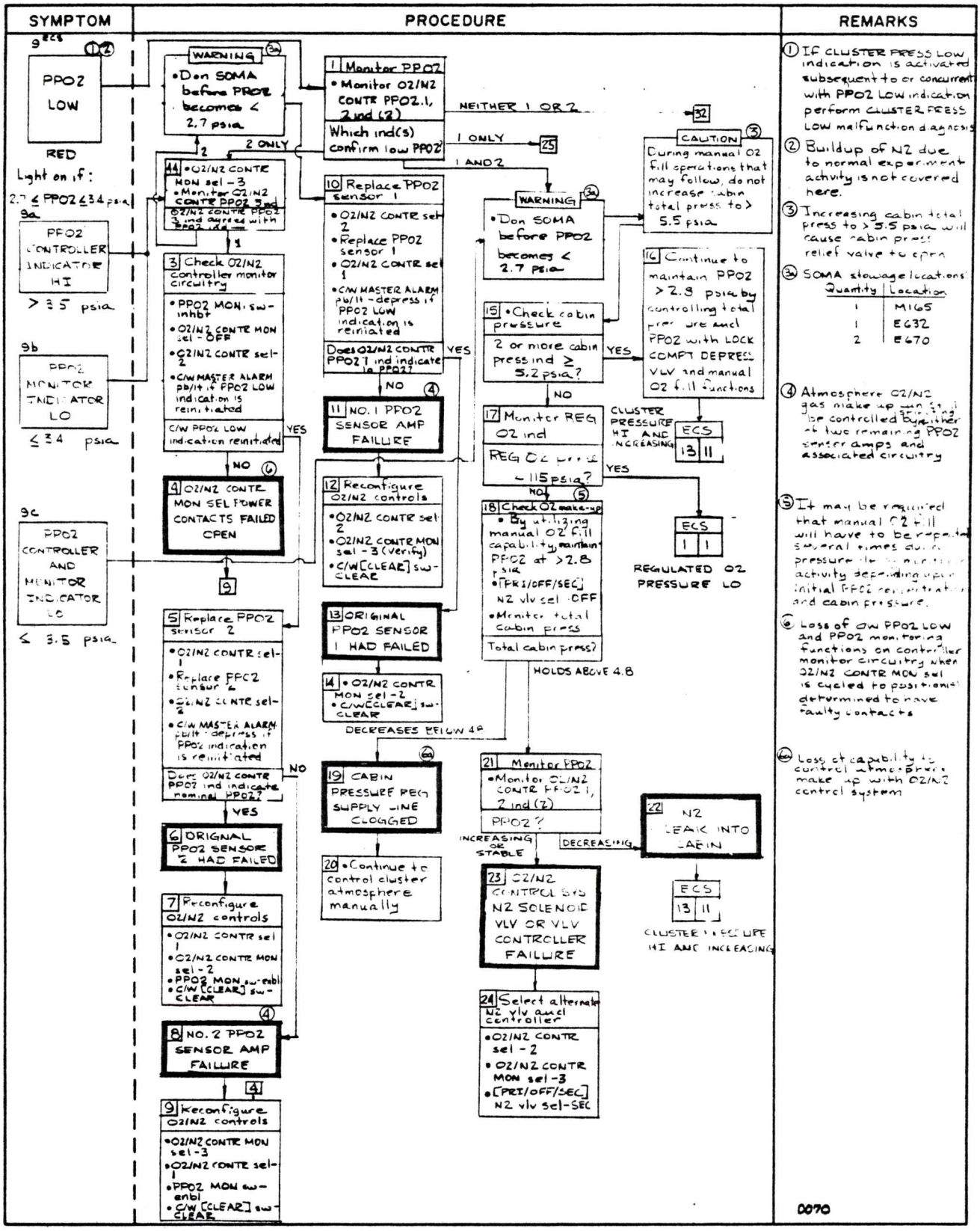


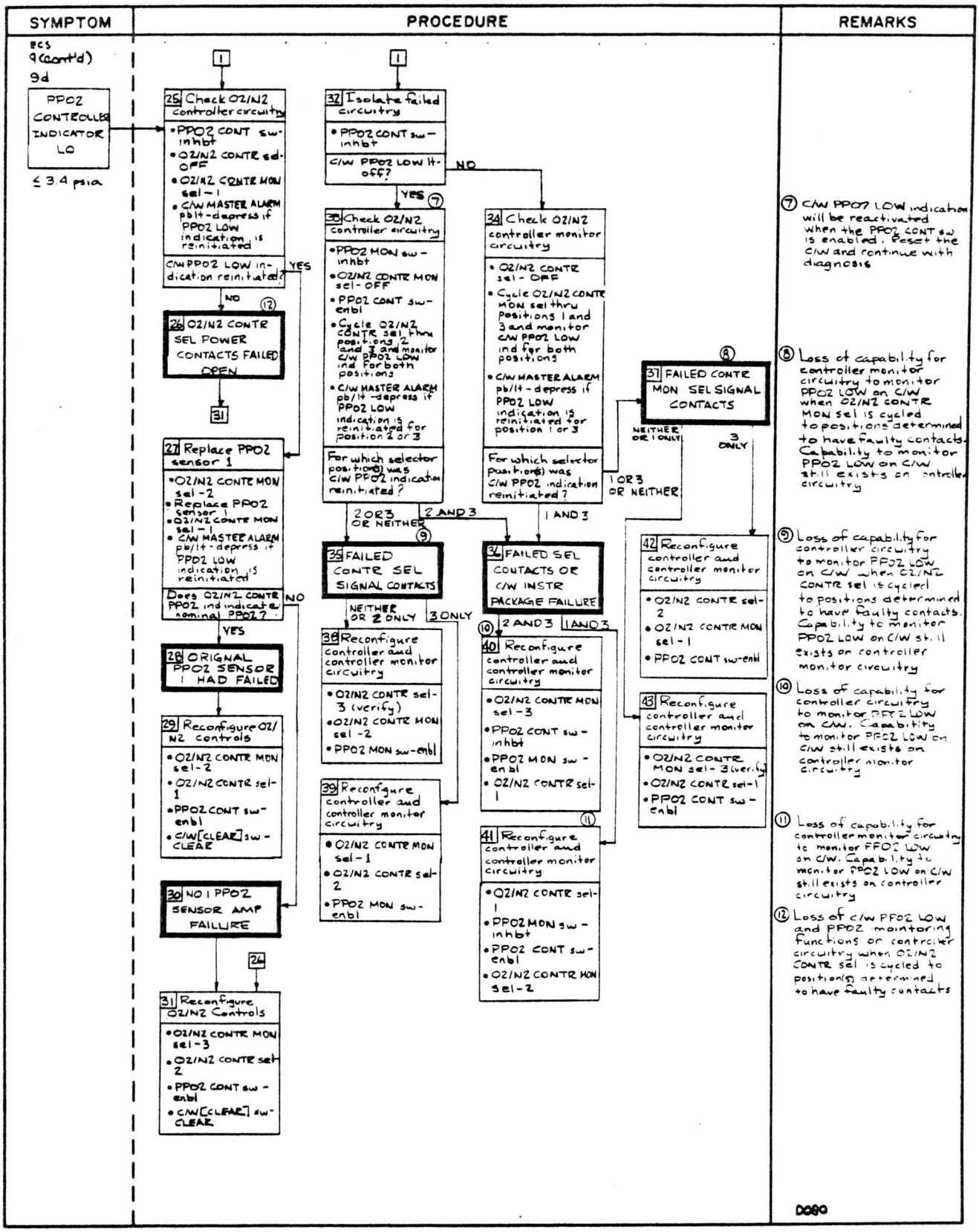

SYMPTOM
PROCEDURE
REMARKS
ECS
4
NO O2 FLOW FOR EVA
4a
NO O2 FLOW FOR IVA
1 Suited activities in progress?
YES
2 • Terminate suited activity
NO
3 Check O2 supply pressure
• Monitor REG O2 ind
REG O2 pressure <115 psia?
YES
ECS 1 1
REGULATED O2 PRESSURE LO
NO
5 Was more than one suited crewman affected?
YES
6 Were suited crewmen utilizing EVA panel or IVA panel O2 ports
IVA
EVA
18
19
7 Check O2 flow at EVA panel
• Any of 4 SUS 1(2) O2 SUP vlv - OPEN
O2 flowing thru vlv port?
YES
8 BLOCKAGE IN IVA PANEL O2 SUPPLY LINE
NO
9 BLOCKAGE IN EVA/IVA O2 SUPPLY LINE
10 Check O2 flow at IVA panel
• Either of 2 SUS 1(2) O2 SUP vlv - OPEN
O2 flowing thru vlv port?
NO
YES
11 BLOCKAGE IN EVA PANEL O2 SUPPLY LINE
12 Check O2 flow thru affected crewmans O2 port
• Applicable SUS 1(2) O2 SUP vlv - OPEN
O2 flowing thru vlv port?
NO
YES
13 BLOCKAGE IN LSU OR PCU O2 LINE
14 • Select alternate PCU and LSU for subsequent EVA
15 • Select alternate O2 port at same panel
• SUS 1(2) O2 SUP vlv - CLOSE
• SUS 2(1) O2 SUP vlv - OPEN
O2 flowing thru vlv port?
NO
YES
16 SUS 1(2) O2 SUPPLY PORT ORIFICE CLOGGED
17 • Utilize alternate O2 supply port on subsequent EVA
18 At which panel is O2 flow problem being experienced?
EVA1
EVA2
IVA
10
7
19 Check O2 flow at EVA panel 323
• Either SUS 1(2) O2 SUP vlv - OPEN
O2 flow thru vlv port?
NO
YES
20 BLOCKAGE IN PANEL 317 O2 SUPPLY LINE
① Loss of capability to supply O2 to IVA panel
② Loss of capability to supply O2 for suited activities
③ Loss of capability to supply O2 to EVA panels
④ Loss of capability to supply O2 to panel 317
⑤ Loss of capability to supply O2 thru 1 of 6 available ports
0030

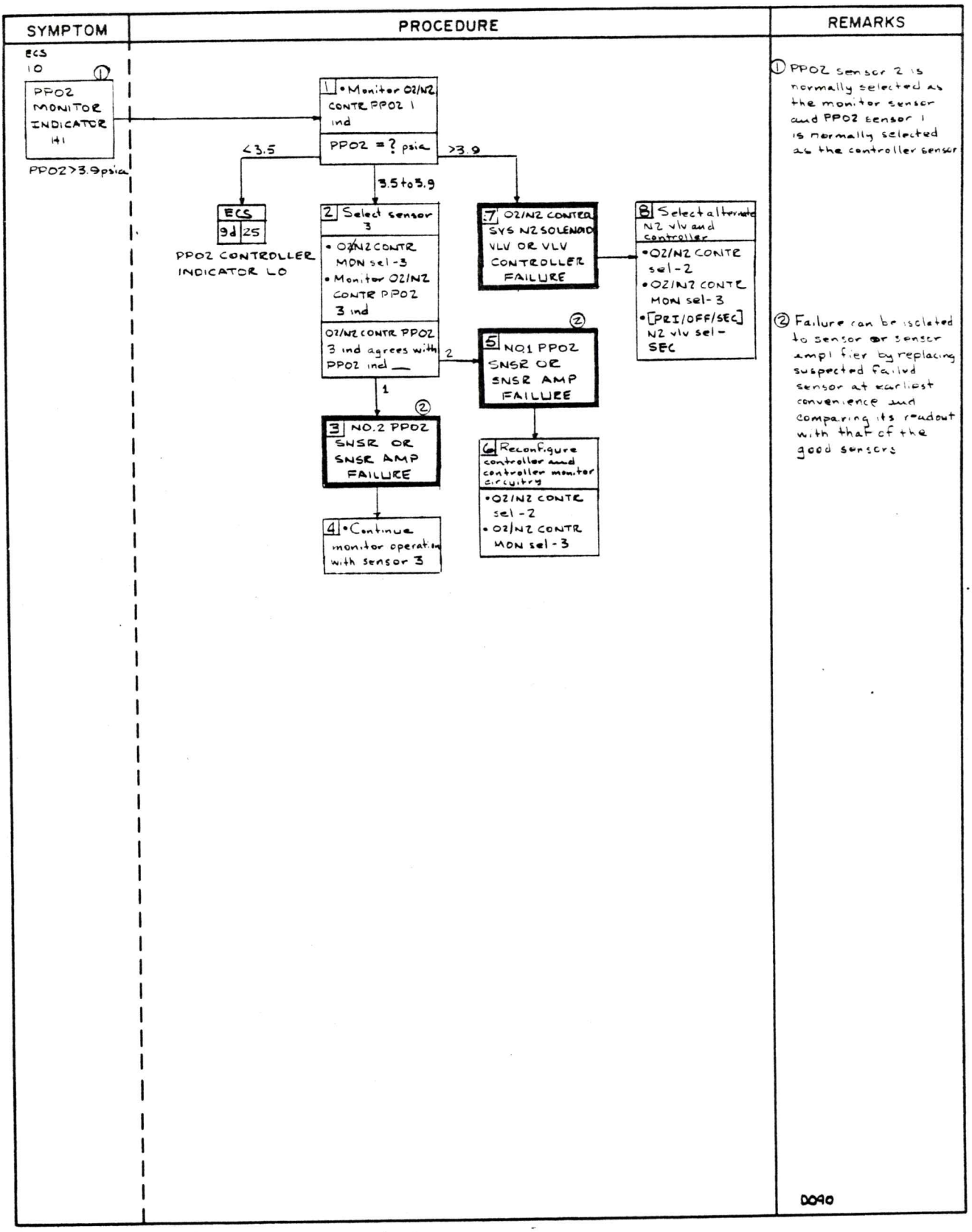

SYMPTOM
PROCEDURE
REMARKS
ECS
5
REGULATED N2 PRESSURE LO
5a
N2 BOTTLE PRESSURE LO
1 Check N2 bottle 3,4,5,6 pressure
•N2 BOTTLES ind sel - cycle thru positions 3-6
•Monitor N2 BOTTLES (PSI X10) ind
Bottle pressure low?
NO
YES
2 CM SIEVE OUT PPCO2 HIGH indication triggered?
NO
YES
3 Are mol sv beds cycling normally?
NO
4 REG N2 PRESSURE XDUCER FAILURE
5 LOSS OF N2 SUPPLY
6 Sel & call N2 bottle pressures
•N2 BOTTLES rot sel-cycle thru posit positions 3-6
•Monitor N2 BOTTLES (PSI X10) ind
Is only one bottle pressure low?
YES
NO
7 INDICATED N2 BOTTLE LEAKS OR PRESSURE XDUCER FAILURE
8 Which N2 bottles regulate O2?
BOTTLES 3,4,5,6
BOTTLES 1 & 2
9 Attempt to isolate leak
•N2 BOTTLES PRI, SEC sw (2) - CLOSE
•Monitor N2 BOTTLES (PSI X10) ind
Bottle pressure decreasing?
NO
YES
10 N2 SUPPLY LINE LEAK BETWEEN N2 SUPPLY VALVES AND VEHICLE
11 LOSS OF N2 SUPPLY FROM BOTTLES 3 4 5 AND 6
12 Reinitiate N2 flow from bottles 3,4,5,6
•N2 BOTTLES PRI, SEC sw (2) - OPEN
13 LOSS OF N2 SUPPLY FROM BOTTLES 1 AND 2
14 Salvage as much N2 as possible from bottles 1 and 2
•N2 BOTTLES PRI, SEC sw (2) - CLOSE
1 N2 supply lines are clogged
2 Low bottle pressure condition is assumed to be the result of a leak external of the sensor. Any internal leak would be manifested as a cluster pressure drop condition or PPO2 low condition before the N2 bottle pressure could be determined by indicators.
3 MSFN can isolate failure to sensor or loss of redundancy utilizing redundant pressure sensor available for each N2 tank
4 Manually control cluster atmosphere PPN2 through-out remainder of mission thru MS09 BOTTLE RECHG UMB VENT vlv (panel 390)
5 Manually control cluster atmosphere PPN2 with N2 tanks 1 and 2 thru MS09 BOTTLE RECHG UMB VENT vlv (panel 390) until tanks 1 and 2 are depleted. Once tanks 1 and 2 are depleted resume normal operation with bottles 3,4,5,6
6 Utilize N2 from bottles 3,4,5,6 until depletion. After depletion of bottles 3,4,5,6 add N2 manually for atmosphere gas make up at panel 390 utilizing MS09 BOTTLE RECHG UMB VENT vlv (panel 390) and N2 from bottles 1 and 2
7 Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact
D040

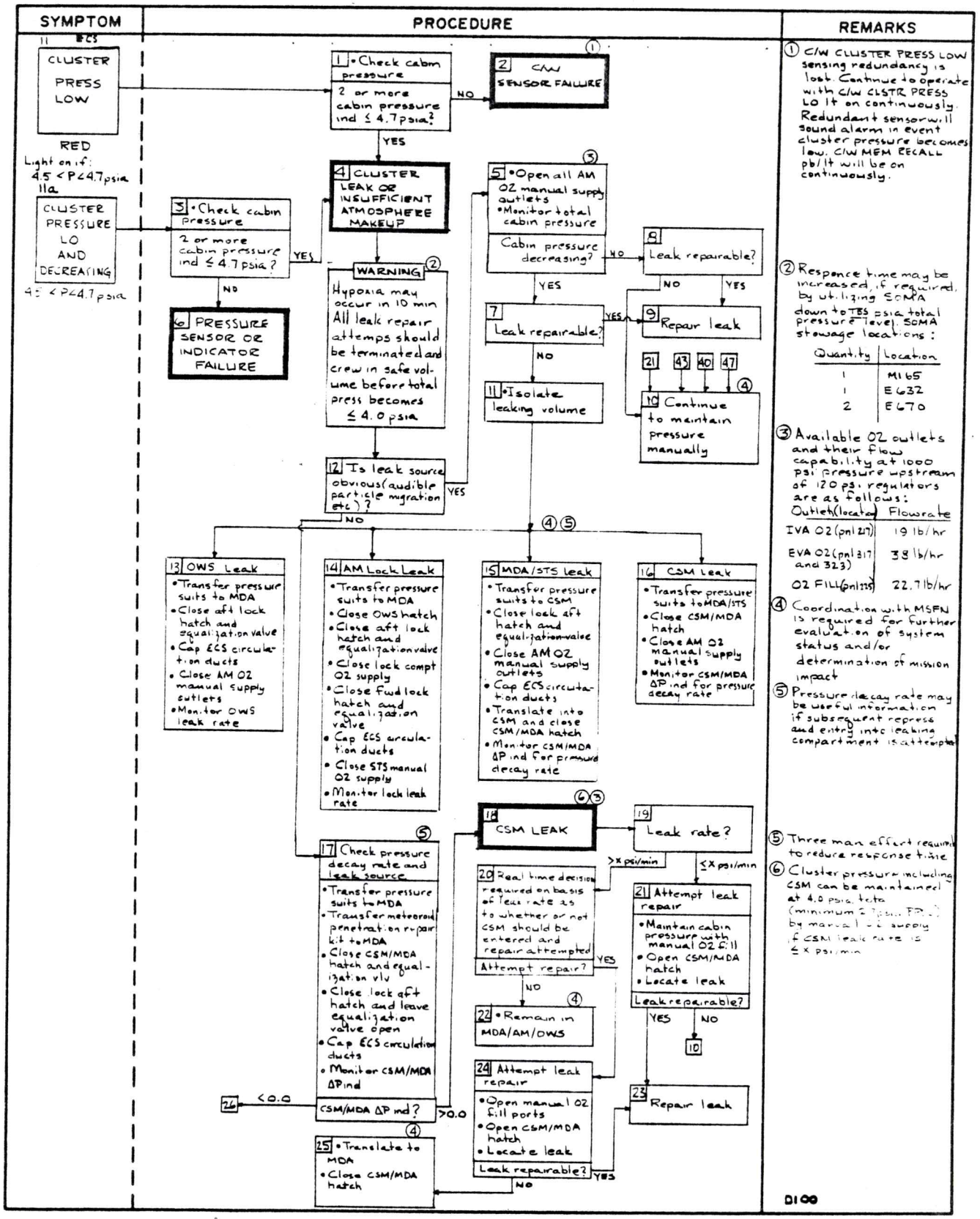

SYMPTOM
PROCEDURE
REMARKS
ECS
6
NO N2 FLOW FOR SENSOR CALIBRATION
1 Check N2 supply pressure
•Monitor REG N2 ind
REG N2 pressure < 145psia?
YES
ECS 5 8
REGULATED N2 PRESSURE LO
NO
2 Select alternate N2 FILL vlv
•N2 FILL PRI sw - OFF
•N2 FILL SEC sw - OPEN
•Monitor O2/N2 CONTR PPO2 1,2 ind (2)
PPO2 = 0.0psia?
NO
YES
3 Attempt to flood PPO2 sensors with O2
•N2 FILL SEC sw - OFF
•O2 FILL PRI sw - OPEN
•Monitor O2/N2 CONTR PPO2 1,2 ind (2)
PPO2 = 5.0psia?
NO
YES
4 CALIBRATION FLOW ORIFICE CLOGGED
6 PRI N2 FILL VALVE OR SWITCH FAILURE
5 N2 FILL ORIFICE CLOGGED
7 •Resume normal operation
① Loss of capability to perform PPO2 sensor functional test
② Loss of redundant manual control of N2 FILL solenoid valves MSFN may isolate failure to switch or vlv by attempting to command vlv open
③ Loss of capability to flow N2 into the cluster thru N2 fill lines.
7
NO N2 FLOW FOR ESS
7a
NO N2 FLOW FOR MIT
1 Check N2 supply pressure
•Monitor REG N2 ind
REG N2 pressure < 145psia?
YES
ECS 5 8
REGULATED N2 PRESSURE LO
NO
2 •Check H2O system pressure
•PRESS vlv (WDRM & WMC tank) (2) - CLOSE
•PRESS BLEED vlv - OPEN
Is there a continuous flow of N2 from PRESS BLEED vlv port?
YES
3 N2 is being delivered to OWS. Problem is in experiment package
•PRESS BLEED vlv - CLOSE
•PRESS vlv (WDRM & WMC tank) (2) - OPEN
SLEDH EXP TBS TBY TPS
NO
4 OWS N2 ORIFICE CLOGGED
① Loss of capability to supply N2 to OWS from AM for experiments and H2O system pressure. Use N2 remaining in portable H2O tank to pressurize H2O system for as long as possible
DO50

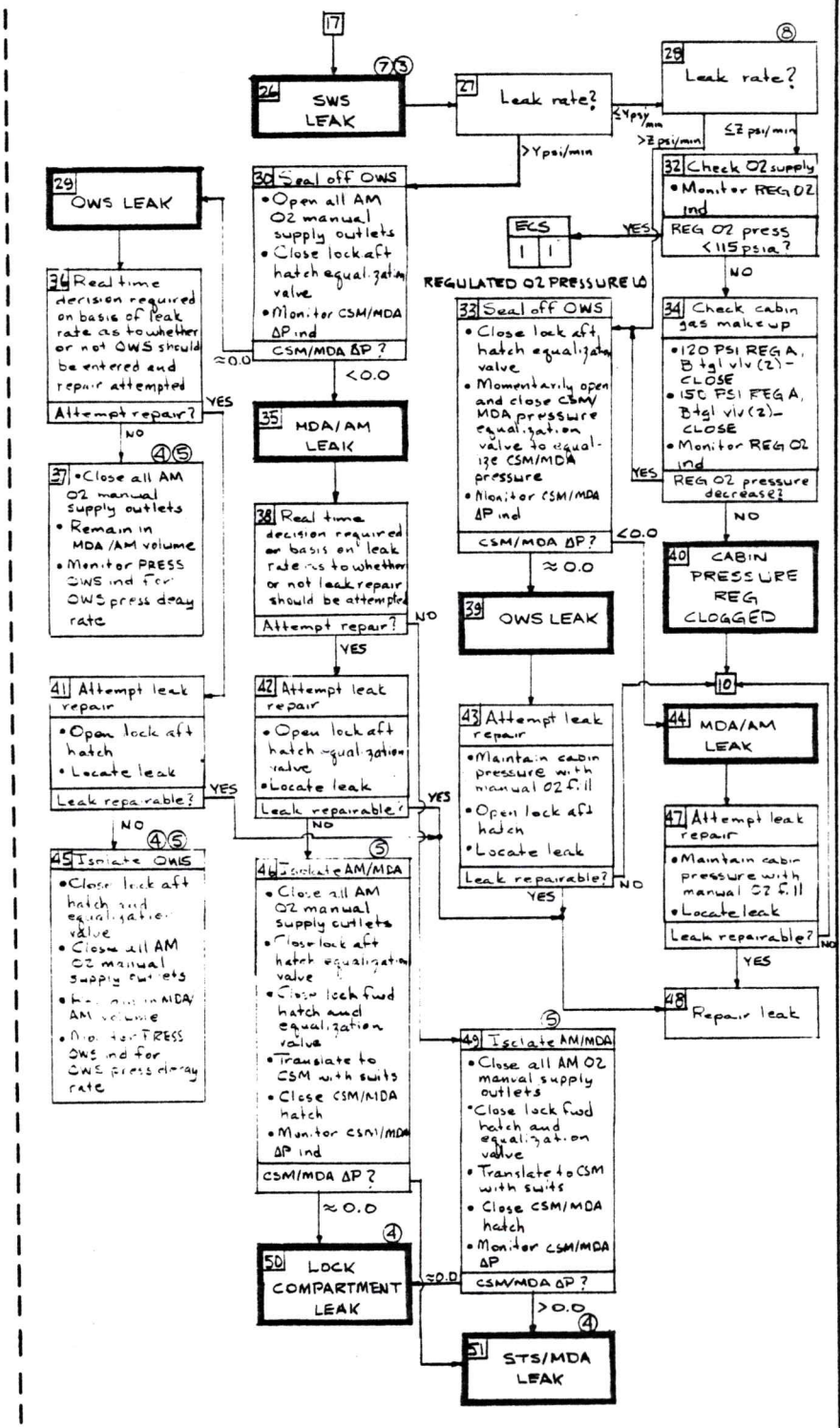

SYMPTOM
PROCEDURE
REMARKS
ECS
REGULATED N2 PRESSURE HI
P>180 psia
1 Isolate Failed regulator
• 150 PSI REG A tgl vlv - CLOSE
• Monitor REG N2 ind
REG N2 pressure < 180psia?
YES
NO
2 150 PSI REG A FAILURE
• Continue 150 PSI REG B operation
3 150 PSI REG B FAILURE
4 • 150 PSI REG A tgl vlv - OPEN
• 150 PSI REG B tgl vlv - CLOSE
① Loss of redundancy in 150 psig regulation
D060

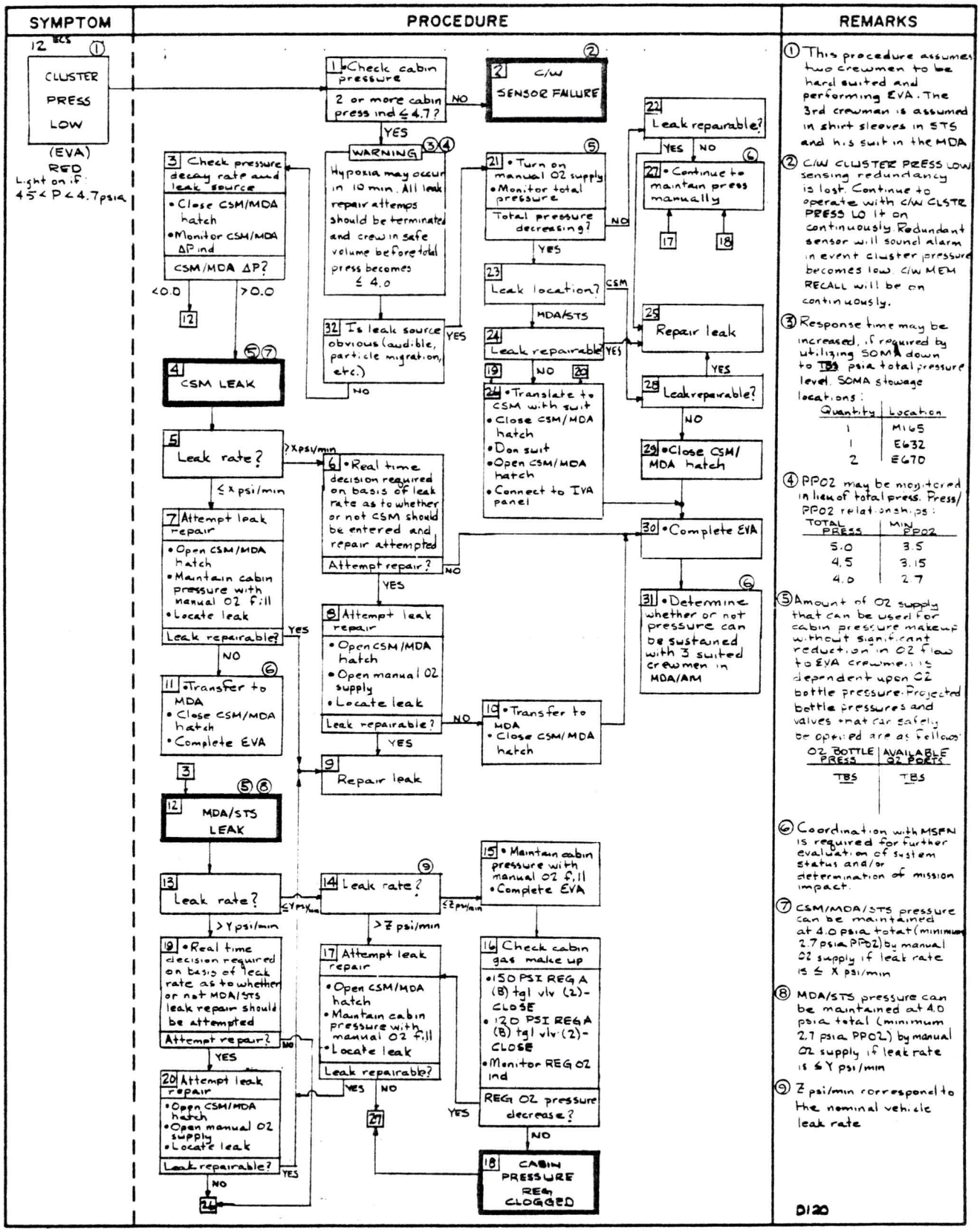

SYMPTOM
PROCEDURE
REMARKS
9 ECS
PPO2 LOW
RED
Light on if:
2.7 ≤ PPO2 ≤ 3.4 psia
9a
PPO2 CONTROLLER INDICATOR HI
> 3.5 psia
9b
PPO2 MONITOR INDICATOR LO
≤ 3.4 psia
9c
PPO2 CONTROLLER AND MONITOR INDICATOR LO
≤ 3.5 psia
WARNING
•Don SOMA before PPO2 becomes < 2.7 psia
1 Monitor PPO2
• Monitor O2/N2 CONTR PPO2 1, 2 ind (2)
Which ind(s) confirm low PPO2?
NEITHER 1 OR 2
1 ONLY
1 AND 2
2 ONLY
44 • O2/N2 CONTR MON sel - 3
• Monitor O2/N2 CONTR PPO2 2nd
O2/N2 CONTR PPO2 2nd agreed with PPO2 ind
3 Check O2/N2 controller monitor circuitry
• PPO2 MON sw - inhbt
• O2/N2 CONTR MON sel - OFF
• O2/N2 CONTR sel - 2
• C/W MASTER ALARM pb/lt - depress if PPO2 LOW indication is reinitiated
C/W PPO2 LOW indication reinitiated
YES
NO
4 O2/N2 CONTR MON SEL POWER CONTACTS FAILED OPEN
9
5 Replace PPO2 sensor 2
• O2/N2 CONTR sel - 1
• Replace PPO2 sensor 2
• O2/N2 CONTR sel - 2
• C/W MASTER ALARM pb/lt - depress if PPO2 indication is reinitiated
Does O2/N2 CONTR PPO2 ind indicate nominal PPO2?
NO
YES
6 ORIGNAL PPO2 SENSOR 2 HAD FAILED
7 Reconfigure O2/N2 controls
• O2/N2 CONTR sel 1
• O2/N2 CONTR MON sel - 2
• PPO2 MON sw - enbl
• C/W [CLEAR] sw - CLEAR
4
8 NO. 2 PPO2 SENSOR AMP FAILURE
4
9 Reconfigure O2/N2 controls
• O2/N2 CONTR MON sel - 3
• O2/N2 CONTR sel - 1
• PPO2 MON sw - enbl
• C/W [CLEAR] sw - CLEAR
10 Replace PPO2 sensor 1
• O2/N2 CONTR sel 2
• Replace PPO2 sensor 1
• O2/N2 CONTR sel 1
• C/W MASTER ALARM pb/lt - depress if PPO2 LOW indication is reinitiated
Does O2/N2 CONTR PPO2 1 ind indicate PPO2?
YES
NO
4
11 NO. 1 PPO2 SENSOR AMP FAILURE
12 Reconfigure O2/N2 controls
• O2/N2 CONTR sel 2
• O2/N2 CONTR MON sel - 3 (Verify)
• C/W [CLEAR] sw - CLEAR
13 ORIGINAL PPO2 SENSOR 1 HAD FAILED
14 • O2/N2 CONTR MON sel - 2
• C/W [CLEAR] sw - CLEAR
DECREASES BELOW 4.8
6a
19 CABIN PRESSURE REG SUPPLY LINE CLOGGED
20 • Continue to control cluster atmosphere manually
WARNING
•Don SOMA before PPO2 becomes < 2.7 psia
15 • Check cabin pressure
2 or more cabin press ind ≥ 5.2 psia?
YES
NO
17 Monitor REG O2 ind
REG O2 press ~ 115 psia?
YES
NO
5
18 Check O2 make-up
• By utilizing manual O2 fill capability, maintain PPO2 at > 2.8 psia
• [PRI/OFF/SEC] N2 vlv sel - OFF
• Monitor total cabin press
Total cabin press?
HOLDS ABOVE 4.8
21 Monitor PPO2
• Monitor O2/N2 CONTR PPO2 1, 2 ind (2)
PPO2?
INCREASING OR STABLE
DECREASING
23 O2/N2 CONTROL SYS N2 SOLENOID VLV OR VLV CONTROLLER FAILURE
24 Select alternate N2 vlv and controller
• O2/N2 CONTR sel - 2
• O2/N2 CONTR MON sel - 3
• [PRI/OFF/SEC] N2 vlv sel - SEC
22 N2 LEAK INTO CABIN
ECS 13 11
CLUSTER 1 & 2 ECS LIFE HI AND INCREASING
32
CAUTION 3
During manual O2 fill operations that may follow, do not increase cabin total press to > 5.5 psia
16 Continue to maintain PPO2 > 2.8 psia by controlling total pressure and PPO2 with LOCK COMPT DEPRESS VLV and manual O2 fill functions
CLUSTER PRESSURE HI AND INCREASING
ECS 13 11
ECS 1 1
REGULATED O2 PRESSURE LO
0070
① IF CLUSTER PRESS LOW indication is activated subsequent to or concurrent with PPO2 LOW indication perform CLUSTER PRESS LOW malfunction diagnosis
② Buildup of N2 due to normal experiment activity is not covered here.
③ Increasing cabin total press to > 5.5 psia will cause cabin press relief valve to open
③a SOMA stowage locations
Quantity | Location
1 | M165
1 | E632
2 | E670
④ Atmosphere O2/N2 gas make up capability may be controlled by either of two remaining PPO2 sensor amps and associated circuitry
⑤ It may be required that manual O2 fill will have to be repeated several times during pressure line maintenance activity depending upon initial PPO2 concentration and cabin pressure.
⑥ Loss of C/W PPO2 LOW and PPO2 monitoring functions on controller monitor circuitry when O2/N2 CONTR MON sel is cycled to positions determined to have faulty contacts
⑥a Loss of capability to control atmosphere make up with O2/N2 control system

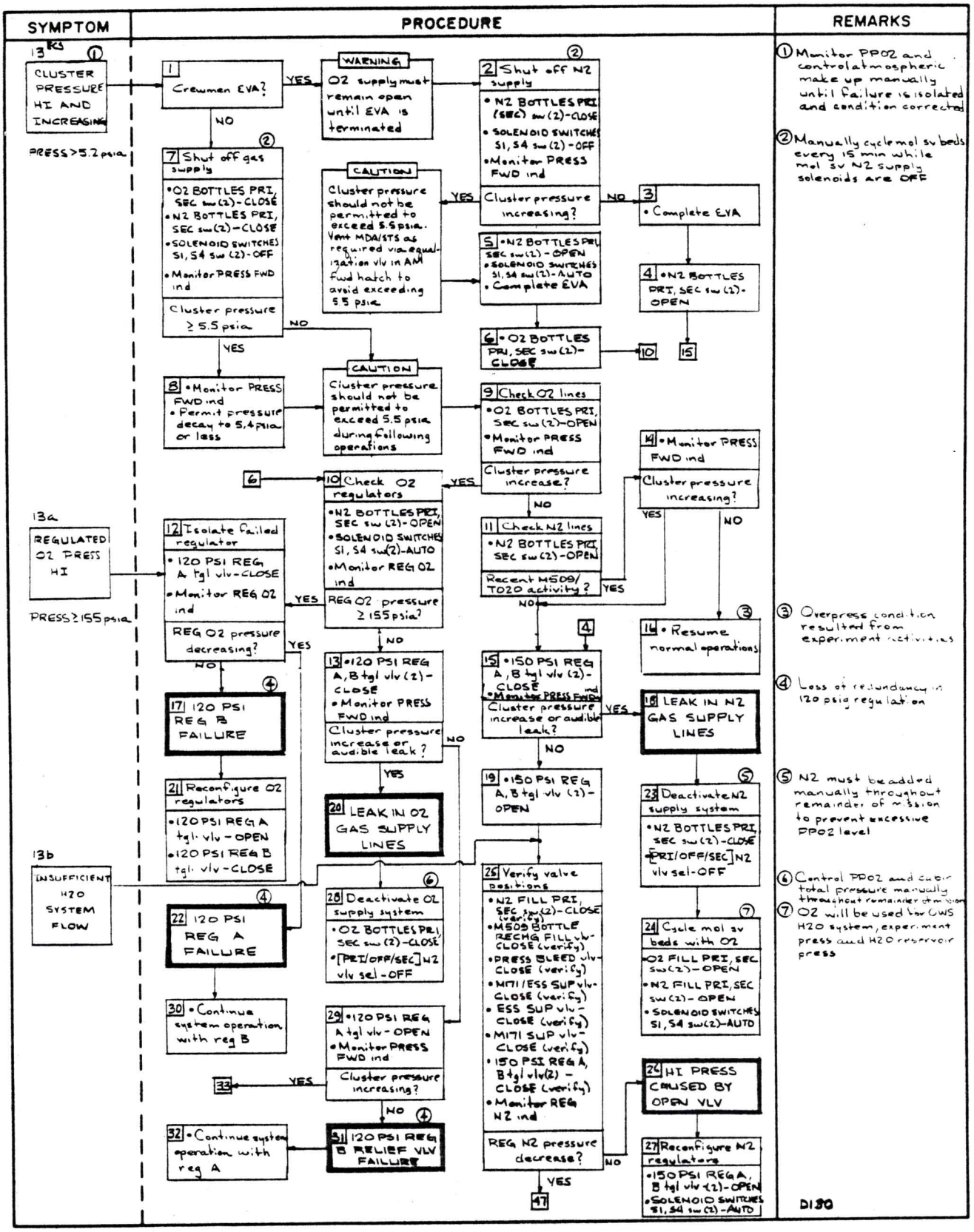

SYMPTOM
PROCEDURE
REMARKS
ECS
9 (cont'd)
9d
PPO2 CONTROLLER INDICATOR LO
≤ 3.4 psia
1
25 Check O2/N2 controller circuitry
•PPO2 CONT sw-inhbt
•O2/N2 CONTR sel-OFF
•O2/N2 CONTR MON sel-1
•C/W MASTER ALARM pb/lt-depress if PPO2 LOW indication is reinitiated
C/W PPO2 LOW indication reinitiated?
YES
NO
12
26 O2/N2 CONTR SEL POWER CONTACTS FAILED OPEN
31
27 Replace PPO2 sensor 1
•O2/N2 CONTR MON sel-2
•Replace PPO2 sensor 1
•O2/N2 CONTR MON sel-1
•C/W MASTER ALARM pb/lt-depress if PPO2 LOW indication is reinitiated
Does O2/N2 CONTR PPO2 indicate nominal PPO2?
NO
YES
28 ORIGNAL PPO2 SENSOR 1 HAD FAILED
29 Reconfigure O2/N2 controls
•O2/N2 CONTR MON sel-2
•O2/N2 CONTR sel-1
•PPO2 CONT sw-enbl
•C/W [CLEAR] sw-CLEAR
30 NO 1 PPO2 SENSOR AMP FAILURE
24
31 Reconfigure O2/N2 Controls
•O2/N2 CONTR MON sel-3
•O2/N2 CONTR sel-2
•PPO2 CONT sw-enbl
•C/W [CLEAR] sw-CLEAR
1
32 Isolate failed circuitry
•PPO2 CONT sw-inhbt
C/W PPO2 LOW lt-off?
NO
YES
7
33 Check O2/N2 controller circuitry
•PPO2 MON sw-inhbt
•O2/N2 CONTR MON sel-OFF
•PPO2 CONT sw-enbl
•Cycle O2/N2 CONTR sel thru positions 2 and 3 and monitor C/W PPO2 LOW ind for both positions
•C/W MASTER ALARM pb/lt-depress if PPO2 LOW indication is reinitiated for position 2 or 3
For which selector position(s) was C/W PPO2 indication reinitiated?
2 OR 3 OR NEITHER
2 AND 3
9
35 FAILED CONTR SEL SIGNAL CONTACTS
NEITHER OR 2 ONLY
3 ONLY
36 Reconfigure controller and controller monitor circuitry
•O2/N2 CONTR sel-3 (verify)
•O2/N2 CONTR MON sel-2
•PPO2 MON sw-enbl
39 Reconfigure controller and controller monitor circuitry
•O2/N2 CONTR MON sel-1
•O2/N2 CONTR sel-2
•PPO2 MON sw-enbl
34 Check O2/N2 controller monitor circuitry
•O2/N2 CONTR sel-OFF
•Cycle O2/N2 CONTR MON sel thru positions 1 and 3 and monitor C/W PPO2 LOW ind for both positions
•C/W MASTER ALARM pb/lt-depress if PPO2 LOW indication is reinitiated for position 1 or 3
For which selector position(s) was C/W PPO2 indication reinitiated?
1 OR 3 OR NEITHER
1 AND 3
8
37 FAILED CONTR MON SEL SIGNAL CONTACTS
NEITHER OR 1 ONLY
3 ONLY
42 Reconfigure controller and controller monitor circuitry
•O2/N2 CONTR sel-2
•O2/N2 CONTR MON sel-1
•PPO2 CONT sw-enbl
43 Reconfigure controller and controller monitor circuitry
•O2/N2 CONTR MON sel-3 (verify)
•O2/N2 CONTR sel-1
•PPO2 CONT sw-enbl
34 FAILED SEL CONTACTS OR C/W INSTR PACKAGE FAILURE
2 AND 3
1 AND 3
10
40 Reconfigure controller and controller monitor circuitry
•O2/N2 CONTR MON sel-3
•PPO2 CONT sw-inhbt
•PPO2 MON sw-enbl
•O2/N2 CONTR sel-1
11
41 Reconfigure controller and controller monitor circuitry
•O2/N2 CONTR sel-1
•PPO2 MON sw-inhbt
•PPO2 CONT sw-enbl
•O2/N2 CONTR MON sel-2
7 C/W PPO2 LOW indication will be reactivated when the PPO2 CONT sw is enabled. Reset the C/W and continue with diagnosis
8 Loss of capability for controller monitor circuitry to monitor PPO2 LOW on C/W when O2/N2 CONTR MON sel is cycled to positions determined to have faulty contacts. Capability to monitor PPO2 LOW on C/W still exists on controller circuitry
9 Loss of capability for controller circuitry to monitor PPO2 LOW on C/W when O2/N2 CONTR sel is cycled to positions determined to have faulty contacts. Capability to monitor PPO2 LOW on C/W still exists on controller monitor circuitry
10 Loss of capability for controller circuitry to monitor PPO2 LOW on C/W. Capability to monitor PPO2 LOW on C/W still exists on controller monitor circuitry
11 Loss of capability for controller monitor circuitry to monitor PPO2 LOW on C/W. Capability to monitor PPO2 LOW on C/W still exists on controller circuitry
12 Loss of C/W PPO2 LOW and PPO2 monitoring functions on controller circuitry when O2/N2 CONTR sel is cycled to position(s) determined to have faulty contacts
D080

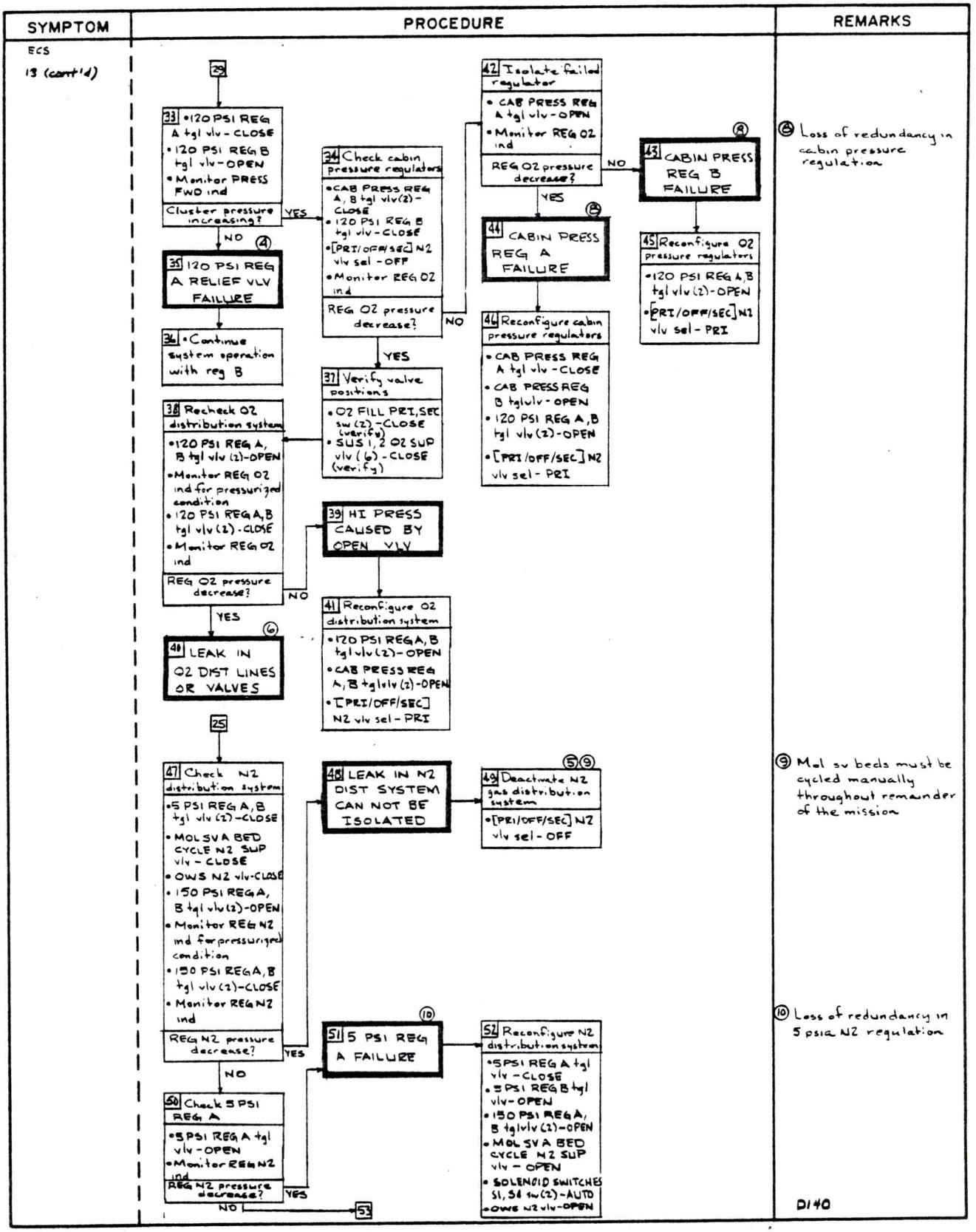

SYMPTOM
PROCEDURE
REMARKS
ECS
10
PPO2 MONITOR INDICATOR 141
PPO2 > 3.9 psia
1 • Monitor O2/N2 CONTR PPO2 1 ind
PPO2 = ? psia
< 3.5
3.5 to 3.9
> 3.9
ECS 9d 25
PPO2 CONTROLLER INDICATOR LO
2 Select sensor 3
• O2/N2 CONTR MON sel - 3
• Monitor O2/N2 CONTR PPO2 3 ind
O2/N2 CONTR PPO2 3 ind agrees with PPO2 ind
2
1
3 NO. 2 PPO2 SNSR OR SNSR AMP FAILURE
4 • Continue monitor operation with sensor 3
5 NO. 1 PPO2 SNSR OR SNSR AMP FAILURE
6 Reconfigure controller and controller monitor circuitry
• O2/N2 CONTR sel - 2
• O2/N2 CONTR MON sel - 3
7 O2/N2 CONTR SYS N2 SOLENOID VLV OR VLV CONTROLLER FAILURE
8 Select alternate N2 vlv and controller
• O2/N2 CONTR sel - 2
• O2/N2 CONTR MON sel - 3
• [PRI/OFF/SEC] N2 vlv sel - SEC
① PPO2 sensor 2 is normally selected as the monitor sensor and PPO2 sensor 1 is normally selected as the controller sensor
② Failure can be isolated to sensor or sensor amplifier by replacing suspected failed sensor at earliest convenience and comparing its readout with that of the good sensors
D090


SYMPTOM
PROCEDURE
REMARKS
11 ECS
CLUSTER PRESS LOW
RED
Light on if: 4.5 < P < 4.7 psia
11a
CLUSTER PRESSURE LO AND DECREASING
4.5 < P < 4.7 psia
1 • Check cabin pressure
2 or more cabin pressure ind ≤ 4.7 psia?
NO
YES
2 C/W SENSOR FAILURE
4 CLUSTER LEAK OR INSUFFICIENT ATMOSPHERE MAKEUP
3 • Check cabin pressure
2 or more cabin pressure ind ≤ 4.7 psia?
YES
NO
6 PRESSURE SENSOR OR INDICATOR FAILURE
WARNING (2)
Hypoxia may occur in 10 min All leak repair attemps should be terminated and crew in safe volume before total press becomes ≤ 4.0 psia
12 Is leak source obvious (audible particle migration etc)?
YES
NO
5 • Open all AM O2 manual supply outlets
• Monitor total cabin pressure
Cabin pressure decreasing?
NO
YES
9 Leak repairable?
NO
YES
7 Leak repairable?
YES
NO
9 Repair leak
11 • Isolate leaking volume
21 43 40 47 (4)
10 Continue to maintain pressure manually
13 OWS Leak
• Transfer pressure suits to MDA
• Close aft lock hatch and equalization valve
• Cap ECS circulation ducts
• Close AM O2 manual supply outlets
• Monitor OWS leak rate
14 AM Lock Leak
• Transfer pressure suits to MDA
• Close OWS hatch
• Close aft lock hatch and equalization valve
• Close lock compt O2 supply
• Close fwd lock hatch and equalization valve
• Cap ECS circulation ducts
• Close STS manual O2 supply
• Monitor lock leak rate
15 MDA/STS leak
• Transfer pressure suits to CSM
• Close lock aft hatch and equalization valve
• Close AM O2 manual supply outlets
• Cap ECS circulation ducts
• Translate into CSM and close CSM/MDA hatch
• Monitor CSM/MDA ΔP ind for pressure decay rate
16 CSM Leak
• Transfer pressure suits to MDA/STS
• Close CSM/MDA hatch
• Close AM O2 manual supply outlets
• Monitor CSM/MDA ΔP ind for pressure decay rate
18 CSM LEAK
19 Leak rate?
>X psi/min
≤X psi/min
17 Check pressure decay rate and leak source
• Transfer pressure suits to MDA
• Transfer meteoroid penetration repair kit to MDA
• Close CSM/MDA hatch and equalization vlv
• Close lock aft hatch and leave equalization valve open
• Cap ECS circulation ducts
• Monitor CSM/MDA ΔP ind
CSM/MDA ΔP ind?
<0.0
>0.0
26
25 • Translate to MDA
• Close CSM/MDA hatch
20 Real time decision required on basis of leak rate as to whether or not CSM should be entered and repair attempted
Attempt repair?
YES
NO
22 • Remain in MDA/AM/OWS
24 Attempt leak repair
• Open manual O2 fill ports
• Open CSM/MDA hatch
• Locate leak
Leak repairable?
YES
NO
21 Attempt leak repair
• Maintain cabin pressure with manual O2 fill
• Open CSM/MDA hatch
• Locate leak
Leak repairable?
YES
NO
10
23 Repair leak
(1) C/W CLUSTER PRESS LOW sensing redundancy is lost. Continue to operate with C/W CLSTR PRESS LO lt on continuously. Redundant sensor will sound alarm in event cluster pressure becomes low. C/W MEM RECALL pb/lt will be on continuously.
(2) Response time may be increased, if required, by utilizing SCMA down to TBS psia total pressure level. SCMA stowage locations:
Quantity | Location
1 | M165
1 | E632
2 | E670
(3) Available O2 outlets and their flow capability at 1000 psi pressure upstream of 120 psi regulators are as follows:
Outlet (location) | Flowrate
IVA O2 (pnl 217) | 19 lb/hr
EVA O2 (pnl 317 and 323) | 38 lb/hr
O2 FILL (pnl 225) | 22.7 lb/hr
(4) Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact
(5) Pressure decay rate may be useful information if subsequent repress and entry into leaking compartment is attempted
(5) Three man effort required to reduce response time
(6) Cluster pressure including CSM can be maintained at 4.0 psia total (minimum 2 psia PPO2) by manual O2 supply if CSM leak rate is ≤ X psi/min
D100

SYMPTOM	PROCEDURE	REMARKS
ECS 11 (cont'd)		⑦ Cluster pressure including CSM can be maintained at 4.0 psia total (minimum 2.7 psia PPO2) by manual O2 supply if SWS leak rate is ≤ Y psi/min ⑧ Z psi/min corresponds to the nominal vehicle leak rate


SYMPTOM
PROCEDURE
REMARKS
12 ECS
CLUSTER PRESS LOW
(EVA)
RED
Light on if:
4.5 < P < 4.7 psia
1 • Check cabin pressure
2 or more cabin press ind ≤ 4.7?
NO
2 C/W SENSOR FAILURE
YES
WARNING
Hypoxia may occur in 10 min. All leak repair attemps should be terminated and crew in safe volume before total press becomes ≤ 4.0
3 Check pressure decay rate and leak source
• Close CSM/MDA hatch
• Monitor CSM/MDA ΔP ind
CSM/MDA ΔP?
<0.0
>0.0
4 CSM LEAK
5 Leak rate?
≤ X psi/min
> X psi/min
6 • Real time decision required on basis of leak rate as to whether or not CSM should be entered and repair attempted
Attempt repair?
NO
YES
7 Attempt leak repair
• Open CSM/MDA hatch
• Maintain cabin pressure with manual O2 fill
• Locate leak
Leak repairable?
YES
NO
8 Attempt leak repair
• Open CSM/MDA hatch
• Open manual O2 supply
• Locate leak
Leak repairable?
YES
NO
9 Repair leak
10 • Transfer to MDA
• Close CSM/MDA hatch
11 • Transfer to MDA
• Close CSM/MDA hatch
• Complete EVA
12 MDA/STS LEAK
13 Leak rate?
≤ Y psi/min
> Y psi/min
14 Leak rate?
≤ Z psi/min
> Z psi/min
15 • Maintain cabin pressure with manual O2 fill
• Complete EVA
16 Check cabin gas make up
• 150 PSI REG A (B) tgl vlv (2) - CLOSE
• 120 PSI REG A (B) tgl vlv (2) - CLOSE
• Monitor REG O2 ind
REG O2 pressure decrease?
YES
NO
17 Attempt leak repair
• Open CSM/MDA hatch
• Maintain cabin pressure with manual O2 fill
• Locate leak
Leak repairable?
YES
NO
18 CABIN PRESSURE REG CLOGGED
19 • Real time decision required on basis of leak rate as to whether or not MDA/STS leak repair should be attempted
Attempt repair?
NO
YES
20 Attempt leak repair
• Open CSM/MDA hatch
• Open manual O2 supply
• Locate leak
Leak repairable?
YES
NO
21 • Turn on manual O2 supply
• Monitor total pressure
Total pressure decreasing?
NO
YES
22 Leak repairable?
YES
NO
23 Leak location?
CSM
MDA/STS
24 Leak repairable
YES
NO
24 • Translate to CSM with suit
• Close CSM/MDA hatch
• Don suit
• Open CSM/MDA hatch
• Connect to IVA panel
25 Repair leak
26 Leak repairable?
YES
NO
27 • Continue to maintain press manually
28 • Close CSM/MDA hatch
29 • Complete EVA
30 • Determine whether or not pressure can be sustained with 3 suited crewmen in MDA/AM
31 Leak rate?
≤ Z psi/min
32 Is leak source obvious (audible, particle migration, etc.)
YES
NO
1 This procedure assumes two crewmen to be hard suited and performing EVA. The 3rd crewman is assumed in shirt sleeves in STS and his suit in the MDA
2 C/W CLUSTER PRESS LOW sensing redundancy is lost. Continue to operate with C/W CLSTR PRESS LO lt on continuously. Redundant sensor will sound alarm in event cluster pressure becomes low. C/W MEM RECALL will be on continuously.
3 Response time may be increased, if required by utilizing SOMA down to TBS psia total pressure level. SOMA stowage locations:
Quantity | Location
1 | M165
1 | E632
2 | E670
4 PPO2 may be monitored in lieu of total press. Press/PPO2 relationships:
TOTAL PRESS | MIN PPO2
5.0 | 3.5
4.5 | 3.15
4.0 | 2.7
5 Amount of O2 supply that can be used for cabin pressure makeup without significant reduction in O2 flow to EVA crewmen is dependent upon O2 bottle pressure. Projected bottle pressures and valves that can safely be opened are as follows:
O2 BOTTLE PRESS | AVAILABLE O2 PORTS
TBS | TBS
6 Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact.
7 CSM/MDA/STS pressure can be maintained at 4.0 psia total (minimum 2.7 psia PPO2) by manual O2 supply if leak rate is ≤ X psi/min
8 MDA/STS pressure can be maintained at 4.0 psia total (minimum 2.7 psia PPO2) by manual O2 supply if leak rate is ≤ Y psi/min
9 Z psi/min corresponds to the nominal vehicle leak rate
D120

