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STS-078 (OV-102,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 1

IFA NUMBER> STS-78-D-01

TITLE:LOSS OF READ/WRITE SERVERS

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062117 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M MCC-01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: M.HENDERSON DA

2:

0 DESCRIPTION:

At 0911L on 07/05, the read/write server operation became degraded and eventually both CPUs crashed. The first CPU crashed at 0936L, second CPU crashed at 0956L. This resulted in significant degradation in MCC workstation operation. Read/write server support was restored at 1017L by performing a power recycle on both CPUs. The problem occurred during an attempt to restore disk redundancy on the read/write server. The restore procedure was initiated due to a failure detected at 2200L on 07/04, at which time it was determined that redundancy had been lost on 2 of 4 disk sets. Redundancy was restored on the first set of disks at 0515L on 07/05. In an attempt to restore a second set of redundant disks, the restore command did not execute. An alternate restore procedure was invoked at 0908L on 07/05 (which had been previously exercised successfully), resulted in degradation and subsequent crash on

both read/write server CPUs.

THERE WERE TWO INDIVIDUAL PROBLEMS IDENTIFIED:

1) Read/write server CPU crash during attempt to recover redundany
   -performed attempt to recreate problem post flight, no adverse effect identified
   -only differences noted between execution of procedure performed on occurrence and attempt post mission were related to load on the system and execution of initial attempt to restore redundancy on 07/05 which did not execute.
   -system crash dumps were acquired on original failure, under analysis by digital engineering
2) Loss of disk redundancy
   -experienced 6 occurrences during STS-78 mission
   -enhanced logging was enabled on 06/25, revealed pattern to two disk drive failures (media errors)
   -digital engineering support identified a secondary problem with disk firmware which caused loss of redundancy when disk drive failures were experienced
   -disk errors should recover automatically with on-line spare, mirroring should not be impacted
   -recommendation for resolution included replacement of suspect disk drives to resolve root cause problem and upgrade of firmware to resolve recovery problem

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IFA NUMBER> STS-78-D-01

TITLE:LOSS OF READ/WRITE SERVERS

0 DESCRIPTION: (Continued from previous page).

RESOLUTION OF CPU CRASH WHICH RESULTED IN LOSS OF READ/WRITE SERVER SUPPORT.

The situation was introduced by a combination of failure state of the system and attempted recovery procedures. The crash dumps are still under investigation by EC, analyis being performed on a 24 hr/day basis.

THE LOSS OF DISK REDUNDANCY HAS BEEN TRACED TO TWO PROBLEMS:

1) suspect hard disk drive failures
   -disk drives have been removed from system and sent to digital engine engineering analysis
2) Ability to recover from disk errors
   -disk firmware defect confirmed by digital, upgrade to version with fix scheduled to be implemented by 07/13

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STS-078 (OV-102,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 3

IFA NUMBER> STS-78-E-01

TITLE:MAIN ENGINE 2036 VIOLATED THRUST BUILD-UP RATE DURING ENGINE START

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1996-07-17 HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062117 PHASE:

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	A16881	A	UCR A033728

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: J.EBERT RKDN

2:

0 DESCRIPTION:

Main engine 2036 violated the thrust build up rate during STS-78 engine

start. The requirement specified in the ICD 13M15000 Rev AA, paragraph 7.6.2a, states that the thrust build up rate will not exceed 14,000 lbs. Thrust change for any two consecutive 20 millisecond time intervals above 15% of rated power level thrust. Three total data points violated the 14,000 lb / 0.020 second requirement with two being consecutive in time.

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STS-078 (OV-102,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-78-I-01

TITLE:MPS LH2 LOW LEVEL CUTOFF (LLCO) SENSOR INDICATED DRY

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062117 PHASE:

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
*	********NONE FOUND*******	*	********NONE FOUND*******

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: D. WHITEHEAD - JSC-MS

2:

0 DESCRIPTION:

The MPS LH2 low level cutoff (LLCO) sensors indicated dry 2.3 seconds after Main Engine Cutoff command during the shutdown transient flow. This is the first occurrence of the LH2 LLCO sensors flashing dry since return-to-flight. Post flight reocnstruction has determined that an unbalanced usage of propellant was experiencd. Approximately 800 lbs more LH2 and 3200 lbs less LO2 was consumed than predicted. This is the first time in the Shuttle Program history that insufficient LH2 remained

to burn all available LO2. An investigation is underway to detrmine the cause of the excessive LH2 consumption and propellant usage imbalance.

1

STS-078 (OV-102,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-78-M-02

TITLE:SOOTING/HEAT EFFECTS BEYOND J-LEG INSULATION TIP ON FIELD JOINTS

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1996-07-17 HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062117 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

A A16880 D DR4-5/286

T PFAR 360L055A-02

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.GRAVES THIOKOL-RSRM

2:

0 DESCRIPTION:

Heavy sooting and heat effects (discoloration and charring) observed on insulation interfaces within STS-78 field joints. There were no heat effects to metal interfaces or Capture Feature (CF) O-rings, no gas past CF O-rings. All engineering and Contract End Item (CEI) specification requirements met. However, this is a first occurrence of heat effect within J-leg Insulation. All 6 field joints exhibited some degree of gas penetration past the J-leg tip. Soot/char patterns were most extensive in the center joints. The aft joints were next, with forward joints exhibiting only slight soot penetration at localized points. The LH center exhibited 9 locations with soot to CF O-ring and seal surfaces - no charring but, slight discoloration at some locations. The

RH center exhibited 3 locations with light soot slightly past J-leg radius - no charring or discoloration present after cleaning. Aft and forward joints did not exhibit any soot patterns past the radius. The concern is change in J-leg insulation performance and implications to field joint performance.

