

# **STS 41G NATIONAL SPACE TRANSPORTATION SYSTEMS MISSION REPORT**

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November 1984



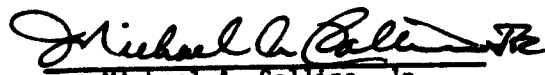
**National Aeronautics and  
Space Administration**

**Lyndon B. Johnson Space Center  
Houston, Texas**

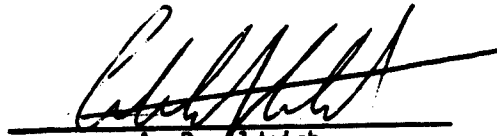
STS 41-G

NATIONAL SPACE TRANSPORTATION SYSTEMS PROGRAM

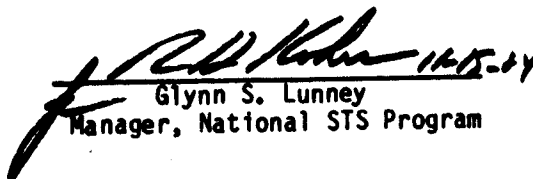
MISSION REPORT



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## INTRODUCTION AND MISSION OBJECTIVES

The STS 41-G National Space Transportation Systems Program Mission Report contains a summary of the major activities and accomplishments of the thirteenth Space Shuttle flight and the sixth flight of the OV-099 vehicle, Challenger. This report also summarizes the significant problems that occurred and provides a problem tracking list that is a complete listing of all problems that occurred during the flight. None of the problems will affect the STS 51-A flight.

The primary objectives of this flight were to successfully deploy the ERBS (Earth Resources Budget Satellite) spacecraft, and to conduct operations of the OAST-3 (Office of Space and Terrestrial Applications), the LFC (large format camera), the ORS (orbital refueling system), the CANEX (Canadian experiments), and the IMAX camera.

The sequence of events for this mission is shown in table I. The problem tracking list for the Orbiter is shown in table II at the end of the report.

## MISSION SUMMARY

The STS 41-G mission, the sixth flight for the OV-099 vehicle, Challenger, was launched from Launch Complex 39A at KSC (Kennedy Space Center) on October 5, 1984. Data were collected on all 14 detailed test objectives, as well as on the 11 detailed supplementary objectives. In the areas of payloads and experiments, all except the SIR (Shuttle Imaging Radar) accomplished essentially all of their objectives.

The crew for this flight were Robert L. Crippen, Captain, USN, Commander; Jon A. McBride, Commander, USN, Pilot; Sally K. Ride, PhD., Kathryn D. Sullivan, PhD., and David C. Leetsma, Lt. Cdr., USN, Mission Specialists; Paul D. Scully-Power, PhD., Payload Specialist; and Marc Garneau, PhD., Canadian Payload Specialist.

The ascent phase was normal in all respects; however, on orbit the crew reported that a section of AFRSI (advanced felt reusable surface insulation) was missing from the starboard OMS (orbital maneuvering system) pod, and some TPS (thermal protection system) tiles had minor damage. The loss and damage did not impact the mission. All other Orbiter subsystems performed satisfactorily during ascent.

The SRB's (solid rocket boosters) performed satisfactorily. The propellant burn rates were essentially as predicted and a satisfactory SRB separation occurred 0.27 second later than predicted. The external tank subsystems performed as expected and no TPS anomalies were observed. The MPS (main propulsion system) performance was excellent with main engine cutoff occurring at the predicted time.

The first day of the STS 41-G mission was very active. The ERBS (Earth Radiation Budget Satellite) was released about 2 hours 50 minutes later than planned because the solar array on the satellite did not deploy when commanded. After exposure to the Sun, the solar arrays deployed, and the satellite was released in a very stable attitude with rates of less than 0.01 deg/sec.

Thruster R3R (primary right yaw) was automatically deselected at 279:11:26 G.m.t. The thruster remained deselected for the remainder of the mission. At 279:23:54 G.m.t., a Ku-band antenna bypass message was noted and, coincident with this message, the Ku-band RF power went to zero. The Ku-band power cable in Avionics Bay 3A in the aft middeck was disconnected to remove all Ku-band antenna drive signals and leave the antenna in a selected position. The Orbiter was then maneuvered to aim the antenna at the TDRS (tracking and data relay satellite).