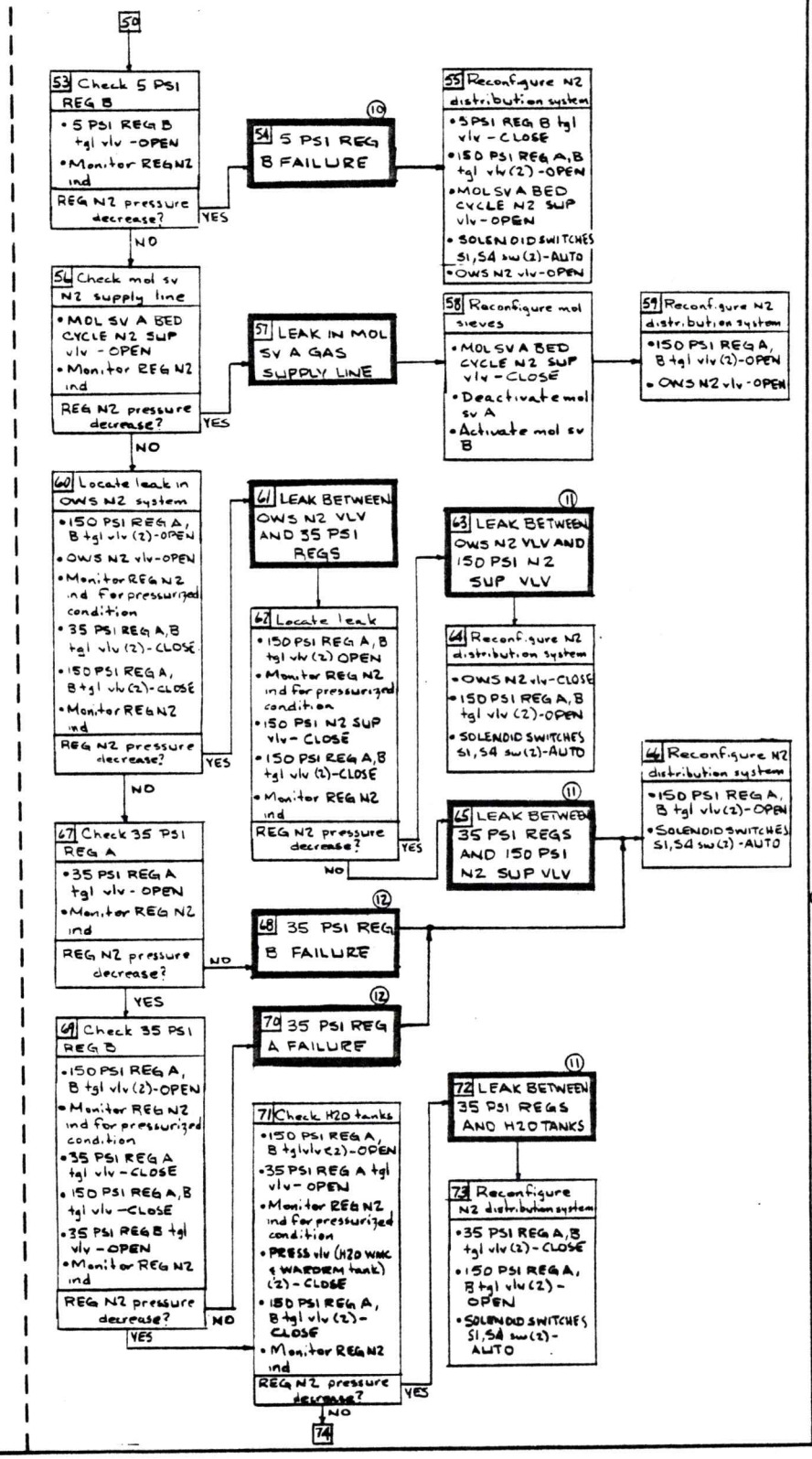

SYMPTOM
PROCEDURE
REMARKS
13 KS ①
CLUSTER PRESSURE HI AND INCREASING
PRESS > 5.2 psia
1 Crewmen EVA?
YES
NO
WARNING
O2 supply must remain open until EVA is terminated
2 Shut off N2 supply
• N2 BOTTLES PRI (SEC) sw (2) - CLOSE
• SOLENOID SWITCHES S1, S4 sw (2) - OFF
• Monitor PRESS FWD ind
Cluster pressure increasing?
NO
3 • Complete EVA
4 • N2 BOTTLES PRI, SEC sw (2) - OPEN
YES
CAUTION
Cluster pressure should not be permitted to exceed 5.5 psia. Vent MDA/STS as required via equalization vlv in AM fwd hatch to avoid exceeding 5.5 psia
5 • N2 BOTTLES PRI SEC sw (2) - OPEN
• SOLENOID SWITCHES S1, S4 sw (2) - AUTO
• Complete EVA
6 • O2 BOTTLES PRI, SEC sw (2) - CLOSE
10
15
7 Shut off gas supply
• O2 BOTTLES PRI, SEC sw (2) - CLOSE
• N2 BOTTLES PRI, SEC sw (2) - CLOSE
• SOLENOID SWITCHES S1, S4 sw (2) - OFF
• Monitor PRESS FWD ind
Cluster pressure ≥ 5.5 psia
NO
YES
8 • Monitor PRESS FWD ind
• Permit pressure decay to 5.4 psia or less
CAUTION
Cluster pressure should not be permitted to exceed 5.5 psia during following operations
9 Check O2 lines
• O2 BOTTLES PRI, SEC sw (2) - OPEN
• Monitor PRESS FWD ind
Cluster pressure increase?
YES
NO
6
10 Check O2 regulators
• N2 BOTTLES PRI, SEC sw (2) - OPEN
• SOLENOID SWITCHES S1, S4 sw (2) - AUTO
• Monitor REG O2 ind
REG O2 pressure ≥ 155 psia?
YES
NO
11 Check N2 lines
• N2 BOTTLES PRI, SEC sw (2) - OPEN
Recent MS09/TO20 activity?
YES
NO
14 • Monitor PRESS FWD ind
Cluster pressure increasing?
YES
NO
13a
REGULATED O2 PRESS HI
PRESS ≥ 155 psia
12 Isolate failed regulator
• 120 PSI REG A tgl vlv - CLOSE
• Monitor REG O2 ind
REG O2 pressure decreasing?
YES
NO
④
13 • 120 PSI REG A, B tgl vlv (2) - CLOSE
• Monitor PRESS FWD ind
Cluster pressure increase or audible leak?
YES
NO
4
15 • 150 PSI REG A, B tgl vlv (2) - CLOSE
• Monitor PRESS FWD ind
Cluster pressure increase or audible leak?
YES
NO
16 LEAK IN N2 GAS SUPPLY LINES
③
16 • Resume normal operations
17 120 PSI REG B FAILURE
20 LEAK IN O2 GAS SUPPLY LINES
19 • 150 PSI REG A, B tgl vlv (2) - OPEN
21 Reconfigure O2 regulators
• 120 PSI REG A tgl vlv - OPEN
• 120 PSI REG B tgl vlv - CLOSE
13b
INSUFFICIENT H2O SYSTEM FLOW
④
22 120 PSI REG A FAILURE
⑥
28 Deactivate O2 supply system
• O2 BOTTLES PRI, SEC sw (2) - CLOSE
• [PRI/OFF/SEC] N2 vlv sel - OFF
25 Verify valve positions
• N2 FILL PRI, SEC sw (2) - CLOSE (verify)
• MS09 BOTTLE RECHG FILL vlv - CLOSE (verify)
• PRESS BLEED vlv - CLOSE (verify)
• M171 ESS SUP vlv - CLOSE (verify)
• ESS SUP vlv - CLOSE (verify)
• M171 SUP vlv - CLOSE (verify)
• 150 PSI REG A, B tgl vlv (2) - CLOSE (verify)
• Monitor REG N2 ind
REG N2 pressure decrease?
NO
YES
47
⑤
23 Deactivate N2 supply system
• N2 BOTTLES PRI, SEC sw (2) - CLOSE
• [PRI/OFF/SEC] N2 vlv sel - OFF
⑦
24 Cycle mol sv beds with O2
• O2 FILL PRI, SEC sw (2) - OPEN
• N2 FILL PRI, SEC sw (2) - OPEN
• SOLENOID SWITCHES S1, S4 sw (2) - AUTO
24 HI PRESS CAUSED BY OPEN VLV
27 Reconfigure N2 regulators
• 150 PSI REG A, B tgl vlv (2) - OPEN
• SOLENOID SWITCHES S1, S4 sw (2) - AUTO
30 • Continue system operation with reg B
29 • 120 PSI REG A tgl vlv - OPEN
• Monitor PRESS FWD ind
Cluster pressure increasing?
33
YES
NO
④
31 120 PSI REG B RELIEF VLV FAILURE
32 • Continue system operation with reg A
① Monitor PPO2 and control atmospheric make up manually until failure is isolated and condition corrected
② Manually cycle mol sv beds every 15 min while mol sv N2 supply solenoids are OFF
③ Overpress condition resulted from experiment activities
④ Loss of redundancy in 120 psig regulation
⑤ N2 must be added manually throughout remainder of mission to prevent excessive PPO2 level
⑥ Control PPO2 and cabin total pressure manually throughout remainder of mission
⑦ O2 will be used for OWS H2O system, experiment press and H2O reservoir press
D130


SYMPTOM
PROCEDURE
REMARKS
ECS
13 (cont'd)
29
33 •120 PSI REG A tgl vlv - CLOSE • 120 PSI REG B tgl vlv - OPEN • Monitor PRESS FWD ind
Cluster pressure increasing?
YES
NO
4
35 120 PSI REG A RELIEF VLV FAILURE
36 • Continue system operation with reg B
34 Check cabin pressure regulators
•CAB PRESS REG A, B tgl vlv(2) - CLOSE • 120 PSI REG B tgl vlv - CLOSE •[PRI/OFF/SEC] N2 vlv sel - OFF • Monitor REG O2 ind
REG O2 pressure decrease?
NO
YES
37 Verify valve positions
• O2 FILL PRI, SEC sw (2) - CLOSE (verify) • SUS 1, 2 O2 SUP vlv (6) - CLOSE (verify)
38 Recheck O2 distribution system
•120 PSI REG A, B tgl vlv (2) - OPEN • Monitor REG O2 ind for pressurized condition • 120 PSI REG A, B tgl vlv (2) - CLOSE • Monitor REG O2 ind
REG O2 pressure decrease?
NO
YES
6
40 LEAK IN O2 DIST LINES OR VALVES
39 HI PRESS CAUSED BY OPEN VLV
41 Reconfigure O2 distribution system
• 120 PSI REG A, B tgl vlv (2) - OPEN • CAB PRESS REG A, B tgl vlv (2) - OPEN • [PRI/OFF/SEC] N2 vlv sel - PRI
42 Isolate failed regulator
• CAB PRESS REG A tgl vlv - OPEN • Monitor REG O2 ind
REG O2 pressure decrease?
NO
YES
8
43 CABIN PRESS REG B FAILURE
45 Reconfigure O2 pressure regulators
• 120 PSI REG A, B tgl vlv (2) - OPEN • [PRI/OFF/SEC] N2 vlv sel - PRI
8
44 CABIN PRESS REG A FAILURE
46 Reconfigure cabin pressure regulators
• CAB PRESS REG A tgl vlv - CLOSE • CAB PRESS REG B tgl vlv - OPEN • 120 PSI REG A, B tgl vlv (2) - OPEN • [PRI/OFF/SEC] N2 vlv sel - PRI
25
47 Check N2 distribution system
•5 PSI REG A, B tgl vlv (2) - CLOSE • MOL SV A BED CYCLE N2 SUP vlv - CLOSE • OWS N2 vlv - CLOSE • 150 PSI REG A, B tgl vlv (2) - OPEN • Monitor REG N2 ind for pressurized condition • 150 PSI REG A, B tgl vlv (2) - CLOSE • Monitor REG N2 ind
REG N2 pressure decrease?
YES
NO
48 LEAK IN N2 DIST SYSTEM CAN NOT BE ISOLATED
5 9
49 Deactivate N2 gas distribution system
•[PRI/OFF/SEC] N2 vlv sel - OFF
10
51 5 PSI REG A FAILURE
52 Reconfigure N2 distribution system
• 5 PSI REG A tgl vlv - CLOSE • 5 PSI REG B tgl vlv - OPEN • 150 PSI REG A, B tgl vlv (2) - OPEN • MOL SV A BED CYCLE N2 SUP vlv - OPEN • SOLENOID SWITCHES S1, S4 sw (2) - AUTO • OWS N2 vlv - OPEN
50 Check 5 PSI REG A
•5 PSI REG A tgl vlv - OPEN • Monitor REG N2 ind
REG N2 pressure decrease?
YES
NO
53
8 Loss of redundancy in cabin pressure regulation
9 MOL sv beds must be cycled manually throughout remainder of the mission
10 Loss of redundancy in 5 psia N2 regulation
D140

SYMPTOM	PROCEDURE	REMARKS

ECS

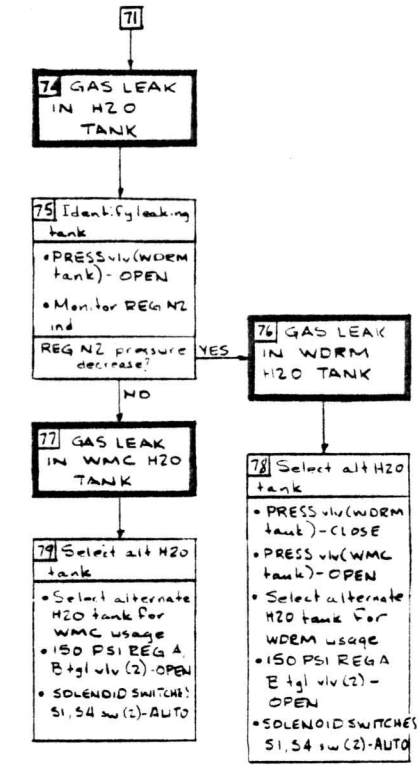
13 (cont'd)

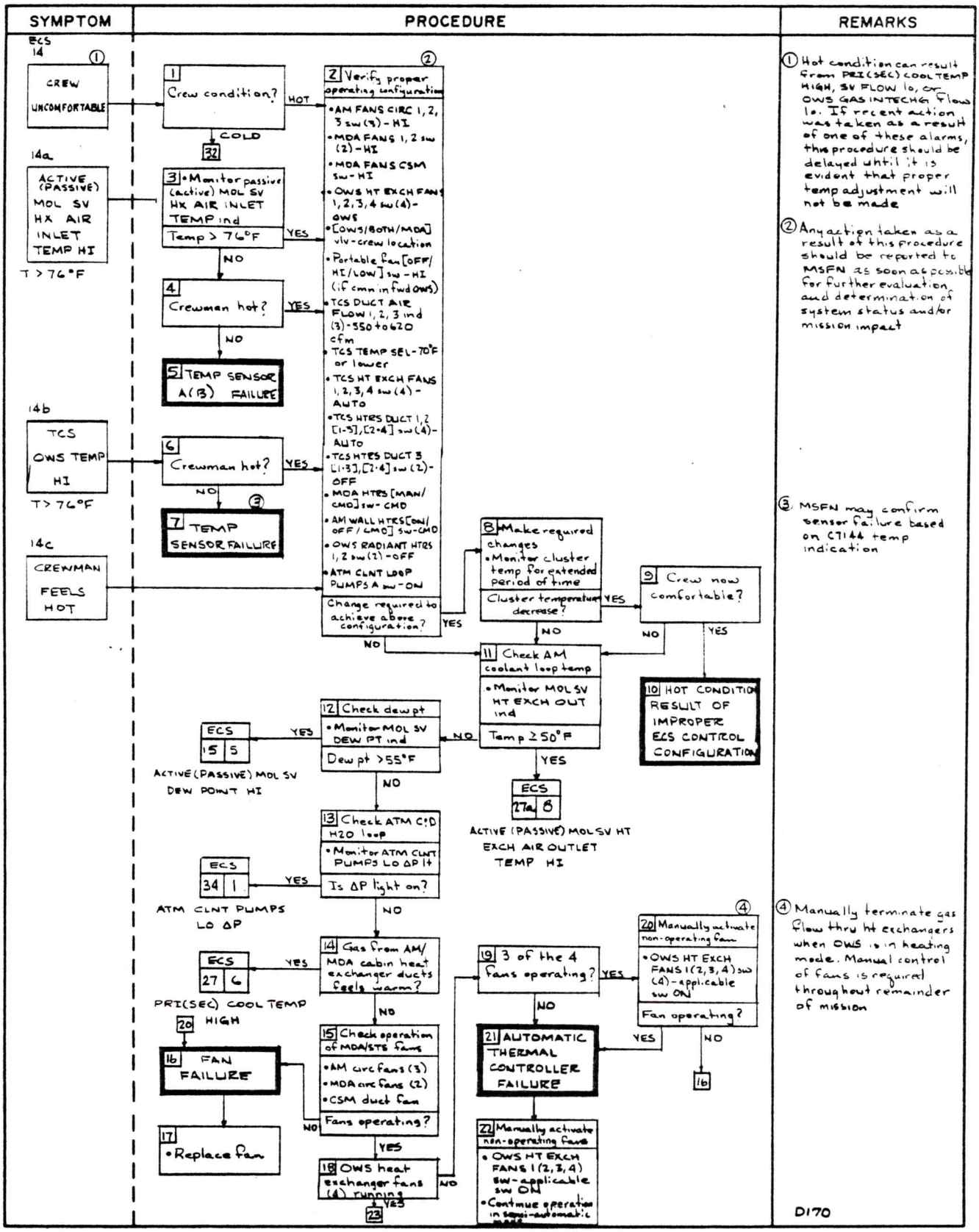


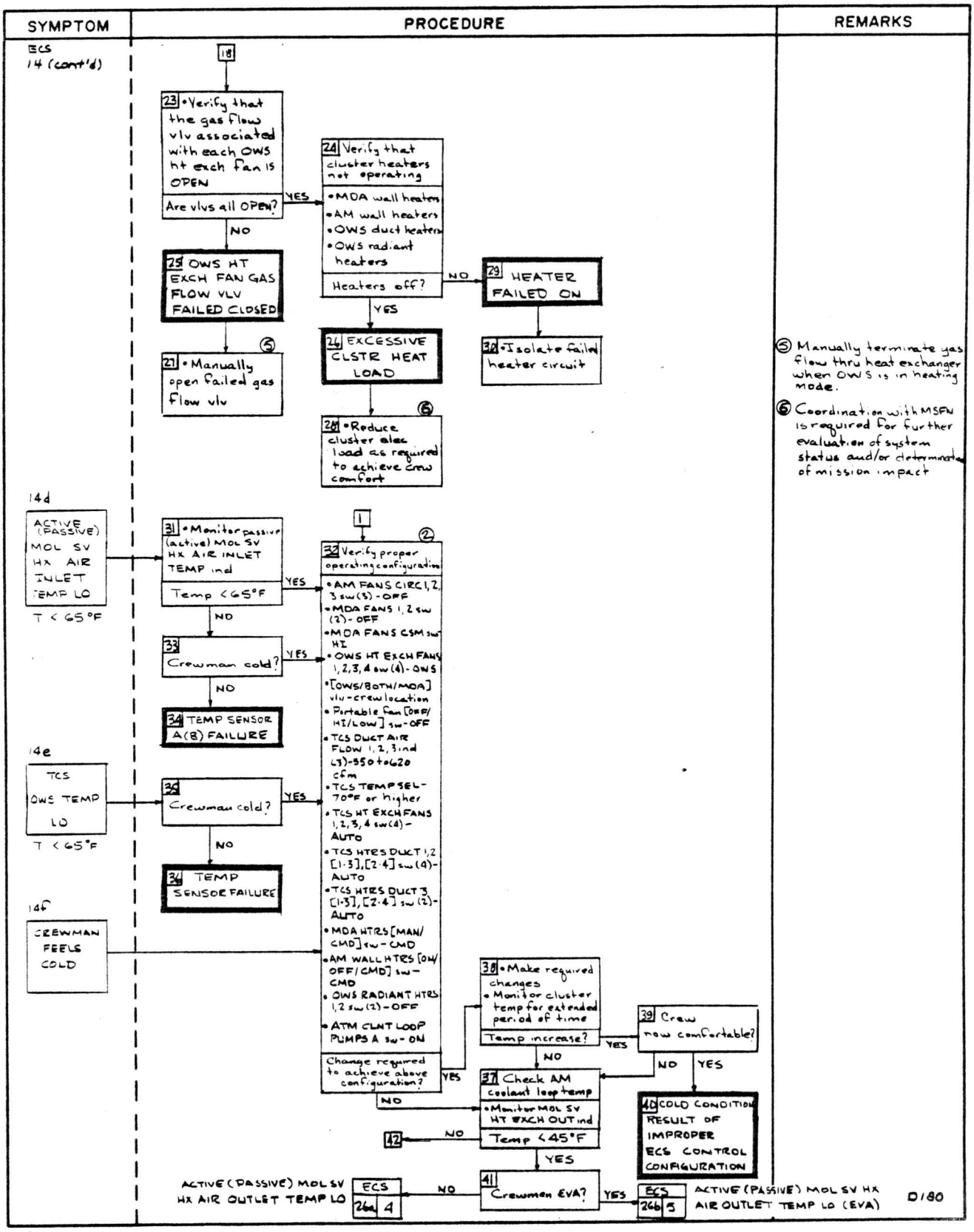
(11) Loss of automatic pressurization of H2O system. Periodic manual pressurization will be required

(12) Loss of redundancy in 35 psig N2 regulation

D1B0

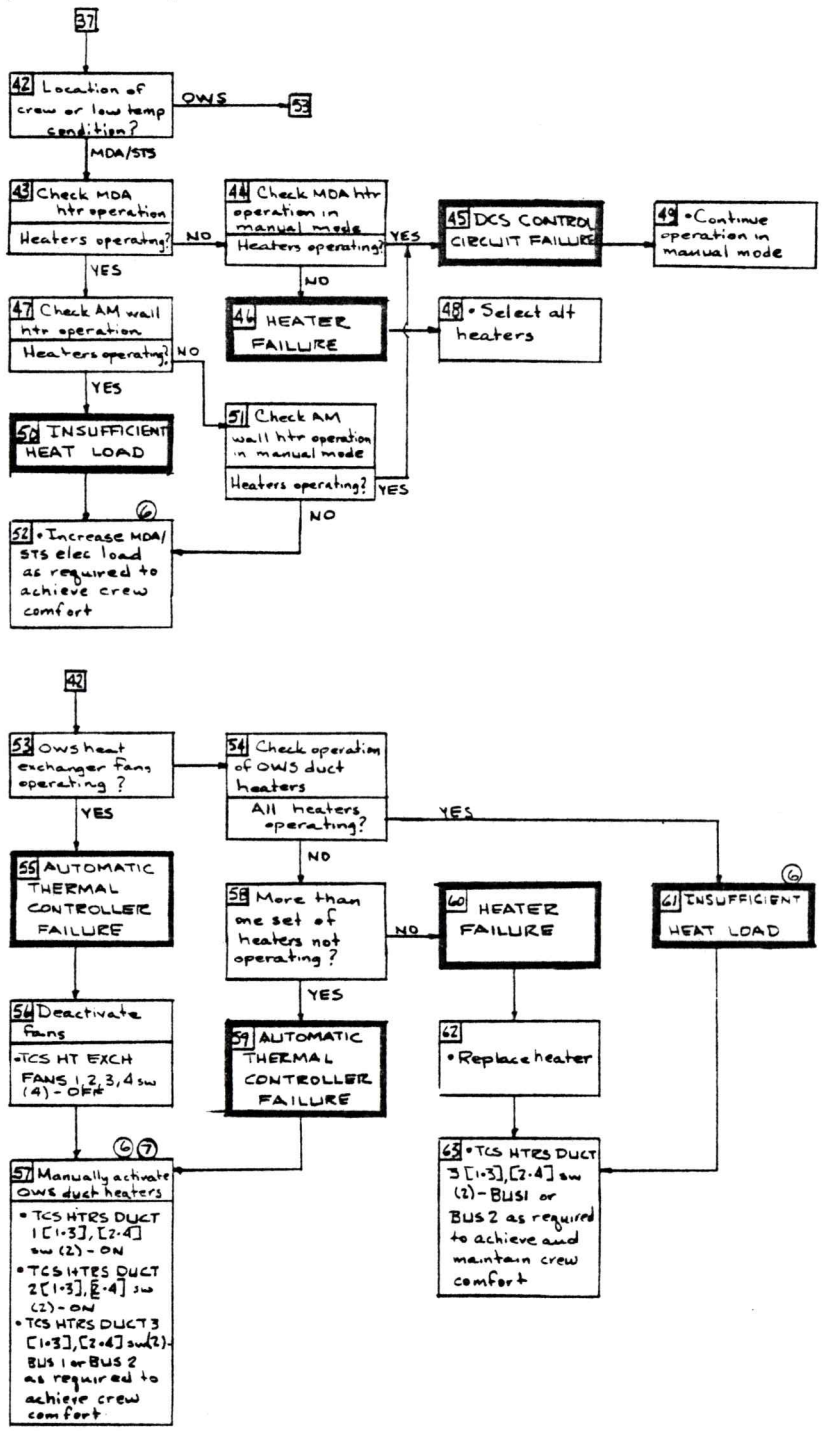
SYMPTOM	PROCEDURE	REMARKS
ECS 13 (cont'd)		D160


SYMPTOM
PROCEDURE
REMARKS
ECS 14
CREW UNCOMFORTABLE
14a
ACTIVE (PASSIVE) MDL SV HX AIR INLET TEMP HI
T > 76°F
14b
TCS OWS TEMP HI
T > 76°F
14c
CREWMAN FEELS HOT
1 Crew condition?
HOT
COLD
32
2 Verify proper operating configuration
•AM FANS CIRC 1, 2, 3 sw (3) - HI
•MDA FANS 1, 2 sw (2) - HI
•MDA FANS CSM sw - HI
•OWS HT EXCH FANS 1, 2, 3, 4 sw (4) - OWS
•[OWS/BOTH/MDA] vlv - crew location
•Portable fan [OFF/HI/LOW] sw - HI (if cmn in fwd OWS)
•TCS DUCT AIR FLOW 1, 2, 3 ind (3) - 550 to 620 cfm
•TCS TEMP SEL - 70°F or lower
•TCS HT EXCH FANS 1, 2, 3, 4 sw (4) - AUTO
•TCS HTRS DUCT 1, 2 [1-3], [2-4] sw (4) - AUTO
•TCS HTRS DUCT 3 [1-3], [2-4] sw (2) - OFF
•MDA HTRS [MAN/CMD] sw - CMD
•AM WALL HTRS [ON/OFF/CMD] sw - CMD
•OWS RADIANT HTRS 1, 2 sw (2) - OFF
•ATM CLNT LOOP PUMPS A sw - ON
Change required to achieve above configuration?
YES
NO
3 •Monitor passive (active) MDL SV HX AIR INLET TEMP ind
Temp > 76°F
YES
NO
4 Crewman hot?
YES
NO
5 TEMP SENSOR A(B) FAILURE
6 Crewman hot?
YES
NO
7 TEMP SENSOR FAILURE
8 Make required changes
•Monitor cluster temp for extended period of time
Cluster temperature decrease?
YES
NO
9 Crew now comfortable?
NO
YES
10 HOT CONDITION RESULT OF IMPROPER ECS CONTROL CONFIGURATION
11 Check AM coolant loop temp
•Monitor MDL SV HT EXCH OUT ind
Temp ≥ 50°F
NO
YES
ECS 27a 8
ACTIVE (PASSIVE) MDL SV HT EXCH AIR OUTLET TEMP HI
12 Check dew pt
•Monitor MDL SV DEW PT ind
Dew pt > 55°F
YES
NO
ECS 15 5
ACTIVE (PASSIVE) MDL SV DEW POINT HI
13 Check ATM C&D H2O loop
•Monitor ATM CLNT PUMPS LO ΔP lt
Is ΔP light on?
YES
NO
ECS 34 1
ATM CLNT PUMPS LO ΔP
14 Gas from AM/MDA cabin heat exchanger ducts feels warm?
YES
NO
ECS 27 6
PRI(SEC) COOL TEMP HIGH
20
16 FAN FAILURE
17 •Replace fan
15 Check operation of MDA/STS fans
•AM circ fans (3)
•MDA circ fans (2)
•CSM duct fan
Fans operating?
NO
YES
18 OWS heat exchanger fans (4) running
NO
YES
23
19 3 of the 4 fans operating?
YES
NO
20 Manually activate non-operating fans
•OWS HT EXCH FANS 1 (2, 3, 4) sw (4) - applicable sw ON
Fan operating?
YES
NO
16
21 AUTOMATIC THERMAL CONTROLLER FAILURE
22 Manually activate non-operating fans
•OWS HT EXCH FANS 1 (2, 3, 4) sw - applicable sw ON
•Continue operation in semi-automatic mode
① Hot condition can result from PRI (SEC) COOL TEMP HIGH, SV FLOW lo, or OWS GAS IN TECHG Flow lo. If recent action was taken as a result of one of these alarms, this procedure should be delayed until it is evident that proper temp adjustment will not be made
② Any action taken as a result of this procedure should be reported to MSFN as soon as possible for further evaluation and determination of system status and/or mission impact
③ MSFN may confirm sensor failure based on C7144 temp indication
④ Manually terminate gas flow thru ht exchangers when OWS is in heating mode. Manual control of fans is required throughout remainder of mission
D170


SYMPTOM
PROCEDURE
REMARKS
ECS
14 (cont'd)
18
23 • Verify that the gas flow vlv associated with each OWS ht exch fan is OPEN
Are vlvs all OPEN?
YES
NO
24 Verify that cluster heaters not operating
• MDA wall heaters
• AM wall heaters
• OWS duct heaters
• OWS radiant heaters
Heaters off?
NO
YES
29 HEATER FAILED ON
30 • Isolate failed heater circuit
25 OWS HT EXCH FAN GAS FLOW VLV FAILED CLOSED
21 • Manually open failed gas flow vlv
⑤
26 EXCESSIVE CLSTR HEAT LOAD
28 • Reduce cluster elec load as required to achieve crew comfort
⑥
⑤ Manually terminate gas flow thru heat exchanger when OWS is in heating mode.
⑥ Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact
14d
ACTIVE (PASSIVE) MOL SV HX AIR INLET TEMP LO
T < 65°F
31 • Monitor passive (active) MOL SV HX AIR INLET TEMP ind
Temp < 65°F
YES
NO
33 Crewman cold?
YES
NO
34 TEMP SENSOR A(B) FAILURE
1
②
32 Verify proper operating configuration
• AM FANS CIRC 1, 2, 3 sw (3) - OFF
• MDA FANS 1, 2 sw (2) - OFF
• MDA FANS CSM sw HI
• OWS HT EXCH FANS 1, 2, 3, 4 sw (4) - OWS
• [OWS/BOTH/MDA] vlv - crew location
• Portable fan [OFF/HI/LOW] sw - OFF
• TCS DUCT AIR FLOW 1, 2, 3 ind (3) - 550 to 620 cfm
• TCS TEMP SEL - 70°F or higher
• TCS HT EXCH FANS 1, 2, 3, 4 sw (4) - AUTO
• TCS HTRS DUCT 1, 2 [1-3], [2-4] sw (4) - AUTO
• TCS HTRS DUCT 3 [1-3], [2-4] sw (2) - AUTO
• MDA HTRS [MAN/CMD] sw - CMD
• AM WALL HTRS [ON/OFF/CMD] sw - CMD
• OWS RADIANT HTRS 1, 2 sw (2) - OFF
• ATM CLNT LOOP PUMPS A sw - ON
Change required to achieve above configuration?
YES
NO
14e
TCS OWS TEMP LO
T < 65°F
35 Crewman cold?
YES
NO
36 TEMP SENSOR FAILURE
14f
CREWMAN FEELS COLD
38 • Make required changes
• Monitor cluster temp for extended period of time
Temp increase?
YES
NO
39 Crew now comfortable?
NO
YES
37 Check AM coolant loop temp
• Monitor MOL SV HT EXCH OUT ind
Temp < 45°F
NO
42
YES
40 COLD CONDITION RESULT OF IMPROPER ECS CONTROL CONFIGURATION
41 Crewmen EVA?
NO
YES
ACTIVE (PASSIVE) MOL SV HX AIR OUTLET TEMP LO
ECS 266 4
ECS 266 5
ACTIVE (PASSIVE) MOL SV HX AIR OUTLET TEMP LO (EVA)
D180

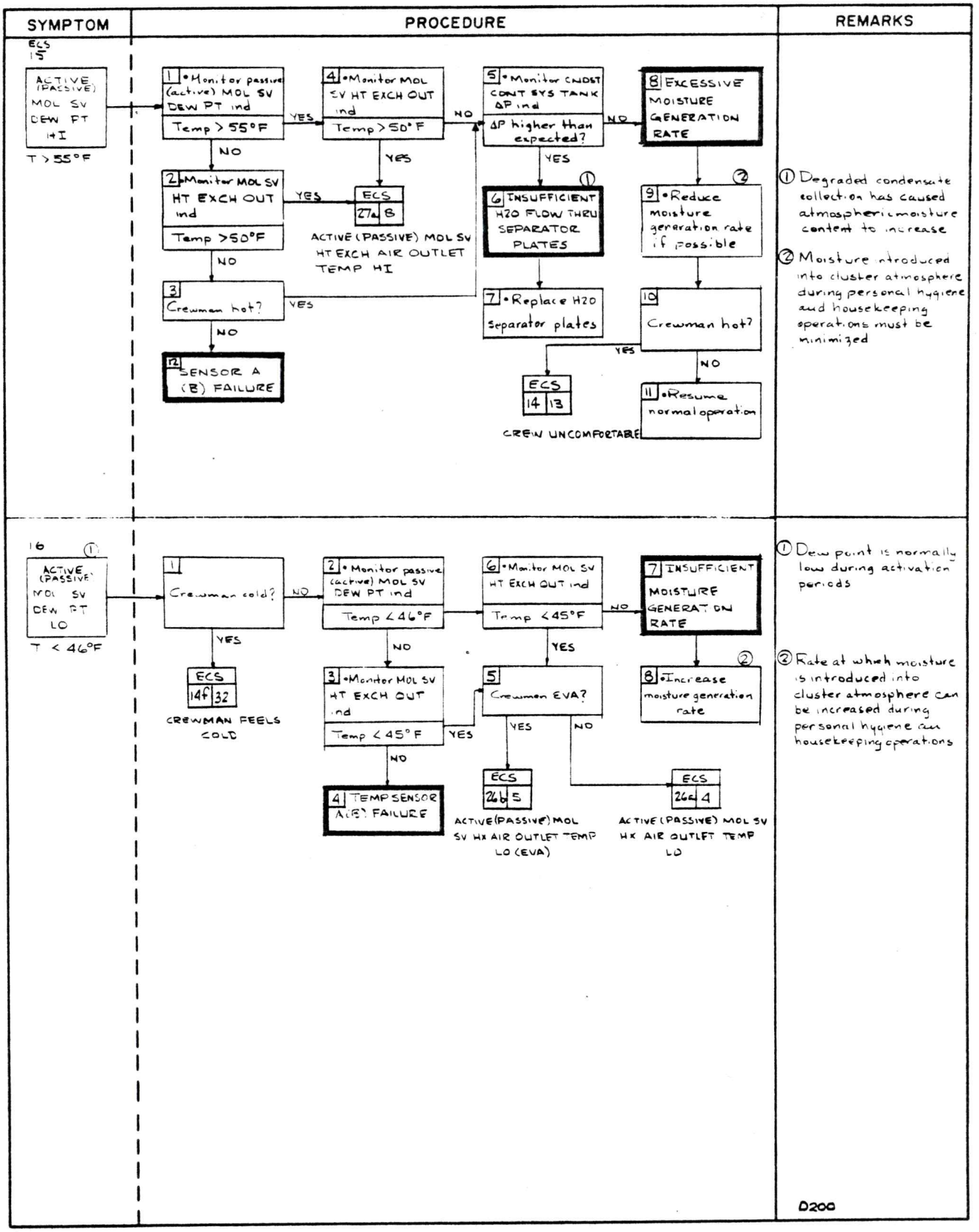
SYMPTOM	PROCEDURE	REMARKS

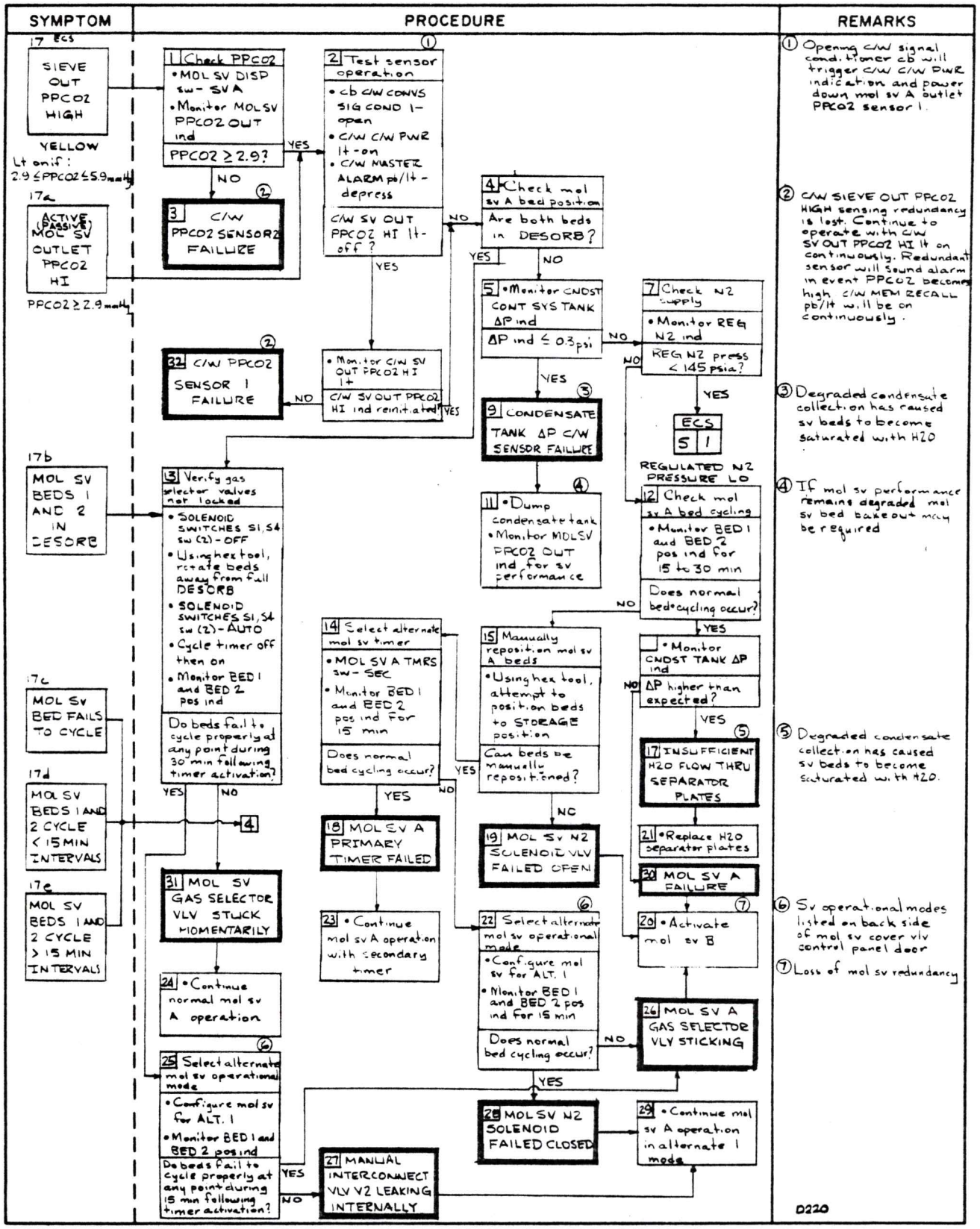
ECS
14 (cont'd)



⑦ Manually deactivate heaters when OWS is in cooling mode Manual control of heaters required throughout remainder of mission

D190


SYMPTOM
PROCEDURE
REMARKS
ECS 15
ACTIVE (PASSIVE) MDL SV DEW PT HI
T > 55°F
1 • Monitor passive (active) MDL SV DEW PT ind
Temp > 55°F
YES
NO
4 • Monitor MDL SV HT EXCH OUT ind
Temp > 50°F
YES
NO
2 • Monitor MDL SV HT EXCH OUT ind
Temp > 50°F
YES
NO
ECS 27a 8
ACTIVE (PASSIVE) MDL SV HT EXCH AIR OUTLET TEMP HI
3 Crewman hot?
YES
NO
12 SENSOR A (B) FAILURE
5 • Monitor CNDST CONT SYS TANK ΔP ind
ΔP higher than expected?
NO
YES
8 EXCESSIVE MOISTURE GENERATION RATE
6 INSUFFICIENT H2O FLOW THRU SEPARATOR PLATES
①
7 • Replace H2O separator plates
9 • Reduce moisture generation rate if possible
②
10 Crewman hot?
YES
NO
ECS 14 13
CREW UNCOMFORTABLE
11 • Resume normal operation
① Degraded condensate collection has caused atmospheric moisture content to increase
② Moisture introduced into cluster atmosphere during personal hygiene and housekeeping operations must be minimized
16 ①
ACTIVE (PASSIVE) MDL SV DEW PT LO
T < 46°F
1 Crewman cold?
YES
NO
ECS 14f 32
CREWMAN FEELS COLD
2 • Monitor passive (active) MDL SV DEW PT ind
Temp < 46°F
NO
YES
3 • Monitor MDL SV HT EXCH OUT ind
Temp < 45°F
YES
NO
4 TEMP SENSOR A(B) FAILURE
6 • Monitor MDL SV HT EXCH OUT ind
Temp < 45°F
NO
YES
5 Crewmen EVA?
YES
NO
ECS 26b 5
ACTIVE (PASSIVE) MDL SV HX AIR OUTLET TEMP LO (EVA)
7 INSUFFICIENT MOISTURE GENERATION RATE
8 • Increase moisture generation rate
②
ECS 26c 4
ACTIVE (PASSIVE) MDL SV HX AIR OUTLET TEMP LO
① Dew point is normally low during activation periods
② Rate at which moisture is introduced into cluster atmosphere can be increased during personal hygiene and housekeeping operations
D200


SYMPTOM
PROCEDURE
REMARKS
17 ECS
SIEVE OUT PPCO2 HIGH
YELLOW
Lt on if: 2.9 ≤ PPCO2 ≤ 5.9 mmHg
17a
ACTIVE (PASSIVE) MOL SV OUTLET PPCO2 HI
PPCO2 ≥ 2.9 mmHg
17b
MOL SV BEDS 1 AND 2 IN DESORB
17c
MOL SV BED FAILS TO CYCLE
17d
MOL SV BEDS 1 AND 2 CYCLE < 15 MIN INTERVALS
17e
MOL SV BEDS 1 AND 2 CYCLE > 15 MIN INTERVALS
1 Check PPCO2
• MOL SV DISP sw - SV A
• Monitor MOL SV PPCO2 OUT ind
PPCO2 ≥ 2.9?
YES
NO
2 Test sensor operation
• cb C/W CONVS SIG COND 1 - open
• C/W C/W PWR lt - on
• C/W MASTER ALARM pb/lt - depress
C/W SV OUT PPCO2 HI lt - off ?
NO
YES
3 C/W PPCO2 SENSOR 2 FAILURE
32 C/W PPCO2 SENSOR 1 FAILURE
• Monitor C/W SV OUT PPCO2 HI lt
C/W SV OUT PPCO2 HI ind reinitiated?
YES
NO
4 Check mol sv A bed position
Are both beds in DESORB?
YES
NO
5 • Monitor CNDST CONT SYS TANK ΔP ind
ΔP ind ≤ 0.3 psi
NO
YES
7 Check N2 supply
• Monitor REG N2 ind
REG N2 press < 145 psia?
NO
YES
ECS 5 1
REGULATED N2 PRESSURE LO
9 CONDENSATE TANK ΔP C/W SENSOR FAILURE
11 • Dump condensate tank
• Monitor MOL SV PPCO2 OUT ind for sv performance
12 Check mol sv A bed cycling
• Monitor BED 1 and BED 2 pos ind for 15 to 30 min
Does normal bed cycling occur?
NO
YES
13 Verify gas selector valves not locked
• SOLENOID SWITCHES S1, S4 sw (2) - OFF
• Using hex tool, rotate beds away from full DESORB
• SOLENOID SWITCHES S1, S4 sw (2) - AUTO
• Cycle timer off then on
• Monitor BED 1 and BED 2 pos ind
Do beds fail to cycle properly at any point during 30 min following timer activation?
YES
NO
14 Select alternate mol sv timer
• MOL SV A TMRS sw - SEC
• Monitor BED 1 and BED 2 pos ind For 15 min
Does normal bed cycling occur?
YES
NO
15 Manually reposition mol sv A beds
• Using hex tool, attempt to position beds to STORAGE position
Can beds be manually repositioned?
YES
NO
• Monitor CNDST TANK ΔP ind
ΔP higher than expected?
NO
YES
17 INSUFFICIENT H2O FLOW THRU SEPARATOR PLATES
21 • Replace H2O separator plates
30 MOL SV A FAILURE
20 • Activate mol sv B
26 MOL SV A GAS SELECTOR VLV STICKING
18 MOL SV A PRIMARY TIMER FAILED
23 • Continue mol sv A operation with secondary timer
19 MOL SV N2 SOLENOID VLV FAILED OPEN
22 Select alternate mol sv operational mode
• Configure mol sv for ALT. 1
• Monitor BED 1 and BED 2 pos ind for 15 min
Does normal bed cycling occur?
NO
YES
28 MOL SV N2 SOLENOID FAILED CLOSED
29 • Continue mol sv A operation in alternate 1 mode
31 MOL SV GAS SELECTOR VLV STUCK MOMENTARILY
24 • Continue normal mol sv A operation
25 Select alternate mol sv operational mode
• Configure mol sv for ALT. 1
• Monitor BED 1 and BED 2 pos ind
Do beds fail to cycle properly at any point during 15 min following timer activation?
YES
NO
27 MANUAL INTERCONNECT VLV V2 LEAKING INTERNALLY
4
6
7
5
D220
① Opening C/W signal conditioner cb will trigger C/W C/W PWR indication and power down mol sv A outlet PPCO2 sensor 1.
② C/W SIEVE OUT PPCO2 HIGH sensing redundancy is lost. Continue to operate with C/W SV OUT PPCO2 HI lt on continuously. Redundant sensor will sound alarm in event PPCO2 becomes high. C/W MEM RECALL pb/lt will be on continuously.
③ Degraded condensate collection has caused sv beds to become saturated with H2O
④ If mol sv performance remains degraded mol sv bed bake-out may be required
⑤ Degraded condensate collection has caused sv beds to become saturated with H2O.
⑥ Sv operational modes listed on back side of mol sv cover vlv control panel door
⑦ Loss of mol sv redundancy

SYMPTOM	PROCEDURE	REMARKS

ECS
18

SIEVE TIMER

YELLOW
Lt on if Power interrupt to timer circuitry

1 Check cycling of mol sv beds
- Monitor BED 1 and BED 2 pos ind for 15 min

Does normal bed cycling occur?

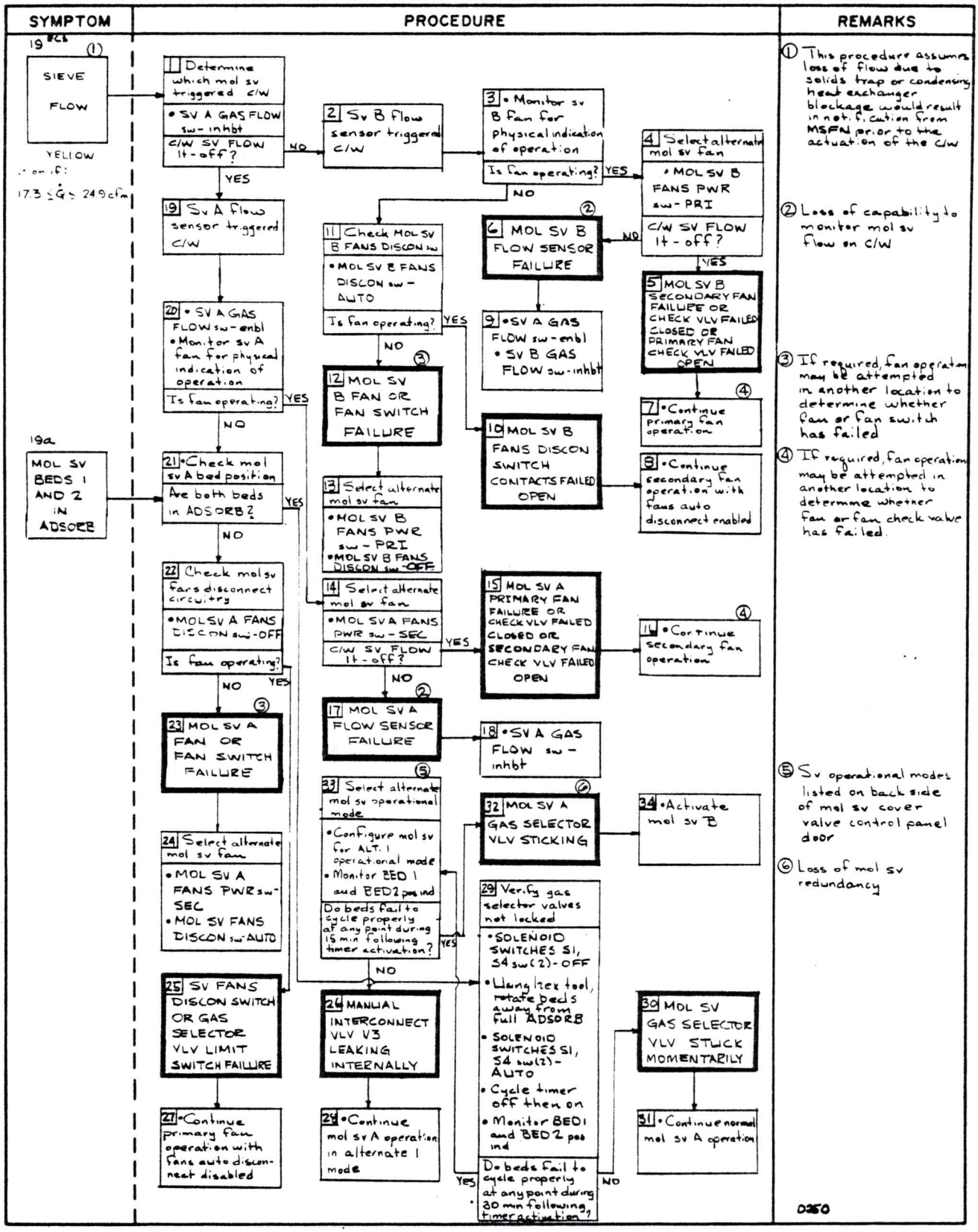
NO → 4 MDL SV PRI TIMER FAILURE ①
→ 5 Select alternate timer
- MOL SV A TMRS sw - SEC

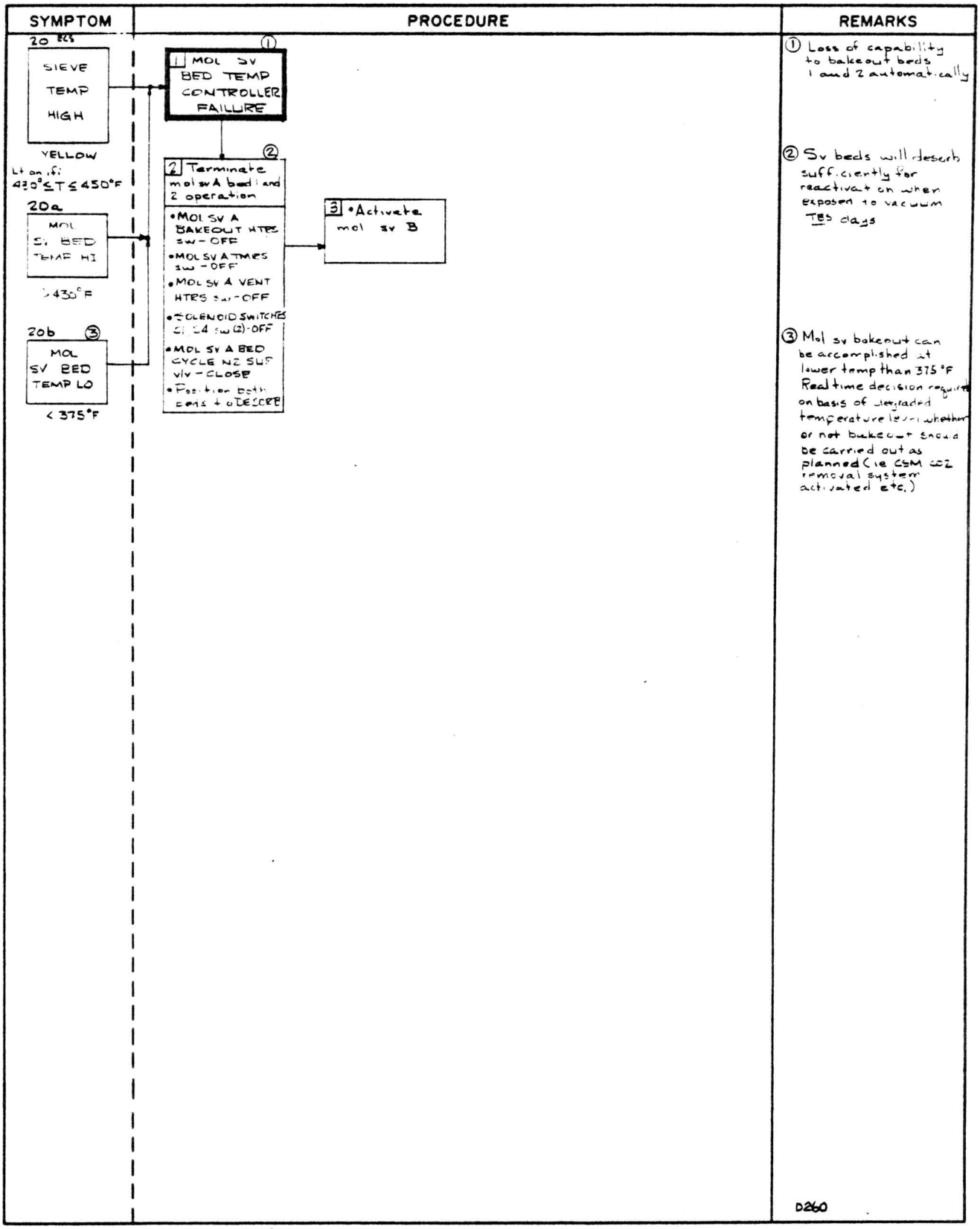
YES → 2 MOMENTARY POWER INTERRUPT TO TIMER ①