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STS-078 (OV-102,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-78-V-01

TITLE:GPC 5 I/O TERMINATE B DISCRETE ERRATIC (ORB)

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 172 : 15.18.00

IFA DATE: 06/20/1996

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.29.00

PRACA STATUS: CLOSED : 1996-10-15 HOUSTON TIME: 10.18.00

PRCBD NUMBER: S062117 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 80V-0003	M	DPS-01
M	MER-01	P	SPR/CAR 78RF03

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.MUNOZ EV2 X38359

2:

0 DESCRIPTION:

The General Purpose Computer (GPC) 5 input/output (I/O) terminate B discrete began behaving erratically, toggling from high to low six times. The Backup Flight System (BFS) software was contained in GPC 5. The I/O term B discrete control GPC I/O on the flight critical buses.

The BFS software was successfully loaded into GPC 2 at approximately 176:20:05 G.m.t. A dump and compare of the GPC 2 software confirmed a

nominal software load. During the same time frame, GPC 5 was initial-program loaded (IPL) with PASS, loaded with GNC OPS 2 software, and placed in a redundant set with GPC 1 (commanding no strings). The GPC 5 output switch was placed in the terminate position. This configuration was maintained, with no anomalous GPC 5 behavior observed, until 177:21:01 G.m.t. (approximatley 25 hrs), at which time the GPC 5 output switch was placed in normal. This configuration was maintained until deorbit preparations and no further occurrences of the erratic I/O term B discrete were observed.

Troubleshooting steps involving GPC 4 were taken to assist in isolating the failure. The GPC 4 output switch was placed in the backup position at 181:17:07 G.m.t. to provide insight into a possible failure between the essential bus (ESS) 3AB fuse powering the backup position of the GPC output BFS regardless of which GPC contained the BFS software. No toggles were seen and the GPC 4 output switch was placed interminate at 184:07:29 G.m.t.

During deorbit preparations at 189:09:19 G.m.t., the BFS (in GPC 2) registered an error code 41 (illegal engage) similar to the error that was logged during ascent when the BFS was in GPC 5. This incident is coincident with the GPC 4 output switch being taken from terminate to normal, offering an explanation for the error code. The output switches for the GPCs are "break-before-make", and as such, moving the GPC 4 output switch from terminate to normal causes a momentary break in the ESS 3 AB power to the Backup position of the GPC 2 output switch, in turn causing a transient in the I/O term B for GPC 2. No further occurrences of the erratic I/O term B were seen during the remainder of the mission. Postlanding, GPC 2 software (BFS) was dumped for analysis

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IFA NUMBER> STS-78-V-01

TITLE:GPC 5 I/O TERMINATE B DISCRETE ERRATIC (ORB)

0 DESCRIPTION: (Continued from previous page).

as a precaution.

A similar failure occurred in this same slot on STS-32 (OV-102/flight 9). The backup flight controller (BFC) and the GPC were removed and replaced. The failure was not isolated in ground testing and was closed as an unexplained anomaly with a most probable cause of the BFC.

A troubleshooting plan has been developed and the first step in that troubleshooting began on Tuesday, July 9.

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IFA NUMBER> STS-78-V-02

TITLE:FES HI-LOAD DUCT TEMP LOW DURING ASCENT AND HI-LOAD CORE FREEZE-UP DURING DEORBIT PREP

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 172 : 15.00.00

IFA DATE: 06/20/1996

IFA STATUS: OPEN

ELAPSED TIME: 000 : 00.11.00

PRACA STATUS: CLOSED : 1996-08-27

HOUSTON TIME: 10.00.00

PRCBD NUMBER: S062117

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 80V-0005	M	EECOM-01
M	MER-03	P	SPR/CAR 78RF06

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: N.CERNA EC3 X39045

2:

0 DESCRIPTION:

During ascent, the flash evaporator system (FES) high-load duct temperatures were erratic and lower than normal. The inboard duct temperature dropped to approximately 119 deg F by 13 minutes MET (normally the temperature stays above 190 deg F). The heaters were reconfigured from system A only to systems A and B at approximately 13.5 minutes MET and the temperatures eventually recovered. Throughout the occurrence, the evaporator outlet temperatures were stable. No further problems with the FES were noted during ascent. In order to verify the performance of the high load duct system A heater, the heater was powered up at 173:16:14 G.mt. and temperatures were monitored for approximately 2 hours and 45 minutes. A nominal temperature signature was observed.

During deorbit preparations at approximately 189:10:04 G.m.t., the FES shut down after almost an hour and a half of operation in the full-up mode on the primary B controller. The high-load core was flushed, and the data indicated ice exiting through the high-load duct. A flush was also performed using the primary A controller with no further anomalies.

Initial KSC troubleshooting will consist of internal and external visual-inspections of the high-load core. Also, the system A and B high-load spray valves will be back flushed to remove any contamination that may be present. Analysis of the flight data is continuing as well as an analysis to determine if the freon coolant loop (FCL) 1 flow rate, which is the highest flow rate of any FCL in the fleet, played any role in the performance of the high-load evaporator.