TABLE I. - STS 41-G SEQUENCE OF EVENTS

EVENT	Actual G.m.t.
APU activation (1)	279:10:58:12
(2)	279:10:58:11
(3)	279:10:58:10
SRB HPU activation command (RH-B2)	279:11:02:32.7
MPS start command sequence (engine 3)	279:11:02:53.4
SRB ignition command from GPC (lift-off)	279:11:03:00
MPS throttledown to 92 percent thrust (engine 3)	279:11:03:18.4
MPS throttle down to 65 percent thrust (engine 3)	279:11:03:26
Maximum dynamic pressure	279:11:03:51
MPS throttleup to 100-percent thrust (engine 3)	279:11:03:58
SRB separation command	279:11:05:04
MPS throttledown for 3g acceleration (engine 3)	279:11:10:52
Main engine cutoff (MECO)	279:11:11:50.8
External tank separation	279:11:12:08.4
OMS-1 ignition	279:11:13:50.5
OMS-1 cutoff	279:11:16:04
APU deactivation (APU 3)	279:11:16:57
OMS-2 ignition	279:11:49:30
OMS-2 cutoff	279:11:51:54
Earth Resources Budget Satellite release	279:22:18:22
Start extravehicular activity	285:15:38
End extravehicular activity	285:19:05
OPS-8 (flight control system) checkout	286:13:46:04
APU-2 activation	287:15:25:01
Deorbit maneuver ignition	287:15:30:00
Deorbit maneuver cutoff	287:15:32:22
APU-1 and -3 activation	287:15:42:09
Entry interface (400,000 ft)	287:15:55:04
End blackout	287:16:12:00
Terminal area energy management	287:16:20:12
Main landing gear contact	287:16:26:33
Nose landing gear contact	287:16:26:47
Wheels stop	287:16:27:32
APU deactivation complete	287:16:37:00

STS 41-G activities during the second day included performing troubleshooting and inflight maintenance procedures on the Ku-band and SIR-B antennas, in addition to the planned payload activities.

The difficulties in refolding and latching the SIR-B antenna delayed the OMS-3 maneuver. The RMS (remote manipulator system) arm end effector was used to push the outer antenna leaf into position so it could be latched.

ORS transfer no. 1 was successfully completed with 70 pounds of hydrazine transferred in approximately 25 minutes. Review of available data indicates that the ORS performed nominally.

STS 41-G activities during the third day included successful data dumps from the HDRR (high data rate recorder) through the Ku-band antenna that was being pointed using Orbiter attitude control. A decision was made to delay the EVA (extravehicular activity) from day 5 to day 7 so that the Ku-band antenna could be stowed later in the mission and thereby allow more SIR-B data to be collected and dumped through TDRS. Two extremely successful ORS fuel transfers were also performed. ERBS reported a successful transfer from TDRS to G-station communications and that their test calibration burns worked precisely as planned.

The FES (flash evaporator system) shut down on primary A controller. Numerous attempts to re-establish control using primary A system were unsuccessful. One attempt on the primary B controller was also unsuccessful.

Science accomplishments were the major activities during the fourth day of the STS 41-G mission. Some SIR-B activities were lost as a result of the temporary loss of TDRS because the HDRR could not be dumped. This outage caused a loss of telemetry data for all experiments since data and communications occurred only over ground stations, even though several additional ground stations had been added.

After conditioning the flash evaporator by using the high temperature set point for the freon loop, an attempt to restart the evaporator using controller B resulted in dislodging the ice around the evaporator.

During the fifth day, another activation attempt of the FES using the B controller resulted in restoration of satisfactory FES operation. Soon after the FES was activated, the loop set point was lowered to 41.5° F and immediately the cabin and payload coolant loop temperatures began to decrease with the payload loop stabilizing at about 44°F and the cabin at 77° F.

The ORS had two successful transfers followed by a successful "staged depressurization".

The sixth day of the STS 41-G mission was spent collecting payload data and preparing the EMU's (extravehicular mobility units) for the planned EVA on day 7. Included in these preparations was the lowering of the cabin pressure to 10.2 psia.

A very successful 3-hour 27-minute EVA was conducted during the seventh day. Payload activities during the seventh day were near the planned levels except for the SIR-B which completed only 35 percent of the planned data takes.

The ORS ball valve modification kit installation was successfully accomplished according to plan during the EVA. Following the EVA, leak checks of the ORS modification kit valve showed no leaks. In addition, the EVA astronauts positioned the Ku-band antenna successfully for gimbal lock and pinning. Once pinned, the antenna was then redeployed for further use.

A problem developed when CRT (cathode ray tube) 2 went blank. Data evaluation did not isolate the source of the problem. The crew reloaded the software and CRT 2 was successfully brought back on-line. However, after less than 1 hour of operation, CRT 2 again went blank. The cables of DEU (display electronics unit) 2 and DEU 4 were interchanged and the CRT operated satisfactorily for the remainder of the flight.

On the eighth day, final stowage and preparations were completed for entry and landing at Kennedy Space Center. The flight control system checkout using APU (auxiliary power unit) 3 was successfully completed with 3 minutes 11 seconds run time on the APU. All Orbiter systems continued to operate satisfactorily.