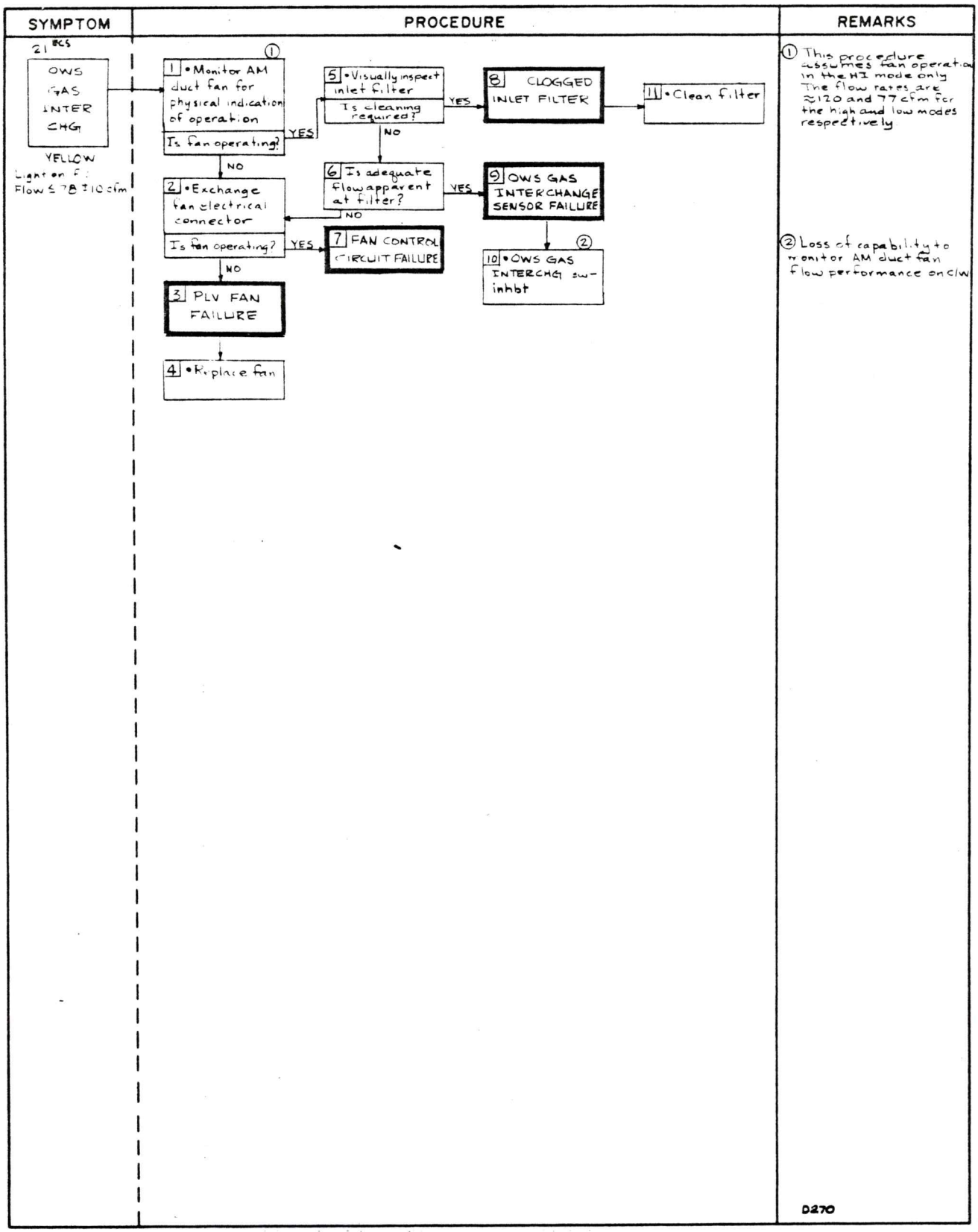
3 • Resume normal operation

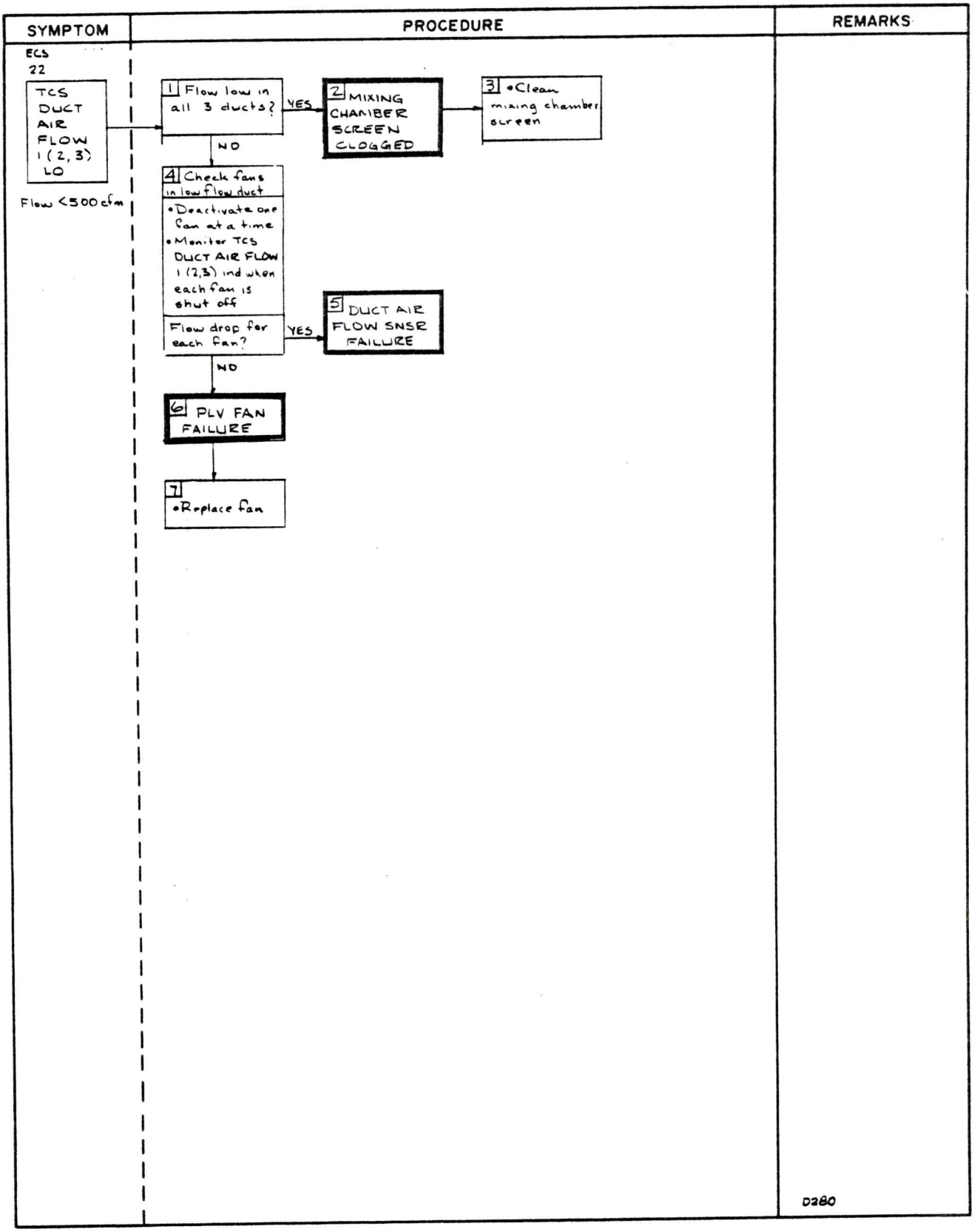
① C/W SIEVE OUT PPCO2 HIGH indication may be triggered if mol sv bed cycling timer circuitry was reset such that a mol sv bed undergoes two consecutive adsorb cycles If indication is triggered reset c/w. Light will go out as bed undergoes first desorb cycle

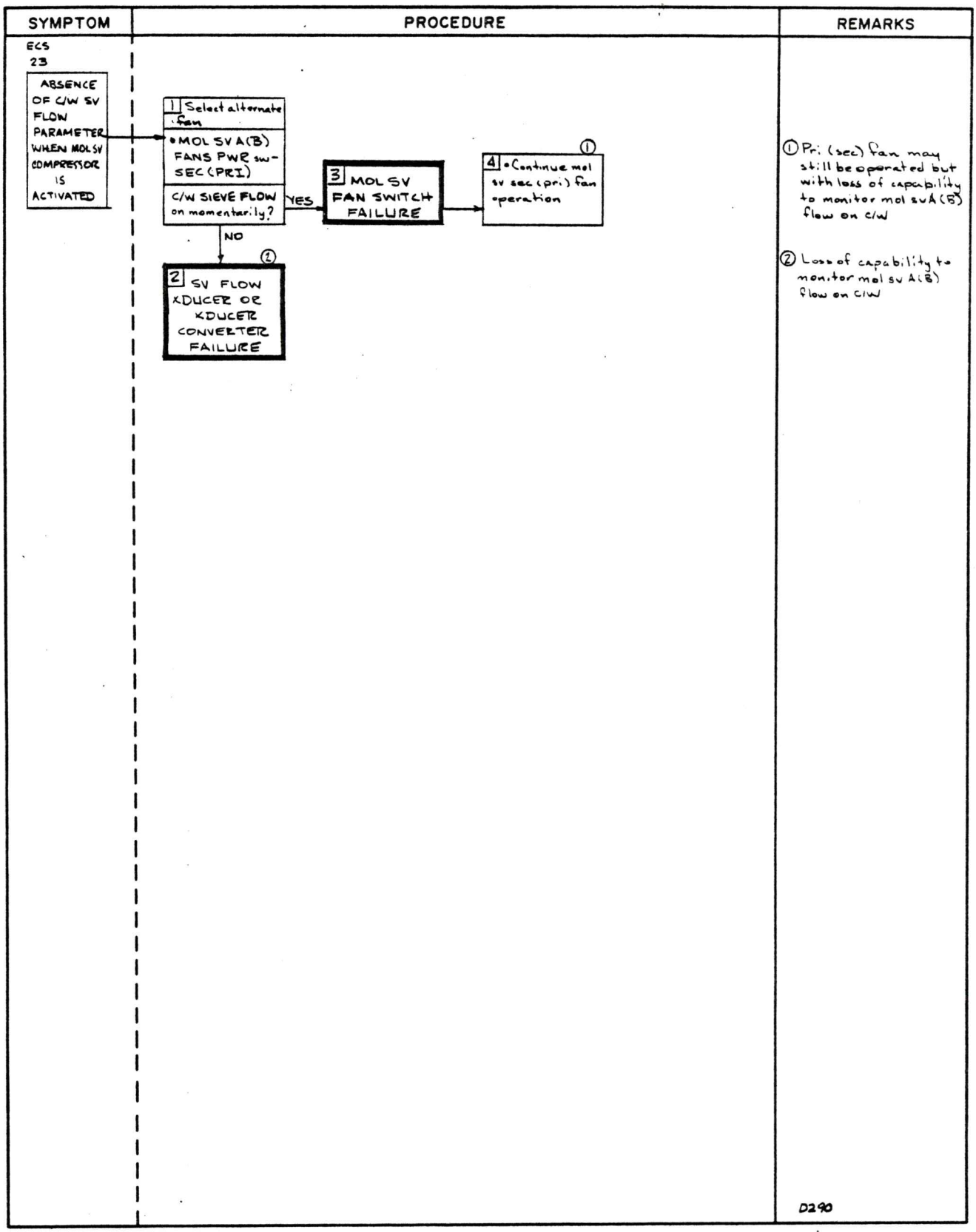
0240

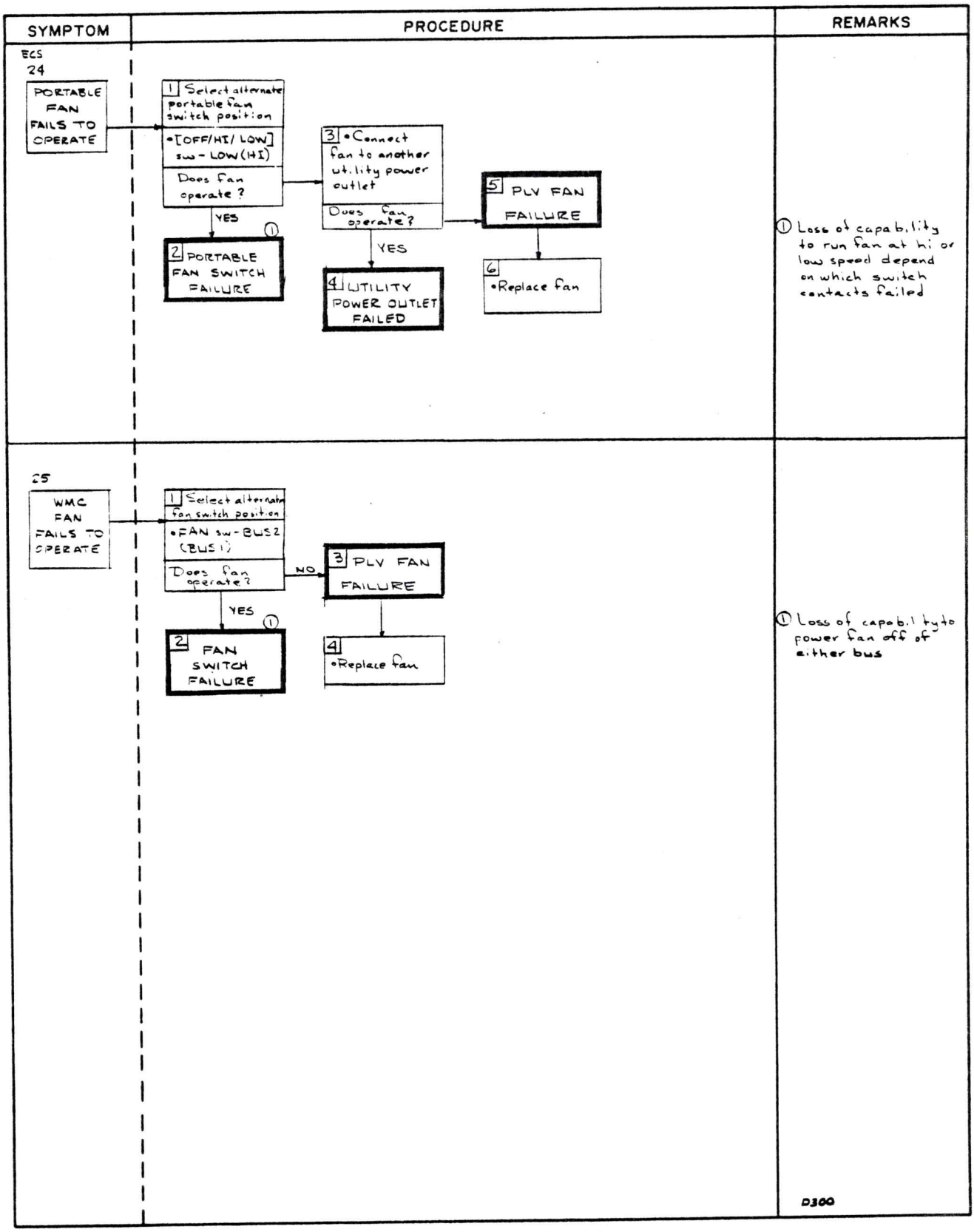

SYMPTOM
PROCEDURE
REMARKS
19 ECS
(1)
SIEVE FLOW
YELLOW
on if:
17.3 ≤ Ġ ≤ 24.9 cfm
19a
MOL SV BEDS 1 AND 2 IN ADSORB
1 Determine which mol sv triggered c/w
• SV A GAS FLOW sw - inhbt
c/w SV FLOW lt - off?
NO
YES
2 Sv B Flow sensor triggered c/w
3 • Monitor sv B fan for physical indication of operation
Is fan operating?
YES
NO
4 Select alternate mol sv fan
• MOL SV B FANS PWR sw - PRI
c/w SV FLOW lt - off?
NO
YES
19 Sv A Flow sensor triggered c/w
11 Check MOL SV B FANS DISCON sw
• MOL SV B FANS DISCON sw - AUTO
Is fan operating?
YES
NO
6 MOL SV B FLOW SENSOR FAILURE
(2)
5 MOL SV B SECONDARY FAN FAILURE OR CHECK VLV FAILED CLOSED OR PRIMARY FAN CHECK VLV FAILED OPEN
20 • SV A GAS FLOW sw - enbl
• Monitor sv A fan for physical indication of operation
Is fan operating?
YES
NO
12 MOL SV B FAN OR FAN SWITCH FAILURE
(3)
9 • SV A GAS FLOW sw - enbl
• SV B GAS FLOW sw - inhbt
10 MOL SV B FANS DISCON SWITCH CONTACTS FAILED OPEN
7 • Continue primary fan operation
8 • Continue secondary fan operation with fans auto disconnect enabled
(4)
21 • Check mol sv A bed position
Are both beds in ADSORB?
YES
NO
13 Select alternate mol sv fan
• MOL SV B FANS PWR sw - PRI
• MOL SV B FANS DISCON sw - OFF
14 Select alternate mol sv fan
• MOL SV A FANS PWR sw - SEC
c/w SV FLOW lt - off?
YES
NO
15 MOL SV A PRIMARY FAN FAILURE OR CHECK VLV FAILED CLOSED OR SECONDARY FAN CHECK VLV FAILED OPEN
16 • Continue secondary fan operation
(4)
22 Check mol sv fans disconnect circuitry
• MOL SV A FANS DISCON sw - OFF
Is fan operating?
YES
NO
17 MOL SV A FLOW SENSOR FAILURE
(2)
18 • SV A GAS FLOW sw - inhbt
23 MOL SV A FAN OR FAN SWITCH FAILURE
(3)
33 Select alternate mol sv operational mode
(5)
• Configure mol sv for ALT. 1 operational mode
• Monitor BED 1 and BED 2 pos ind
Do beds fail to cycle properly at any point during 15 min following timer activation?
YES
NO
32 MOL SV A GAS SELECTOR VLV STICKING
(6)
34 • Activate mol sv B
24 Select alternate mol sv fan
• MOL SV A FANS PWR sw - SEC
• MOL SV FANS DISCON sw - AUTO
29 Verify gas selector valves not locked
• SOLENOID SWITCHES S1, S4 sw (2) - OFF
• Using tex tool, rotate bed s away from full ADSORB
• SOLENOID SWITCHES S1, S4 sw (2) - AUTO
• Cycle timer off then on
• Monitor BED1 and BED2 pos ind
Do beds fail to cycle properly at any point during 30 min following timer activation?
YES
NO
30 MOL SV GAS SELECTOR VLV STUCK MOMENTARILY
31 • Continue normal mol sv A operation
25 SV FANS DISCON SWITCH OR GAS SELECTOR VLV LIMIT SWITCH FAILURE
26 MANUAL INTERCONNECT VLV V3 LEAKING INTERNALLY
27 • Continue primary fan operation with fans auto discon-nect disabled
28 • Continue mol sv A operation in alternate 1 mode
① This procedure assumes loss of flow due to solids trap or condensing heat exchanger blockage would result in not. f. cation from MSFN prior to the actuation of the c/w
② Loss of capability to monitor mol sv flow on c/w
③ If required, fan operation may be attempted in another location to determine whether fan or fan switch has failed
④ If required, fan operation may be attempted in another location to determine whether fan or fan check valve has failed
⑤ Sv operational modes listed on back side of mol sv cover valve control panel door
⑥ Loss of mol sv redundancy
0250

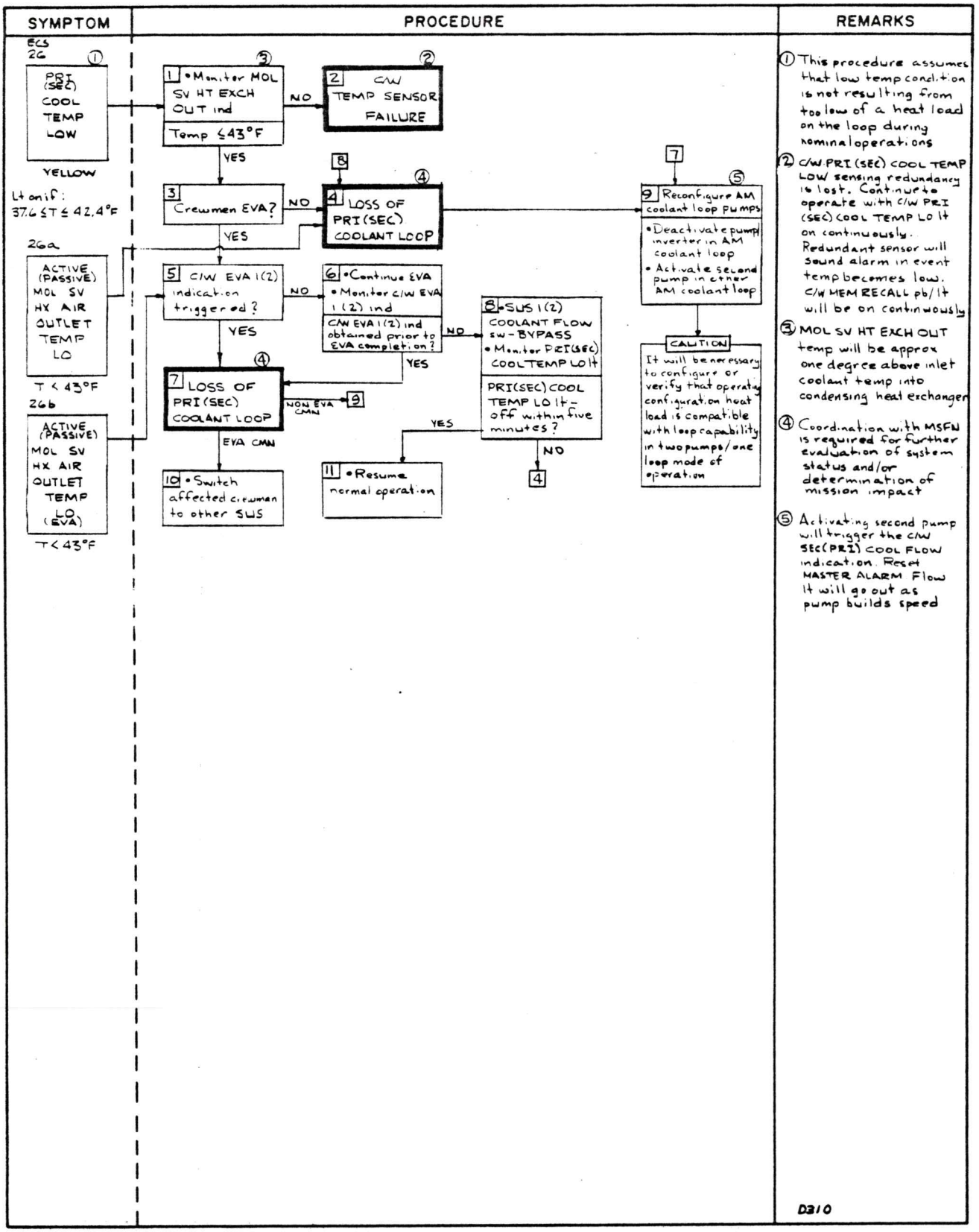

SYMPTOM
PROCEDURE
REMARKS
20 ECS
SIEVE TEMP HIGH
YELLOW
Lt on if 430°≤T≤450°F
20a
MOL SV BED TEMP HI
>430°F
20b
3
MOL SV BED TEMP LO
<375°F
1 MOL SV BED TEMP CONTROLLER FAILURE
1
2
2 Terminate mol sv A bed 1 and 2 operation
•MOL SV A BAKEOUT HTRS sw - OFF
•MOL SV A TMES sw - OFF
•MOL SV A VENT HTRS sw - OFF
•SOLENOID SWITCHES S1 S4 sw (2) - OFF
•MOL SV A BED CYCLE N2 SUP v/v - CLOSE
•Position both cons + o DESORB
3 •Activate mol sv B
① Loss of capability to bakeout beds 1 and 2 automatically
② Sv beds will desorb sufficiently for reactivation when exposed to vacuum TBS days
③ Mol sv bakeout can be accomplished at lower temp than 375°F Real time decision required on basis of degraded temperature level whether or not bakeout should be carried out as planned (ie CSM CO2 removal system activated etc.)
D260

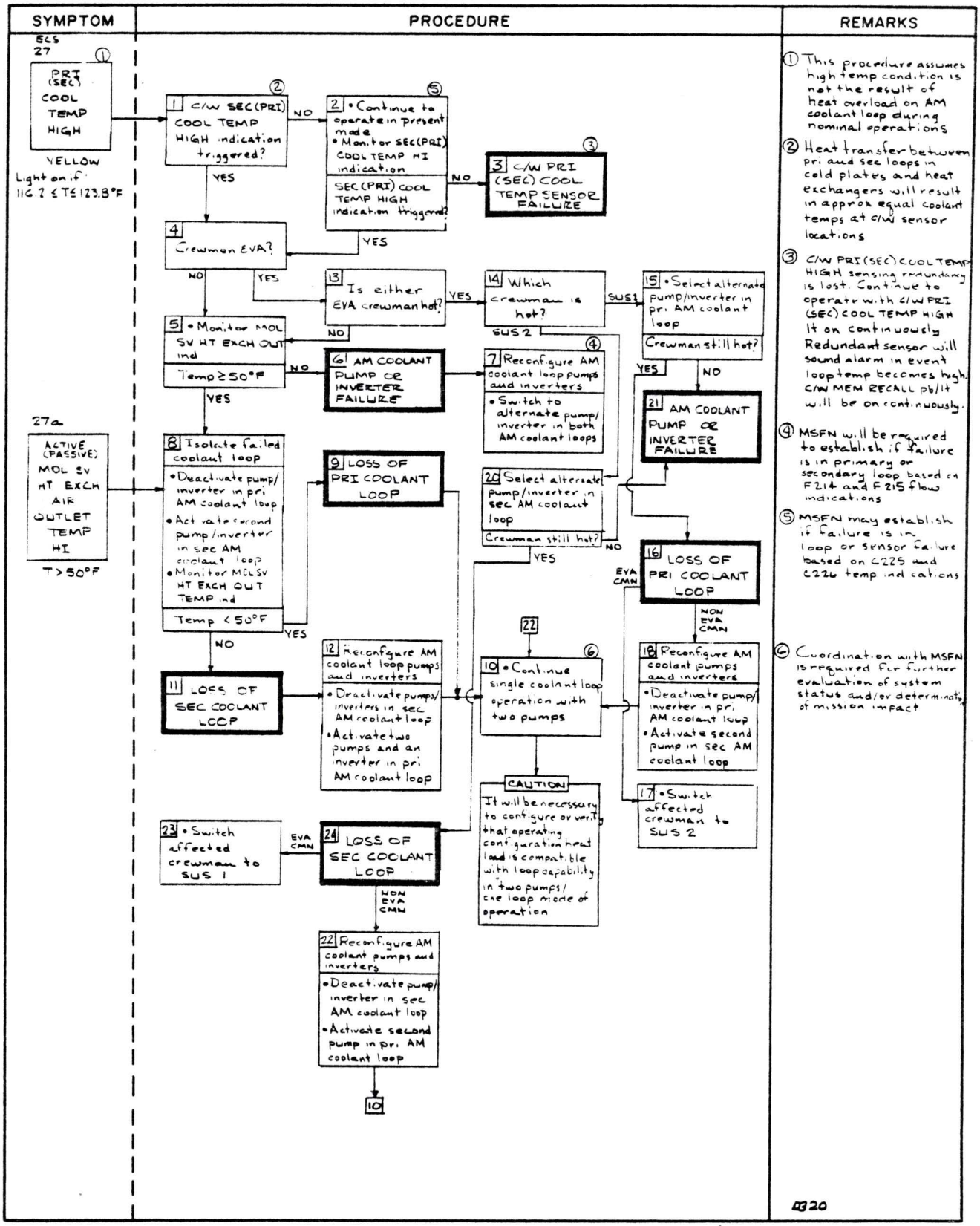

SYMPTOM
PROCEDURE
REMARKS
21 ECS
OWS GAS INTER CHG
YELLOW
Light on if
Flow ≤ 78 ≥ 110 cfm
1 • Monitor AM duct fan for physical indication of operation
Is fan operating?
YES
NO
2 • Exchange fan electrical connector
Is fan operating?
YES
NO
3 PLV FAN FAILURE
4 • Replace fan
5 • Visually inspect inlet filter
Is cleaning required?
YES
NO
8 CLOGGED INLET FILTER
11 • Clean filter
6 Is adequate flow apparent at filter?
YES
NO
7 FAN CONTROL CIRCUIT FAILURE
9 OWS GAS INTERCHANGE SENSOR FAILURE
10 • OWS GAS INTERCHG sw-inhbt
① This procedure assumes fan operation in the HI mode only. The flow rates are ≥120 and 77 cfm for the high and low modes respectively
② Loss of capability to monitor AM duct fan flow performance on c/w
D270

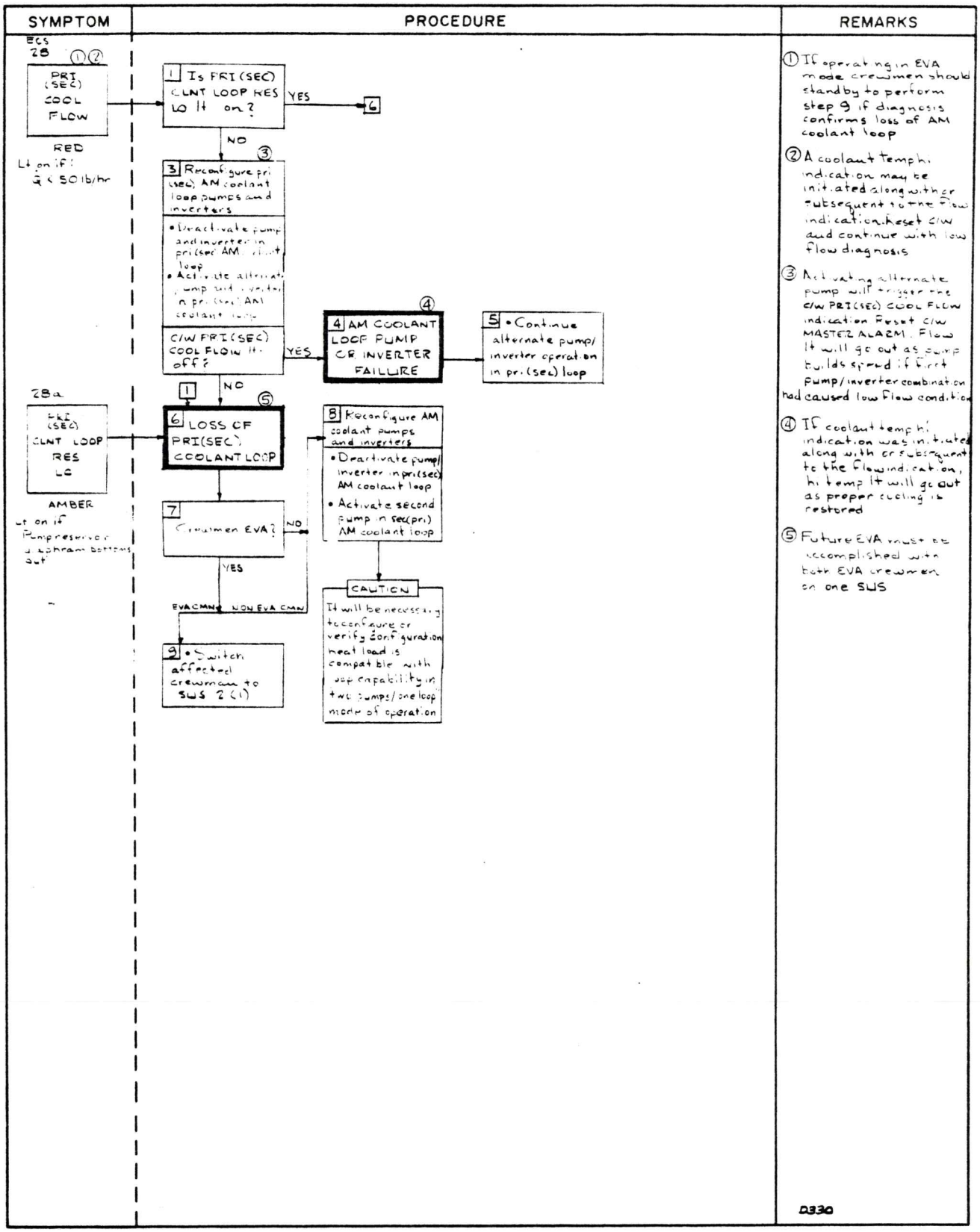

SYMPTOM
PROCEDURE
REMARKS
ECS
22
TCS DUCT AIR FLOW 1 (2, 3) LO
Flow <500 cfm
1 Flow low in all 3 ducts?
YES
2 MIXING CHAMBER SCREEN CLOGGED
3 •Clean mixing chamber screen
NO
4 Check fans in low flow duct
•Deactivate one fan at a time
•Monitor TCS DUCT AIR FLOW 1 (2,3) ind when each fan is shut off
Flow drop for each fan?
YES
5 DUCT AIR FLOW SNSR FAILURE
NO
6 PLV FAN FAILURE
7 •Replace fan
D280


SYMPTOM
PROCEDURE
REMARKS
ECS
23
ABSENCE OF C/W SV FLOW PARAMETER WHEN MOL SV COMPRESSOR IS ACTIVATED
1 Select alternate fan
• MOL SV A(B) FANS PWR sw - SEC (PRI)
C/W SIEVE FLOW on momentarily?
YES
NO
3 MOL SV FAN SWITCH FAILURE
4 • Continue mol sv sec (pri) fan operation
2 SV FLOW XDUCER OR XDUCER CONVERTER FAILURE
① Pri (sec) fan may still be operated but with loss of capability to monitor mol sv A (B) flow on c/w
② Loss of capability to monitor mol sv A (B) flow on c/w
D290

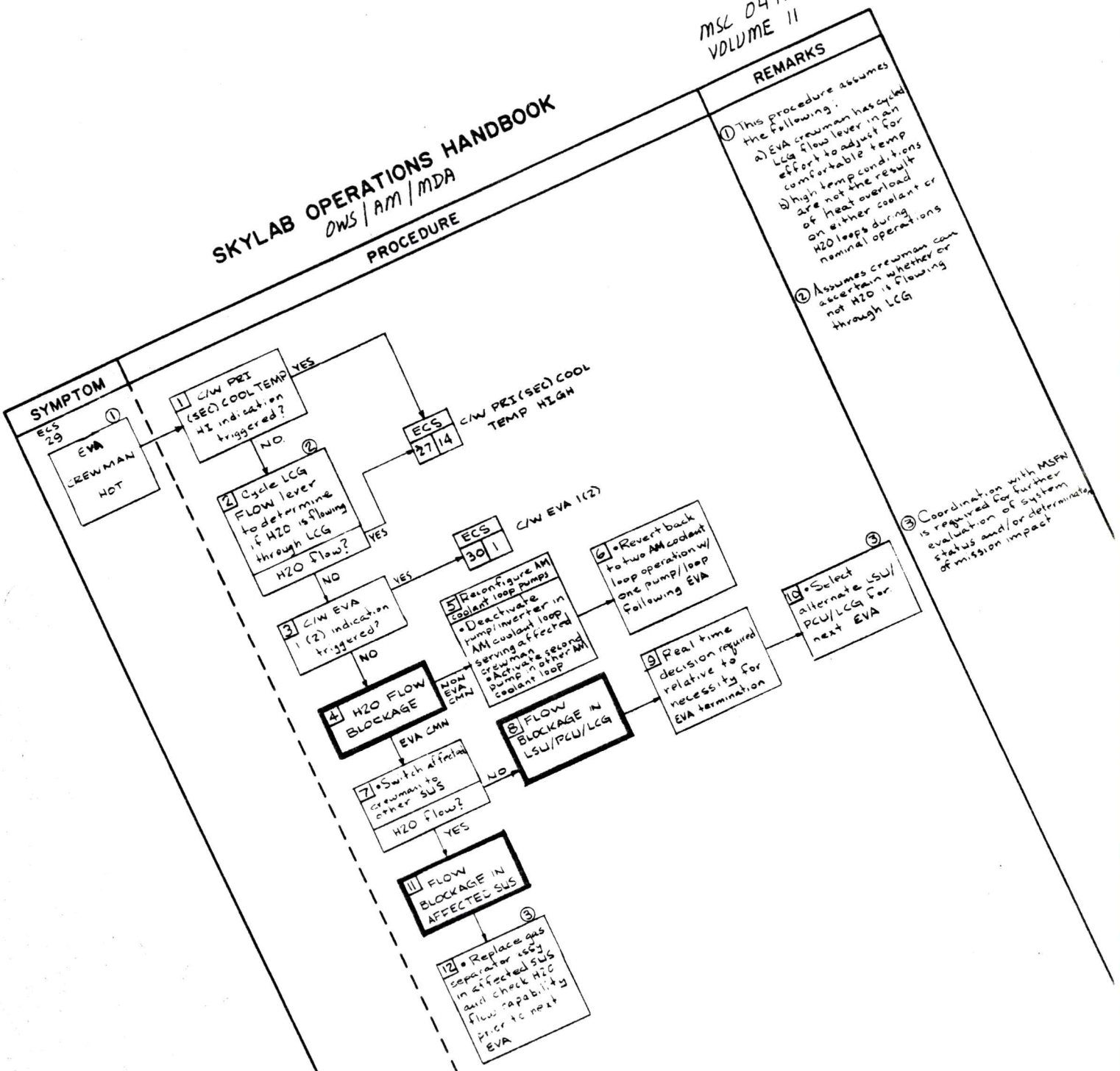

SYMPTOM
PROCEDURE
REMARKS
ECS
24
PORTABLE FAN FAILS TO OPERATE
1 Select alternate portable fan switch position
•[OFF/HI/LOW] sw - LOW (HI)
Does fan operate?
YES
2 PORTABLE FAN SWITCH FAILURE
3 •Connect fan to another utility power outlet
Does fan operate?
YES
4 UTILITY POWER OUTLET FAILED
5 PLV FAN FAILURE
6 •Replace fan
① Loss of capability to run fan at hi or low speed depend on which switch contacts failed
25
WMC FAN FAILS TO OPERATE
1 Select alternate fan switch position
•FAN sw - BUS 2 (BUS 1)
Does fan operate?
NO
YES
2 FAN SWITCH FAILURE
3 PLV FAN FAILURE
4 •Replace fan
① Loss of capability to power fan off of either bus
D300

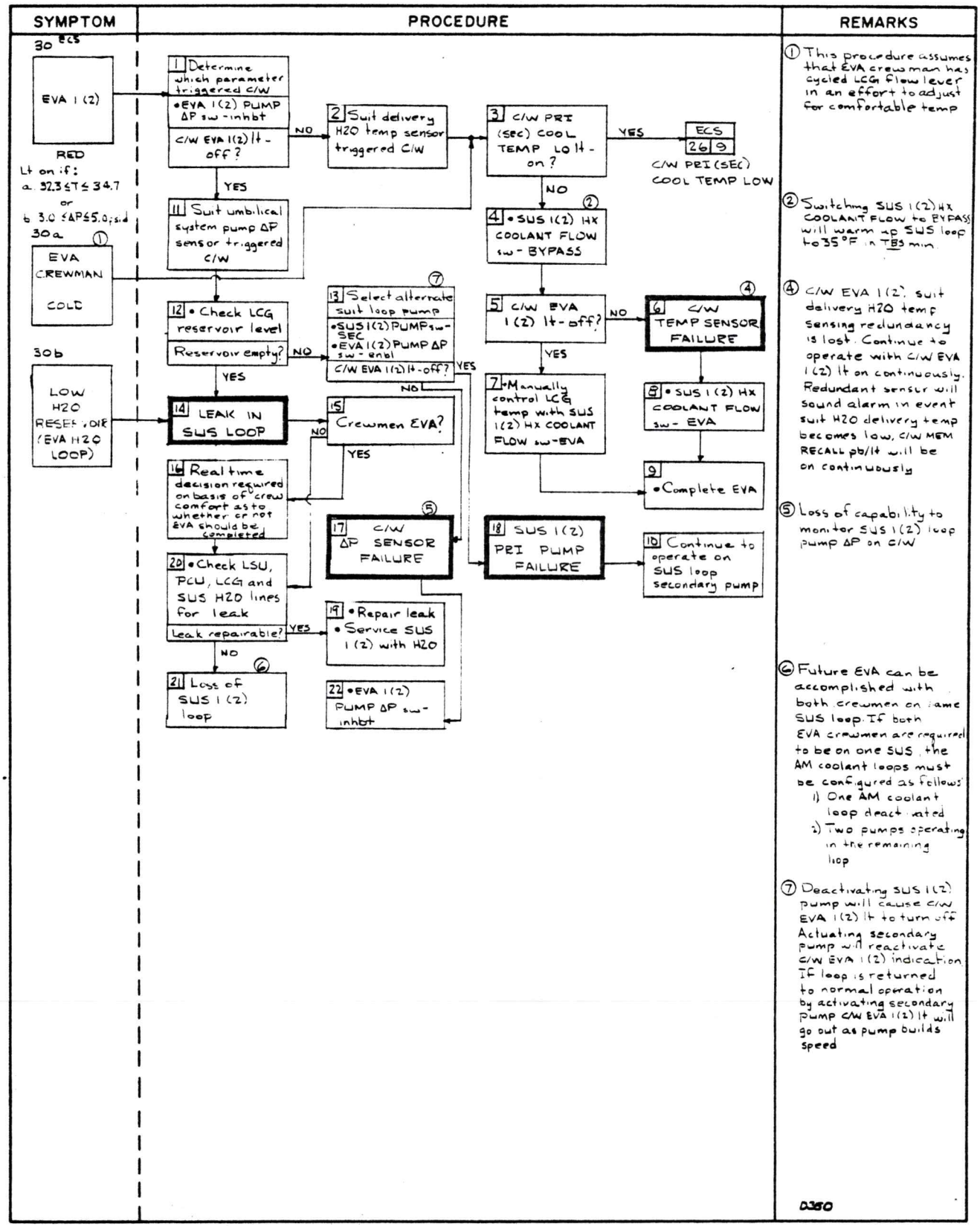

SYMPTOM
PROCEDURE
REMARKS
ECS
2G
PRI (SEC) COOL TEMP LOW
YELLOW
Lt on if: 37.6 ≤ T ≤ 42.4°F
26a
ACTIVE (PASSIVE) MOL SV HX AIR OUTLET TEMP LO
T < 43°F
26b
ACTIVE (PASSIVE) MOL SV HX AIR OUTLET TEMP LO (EVA)
T < 43°F
1 • Monitor MOL SV HT EXCH OUT ind
Temp ≤ 43°F
NO
2 C/W TEMP SENSOR FAILURE
YES
3 Crewmen EVA?
NO
4 LOSS OF PRI (SEC) COOLANT LOOP
YES
5 C/W EVA 1(2) indication triggered?
NO
6 • Continue EVA
• Monitor C/W EVA 1 (2) ind
C/W EVA 1(2) ind obtained prior to EVA completion?
NO
YES
7 LOSS OF PRI (SEC) COOLANT LOOP
NON EVA CMN
9
EVA CMN
10 • Switch affected crewman to other SUS
8 • SUS 1(2) COOLANT FLOW sw - BYPASS
• Monitor PRI(SEC) COOLTEMP LO lt
PRI(SEC) COOL TEMP LO lt - off within five minutes?
YES
NO
11 • Resume normal operation
4
7
9 Reconfigure AM coolant loop pumps
• Deactivate pump inverter in AM coolant loop
• Activate second pump in other AM coolant loop
CAUTION
It will be necessary to configure or verify that operating configuration heat load is compatible with loop capability in two pumps/one loop mode of operation
① This procedure assumes that low temp condition is not resulting from too low of a heat load on the loop during nominal operations
② C/W PRI (SEC) COOL TEMP LOW sensing redundancy is lost. Continue to operate with C/W PRI (SEC) COOL TEMP LO lt on continuously. Redundant sensor will sound alarm in event temp becomes low. C/W MEM RECALL pb/lt will be on continuously
③ MOL SV HT EXCH OUT temp will be approx one degree above inlet coolant temp into condensing heat exchanger
④ Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact
⑤ Activating second pump will trigger the C/W SEC(PRI) COOL FLOW indication. Reset MASTER ALARM Flow lt will go out as pump builds speed
D310

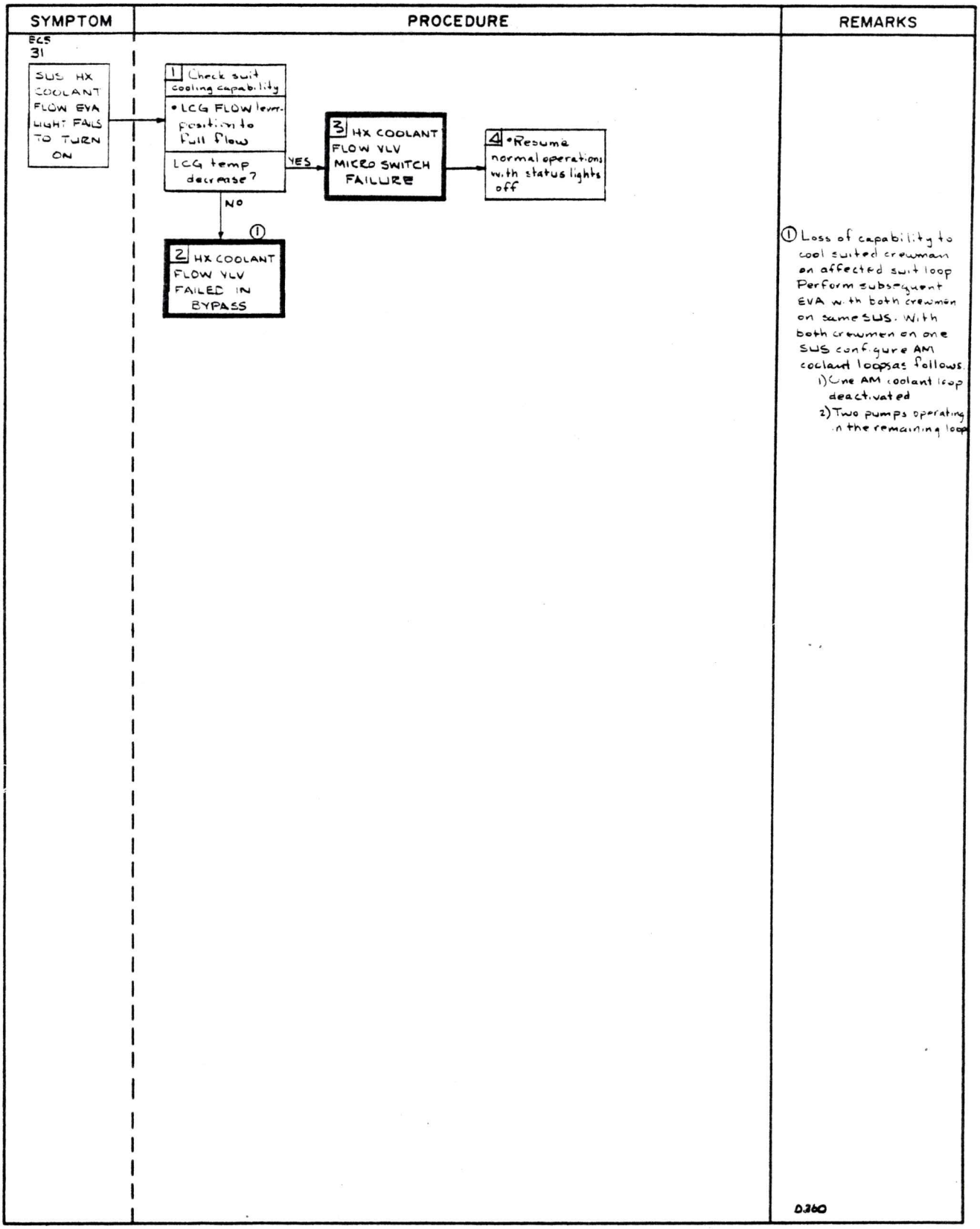

SYMPTOM
PROCEDURE
REMARKS
ECS 27
PRI (SEC) COOL TEMP HIGH
YELLOW Light on if: 116.7 ≤ T ≤ 123.8°F
1 C/W SEC(PRI) COOL TEMP HIGH indication triggered?
NO
YES
2 • Continue to operate in present mode • Monitor SEC(PRI) COOL TEMP HI indication
SEC(PRI) COOL TEMP HIGH indication triggered?
NO
YES
3 C/W PRI (SEC) COOL TEMP SENSOR FAILURE
4 Crewman EVA?
NO
YES
13 Is either EVA crewman hot?
YES
NO
14 Which crewman is hot?
SUS 1
SUS 2
15 • Select alternate pump/inverter in pri AM coolant loop
Crewman still hot?
YES
NO
21 AM COOLANT PUMP OR INVERTER FAILURE
5 • Monitor MDL SV HT EXCH OUT ind
Temp ≥ 50°F
NO
YES
6 AM COOLANT PUMP OR INVERTER FAILURE
7 Reconfigure AM coolant loop pumps and inverters
• Switch to alternate pump/inverter in both AM coolant loops
27a
ACTIVE (PASSIVE) MDL SV HT EXCH AIR OUTLET TEMP HI
T > 50°F
8 Isolate failed coolant loop
• Deactivate pump/inverter in pri AM coolant loop
• Activate second pump/inverter in sec AM coolant loop
• Monitor MDL SV HT EXCH OUT TEMP ind
Temp < 50°F
YES
NO
9 LOSS OF PRI COOLANT LOOP
26 Select alternate pump/inverter in sec AM coolant loop
Crewman still hot?
NO
YES
16 LOSS OF PRI COOLANT LOOP
EVA CMN
NON EVA CMN
18 Reconfigure AM coolant pumps and inverters
• Deactivate pump/inverter in pri AM coolant loop
• Activate second pump in sec AM coolant loop
17 • Switch affected crewman to SUS 2
11 LOSS OF SEC COOLANT LOOP
12 Reconfigure AM coolant loop pumps and inverters
• Deactivate pumps/inverters in sec AM coolant loop
• Activate two pumps and an inverter in pri AM coolant loop
22
10 • Continue single coolant loop operation with two pumps
CAUTION
It will be necessary to configure or verify that operating configuration heat load is compatible with loop capability in two pumps/one loop mode of operation
23 • Switch affected crewman to SUS 1
EVA CMN
24 LOSS OF SEC COOLANT LOOP
NON EVA CMN
22 Reconfigure AM coolant pumps and inverters
• Deactivate pump/inverter in sec AM coolant loop
• Activate second pump in pri AM coolant loop
10
① This procedure assumes high temp condition is not the result of heat overload on AM coolant loop during nominal operations
② Heat transfer between pri and sec loops in cold plates and heat exchangers will result in approx equal coolant temps at c/w sensor locations
③ C/W PRI (SEC) COOL TEMP HIGH sensing redundancy is lost. Continue to operate with C/W PRI (SEC) COOL TEMP HIGH lt on continuously. Redundant sensor will sound alarm in event loop temp becomes high. C/W MEM RECALL pb/lt will be on continuously.
④ MSFN will be required to establish if failure is in primary or secondary loop based on F21t and F21s flow indications
⑤ MSFN may establish if failure is in loop or sensor failure based on C225 and C226 temp indications
⑥ Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact
4320


SYMPTOM
PROCEDURE
REMARKS
ECS 28 ①②
PRI (SEC) COOL FLOW
RED
Lt on if: q̇ < 501b/hr
1 Is PRI (SEC) CLNT LOOP RES Lt on?
YES
6
NO
3
3 Reconfigure pri (sec) AM coolant loop pumps and inverters
• Deactivate pump and inverter in pri (sec) AM coolant loop
• Activate alternate pump unit inverter in pri (sec) AM coolant loop
C/W PRI (SEC) COOL FLOW lt off?
YES
4 AM COOLANT LOOP PUMP OR INVERTER FAILURE
5 • Continue alternate pump/inverter operation in pri (sec) loop
28a
PRI (SEC) CLNT LOOP RES LC
AMBER
Lt on if Pump reservoir ΔP/ΔTemp bottoms out
1
NO
5
6 LOSS OF PRI (SEC) COOLANT LOOP
7 Crewmen EVA?
NO
YES
EVA CMN
NON EVA CMN
8 Reconfigure AM coolant pumps and inverters
• Deactivate pump/inverter in pri (sec) AM coolant loop
• Activate second pump in sec (pri) AM coolant loop
CAUTION
It will be necessary to reconfigure or verify configuration heat load is compatible with pump capability in two pumps/one loop mode of operation
9 • Switch affected crewman to SUS 2 (1)
① If operating in EVA mode crewmen should standby to perform step 9 if diagnosis confirms loss of AM coolant loop
② A coolant temp hi indication may be initiated along with or subsequent to the flow indication. Reset C/W and continue with low flow diagnosis
③ Activating alternate pump will trigger the C/W PRI (SEC) COOL FLOW indication. Reset C/W MASTER ALARM. Flow lt will go out as pump builds speed if first pump/inverter combination had caused low flow condition
④ If coolant temp hi indication was initiated along with or subsequent to the flow indication, hi temp lt will go out as proper cooling is restored
⑤ Future EVA must be accomplished with both EVA crewmen on one SUS
D330

SKYLAB OPERATIONS HANDBOOK
OWS / AM / MDA




SYMPTOM
PROCEDURE
REMARKS
30 ECS
EVA 1 (2)
RED
Lt on if:
a. 32.3≤T≤34.7
or
b 3.0 ≤ΔP≤5.0 psid
30a
EVA CREWMAN COLD
30b
LOW H2O RESET DIR (EVA H2O LOOP)
1 Determine which parameter triggered C/W
•EVA 1(2) PUMP ΔP sw - inhbt
C/W EVA 1(2) lt - off?
NO
YES
2 Suit delivery H2O temp sensor triggered C/W
3 C/W PRI (SEC) COOL TEMP LO lt - on?
YES
ECS 26 9
C/W PRI (SEC) COOL TEMP LOW
NO
4 • SUS 1(2) HX COOLANT FLOW sw - BYPASS
11 Suit umbilical system pump ΔP sensor triggered C/W
12 • Check LCG reservoir level
Reservoir empty?
NO
YES
13 Select alternate suit loop pump
•SUS 1(2) PUMP sw - SEC
•EVA 1(2) PUMP ΔP sw - enbl
C/W EVA 1(2) lt - off?
YES
NO
5 C/W EVA 1(2) lt - off?
NO
YES
6 C/W TEMP SENSOR FAILURE
7 •Manually control LCG temp with SUS 1(2) HX COOLANT FLOW sw - EVA
8 • SUS 1(2) HX COOLANT FLOW sw - EVA
9 •Complete EVA
14 LEAK IN SUS LOOP
15 Crewmen EVA?
NO
YES
16 Real time decision required on basis of crew comfort as to whether or not EVA should be completed
17 C/W ΔP SENSOR FAILURE
18 SUS 1(2) PRI PUMP FAILURE
10 Continue to operate on SUS loop secondary pump
20 • Check LSU, PCU, LCG and SUS H2O lines for leak
Leak repairable?
YES
NO
19 • Repair leak
• Service SUS 1(2) with H2O
21 Loss of SUS 1(2) loop
22 • EVA 1(2) PUMP ΔP sw - inhbt
① This procedure assumes that EVA crewman has cycled LCG flow lever in an effort to adjust for comfortable temp
② Switching SUS 1(2) HX COOLANT FLOW to BYPASS will warm up SUS loop to 35°F in TBS min
④ C/W EVA 1(2) suit delivery H2O temp sensing redundancy is lost. Continue to operate with C/W EVA 1(2) lt on continuously. Redundant sensor will sound alarm in event suit H2O delivery temp becomes low, C/W MEM RECALL pb/lt will be on continuously
⑤ Loss of capability to monitor SUS 1(2) loop pump ΔP on C/W
⑥ Future EVA can be accomplished with both crewmen on same SUS loop. If both EVA crewmen are required to be on one SUS, the AM coolant loops must be configured as follows:
1) One AM coolant loop deactivated
2) Two pumps operating in the remaining loop
⑦ Deactivating SUS 1(2) pump will cause C/W EVA 1(2) lt to turn off. Actuating secondary pump will reactivate C/W EVA 1(2) indication. If loop is returned to normal operation by activating secondary pump C/W EVA 1(2) lt will go out as pump builds speed
0360


SYMPTOM
PROCEDURE
REMARKS
ECS
31
SUS HX COOLANT FLOW EVA LIGHT FAILS TO TURN ON
1 Check suit cooling capability
• LCG FLOW lever position to Full Flow
LCG temp decrease?
YES
NO
3 HX COOLANT FLOW VLV MICRO SWITCH FAILURE
4 • Resume normal operations with status lights off
2 HX COOLANT FLOW VLV FAILED IN BYPASS
①
① Loss of capability to cool suited crewman on affected suit loop Perform subsequent EVA with both crewmen on same SUS. With both crewmen on one SUS configure AM coolant loops as follows.
1) One AM coolant loop deactivated
2) Two pumps operating in the remaining loop
D.360

SYMPTOM	PROCEDURE	REMARKS

ECS

32 (1) ABSENCE OF C/W EVA PARAMETER WHEN SUIT LOOP PUMP IS ACTIVATED

1 Select alternate SUS pump
- SUS 1 (2) PUMP sw - SEC

C/W EVA indication momentarily?