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0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 174 : 15.50.00

IFA DATE: 06/22/1996

IFA STATUS: OPEN ELAPSED TIME: 002 : 01.01.00

PRACA STATUS: CLOSED : 1996-08-27 HOUSTON TIME: 10.50.00

PRCBD NUMBER: S062117 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 80V-0007	M	EECOM-03
M	MER-07	P	SPR/CAR 78RF07

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: N.CERNA EC3 X39045

2:

0 DESCRIPTION:

While in the topping mode and on the primary A controller, the flash evaporator system (FES) shut down. A restart attempt on the A controller was unsuccessful, and was followed by an unsuccessful restart attempt on the B controller. Data from the shutdown and subsequent unsuccessful restarts indicated icing on the FES core. A FES core-flush initiated at 174:17:12 G.m.t. successfully removed the ice from the core and nominal operation was restored on the B controller. Although the cause of the FES freeze-up was unknown, a contributing factor was believed to have been operating the FES in the topping mode near its maximum heat load capability. Therefore, to reduce the heat load to the FES, the port radiator was deployed at 174:18:13 G.m.t.. The deployed radiator provided additional cooling capacity for the active thermal control system, thereby minimizing the chance of additional FES freeze-ups.

To obtain additional data, a FES water dump was requested (mission chit 13) on the B controller, and if successful, the A controller. The water dump on the B controller was initiated at approximately 180:08:19 G.m.t

and the FES shut down due to icing at approximately 180:10:08 G.m.t.. The core-flush procedure was performed and no additional FES water dumps were attemped.

Initial KSC troubleshooting will consist of internal and external visual-inspection of the tipping core. Also, the system A and B topping spray valves will be back flushed to remove any contamination that may be present. Analysis of the flight data is continuing as well as an analysis to determine if the freon coolant loop (FCL) 1 flow rate, which is the highest flow rate of any FCL on the fleet, played any role in the freeze-ups of the topping evaporator.

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STS-078 (OV-102,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

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IFA NUMBER> STS-78-V-04

TITLE:PRSD H2 TANK 4 HEATER B FAILURE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 176 : 12.00.00

IFA DATE: 06/24/1996

IFA STATUS: OPEN ELAPSED TIME: 003 : 21.11.00

PRACA STATUS: CLOSED : 1996-10-01 HOUSTON TIME: 07.00.00

PRCBD NUMBER: S062117 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 80V-0004	M	EGIL-01
M	MER-10	P	SPR/CAR 78RF05

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: H.WAGNER EP2 X39048

2:

0 DESCRIPTION:

While the fuel cell H2 was being supplied by tanks 4 and 5, H2 tanks 4 and 5 quantities began diverging, with the tank 4 quantity decreasing at

a slower rate than the tank 5 quantity. The heaters on both tanks are controlled by a common controller and are therefore commanded on simultaneously. On-orbit troubleshooting, during which tanks 4 and 5 were operated for several hours on the A heaters only, followed by the B heaters only, confirmed that the tank 4 B heater had failed. The failure did not significantly impact H2 tank use, and tanks 4 and 5 were run to depletion using the A heaters only.

During STS-75, a similar failure occurred (reference IFA STS-75-V-04). Failure of the tank 4 A heater was confirmed, and the fuse for that heater was removed and replaced during turnaround. The failure analysis determined that the fuse failed mechanically as a result of cyclic heating, not excessive current. KSC will troubleshoot.

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STS-078 (OV-102,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-78-V-05

TITLE:APU 1 FUEL PUMP INLET PRESSURE DECAY

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 172 : 15.39.00

IFA DATE: 06/20/1996

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.50.00

PRACA STATUS: CLOSED : 1997-09-02 HOUSTON TIME: 10.39.00

PRCBD NUMBER: S062117 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR APU-2-A0028	M	MER-08
M	MMACS-02	P	SPR/CAR 78RF08

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B.IRLBECK EP4 X38617

2:

0 DESCRIPTION:

As expected, the APU 1 fuel pump inlet pressure (V46P0110A) decayed post-ascent following closure of the fuel isolation valve (FIV) due to fuel pump carbon seal leakage into the seal cavity drain. This is the same APU that was flown in this position on the previous flight of OV-102 (STS-75), when a similar decay was observed. The fuel inlet pressure dropped to approximately 40 psia indicated (24 psia corrected) which was just above the indicated seal cavity drainline pressure of 22 to 23 psia (MISDs) V46P0190A and V46P0191A). The pressure decayed at a higher rate this mission than during STS-75, which indicates the leak may be worsening (the inlet pressure did not crack the FIV relief valve as is typically seen). Since opening the FIV with a fuel pump inlet pressure above 15 psia was not a concern, and dynamic seal leakage had not been noted, the leak posed no flight impact. The fuel pump inlet and seal cavity drain pressures were stable throughout the mission.

The APU 1 FIV opening was delayed from the normal deorbit Tig-45 minutes to just prior to APU 1 start at EI-13. This was done to minimize the time that the leaking fuel pump seal was subjected to full tank pressure and the subsequent static leakage. APU 1 performance was nominal during its entry run. The APU 1 fuel pump inlet pressure dropped to 43 psia indicated (27 psia corrected) post landing. It had dropped to 49 psia indicated within 26 minutes after landing. Again the data suggests that the leak has increased since STS-75.