The final ORS hydrazine transfers were successfully completed using the plumbing and connections made during the EVA. Over 100 percent of the planned mission objectives for this experiment were completed flawlessly.

With all preparations for entry completed, the deorbit maneuver was performed at 287:15:30:00 G.m.t. The entry was normal in all respects with all PTI's (programmed test inputs) being performed as planned. After completing the heading alignment circle turn angle of 190 degrees, the final approach to the Shuttle Landing Facility at KSC was initiated. Main gear touchdown occurred at 287:16:26:38 G.m.t. about 1639 feet past the runway threshold. The nose gear touched at 287:16:27:32 G.m.t. and the Orbiter rollout required 9952 feet.

#### VEHICLE ASSESSMENT

##### SOLID ROCKET BOOSTER

All SRB (Solid Rocket Booster) systems performed as expected. The SRB prelaunch countdown was nominal with no problems noted. Performance of both solid rocket motors was close to the predicted values and well within the allowed envelopes.

Propellant burn rates were essentially as predicted. Preliminary indications are that the SRB separation occurred approximately 0.27 second later than predicted. The SRB recovery system performed nominally, and both SRB's were reported floating in the normal manner. All parachutes were recovered with no indication of damage.

##### EXTERNAL TANK

All ET (external tank) systems performed as expected. There were no prelaunch LCC (launch commit criteria) violations. No TPS anomalies were observed. There was no acreage ice, only some minor frost spots. It was observed that there was more frost than usual on the LH2 feedline. This occurrence had no effect on flight performance. Impact of the tank was within the predicted footprint.

##### SPACE SHUTTLE MAIN ENGINE

SSME (Space Shuttle Main Engine) performance data followed trends which were similar to those observed during previous flights. Ice/frost inspection for indicated three engines appeared better than previously seen. All mainstage SSME flight data were nominal. The HPOTP (high pressure oxidizer turbopump) and HPFTP (high pressure fuel turbopump) turbine discharge temperatures compared favorably with predicted values. SSME start and cutoff appeared to be normal.

##### MAIN PROPULSION SYSTEM

Overall performance of the MPS (main propulsion system) was excellent. Liquid oxygen and liquid hydrogen loading was accomplished as planned. Liquid oxygen and liquid hydrogen loads relative to predicted values were about 1500 and 600 lbm low, respectively.

Ascent performance appeared to be normal. MECO was near the predicted time. Two MPS measurement failures occurred and these were both minor in nature and had no impact on the flight.

## ORBITER

### Flash Evaporator System Shutdown

The FES (flash evaporator system) automatically shut down on the primary A controller at 282:14:50 G.m.t. A number of attempts to restart the system, using the A controller, plus one attempt with the B controller, were unsuccessful. Data analysis indicated that the flash evaporator core was possibly iced or frozen up. At 282:18:33 G.m.t., a FES restart on primary "B" controller was again attempted. Although an automatic under-temperature shutdown occurred after 6 minutes, the topping steam duct temperatures also dropped, indicating movement of the ice out of the ducts. Another restart attempt with "B" controller at 283:10:51 G.m.t. was successful and the FES operated satisfactorily for the rest of the mission.

### Thermal Protection System Damage on Orbital Maneuvering System Pod

An inflight TPS (thermal protection system) inspection showed a multilayer FRSI (flexible reusable surface insulation) closeout strip approximately 6x40 inches located at the aft edge of the tile/FRSI interface on the right-hand OMS (orbital maneuvering system) pod was missing. A more in-depth inspection of subsequent inflight video showed that the missing FRSI filler strip had most probably exposed the structural skin panels. Analysis indicated that the affected area would experience entry temperatures of approximately 700 to 750 degree F and some debonding of the exposed structure was possible, but no safety issue existed with the entry profile planned. Postflight inspection confirmed that the graphite epoxy panels forward and aft of the missing FRSI strip had debonded and the inner face sheets had bulged inward. The right-hand pod will be removed for repair.

### Ku-Band Antenna Beta Gimbal Control Lost

At about 279:23:54 G.m.t., the Ku-band antenna experienced oscillations of the alpha gimbal and control of the beta gimbal was lost. The crew removed electrical plug P377 from EA1 (electronics assembly 1) and disabled the gimbal drive, after which the gimbals only moved in response to an external force such as OMS (orbital maneuvering system) burns. This movement was slight, and Ku-band communications were maintained through TDRS (tracking data relay satellite), using the Orbiter/TDRS track attitude procedure.