YES → 2 SUS PUMP SWITCH FAILURE → 3 • Continue SUS secondary pump operation (2)

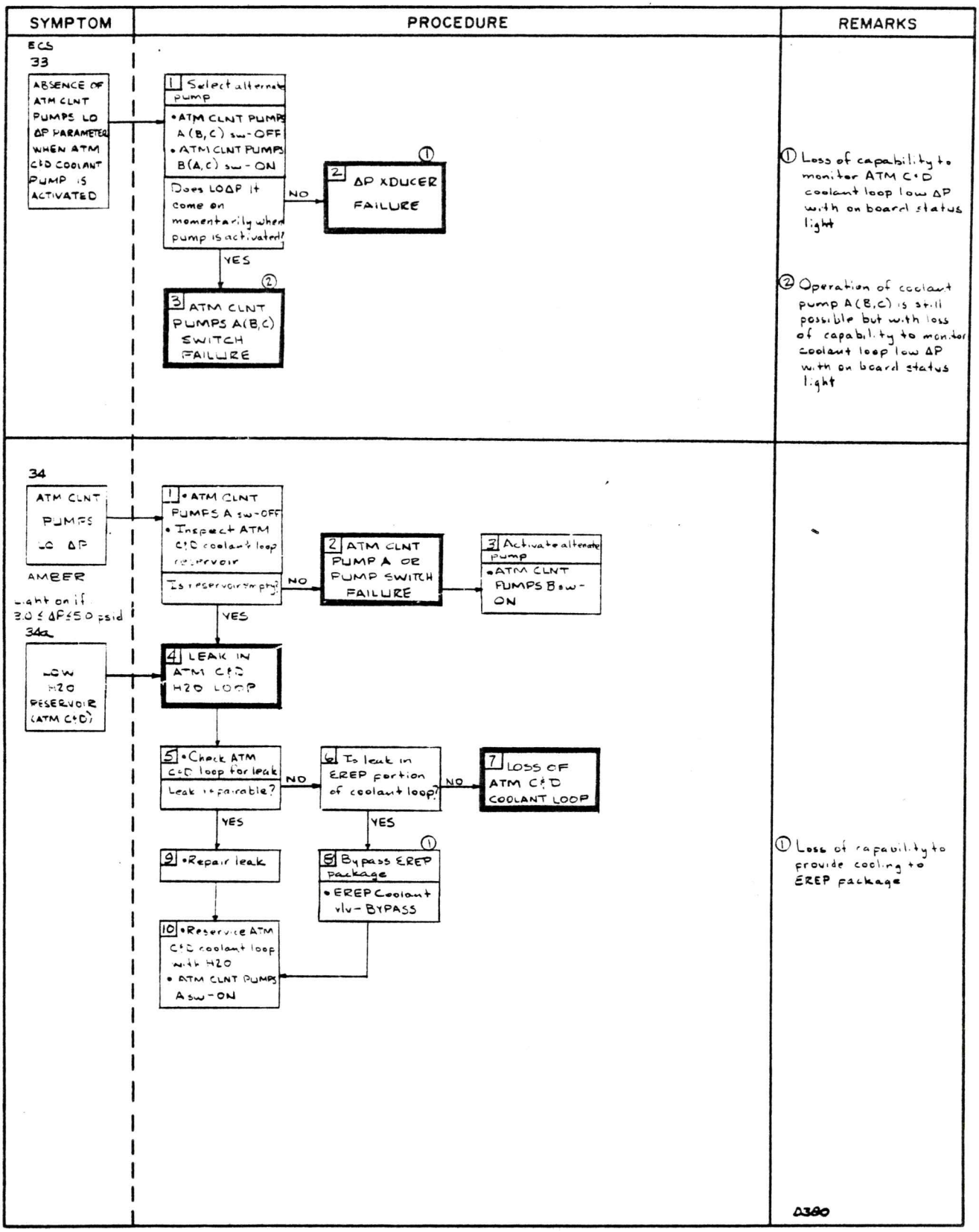
NO → (3) 4 EVA SENSOR PWR RELAY OR PUMP ΔP SW FAILURE

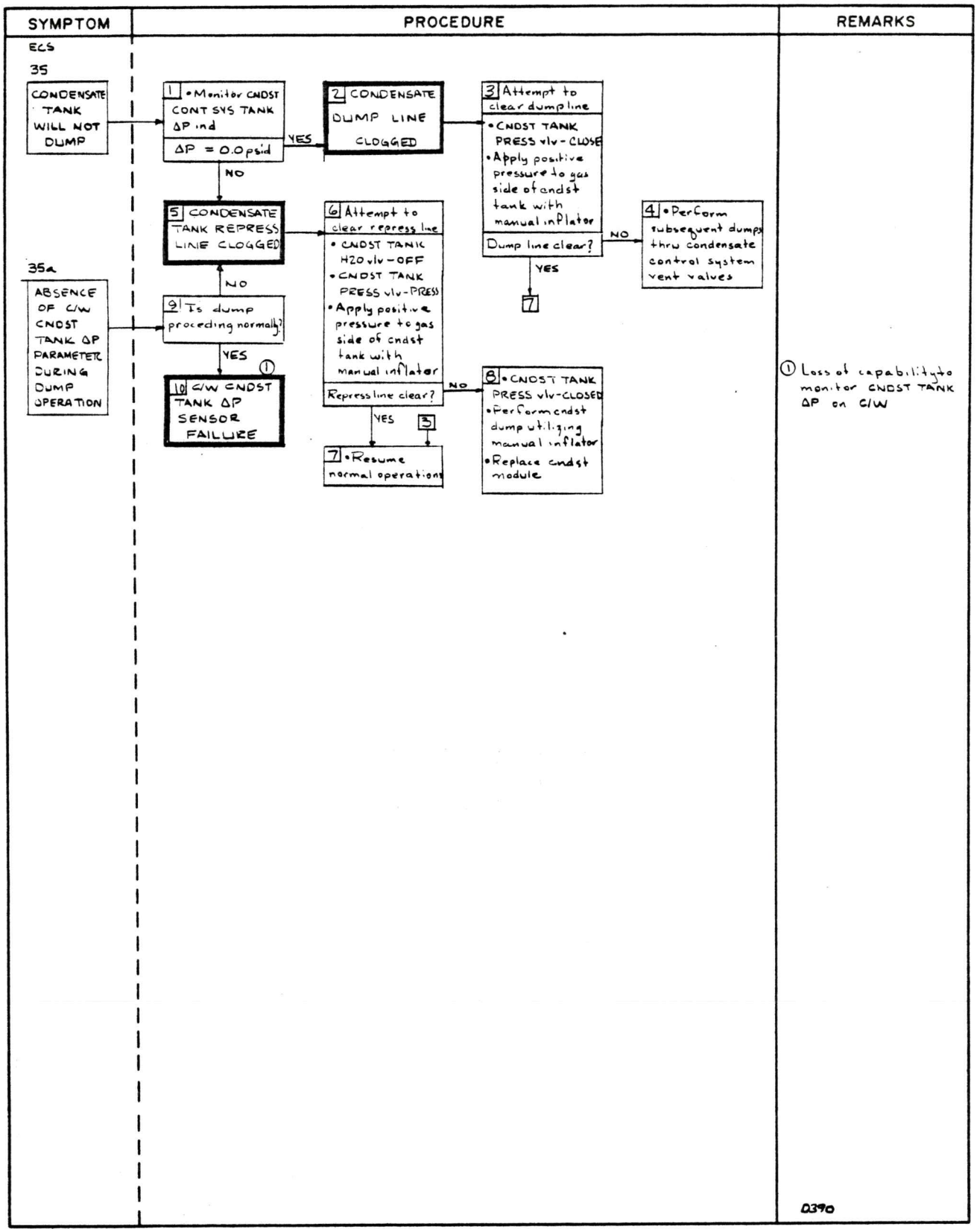
(1) This procedure assumes that pump is being activated from EVA panel (panel 317 or 323). There will be no c/w EVA indication initiated if pump is activated from IVA panel (panel 217) as c/w sensor and sensor power relay are not activated by the pump switch on the IVA panel

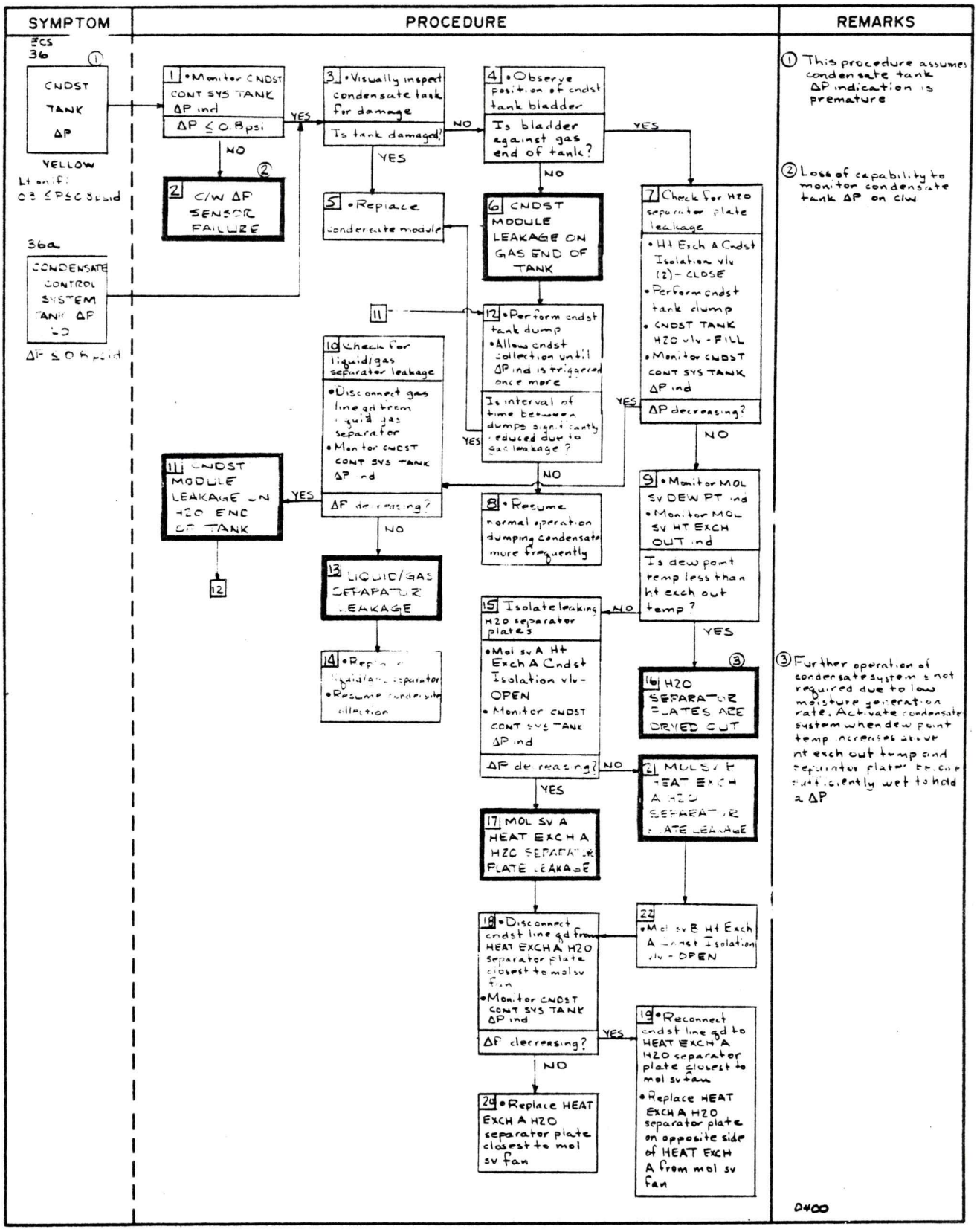
(2) Primary SUS pump may still be operated but with loss of capability to monitor pump ΔP on c/w

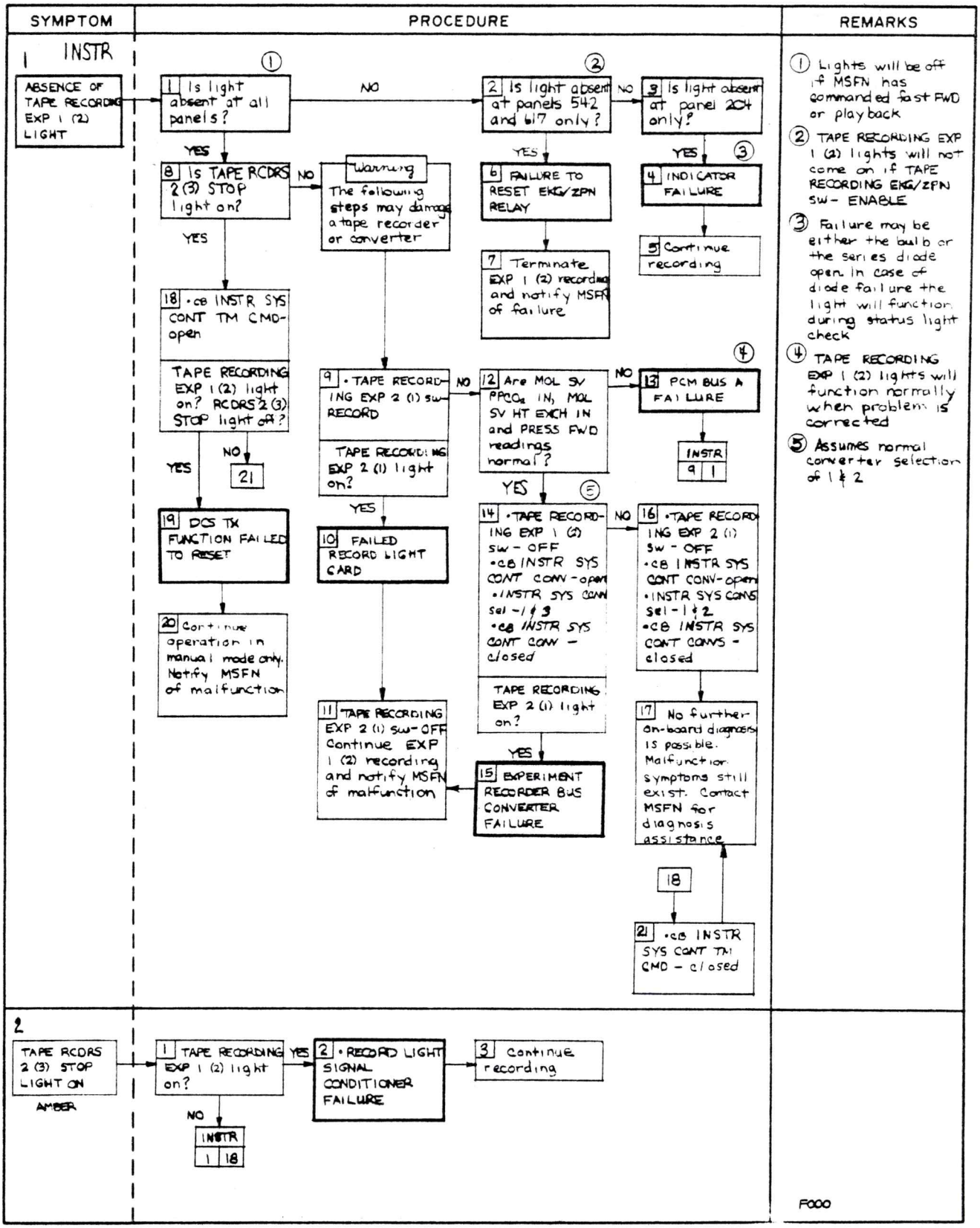
(3) Loss of capability to monitor SUS 1 (2) pump ΔP on c/w

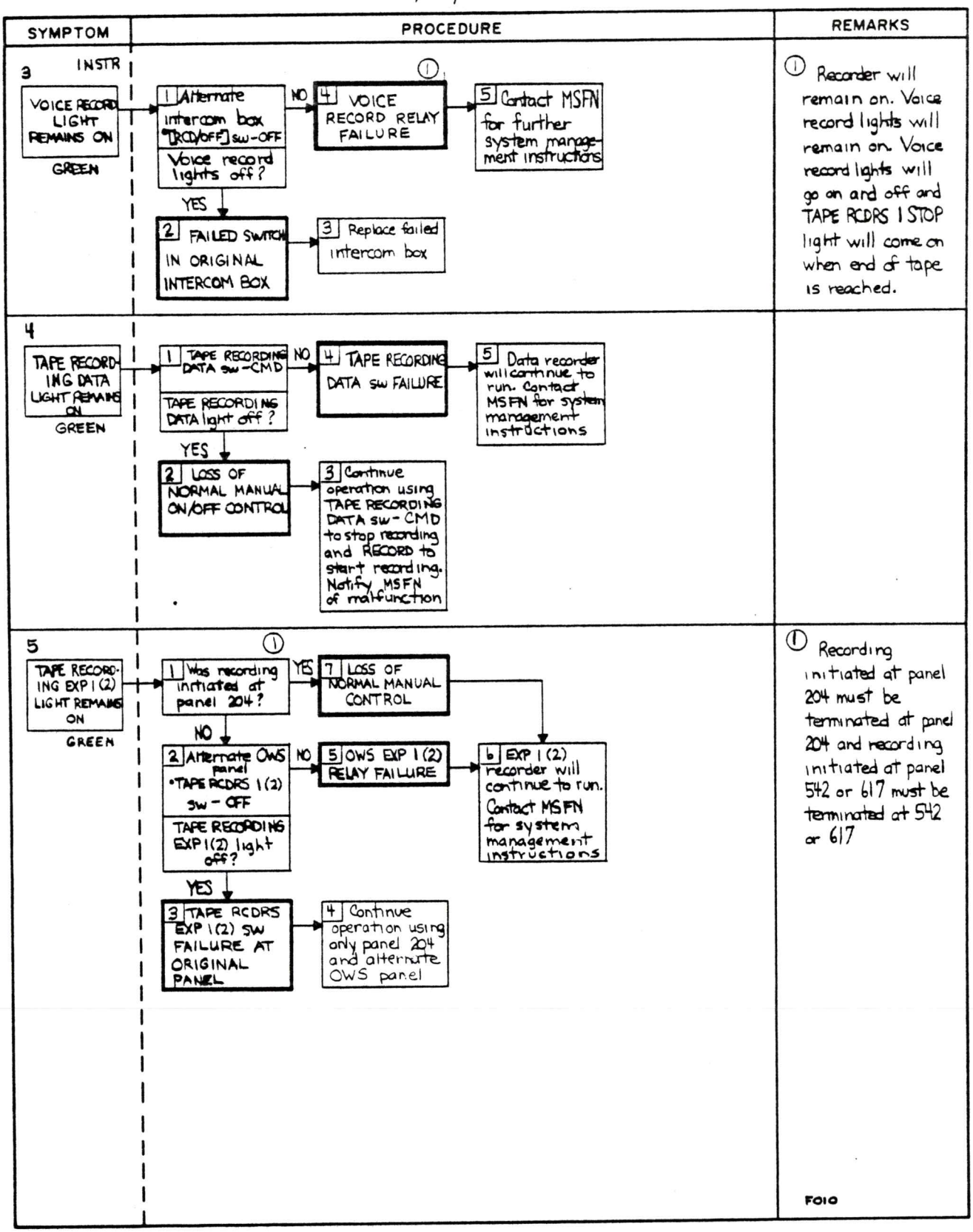
D370

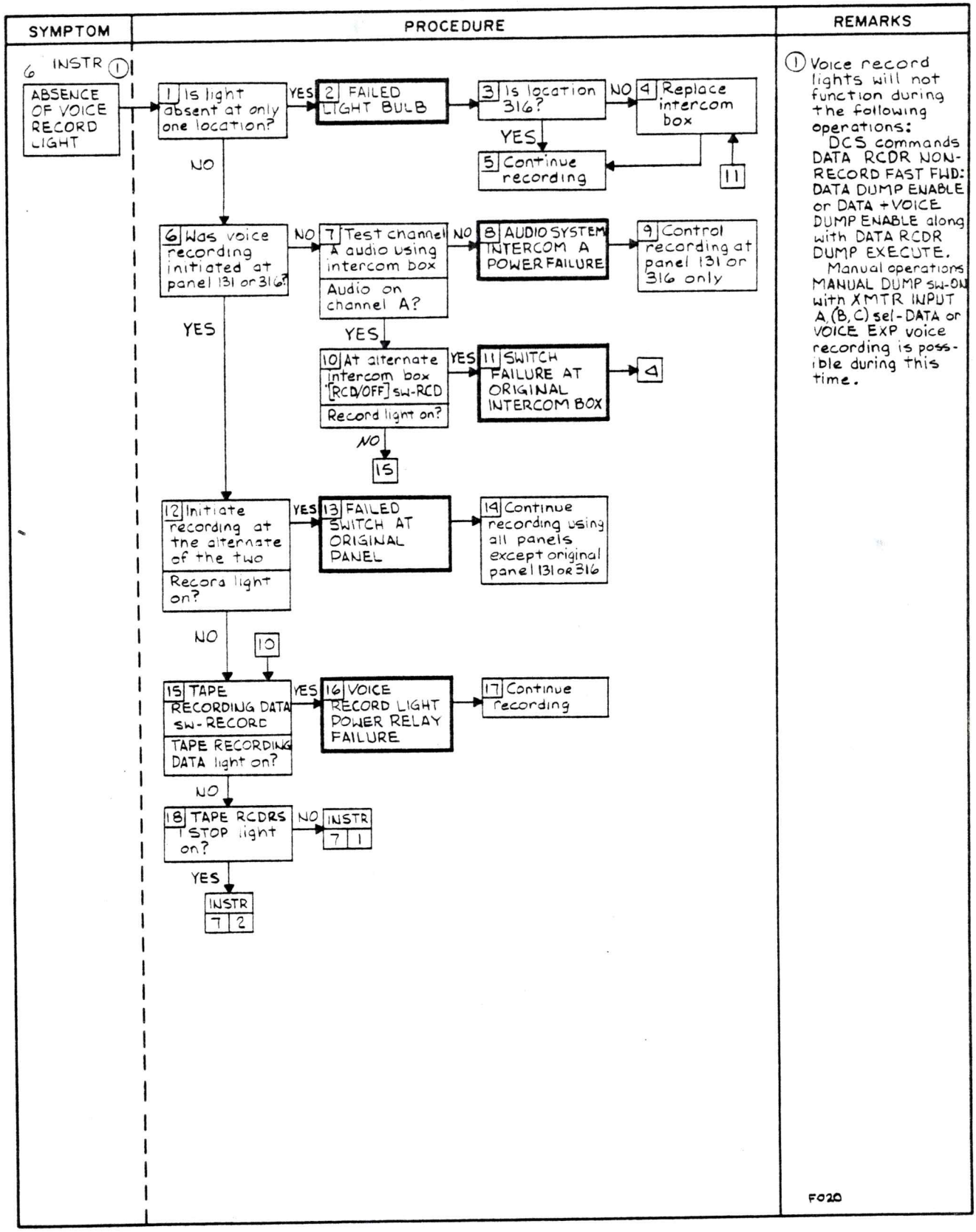

SYMPTOM
PROCEDURE
REMARKS
ECS
33
ABSENCE OF ATM CLNT PUMPS LO ΔP PARAMETER WHEN ATM C&D COOLANT PUMP IS ACTIVATED
1 Select alternate pump
• ATM CLNT PUMPS A(B,C) sw - OFF
• ATM CLNT PUMPS B(A,C) sw - ON
Does LOΔP lt come on momentarily when pump is activated?
NO
2 ΔP XDUCER FAILURE
YES
3 ATM CLNT PUMPS A(B,C) SWITCH FAILURE
① Loss of capability to monitor ATM C&D coolant loop low ΔP with on board status light
② Operation of coolant pump A(B,C) is still possible but with loss of capability to monitor coolant loop low ΔP with on board status light
34
ATM CLNT PUMPS LO ΔP
AMBER
-ight on if 3.0 ≤ ΔP ≤ 5.0 psid
1 • ATM CLNT PUMPS A sw-OFF
• Inspect ATM C&D coolant loop reservoir
Is reservoir empty?
NO
2 ATM CLNT PUMP A OR PUMP SWITCH FAILURE
3 Activate alternate pump
• ATM CLNT PUMPS B sw - ON
YES
34a
LOW H2O RESERVOIR (ATM C&D)
4 LEAK IN ATM C&D H2O LOOP
5 • Check ATM C&D loop for leak
Leak repairable?
NO
6 Is leak in EREP portion of coolant loop?
NO
7 LOSS OF ATM C&D COOLANT LOOP
YES
YES
9 • Repair leak
8 Bypass EREP package
• EREP Coolant vlv - BYPASS
10 • Reservice ATM C&D coolant loop with H2O
• ATM CLNT Pumps A sw - ON
① Loss of capability to provide cooling to EREP package
0380

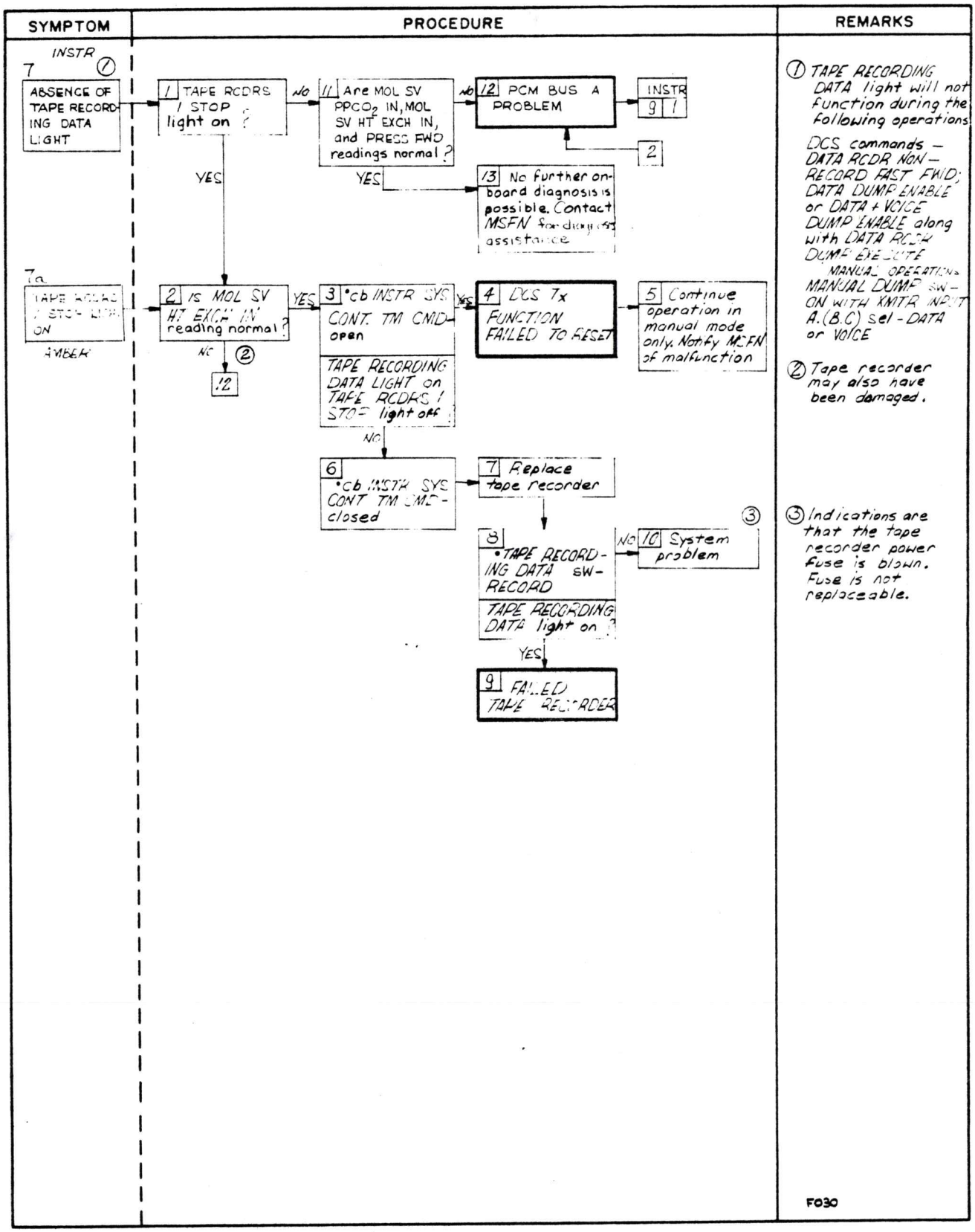

SYMPTOM
PROCEDURE
REMARKS
ECS
35
CONDENSATE TANK WILL NOT DUMP
1 • Monitor CNDST CONT SYS TANK ΔP ind
ΔP = 0.0 psid
YES
NO
2 CONDENSATE DUMP LINE CLOGGED
3 Attempt to clear dump line
• CNDST TANK PRESS vlv - CLOSE
• Apply positive pressure to gas side of cndst tank with manual inflator
Dump line clear?
NO
YES
4 • Perform subsequent dumps thru condensate control system vent valves
7
5 CONDENSATE TANK REPRESS LINE CLOGGED
6 Attempt to clear repress line
• CNDST TANK H2O vlv - OFF
• CNDST TANK PRESS vlv - PRESS
• Apply positive pressure to gas side of cndst tank with manual inflator
Repress line clear?
NO
YES
3
7 • Resume normal operations
8 • CNDST TANK PRESS vlv - CLOSED
• Perform cndst dump utilizing manual inflator
• Replace cndst module
35a
ABSENCE OF C/W CNDST TANK ΔP PARAMETER DURING DUMP OPERATION
9 Is dump proceeding normally?
NO
YES
1
10 C/W CNDST TANK ΔP SENSOR FAILURE
1 Loss of capability to monitor CNDST TANK ΔP on C/W
0390

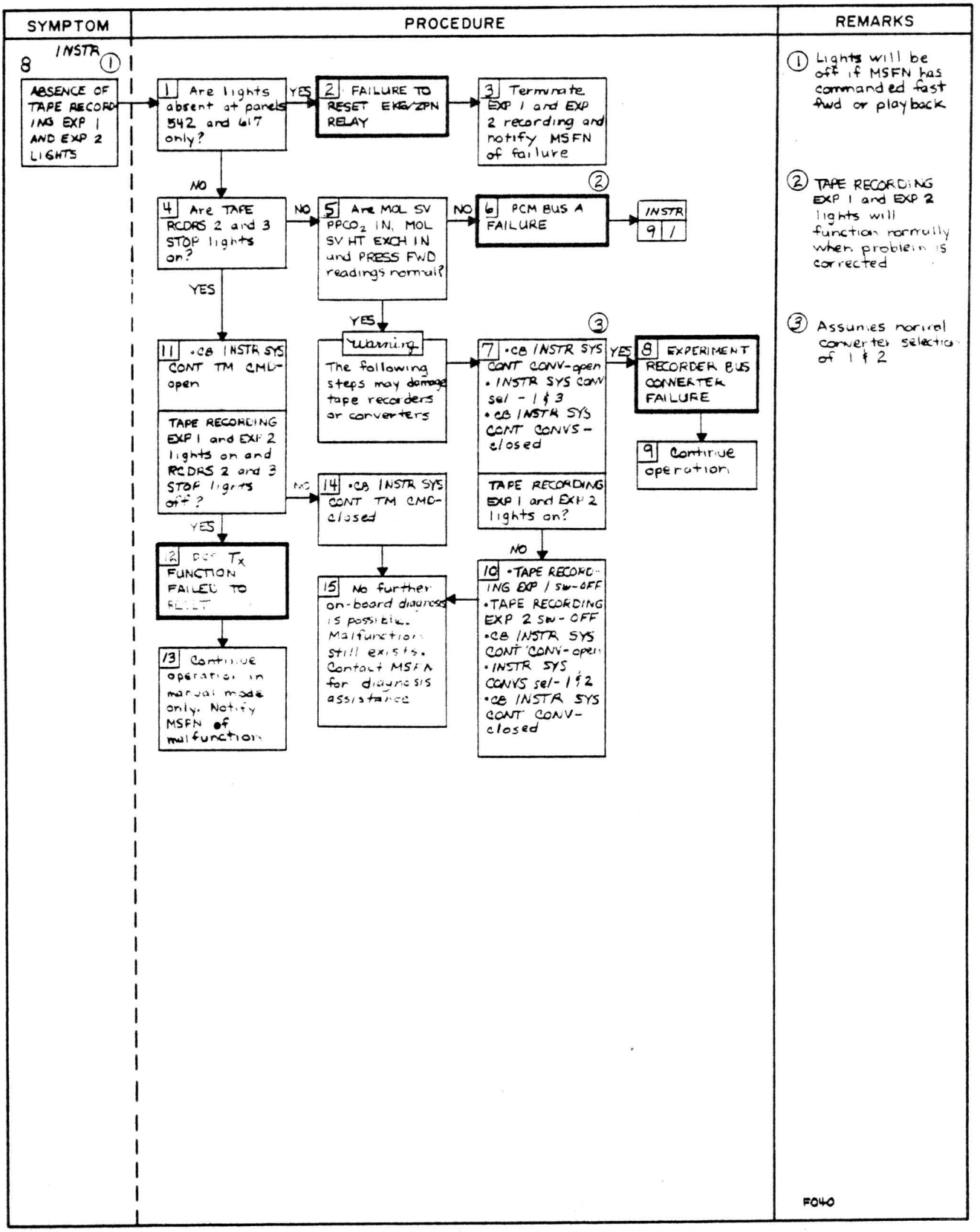

SYMPTOM
PROCEDURE
REMARKS
FCS
36
CNDST TANK ΔP
YELLOW
Lt on if:
0.3 ≤ PSC ≤ Bpsid
36a
CONDENSATE CONTROL SYSTEM TANK ΔP LO
ΔP ≤ 0.6 psid
1 • Monitor CNDST CONT SYS TANK ΔP ind
ΔP ≤ 0.8psi
YES
NO
2 C/W ΔP SENSOR FAILURE
3 • Visually inspect condensate tank for damage
Is tank damaged?
NO
YES
4 • Observe position of cndst tank bladder
Is bladder against gas end of tank?
YES
NO
5 • Replace condensate module
6 CNDST MODULE LEAKAGE ON GAS END OF TANK
7 Check for H2O separator plate leakage
• Ht Exch A Cndst Isolation vlv (2) - CLOSE
• Perform cndst tank dump
• CNDST TANK H2O vlv - FILL
• Monitor CNDST CONT SYS TANK ΔP ind
ΔP decreasing?
YES
NO
8 • Resume normal operation dumping condensate more frequently
9 • Monitor MOL SV DEW PT ind
• Monitor MOL SV HT EXCH OUT ind
Is dew point temp less than ht exch out temp?
YES
NO
10 Check for liquid/gas separator leakage
• Disconnect gas line grd from liquid gas separator
• Monitor CNDST CONT SYS TANK ΔP ind
ΔP decreasing?
YES
NO
11 CNDST MODULE LEAKAGE ON H2O END OF TANK
12 • Perform cndst tank dump
• Allow cndst collection until ΔP ind is triggered once more
Is interval of time between dumps significantly reduced due to gas leakage?
YES
NO
13 LIQUID/GAS SEPARATOR LEAKAGE
14 • Replace liquid/gas separator
• Resume condensate collection
15 Isolate leaking H2O separator plates
• Mol sv A Ht Exch A Cndst Isolation vlv - OPEN
• Monitor CNDST CONT SYS TANK ΔP ind
ΔP decreasing?
NO
YES
16 H2O SEPARATOR PLATES ARE DRIED OUT
21 MOL SV A HEAT EXCH A H2O SEPARATOR PLATE LEAKAGE
17 MOL SV A HEAT EXCH A H2O SEPARATOR PLATE LEAKAGE
18 • Disconnect cndst line grd from HEAT EXCH A H2O separator plate closest to mol sv fan
• Monitor CNDST CONT SYS TANK ΔP ind
ΔP decreasing?
YES
NO
22 • Mol sv B Ht Exch A Cndst Isolation vlv - OPEN
19 • Reconnect cndst line grd to HEAT EXCH A H2O separator plate closest to mol sv fan
• Replace HEAT EXCH A H2O separator plate on opposite side of HEAT EXCH A from mol sv fan
20 • Replace HEAT EXCH A H2O separator plate closest to mol sv fan
① This procedure assumes condensate tank ΔP indication is premature
② Loss of capability to monitor condensate tank ΔP on C/W
③ Further operation of condensate system is not required due to low moisture generation rate. Activate condensate system when dew point temp increases above ht exch out temp and separator plates become sufficiently wet to hold a ΔP
0400

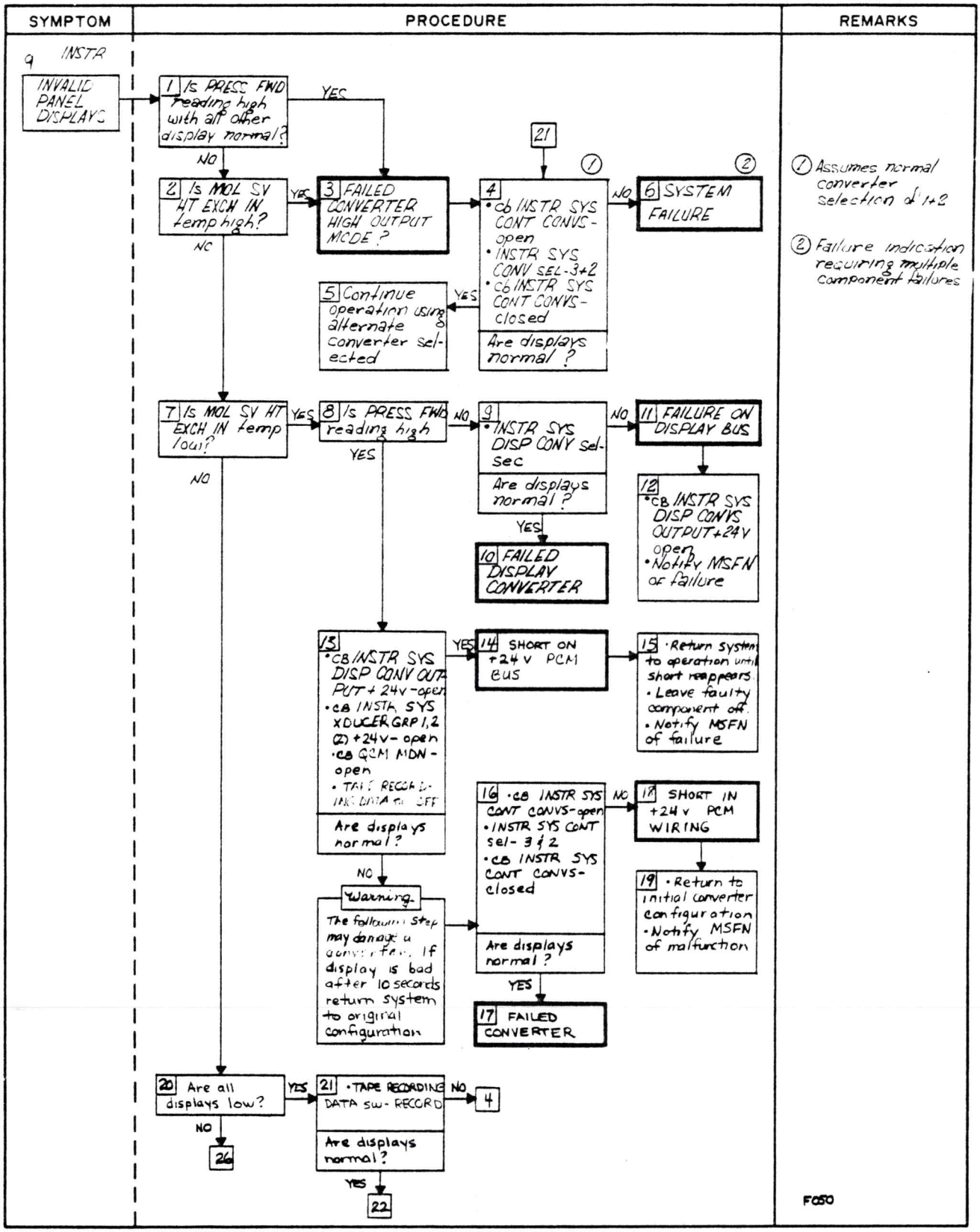

SYMPTOM
PROCEDURE
REMARKS
1 INSTR
ABSENCE OF TAPE RECORDING EXP 1 (2) LIGHT
1 Is light absent at all panels?
NO
2 Is light absent at panels 542 and 617 only?
NO
3 Is light absent at panel 204 only?
YES
8 Is TAPE RCDRS 2 (3) STOP light on?
NO
Warning
The following steps may damage a tape recorder or converter
YES
6 FAILURE TO RESET EKG/ZPN RELAY
YES
4 INDICATOR FAILURE
7 Terminate EXP 1 (2) recording and notify MSFN of failure
5 Continue recording
18 •cb INSTR SYS CONT TM CMD - open
TAPE RECORDING EXP 1 (2) light on? RCDRS 2 (3) STOP light off?
YES
NO
21
9 • TAPE RECORDING EXP 2 (1) sw - RECORD
NO
12 Are MOL SV PPCO2 IN, MOL SV HT EXCH IN and PRESS FWD readings normal?
NO
13 PCM BUS A FAILURE
INSTR 9 1
TAPE RECORDING EXP 2 (1) light on?
YES
YES
19 DCS TX FUNCTION FAILED TO RESET
10 FAILED RECORD LIGHT CARD
14 • TAPE RECORDING EXP 1 (2) sw - OFF • cb INSTR SYS CONT CONV - open • INSTR SYS CONV sel - 1 & 3 • cb INSTR SYS CONT CONV - closed
NO
16 • TAPE RECORDING EXP 2 (1) sw - OFF • cb INSTR SYS CONT CONV - open • INSTR SYS CONV sel - 1 & 2 • cb INSTR SYS CONT CONV - closed
20 Continue operation in manual mode only. Notify MSFN of malfunction
11 TAPE RECORDING EXP 2 (1) sw - OFF Continue EXP 1 (2) recording and notify MSFN of malfunction
TAPE RECORDING EXP 2 (1) light on?
YES
15 EXPERIMENT RECORDER BUS CONVERTER FAILURE
17 No further on-board diagnosis is possible. Malfunction symptoms still exist. Contact MSFN for diagnosis assistance
18
21 • cb INSTR SYS CONT TM CMD - closed
1) Lights will be off if MSFN has commanded fast FWD or playback
2) TAPE RECORDING EXP 1 (2) lights will not come on if TAPE RECORDING EKG/ZPN sw - ENABLE
3) Failure may be either the bulb or the series diode open. In case of diode failure the light will function during status light check
4) TAPE RECORDING EXP 1 (2) lights will function normally when problem is corrected
5) Assumes normal converter selection of 1 & 2
2
TAPE RCDRS 2 (3) STOP LIGHT ON
AMBER
1 TAPE RECORDING EXP 1 (2) light on?
YES
2 • RECORD LIGHT SIGNAL CONDITIONER FAILURE
3 Continue recording
NO
INSTR 1 18
F000

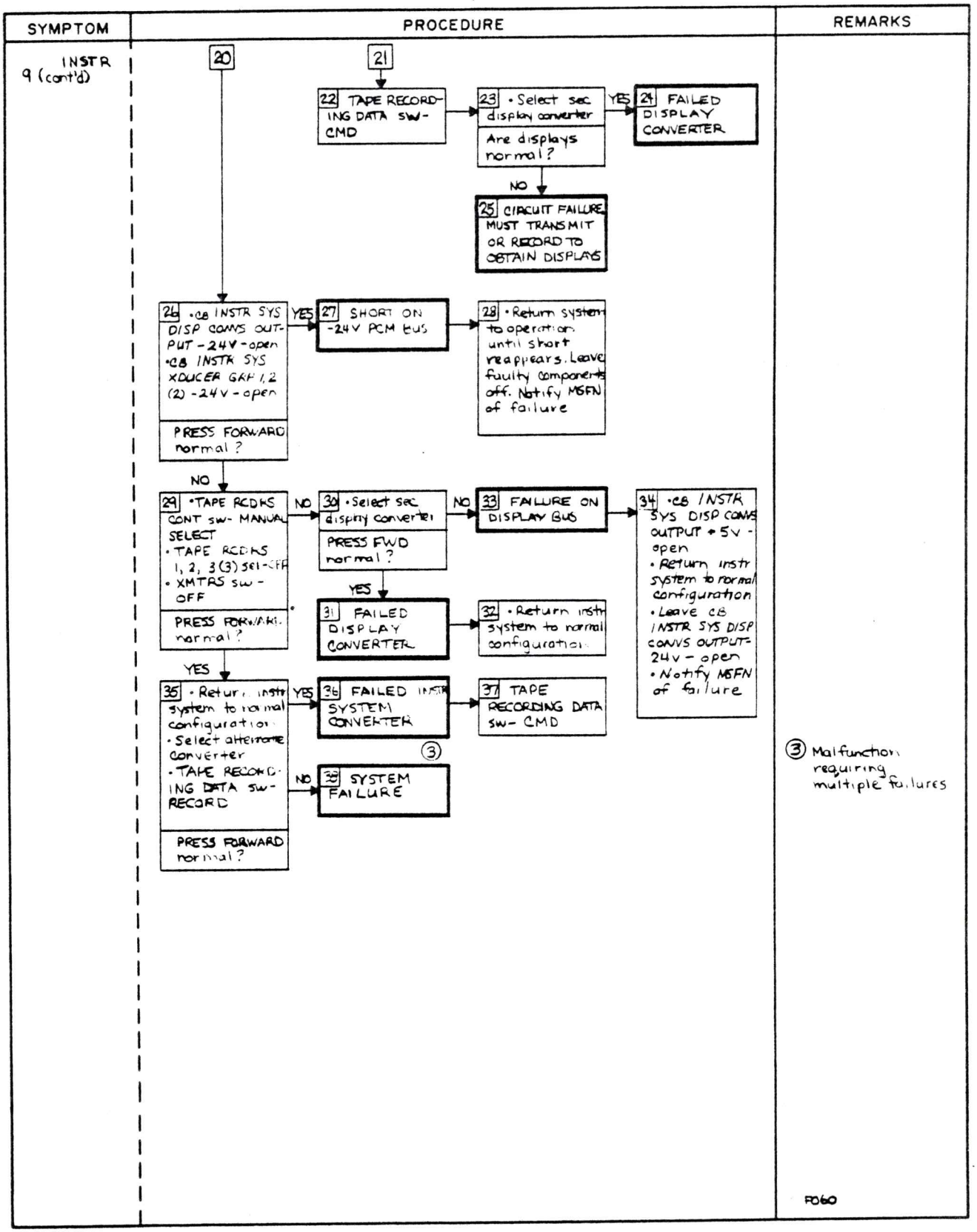

SYMPTOM
PROCEDURE
REMARKS
3 INSTR
VOICE RECORD LIGHT REMAINS ON
GREEN
1 Alternate intercom box "RCD/OFF" sw-OFF
Voice record lights off?
NO
4 VOICE RECORD RELAY FAILURE
5 Contact MSFN for further system management instructions
YES
2 FAILED SWITCH IN ORIGINAL INTERCOM BOX
3 Replace failed intercom box
① Recorder will remain on. Voice record lights will remain on. Voice record lights will go on and off and TAPE RCDRS 1 STOP light will come on when end of tape is reached.
4
TAPE RECORDING DATA LIGHT REMAINS ON
GREEN
1 TAPE RECORDING DATA sw-CMD
TAPE RECORDING DATA light off?
NO
4 TAPE RECORDING DATA sw FAILURE
5 Data recorder will continue to run. Contact MSFN for system management instructions
YES
2 LOSS OF NORMAL MANUAL ON/OFF CONTROL
3 Continue operation using TAPE RECORDING DATA sw-CMD to stop recording and RECORD to start recording. Notify MSFN of malfunction
5
TAPE RECORDING EXP 1(2) LIGHT REMAINS ON
GREEN
① 1 Was recording initiated at panel 204?
YES
7 LOSS OF NORMAL MANUAL CONTROL
NO
2 Alternate OWS panel "TAPE RCDRS 1(2) sw-OFF
TAPE RECORDING EXP 1(2) light off?
NO
5 OWS EXP 1(2) RELAY FAILURE
6 EXP 1(2) recorder will continue to run. Contact MSFN for system management instructions
YES
3 TAPE RCDRS EXP 1(2) SW FAILURE AT ORIGINAL PANEL
4 Continue operation using only panel 204 and alternate OWS panel
① Recording initiated at panel 204 must be terminated at panel 204 and recording initiated at panel 542 or 617 must be terminated at 542 or 617
F010

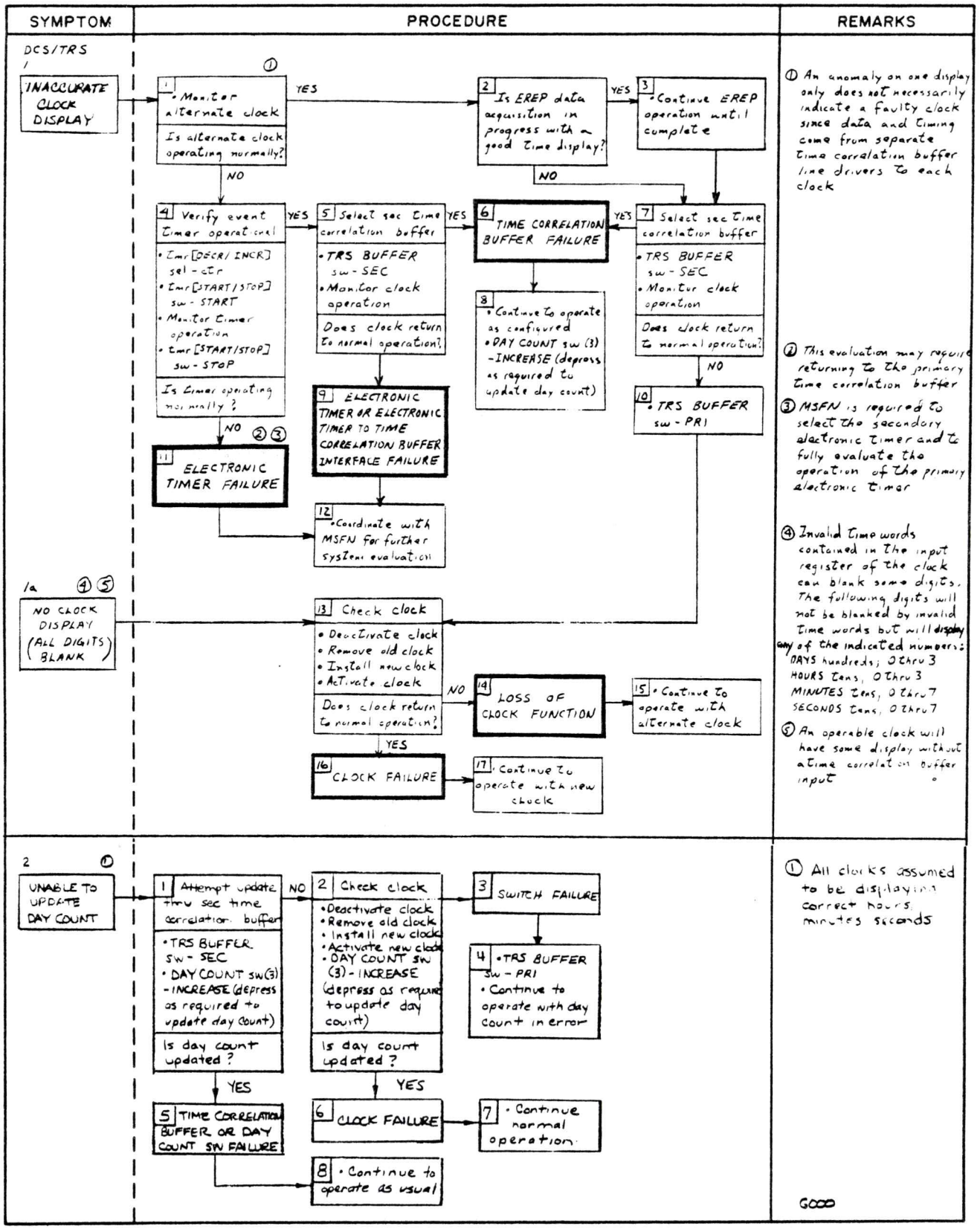

SYMPTOM
PROCEDURE
REMARKS
6 INSTR (1)
ABSENCE OF VOICE RECORD LIGHT
1 Is light absent at only one location?
YES
2 FAILED LIGHT BULB
3 Is location 316?
NO
4 Replace intercom box
YES
5 Continue recording
11
NO
6 Was voice recording initiated at panel 131 or 316?
NO
7 Test channel A audio using intercom box
Audio on channel A?
NO
8 AUDIO SYSTEM INTERCOM A POWER FAILURE
9 Control recording at panel 131 or 316 only
YES
YES
10 At alternate intercom box [RCD/OFF] sw-RCD
Record light on?
YES
11 SWITCH FAILURE AT ORIGINAL INTERCOM BOX
4
NO
15
12 Initiate recording at the alternate of the two
Record light on?
YES
13 FAILED SWITCH AT ORIGINAL PANEL
19 Continue recording using all panels except original panel 131 or 316
NO
10
15 TAPE RECORDING DATA sw-RECORD
TAPE RECORDING DATA light on?
YES
16 VOICE RECORD LIGHT POWER RELAY FAILURE
17 Continue recording
NO
18 TAPE RCDRS STOP light on?
NO
INSTR 7 1
YES
INSTR 7 2
(1) Voice record lights will not function during the following operations:
DCS commands DATA RCDR NON-RECORD FAST FWD: DATA DUMP ENABLE or DATA + VOICE DUMP ENABLE along with DATA RCDR DUMP EXECUTE.
Manual operations MANUAL DUMP sw-ON with XMTR INPUT A, (B, C) sel-DATA or VOICE EXP voice recording is possible during this time.
F020

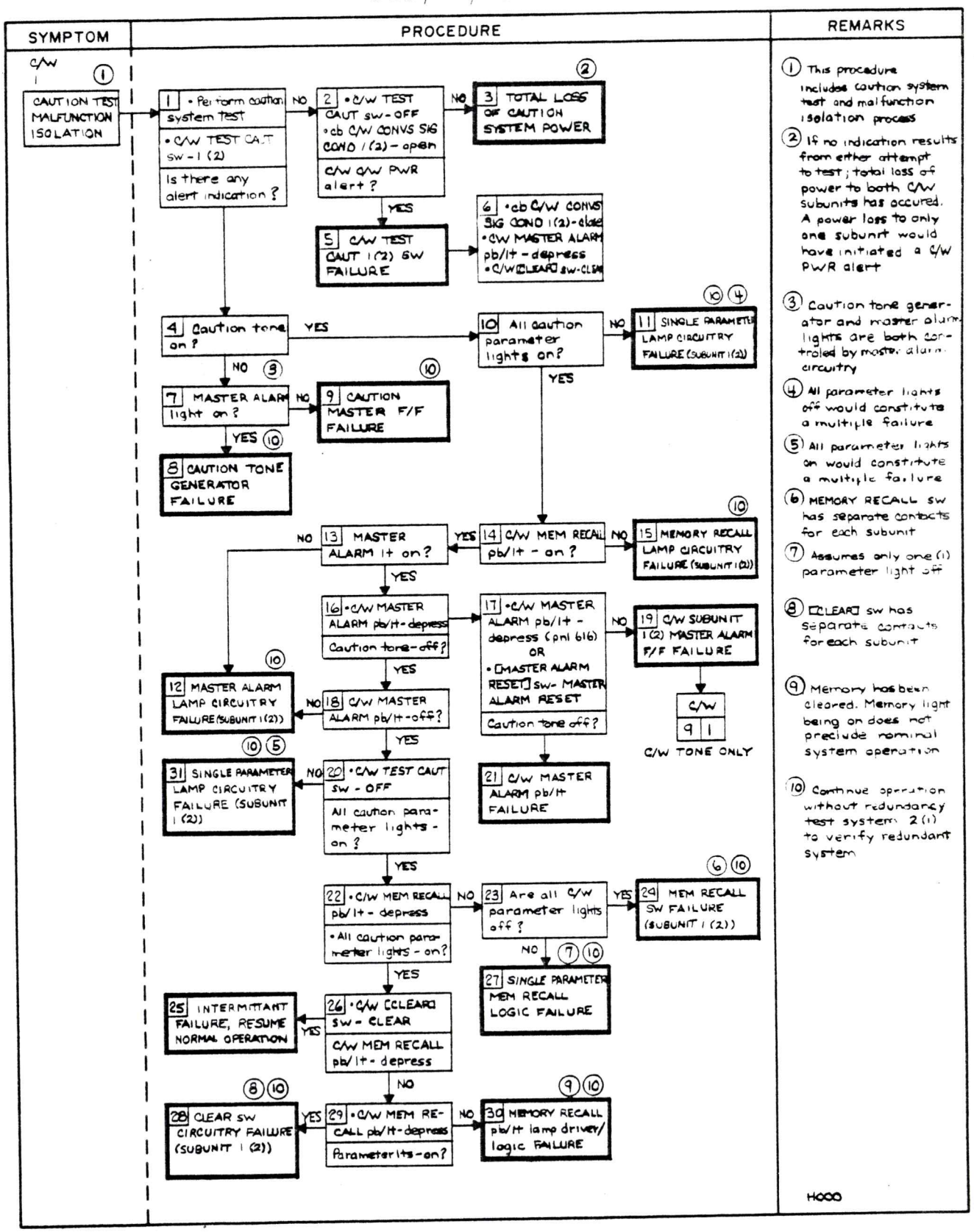

SYMPTOM
PROCEDURE
REMARKS
7 INSTR (1)
ABSENCE OF TAPE RECORDING DATA LIGHT
1 TAPE RCDRS 1 STOP light on ?
No
11 Are MOL SV $PPCO_2$ IN, MOL SV HT EXCH IN, and PRESS FWD readings normal ?
No
12 PCM BUS A PROBLEM
INSTR 9 1
2
YES
YES
13 No further on-board diagnosis is possible. Contact MSFN for diagnostic assistance
7a
TAPE RCDRS 1 STOP LIGHT ON
AMBER
2 IS MOL SV HT EXCH IN reading normal ?
YES
3 *cb INSTR SYS CONT TM CMD - open
Yes
4 DCS Tx FUNCTION FAILED TO RESET
5 Continue operation in manual mode only. Notify MSFN of malfunction
NO (2)
12
TAPE RECORDING DATA LIGHT on TAPE RCDRS 1 STOP light off
NO
6 *cb INSTR SYS CONT TM CMD - closed
7 Replace tape recorder
8 *TAPE RECORDING DATA SW - RECORD
(3)
No
10 System problem
TAPE RECORDING DATA light on ?
YES
9 FAILED TAPE RECORDER
(1) TAPE RECORDING DATA light will not function during the following operations
DCS commands — DATA RCDR NON — RECORD FAST FWD; DATA DUMP ENABLE or DATA + VOICE DUMP ENABLE along with DATA RCDR DUMP EXECUTE
MANUAL OPERATION: MANUAL DUMP SW — ON WITH XMTR INPUT A.(B.C) sel - DATA or VOICE
(2) Tape recorder may also have been damaged.
(3) Indications are that the tape recorder power fuse is blown. Fuse is not replaceable.
F030