APU 1 will be removed and replaced based on the evidence of increased leakage and the probable failure of a speed sensor (MER-15).

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IFA NUMBER> STS-78-V-06

TITLE:APU 1 TURBINE SPEED SENSOR ERRATIC

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 189 : 11.51.00

IFA DATE: 07/07/1996

IFA STATUS: OPEN ELAPSED TIME: 016 : 21.02.00

PRACA STATUS: CLOSED : 1997-03-21 HOUSTON TIME: 06.51.00

PRCBD NUMBER: S062117 PHASE: ENTRY/LANDING

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR APU-2-A0028	M	MER-15
M	MMACS-03	P	SPR/CAR 78RF09

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B.IRLBECK EP4 X38617

2:

0 DESCRIPTION:

When APU 1 was started for its entry run, the downlinked turbine speed sensor (magnetic pickup unit (MPU) 3) was initially failed off, became erratic for appproximately four minutes, and then worked continuously for the remainder of the APU run. MPU 3 is one of three turbine speed sensors per APU and the only one that is downlinked. Its erratic performance did not affect APU 1 operation. The most probable cause of the failure is an open circuit in the MPU 3 coil wire. This failure mode has been seen on nine previous occasions, some of which were intermittent. This is the first in-flight occurrence. KSC will troubleshoot on the vehicle prior to the removal and replacement APU 1.

1

IFA NUMBER> STS-78-V-07

TITLE:RUDDER CHANNEL 3 POSITION FEEDBACK ERRATIC

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 189 : 10.25.00

IFA DATE: 07/07/1996

IFA STATUS: OPEN ELAPSED TIME: 016 : 19.36.00

PRACA STATUS: CLOSED : 1997-08-25 HOUSTON TIME: 05.25.00

PRCBD NUMBER: S062117 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M GNC-01 M MER-14

P SPR/CAR 78RF10

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: V LEVY EG2 X30874

2:

0 DESCRIPTION:

During deorbit preparations, the rudder channel 3 position feedback became erratic. Prior to entry interface (EI), the rudder is positioned at +5 degrees so that a failure of this type can be detected. The problem was also seen in the servo-valve current as well as the secondary differential pressure measurements following APU 2 start. Prior to EI, the measurement appeared to heal but was still very noisy. Afer EI, when the rudder is positioned to 0 degrees, the decision was made to manually bypass rudder channel 3. The crew executed the bypass command at 189:12:02 G.m.t., which left the rudder operating on channels 1, 2, and 4 and was thus tolerant of a second failure. During the after part of entry when the rudder was used for steering, the rudder channel 3 positon measurement healed and operated properly. This problem is believed to be caused by a continuity problem between the positon transducer in the rudder/speedbrake power drive unit (PDU) and the aerosurface servoamplifier assembly (ASA) in avionics bay 6. KSC will troubleshoot.

1

TITLE:WSB 1 READY INDICATION UNEXPLAINED TOGGLES

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 189 : 12.31.00

IFA DATE: 07/07/1996

IFA STATUS: OPEN ELAPSED TIME: 016 : 21.42.00

PRACA STATUS: CLOSED : 1996-11-04 HOUSTON TIME: 07.31.00

PRCBD NUMBER: S062117 PHASE: ENTRY/LANDING

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M MER-16 M MMACS-04

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: D.ALLISON EP2 X39033

2:

0 DESCRIPTION:

Several minutes prior to landing, toggling of the WSB 1 ready indication was indicated. Toggling of this indication is not unusual and is typically caused by the WSB hydraulic fluid bypass valve transitioning between the heat exchanger and bypass position. However, during STS-78, bypass valve movement was not indicated. None of the other parameters that can cause a ready indication to change state (controller enabled, steam vent temperature, or GN2 shut-off valve position) would explain the toggles that were indicated. Proper operation of the bypass valve and the ready indication will be verified post flight.

-JFDPO12: NORMAL TERMINATION OF PROCESSING

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STS-079 (OV-104,FLT #17) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-79-B-01

TITLE:FOREIGN OBJECT DEBRIS IN RH FORWARD SKIRT

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1996-10-22 HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062118 PHASE:

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	A16958	A	PV404-1696

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: D.WILLIAMS USBI-SRB

2:

0 DESCRIPTION:

A 7/16 inch Armstrong combination wrench was found in the RH forward skirt. The metal identification plate is from Dedicated Signal Conditioner (DSC) and not considered FOD (part of flight hardware). Preflight closeout photos show I.D. plate installed.

An Anomaly Team was formed to investigate the issue to determine the source of the FOD and recommend corrective action to prevent recurrence. The team membership includes KSC, MSFC, USA, and USBI personnel. The exact location of FOD during flight could not be determined. Investigation and analysis show no potential for damage to SRB components. The wrench would remain in or near any likely place where it could have been left due to configuration of forward skirt and the direction of acceleration g forces during ascent.

Assembly and Launch Pad Operations, Retrieval Operations, Disassembly Operations and Refurbishment Operation were all cleared as potential sources of FOD. Investigation identified the two potential sources of the FOD as:

Manufacturing Operations

- USBI uses Armstrong tools
- Interior forward skirt operations require use of 7/16 inch tools

Sabotage

- No evidence to support or disprove this possibility
- Not considered a likely source

The Team identified enhancements to major inspections, and USBI will initiate a Kaizen team to implement a more effective tool control system.