During the EVA (extravehicular activity), the Ku-band deployed assembly was rotated to the STOW position by using the DIRECT STOW switches. The EVA crew then positioned the antenna to the lock position which enabled the cabin crew to lock the pins by applying 28 Vdc to pins E and F of plug P377. The antenna was then re-deployed and thereafter HDR (high data rate) and TV transmissions were continued through TDRS. There was no problem when stowing the antenna for entry.

### Display Electronics Units 2 and 3 Failed

At approximately 285:22:20 G.m.t., the crew reported that CRT (cathode ray tube) 2 went blank with an "I/O ERROR CRT 2" message and a DEU (display electronics unit) 2 bite flag tripped. Analysis of downlink data indicated that a transient hardware failure caused a software upset in the DEU. The DEU's software was reloaded and CRT 2 was recovered. The display failed again in approximately 1 hour. A cable exchange was performed to use DEU 4 to drive CRT 2. No further problem was encountered with CRT 2 for the remainder of the mission.



The crew also reported an interface problem between the right keyboard and DU (display unit) 3. When DU 3 was turned on after the failure of DEU (display electronics unit) 2, the keyboard was unable to drive keys on the left column. Control was re-established temporarily by cycling power on DU 3. The right keyboard was able to control DU 3 the following day, but intermittent control losses continued to occur to DU 2 throughout the rest of the mission. However, control of DU 3 from the left keyboard was never lost.

#### Missing Wing Chine Tile and Faulty Tile Screed Area

The postflight inspection showed that one tile was missing in the left-hand wing chine area. Inspection of the missing-tile cavity revealed a small area of exposed screed which was soft and sticky and the red RTV (room temperature vulcanizing) 560 material appeared degraded over the remainder of the cavity as expected. Pull tests of adjacent tile resulted in several tile failing at less than specification values.

#### PAYLOADS AND EXPERIMENTS

The cargo configuration for STS 41-G was comprised of four primary payloads, eight GAS (Getaway Special) canisters, four middeck experiments and the series of experiments associated with Canada (CANEX) and operated by the Canadian payload specialist. The primary payloads were the ERBS (Earth Radiation Budget Satellite), the LFC (Large Format Camera), the ORS (Orbital Refueling System), and the OSTA-3 (Office of Space and Terrestrial Applications-3) experiments. OSTA-3 consisted of three major components and these were the SIR-B (Shuttle Imaging Radar System), the MAPS (Measurement of Air Pollution from Satellites), and the FILE (Feature Identification and Location Experiments). The GAS canisters contained experiments from Utah State University, Kayser Threde from West Germany, the Alabama Space and Rocket Center, the USAF and Naval Research Labs, Marshall-McShane, the Goddard Space Flight Center, and the McDonnell-Douglas Company. The middeck experiments were the IMAX camera, the APE (Auroral Photographic Experiment), the RME (Radiation Monitoring Experiment), and the TLD (Thermoluminescent Dosimeter). The CANEX experiments consisted of five activities and these were the VISET (Space Vision System Experiment Development Tests), the ACOMEX (Advanced Composite Materials Exposure), the OGLOW (Orbiter Glow and Atmospheric Emissions) measurements, the SPEAM (Sun Photometer Earth Atmosphere Measurements), and the SASSE (Space Adaptation Syndrome Supplemental Experiments).

#### EARTH RADIATION BUDGET SATELLITE

Following the launch, orbital insertion, and payload activation activities, the ERBS was prepared for deployment. The ERBS deployment was delayed from orbit 6 to orbit 9 because of thermally induced problems that delayed deployment of the ERBS antenna. The deployment was accomplished with acceptable tipoff rates. On flight day 3, the initial ERBS maneuver (RCS cal burn) of 3 hours duration placed the ERBS in a 228 nmi. orbit. Subsequent planned burns successfully placed the ERBS in its final 352 nmi. orbit.

#### ORBITAL REFUELING SYSTEM

The ORS contained 189 pounds of hydrazine and a total of six transfers were successfully completed with no anomalies. An EVA was used to safely attach a flexline to a typical satellite valve in the payload hardware. Following the EVA, the system was safely leak tested and approximately 130 pounds of hydrazine were transferred through the valve. No anomalies were encountered during the EVA and the crew safely accomplished the tasks with no hydrazine contamination. The data acquired during the transfers are being evaluated. The successful accomplishment of the transfers demonstrated the feasibility of on-orbit refueling of satellites from an ORS-type tanker system.

## OFFICE OF SPACE AND TERRESTRIAL APPLICATIONS-3

### Shuttle Imaging Radar-B

A total of 9 hours of digital data and 8 hours of optically recorded data were acquired during the mission. Prior to launch, it was anticipated that 42 hours of digital data and 8 hours of optically recorded data would be acquired. Two instrument anomalies were encountered and these involved the folding of the SIR-B antenna prior to latching and the amount of back scattered power observed in the radar telemetry signals. The first anomaly was corrected by a revised procedure for driving the leaves of the antenna into their pre-latch positions. The second anomaly was attributed to an intermittent reduction in transmitted power and compensation was made by boosting the gain of the radar receiver during on-orbit operations. Preliminary processing of selected SIR-B images at the Jet Propulsion Laboratory indicates that data of generally high quality were acquired throughout the mission.