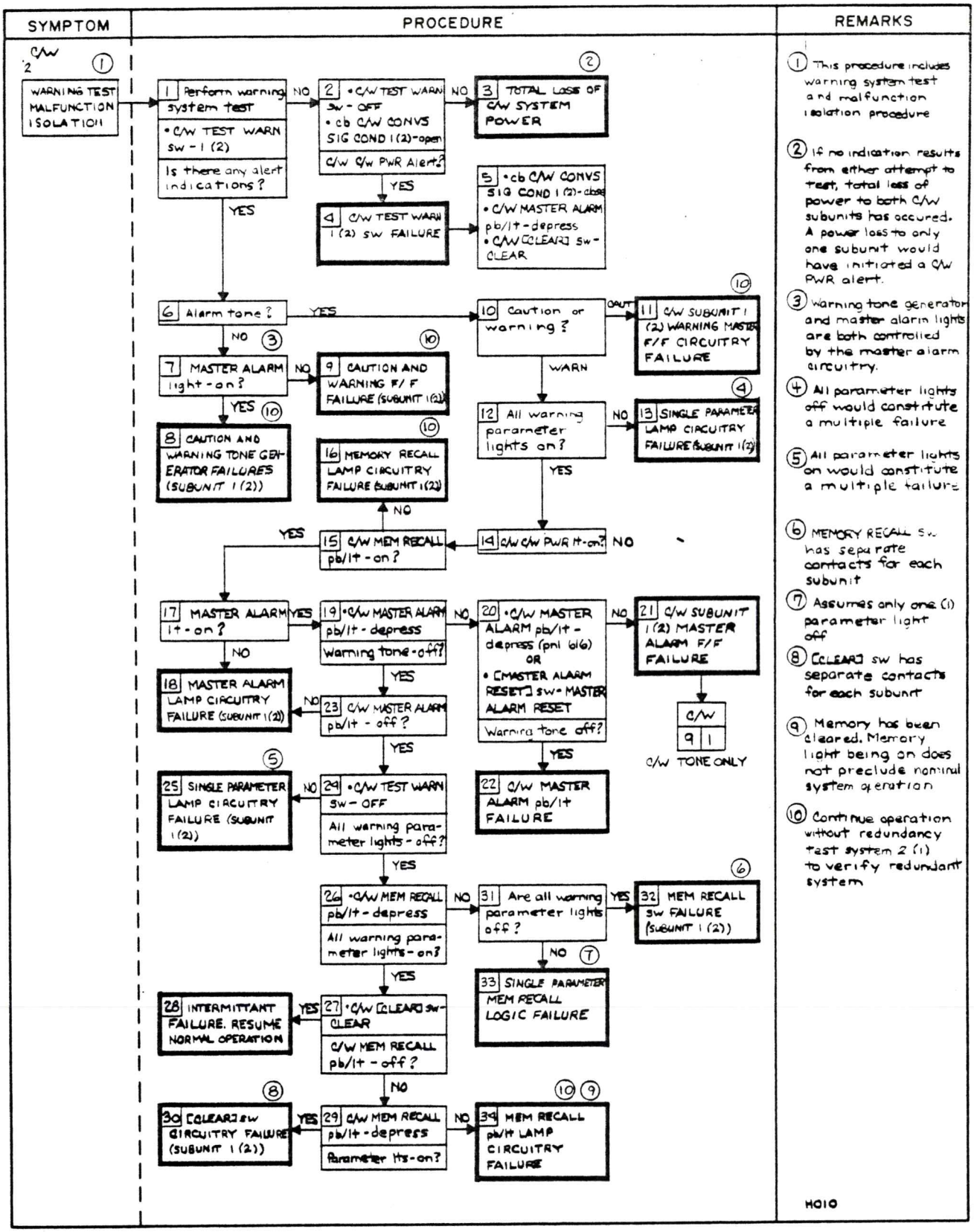

SYMPTOM
PROCEDURE
REMARKS
8 INSTR (1)
ABSENCE OF TAPE RECORDING EXP 1 AND EXP 2 LIGHTS
1 Are lights absent at panels 542 and 617 only?
YES
2 FAILURE TO RESET EKG/ZPN RELAY
3 Terminate EXP 1 and EXP 2 recording and notify MSFN of failure
NO
4 Are TAPE RCDRS 2 and 3 STOP lights on?
NO
5 Are MOL SV PPCO2 IN, MOL SV HT EXCH IN and PRESS FWD readings normal?
NO
(2)
6 PCM BUS A FAILURE
INSTR 9 1
YES
YES
Warning
The following steps may damage tape recorders or converters
11 •CB INSTR SYS CONT TM CMD-open
TAPE RECORDING EXP 1 and EXP 2 lights on and RCDRS 2 and 3 STOP lights off?
NO
14 •CB INSTR SYS CONT TM CMD-closed
YES
12 PCM Tx FUNCTION FAILED TO RESET
13 Continue operation in manual mode only. Notify MSFN of malfunction
15 No further on-board diagnosis is possible. Malfunction still exists. Contact MSFN for diagnosis assistance
(3)
7 •CB INSTR SYS CONT CONV-open
• INSTR SYS CONV sel - 1 & 3
• CB INSTR SYS CONT CONVS - closed
YES
8 EXPERIMENT RECORDER BUS CONVERTER FAILURE
9 Continue operation
TAPE RECORDING EXP 1 and EXP 2 lights on?
NO
10 •TAPE RECORDING EXP 1 SW-OFF
•TAPE RECORDING EXP 2 SW-OFF
•CB INSTR SYS CONT CONV-open
•INSTR SYS CONVS sel-1 & 2
•CB INSTR SYS CONT CONV-closed
(1) Lights will be off if MSFN has commanded fast fwd or playback
(2) TAPE RECORDING EXP 1 and EXP 2 lights will function normally when problem is corrected
(3) Assumes normal converter selection of 1 & 2
F040

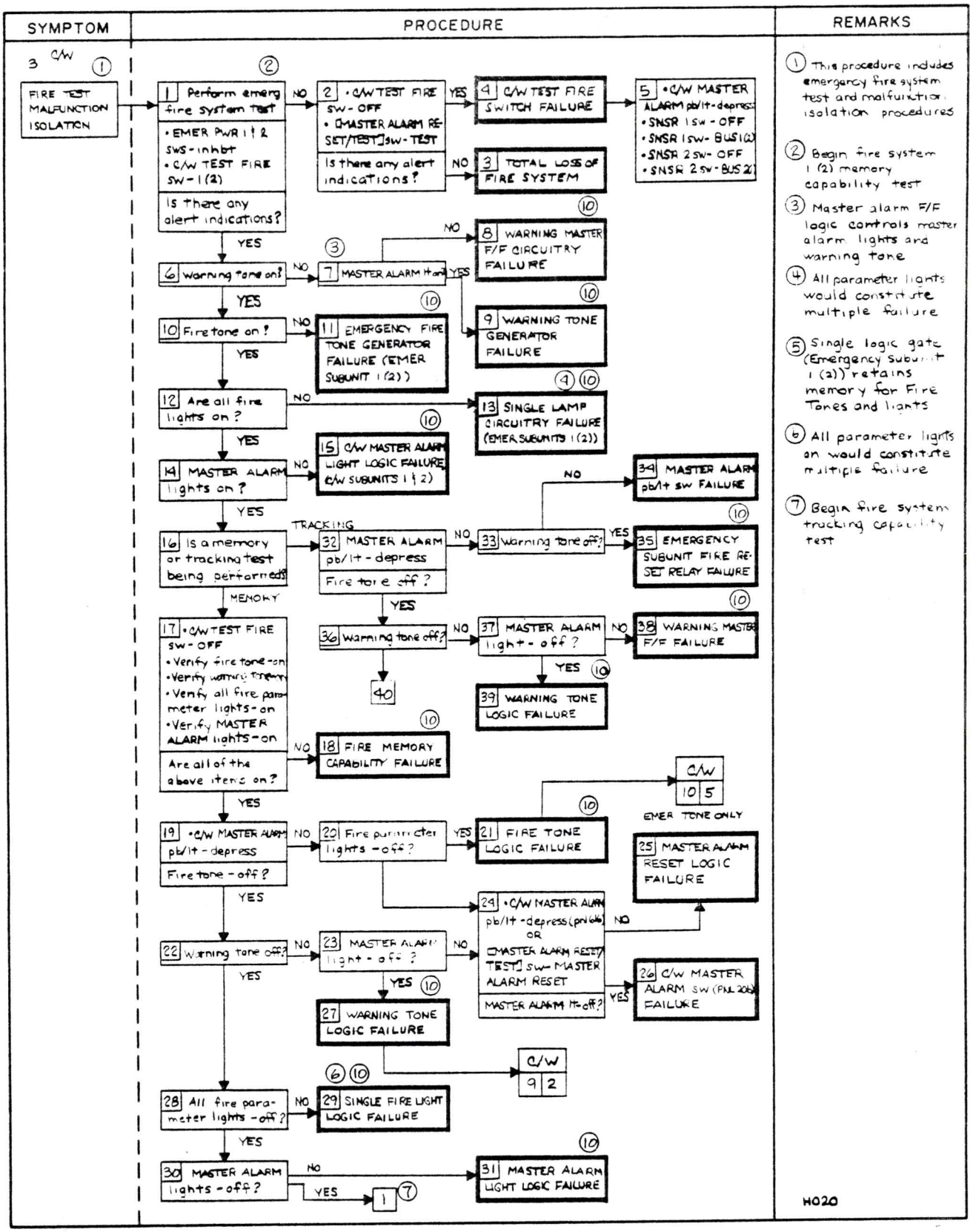

SYMPTOM
PROCEDURE
REMARKS
9 INSTR
INVALID PANEL DISPLAYS
1 Is PRESS FWD reading high with all other display normal?
YES
NO
2 Is MDL SV HT EXCH IN temp high?
YES
NO
3 FAILED CONVERTER HIGH OUTPUT MODE?
21
4 • CB INSTR SYS CONT CONVS - open • INSTR SYS CONV SEL - 3+2 • CB INSTR SYS CONT CONVS - closed
Are displays normal?
NO
6 SYSTEM FAILURE
5 Continue operation using alternate converter selected
YES
7 Is MDL SV HT EXCH IN temp low?
YES
NO
8 Is PRESS FWD reading high
YES
NO
9 • INSTR SYS DISP CONV Sel-Sec
Are displays normal?
YES
NO
10 FAILED DISPLAY CONVERTER
11 FAILURE ON DISPLAY BUS
12 • CB INSTR SYS DISP CONVS OUTPUT +24V open • Notify MSFN of failure
13 • CB INSTR SYS DISP CONV OUTPUT + 24v - open • CB INSTR SYS XDUCER GRP 1,2 (2) +24V - open • CB QTM MDN - open • TAPE RECORDER DATA SW - OFF
Are displays normal?
YES
NO
14 SHORT ON +24 V PCM BUS
15 • Return system to operation until short reappears • Leave faulty component off • Notify MSFN of failure
Warning
The following step may damage a converter. If display is bad after 10 seconds return system to original configuration
16 • CB INSTR SYS CONT CONVS - open • INSTR SYS CONT SEL - 3 & 2 • CB INSTR SYS CONT CONVS - closed
Are displays normal?
YES
NO
17 FAILED CONVERTER
18 SHORT IN +24 v PCM WIRING
19 • Return to initial converter configuration • Notify MSFN of malfunction
20 Are all displays low?
YES
NO
26
21 • TAPE RECORDING DATA SW - RECORD
Are displays normal?
YES
NO
4
22
(1) Assumes normal converter selection of 1+2
(2) Failure indication requiring multiple component failures
F050

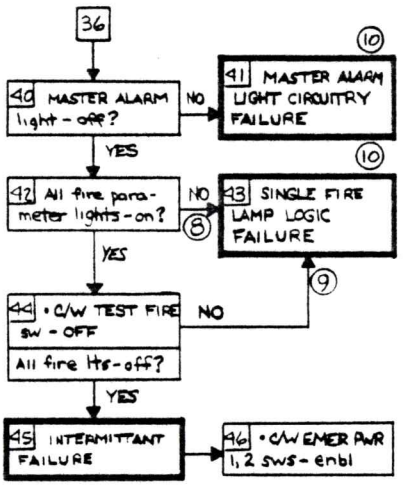

SYMPTOM
PROCEDURE
REMARKS
INSTR 9 (cont'd)
20
21
22 TAPE RECORDING DATA SW - CMD
23 • Select sec display converter
Are displays normal?
YES
24 FAILED DISPLAY CONVERTER
NO
25 CIRCUIT FAILURE MUST TRANSMIT OR RECORD TO OBTAIN DISPLAYS
26 • CB INSTR SYS DISP COMNS OUTPUT - 24V - open
• CB INSTR SYS XDUCER GRP 1, 2 (2) - 24V - open
PRESS FORWARD normal?
YES
27 SHORT ON -24V PCM BUS
28 • Return system to operation until short reappears. Leave faulty components off. Notify MSFN of failure
NO
29 • TAPE RCDRS CONT SW - MANUAL SELECT
• TAPE RCDRS 1, 2, 3 (3) SEL - OFF
• XMTRS SW - OFF
PRESS FORWARD normal?
NO
30 • Select sec display converter
PRESS FWD normal?
NO
33 FAILURE ON DISPLAY BUS
34 • CB INSTR SYS DISP COMNS OUTPUT + 5V - open
• Return instr system to normal configuration
• Leave CB INSTR SYS DISP COMNS OUTPUT - 24V - open
• Notify MSFN of failure
YES
31 FAILED DISPLAY CONVERTER
32 • Return instr system to normal configuration
YES
35 • Return instr system to normal configuration
• Select alternate converter
• TAPE RECORDING DATA SW - RECORD
PRESS FORWARD normal?
YES
36 FAILED INSTR SYSTEM CONVERTER
37 TAPE RECORDING DATA SW - CMD
③
NO
38 SYSTEM FAILURE
③ Malfunction requiring multiple failures
F060


SYMPTOM
PROCEDURE
REMARKS
DCS/TRS
INACCURATE CLOCK DISPLAY
1 • Monitor alternate clock
Is alternate clock operating normally?
YES
NO
2 Is EREP data acquisition in progress with a good time display?
YES
3 • Continue EREP operation until complete
NO
4 Verify event timer operational
• Tmr [DECR/INCR] sel - ctr
• Tmr [START/STOP] sw - START
• Monitor timer operation
• tmr [START/STOP] sw - STOP
Is timer operating normally?
YES
5 Select sec time correlation buffer
• TRS BUFFER sw - SEC
• Monitor clock operation
Does clock return to normal operation?
YES
6 TIME CORRELATION BUFFER FAILURE
7 Select sec time correlation buffer
• TRS BUFFER sw - SEC
• Monitor clock operation
Does clock return to normal operation?
NO
8 • Continue to operate as configured
• DAY COUNT sw (3) - INCREASE (depress as required to update day count)
9 ELECTRONIC TIMER OR ELECTRONIC TIMER TO TIME CORRELATION BUFFER INTERFACE FAILURE
10 • TRS BUFFER sw - PRI
NO ② ③
11 ELECTRONIC TIMER FAILURE
12 • Coordinate with MSFN for further system evaluation
1a ④ ⑤
NO CLOCK DISPLAY (ALL DIGITS BLANK)
13 Check clock
• Deactivate clock
• Remove old clock
• Install new clock
• Activate clock
Does clock return to normal operation?
NO
14 LOSS OF CLOCK FUNCTION
15 • Continue to operate with alternate clock
YES
16 CLOCK FAILURE
17 • Continue to operate with new clock
2 ①
UNABLE TO UPDATE DAY COUNT
1 Attempt update thru sec time correlation buffer
• TRS BUFFER sw - SEC
• DAY COUNT sw (3) - INCREASE (depress as required to update day count)
Is day count updated?
NO
2 Check clock
• Deactivate clock
• Remove old clock
• Install new clock
• Activate new clock
• DAY COUNT sw (3) - INCREASE (depress as required to update day count)
Is day count updated?
YES
3 SWITCH FAILURE
4 • TRS BUFFER sw - PRI
• Continue to operate with day count in error
YES
5 TIME CORRELATION BUFFER OR DAY COUNT SW FAILURE
6 CLOCK FAILURE
7 • Continue normal operation
8 • Continue to operate as usual
① An anomaly on one display only does not necessarily indicate a faulty clock since data and timing come from separate time correlation buffer line drivers to each clock
② This evaluation may require returning to the primary time correlation buffer
③ MSFN is required to select the secondary electronic timer and to fully evaluate the operation of the primary electronic timer
④ Invalid time words contained in the input register of the clock can blank some digits. The following digits will not be blanked by invalid time words but will display any of the indicated numbers:
DAYS hundreds; 0 thru 3
HOURS tens, 0 thru 3
MINUTES tens, 0 thru 7
SECONDS tens, 0 thru 7
⑤ An operable clock will have some display without a time correlation buffer input
① All clocks assumed to be displaying correct hours minutes seconds
GOOD

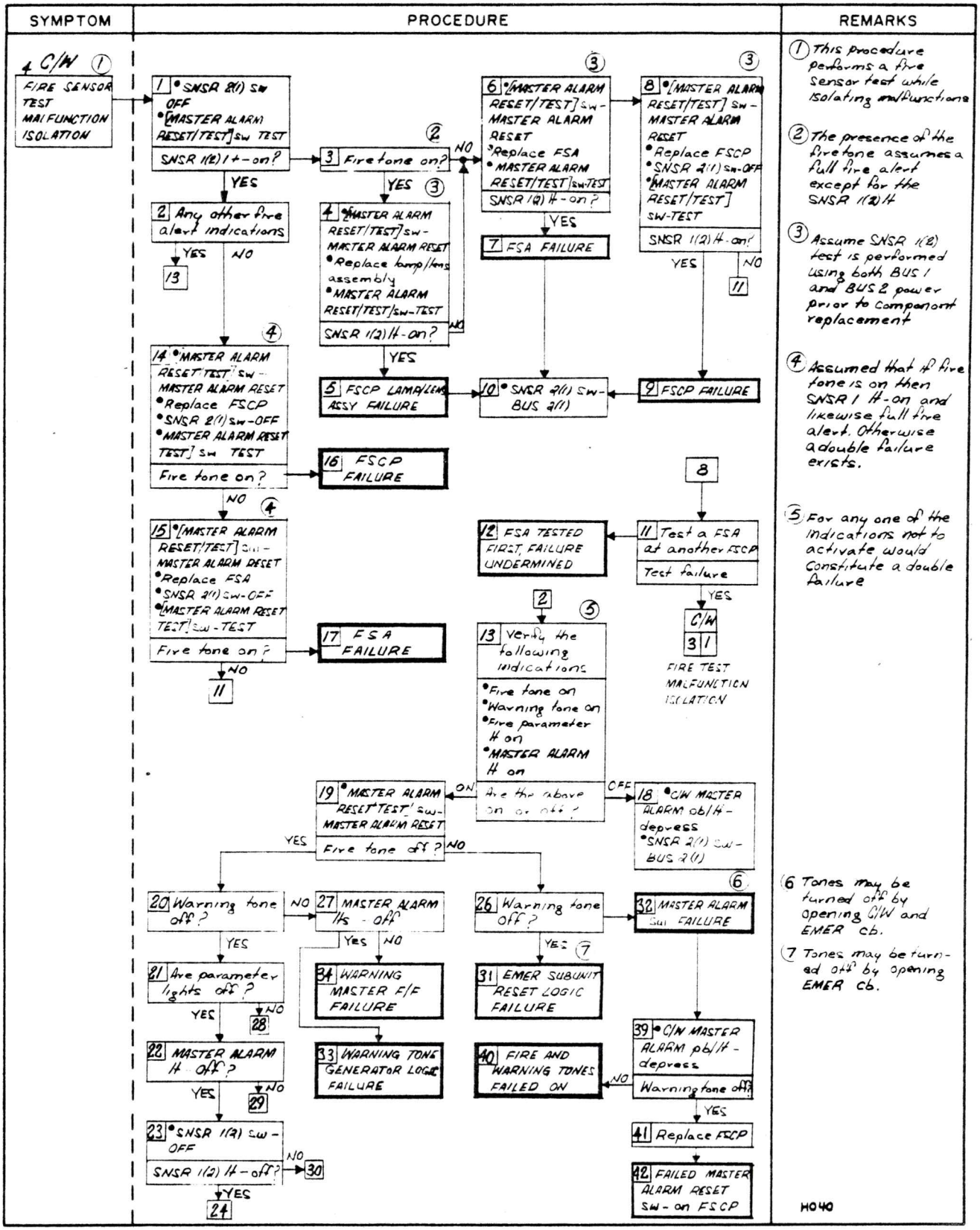

SYMPTOM
PROCEDURE
REMARKS
C/W
1
CAUTION TEST MALFUNCTION ISOLATION
1 • Perform caution system TEST
• C/W TEST CAUT sw - 1 (2)
Is there any alert indication?
NO
2 • C/W TEST CAUT sw - OFF
• cb C/W CONVS SIG COND 1 (2) - open
C/W C/W PWR alert?
NO
3 TOTAL LOSS OF CAUTION SYSTEM POWER
YES
5 C/W TEST CAUT 1 (2) SW FAILURE
6 • cb C/W CONVS SIG COND 1 (2) - close
• C/W MASTER ALARM pb/lt - depress
• C/W CLEAR sw - CLEAR
4 Caution tone on?
YES
10 All caution parameter lights on?
NO
11 SINGLE PARAMETER LAMP CIRCUITRY FAILURE (SUBUNIT 1 (2))
NO
7 MASTER ALARM light on?
NO
9 CAUTION MASTER F/F FAILURE
YES
8 CAUTION TONE GENERATOR FAILURE
YES
13 MASTER ALARM lt on?
NO
14 C/W MEM RECALL pb/lt - on?
NO
15 MEMORY RECALL LAMP CIRCUITRY FAILURE (SUBUNIT 1 (2))
YES
16 • C/W MASTER ALARM pb/lt - depress
Caution tone - off?
YES
17 • C/W MASTER ALARM pb/lt - depress (pnl 616) OR
• MASTER ALARM RESET sw - MASTER ALARM RESET
Caution tone off?
NO
19 C/W SUBUNIT 1 (2) MASTER ALARM F/F FAILURE
C/W
9 1
C/W TONE ONLY
12 MASTER ALARM LAMP CIRCUITRY FAILURE (SUBUNIT 1 (2))
NO
18 C/W MASTER ALARM pb/lt - off?
YES
21 C/W MASTER ALARM pb/lt FAILURE
31 SINGLE PARAMETER LAMP CIRCUITRY FAILURE (SUBUNIT 1 (2))
NO
20 • C/W TEST CAUT sw - OFF
All caution parameter lights - on?
YES
22 • C/W MEM RECALL pb/lt - depress
• All caution parameter lights - on?
NO
23 Are all C/W parameter lights off?
YES
24 MEM RECALL SW FAILURE (SUBUNIT 1 (2))
NO
27 SINGLE PARAMETER MEM RECALL LOGIC FAILURE
YES
25 INTERMITTANT FAILURE, RESUME NORMAL OPERATION
26 • C/W CLEAR sw - CLEAR
C/W MEM RECALL pb/lt - depress
NO
28 CLEAR SW CIRCUITRY FAILURE (SUBUNIT 1 (2))
YES
29 • C/W MEM RECALL pb/lt - depress
Parameter lts - on?
NO
30 MEMORY RECALL pb/lt lamp driver/ logic FAILURE
1 This procedure includes caution system test and malfunction isolation process
2 If no indication results from either attempt to test; total loss of power to both C/W subunits has occured. A power loss to only one subunit would have initiated a C/W PWR alert
3 Caution tone generator and master alarm lights are both controled by master alarm circuitry
4 All parameter lights off would constitute a multiple failure
5 All parameter lights on would constitute a multiple failure
6 MEMORY RECALL sw has separate contacts for each subunit
7 Assumes only one (1) parameter light off
8 CLEAR sw has separate contacts for each subunit
9 Memory has been cleared. Memory light being on does not preclude nominal system operation
10 Continue operation without redundancy test system 2 (1) to verify redundant system
H000

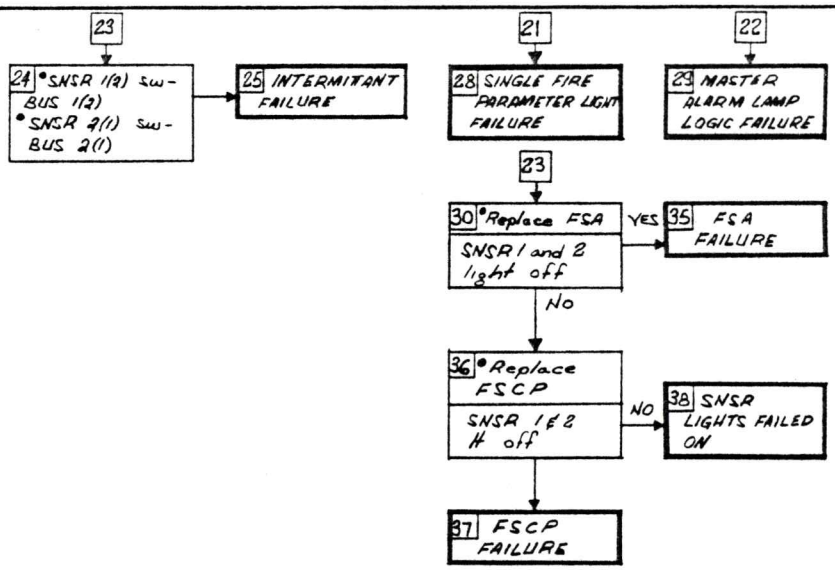

SYMPTOM
PROCEDURE
REMARKS
C/W
2
1
WARNING TEST MALFUNCTION ISOLATION
1 Perform warning system test
• C/W TEST WARN sw - 1 (2)
Is there any alert indications?
NO
2 • C/W TEST WARN sw - OFF
• cb C/W CONVS SIG COND 1 (2) - open
C/W C/W PWR Alert?
NO
3 TOTAL LOSS OF C/W SYSTEM POWER
2
YES
4 C/W TEST WARN 1 (2) sw FAILURE
5 • cb C/W CONVS SIG COND 1 (2) - close
• C/W MASTER ALARM pb/lt - depress
• C/W [CLEAR] sw - CLEAR
YES
6 Alarm tone?
YES
10 Caution or warning?
CAUT
11 C/W SUBUNIT 1 (2) WARNING MASTER F/F CIRCUITRY FAILURE
10
WARN
NO
3
7 MASTER ALARM light - on?
NO
9 CAUTION AND WARNING F/F FAILURE (SUBUNIT 1 (2))
10
YES
10
8 CAUTION AND WARNING TONE GENERATOR FAILURES (SUBUNIT 1 (2))
12 All warning parameter lights on?
NO
13 SINGLE PARAMETER LAMP CIRCUITRY FAILURE (SUBUNIT 1 (2))
4
16 MEMORY RECALL LAMP CIRCUITRY FAILURE (SUBUNIT 1 (2))
10
NO
YES
YES
15 C/W MEM RECALL pb/lt - on?
14 C/W C/W PWR lt - on?
NO
17 MASTER ALARM lt - on?
YES
19 • C/W MASTER ALARM pb/lt - depress
Warning tone - off?
NO
20 • C/W MASTER ALARM pb/lt - depress (pnl 616)
OR
• [MASTER ALARM RESET] sw - MASTER ALARM RESET
Warning tone off?
NO
21 C/W SUBUNIT 1 (2) MASTER ALARM F/F FAILURE
C/W
9 1
C/W TONE ONLY
NO
18 MASTER ALARM LAMP CIRCUITRY FAILURE (SUBUNIT 1 (2))
23 C/W MASTER ALARM pb/lt - off?
NO
YES
YES
5
25 SINGLE PARAMETER LAMP CIRCUITRY FAILURE (SUBUNIT 1 (2))
24 • C/W TEST WARN sw - OFF
All warning parameter lights - off?
NO
22 C/W MASTER ALARM pb/lt FAILURE
YES
26 • C/W MEM RECALL pb/lt - depress
All warning parameter lights - on?
NO
31 Are all warning parameter lights off?
YES
32 MEM RECALL sw FAILURE (SUBUNIT 1 (2))
6
NO
T
33 SINGLE PARAMETER MEM RECALL LOGIC FAILURE
YES
28 INTERMITTANT FAILURE. RESUME NORMAL OPERATION
27 • C/W [CLEAR] sw - CLEAR
C/W MEM RECALL pb/lt - off?
NO
8
30 [CLEAR] sw CIRCUITRY FAILURE (SUBUNIT 1 (2))
YES
29 C/W MEM RECALL pb/lt - depress
parameter lts - on?
NO
10 9
34 MEM RECALL pb/lt LAMP CIRCUITRY FAILURE
1 This procedure includes warning system test and malfunction isolation procedure
2 If no indication results from either attempt to test, total loss of power to both C/W subunits has occured. A power loss to only one subunit would have initiated a C/W PWR alert.
3 Warning tone generator and master alarm lights are both controlled by the master alarm circuitry.
4 All parameter lights off would constitute a multiple failure
5 All parameter lights on would constitute a multiple failure
6 MEMORY RECALL sw has separate contacts for each subunit
7 Assumes only one (1) parameter light off
8 [CLEAR] sw has separate contacts for each subunit
9 Memory has been cleared. Memory light being on does not preclude nominal system operation
10 Continue operation without redundancy test system 2 (1) to verify redundant system
H010


SYMPTOM
PROCEDURE
REMARKS
3 C/W ①
FIRE TEST MALFUNCTION ISOLATION
② 1 Perform emerg fire system test • EMER PWR 1 & 2 SWS - inhbt • C/W TEST FIRE SW - 1 (2) Is there any alert indications?
NO 2 • C/W TEST FIRE SW - OFF • MASTER ALARM RESET/TEST SW - TEST Is there any alert indications?
YES 4 C/W TEST FIRE SWITCH FAILURE
5 • C/W MASTER ALARM pb/lt - depress • SNSR 1 SW - OFF • SNSR 1 SW - BUS 1(2) • SNSR 2 SW - OFF • SNSR 2 SW - BUS 2(1)
NO 3 TOTAL LOSS OF FIRE SYSTEM
YES
6 Warning tone on?
NO ③ 7 MASTER ALARM lt - on?
NO 8 WARNING MASTER F/F CIRCUITRY FAILURE ⑩
YES 9 WARNING TONE GENERATOR FAILURE ⑩
YES
10 Fire tone on?
NO 11 EMERGENCY FIRE TONE GENERATOR FAILURE (EMER SUBUNIT 1 (2)) ⑩
YES
12 Are all fire lights on?
NO 13 SINGLE LAMP CIRCUITRY FAILURE (EMER SUBUNITS 1 (2)) ④ ⑩
YES
14 MASTER ALARM lights on?
NO 15 C/W MASTER ALARM LIGHT LOGIC FAILURE (C/W SUBUNITS 1 & 2) ⑩
YES
16 Is a memory or tracking test being performed?
TRACKING 32 MASTER ALARM pb/lt - depress Fire tone off?
NO 33 Warning tone off?
NO 34 MASTER ALARM pb/lt SW FAILURE
YES 35 EMERGENCY SUBUNIT FIRE RESET RELAY FAILURE ⑩
YES
36 Warning tone off?
NO 37 MASTER ALARM light - off?
NO 38 WARNING MASTER F/F FAILURE ⑩
YES 39 WARNING TONE LOGIC FAILURE ⑩
40
MEMORY
17 • C/W TEST FIRE SW - OFF • Verify fire tone - on • Verify warning tone - on • Verify all fire parameter lights - on • Verify MASTER ALARM lights - on Are all of the above items on?
NO 18 FIRE MEMORY CAPABILITY FAILURE ⑩
YES
19 • C/W MASTER ALARM pb/lt - depress Fire tone - off?
NO 20 Fire parameter lights - off?
YES 21 FIRE TONE LOGIC FAILURE ⑩
C/W 10 5 EMER TONE ONLY
35 MASTER ALARM RESET LOGIC FAILURE
YES
22 Warning tone off?
NO 23 MASTER ALARM light - off?
NO 24 • C/W MASTER ALARM pb/lt - depress (pnl 6) OR MASTER ALARM RESET/TEST SW - MASTER ALARM RESET MASTER ALARM lt - off?
NO
YES 26 C/W MASTER ALARM SW (PNL 206) FAILURE
YES 27 WARNING TONE LOGIC FAILURE ⑩
C/W 9 2
⑥ ⑩ 28 All fire parameter lights - off?
NO 29 SINGLE FIRE LIGHT LOGIC FAILURE
YES
30 MASTER ALARM lights - off?
NO 31 MASTER ALARM LIGHT LOGIC FAILURE ⑩
YES 1 ⑦
① This procedure includes emergency fire system test and malfunction isolation procedures
② Begin fire system 1 (2) memory capability test
③ Master alarm F/F logic controls master alarm lights and warning tone
④ All parameter lights would constitute multiple failure
⑤ Single logic gate (Emergency Subunit 1 (2)) retains memory for Fire Tones and lights
⑥ All parameter lights on would constitute multiple failure
⑦ Begin fire system tracking capability test
H020

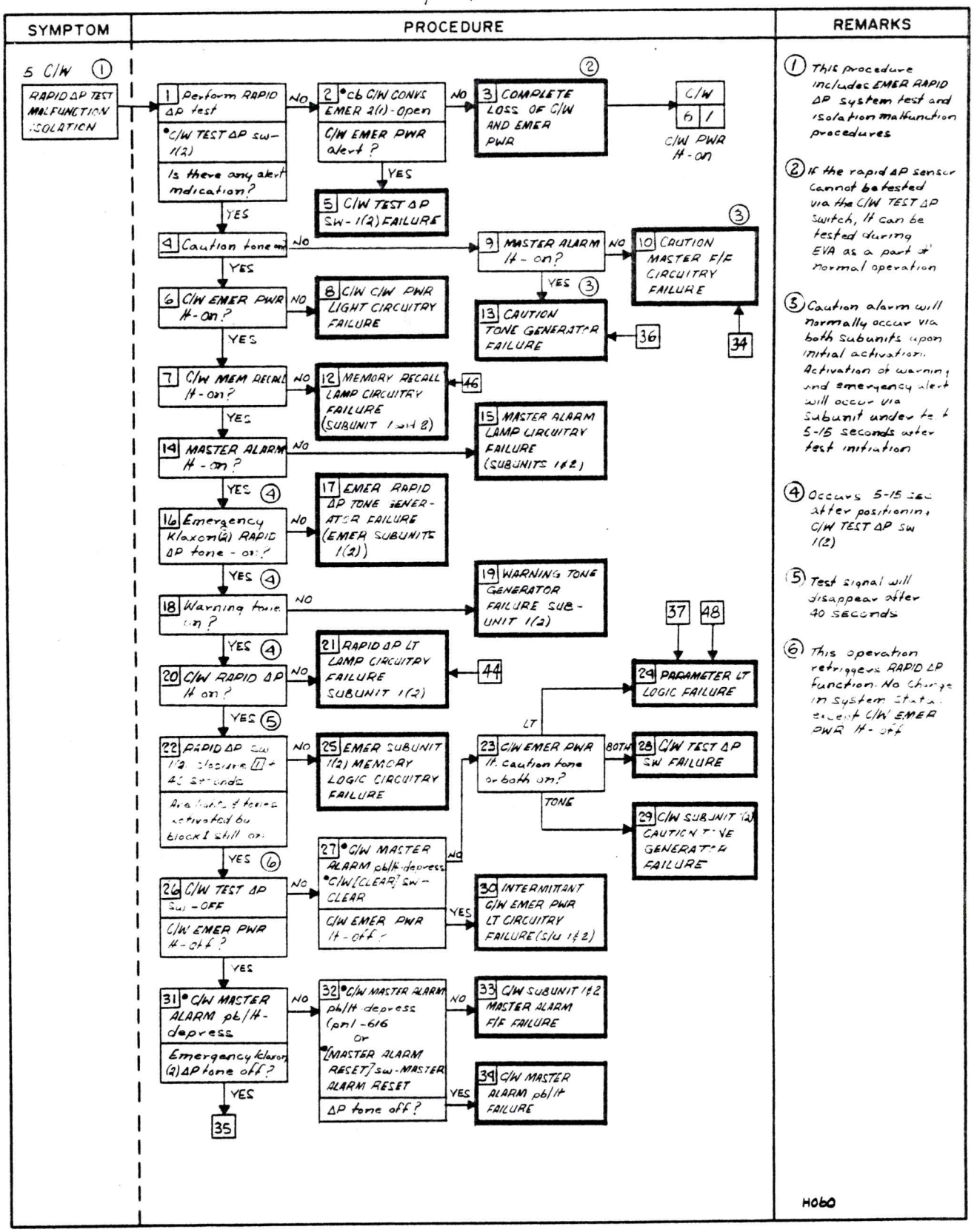
SYMPTOM	PROCEDURE	REMARKS
3 C/W (cont'd)		(8) All fire lights ~~off~~ would require multiple failure (9) All fire lights on would constitute multiple failure (10) Continue operation without redundancy. Test system 2 (1) to verify redundant system

H030


SYMPTOM
PROCEDURE
REMARKS
4 C/W (1)
FIRE SENSOR TEST MALFUNCTION ISOLATION
1 • SNSR 2(1) SW OFF • [MASTER ALARM RESET/TEST] SW TEST
SNSR 1(2) H - on?
YES
NO
2 Any other fire alert indications
YES
NO
13
3 Fire tone on?
(2)
NO
YES
(3)
4 • [MASTER ALARM RESET/TEST] SW - MASTER ALARM RESET • Replace lamp/lens assembly • MASTER ALARM RESET/TEST/SW-TEST
SNSR 1(2) H - on?
NO
YES
5 FSCP LAMP/LEM ASSY FAILURE
6 • [MASTER ALARM RESET/TEST] SW - MASTER ALARM RESET • Replace FSA • MASTER ALARM RESET/TEST SW-TEST
SNSR 1(2) H - on?
YES
7 FSA FAILURE
8 • [MASTER ALARM RESET/TEST] SW - MASTER ALARM RESET • Replace FSCP • SNSR 2(1) SW-OFF • [MASTER ALARM RESET/TEST] SW-TEST
SNSR 1(2) H - on?
YES
NO
11
9 FSCP FAILURE
10 • SNSR 2(1) SW - BUS 2(1)
14 • [MASTER ALARM RESET/TEST] SW - MASTER ALARM RESET • Replace FSCP • SNSR 2(1) SW-OFF • [MASTER ALARM RESET/TEST] SW TEST
Fire tone on?
NO
16 FSCP FAILURE
15 • [MASTER ALARM RESET/TEST] SW - MASTER ALARM RESET • Replace FSA • SNSR 2(1) SW-OFF • [MASTER ALARM RESET/TEST] SW-TEST
Fire tone on?
NO
17 FSA FAILURE
11
8
11 Test a FSA at another FSCP
Test failure
YES
C/W 3 1
FIRE TEST MALFUNCTION ISOLATION
12 FSA TESTED FIRST, FAILURE UNDERMINED
2
(5)
13 Verify the following indications • Fire tone on • Warning tone on • Fire parameter H on • MASTER ALARM H on
Are the above on or off?
ON
OFF
18 • C/W MASTER ALARM pb/H - depress • SNSR 2(1) SW - BUS 2(1)
19 • MASTER ALARM RESET/TEST SW - MASTER ALARM RESET
Fire tone off?
YES
NO
(6)
20 Warning tone off?
NO
YES
27 MASTER ALARM H - off
Yes
NO
21 Are parameter lights off?
YES
NO
28
34 WARNING MASTER F/F FAILURE
22 MASTER ALARM H off?
YES
NO
29
33 WARNING TONE GENERATOR LOGIC FAILURE
23 • SNSR 1(2) SW - OFF
SNSR 1(2) H - off?
NO
YES
30
24
26 Warning tone off?
YES
(7)
31 EMER SUBUNIT RESET LOGIC FAILURE
32 MASTER ALARM SW FAILURE
39 • C/W MASTER ALARM pb/H - depress
Warning tone off?
NO
YES
40 FIRE AND WARNING TONES FAILED ON
41 Replace FSCP
42 FAILED MASTER ALARM RESET SW - on FSCP
(1) This procedure performs a fire sensor test while isolating malfunctions
(2) The presence of the fire tone assumes a full fire alert except for the SNSR 1(2) H
(3) Assume SNSR 1(2) test is performed using both BUS 1 and BUS 2 power prior to component replacement
(4) Assumed that if fire tone is on then SNSR 1 H - on and likewise full fire alert. Otherwise a double failure exists.
(5) For any one of the indications not to activate would constitute a double failure
(6) Tones may be turned off by opening C/W and EMER cb.
(7) Tones may be turned off by opening EMER cb.
H040

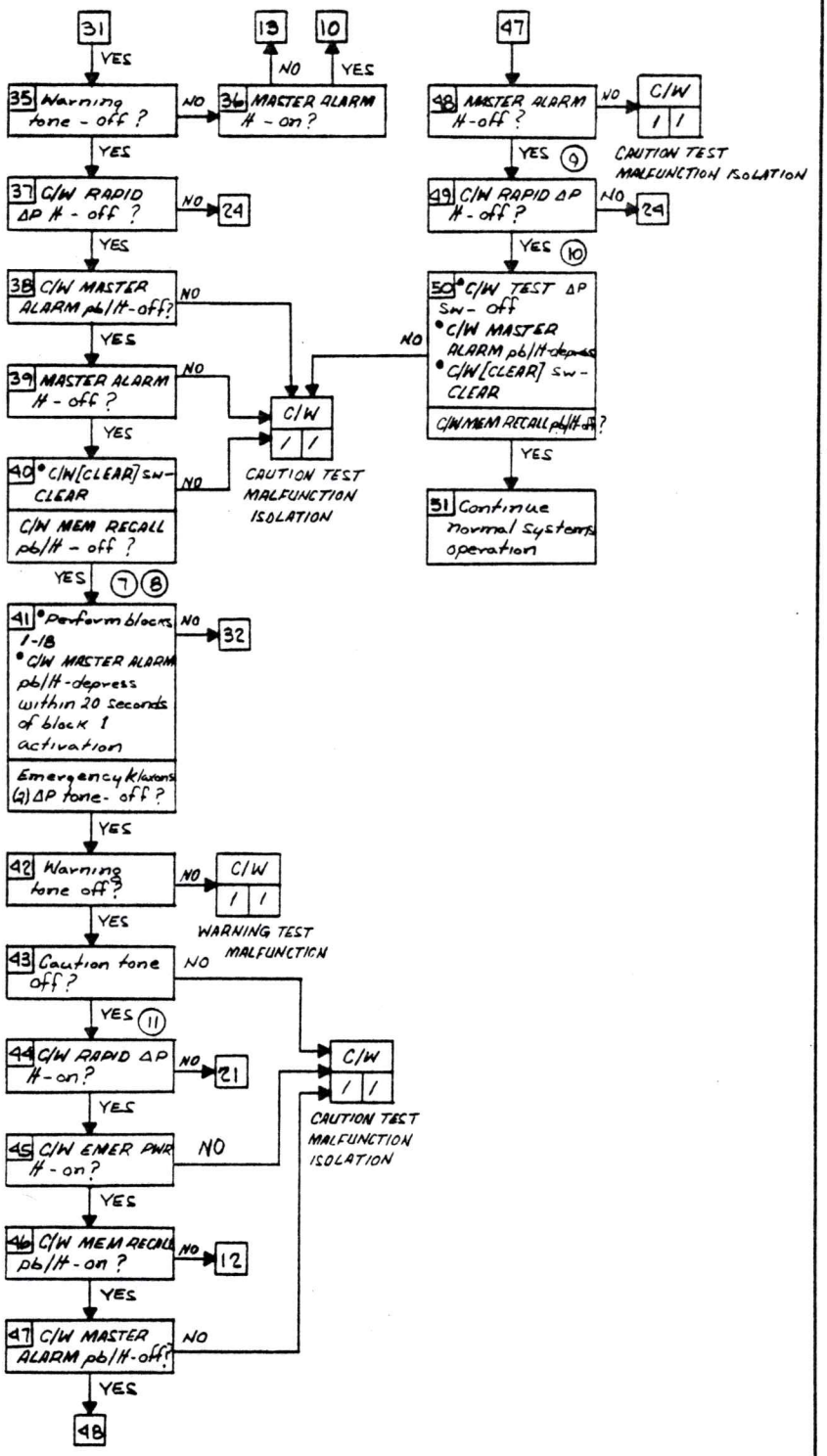
SYMPTOM	PROCEDURE	REMARKS
C/W 4 (CONT'D)		

H050


SYMPTOM
PROCEDURE
REMARKS
5 C/W (1)
RAPID ΔP TEST MALFUNCTION ISOLATION
1 Perform RAPID ΔP test
•C/W TEST ΔP sw-1(2)
Is there any alert indication?
NO
YES
2 •cb C/W CONVS EMER 2(1)-open
C/W EMER PWR alert?
NO
YES
3 COMPLETE LOSS OF C/W AND EMER PWR
(2)
C/W 6 1
C/W PWR H-on
5 C/W TEST ΔP SW-1(2) FAILURE
4 Caution tone on?
NO
YES
9 MASTER ALARM H-on?
NO
YES (3)
10 CAUTION MASTER F/F CIRCUITRY FAILURE
(3)
13 CAUTION TONE GENERATOR FAILURE
36
34
6 C/W EMER PWR H-on?
NO
YES
8 C/W C/W PWR LIGHT CIRCUITRY FAILURE
7 C/W MEM RECALL H-on?
NO
YES
12 MEMORY RECALL LAMP CIRCUITRY FAILURE (SUBUNIT 1 and 2)
46
14 MASTER ALARM H-on?
NO
YES (4)
15 MASTER ALARM LAMP CIRCUITRY FAILURE (SUBUNITS 1&2)
16 Emergency Klaxon(2) RAPID ΔP tone-on?
NO
YES (4)
17 EMER RAPID ΔP TONE GENERATOR FAILURE (EMER SUBUNITS 1(2))
18 Warning tone on?
NO
YES (4)
19 WARNING TONE GENERATOR FAILURE SUBUNIT 1(2)
37
48
20 C/W RAPID ΔP H on?
NO
YES (5)
21 RAPID ΔP LT LAMP CIRCUITRY FAILURE SUBUNIT 1(2)
44
29 PARAMETER LT LOGIC FAILURE
22 RAPID ΔP sw 1(2) depressed (1) + 40 seconds
Are both of tones activated by block I still on?
NO
YES (6)
25 EMER SUBUNIT 1(2) MEMORY LOGIC CIRCUITRY FAILURE
23 C/W EMER PWR H. Caution tone or both on?
LT
BOTH
TONE
28 C/W TEST ΔP SW FAILURE
29 C/W SUBUNIT 1(2) CAUTION TONE GENERATOR FAILURE
27 •C/W MASTER ALARM pb/H-depress •C/W [CLEAR] SW-CLEAR
C/W EMER PWR H-off?
NO
YES
30 INTERMITTANT C/W EMER PWR LT CIRCUITRY FAILURE (S/U 1&2)
26 C/W TEST ΔP SW-OFF
C/W EMER PWR H-off?
NO
YES
31 •C/W MASTER ALARM pb/H-depress
Emergency klaxon (2) ΔP tone off?
NO
YES
35
32 •C/W MASTER ALARM pb/H depress (pnl-616 or •[MASTER ALARM RESET] sw-MASTER ALARM RESET
ΔP tone off?
NO
YES
33 C/W SUBUNIT 1&2 MASTER ALARM F/F FAILURE
39 C/W MASTER ALARM pb/H FAILURE
(1) This procedure includes EMER RAPID ΔP system test and isolation malfunction procedures
(2) If the rapid ΔP sensor cannot be tested via the C/W TEST ΔP switch, it can be tested during EVA as a part of normal operation
(3) Caution alarm will normally occur via both subunits upon initial activation. Activation of warning and emergency alert will occur via subunit under test 5-15 seconds after test initiation
(4) Occurs 5-15 sec after positioning C/W TEST ΔP SW 1(2)
(5) Test signal will disappear after 40 seconds
(6) This operation retriggers RAPID ΔP function. No change in system status, except C/W EMER PWR H-off
H060

SYMPTOM	PROCEDURE	REMARKS

C/W
5 (CONT'D)



(7) RAPID ΔP system tracking capability test

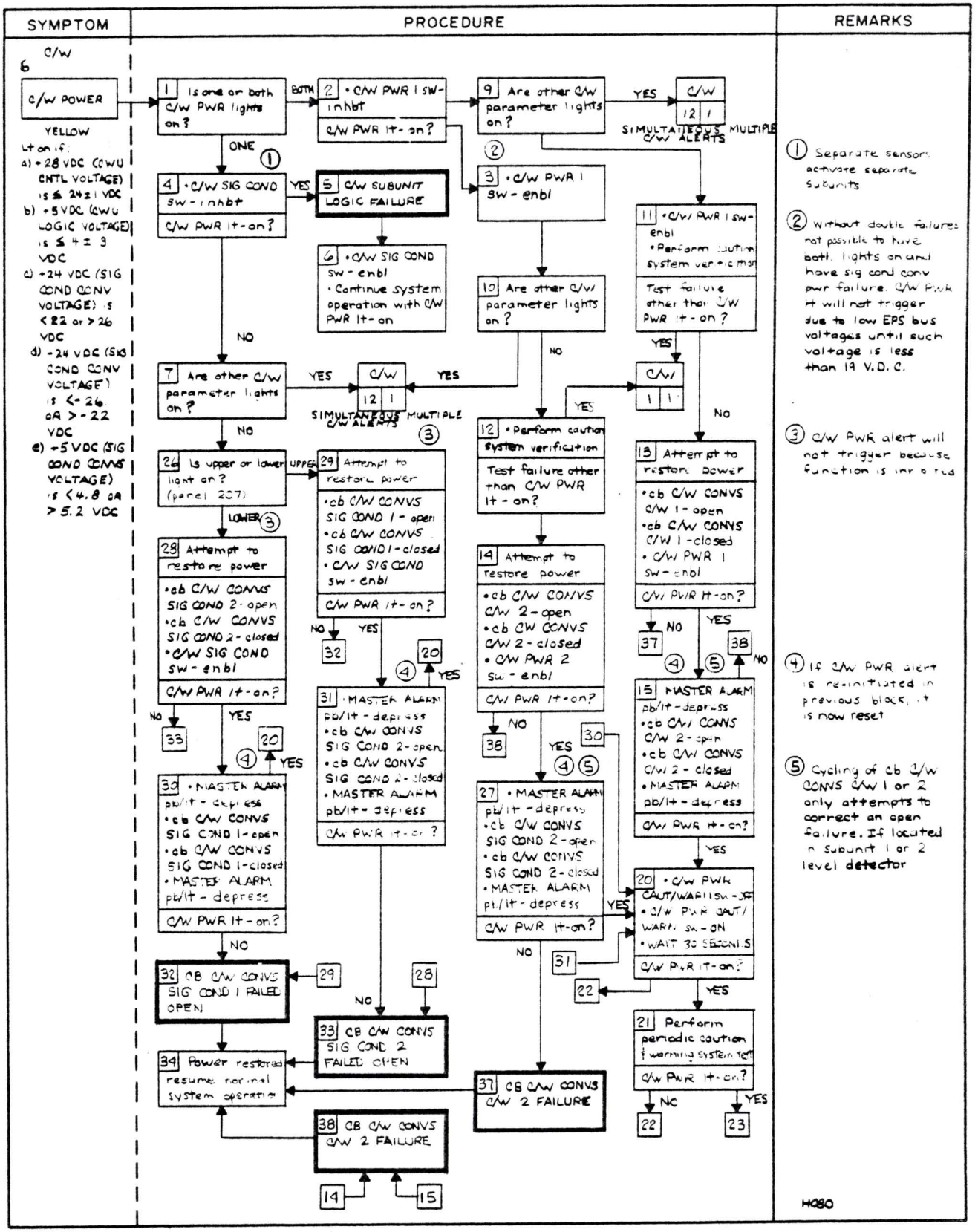
(8) Light and tones status must be verified within 20 - 25 seconds after depressing C/W MASTER ALARM pb/lt

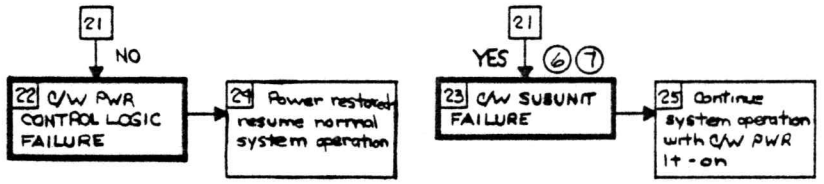
(9) Light will go off when RAPID ΔP test signal stops. This will occur approx. 20 - 25 Sec. after all associated lights and tones initially come on.