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STS-079 (OV-104,FLT #17) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 2

IFA NUMBER> STS-79-M-01

TITLE:ABNORMAL EROSION AREAS ON RH NOZZLE THROAT & FORWARD EXIT CONE CCP

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1996-10-22 HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062118 PHASE:

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	A16932	A	DR4-5/292
T	360T056		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.GRAVES THIO-RSRM

2:

0 DESCRIPTION:

About 60 irregular spaced erosion channels were present full circumference on the throat and forward exit cone carbon-phenolic flame surface. The erosion areas extended forward on the throat ring 0.97-to-2.6 inches from joint 4, and aft from joint 4 onto the forward exit cone 6-to-24 inches. The depth of the erosion areas measured 0.13-to-0.48 inch deep from the surrounding material, tapering aft to zero depth. Margin-of-safety at the deepest erosion areas in the throat was -0.07 based on required safety factors (2.0 x erosion + 1.25 x char). A 0.0 margin calculated based on safety factor of (1.8 x erosion + 1.25 x char). The margin-of-safety at the deepest erosion area in the forward exit cone was +0.04 based on required safety factors (1.7 x erosion + 1.25 x char).

Thiokol and MSFC have formed independent investigation teams chartered to determine the cause of the RSRM-56B anomalous throat erosion. Preliminary results to date have not found a special cause related to the RSRM-56B anomalous erosion.

The RSRM-56B flight safety was not adversely affected. No special causes have been identified to date. Raw materials, processing, and motor environment appear nominal. Investigation is on-going.

1

IFA NUMBER> STS-79-P-09

TITLE:DOCKING TARGET/STANDOFF CROSS PAINT PEELING

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062118 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M RNDZ-01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: F.MORENO JSC-MT

2: R.IACOMINI JSC-ES5

0 DESCRIPTION:

Post docking and hatch opening the crew reported that the paint on the Axial Target Standoff Cross was peeling from the metal. No impact to rendezvous/docking operations. Further peeling may degrade cross visibility for angular alignment verification. IFM was performed to tape the black paint down to the metal for STS-81 docking support. The optical quality of workaround is unknown due to the effects of Atomic Oxygen Exposure to the tape. A backup method of using the non-axial target for alignment is unacceptable should the centerline target become unreadable. A new Standoff Cross will be manufactured and installed at post STS-81 support.

Paint delamination was caused by insufficient bond between Alodined (Chemical Conversion Coated) Aluminum surface and Chem Glaze Wash Primer, incorrect primer for this application. Back-up crosses are currently being re-assembled and are to be back in bond by 10/11/96. A new cross will be flown on STS-81 for STS-84 and the remaining Shuttle/Mir missions.

1

IFA NUMBER> STS-79-V-01

TITLE:APU 2 UNEXPLAINED SHUTDOWN

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 260 : 09.07.58

IFA DATE: 09/16/1996

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.13.10

PRACA STATUS: CLOSED : 1997-04-14 HOUSTON TIME: 04.07.58

PRCBD NUMBER: S062118 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 81V-0004	M	MER-01
M	MMACS-01	P	CAR 79RF01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B.IRLBECK EP4 X38617

2: W.SCOTT RIH 2825455

0 DESCRIPTION:

After ascent and MECO, prior to the nominal time for APU shutdown, APU-2 experienced an unexplained shutdown. Initial review of data shows nominal performance up to the time the shutdown occurred. Subsequent review of the data shows that fuel stopped flowing to the gas generator causing the turbine speed to decrease. Data also indicates that the APU controller responded to an 80% speed indication and properly closed the isolation valve. Review of historical data for the three APUs has been completed. Currently the most probable causes for the shutdown involve wiring or controller problems. The pressure, turbine speed, and temperature signature of the shutdown are not indicative of a fuel delivery system blockage or a turbine problem.

Circ pump 2 will be used for FCS C/O. For entry, a nominal APU pre-start will be performed for all three systems prior to the deorbit burn. APU 3 will be started at TIG-5 and APU 1 at EI-13. High speed will be selected for APU's 1 and 3 from TAEM through touchdown. An APU 2 start will not be attempted unless APUs 1 or 3 shutdown. A troubleshooting plan was developed and approved by KSC, JSC, and

RI-Downey. On 09/29/96, KSC reported that the Auto Bite Test was performed with no problems found. The CCU checkout was performed on 09/30/96 with no problems found. GGVM test was performed on 10/01/96 and found no anomalies.

Wire runs involving the shut valve, pulse control valve, MPU 1 & 2 were thoroughly manipulated from each of these components to the controller interface with no indications of failures. Resistances measured on each of these components was again nominal throughout the testing. The controller was removed on 10/03/96 and was shipped to the vendor on 10/04/96. APU removal is in work.