### Measurement of Air Pollution from Satellites

The MAPS sensor functioned nominally throughout the mission. Data collection was suspended for 10 hours during the middle of the mission due to thermal fluctuations in the coolant loop used to stabilize the MAPS operating temperature. Two globally synoptic surveys of atmospheric carbon monoxide concentration were conducted at the beginning and end of the mission on flight days 1 to 3 and days 7 to 8, respectively. These surveys were conducted at a spatial resolution of 10 degrees by 10 degrees and from 57 degrees north latitude to 57 degrees south latitude. The two data sets provide a unique opportunity to study temporal variations in carbon monoxide distribution on a global basis for the first time. Successful airborne under-flights to acquire in situ measurements of carbon monoxide concentration during the mission were performed on the east and west coasts of the United States. Data acquired by these airborne sensors will be used to evaluate sensor performance for calibration purposes. The MAPS experiment was considered to be a complete success.

### Feature Identification and Location Experiment

The FILE instrument operated nominally and image data were acquired over a range of natural environments. This experiment was considered to be a complete success.

### LARGE FORMAT CAMERA

A total of 2300 photographic frames were obtained, as originally planned. High-priority coverage of Mt. Everest in Nepal was acquired. A special roll maneuver was performed during flight day 8 to obtain oblique photography of Hurricane Josephine off the eastern coast of the United States. The LFC experiment was considered to be a complete success.

### GETAWAY SPECIAL CANISTERS

The groups of getaway special canisters were operated as preflight planned.

### AURORAL PHOTOGRAPHY EXPERIMENT

The APE (Auroral Photography Experiment) consisted of crew-conducted photography from the aft flight deck to document Orbiter encounters with the auroral zone. The experiment used standard 35-mm camera equipment supplemented by a USAF-provided image intensifier and filter assembly. Results obtained from STS 41-G are over 200 excellent photographs showing the Earth's aurora and Orbiter glow. These photographs are currently being analyzed by the USAF Geophysics Laboratory to determine the extent and duration of Orbiter exposure to the high-energy electron flux which creates the Earth's aurora. All activities on STS 41-G were a complete success.

## IMAX

All IMAX photography was accomplished as planned during the mission.

## THERMOLUMINESCENT DETECTOR

The Hungarian TLD experiment was successfully accomplished. The six dosimeters were unstowed and located next to the United States PRD's (passive radiation dosimeters) at about 3 hours into the mission. The dosimeters were then collected and read at six different times during the flight. There were no problems or anomalies reported. Preliminary postflight results indicate that the TLD measurements were in excellent agreement with the PRD's.

## CANADIAN EXPERIMENTS

### Space Vision System Experiment Development Tests

From the daily verbal reports and the successful analysis of downlinked video from the experiment, it was concluded that all objectives were achieved.

### Advanced Composite Materials Exposure

Over 90 percent of mission objectives (exposure and observation of the specimen) were met.

### Orbiter Glow and Atmospheric Emissions

Seventy-five percent of all objectives and 100 percent of all prime objectives were met.

### Sun Photometer Earth Atmosphere Measurements

All sun photometer, high sun, and sunset measurements required were obtained. Sunrise readings were unsuccessful.

### Space Adaptation Supplemental Experiments

All on-orbit tests were completed as planned. Entry and postlanding tests were completed.

TABLE III.- JSC CV-103 STS 41-G PROBLEM TRACKING LIST.