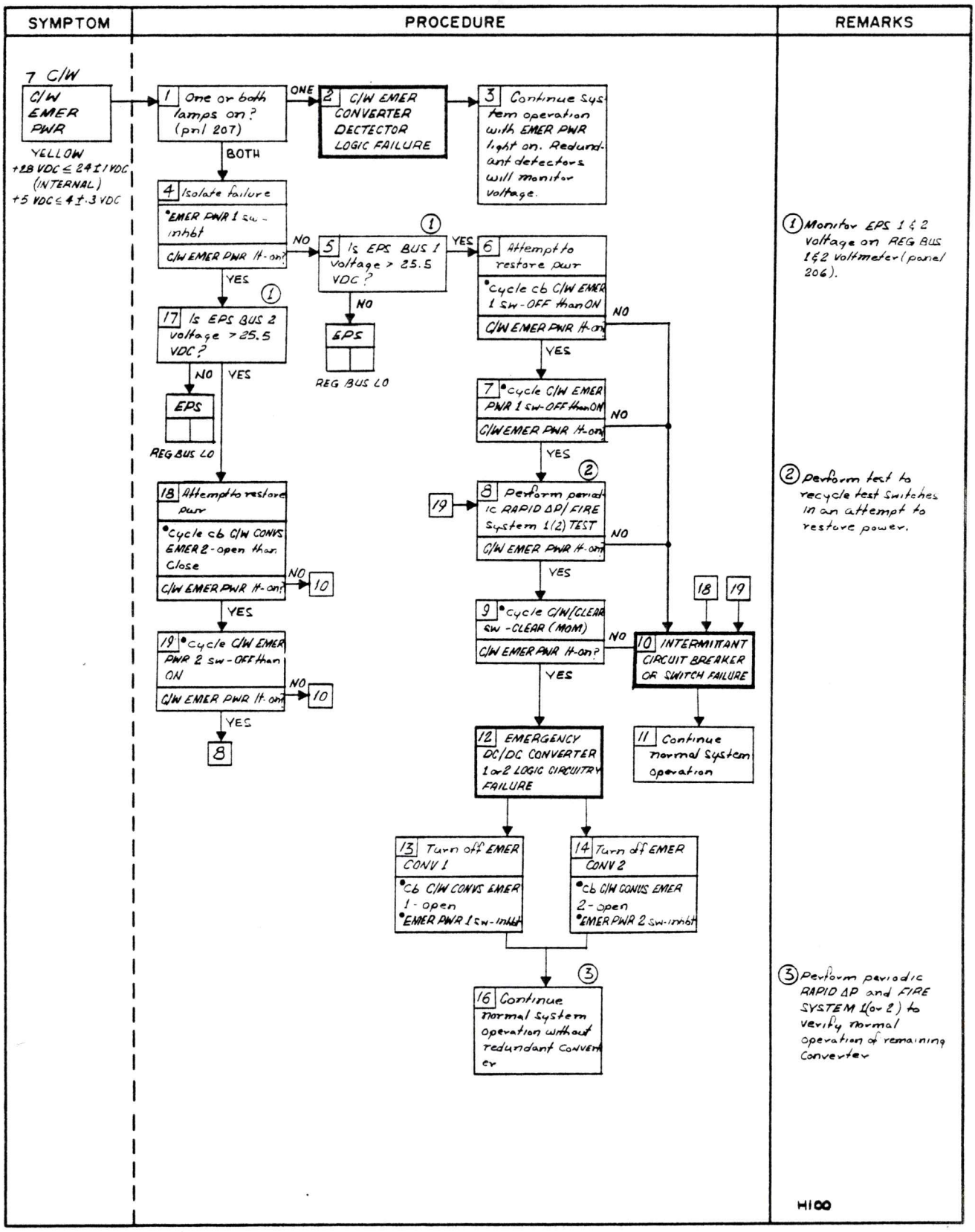
(10) This operation may retrigger RAPID ΔP alert

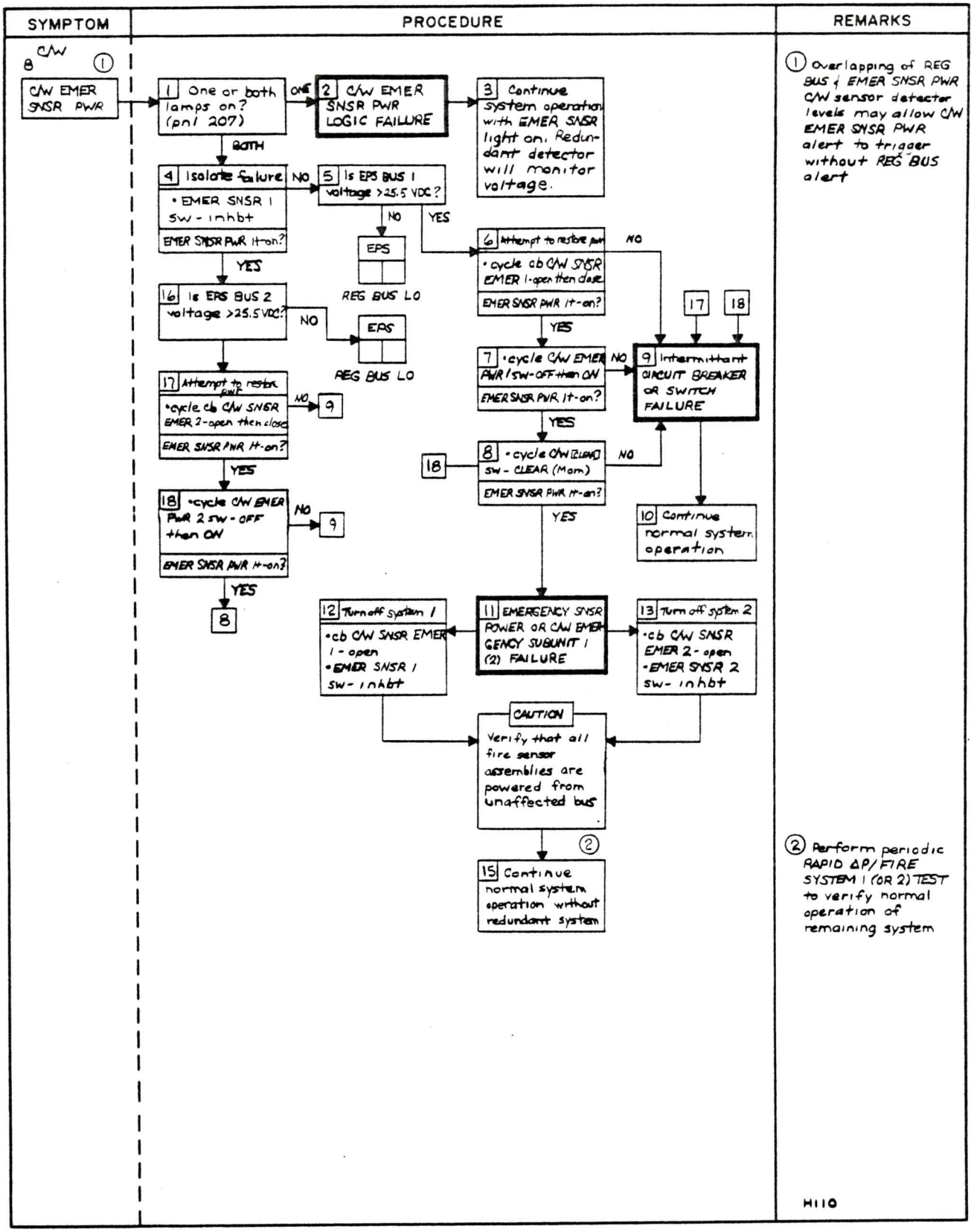
(11) RAPID ΔP light will extinguish automatically approximately 30 seconds After start of test if master reset has been initiated

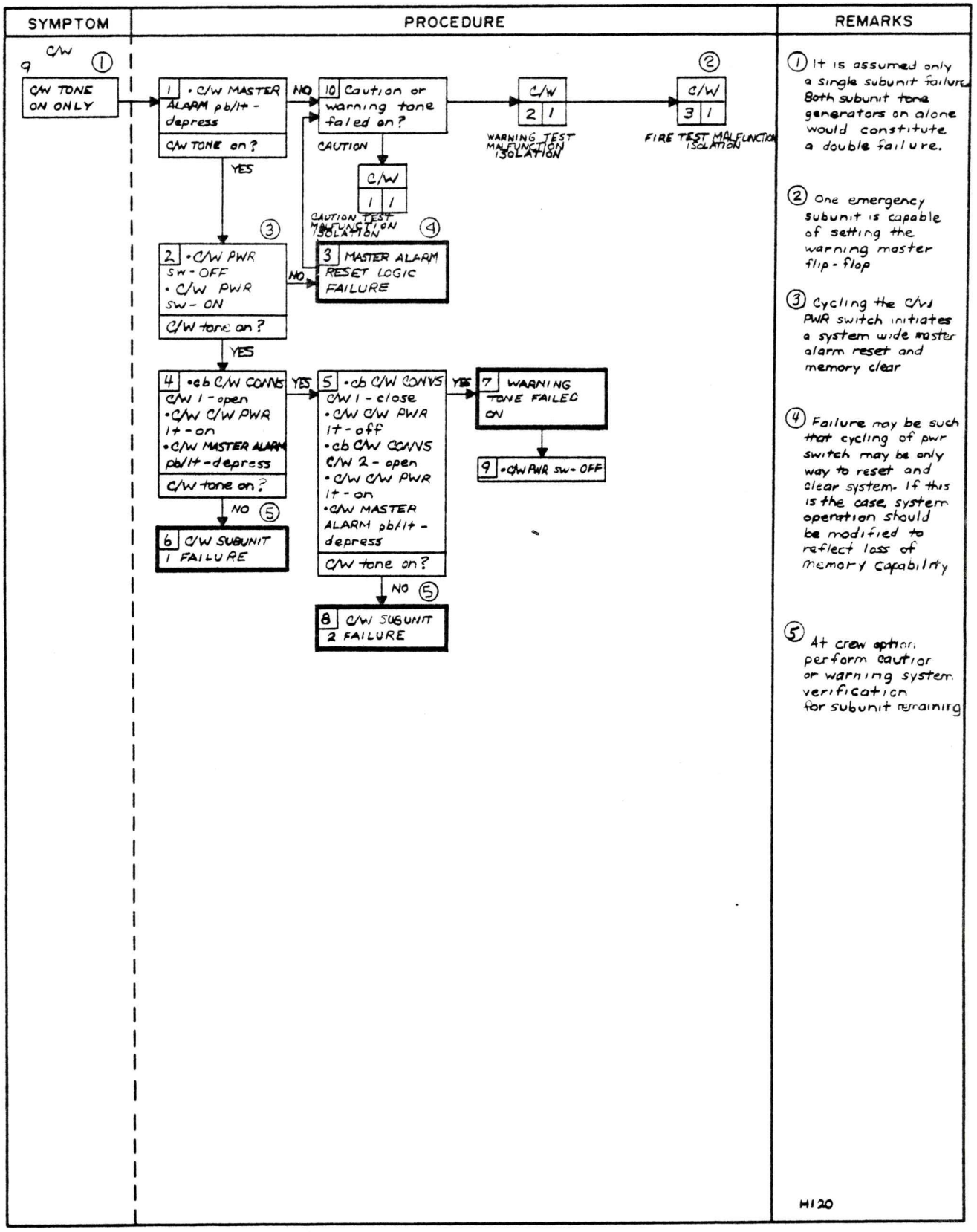
H070


SYMPTOM
PROCEDURE
REMARKS
6 C/W
C/W POWER
YELLOW Lt on if:
a) +28 VDC (CWU CNTL VOLTAGE) is ≤ 24±1 VDC
b) +5 VDC (CWU LOGIC VOLTAGE) is ≤ 4±3 VDC
c) +24 VDC (SIG COND CONV VOLTAGE) is < 22 or > 26 VDC
d) -24 VDC (SIG COND CONV VOLTAGE) is < -26 or > -22 VDC
e) -5 VDC (SIG COND CONV VOLTAGE) is < 4.8 or > 5.2 VDC
1 Is one or both C/W PWR lights on?
BOTH
ONE
2 • C/W PWR 1 SW-inhbt
C/W PWR lt-on?
3 • C/W PWR 1 SW-enbl
4 • C/W SIG COND SW-inhbt
C/W PWR lt-on?
5 C/W SUBUNIT LOGIC FAILURE
6 • C/W SIG COND SW-enbl
• Continue system operation with C/W PWR lt-on
7 Are other C/W parameter lights on?
C/W 12 1
SIMULTANEOUS MULTIPLE C/W ALERTS
26 Is upper or lower light on? (panel 207)
UPPER
LOWER
29 Attempt to restore power
• cb C/W CONVS SIG COND 1-open
• cb C/W CONVS SIG COND 1-closed
• C/W SIG COND SW-enbl
C/W PWR lt-on?
28 Attempt to restore power
• cb C/W CONVS SIG COND 2-open
• cb C/W CONVS SIG COND 2-closed
• C/W SIG COND SW-enbl
C/W PWR lt-on?
31 • MASTER ALARM pb/lt-depress
• cb C/W CONVS SIG COND 2-open
• cb C/W CONVS SIG COND 2-closed
• MASTER ALARM pb/lt-depress
C/W PWR lt-on?
30 • MASTER ALARM pb/lt-depress
• cb C/W CONVS SIG COND 1-open
• cb C/W CONVS SIG COND 1-closed
• MASTER ALARM pb/lt-depress
C/W PWR lt-on?
32 CB C/W CONVS SIG COND 1 FAILED OPEN
33 CB C/W CONVS SIG COND 2 FAILED OPEN
34 Power restored resume normal system operation
38 CB C/W CONVS C/W 2 FAILURE
14
15
9 Are other C/W parameter lights on?
10 Are other C/W parameter lights on?
12 • Perform caution system verification
Test failure other than C/W PWR lt-on?
14 Attempt to restore power
• cb C/W CONVS C/W 2-open
• cb C/W CONVS C/W 2-closed
• C/W PWR 2 SW-enbl
C/W PWR lt-on?
27 • MASTER ALARM pb/lt-depress
• cb C/W CONVS SIG COND 2-open
• cb C/W CONVS SIG COND 2-closed
• MASTER ALARM pb/lt-depress
C/W PWR lt-on?
37 CB C/W CONVS C/W 2 FAILURE
11 • C/W PWR 1 SW-enbl
• Perform caution system verification
Test failure other than C/W PWR lt-on?
13 Attempt to restore power
• cb C/W CONVS C/W 1-open
• cb C/W CONVS C/W 1-closed
• C/W PWR 1 SW-enbl
C/W PWR lt-on?
15 MASTER ALARM pb/lt-depress
• cb C/W CONVS C/W 2-open
• cb C/W CONVS C/W 2-closed
• MASTER ALARM pb/lt-depress
C/W PWR lt-on?
20 • C/W PWR CAUT/WARN SW-OFF
• C/W PWR CAUT/WARN SW-ON
• WAIT 30 SECONDS
C/W PWR lt-on?
21 Perform periodic caution & warning system test
C/W PWR lt-on?
22
23
SIMULTANEOUS MULTIPLE C/W ALERTS
1 Separate sensors activate separate subunits
2 Without double failures not possible to have both lights on and have sig cond conv pwr failure. C/W PWR lt will not trigger due to low EPS bus voltages until such voltage is less than 19 V.D.C.
3 C/W PWR alert will not trigger because function is inhibited
4 If C/W PWR alert is re-initiated in previous block, it is now reset
5 Cycling of cb C/W CONVS C/W 1 or 2 only attempts to correct an open failure. If located in subunit 1 or 2 level detector
H080

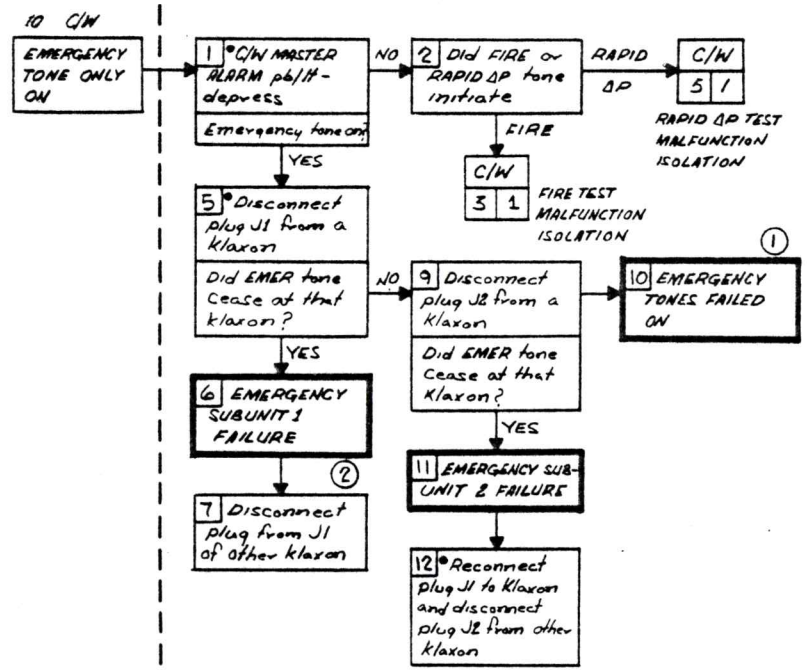
SYMPTOM	PROCEDURE	REMARKS
C/W 6 (cont'd)		⑥ If alert is due to low signal condition converter voltage, system may operate normally until out-of-tolerance voltage exceeds dead band limits, causing other C/W alerts to be initiated ⑦ If alert is due to false level detector output, system operation should be continued with C/W PWR lt-on. Subsequent out-of-tolerance condition will trigger redundant C/W subunit and sensors H090


SYMPTOM
PROCEDURE
REMARKS
7 C/W
C/W EMER PWR
YELLOW
+28 VDC ≤ 24 ± 1 VDC (INTERNAL)
+5 VDC ≤ 4 ± .3 VDC
1 One or both lamps on? (pnl 207)
ONE
2 C/W EMER CONVERTER DECTECTOR LOGIC FAILURE
3 Continue system operation with EMER PWR light on. Redundant detectors will monitor voltage.
BOTH
4 Isolate failure
•EMER PWR 1 sw - inhbt
C/W EMER PWR lt-on?
NO
5 Is EPS BUS 1 voltage > 25.5 VDC?
(1)
YES
6 Attempt to restore pwr
•Cycle cb C/W EMER 1 sw - OFF then ON
C/W EMER PWR lt-on?
NO
YES
7 •Cycle C/W EMER PWR 1 sw - OFF then ON
C/W EMER PWR lt-on?
NO
YES
(2)
8 Perform periodic RAPID ΔP/FIRE System 1(2) TEST
C/W EMER PWR lt-on?
NO
YES
9 •Cycle C/W CLEAR sw - CLEAR (MOM)
C/W EMER PWR lt-on?
NO
YES
10 INTERMITTANT CIRCUIT BREAKER OR SWITCH FAILURE
11 Continue normal system operation
12 EMERGENCY DC/DC CONVERTER 1 or 2 LOGIC CIRCUITRY FAILURE
13 Turn off EMER CONV 1
•cb C/W CONVS EMER 1 - open
•EMER PWR 1 sw - inhbt
14 Turn off EMER CONV 2
•cb C/W CONVS EMER 2 - open
•EMER PWR 2 sw - inhbt
(3)
16 Continue normal system operation without redundant converter
17 Is EPS BUS 2 voltage > 25.5 VDC?
(1)
NO
YES
EPS
REG BUS LO
EPS
REG BUS LO
18 Attempt to restore pwr
•Cycle cb C/W CONVS EMER 2 - open then Close
C/W EMER PWR lt-on?
NO
10
YES
19 •Cycle C/W EMER PWR 2 sw - OFF then ON
C/W EMER PWR lt-on?
NO
10
YES
8
19
18
19
(1) Monitor EPS 1 & 2 voltage on REG BUS 1&2 voltmeter (panel 206).
(2) Perform test to recycle test switches in an attempt to restore power.
(3) Perform periodic RAPID ΔP and FIRE SYSTEM 1(or 2) to verify normal operation of remaining converter
H100


SYMPTOM
PROCEDURE
REMARKS
8 C/W ①
C/W EMER SNSR PWR
1 One or both lamps on? (pnl 207)
ONE
2 C/W EMER SNSR PWR LOGIC FAILURE
3 Continue system operation with EMER SNSR light on. Redundant detector will monitor voltage.
BOTH
4 Isolate failure
• EMER SNSR 1 SW - inhbt
EMER SNSR PWR lt-on?
NO
5 Is EPS BUS 1 voltage >25.5 VDC?
NO
YES
EPS
REG BUS LO
YES
6 Attempt to restore pwr
• cycle cb C/W SNSR EMER 1-open then close
EMER SNSR PWR lt-on?
NO
YES
16 Is EPS BUS 2 voltage >25.5 VDC?
NO
EPS
REG BUS LO
17
18
7 • cycle C/W EMER PWR/SW-OFF-then ON
EMER SNSR PWR lt-on?
NO
9 Intermittant CIRCUIT BREAKER OR SWITCH FAILURE
YES
17 Attempt to restore pwr
• cycle cb C/W SNSR EMER 2-open then close
EMER SNSR PWR lt-on?
NO
9
YES
18
8 • cycle C/W CLEAR SW - CLEAR (Mom)
EMER SNSR PWR lt-on?
NO
YES
10 Continue normal system operation
18 • cycle C/W EMER PWR 2 SW - OFF then ON
EMER SNSR PWR lt-on?
NO
9
YES
8
12 Turn off system 1
• cb C/W SNSR EMER 1 - open
• EMER SNSR 1 SW - inhbt
11 EMERGENCY SNSR POWER OR C/W EMERGENCY SUBUNIT 1 (2) FAILURE
13 Turn off system 2
• cb C/W SNSR EMER 2 - open
• EMER SNSR 2 SW - inhbt
CAUTION
Verify that all fire sensor assemblies are powered from unaffected bus
②
15 Continue normal system operation without redundant system
① Overlapping of REG BUS & EMER SNSR PWR C/W sensor detector levels may allow C/W EMER SNSR PWR alert to trigger without REG BUS alert
② Perform periodic RAPID ΔP/FIRE SYSTEM 1 (OR 2) TEST to verify normal operation of remaining system
H110


SYMPTOM
PROCEDURE
REMARKS
C/W
9
1
C/W TONE ON ONLY
1 • C/W MASTER ALARM pb/lt - depress
C/W TONE on?
YES
NO
10 Caution or warning tone failed on?
CAUTION
C/W 2 1
WARNING TEST MALFUNCTION ISOLATION
C/W 3 1
FIRE TEST MALFUNCTION ISOLATION
C/W 1 1
CAUTION TEST MALFUNCTION ISOLATION
2 • C/W PWR SW - OFF • C/W PWR SW - ON
C/W tone on?
3
4
3 MASTER ALARM RESET LOGIC FAILURE
4 • cb C/W CONNS C/W 1 - open • C/W C/W PWR lt - on • C/W MASTER ALARM pb/lt - depress
C/W tone on?
5 • cb C/W CONNS C/W 1 - close • C/W C/W PWR lt - off • cb C/W CONNS C/W 2 - open • C/W C/W PWR lt - on • C/W MASTER ALARM pb/lt - depress
C/W tone on?
7 WARNING TONE FAILED ON
9 • C/W PWR SW - OFF
6 C/W SUBUNIT 1 FAILURE
8 C/W SUBUNIT 2 FAILURE
(1) It is assumed only a single subunit failure. Both subunit tone generators on alone would constitute a double failure.
(2) One emergency subunit is capable of setting the warning master flip - flop
(3) Cycling the C/W PWR switch initiates a system wide master alarm reset and memory clear
(4) Failure may be such that cycling of pwr switch may be only way to reset and clear system. If this is the case, system operation should be modified to reflect loss of memory capability
(5) At crew option, perform caution or warning system verification for subunit remaining
H120

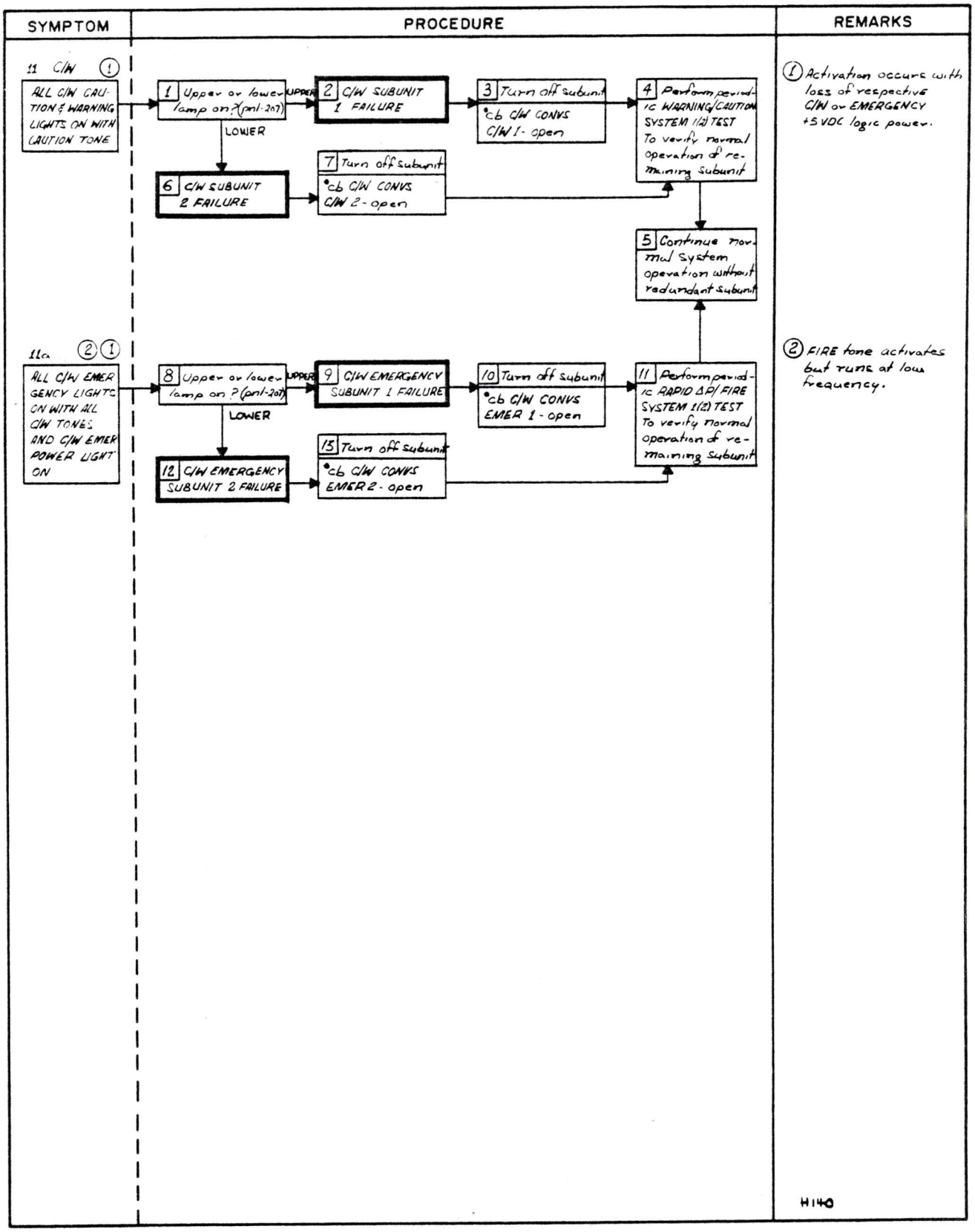
SYMPTOM	PROCEDURE	REMARKS

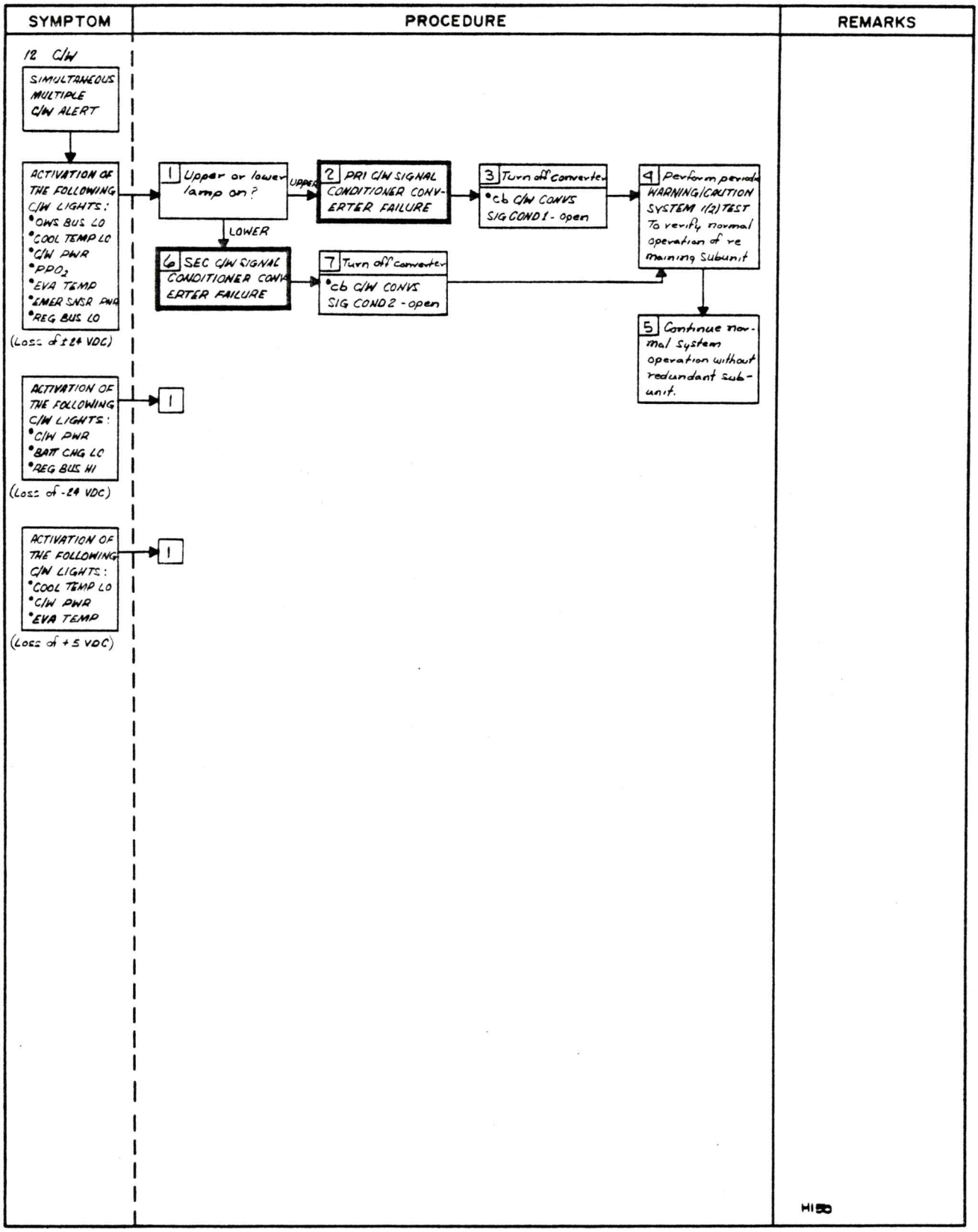


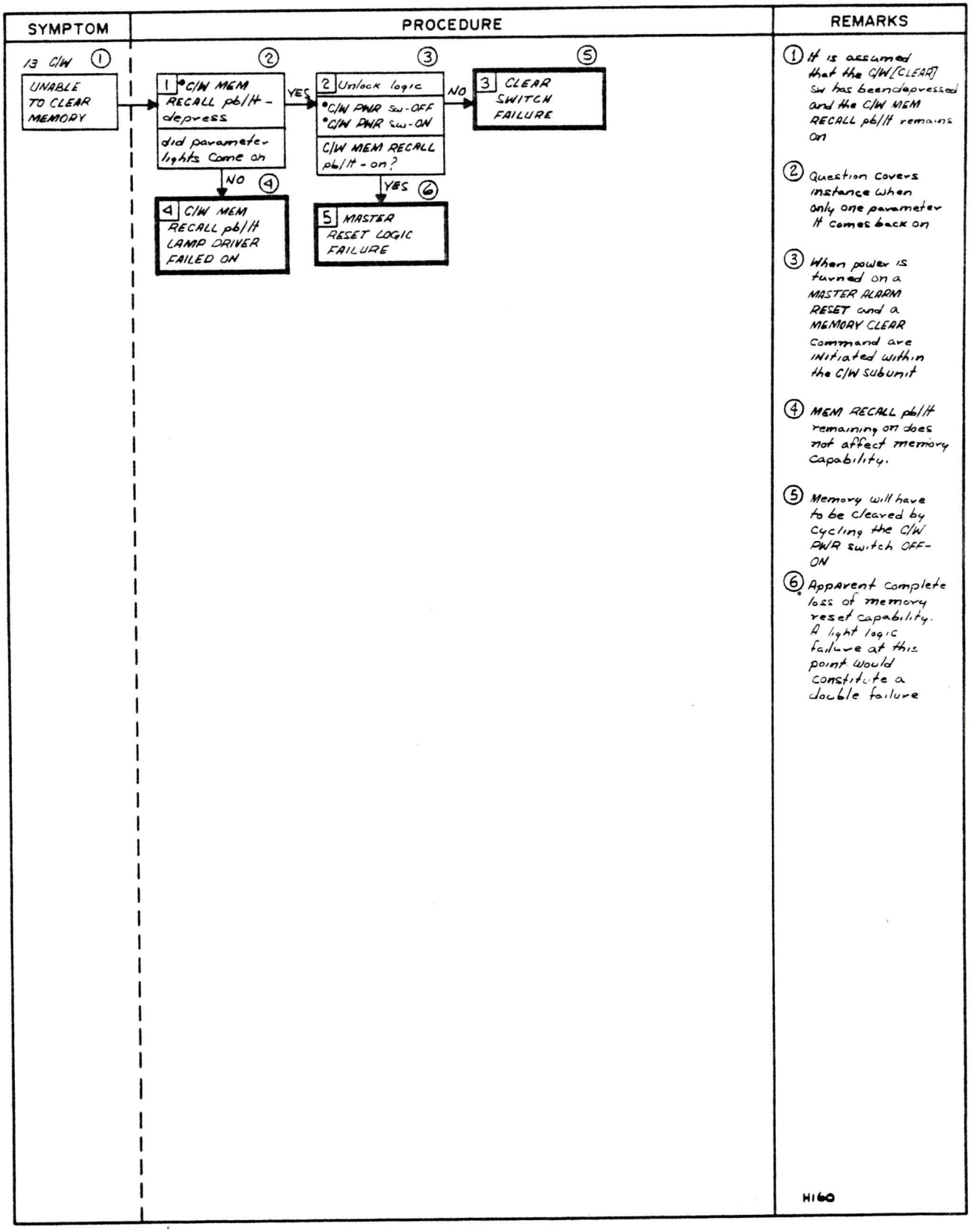
(1) Not possible without multiple failures. Pwr Can be interrupted to subunit if failure occurs

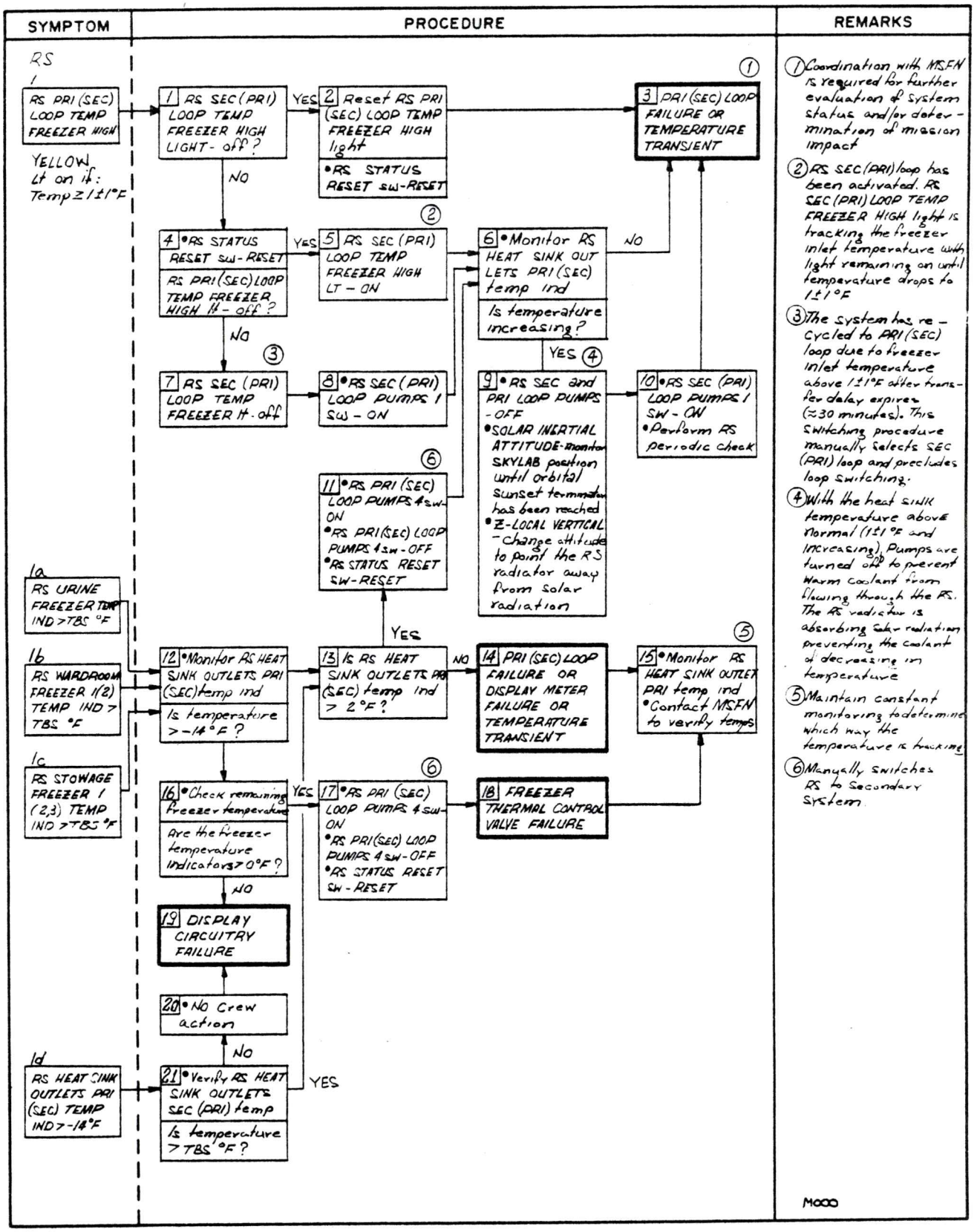
(2) At Crew option test procedure could be performed to validate redundant klaxon tone

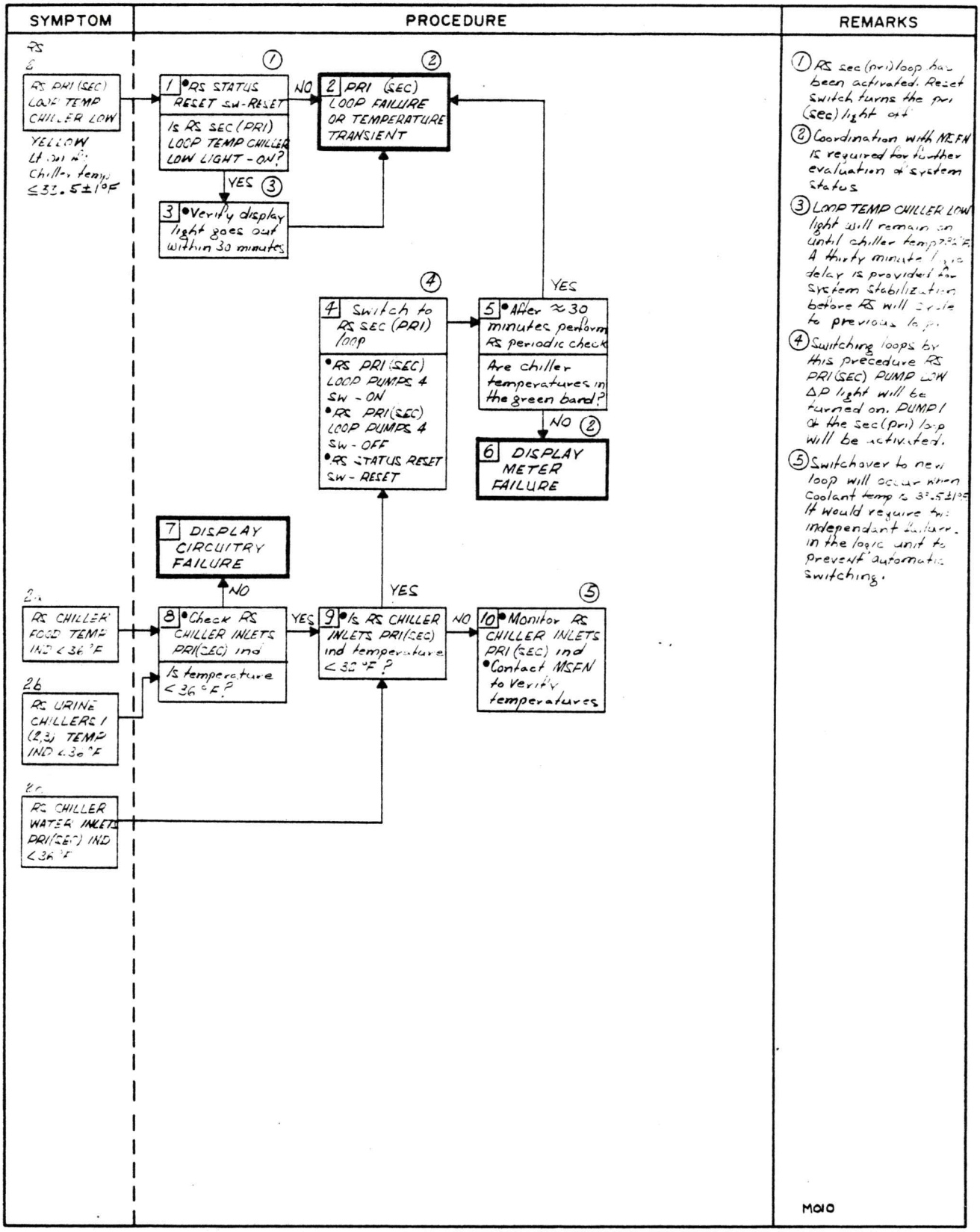
H130

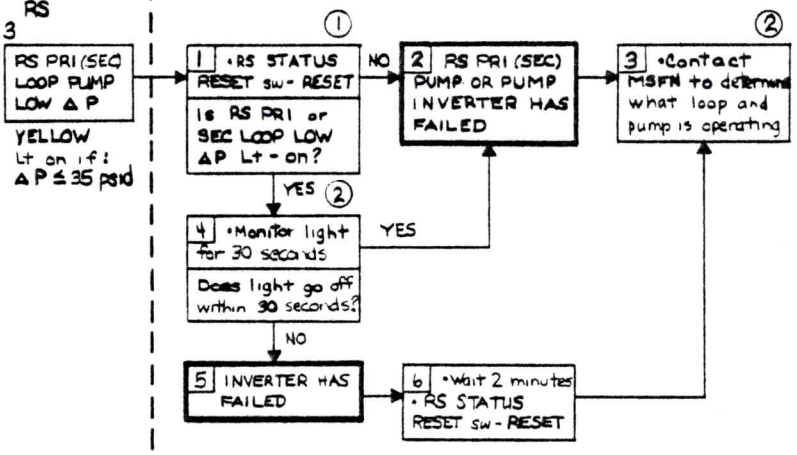
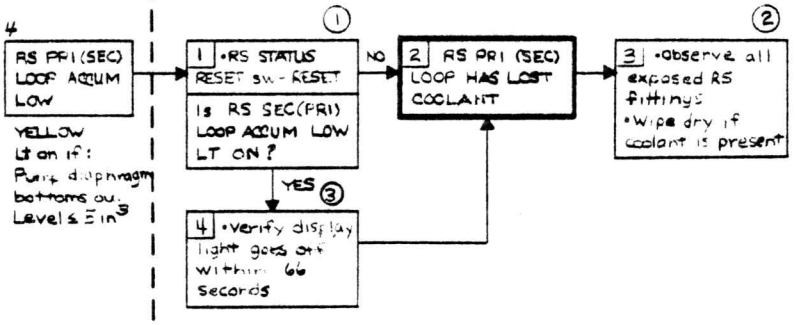

SYMPTOM
PROCEDURE
REMARKS
11 C/W (1)
ALL C/W CAUTION & WARNING LIGHTS ON WITH CAUTION TONE
1 Upper or lower lamp on P (pnl-207)
UPPER
2 C/W SUBUNIT 1 FAILURE
3 Turn off subunit
•cb C/W CONVS C/W 1 - open
4 Perform periodic WARNING/CAUTION SYSTEM 1(2) TEST To verify normal operation of remaining subunit
LOWER
6 C/W SUBUNIT 2 FAILURE
7 Turn off subunit
•cb C/W CONVS C/W 2 - open
5 Continue normal system operation without redundant subunit
11a (2) (1)
ALL C/W EMERGENCY LIGHTS ON WITH ALL C/W TONES AND C/W EMER POWER LIGHT ON
8 Upper or lower lamp on P (pnl-207)
UPPER
9 C/W EMERGENCY SUBUNIT 1 FAILURE
10 Turn off subunit
•cb C/W CONVS EMER 1 - open
11 Perform periodic RAPID ΔP/FIRE SYSTEM 1(2) TEST To verify normal operation of remaining subunit
LOWER
12 C/W EMERGENCY SUBUNIT 2 FAILURE
13 Turn off subunit
•cb C/W CONVS EMER 2 - open
(1) Activation occurs with loss of respective C/W or EMERGENCY +5 VDC logic power.
(2) FIRE tone activates but runs at low frequency.
H140

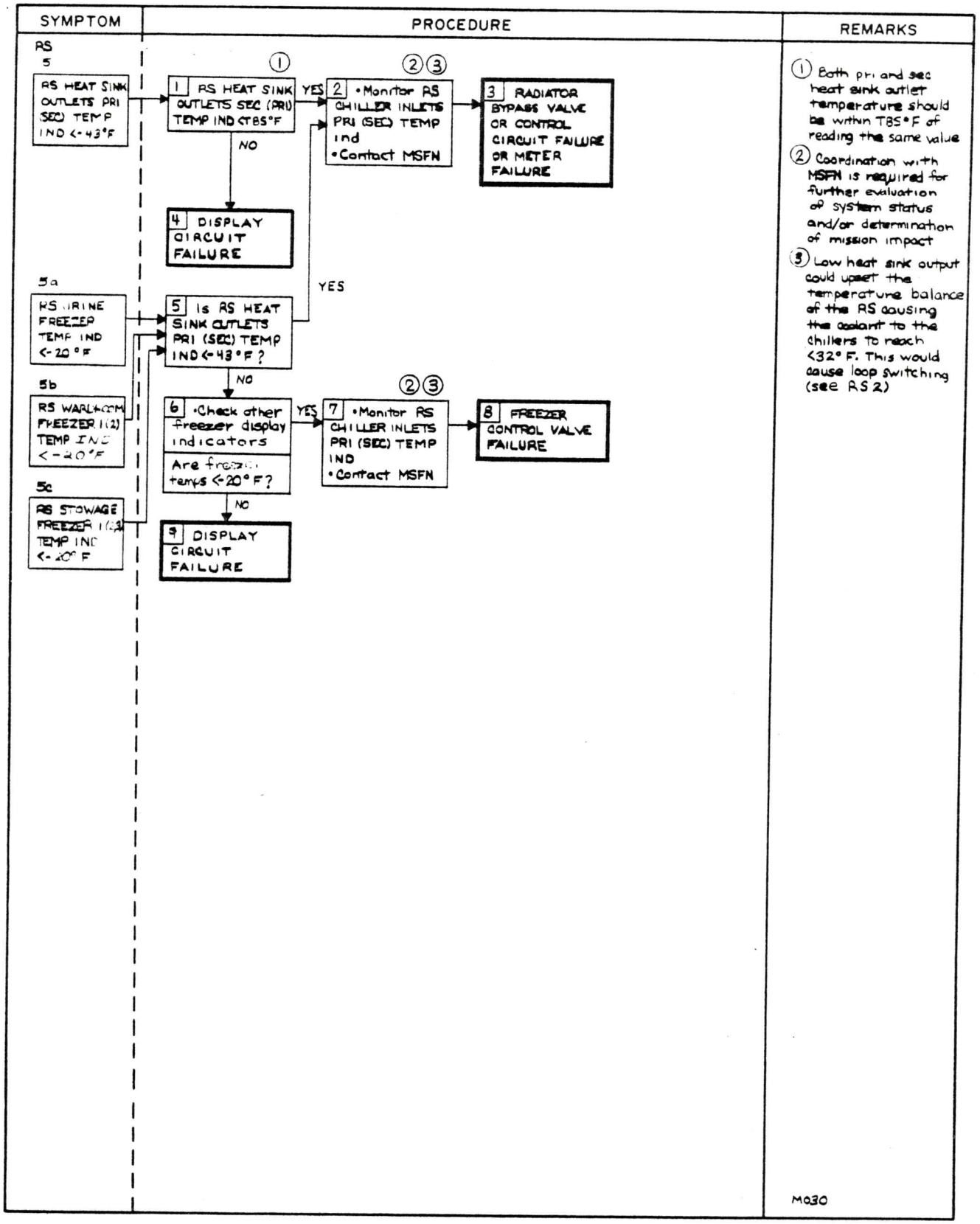

SYMPTOM
PROCEDURE
REMARKS
12 C/W SIMULTANEOUS MULTIPLE C/W ALERT
ACTIVATION OF THE FOLLOWING C/W LIGHTS:
•OWS BUS LO
•COOL TEMP LO
•C/W PWR
•PPO2
•EVA TEMP
•EMER SNSR PWR
•REG BUS LO
(Loss of ±24 VDC)
1 Upper or lower lamp on?
UPPER
LOWER
2 PRI C/W SIGNAL CONDITIONER CONVERTER FAILURE
3 Turn off converter
•cb C/W CONVS SIG COND 1 - open
4 Perform periodic WARNING/CAUTION SYSTEM 1(2) TEST To verify normal operation of remaining subunit
5 Continue normal system operation without redundant subunit.
6 SEC C/W SIGNAL CONDITIONER CONVERTER FAILURE
7 Turn off converter
•cb C/W CONVS SIG COND 2 - open
ACTIVATION OF THE FOLLOWING C/W LIGHTS:
•C/W PWR
•BATT CHG LO
•REG BUS HI
(Loss of -24 VDC)
1
ACTIVATION OF THE FOLLOWING C/W LIGHTS:
•COOL TEMP LO
•C/W PWR
•EVA TEMP
(Loss of +5 VDC)
1
HI50

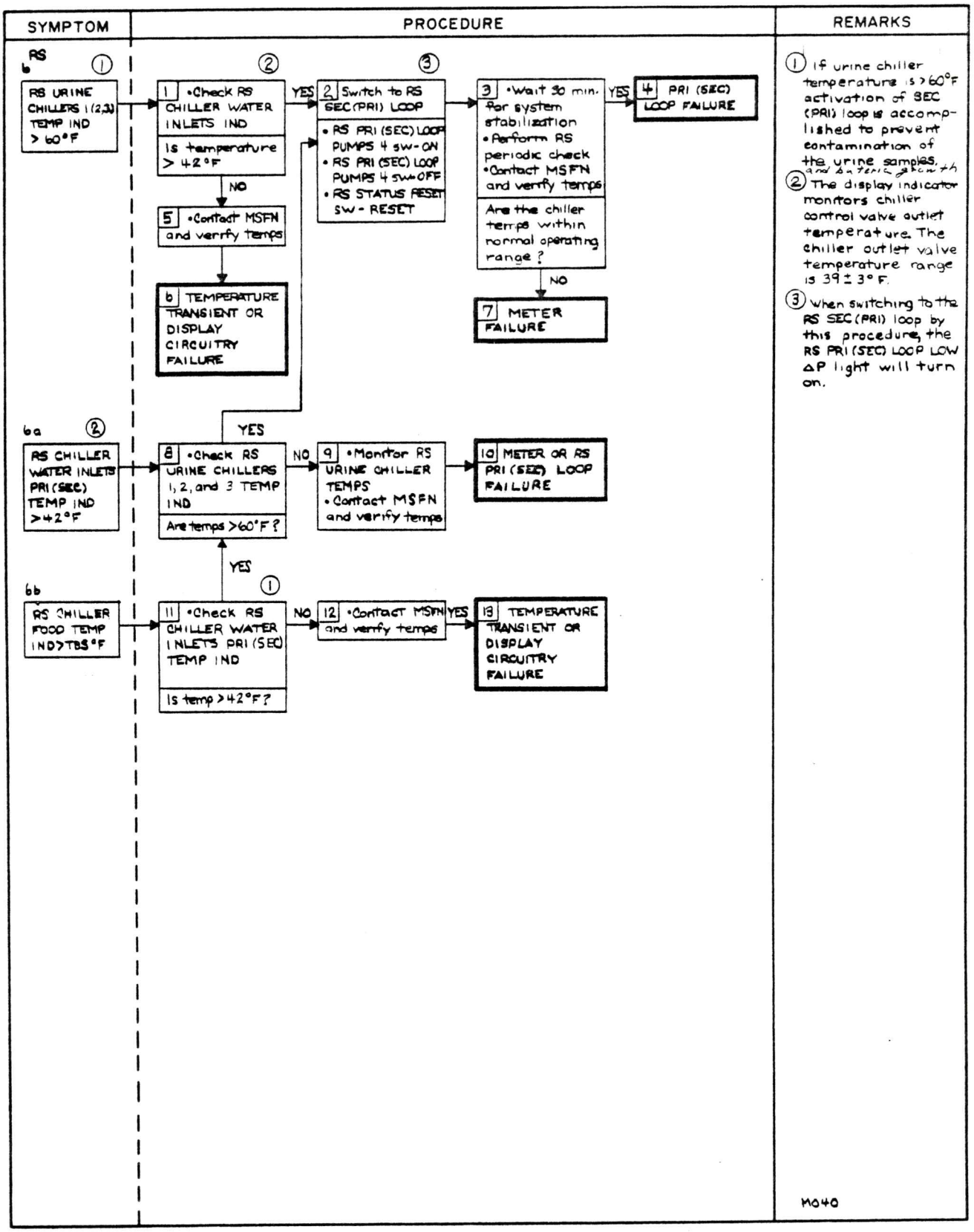

SYMPTOM
PROCEDURE
REMARKS
13 C/W
UNABLE TO CLEAR MEMORY
1 *C/W MEM RECALL pb/lt - depress
did parameter lights come on
YES
2 Unlock logic
*C/W PWR sw-OFF
*C/W PWR sw-ON
C/W MEM RECALL pb/lt - on?
NO
3 CLEAR SWITCH FAILURE
NO
4 C/W MEM RECALL pb/lt LAMP DRIVER FAILED ON
YES
5 MASTER RESET LOGIC FAILURE
(1) It is assumed that the C/W [CLEAR] sw has been depressed and the C/W MEM RECALL pb/lt remains on
(2) Question covers instance when only one parameter lt comes back on
(3) When power is turned on a MASTER ALARM RESET and a MEMORY CLEAR command are initiated within the C/W subunit
(4) MEM RECALL pb/lt remaining on does not affect memory capability.
(5) Memory will have to be cleared by cycling the C/W PWR switch OFF-ON
(6) Apparent complete loss of memory reset capability. A light logic failure at this point would constitute a double failure
H160

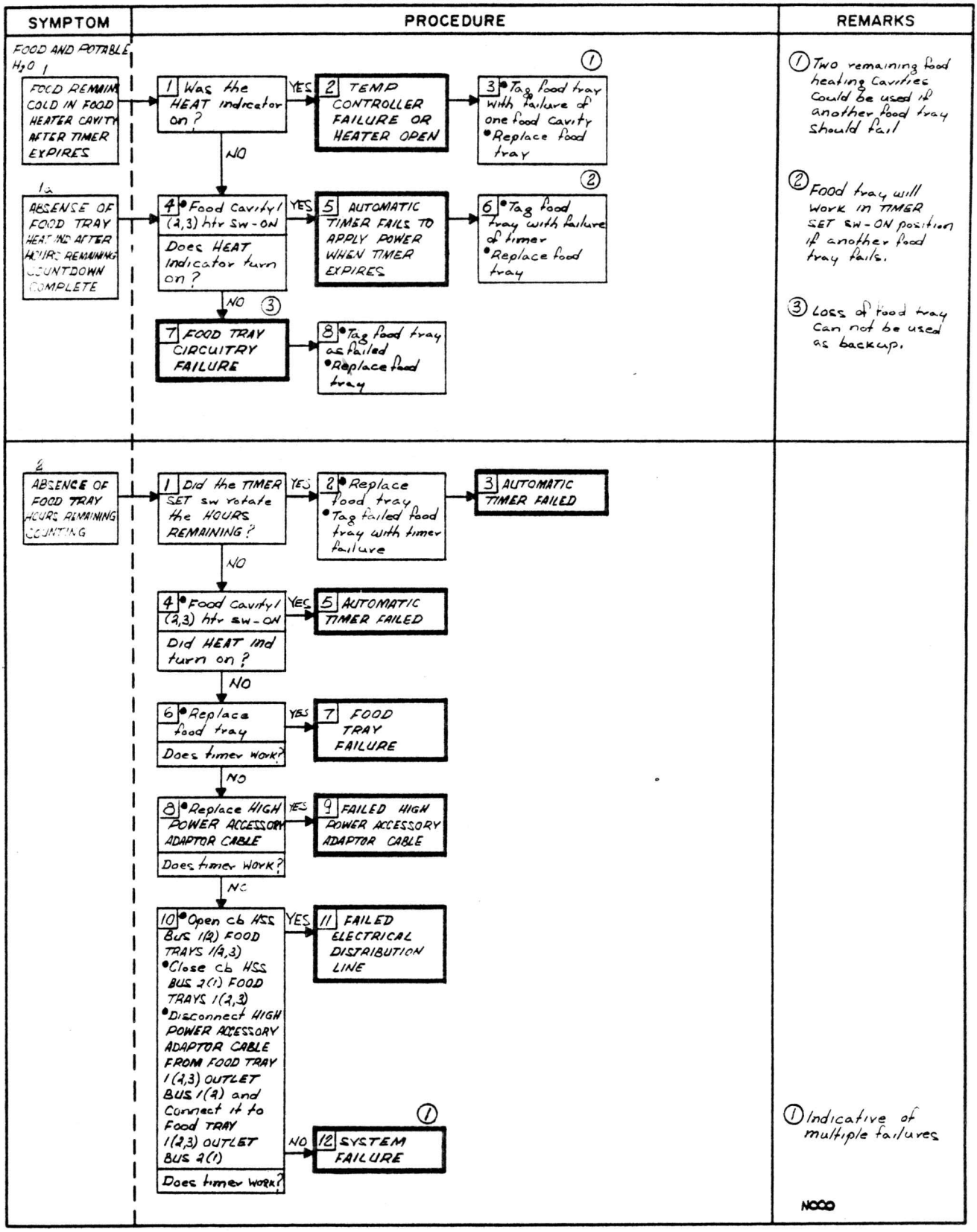

SYMPTOM
PROCEDURE
REMARKS
RS
1
RS PRI (SEC) LOOP TEMP FREEZER HIGH
YELLOW Lt on if: Temp ≥ 11°F
1 RS SEC (PRI) LOOP TEMP FREEZER HIGH LIGHT - off?
YES
2 Reset RS PRI (SEC) LOOP TEMP FREEZER HIGH light
•RS STATUS RESET SW - RESET
3 PRI (SEC) LOOP FAILURE OR TEMPERATURE TRANSIENT
NO
4 •RS STATUS RESET SW - RESET
RS PRI (SEC) LOOP TEMP FREEZER HIGH lt - off?
YES
5 RS SEC (PRI) LOOP TEMP FREEZER HIGH LT - ON
6 •Monitor RS HEAT SINK OUTLETS PRI (SEC) temp ind
Is temperature increasing?
NO
YES
7 RS SEC (PRI) LOOP TEMP FREEZER lt - off
8 •RS SEC (PRI) LOOP PUMPS 1 SW - ON
9 •RS SEC and PRI LOOP PUMPS - OFF
•SOLAR INERTIAL ATTITUDE - Monitor SKYLAB position until orbital sunset termination has been reached
•Z-LOCAL VERTICAL - Change attitude to point the RS radiator away from solar radiation
10 •RS SEC (PRI) LOOP PUMPS 1 SW - ON
•Perform RS periodic check
11 •RS PRI (SEC) LOOP PUMPS 4 SW - ON
•RS PRI (SEC) LOOP PUMPS 4 SW - OFF
•RS STATUS RESET SW - RESET
1a RS URINE FREEZER TEMP IND > TBS °F
1b RS WARDROOM FREEZER 1(2) TEMP IND > TBS °F
1c RS STOWAGE FREEZER 1 (2,3) TEMP IND > TBS °F
12 •Monitor RS HEAT SINK OUTLETS PRI (SEC) temp ind
Is temperature > -14°F?
13 Is RS HEAT SINK OUTLETS PRI (SEC) temp ind > 2°F?
YES
NO
14 PRI (SEC) LOOP FAILURE OR DISPLAY METER FAILURE OR TEMPERATURE TRANSIENT
15 •Monitor RS HEAT SINK OUTLET PRI temp ind
•Contact MSFN to verify temps
16 •Check remaining freezer temperature
Are the freezer temperature indicators > 0°F?
YES
NO
17 •RS PRI (SEC) LOOP PUMPS 4 SW - ON
•RS PRI (SEC) LOOP PUMPS 4 SW - OFF
•RS STATUS RESET SW - RESET
18 FREEZER THERMAL CONTROL VALVE FAILURE
19 DISPLAY CIRCUITRY FAILURE
20 •No Crew action
NO
1d RS HEAT SINK OUTLETS PRI (SEC) TEMP IND > -14°F
21 •Verify RS HEAT SINK OUTLETS SEC (PRI) temp
Is temperature > TBS °F?
YES
(1) Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact
(2) RS SEC (PRI) loop has been activated. RS SEC (PRI) LOOP TEMP FREEZER HIGH light is tracking the freezer inlet temperature with light remaining on until temperature drops to 1±1°F
(3) The system has re-cycled to PRI (SEC) loop due to freezer inlet temperature above 1±1°F after transfer delay expires (≈30 minutes). This switching procedure manually selects SEC (PRI) loop and precludes loop switching.
(4) With the heat SINK temperature above normal (1±1°F and increasing), Pumps are turned off to prevent warm coolant from flowing through the RS. The RS radiator is absorbing solar radiation preventing the coolant of decreasing in temperature
(5) Maintain constant monitoring to determine which way the temperature is tracking
(6) Manually switches RS to Secondary system
M000