1

STS-079 (OV-104,FLT #17) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 5

IFA NUMBER> STS-79-V-02

TITLE:GPS POSITION AND TIME ANOMALIES

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 260 : 11.03.00

IFA DATE: 09/16/1996

IFA STATUS: OPEN ELAPSED TIME: 000 : 02.08.12

PRACA STATUS: CLOSED : 1997-01-06 HOUSTON TIME: 06.03.00

PRCBD NUMBER: S062118 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR COM-4-A-0017	M	GNC-01
M	GNC-02	M	MER-09
P	CAR79RF07		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.NUSS EV3 X31484

2:

0 DESCRIPTION:

At lift-off plus 4 seconds, the GPS receiver appeared to lose track on 3 out of 4 channels with poor tracking indicated on the 4th channel. It was observerd that the GPS nav solution deviated significantly from that of the BFS throughout the liftoff through ET separation period. During this flight phase, it has been concluded that the receiver had encountered the 'runaway' anomaly previously seen during ground testing at KSC.

After ET sep the receiver was still not able to track four satellites. The deviations between the nav state of the GPS receiver and the BFS continued and increased significantly between ET sep and OMS 2. These deviations are consistent with the fact that the receiver was unable to adequately track satellites. After the OMS-2 burn the receiver was power cycled prior to bringing down the BFS. When the receiver was powered back on, a + 6 hour deviation between the receiver and the GPC was noted. This anomaly was also observed during ground testing at KSC during the week of 09/08/96. The BFS was then powered down resulting in the loss of GPS downlist data. After two troubleshooting attempts, the second at approximately 262:09:55 G.m.t., the GPS and PGSC were properly connected and the crew reported nominal GPS receiver performance.

With respect to the 'runaway' anomaly, preliminary analysis indicates that the software in the receiver most probably executed the software error previously identified by the GPS developer. The software error essentially polluted the receiver's nav solution with bad data causing the deviation in position accuracy as well as the receiver's ability to track satellites. The bias time error is still under investigation.

During entry the GPS experienced the runaway anomaly again.

1

IFA NUMBER> STS-79-V-03

TITLE:PRSD H2 TANK 3 HEATER B FAIL OFF

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 268 : 18.11.00

IFA DATE: 09/24/1996

IFA STATUS: OPEN ELAPSED TIME: 008 : 09.16.12

PRACA STATUS: CLOSED : 1997-06-16 HOUSTON TIME: 13.11.00

PRCBD NUMBER: S062118 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 81V-0012	M	EGIL-04
M	MER-17	P	CAR 79RF10

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: H.WAGNER EP2 X39048

2: R.GONZALES RIH 2825289

0 DESCRIPTION:

The H2 tank 3 system B heater failed off. Prior to this event, the B heater had been properly cycling with the A heater. The system A heater on H2 tank 3 continues to energize nominally and can be used to deplete the tank. KSC troubleshooting has started which has verifed the heater to be failed off. Troubleshooting performed on 10/07/96 found the fuse to be open. Failure analysis will be performed on the fuse. A new fuse was installed.

1

IFA NUMBER> STS-79-V-04

TITLE:CRT 1 POLL FAIL

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 261 : 01.27.00

IFA DATE: 09/16/1996

IFA STATUS: OPEN ELAPSED TIME: 000 : 16.32.12

PRACA STATUS: CLOSED : 1997-12-08 HOUSTON TIME: 20.27.00

PRCBD NUMBER: S062118 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 81V-0006	M	DPS-01
M	MER-04	P	CAR 79RF13

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.MUNOZ EV21 X38359

2: D. TEE RIH 2825340

0 DESCRIPTION:

The crew reported a poll fail and tripped BITE flag on CRT 1. The condition occurred while entering an item 4 on spec 20. A 'CRT BITE 1' fault message was also annunciated. The data indicates a memory parity error occurred. There are no user notes which explain a condition of this nature. Malfunction procedure 5.4 (I/O Error CRT) was performed and the CRT was subsequently reassigned. Following reassignment, the CRT functioned nominally. CRT 1 did not experience any other problems. DEU #1 is being reviewed for removal and replacement.

1

IFA NUMBER> STS-79-V-05

TITLE:AIR DATA DILEMMA

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 270 : 12.04.47

IFA DATE: 09/26/1996

IFA STATUS: OPEN ELAPSED TIME: 010 : 03.09.59

PRACA STATUS: CLOSED : 1997-03-10 HOUSTON TIME: 07.04.47

PRCBD NUMBER: S062118 PHASE: ENTRY/LANDING

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M GNC-05 M MER-20

P CAR 79RF12

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: T. WOEST EG2 X38298

2:

0 DESCRIPTION:

Shortly after Air Data probe deploy, about 3 seconds, RM declared an Air Data Dilemma. Crew recognized the dilemma and deselected and re-selected ADTA 1 per the crew procedures, thus resetting RM. No further problems were noted with air data for the remainder of entry or landing.

When in PASS, the RM only uses pressure date to declare failures and dilemmas. Post flight data review shows that the right side pneumatics and a 10 to 15 second lag on the Pau pressure. The lag caused the comparison of the Pau pressures between the right side ADTAs (ADTA 2 & 4) and the left side ADTAs (ADTA 1 & 3) to differ by greater than the cross-side comparison limit in RM. All other pressure data tracked normally (Pt, PS, Pal).

The data from the past three flights, STS-71, 74, and 76, was nominal during probe deploy. The problem on STS-79 could have been caused by blockage of the port or the tube. Troubleshooting has been developed and agreed to by KSC, JSC, and RI. The work is planned for October 8th.