JSC OV-099 STS 41-G PROBLEM TRACKING LIST		NOV 05, 1984	
NO.	TITLE	TIME, G.M.T.	COMMENTS
1	HYDRAULIC ACCUMULATOR 1 PRESSURE (V58P0167A) DROPPED.	PRELAUNCH 279:08:25	DROPPED TO 1632 PSIA. LCC MIN IS 1906 PSIA. CYCLED SEVERAL TIMES. RETURNED TO NORMAL PRESSURE. OPERATED NORMAL FOR LAUNCH. SUSPECT TRANSIENT CONTAMINATION. FLY AS IS UNLESS PROBLEM REPEATS.
2	RIGHT RCS YAW JET (R3R) FAILED OFF.	279:11:26:17	JET DESELECTED. DATA INDICATES OXIDIZER VALVE DID NOT OPEN. T/S AT KSC IN HMF. IPR. CHIT J-1370.
3	INSTRUMENTATION FAILURES:		
A	SSME 2 GH2 OUTLET PRESSURE (V41P1260A) FAILED.	279:11:07:54	READ OFF-SCALE HIGH. R&R.
B	SSME 1 GH2 OUTLET TEMPERATURE (V41T1161A) FAILED.	279:11:09:21	READ OFF-SCALE HIGH. READ ON-SCALE AFTER MECO. R&R WITH IMPROVED DESIGN SENSOR.
C	APU 2 BEARING 1 TEMPERATURE (V46T0261A) FAILED.	PRELAUNCH	READ OFF-SCALE LOW. FOUND AN OPEN CIRCUIT BETWEEN SIGNAL CONDITIONER AND MDM. WIRING REPAIRED.
4	RIGHT OMS ON-BOARD HELIUM PRESSURE GAGE FAILED.	PRELAUNCH	CREW REPORT AT 279:12:36 ON-BOARD GAGE READ OFF SCALE LOW. CRT, C&W AND BOTH DOWNLINK READINGS NORMAL. FOUND AN OPEN CIRCUIT IN CONNECTOR BETWEEN SIGNAL CONDITIONER AND SELECTOR SWITCH.
			D. HAINES CAR 17F003 CLOSED 10/31/84
			C. HOHMANN CAR 17F011 CLOSED 11/05/84
			CLOSED 10/31/84
			D. PREVETT CAR 17F001
			D. PREVETT CAR 17F002
			W. SCOTT R. EGUSQUIZA
			C. HUMPHRIES R. EGUSQUIZA CLOSED 11/05/84

TABLE III.- JSC OV-103 STS 41-G PROBLEM TRACKING LIST.

JSC OV-099 STS 41-G PROBLEM TRACKING LIST

NOV 05, 1984

NO.	TITLE	TIME, G.M.T.	COMMENTS	RESP. MGR.
5	THERMAL PROTECTION SYSTEM (TPS) DAMAGED ON OMS PODS.	LAUNCH	CREW REPORT AT 279:15:03. A 40-INCH LONG STRIP OF FRSI ABOUT 6 INCHES WIDE PEELED OFF RIGHT POD. TV INSPECTION OF R POD ALSO SHOWED A 4X8 INCH FRSI SECTION LIFTED UP IN FORWARD INBOARD CORNER. A 3X6 INCH V-SHAPED SECTION ON LAST ROW OF TILE WAS DAMAGED ON LEFT POD. NO SAFETY CONCERN FOR ENTRY. R POD DELAMINATED. R&R WITH OV-104 POD. CHANGED PROCESS.	J. SMITH CAR 17F010 CLOSURE IN PROCESS
6	KU BAND ANTENNA GIMBAL CONTROL LOST.	279:23:54	BCE BYPASS KU MESSAGE RECEIVED. ANTENNA DID NOT MOVE IN BETA AXIS. IFM PERFORMED TO OBTAIN RF POWER AND DISABLE ANTENNA DRIVE. USED ORBITER TO POINT FOR SIR-B HDRR DATA. USED EVA IFM TO LOCK BOTH ANTENNA AXES FOR STOWAGE. FOUND SHORT IN DEPLOYED ASSEMBLY BETA DRIVE-MOTOR ARMATURE. R&R. SCREW BACKED OUT OF BRUSH BLOCK ASSEMBLY.	R. FENNER CAR 17F005 CAR 17F007 CLOSURE IN PROCESS
7	APU 2 PUMP DRAIN-LINE HEATER A FAILED. (V46T0286A).	280:00:45	B HEATER SELECTED AND TEMPERATURES RETURNED TO NORMAL. PROBABLE THERMOSTAT (S112A) PROBLEM. HEATER NICKED. R&R THERMOSTAT AND HEATER.	W. SCOTT CLOSED 10/31/84
8	AFT FLIGHT DECK PORT WINDOW (W10) HAD ICE-LIKE PARTICLES BETWEEN PANES AND FORWARD WINDOWS (W 1 AND 4) WERE CHIPPED.	279:12:41	CREW REPORTED, AFTER PLBD OPEN, LITTLE FLECKS AS SEEN ON STS 41-C. FLECKS FOUND POSTFLIGHT AND IN PICTURES TAKEN ON ORBIT. SOME FLECKS ALSO IN W10 ON OV-103. SUSPECT CONTAMINATION OR COATING SEPARATION. R&R W1&4.	O. PIGG CLOSED FOR STS 51-C 11/05/84
9	FES SHUTDOWN USING BOTH CONTROLLERS.	281:14:50	SHUTDOWN ON CONTROLLER A, RESTARTS UNSUCCESSFUL. AT 281:16:56 SWITCHED TO CONTROLLER B, SHUTDOWN AGAIN. PROBABLY ICING PROBLEM IN FES CORE. WENT TO HIGH SET POINT (57 DEG) TO WARM FES. DAY 4 FES OPERATION FOR 6 MIN CLEARED ICE BEFORE UNDERTEMP SHUTDOWN. DAY 5 FES OPERATION NORMAL ON CONTROLLER B. SUSPECT SYSTEM A PULSING VALVE LEAK. INSPECTION AND X-RAY LOOK GOOD. R&R.	H. ROTTER CAR 17F004 CLOSURE IN PROCESS

TABLE III.- JSC OV-103 STS 41-G PROBLEM TRACKING LIST.