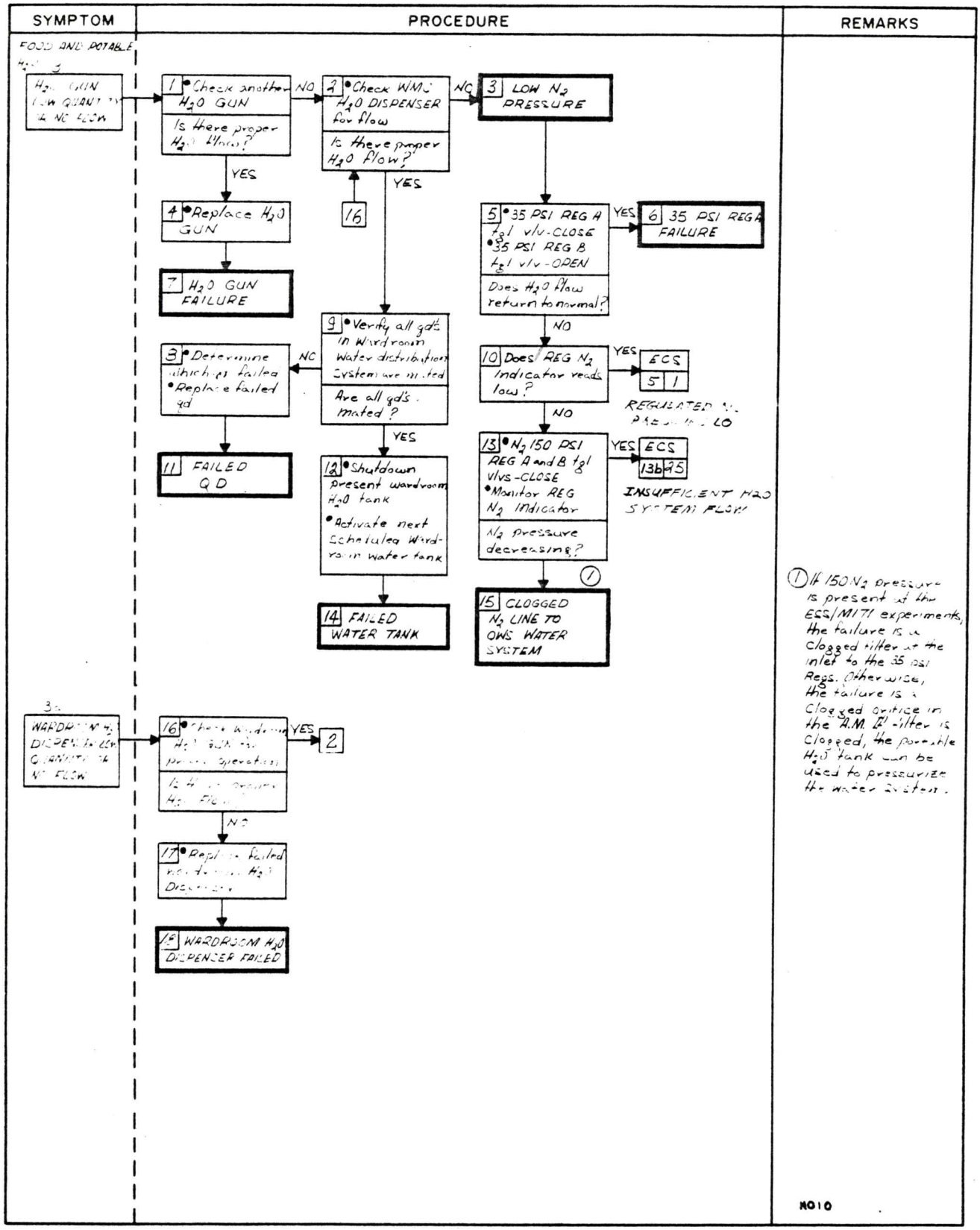

SYMPTOM
PROCEDURE
REMARKS
RS
6
RS PRI (SEC) LOOP TEMP CHILLER LOW
YELLOW LT on RS Chiller temp. ≤33.5±1°F
1 •RS STATUS RESET SW-RESET
Is RS SEC (PRI) LOOP TEMP CHILLER LOW LIGHT - ON?
NO
YES
2 PRI (SEC) LOOP FAILURE OR TEMPERATURE TRANSIENT
3 •Verify display light goes out within 30 minutes
4 Switch to RS SEC (PRI) loop
•RS PRI (SEC) LOOP PUMPS 4 SW - ON
•RS PRI (SEC) LOOP PUMPS 4 SW - OFF
•RS STATUS RESET SW - RESET
5 •After ≈30 minutes perform RS periodic check
Are chiller temperatures in the green band?
YES
NO
6 DISPLAY METER FAILURE
7 DISPLAY CIRCUITRY FAILURE
2a
RS CHILLER FOOD TEMP IND < 36 °F
26
RS URINE CHILLERS 1 (2,3) TEMP IND < 36 °F
8a
RS CHILLER WATER INLETS PRI(SEC) IND < 36 °F
8 •Check RS CHILLER INLETS PRI(SEC) ind
Is temperature < 36 °F?
YES
NO
9 •Is RS CHILLER INLETS PRI(SEC) ind temperature < 35 °F?
YES
NO
10 •Monitor RS CHILLER INLETS PRI (SEC) ind
•Contact MSFN to verify temperatures
1 RS sec (pri) loop has been activated. Reset switch turns the pri (sec) light out
2 Coordination with MSFN is required for further evaluation of system status
3 LOOP TEMP CHILLER LOW light will remain on until chiller temp ≥ 35°F. A thirty minute time delay is provided for system stabilization before RS will cycle to previous loop.
4 Switching loops by this procedure RS PRI (SEC) PUMP ΔP light will be turned on. PUMP 1 of the sec (pri) loop will be activated.
5 Switchover to new loop will occur when coolant temp is 35.5±1°F. It would require two independant failures in the logic unit to prevent automatic switching.
M010

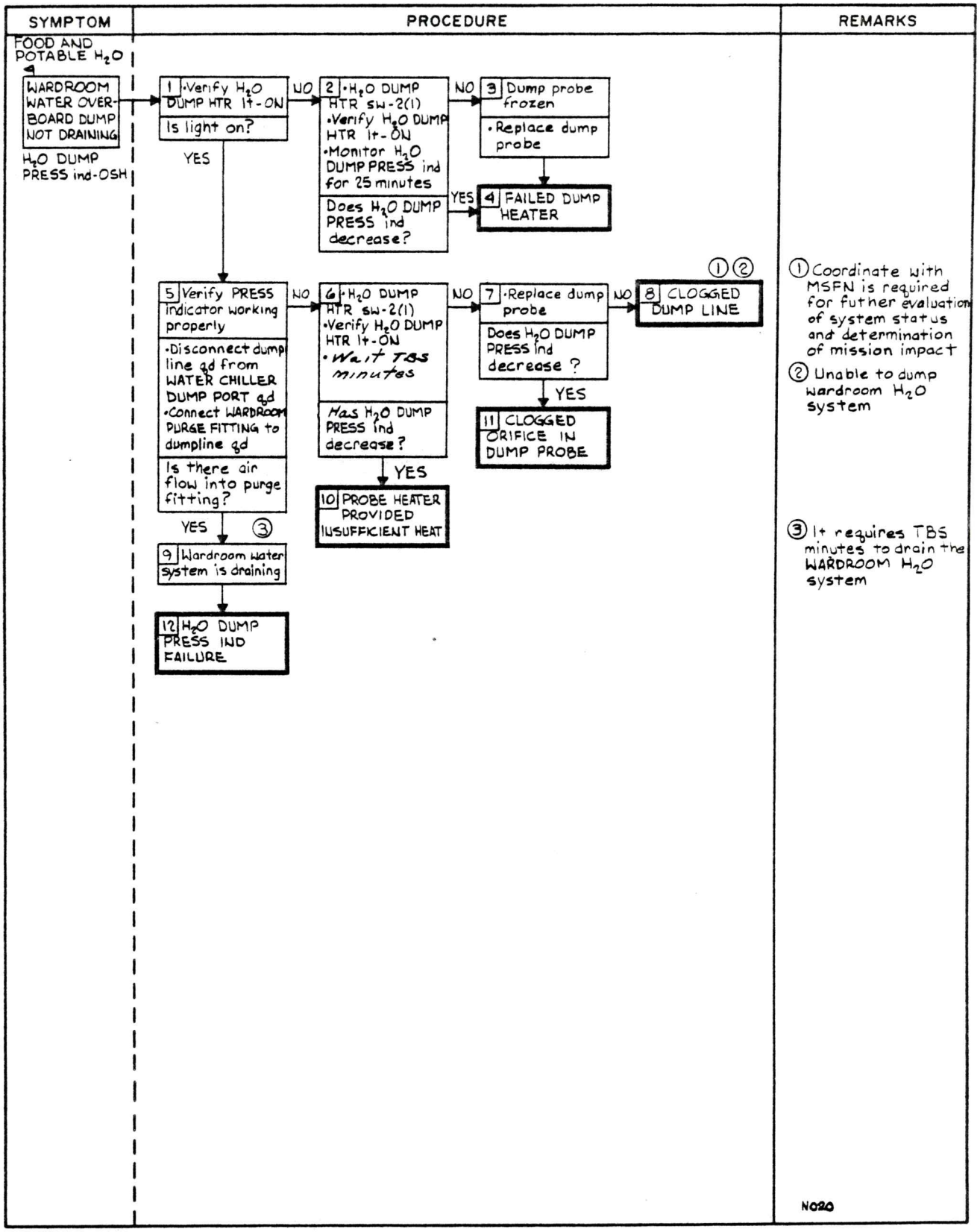
SYMPTOM	PROCEDURE	REMARKS
3 RS PRI (SEC) LOOP PUMP LOW Δ P YELLOW Lt on if: Δ P ≤ 35 psid		(1) The next higher numbered pump has been sequenced on. If pump 4 in primary loop has low Δ P, pump 1 in secondary loop is activated. After reset, light remains on until Δ P > 35 psid (2) It is possible for the pump inverter to fail in such way causing the logic to cycle through the remaining pumps in the loop and then switch loops. A 30 second delay in logic unit is provided to allow for pressure buildup after a pump has been switched on.
4 RS PRI (SEC) LOOP ACCUM LOW YELLOW Lt on if: Purge diaphragm bottoms out. Level ≤ Ξ in^3		(1) RS SEC (PRI) Loop has been activated (2) Coordination with MSFN is required for further system evaluation (3) Light will remain on until SEC (PRI) loop accumulator low sensor senses level > 5 in^3 of coolant in the reservoir. The SEC (PRI) light should go out instantaneously upon switchover but the logic has a 66 sec delay before RS will cycle back to the original loop.
		M020

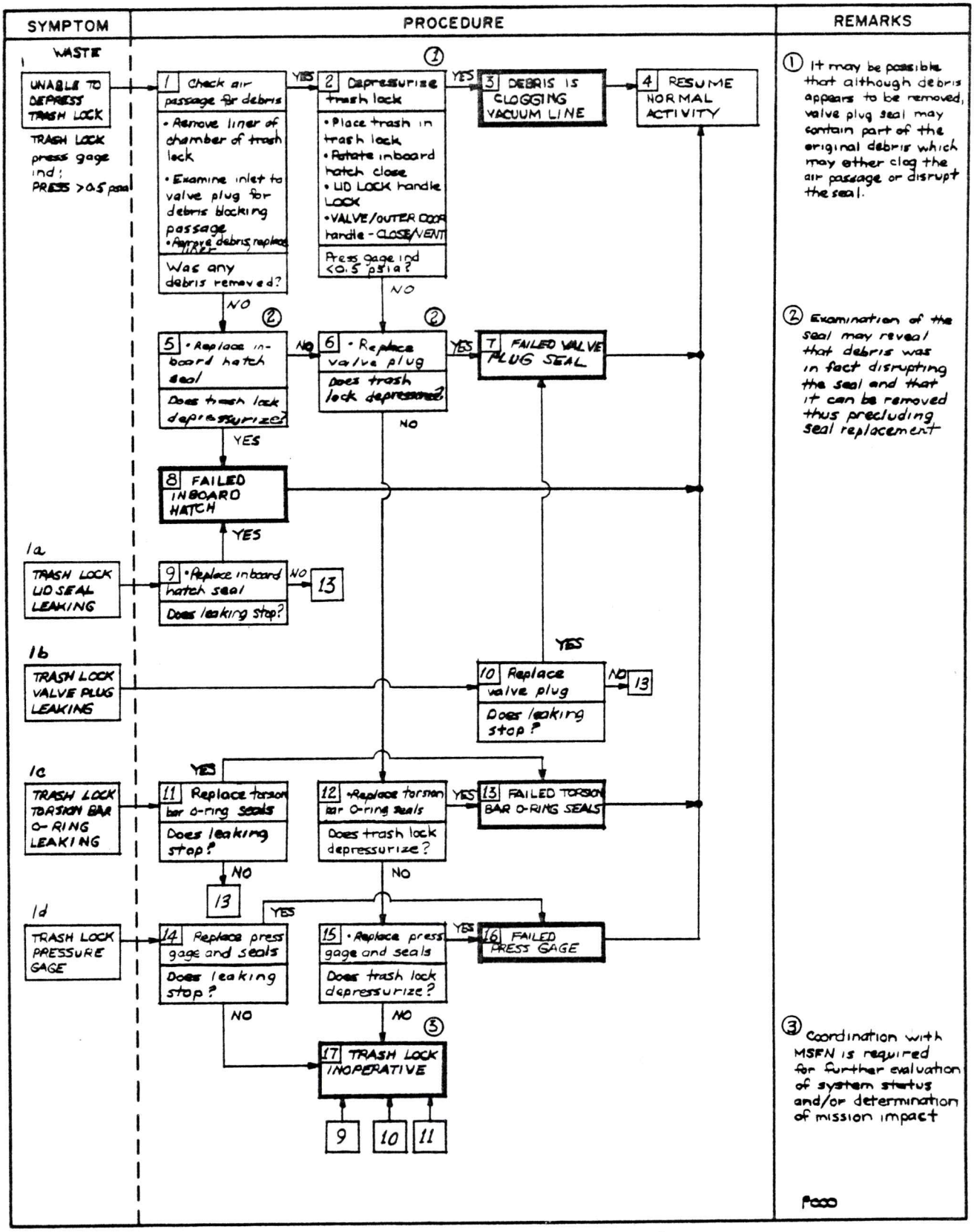

SYMPTOM
PROCEDURE
REMARKS
RS 5
RS HEAT SINK OUTLETS PRI (SEC) TEMP IND <-43°F
1 RS HEAT SINK OUTLETS SEC (PRI) TEMP IND <185°F
YES
NO
2 •Monitor RS CHILLER INLETS PRI (SEC) TEMP Ind •Contact MSFN
3 RADIATOR BYPASS VALVE OR CONTROL CIRCUIT FAILURE OR METER FAILURE
4 DISPLAY CIRCUIT FAILURE
5a RS URINE FREEZER TEMP IND <-20°F
5b RS WARDROOM FREEZER 1(2) TEMP IND <-20°F
5c RS STOWAGE FREEZER 1(2) TEMP IND <-20°F
5 Is RS HEAT SINK OUTLETS PRI (SEC) TEMP IND <-43°F?
6 •Check other freezer display indicators
Are freezer temps <-20°F?
7 •Monitor RS CHILLER INLETS PRI (SEC) TEMP IND •Contact MSFN
8 FREEZER CONTROL VALVE FAILURE
9 DISPLAY CIRCUIT FAILURE
(1) Both pri and sec heat sink outlet temperature should be within 185°F of reading the same value
(2) Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact
(3) Low heat sink output could upset the temperature balance of the RS causing the coolant to the chillers to reach <32°F. This would cause loop switching (see RS 2)
M030


SYMPTOM
PROCEDURE
REMARKS
6 RS
RS URINE CHILLERS 1(2,3) TEMP IND > 60°F
1 •Check RS CHILLER WATER INLETS IND
Is temperature > 42°F
YES
2 Switch to RS SEC(PRI) LOOP
• RS PRI (SEC) LOOP PUMPS 4 sw - ON
• RS PRI (SEC) LOOP PUMPS 4 sw - OFF
• RS STATUS RESET SW - RESET
3 •Wait 30 min. for system stabilization
•Perform RS periodic check
•Contact MSFN and verify temps
Are the chiller temps within normal operating range ?
YES
4 PRI (SEC) LOOP FAILURE
NO
7 METER FAILURE
NO
5 •Contact MSFN and verify temps
6 TEMPERATURE TRANSIENT OR DISPLAY CIRCUITRY FAILURE
6a
RS CHILLER WATER INLETS PRI (SEC) TEMP IND >42°F
8 •Check RS URINE CHILLERS 1, 2, and 3 TEMP IND
Are temps >60°F ?
NO
9 •Monitor RS URINE CHILLER TEMPS
•Contact MSFN and verify temps
10 METER OR RS PRI (SEC) LOOP FAILURE
YES
6b
RS CHILLER FOOD TEMP IND>TBS°F
11 •Check RS CHILLER WATER INLETS PRI (SEC) TEMP IND
Is temp >42°F ?
NO
12 •Contact MSFN and verify temps
YES
13 TEMPERATURE TRANSIENT OR DISPLAY CIRCUITRY FAILURE
YES
1
(1) If urine chiller temperature is >60°F activation of SEC (PRI) loop is accomplished to prevent contamination of the urine samples and batteries stowed in
(2) The display indicator monitors chiller control valve outlet temperature. The chiller outlet valve temperature range is 39 ± 3°F.
(3) When switching to the RS SEC (PRI) loop by this procedure, the RS PRI (SEC) LOOP LOW ΔP light will turn on.
M040


SYMPTOM
PROCEDURE
REMARKS
FOOD AND POTABLE H2O
1
FOOD REMAINS COLD IN FOOD HEATER CAVITY AFTER TIMER EXPIRES
1 Was the HEAT indicator on?
YES
2 TEMP CONTROLLER FAILURE OR HEATER OPEN
3 • Tag food tray with failure of one food cavity • Replace food tray
(1)
NO
1a
ABSENSE OF FOOD TRAY HEATING AFTER HOURS REMAINING COUNTDOWN COMPLETE
4 • Food cavity 1 (2,3) htr sw-ON
Does HEAT indicator turn on?
YES
5 AUTOMATIC TIMER FAILS TO APPLY POWER WHEN TIMER EXPIRES
6 • Tag food tray with failure of timer • Replace food tray
(2)
NO
(3)
7 FOOD TRAY CIRCUITRY FAILURE
8 • Tag food tray as failed • Replace food tray
(1) Two remaining food heating cavities could be used if another food tray should fail
(2) Food tray will work in TIMER SET sw-ON position if another food tray fails.
(3) Loss of food tray can not be used as backup.
2
ABSENCE OF FOOD TRAY HOURS REMAINING COUNTING
1 Did the TIMER SET sw rotate the HOURS REMAINING?
YES
2 • Replace food tray • Tag failed food tray with timer failure
3 AUTOMATIC TIMER FAILED
NO
4 • Food cavity 1 (2,3) htr sw-ON
Did HEAT ind turn on?
YES
5 AUTOMATIC TIMER FAILED
NO
6 • Replace food tray
Does timer work?
YES
7 FOOD TRAY FAILURE
NO
8 • Replace HIGH POWER ACCESSORY ADAPTOR CABLE
Does timer work?
YES
9 FAILED HIGH POWER ACCESSORY ADAPTOR CABLE
NO
10 • Open cb HSS Bus 1(2) FOOD TRAYS 1(2,3) • Close cb HSS BUS 2(1) FOOD TRAYS 1(2,3) • Disconnect HIGH POWER ACCESSORY ADAPTOR CABLE FROM FOOD TRAY 1(2,3) OUTLET BUS 1(2) and Connect it to Food TRAY 1(2,3) OUTLET BUS 2(1)
Does timer work?
YES
11 FAILED ELECTRICAL DISTRIBUTION LINE
(1)
NO
12 SYSTEM FAILURE
(1) Indicative of multiple failures
NOOO

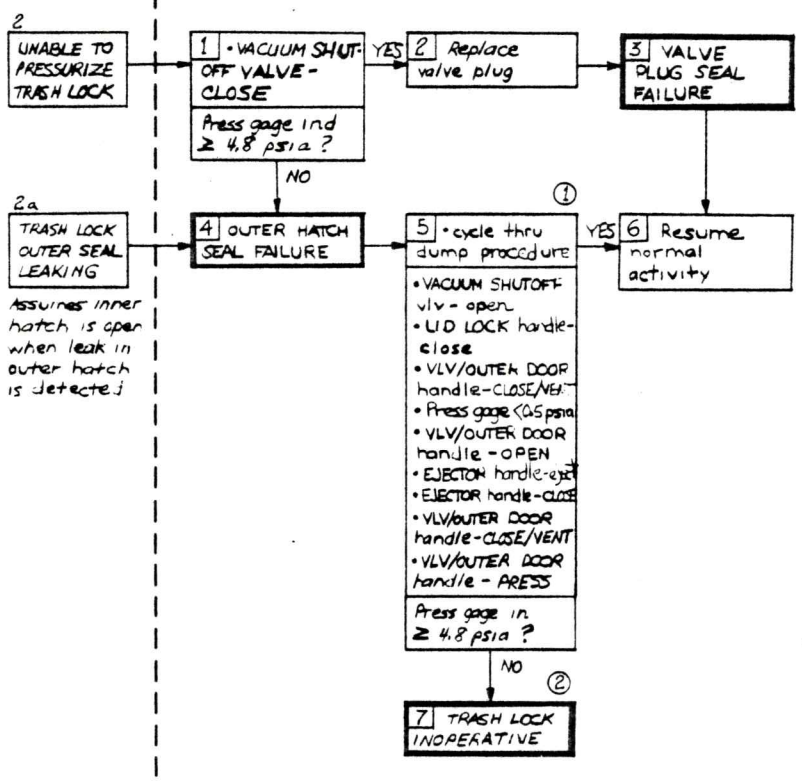

SYMPTOM
PROCEDURE
REMARKS
FOOD AND POTABLE H2O
H2O GUN LOW QUANTITY OR NO FLOW
1 • Check another H2O GUN
Is there proper H2O flow?
NO
YES
2 • Check WMS H2O DISPENSER for flow
Is there proper H2O flow?
NO
YES
3 LOW N2 PRESSURE
4 • Replace H2O GUN
7 H2O GUN FAILURE
16
5 • 35 PSI REG A t3 l v/v-CLOSE
• 35 PSI REG B t3 l v/v-OPEN
Does H2O flow return to normal?
YES
6 35 PSI REG A FAILURE
NO
9 • Verify all qd's in Wardroom Water distribution system are mated
Are all qd's mated?
NO
YES
3 • Determine which qd is failed
• Replace failed qd
11 FAILED QD
12 • Shutdown present wardroom H2O tank
• Activate next scheduled Wardroom water tank
14 FAILED WATER TANK
10 Does REG N2 indicator reads low?
YES
ECS 5 1
REGULATED N2 PRESSURE LO
NO
13 • N2 150 PSI REG A and B t3 l v/vs-CLOSE
• Monitor REG N2 indicator
N2 pressure decreasing?
YES
ECS 13b 15
INSUFFICIENT H2O SYSTEM FLOW
1
15 CLOGGED N2 LINE TO OWS WATER SYSTEM
3a
WARDROOM H2O DISPENSER LOW QUANTITY OR NO FLOW
16 • Check wardroom H2O gun for proper operation
Is H2O pressure H2O flow
YES
2
NO
17 • Replace failed wardroom H2O Dispenser
18 WARDROOM H2O DISPENSER FAILED
(1) If 150 N2 pressure is present at the ECS/M171 experiments, the failure is a clogged filter at the inlet to the 35 PSI Regs. Otherwise, the failure is a clogged orifice in the A.M. If filter is clogged, the portable H2O tank can be used to pressurize the water system.
NO10


SYMPTOM
PROCEDURE
REMARKS
FOOD AND POTABLE H_2O
WARDROOM WATER OVERBOARD DUMP NOT DRAINING
H_2O DUMP PRESS ind-OSH
1 •Verify H_2O DUMP HTR lt-ON
Is light on?
NO
YES
2 •H_2O DUMP HTR sw-2(1)
•Verify H_2O DUMP HTR lt-ON
•Monitor H_2O DUMP PRESS ind for 25 minutes
Does H_2O DUMP PRESS ind decrease?
NO
YES
3 Dump probe frozen
•Replace dump probe
4 FAILED DUMP HEATER
5 Verify PRESS indicator working properly
•Disconnect dump line qd from WATER CHILLER DUMP PORT qd
•Connect WARDROOM PURGE FITTING to dumpline qd
Is there air flow into purge fitting?
NO
YES
③
6 •H_2O DUMP HTR sw-2(1)
•Verify H_2O DUMP HTR lt-ON
• Wait TBS minutes
Has H_2O DUMP PRESS ind decrease?
NO
YES
7 •Replace dump probe
Does H_2O DUMP PRESS ind decrease ?
NO
YES
①②
8 CLOGGED DUMP LINE
9 Wardroom water system is draining
10 PROBE HEATER PROVIDED INSUFFICIENT HEAT
11 CLOGGED ORIFICE IN DUMP PROBE
12 H_2O DUMP PRESS IND FAILURE
① Coordinate with MSFN is required for futher evaluation of system status and determination of mission impact
② Unable to dump wardroom H_2O system
③ It requires TBS minutes to drain the WARDROOM H_2O system
N020


SYMPTOM
PROCEDURE
REMARKS
WASTE
UNABLE TO DEPRESS TRASH LOCK
TRASH LOCK press gage ind; PRESS >0.5 psia
1 Check air passage for debris
• Remove liner of chamber of trash lock
• Examine inlet to valve plug for debris blocking passage
• Remove debris, replace liner
Was any debris removed?
YES
2 Depressurize trash lock
• Place trash in trash lock
• Rotate inboard hatch close
• LID LOCK handle LOCK
• VALVE/OUTER DOOR handle - CLOSE/VENT
Press gage ind <0.5 psia?
YES
3 DEBRIS IS CLOGGING VACUUM LINE
4 RESUME NORMAL ACTIVITY
NO
5 • Replace inboard hatch seal
Does trash lock depressurize?
NO
6 • Replace valve plug
Does trash lock depressurize?
YES
7 FAILED VALVE PLUG SEAL
NO
8 FAILED INBOARD HATCH
YES
1a
TRASH LOCK LID SEAL LEAKING
9 • Replace inboard hatch seal
Does leaking stop?
NO
13
1b
TRASH LOCK VALVE PLUG LEAKING
10 Replace valve plug
Does leaking stop?
YES
NO
13
1c
TRASH LOCK TORSION BAR O-RING LEAKING
11 Replace torsion bar o-ring seals
Does leaking stop?
YES
NO
12 • Replace torsion bar O-ring seals
Does trash lock depressurize?
YES
13 FAILED TORSION BAR O-RING SEALS
NO
13
1d
TRASH LOCK PRESSURE GAGE
14 Replace press gage and seals
Does leaking stop?
YES
NO
15 • Replace press gage and seals
Does trash lock depressurize?
YES
16 FAILED PRESS GAGE
NO
17 TRASH LOCK INOPERATIVE
9
10
11
① It may be possible that although debris appears to be removed, valve plug seal may contain part of the original debris which may either clog the air passage or disrupt the seal.
② Examination of the seal may reveal that debris was in fact disrupting the seal and that it can be removed thus precluding seal replacement
③ Coordination with MSFN is required for further evaluation of system status and/or determination of mission impact
F000

SYMPTOM	PROCEDURE	REMARKS

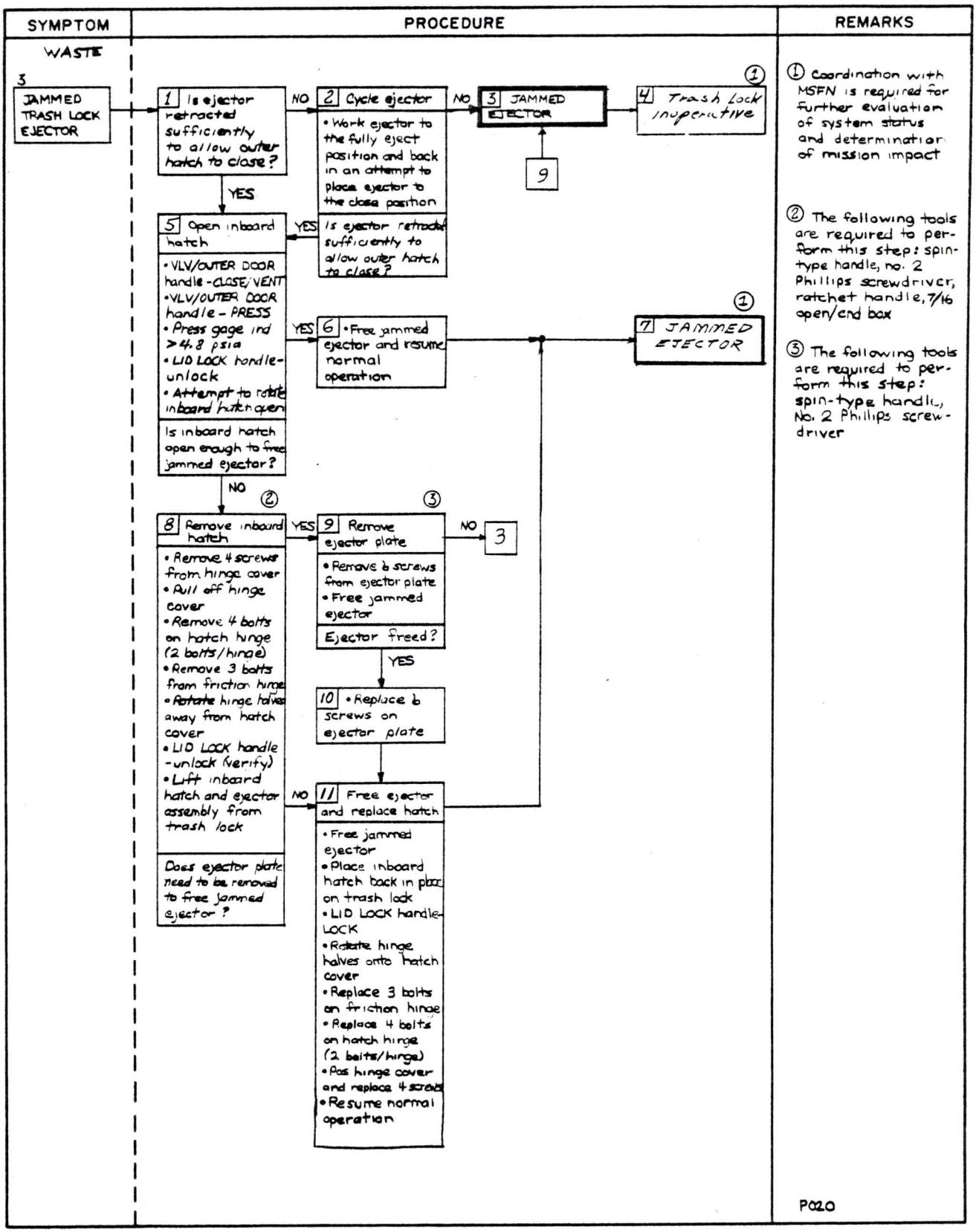
WASTE

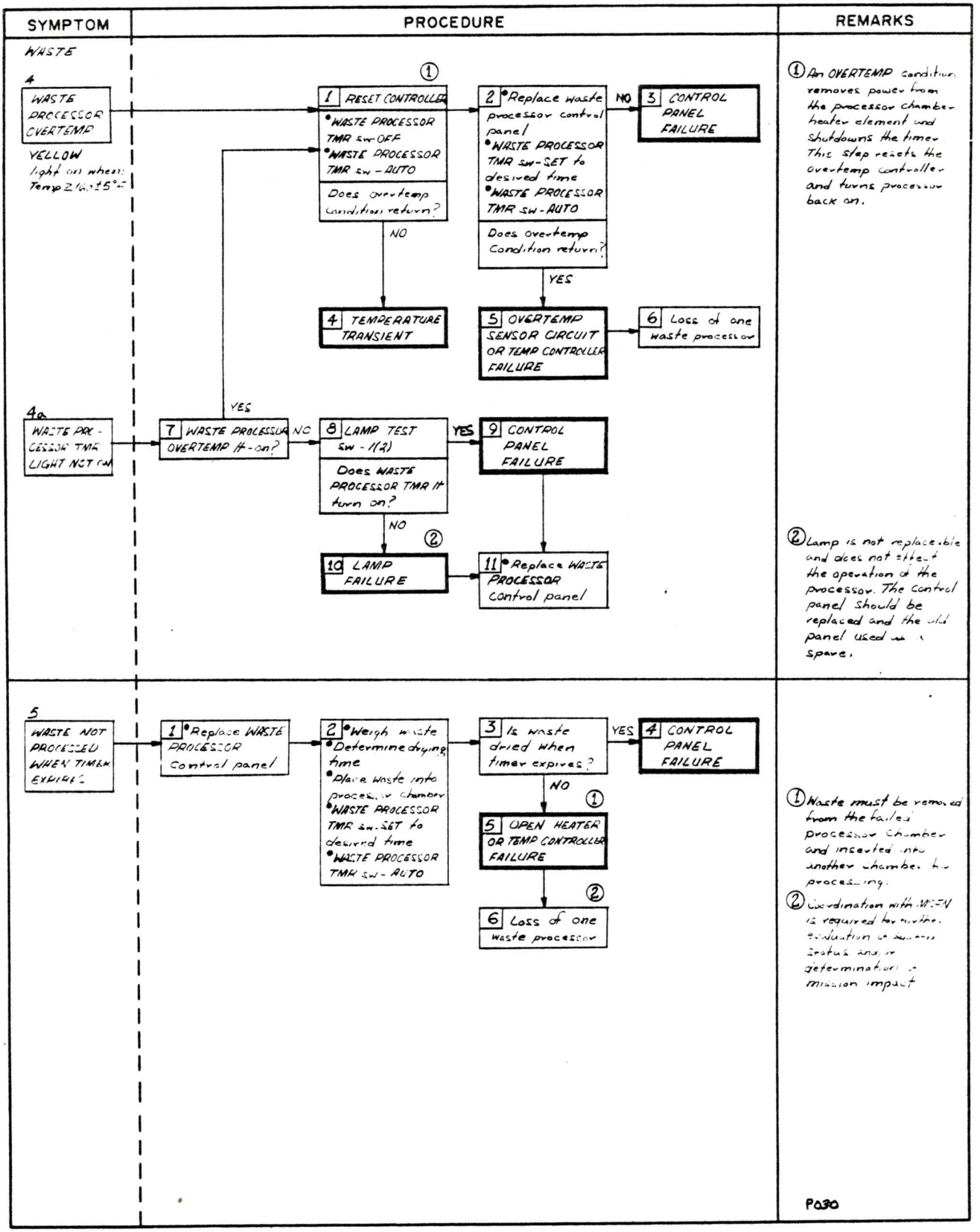


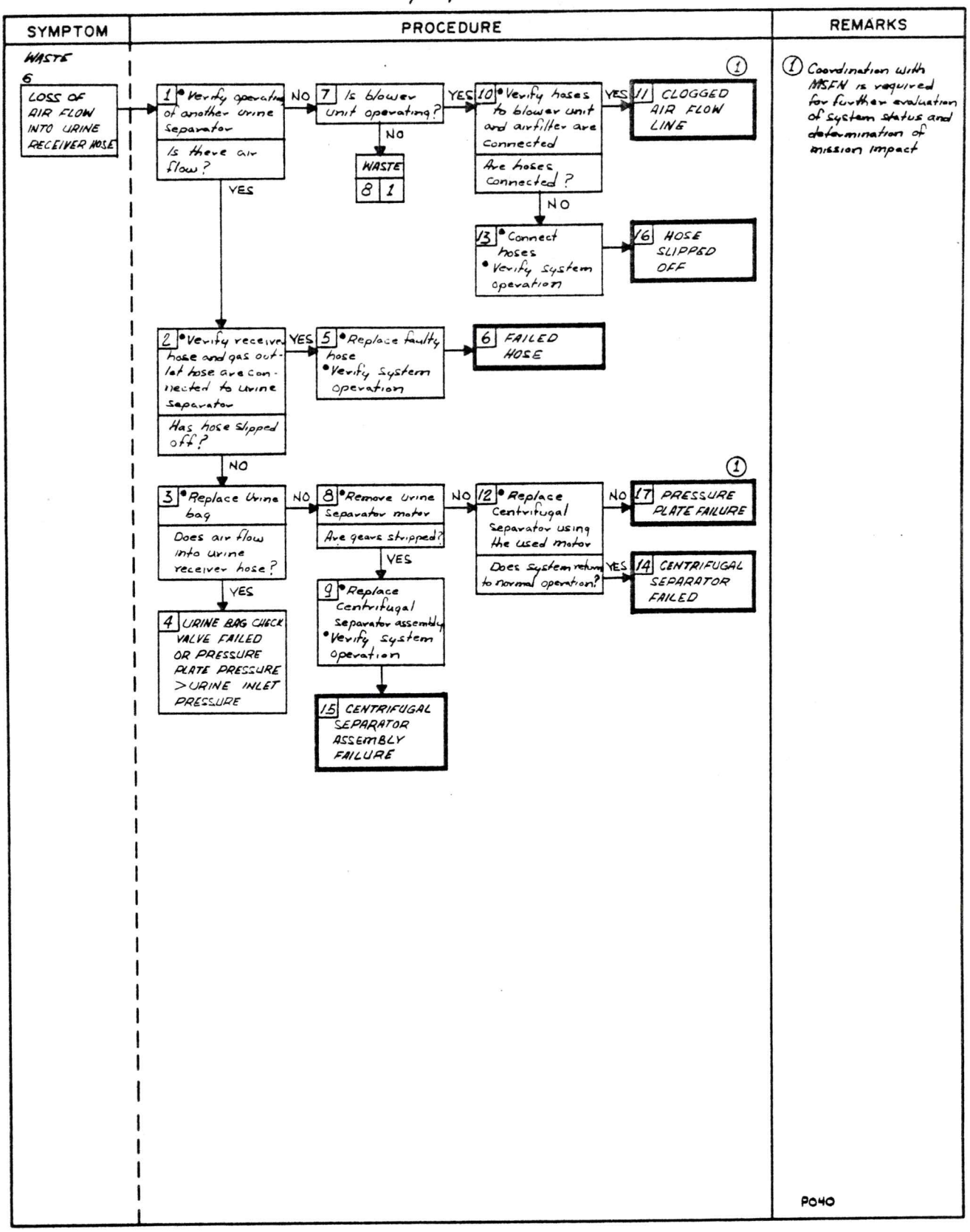
(1) Cycling the ejector may clear the seal of debris. The seal is not replaceable

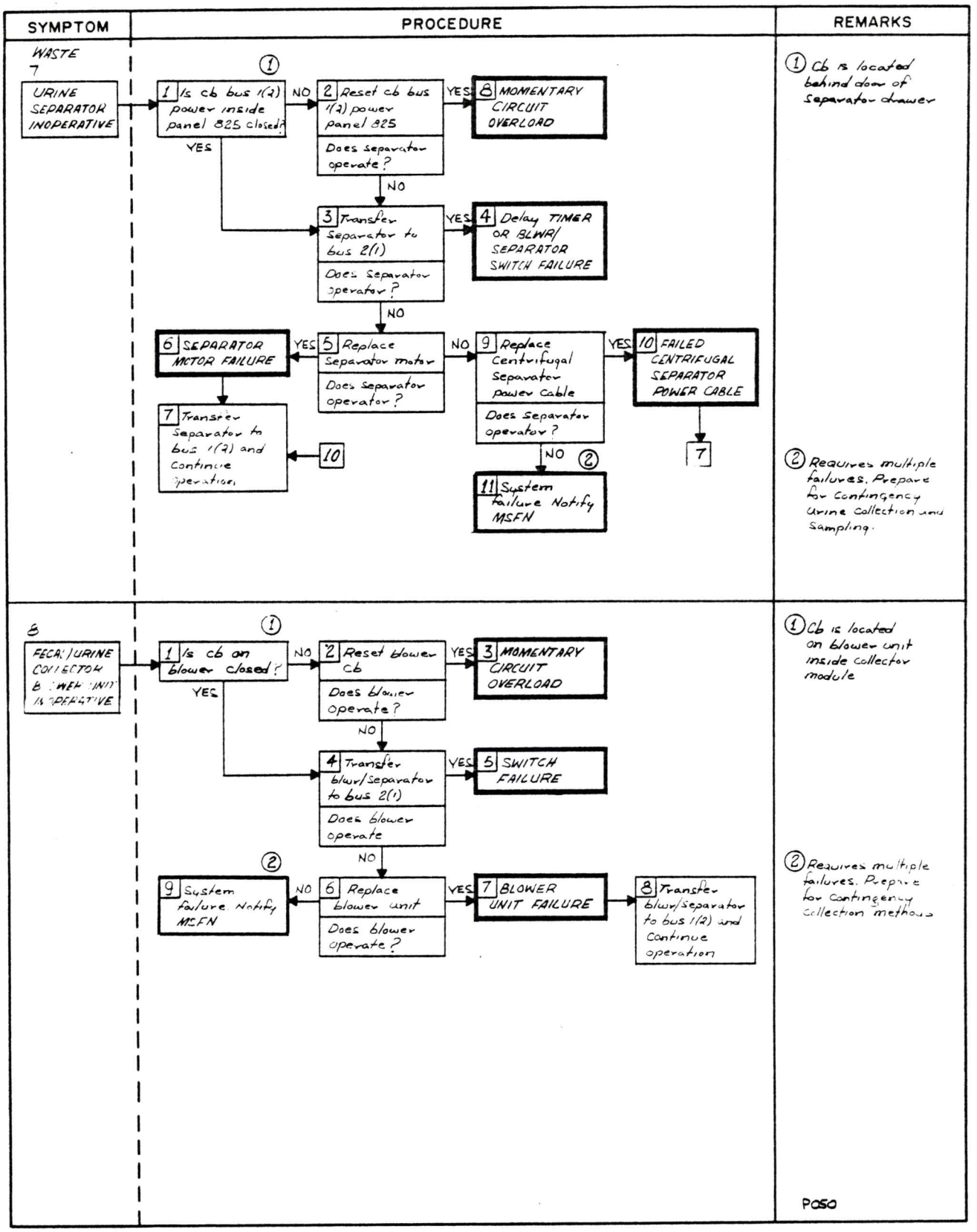
(2) Coordination with MSFN is required for further evaluation of system status and determination of mission impact

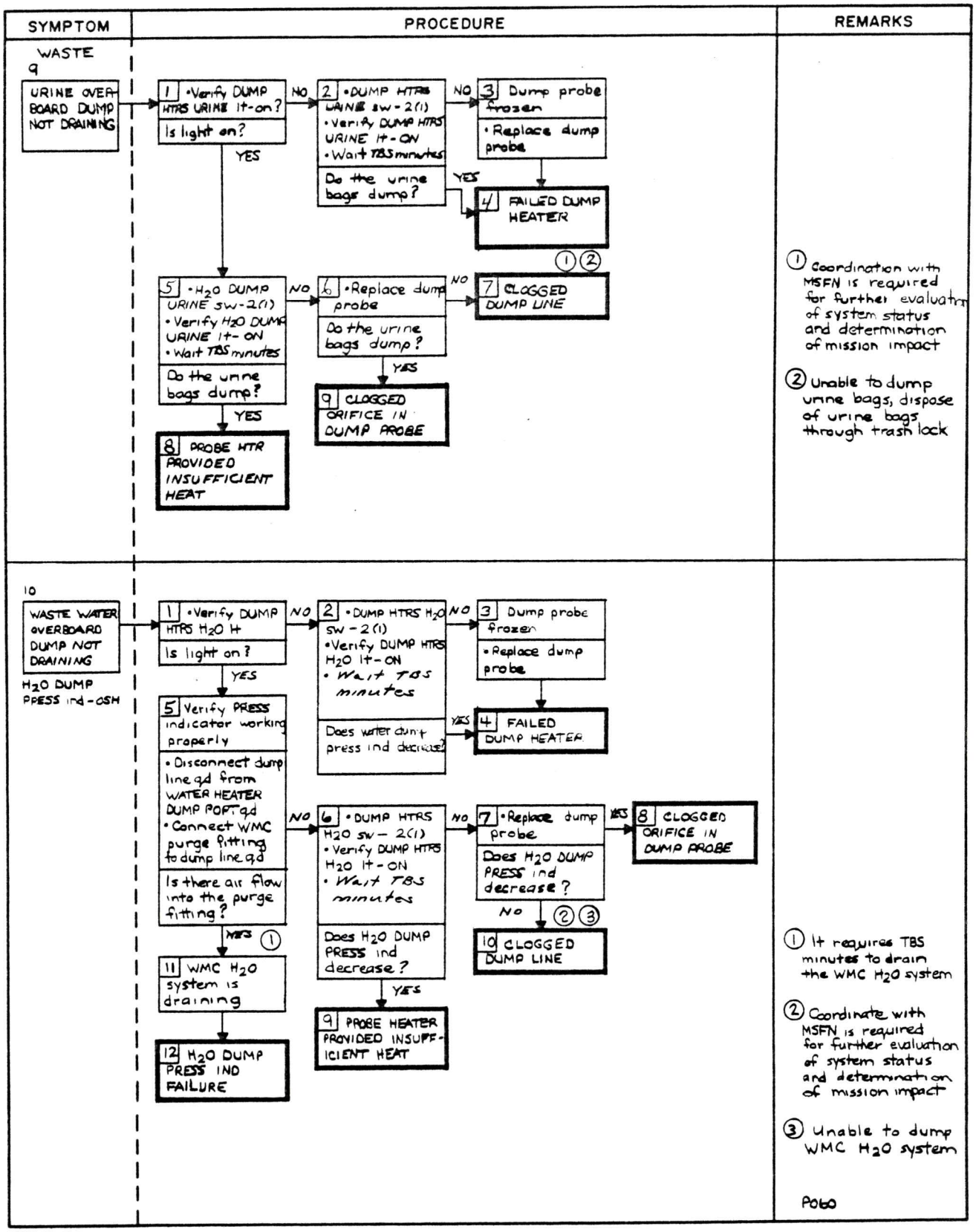
P010


SYMPTOM
PROCEDURE
REMARKS
WASTE
3
JAMMED TRASH LOCK EJECTOR
1 Is ejector retracted sufficiently to allow outer hatch to close?
NO
2 Cycle ejector
• Work ejector to the fully eject position and back in an attempt to place ejector to the close position
Is ejector retracted sufficiently to allow outer hatch to close?
YES
NO
3 JAMMED EJECTOR
4 Trash Lock inoperative
1
9
YES
5 Open inboard hatch
• VLV/OUTER DOOR handle - CLOSE/VENT
• VLV/OUTER DOOR handle - PRESS
• Press gage ind > 4.8 psia
• LID LOCK handle - unlock
• Attempt to rotate inboard hatch open
Is inboard hatch open enough to free jammed ejector?
YES
6 • Free jammed ejector and resume normal operation
1
7 JAMMED EJECTOR
NO
2
8 Remove inboard hatch
• Remove 4 screws from hinge cover
• Pull off hinge cover
• Remove 4 bolts on hatch hinge (2 bolts/hinge)
• Remove 3 bolts from friction hinge
• Rotate hinge halves away from hatch cover
• LID LOCK handle - unlock (verify)
• Lift inboard hatch and ejector assembly from trash lock
Does ejector plate need to be removed to free jammed ejector?
YES
3
9 Remove ejector plate
• Remove 6 screws from ejector plate
• Free jammed ejector
Ejector freed?
NO
3
YES
10 • Replace 6 screws on ejector plate
NO
11 Free ejector and replace hatch
• Free jammed ejector
• Place inboard hatch back in place on trash lock
• LID LOCK handle - LOCK
• Rotate hinge halves onto hatch cover
• Replace 3 bolts on friction hinge
• Replace 4 bolts on hatch hinge (2 bolts/hinge)
• Pos hinge cover and replace 4 screws
• Resume normal operation
1 Coordination with MSFN is required for further evaluation of system status and determination of mission impact
2 The following tools are required to perform this step: spin-type handle, no. 2 Phillips screwdriver, ratchet handle, 7/16 open/end box
3 The following tools are required to perform this step: spin-type handle, No. 2 Phillips screwdriver
P020


SYMPTOM
PROCEDURE
REMARKS
WASTE
4
WASTE PROCESSOR OVERTEMP
YELLOW light on when: Temp 216 ± 5°F
1
1 RESET CONTROLLER
• WASTE PROCESSOR TMR sw-OFF
• WASTE PROCESSOR TMR sw - AUTO
Does overtemp condition return?
NO
4 TEMPERATURE TRANSIENT
2 • Replace waste processor control panel
• WASTE PROCESSOR TMR sw-SET to desired time
• WASTE PROCESSOR TMR sw-AUTO
Does overtemp condition return?
NO
3 CONTROL PANEL FAILURE
YES
5 OVERTEMP SENSOR CIRCUIT OR TEMP CONTROLLER FAILURE
6 Loss of one waste processor
4a
WASTE PROCESSOR TMR LIGHT NOT ON
7 WASTE PROCESSOR OVERTEMP lt-on?
YES
NO
8 LAMP TEST sw - 1(2)
Does WASTE PROCESSOR TMR lt turn on?
YES
9 CONTROL PANEL FAILURE
NO
2
10 LAMP FAILURE
11 • Replace WASTE PROCESSOR control panel
1 An OVERTEMP condition removes power from the processor chamber heater element and shutdowns the timer. This step resets the overtemp controller and turns processor back on.
2 Lamp is not replaceable and does not effect the operation of the processor. The control panel should be replaced and the old panel used as a spare.
5
WASTE NOT PROCESSED WHEN TIMER EXPIRES
1 • Replace WASTE PROCESSOR control panel
2 • Weigh waste
• Determine drying time
• Place waste into processor chamber
• WASTE PROCESSOR TMR sw-SET to desired time
• WASTE PROCESSOR TMR sw - AUTO
3 Is waste dried when timer expires?
YES
4 CONTROL PANEL FAILURE
NO
1
5 OPEN HEATER OR TEMP CONTROLLER FAILURE
2
6 Loss of one waste processor
1 Waste must be removed from the failed processor chamber and inserted into another chamber for processing.
2 Coordination with MCC-H is required for routine evaluation of system status and for determination of mission impact
P030


SYMPTOM
PROCEDURE
REMARKS
WASTE
6
LOSS OF AIR FLOW INTO URINE RECEIVER HOSE
1 • Verify operation of another urine separator
Is there air flow?
NO
7 Is blower unit operating?
YES
10 • Verify hoses to blower unit and airfilter are connected
Are hoses connected?
YES
11 CLOGGED AIR FLOW LINE
NO
WASTE 8 1
NO
13 • Connect hoses • Verify system operation
16 HOSE SLIPPED OFF
YES
2 • Verify receiver hose and gas outlet hose are connected to urine separator
Has hose slipped off?
YES
5 • Replace faulty hose • Verify system operation
6 FAILED HOSE
NO
3 • Replace urine bag
Does air flow into urine receiver hose?
NO
8 • Remove urine separator motor
Are gears stripped?
NO
12 • Replace Centrifugal Separator using the used motor
Does system return to normal operation?
NO
17 PRESSURE PLATE FAILURE
YES
14 CENTRIFUGAL SEPARATOR FAILED
YES
4 URINE BAG CHECK VALVE FAILED OR PRESSURE PLATE PRESSURE > URINE INLET PRESSURE
YES
9 • Replace Centrifugal Separator assembly • Verify system operation
15 CENTRIFUGAL SEPARATOR ASSEMBLY FAILURE
(1)
(1) Coordination with MSFN is required for further evaluation of system status and determination of mission impact
P040


SYMPTOM
PROCEDURE
REMARKS
WASTE 7
URINE SEPARATOR INOPERATIVE
1 Is cb bus 1(2) power inside panel 825 closed?
NO
2 Reset cb bus 1(2) power panel 825
Does separator operate?
YES
8 MOMENTARY CIRCUIT OVERLOAD
NO
3 Transfer Separator to bus 2(1)
Does Separator operate?
YES
4 Delay TIMER OR BLWR/ SEPARATOR SWITCH FAILURE
NO
6 SEPARATOR MOTOR FAILURE
YES
5 Replace Separator motor
Does Separator operator?
NO
9 Replace Centrifugal Separator power Cable
Does Separator operator?
YES
10 FAILED CENTRIFUGAL SEPARATOR POWER CABLE
7 Transfer Separator to bus 1(2) and Continue operation
10
NO
11 System failure Notify MSFN
7
(1) Cb is located behind door of separator drawer
(2) Requires multiple failures. Prepare for contingency urine collection and sampling.
8
FECAL/URINE COLLECTOR & BLWR UNIT INOPERATIVE
1 Is cb on blower closed?
NO
2 Reset blower cb
Does blower operate?
YES
3 MOMENTARY CIRCUIT OVERLOAD
NO
4 Transfer blwr/separator to bus 2(1)
Does blower operate
YES
5 SWITCH FAILURE
NO
9 System failure Notify MSFN
NO
6 Replace blower unit
Does blower operate?
YES
7 BLOWER UNIT FAILURE
8 Transfer blwr/separator to bus 1(2) and Continue operation
(1) Cb is located on blower unit inside collector module
(2) Requires multiple failures. Prepare for contingency collection methods
P050

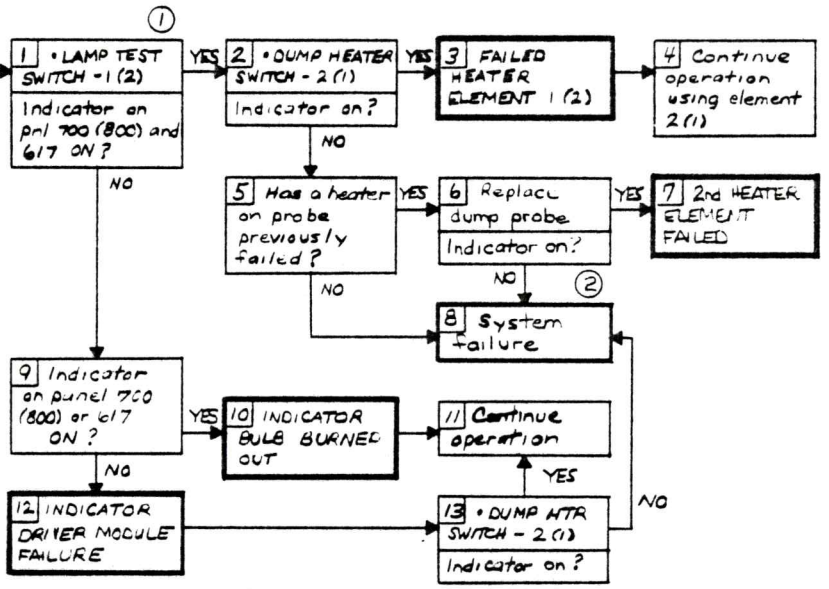

SYMPTOM
PROCEDURE
REMARKS
9
WASTE
URINE OVERBOARD DUMP NOT DRAINING
1 •Verify DUMP HTRS URINE lt-on?
Is light on?
NO
YES
2 •DUMP HTRS URINE sw-2(1)
•Verify DUMP HTRS URINE lt-ON
•Wait TBS minutes
Do the urine bags dump?
NO
3 Dump probe frozen
•Replace dump probe
YES
4 FAILED DUMP HEATER
1 2
5 •H2O DUMP URINE sw-2(1)
•Verify H2O DUMP URINE lt-ON
•Wait TBS minutes
Do the urine bags dump?
NO
6 •Replace dump probe
Do the urine bags dump?
NO
7 CLOGGED DUMP LINE
YES
9 CLOGGED ORIFICE IN DUMP PROBE
YES
8 PROBE HTR PROVIDED INSUFFICIENT HEAT
1 Coordination with MSFN is required for further evaluation of system status and determination of mission impact
2 Unable to dump urine bags, dispose of urine bags through trash lock
10
WASTE WATER OVERBOARD DUMP NOT DRAINING
H2O DUMP PPESS ind-OSH
1 •Verify DUMP HTRS H2O lt
Is light on?
NO
YES
2 •DUMP HTRS H2O sw-2(1)
•Verify DUMP HTRS H2O lt-ON
• Wait TBS minutes
Does water dump press ind decrease?
NO
3 Dump probe frozen
•Replace dump probe
YES
4 FAILED DUMP HEATER
5 Verify PRESS indicator working properly
•Disconnect dump line qd from WATER HEATER DUMP PORT qd
•Connect WMC purge fitting to dump line qd
Is there air flow into the purge fitting?
YES 1
11 WMC H2O system is draining
12 H2O DUMP PRESS IND FAILURE
NO
6 •DUMP HTRS H2O sw-2(1)
•Verify DUMP HTRS H2O lt-ON
• Wait TBS minutes
Does H2O DUMP PRESS ind decrease?
YES
9 PROBE HEATER PROVIDED INSUFFICIENT HEAT
NO
7 •Replace dump probe
Does H2O DUMP PRESS ind decrease?
YES
8 CLOGGED ORIFICE IN DUMP PROBE
No 2 3
10 CLOGGED DUMP LINE
1 It requires TBS minutes to drain the WMC H2O system
2 Coordinate with MSFN is required for further evaluation of system status and determination of mission impact
3 Unable to dump WMC H2O system
P060