1

IFA NUMBER> STS-79-V-06

TITLE:UNEXPECTED RCS JET FIRINGS DURING PTI DTO 255

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1996-10-28 HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062118 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K PR S/W DR-110271 M MER-22

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: M.HAMMERSCHMIDT EG2 3830

2:

0 DESCRIPTION:

There were unexpected yaw RCS jet firings durng the Wraparound DAP part of PTI #1 (DTO 255) during STS-79 entry. The PTI maneuver is a roll doublet with the first roll pulse using the Wraparound DAP and the second roll pulse using the current baselined DAP. The Wraparound DAP I-Loads for the yaw RCS jet deadbands were set to zero on STS-70 so that a test of the core "no yaw jet" mode of the Wraparound DAP could be performed. Post flight examination of the STS-79 flight data shows that yaw RCS jets fired during the Wraparound DAP part of the PTI when there should have been absolutely no jet firings. This was discovered last Friday afternoon September 27, 1996.

An Entry IET GNC Panel was held to discuss the post flight analysis of DTO 255. By the time of the meeting, the flight software community had identified the source of the unexpected RCS jet firings. During the reconfiguration process, the flight I-Loads are merged with the flight software to build an executable load for flight. The mapping of I-Load MSID's to actual locations in the flight software is defined with "PFS" cards. The PSF cards that define the "first pass" initialization values for the Wraparound DAP's yaw RCS jet deadband values were omitted from the STS-79 flight software build. Therefore, the initial values for

these deadbands defaulted to the hardcoded values used during the CR development for the Wraparound DAP. DR 110271 has been opened to document this omission.

STS-79 SAIL testing did not show this problem because of where the PTI started execution. There are two sets of yaw RCS jet deadbands; one set for lowq (qbar <40 psf) and one set for highq (qbar>40 psf). The code that reinitializes the deadband values when transitioning from lowq to highq or vice versa works properly as the PSF cards are properly defined for this piece of flight code. Therefore, once the trajectory reaches highq (qbar>40), the yaw RCS jet deadbands are properly set to the I-load values. The window for PTI#1 on STS-79 was I-Loaded to occur between qbar = 35 and qbar = 50 which spans the lowq/highq switch point. PTI #1 on the STS-79 SAIL test executed shortly after highq was set and so worked as expected. PTI #1 on the actual flight of STS-79 executed shortly before highq was set and so did not work as expected. Re-examination of the STS-80 SAIL testing shows the same problem as seen

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STS-079 (OV-104,FLT #17) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 10

IFA NUMBER> STS-79-V-06

TITLE:UNEXPECTED RCS JET FIRINGS DURING PTI DTO 255

0 DESCRIPTION: (Continued from previous page).

on the STS-79 flight. On STS-80, PTI #1 executed before highq was set and so the jets fired. Rockwell-Downey wrote a SAIL IDR yesterday to document the STS-80 problem.

The consensus of the Entry GNC Panel is that no software changes should be considered for STS-80. STS-80 is the only other flight for DTO 255 where we have set the yaw RCS jet deadband I-Loads to zero. The window

for PTI #1 is from Mach 22 to Mach 18. The Mach 22 point is just before the switch to highq. We asked the flight directors to change the crew procedure to enable the PTI's after qbar 40 is reached. This will prevent the PTI from starting before highq switch point. The flight directors agreed that this would be a simple matter for them to handle.

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STS-079 (OV-104,FLT #17) INFLIGHT ANOMALY REPORT 08/26/98

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IFA NUMBER> STS-79-V-07

TITLE:KU-BAND BCE BYPASS - FF3/PF1

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 265 : 18.50.52

IFA DATE: 09/21/1996

IFA STATUS: OPEN ELAPSED TIME: 005 : 09.56.04

PRACA STATUS: CLOSED : 1997-05-05 HOUSTON TIME: 13.50.52

PRCBD NUMBER: S062118 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 81V-0011	M	INCO-01
M	MER-14	P	CAR 79RF09

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: A. CHU EV3 X31445

2: M.O'HARE RIH 282-5398

0 DESCRIPTION:

An unexplained Ku-Band BCE bypass occurred. At the time, Ku-Band was in standby as part of the group B powerdown. The Ku-Band system was power cycled and then an I/O reset was commanded, resulting in recovery of Ku-Band I/O to the GPC. There is no mission impact as long as I/O can be recovered. KSC plans to perform the troubleshooting plan that was developed for the OV-105 Ku-Band BCE bypass problem.

1

IFA NUMBER> STS-79-V-08

TITLE:CRT 2 DISPLAY SHRUNK MOMENTARILY

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1997-05-05 HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062118 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
M	DPS-03	M	MER-23

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.MUNOZ EV21 X38359

2: D. TEE RIH 282-5340

0 DESCRIPTION:

Post mission the crew reported that CRT 2 display shrunk twice horizontally by approximately 10% during the mission. The crew report the occurrence happened early in the mission and then on entry near the time of probe deploy. The crew stated that the condition existed for only 2 to 3 seconds each time occurrence. No indications of any problem was seen in the downlisted data.

-JFDPO12: NORMAL TERMINATION OF PROCESSING

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STS-080 (OV-102,FLT #21) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 1

IFA NUMBER> STS-80-I-01

TITLE:EVA HELMET LATCH/LOCK

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062119 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

* ********NONE FOUND******* * ********NONE FOUND*******

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1:

2:

0 DESCRIPTION:

No data available.

Action Assigned:

JSC-XA (2-1) Determine the cause of the EV2 Helmet difficut to latch/lock. Report results to the PRCB prior to next space shuttle mission.