NOV 05, 1984

JSC OV-099 STS 41-C PROBLEM TRACKING LIST

NO.	TITLE	TIME, G.M.T.	COMMENTS	RESP. MGR.
10	DEU 2 FAILED.	285:22:20	CRT 2 WENT BLANK. ISOLATED TO DEU 2. CREW SWAPPED CABLES WITH DEU 4. R&R. VENDOR ISOLATED TO A CARD IN DEU.	P. SOLLOCK CAR 17F008 CLOSED 10/31/84
11	RIGHT KEYBOARD CONTROL OF DEU 3 LOST.	285:22:20	CONTROL INTERMITTENT. T/S AT KSC, DID NOT REPEAT. R&R DEU 3 AND RIGHT KEYBOARD. CHIT J-1389.	P. SOLLOCK CAR 17F009 CLOSED 10/31/84
12	MISSION EVENTS TIMER ON PANEL 03 LOST ONE HORIZONTAL SEGMENT ON LEFT DIGIT.	286:11:38	CREW REPORT. RED LIGHT ON. SUSPECT FAILED OR OPEN FILAMENT. R&R WITH MET FROM OV-102.	A. FARKAS CAR 17F014 CLOSED 10/31/84
13	TWO BRACKETS ATTACHED TO GALLEY FOR PRIVACY CURTAIN DEBONDED AND GALLEY BOTTOM DOOR DID NOT LOCK IN OPEN POSITION.	286:11:38	CREW REPORT. ONE PRIVACY CURTAIN BRACKET DEBONDED FROM BULKHEAD LAST OV-099 FLIGHT. SEE STS-41C-24. REBONDED TO GALLEY PER PRINT. SPRING LOADED BALL DETENT DID NOT LOCK DOOR IN OPEN POSITION DURING MEAL PREP.	R. TRABANINO CLOSURE IN PROCESS
14	COLOR TV CAMERA ON RMS ELBOW LOST COLOR WHEEL SYNCHRONIZATION.	279:16:09 284:20:06	RECOVERED FIRST TIME BY CYCLING POWER. R&R. FIAR JSC-EE-0592.	B. EMBREY JSC-EE-0592 CLOSED IN PROCESS
15	LEFT RCS FUEL PRIMARY HELIUM REGULATOR B INTERNAL LEAK.	284:09:03	LEAK DETECTED WHEN SYSTEM WENT TO OMS INTERCONNECT. LEAK RATE APPROXIMATELY 430 SCCH. NO MISSION IMPACT. T/S AT KSC.	C. HOHMANN CAR 17F012 CLOSED 10/31/84
16	RIGHT OMS OXIDIZER DRAIN-LINE TEMPERATURE (V43T6237A) ERRATIC.	282:02:57	EXCEEDED FDA LIMIT OF 110 DEG F BY 2 DEG ON B HEATERS. RAISED LIMIT TO 125 DEG F. SWITCHED TO A HEATERS AND CYCLED AT 25 DEG LOWER TEMPERATURES. R&R THERMOSTAT IN HMF.	C. HUMPHRIES CAR 17F016 CLOSED 11/01/84

TABLE III.- JSC OV-103 STS 41-G PROBLEM TRACKING LIST.