SYMPTOM	PROCEDURE	REMARKS

SYMPTOM

WASTE
II
FAULTY DUMP HEATER INDICATIONS

PROCEDURE



REMARKS

① Indicator and switch groupings are as follows:

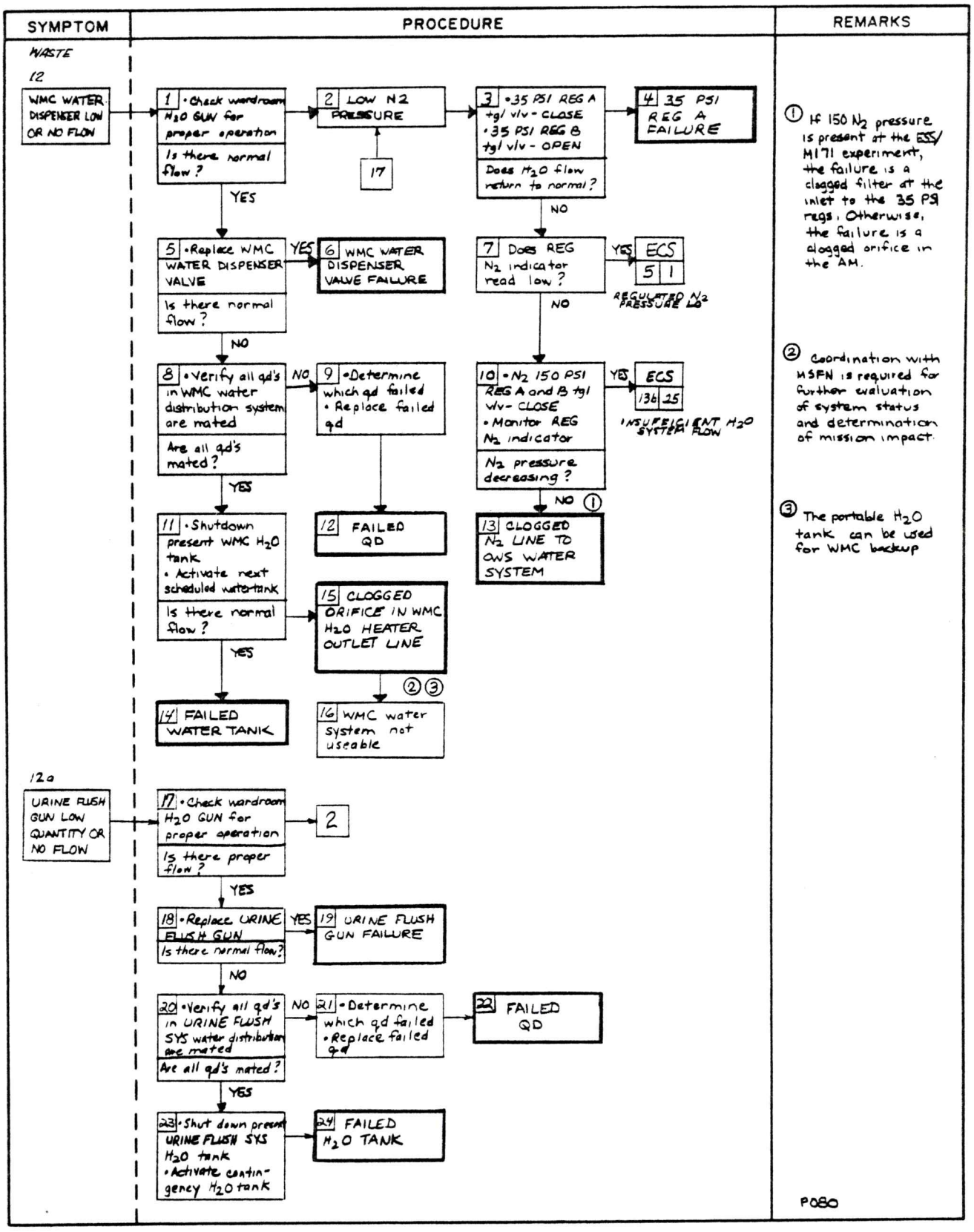
(a) H20 DUMP HTR SW (700)
H20 DUMP HTR IT (700)
LAMP TEST SW (700)
DUMP HTR IT (617)

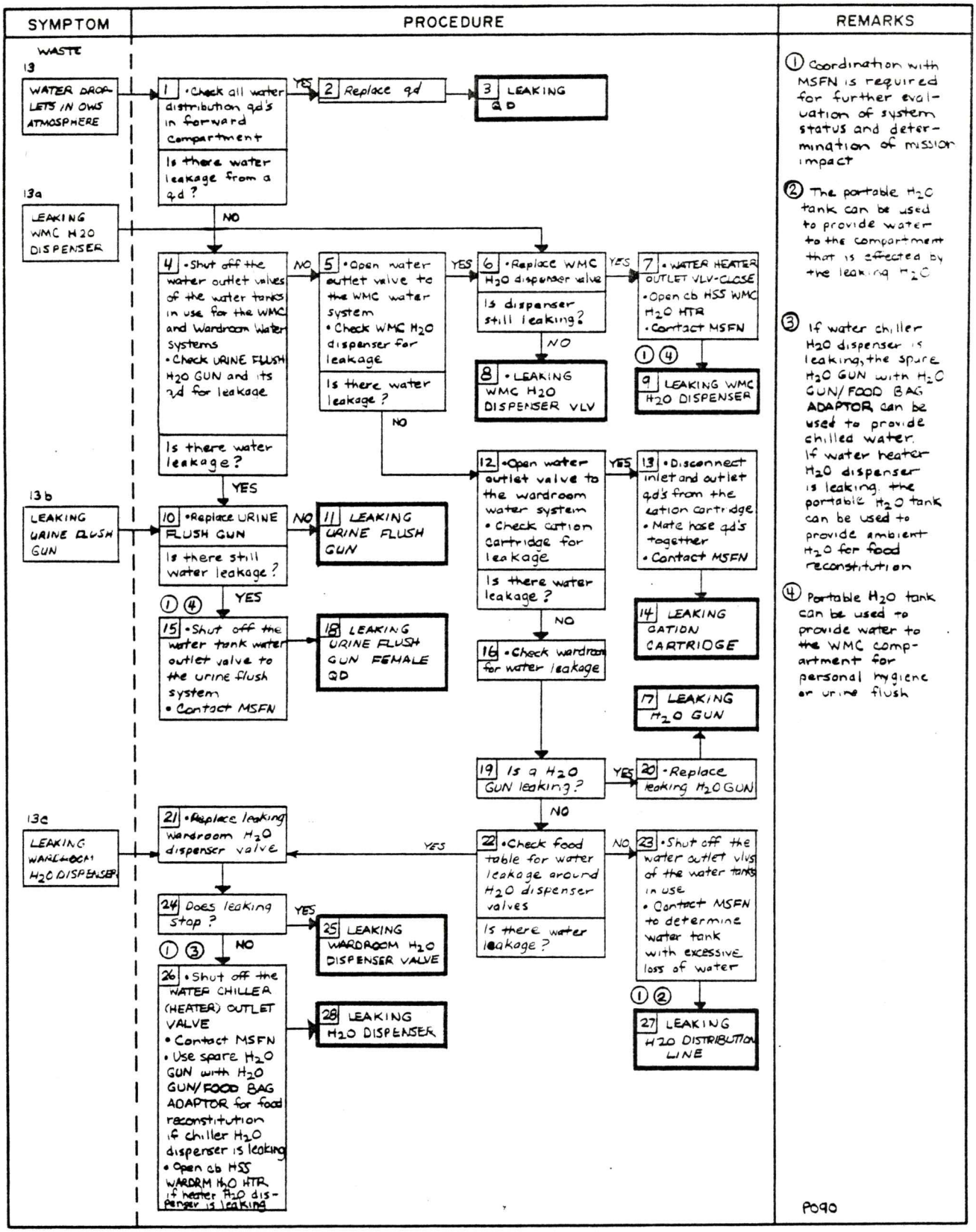
(b) DUMP HTRS URINE SW (700)
DUMP HTRS URINE IT (700)
LAMP TEST SW (800)
DUMP HTR IT (617)

(c) DUMP HTRS H20 SW (800)
DUMP HTRS H20 IT (800)
LAMP TEST SW (800)
DUMP HTR IT (617)

② Requires multiple failures

P070


SYMPTOM
PROCEDURE
REMARKS
WASTE
12
WMC WATER DISPENSER LOW OR NO FLOW
1 • Check wardroom H2O GUN for proper operation
Is there normal flow?
YES
2 LOW N2 PRESSURE
17
3 • 35 PSI REG A tgl v/v - CLOSE
• 35 PSI REG B tgl v/v - OPEN
Does H2O flow return to normal?
NO
4 35 PSI REG A FAILURE
5 • Replace WMC WATER DISPENSER VALVE
Is there normal flow?
YES
6 WMC WATER DISPENSER VALVE FAILURE
NO
7 Does REG N2 indicator read low?
YES
ECS 5 1
REGULATED N2 PRESSURE LO
NO
8 • Verify all qd's in WMC water distribution system are mated
Are all qd's mated?
NO
9 • Determine which qd failed
• Replace failed qd
YES
10 • N2 150 PSI REG A and B tgl v/v - CLOSE
• Monitor REG N2 indicator
N2 pressure decreasing?
YES
ECS 136 25
INSUFFICIENT H2O SYSTEM FLOW
NO (1)
11 • Shutdown present WMC H2O tank
• Activate next scheduled watertank
Is there normal flow?
YES
12 FAILED QD
13 CLOGGED N2 LINE TO OWS WATER SYSTEM
15 CLOGGED ORIFICE IN WMC H2O HEATER OUTLET LINE
(2) (3)
14 FAILED WATER TANK
16 WMC water system not useable
12a
URINE FLUSH GUN LOW QUANTITY OR NO FLOW
17 • Check wardroom H2O GUN for proper operation
Is there proper flow?
2
YES
18 • Replace URINE FLUSH GUN
Is there normal flow?
YES
19 URINE FLUSH GUN FAILURE
NO
20 • Verify all qd's in URINE FLUSH SYS water distribution are mated
Are all qd's mated?
NO
21 • Determine which qd failed
• Replace failed qd
22 FAILED QD
YES
23 • Shut down present URINE FLUSH SYS H2O tank
• Activate contingency H2O tank
24 FAILED H2O TANK
(1) If 150 N2 pressure is present at the ESS/M171 experiment, the failure is a clogged filter at the inlet to the 35 PSI regs. Otherwise, the failure is a clogged orifice in the AM.
(2) Coordination with MSFN is required for further evaluation of system status and determination of mission impact.
(3) The portable H2O tank can be used for WMC backup
P080


SYMPTOM
PROCEDURE
REMARKS
WASTE
13 WATER DROPLETS IN OWS ATMOSPHERE
13a LEAKING WMC H2O DISPENSER
13b LEAKING URINE FLUSH GUN
13c LEAKING WARDROOM H2O DISPENSER
1 • Check all water distribution qd's in forward compartment
Is there water leakage from a qd?
YES
2 Replace qd
3 LEAKING QD
NO
4 • Shut off the water outlet valves of the water tanks in use for the WMC and Wardroom water systems • Check URINE FLUSH H2O GUN and its qd for leakage
Is there water leakage?
NO
5 • Open water outlet valve to the WMC water system • Check WMC H2O dispenser for leakage
Is there water leakage?
YES
6 • Replace WMC H2O dispenser valve
Is dispenser still leaking?
YES
7 • WATER HEATER OUTLET VLV-CLOSE • Open cb H5S WMC H2O HTR • Contact MSFN
(1) (4)
9 LEAKING WMC H2O DISPENSER
NO
8 • LEAKING WMC H2O DISPENSER VLV
NO
12 • Open water outlet valve to the wardroom water system • Check cation cartridge for leakage
Is there water leakage?
YES
13 • Disconnect inlet and outlet qd's from the cation cartridge • Mate hose qd's together • Contact MSFN
14 LEAKING CATION CARTRIDGE
NO
16 • Check wardroom for water leakage
10 • Replace URINE FLUSH GUN
Is there still water leakage?
NO
11 LEAKING URINE FLUSH GUN
YES
(1) (4)
15 • Shut off the water tank water outlet valve to the urine flush system • Contact MSFN
18 LEAKING URINE FLUSH GUN FEMALE QD
17 LEAKING H2O GUN
19 Is a H2O GUN leaking?
YES
20 • Replace leaking H2O GUN
NO
21 • Replace leaking wardroom H2O dispenser valve
YES
22 • Check food table for water leakage around H2O dispenser valves
Is there water leakage?
NO
23 • Shut off the water outlet vlvs of the water tanks in use • Contact MSFN to determine water tank with excessive loss of water
(1) (2)
27 LEAKING H2O DISTRIBUTION LINE
24 Does leaking stop?
YES
25 LEAKING WARDROOM H2O DISPENSER VALVE
(1) (3)
NO
26 • Shut off the WATER CHILLER (HEATER) OUTLET VALVE • Contact MSFN • Use spare H2O GUN with H2O GUN/FOOD BAG ADAPTOR for food reconstitution if chiller H2O dispenser is leaking • Open cb H5S WARDRM H2O HTR if heater H2O dispenser is leaking
28 LEAKING H2O DISPENSER
(1) Coordination with MSFN is required for further evaluation of system status and determination of mission impact
(2) The portable H2O tank can be used to provide water to the compartment that is effected by the leaking H2O
(3) If water chiller H2O dispenser is leaking, the spare H2O GUN with H2O GUN/FOOD BAG ADAPTOR can be used to provide chilled water. If water heater H2O dispenser is leaking, the portable H2O tank can be used to provide ambient H2O for food reconstitution
(4) Portable H2O tank can be used to provide water to the WMC compartment for personal hygiene or urine flush
P090

SECTION 5.3

EMERGENCY PROCEDURES

INTRODUCTION

Emergency procedures provide the crew with the necessary steps to quickly alleviate situations that have (or will) become both crew-hazardous and/or destructive to spacecraft systems. The procedures require instant reaction on the part of the crew.

FIRE ALERT RESPONSE GROUND RULES AND ASSUMPTIONS

The fire alert response procedure (5.3.2) contained within this section is based upon the following ground rules and assumptions:

1. Priorities given consideration - in order of importance:
   a. Safe the crew
   b. Safe spacecraft equipment
   c. Recovery of systems and operational status
   d. Maintain capability to re-enter burned-out volume

2. Crew translation in response to fire alert should always be toward CM, obtaining life support and fire fighting equipment enroute.

3. Fire location and assessment will be accomplished enroute to CM.

4. Crew will fight fire if:
   a. Fire blocks path to CM
   b. Fire is visible
   c. Fire can be contained (assumes crew assessment of fire controllability prior to fire fighting attempt)
   When fighting fire crewman will position himself between CM and fire

5. Crew will deactivate circulation fans in alarm area

6. Crew will turn off electrical power to components in the alarm area. This equipment isolation will be back as far as bus where possible and appropriate. Power disconnect switches (panel 205) will not be utilized except in extreme conditions (to be identified).

7. Crew will deactivate flow of coolant loops utilizing Coolanol-15 in alarm area.

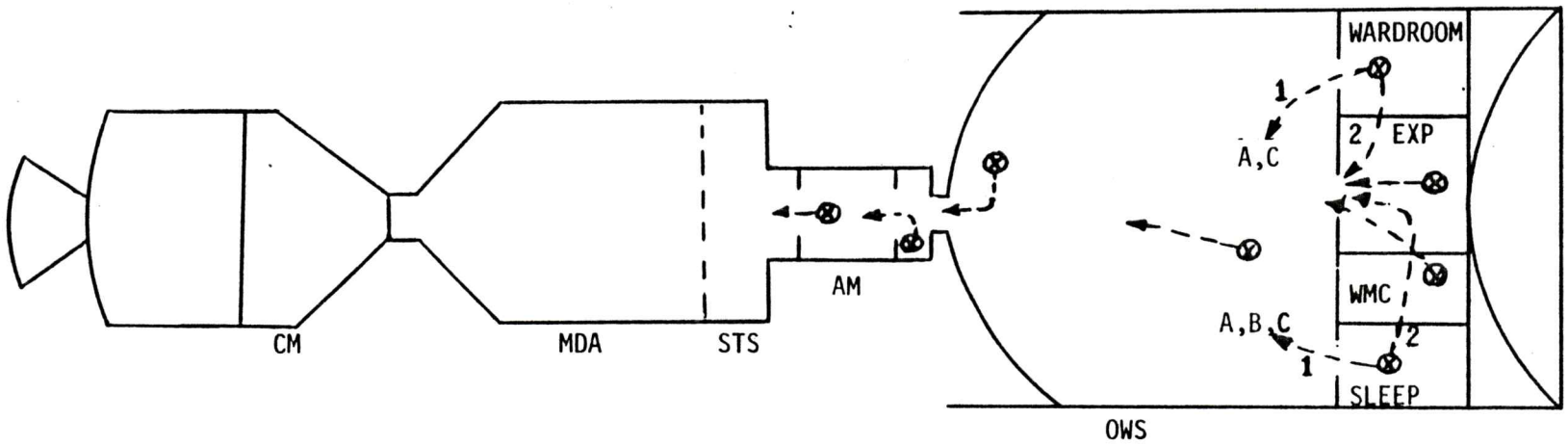
8. All fire alarms are considered valid.

9. Due to normal operational modes, cluster atmosphere venting is not considered as a means of extinguishing fire.

10. As many manual/command systems as possible (without jeopardizing crew safety during nominal operations) are assumed configured for command operation prior to fire alerts

11. Fire extinguishers are assumed:
    a. to have nozzles installed at time of fire alert
    b. to have been agitated periodically

12. All PGA (3) are assumed stowed in CM during entire habitation period except during EVA and suit drying



⊗ - CREW LOCATION
A - EMERGENCY EXIT IN COMPARTMENT CEILING NOT USED IF:
- o FIRE IS IN OWS FORWARD AREA
- o CREWMAN IS LOCATED IN COMPARTMENT WITHOUT EMERGENCY EXIT
- o VISIBILITY IS OBSCURED BY SMOKE IN OWS

B - SLEEP COMPARTMENT EMERGENCY EXIT LOCATED IN CENTER SLEEP STATION CEILING ONLY
C - ONLY ONE CREWMAN SHOULD UTILIZE EMERGENCY EXIT

FIRE RESPONSE ESCAPE ROUTES
Figure 5.3.2-1

CREWMAN	PANEL	PROCEDURE	REMARKS
		5.3.1 EMERGENCY COMMUNICATIONS (CSM INOPERATIVE)	
		1. DEACTIVATE MDA CONTROL UMBILICALS	
	CSM225	cb VHF/CREW STATION AUDIO CTR FLT/POST LDG BUS - open	
	CSM230	CSM/SWS INTERFACE SIGNAL sw - DISCONNECT	
		CSM/SWS INTERFACE SIGNAL SAFE tb - gray	Gray indicates SWS/CSM call circuit deactivated
	200	cb AUDIO SYS CREW ALERT CALL 1, 2 (2) - open	
		2. REMOVE MDA CONTROL UMBILICALS	
		Disconnect MDA control umbilicals (2) in CSM tunnel (SLOH/CSM 4.10.2.1)	
		Disconnect MDA control umbilicals (2) from INSTR A, B connectors (2) in MDA tunnel	
		Stow umbilicals	(M151)
		3. OBTAIN MDA CONTROL UMBILICAL SHORTING PLUGS (2)	
		4. INSTALL MDA CONTROL UMBILICAL SHORTING PLUGS ON INSTR A, B CONNECTORS	
		5. CONFIGURE AM TAPE RECORDER FOR EMERGENCY COMMUNICATIONS	
	204	TAPE RCDRS 1 sel - DATA VOICE	
		TAPE RCDRS 2 sel - EXP 1 VOICE	
		TAPE RCDRS 3 sel - OFF	
		TAPE RCDRS CONT sw - MANUAL SELECT	
	131	COMM CHAN sel - A ON	
	INTERCOM	Repeat above operation as required	
	131	[RCD/OFF] sw - OFF	Momentary switch
		Rcd lt - off (verify)	
		Unscrew Calfax fasteners (6) on AM tape recorder access panel	Two yellow Calfax if subsequent to tape recorder replacement
		Open hinged cover	
		Disconnect electrical cable at connector bracket 3	
		Disconnect EMERGENCY COMM SHORTING PLUG from dummy connector	(TBS)
		Install EMERGENCY COMM SHORTING PLUG on receptacle on connector bracket 3	
		Close access panel cover and tighten yellow Calfax fasteners (2)	
		6. CONFIGURE AM CONTROLS FOR EMERGENCY COMMUNICATIONS	
	131	[RCD/OFF] sw - RECORD	Momentary switch
		Rcd lt - on	
	204	TAPE RCDRS CONT sw - CMD	
		TAPE RCDRS 3 sel - EXP 2	Controls configured for R/T voice downlink
		TAPE RCDRS CONT sw - MANUAL SELECT	
		RCDR AUDIO sw - A	All downlink and recorded voice on channel A
		XMTRS sw - OFF	
		XMTR INPUT A sel - REAL TIME	
		XMTR INPUT B sel - EXP 2	
		XMTR INPUT C sel - OFF	
		XMTRS sw - ON	MSFN should be informed SWS ready for emergency downlink on subsequent passes

CREWMAN	PANEL	PROCEDURE	REMARKS
		5.3.1 EMERGENCY COMMUNICATIONS (CSM INOPERATIVE) (cont'd)	
		7. CONFIGURE CONTROLS FOR MSFN OPERATION TAPE RCDRS CONT sw - CMD XMTRS sw - CMD XMTR INPUT A sel - OFF XMTR INPUT B sel - OFF	
		NOTE MSFN AOS will be indicated to crew by TBS	
		5.3.2 FIRE RESPONSE	
		WARNING All crewmen, regardless of their location, retreat to CM along escape route. The following steps should be performed only while enroute to CM	Figure 5.3.2-1
		1. OBTAIN SAFETY EQUIPMENT Fire extinguisher(2)	(E632, E670, F587, D498, M180). Only those easily accessible along escape route
		SOMA/SOP	(M165, E632, E670) Toxicity level may necessitate utilization
		PGA (2)	(Suit drying station) If suit drying not in process, suits stowed in CM
		PCU (dry)	(F550) Supports suited reentry to affected area
	617, 206 FSCP	2. LOCATE FIRE Observe C&D panels or fire visually	
		3. ISOLATE ELECTRICAL POWER IN ALARM AREA Fire In OWS	
	206, 617	OWS BUS sw (2) - OFF	Momentary switches
	200	cb OWS RADIANT HTRS (4) - open	
		cb OWS HT EXCH FANS (4) - open	
	201	cb OWS BUS 1 FEEDERS CONT OWS - open	
		cb OWS BUS 2 FEEDERS CONT OWS - open	
	202	cb OWS REFRIG (2) - open	
		cb UTIL PWR AM 1 3 5 - open	
		cb SAL (2) - open	
		cb EMER LTS OWS (2) - open	After crewmen have vacated OWS
	627	If crew location allows, disconnect cables from intercoms in dome and experiment compartment	Deactivates all OWS intercoms
	401		
		Fire In AM/MDA	
	206	Monitor EPS indicators for excessive current	
		Isolate affected bus	POWER DISCON switches on panel 205 utilized only under TBS conditions

CREWMAN	PANEL	PROCEDURE	REMARKS
		5.3.2 FIRE RESPONSE (cont'd)	
		4. DEACTIVATE ATMOSPHERIC CIRCULATION IN AFFECTED AREA	
		Fire in AM/MDA	OWS fans deactivated in step 3
	203	MOL SV A FANS PWR sw - OFF	
		MOL SV B FANS PWR sw - OFF	
		AM FANS sw (4) - OFF	
		MDA FANS sw (3) - OFF	
	200	cb OWS HT EXCH FANS (4) - open	
		5. DEACTIVATE GLYCOL LOOP IN ALARM AREA	
		Fire In AM/MDA	OWS refrigeration loop deactivated in step 3
	203	PRI, SEC CLNT LOOP INV sel (2) - OFF	
		6. ENABLE MSFN CONTROL OF SYSTEMS	
		Fire In OWS/AM/MDA	
	403	If crew location allows, remove vent sealing device from SOLENOID VENT PORT	Paragraph 4.3.4.1
	202	cb OWS SOLENOID VENT VLVS (4) - close	Omit if vent sealing device not removed
		cb TACS CMD CONT (4) - close	
	200	cb VHF XPNDR - close	
	225	O2 FILL sw (2) - CMD	
		N2 FILL sw (2) - CMD	
		OWS FILL sw (2) - CMD	
		AM FILL sw (2) - CMD	
		7. BREAK FIRE PROPAGATION PATHS	
		Fire In OWS/AM/MDA	
		If crew location allows, disconnect OWS/AM VCS duct from OWS plenum inlet	
		Fire In OWS	
	234	[OWS/BOTH/MDA] vlv - MDA	
		Obtain gas supply duct caps from stowage	Paragraph 4.6.1.15, step 1
		Install caps on supply and return ducts	
		Fire In AM	
		Disconnect CM/MDA interchange duct	Paragraph 4.5.2.10, step 2
		8. FIGHT FIRE	
		Use fire extinguisher as required, if fire can be located visually, if fire blocks escape route; if fire can be contained	Paragraph 4.3.5.2. Fire extinguisher nozzles installed during activation and units periodically agitated
		9. ATMOSPHERIC CONTAMINATION REMOVAL	If OA atmospheric contamination minimal, MSFN venting or crew activation of OA fans may be attempted to scrub OA atmosphere
		NOTE	
		Step performed only if fire contained and extinguished	

CREWMAN	PANEL	PROCEDURE	REMARKS
		5.3.2 FIRE RESPONSE (cont'd)	
		10. ISOLATE FIRE LOCATION	
		Fire In OWS or AM Aft Compartment	
	325	Close AM aft hatch	Paragraph 4.6.1.6
		Deactivate AM coolant loop if fire in close proximity to OWS cooling heat exchanger module	AM coolant flow cannot be bypassed around OWS cooling heat exchanger
		Fire In AM/MDA (Less AM Aft Compartment)	
	100	Close MDA axial hatch	Paragraph 4.5.2.12, step 9

APPENDIX A

ABBREVIATIONS AND ACRONYMS

Abbreviations shall be used for all tenses, the possessive case, participle endings, the singular or plural, and the noun and modifying forms.

ac - alternating current
acc - accessory
ACCESS - accessory (This abbr appearing in the panel column of a procedure indicates that related steps apply to the following Hi Pwr Acc outlets: 115, 139, 402, 521, 531, 551, 631, 803)
accum - accumulator
ACS - Attitude Control System
adj - adjustment
AH - ampere hour
AID - Air Interchange Duct
altn - alternate
AM - Airlock Module
amp - ampere, amplifier
ant - antenna
ATM - Apollo Telescope Mount
att - attitude
auto - automatic
bat - battery
blwr - blower
BMMD - Body Mass Measurement Device
bp - barber pole
Btu - British thermal unit
byp - bypass
byps - bypass
cab - cabin
cal - calibrate
camr - camera
caut - caution
cb - circuit breaker
CCU - Crewman Communications Umbilical
ccw - counterclockwise
C&D - Control & Display
cfm - cubic feet per minute
chan - channel
chg - charge
chgr - charger
circ - circulation
clnt - coolant
clstr - cluster (orbital assembly)
CM - Command Module
cmd - command
Cmn - crewman
cmptr - computer
cndsate - condensate
cndst - condensate
cnst - canister
cntl - control
CO2 - carbon dioxide
comm - communication
compt - compartment
cond - condition
condg - conditioning
conn - connector
cont - control
cont'd - continued
cntr - controller
conv - converter
cool - coolant
CRDU - Command Relay Driver Unit
CS - Crew Systems
CSM - Command and Service Module
ctr - center
cw - clockwise
C/W - Caution and Warning
CWG - Constant Wear Garment
CWS - Center Work Station
DA - Deployment Assembly
dc - direct current
DCS - Digital Command System
decr - decrease
disc - discone
disch - discharge
discon - disconnect
disp - display
dkg - docking
dply - deploy
ECS - Environmental Control System
EKG - electrocardiogram
elec - electrical
elect - electronics
emer - emergency
emerg - emergency
enbl - enable
EPS - Electrical Power System
equal - equalization
ER - Earth Resources
EREP - Earth Resources Experiment Package
ESS - Experiment Support System
EVA - Extravehicular Activity
exch - exchanger
exp - experiment
°F - degrees Farenheit
fps - feet per second
FSA - Fire Sensor Assembly
FSCP - Fire Sensor Control Panel (This acronym appearing the panel column of a procedure indicates that related steps apply to the following UV Fire Detector Panels: 120, 236, 237, 238, 392, 529, 530, 618, 619, 633, 638, 639)
fwd - forward
g - gravity
GMT - Greenwich Mean Time
GN2 - gaseous nitrogen
gnd - ground
GO2 - gaseous oxygen
grp - group
GSE - Ground Support Equipment
hi - high
HPI - high-performance insulation
hr - hour
HSS - Habitability Support System
ht - heat
htr - heater
Hz - Hertz
HX - heat exchanger
icom - intercom
IFM - Inflight Maintenance
I/LCA - inverter/light control assembly
in - inch
IN - inlet
incr - increase
ind - indicator
inhbt - inhibit
inj - injector
instr - instrumentation
interchg - interchange

INTERCOM -intercom (This acronym appearing in the panel column of a procedure indicates that related steps apply to the following speaker intercom assemblies: 102, 116, 131, 401, 520, 540, 600, 627, 702, 801, 901, 902, 903)
inv -inverter
ips -inches per second
IVA -intravehicular activity
LBNP -Lower Body Negative Pressure
LCG -liquid cooling garment
LH -left hand
LH2 -liquid hydrogen
LiOH -lithium Hydroxide
lmtd -limited
lnch -launch
LO -low
LSU -Life Support Umbilical
lt -light
ltg -lighting
malf -malfunction
man -manual
max -maximum
MDA -Multiple Docking Adapter
mem -memory
MET -Mission Elapsed Time
min -minutes/minimum
mm -millimeter
mmHg -millimeters of Mercury
mn -main
MNA -main A
MNB -main B
mol -molecular
mom -momentary
mon -monitor
MPF -Multispectral Photographic Facility
MSC -Manned Spacecraft Center
MSFC -George C. Marshall Space Flight Center
MSFN -Manned Spaceflight Network
mux -multiplexer
N2 -nitrogen
N/A -not applicable
NASA -National Aeronautics and Space Administration
norm -normal
O2 -oxygen
OA -Orbital Assembly (CSM + OWS)
OSH -off-scale high
OSL -off-scale low
OUT -outlet
overtemp -overtemperature
OWS -Orbital Workshop
oz -ounces
P -pressure
ΔP -differential pressure
pb -pushbutton
PCG -power conditioning group
PCU -Pressure Control Unit
PGA -Pressure Garment Assembly
Plt -Pilot (Cmn 3)
PLV -post landing ventilation
pneu -pneumatic
pnl -panel
pos -position
pot -potentiometer
PP -partial pressure
ppm -parts per million
press -pressure
pri -primary
prog -program
psi -pounds per square inch
psia -pounds per square inch absolute
psid -pounds per square inch differential
psig -pounds per square inch gauge
rechg -recharge
ref -reference
refrig -refrigeration
reg -regulator
regen -regenerative
res -reservoir
RH -right hand
rly -relay
RS -Refrigeration System
SAL -Scientific Airlock
SAS -Solar Array System
sat -saturated
sec -secondary
sel -selector
seq -sequential
SEVA -Skylab Extravehicular Visor Assembly
sig -signal
SL -Skylab
SL-1,2 etc. -Mission designation
SLEOH -Skylab Experiments Operations Handbook
SLOH -Skylab Operations Handbook
SM -Service Module
SMMD -Speciment Mass Measurement Device
snsr -sensor
SOMA -Skylab Oxygen Mask Assembly
SOP -Secondary Oxygen Package
spect -spectrometer
SPG -single-point ground
spkr -speaker
SPT -Scientist pilot (Cmn2)
strt -start
STS -Structural Transition Section
sup -supply
sv -sieve
sw -switch
SWS -Saturn Workshop (ATM/OWS/AM/MDA)
sync -synchronization
sys -system
TACS -Thruster Attitude Control System
TBS -To Be Supplied
TCS -Thermal Control System
Te -elapsed time
temp -temperature
tgl -toggle
therm -thermal
TLM -Telemetry
TM -Telemetry
tmrs -timers
Tr -Time to go to redundant receiver/decoder
TRS -Time Reference System
ttg -time to go
tunl -tunnel
TV -Television (This abbr in the panel column of a procedure indicates the related steps apply to the following television stations: 133, 320, 404, 555, 642)
tx -time to go to equipment reset
UCTA -Urine Collection and Transfer Assembly
UHF -ultra-high frequency
USB -Unified S-band
UTIL -Utility (This abbr appearing in the panel column of a procedure indicates the related steps apply to the following utility outlets: 104, 112, 134, 140, 213, 214, 219, 221, 316, 390, 402, 521, 531, 551, 601, 628, 711, 803)
UV -ultraviolet
V -Volts
VHF -Very high frequency

PSS	-Propellant Supply Subsystem
pt	-point
pwr	-power
QCM	-Quartz crystal microbalance
qd	-quick disconnect
qtrs	-quarters (WMC = wardrm + exp compt + sleep compt)
rad	-radiator
rcd	-record
rcdr	-recorder
SUS	-Suit Umbilical System
vlv	-valve
vol	-volume
VOX	-Voice Operated Transmission
VTS	-Viewfinder/Tracking System
warn	-warning
wardrm	-wardroom
windw	-window
WMC	-Waste Management Compartment
WMS	-Waste Management System
xducer	-transducer
xfer	-transfer
xmit	-transmit
xmtr	-transmitter
xover	-crossover
xpndr	-transponder
ZLV	-Z-local vertical
ZPN	-impedance pneumogram

APPENDIX B

CONTROLS AND DISPLAYS

In the cluster reference system herein, panel numbering is sequenced starting with the Multiple Docking Adapter and extends back (-X direction) toward the Orbital Workshop. The panels are numbered in sequence, clockwise, within each module. Panels within each module or structural division use a hundred series number, thereby avoiding repetition of a given number within different modules. The major module, structural division, and first order numbering systems used are listed below:

Multiple Docking Adapter	100 - 199
Airlock Module	200 - 399
Orbital Workshop	400 -1099

During orbital operation, the Command Module and Saturn Workshop will be referred to as separate operational units; therefore, the Command Module C&D panels retain their present numbering system.

A tabular summary of the Saturn Workshop C&D panels and number designations; a C&D panel locator index and pictorial illustrations of OWS/AM/MDA C&D panels are included.

Page B-5 provides a summary of OA crew stations and their identifiers which are used for flight planning and activity element purposes. Each crew station consists of groups of C&D panels consistent with the numbering sequences defined herein.

100 - 199 Multiple Docking Adapter

100 - Axial Hatch
101 - Interior Lights Panel
102 - Intercom Box
103 - Vent Panel
104 - Utility Outlet #3
*105 - Experiment M512
*106 - Experiment S190
107 - Window Cover Latch
108 - Window Cover Crank
*109 - Experiment S191 C&D
*110 - EREP C&D
*111 - Experiment S009
112 - Utility Outlet #1
113 - M512 Work Chamber Vent Valve
114 - M512 Bulkhead Vent Valve
115 - High Power Accessory Outlet #1
116 - Intercom Box
117 - Window Heater Panel
118 - Radial Hatch
119 - Unassigned
120 - Fire Sensor Control Panel
*121 - Digital Address System
122-127 - Unassigned
*128 - Radio Noise Burst Monitor (Backup)
*129 - Radio Noise Burst Monitor
*130 - ATM Display and Control Console
131 - Intercom Box
132 - Video Selector
133 - Television Station
134 - Utility Outlet #2
135 - EREP Coolant Valve
*136 - Experiment S192
137-138 - Unassigned
139 - High Power Accessory Outlet #2
140 - Utility Outlet #4
141-159 - Unassigned
*160 - ATM Canister Roll Control
161-199 - Unassigned

Airlock Module 200 - 399

200 - 299 Structural Transition Section

200 - Circuit Breaker Panel (ECS/I&C)
201 - Circuit Breaker Panel (EPS)
202 - Circuit Breaker Panel (Miscellaneous)
203 - Control Panel (ECS)
204 - Control Panel (I&C)
205 - Control Panel (EPS)
206 - Control Panel (EPS/C/W)
207 - Control Panel (Lighting/C/W)
208 - Control Panel (Proton Spectrometer)
209 - Control Panel (Teleprinter)
210 - PCG Control Schematic
211 - Bus Distribution Schematic
212 - Clock
213 - Utility Power Outlet #1
214 - Utility Power Outlet #2
215 - Unassigned
216 - Condensate Panel
217 - Control Panel (IVA)
218 - Molecular Sieve B Vent Valve
219 - Control Panel (Utility Outlet #3, Mol Sieve B Bed N2 Supply Valve)
220 - Molecular Sieve A Vent Valve
221 - Control Panel (Utility Outlet #4, Mol Sieve A Bed N2 Supply Valve)
222 - Unassigned
223 - LCG Reservoir Pressurization Valve (System 1)
224 - LCG Reservoir Pressurization Valve (System 2)
225 - O2/N2 Control Panel
226 - Molecular Sieve A Control Valve Panel
227 - Molecular Sieve B Control Valve Panel
228 - Molecular Sieve A Bed Valves
229 - Molecular Sieve B Bed Valves
230 - Mol Sv A Heat Exchanger Valve Panel
231 - Unassigned
232 - Mol Sv B Heat Exchanger Valve Panel
233 - Mol Sv A Air Flow Valve Panel
234 - MDA/OWS Air Selector Valve
235 - ATM Coolant Reservoir Pressurization Valve
236 - Fire Sensor Control Panel
237 - Fire Sensor Control Panel
238 - Fire Sensor Control Panel
239 - Mol Sv B Air Flow Valve Panel
240 - Unassigned
241 - STS +Z Window Crank
242 - STS +Y Window Crank
243 - STS -Z Window Crank
244 - STS -Y Window Crank
245-299 - Unassigned

300 - 310 AM Forward Compartment

300 - Cabin Pressure Relief Valve
301-310 - Unassigned

311 - 389 AM Lock Compartment

311 - Forward Hatch
312 - Forward Hatch Handle
313 - Cabin Pressure Relief Valve
314 - Unassigned
315 - Unassigned
316 - Control Panel (EVA Support)
317 - Control Panel (EVA #1)
318 - Lock Compartment Depressurization Valve
319 - EVA Hatch Handle
320 - Television Station
321 - Extendible Boom Control Panel
322 - Unassigned
323 - Control Panel (EVA #2)
324 - Unassigned
325 - Aft Hatch
326 - Aft Hatch Handle
327-389 - Unassigned

390 - 399 AM Aft Compartment

390 - Control Panel (OWS Support)
391 - Cabin Pressure Relief Valve
392 - Fire Sensor Control Panel
393 - Condensate Dump Port
394-399 - Unassigned

Orbital Workshop 400 - 1099

400 - 499 Dome

400 - OWS Hatch
401 - Intercom Box
402 - Power Outlet (Utility #1 and #2, High Power Accessory #1 and #2)
403 - Solenoid Vent Port
404 - Television Station
405 - Pneumatic Vent Port
406-499 - Unassigned

500 - 599 Forward Compartment

500 - Control Panel (Water System Pressurization)
501-516 - Unassigned
517 - Scientific Airlock (+Z)
518 - Power Outlet (+Z SAL)
519 - Unassigned
520 - Intercom Box
521 - Power Outlet (Utility #1 and #2, High Power Accessory #1 and #2)
*522 - Experiment T020
*523 - Experiment M509
*524 - Experiment T027
*525 - Experiment S020
526 - Unassigned
*527 - Experiment M172
528 - Unassigned
529 - Fire Sensor Control Panel
530 - Fire Sensor Control Panel
531 - Power Outlet (Utility #3 and #4, High Power Accessory #3 and #4)
532-533 - Unassigned
*534 - Experiment T013
535-539 - Unassigned
540 - Intercom Box
541 - Unassigned
542 - Control Panel (Experiment Recorders)
543 - Scientific Airlock (-Z)
544 - Power Outlet (-Z SAL)
*545 - Experiment S019
546-550 - Unassigned
551 - Power Outlet (Utility #5 and #6, High Power Accessory #5 and #6)
552-554 - Unassigned
555 - Television Station
556-599 - Unassigned

600 - 699 Experiment Compartment

600 - Intercom Box
601 - Power Outlet (Utility #1 and #2)
602-606 - Unassigned
607 - Flare Alert Panel
608-609 - Unassigned
610 - Clock
611 - Circuit Breaker Panel (Refrigeration Sys)
612 - Circuit Breaker Panel (Power Outlet)
613 - Circuit Breaker Panel (Lighting/Exp)
614 - Circuit Breaker Panel (HSS/TCS)
615 - Circuit Breaker Panel (EPS)
616 - Control Panel (Lighting/Refrigeration Sys)
617 - Control Panel (EPS/TCS)
618 - Fire Sensor Control Panel
619 - Fire Sensor Control Panel
*620 - ESS/M171 N2 Panel
*621 - Experiment M092
*622 - Metabolic Analyzer
*623 - Experiment Support System
*624 - Experiment M171
*625 - Experiment M092 Vent Valve
626 - Unassigned
627 - Intercom Box
628 - Power Outlet (Utility #3 and #4)
629 - Unassigned
630 - Control Panel (Wardroom/WMC Lights)
631 - Power Outlet (Utility #5 and #6, High Power Accessory #1 and #2)
*632 - Experiment M131
633 - Fire Sensor Control Panel
634 - Trash Airlock
635-637 - Unassigned
638 - Fire Sensor Control Panel
639 - Fire Sensor Control Panel
640 - Dosimeter Panel
641 - Unassigned
642 - Television Station
643-699 - Unassigned

700 - 799 Wardroom

700 - Control Panel (H2O Dump/Window Heater)
*701 - Experiment S063 UV Sync Outlet
702 - Intercom Box
*703 - Experiment M074
704 - Unassigned
705 - Food Preparation Table
706 - Water Dump Valve
707 - Food Tray 1 Outlet
708 - Food Tray 2 Outlet
709 - Food Tray 3 Outlet
710 - Unassigned
711 - Power Outlet (Utility #1 and #2)
712-799 - Unassigned

800-899 Waste Management Compartment (WMC)

800 - Control Panel (WMC)
801 - Intercom Box
802 - Unassigned
803 - Power Outlet (Utility #1 and #2, High Power Accessory #1 and #2)
804-816 - Unassigned
817 - Waste Processor Circuit Breaker Panel
818 - Waste Processor Vent Valve/Urine Dump
819-821 - Unassigned
*822 - Experiment M074
823-824 - Unassigned
825 - Fecal/Urine Collector
826-830 - Unassigned
831 - Water Dump Valve
832-899 - Unassigned

900 - 999 Sleep Compartment

900 - Unassigned
901 - Intercom Box
902 - Intercom Box
903 - Intercom Box
*904 - Experiment M133
905-999 - Unassigned

1000 - 1099 Aft Compartment

1000 - Unassigned
1001 - Refrigeration Pump Package Vacuum Vent Valve
1002-1099 - Unassigned

*Denotes C&D Panels located in SLEOH and SLOH/ATM

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MISCELLANEOUS

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ORBITAL ASSEMBLY CREW STATIONS		PANEL NUMBERS	STOWAGE NUMBERS
CM	- COMMAND MODULE	-	-
M	- MDA	100 SERIES	M100 SERIES
ST	- STS	200 SERIES	M200 SERIES
A	- AM; FWD, LOCK & AFT COMPT	300 SERIES	A300 SERIES
VF	- FASS	-	-
VC	- ATM CWS	-	-
VT	- ATM SUN END TRFR	-	-
VS	- ATM SUN END WS	-	-
D	- OWS DOME	400 SERIES	D400
E	- OWS EXP	600 SERIES	E600
F	- OWS FWD	500 SERIES	F500
S	- OWS SLEEP	900 SERIES	S900
W	- OWS WARD	700 SERIES	W700
H	- OWS WMC	800 SERIES	H800
P	- OWS PLENUM	1000 SERIES	

7512

PANEL	
NO.	NAME
100	AXIAL HATCH
101	INT LIGHT PNL
102	INTERCOM BOX
103	VENT PNL
104	UTILITY OUT 3
105	M512 EXP
106	S190 EXP
107	WINDW COVER LATCH
108	WINDW COVER CRANK
109	S191 EXP D&C PNL
110	EREP PNL
111	S009 EXP
112	UTILITY OUT 1
113	M512 CHBR VENT VLV
114	M512 BLKHD VENT VLV
115	HIGH PWR ACCY OUT 1
116	INTERCOM BOX
117	WINDW HTR PNL
118	RADIAL HATCH
120	FIRE SENSOR CNTL PNL
121	DAS
128	RADIO NOISE BURST MON
129	RADIO NOISE BURST MON
130	ATM D&C PNL
131	INTERCOM BOX
132	VIDEO PNL
133	TV STATION
134	UTILITY OUT 2
135	EREP COOL VLV
136	S192 EXP
139	HIGH PWR ACCY OUT 2
140	UTILITY OUT 4
160	ATM EXT CNST ROLL

PANEL	
NO.	NAME
200	CB PNL (ECS/I&C)
201	CB PNL (EPS)
202	CB PNL (MISC)
203	CNTL PNL (ECS)
204	CNTL PNL (I&C)
205	CNTL PNL (EPS)
206	CNTL PNL (EPS, C&W)
207	CNTL PNL (LTG, C&W)
208	CNTL PNL (PROT SPECT)
209	CNTL PNL (TELEPRINT)
210	PCG CNTL SCH
211	BUS DISTR. SCH
212	CLOCK
213	UTILITY OUT 1
214	UTILITY OUT 2
216	CNTL PNL (CNDSATE)
217	CNTL PNL (IVA)
218	MOL SV B VENT VLV
219	UTILITY OUT 3 (MOL SV B BED N_2 VLV)
220	MOL SV A VENT VLV
221	UTILITY OUT 4 (MOL SV A BED N_2 VLV)
223	SYS 1 LCG RES PRESS VLV
224	SYS 2 LCG RES PRESS VLV
225	O_2/N_2 CNTL SYS PNL
226	MOL SV A VLV CNTL
227	MOL SV B VLV CNTL
228	MOL SV A BED VLVS
229	MOL SV B BED VLVS
230	MOL SV A HT EXCH CNTL PNL
232	MOL SV B HT EXCH CNTL PNL
233	MOL SV A AIRFLOW VLV PNL
234	MDA/OWS AIR SEL VLV
235	ATM CLNT RES PRESS VLV
236	FIRE SENSOR CNTL PNL
237	FIRE SENSOR CNTL PNL
238	FIRE SENSOR CNTL PNL
239	MOL SV B AIRFLOW VLV PNL
241	STS WINDW CRANK +Z
242	STS WINDW CRANK +Y
243	STS WINDW CRANK -Z
244	STS WINDW CRANK -Y

PANEL	
NO.	NAME
300	CABIN PRESS RELIEF VLV

PANEL	
NO.	NAME
311	FWD HATCH
312	FWD HATCH HANDLE
313	CABIN PRESS RELIEF VLV
316	EVA SUPPORT CNTL PNL
317	EVA PNL 1
318	LOCK DEPRESS VLV
319	EVA HATCH HANDLE
320	TV STATION
321	EXTENDIBLE BOOM PNL
323	EVA PNL 2
325	AFT HATCH
326	AFT HATCH HANDLE

PANEL	
NO.	NAME
390	CNTL PNL (OWS, LTG, TCS)
391	CABIN PRESS RELIEF VLV
392	FIRE SENSOR CNTL PNL
393	CONDENSATE DUMP PORT

PANEL	
NO.	NAME
400	OWS HATCH, PRESS EQ VLV
401	INTERCOM BOX
402	PWR OUT (UTILITY 1&2 HIGH PWR ACCY 1&2)
403	SOLENOID VENT PORT
404	TV STATION
405	PNEUMATIC VENT PORT

PANEL	
NO.	NAME
500	WATER SYS PRESS PNL
517	+Z SAL
518	+Z SAL PWR OUT
520	INTERCOM BOX
521	PWR OUT (UTILITY 1&2 HIGH PWR ACCY 1&2)
522	T020 EXP
523	M509 EXP
524	T027 EXP
525	S020 EXP
527	M172EXP
530	FIRE SENSOR CNTL PNL
531	FIRE SENSOR CNTL PNL
531	PWR OUT (UTILITY 3&4, HIGH PWR ACCY 3&4)
534	T013 EXP
540	INTERCOM BOX
542	EXP RCDR CNTL PNL
543	-Z SAL
544	-Z SAL PWR OUT
545	S019 EXP
551	PWR OUT (UTILITY 5&6 HIGH PWR ACCY 5&6)
555	TV STATION

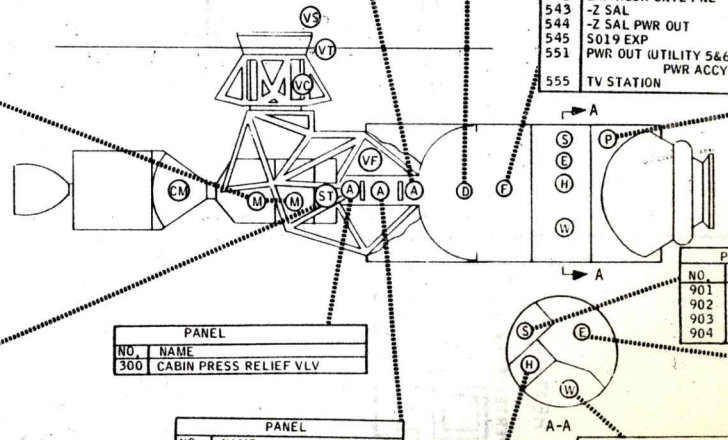
PANEL	
NO.	NAME
1001	REFR PUMP PKG
	VAC VENT VLV

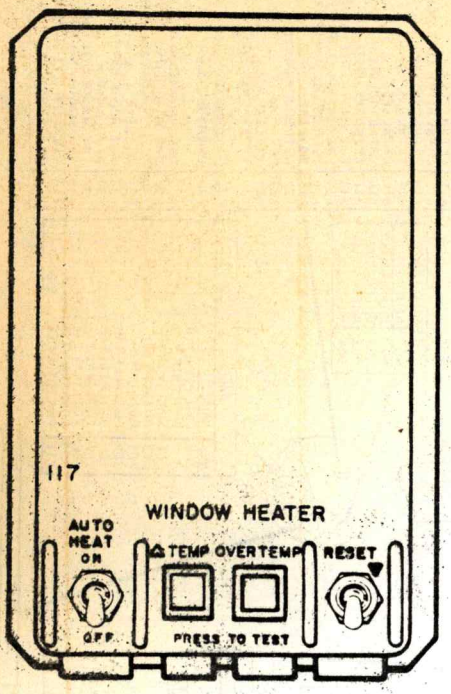
PANEL	
NO.	NAME
600	INTERCOM BOX
601	UTILITY OUT 1&2
607	FLARE ALERT PNL
610	CLOCK
611	CB PNL REFRIG
612	CB PNL HI PWR & UTIL OUT, TV
613	CB PNL LTG, EXP, C&W
614	CB PNL HSS TCS
615	CB PNL EPS
616	CB PNL LTG, REFRIG, C&W
617	CB PNL EPS, INSTR, TCS
618	FIRE SENSOR CNTL PNL
619	FIRE SENSOR CNTL PNL
620	ESS/M171 N_2 SUPPLY PNL
621	M092 EXP
622	METABOLIC ANALYZER
623	ESS
624	M171 EXP
625	M092 VAC VENT VLV
627	INTERCOM BOX
628	UTILITY OUT 3&4
630	CNTL PNL WARDRM/WMC LTGS
631	PWR OUT (UTILITY 5&6, HIGH PWR ACCY 1&2)
632	M131 EXP
633	FIRE SENSOR CNTL PNL
634	TRASH AIRLOCK
638	FIRE SENSOR CNTL PNL
639	FIRE SENSOR CNTL PNL
640	VAN ALLEN BELT DOSIMETER
642	TV STATION

PANEL	
NO.	NAME
700	CNTL PNL H_2O DUMP/ WINDW HTR
701	S063 UV SYNC
702	INTERCOM BOX
703	M074 EXP
705	FOOD PREP TABLE
706	WATER DUMP VLV
707	FOOD TRAY 1 OUTLET
708	FOOD TRAY 2 OUTLET
709	FOOD TRAY 3 OUTLET
711	PWR OUT (UTILITY 1 & 2)

PANEL	
NO.	NAME
800	CNTL PNL WMC
801	INTERCOM BOX
803	PWR OUT (UTILITY 1&2 HIGH PWR ACCY 1&2)
817	CB PNL WASTE PROCESSOR
818	PROCESSOR VENT / URINE DUMP
822	M074 EXP
825	FECAL/URINE COLLECTOR
831	WATER DUMP VLV

PANEL	
NO.	NAME
901	INTERCOM BOX
902	INTERCOM BOX
903	INTERCOM BOX
904	M133 EXP





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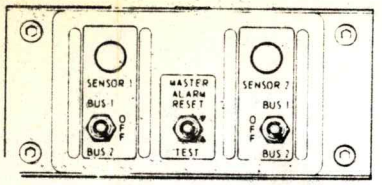

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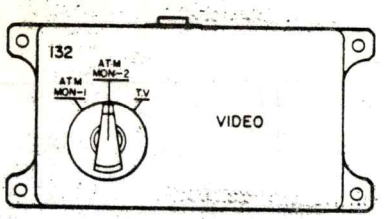

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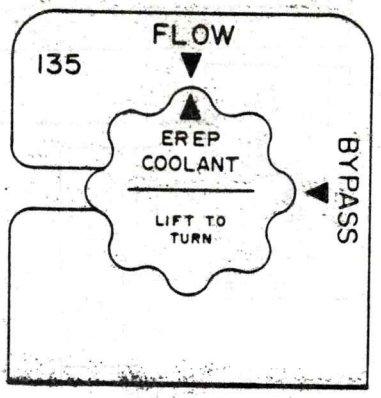

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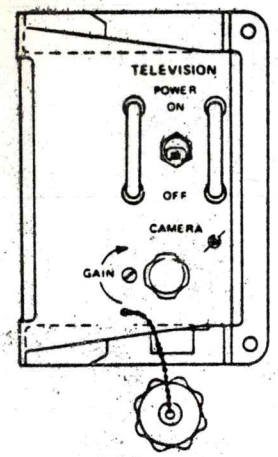

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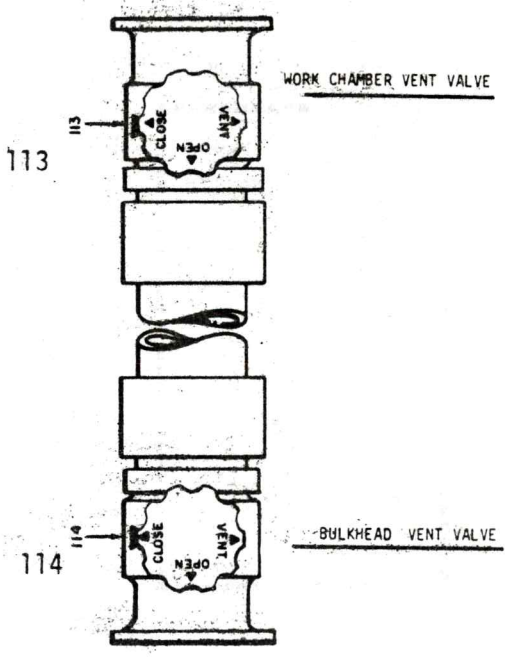

NOTE:
▲SYMBOL DENOTES MOMENTARY SWITCH POSITION AND DOES NOT APPEAR ON PANEL

APPENDIX C

TOOL MATRIX

| | | Spin-Type Handle | Ratchet Handle | 4-Inch Extension | 8-Inch Extension | 5/32 Square Driver Bit | 3/32 Hex Driver Bit | 1/8 Hex Driver Bit | 5/32 Hex Driver Bit | 3/16 Hex Driver Bit | 3/32 Allen Wrench | 5/32 Allen Wrench | 3/16 Allen Wrench | 3/8 Standard Screwdriver Bit | No. 3 Hi-Torque Screwdriver Bit (T3S) | 3/32 Screwdriver | 3/16 Screwdriver (E624) | No. 2 Phillips Screwdriver | 1/4 Standard Socket | 5/16 Standard Socket (T3S) | 3/8 Standard Socket (E624) | 7/16 Standard Socket | 5/16 Deepwell Socket | 5/16 Open End/Box | 11/32 Open End/Box | 3/8 Open End/Box (E624) | 7/16 Open End/Box | 9/16 Open End/Box | 3/4 Open End/Box | 1 Open End/Box | 1 1/8 Open End/Box | 1 1/4 Open End/Box | 1 3/8 Open End/Box (T3S) | Diagonal Cutter (E624) | Connector Pliers | Pinch Bar | O-Ring Extractor | Scissors (E623) | 1-Inch Red Tape | Tool Caddy (E625) | Utility Belt | Lubricant (E623) | Utility Cable (D418) | Portable Light | Repair Kit (F520) | 3/16 Screwdriver Blade | Screwdriver Handle | Retaining Ring Removal Tool (CSM) | Pin Removal Tool | Seal Removal Tool | 11/16 Open End Box | CSM Tool B | CSM Ratchet Handle | Leak Detector (T3S) | Cluster Leak Repair Kit | 1/4 12-Point Standard Socket |
|---|---|---