JSC OV-099 STS 41-C PROBLEM TRACKING LIST		NOV 05, 1984	
NO.	TITLE	TIME, G.M.T.	COMMENTS
17	BRAKES DAMAGED.	LANDING	CRACKS IN BERYLLIUM ON ROTOR 4 OF RHIB, LHIB AND RHOB BRAKES AND ON ROTOR 3 OF RHOB BRAKE. TZM WASHERS BROKEN. R&R. CAR 17F006. C. CAMPBELL CLOSURE IN PROCESS
18	MLG ALL 4 TIRES HAD A FLAT SPOT AND SECOND TREAD RIB WORN TO CORD ALL AROUND ON RIGHT INBOARD TIRE.	LANDING	FLAT SPOTS SIMILAR TO STS-11 BUT SKID MARKS WERE 3X LONGER INDICATING LOWER SINK RATE AT MLG TOUCHDOWN. RHIB HAD DIAGONAL TEAR PATTERN ON SECOND TREAD RIB. R&R. MAY PAINT TOUCHDOWN AREAS. C. CAMPBELL CLOSURE IN PROCESS
19	RMS WRIST ROLL ENCODER CHECK ALARM DURING RMS POWER-UP AND 4 WARNING LIGHTS POPPED OUT DURING ASCENT.	285:14:15	ALARM UNEXPLAINED AFTER APPLYING KNOWN BIASES. CREW RESET 3 LIGHTS BUT PIN IN BACK OF "CHECK CRT" LIGHT CAME OUT. REMOVE AND REPAIR INDICATOR AND REINSTALL. J. PECK CLOSED 11/05/84
20	PAYLOAD SPECIALIST STATION FLOODLIGHT FAILED.	ON ORBIT	CREW DEBRIEFING. KSC FOUND CB50 ON PANEL R15 POPS AFTER ABOUT 40 SECONDS. SUSPECT COMPONENT FAILURE IN CONTROL ELECTRONICS. R&R. A. FARKAS CAR 17F013 CLOSED 10/31/84
21	SIR-B ANTENNA OUTER LEAF DIVERGENT OSCILLATION UNTIL INNER LEAF DEPLOYED.	ON ORBIT	CREW DEBRIEFING. NO KSC ACTION. WILL REDESIGN PRIOR TO NEXT FLIGHT OF SIR ANTENNA. H. NITSCHKE R. BALDWIN
22	CREW INTERFACE:		CLOSED 11/05/84
A	VOLUME "C" DOOR OPENED AT LAUNCH, HAD TO PRY "H" OPEN ON ORBIT AND WCS DOOR DID NOT CLOSE ON ORBIT.	IN FLIGHT	WCS DOOR WAS 1/4 IN SHORT, TAPED CLOSED. FIX DEFINED IN MCR 10742. CHIT J-1393. G. SANDARS J. GOODMAN
B	EVA FLASHLIGHT FAILED.	EVA	BULB CAME LOOSE INSIDE LIGHT, EV-1 USED MIRROR ON LIGHT. ADDED EPOXY TO RETAIN BULB FOR STS 51-A. R. MARAK
C	EVA OPERATIONAL SLIDE WIRE CUSHION STRAP DIFFICULT TO SECURE.	EVA	EV-1 UNABLE TO SNAP USING ONE HAND. USED BOTH HANDS TO SECURE TWO TETHER HOOKS AND STEEL GUIDES ON SLIDE WIRE FOR ENTRY. FLY AS IS. J. O'KANE

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JSC OV-099 STS 41-G PROBLEM TRACKING LIST		NOV 05, 1984	
NO.	TITLE	TIME, G.M.T.	COMMENTS
D	EVA SLIDE WIRE SAFETY TETHER TENSION TOO HIGH.	EVA	EV-1 & 2 BOTH LOCKED TAKE-UP REELS DURING PART OF EVA. REDUCED TENSION PROPOSED FOR STS 51-D.
E	OUTER HATCH EQUALIZATION VALVE COVER BROKE LOOSE.	EVA	EV-1 RETRIEVED COVER FROM PAYLOAD BAY. PROBABLY KICKED DURING EGRESS OR INGRESS. PILOT SNAPPED TETHER BACK ON TO COVER FOR ENTRY.
23	MPS HELIUM PNEUMATIC SYSTEM PRESSURE DECAYED DURING ASCENT.	ASCENT	DECAYED FROM 4200 TO 3800 PSIA. SIMILAR TO PROBLEM 36 DURING STS-7 ON OV-099. SUSPECT CONTAMINATION IN A SOLENOID VALVE. T/S AT KSC.
24	ACIP FAILED BEFORE LAUNCH.	PRELAUNCH	TURNED ON ABOUT 17 SECONDS BEFORE LAUNCH. ALL ACIP SCIENCE DATA WENT OFF SCALE HIGH 4 SECONDS LATER WHEN 5-VOLT POWER SUPPLY READ OFF SCALE LOW. ACIP HOUSEKEEPING DATA WAS GOOD. R&R WITH OV-102 ACIP.
25	ONE THERMAL PROTECTION SYSTEM (TPS) TILE MISSING FROM LEFT WING GLOVE AREA.	IN FLIGHT	IN THE MISSING TILE CAVITY, A SMALL AREA OF EXPOSED SCREED WAS SOFT AND STICKY WITH THE RED RTV 560 DEGRADED. VERIFYING TILE BOND ON OV-103 AND OV-099.

PREPARED BY: /s/RJW  
ROBERT J. WARD

11/05/84  
DATE

APPROVED BY: /s/JEM  
JOSEPH E. MECHELAY

11/05/84  
DATE

MASA-JSC