1

STS-080 (OV-102,FLT #21) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 2

IFA NUMBER> STS-80-V-01

TITLE:AFT H2 CONCENTRATION HIGH

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 324 : 19.53.00

IFA DATE: 11/19/1996

IFA STATUS: OPEN
ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1997-06-17
HOUSTON TIME: 13.53.00

PRCBD NUMBER: S062119
PHASE: PRE-LAUNCH

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR 83V-0005 M MER-01

P CAR 80-RF01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: C POPP EP2/X39014
2: T REITH RIH/X39064

0 DESCRIPTION:

Following the initiation of LH2 prepress at T-1 minute 57 seconds, the aft H2 concentration exceeded the 300-ppm LCC limit (HAZ-03). As a result of this exceedence, the preplanned contingency procedure was involved, which was to hold for 2 minutes and confirm that the concentration did not exceed 600-ppm. An equilibrium concentration of approximately 600-ppm was observed and, after a hold of approximately 2 minutes 47 seconds, the decision was made to launch the vehicle as planned.

1

IFA NUMBER> STS-80-V-02

TITLE:AIRLOCK OUTER HATCH FAILURE TO UNLATCH (ORB)

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 334 : 02.30.00

IFA DATE: 11/28/1996

IFA STATUS: OPEN
ELAPSED TIME: 009 : 06.34.14

PRACA STATUS: CLOSED : 1997-03-10
HOUSTON TIME: 20.30.00

PRCBD NUMBER: S062119
PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR 83V-0006 K PR MEQ-2-22-0865

M MMACS-03 P CAR 80RF04

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: C CAMPBELL ES5/X38948

2: S SHARP RIH/X38929

0 DESCRIPTION:

The crew reported that they were unable to unlatch the outer hatch of the airlock when they attempted to open the hatch for the extravehicular activity scheduled for flight day 10. This was the first attempt to unlatch this hatch during this mission. The crew's description of the difficulty, video downlink of the payload-bay side and airlock side of the hatch, and airlock qualification hardware were analyzed to determine what may have caused the failure to open the hatch. Further attempts to turn the handle past about 30 deg. were unsuccessful. The mission's planned EVAs were cancelled.

Post mission inspection determined that the cause of the failure was a loose screw within the hatch actuator mechanism. The screw had backed out and was lodged within the actuator's gears.

1

IFA NUMBER> STS-80-V-03

TITLE:IMU 1 FAILURE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 339 : 09.21.00

IFA DATE: 12/04/1996

IFA STATUS: OPEN ELAPSED TIME: 014 : 13.25.14

PRACA STATUS: CLOSED : 1998-03-05 HOUSTON TIME: 03.21.00

PRCBD NUMBER: S062119 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K PR GNC-2-22-0123 M GNC-01

M MER-11 P CAR 80RF05

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S MURRAY EV15/X38242

2: P PERKINS RIH/2825486

0 DESCRIPTION:

Shortly after rendezvous with the ORFEUS-SPAS, the inertial measurement unit (IMU 1) attitude began degrading and the IMU was deselected by the crew. Several built-in test equipment (BITE) indications were annunciated (redundant rate fail, platform fail, IMU good, and platform temperature) and the IMU was taken to standby at 339:10:09 G.m.t. Data review indicates that the IMU failure occurred for a period of about 28 minutes and then recovered and remained operational for the remaining 20 minutes that the unit was in the operate mode.

Because IMU 1 appeared to have recovered before it was transitioned to standby, it was transitioned to OPERATE at 340:03:58 G.m.t., aligned, and left deselected for the flight day 16 landing attempt. The IMU performed nominally but was taken back to standby when the decision was made to wave-of landing due to unacceptable weather. During the crew sleep period, an inner roll null BITE was annunciated and the ground asked the crew to take IMU 1 off. However, analysis determined that the BITE resulted from the way the software operates when the IMU is comm faulted. This is a known condition and has user note DR 47741. A DEU equivalent was sent to mask the BITEs for IMU 1 during crew sleep.

The following day the crew again transitioned IMU 1 to OPERATE for the flight day 17 landing attempt. The IMU was left deselected with its BITEs masked. The landing attempt was waved-off due to unacceptable weather, however, IMU 1 operated faultlessly. For sleep, the ground had the crew turn the IMU off and its BITEs remained masked. For the FD18,

IMU 1 was powered on, put in OPERATE, and left deselected. It performed nominally during entry and landing.

1

IFA NUMBER> STS-80-V-04

TITLE:SPAS KEEL LATCH TRUNNION-IN-PLACE SYS 2 INDICATION FAILED

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 339 : 12.45.00
IFA DATE: 12/04/1996
IFA STATUS: OPEN ELAPSED TIME: 014 : 16.49.14
PRACA STATUS: CLOSED : 1997-10-06 HOUSTON TIME: 06.45.00
PRCBD NUMBER: S062119 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 83V-0011	M	MER-12
M	MMACS-04	P	CAR 80RF06

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.DAVIS ES5/X38946
2: S.SHARP RIH/X38929

0 DESCRIPTION:

During berthing of the ORFEUS-SPAS, the keel latch trunnion-in-place system 2 indication did not transfer on as required. The keel latch trunnion-in-place system 1 indication was on and the keel latch was subsequently latched (both latch indications were received). The system 2 trunnion-in-place indication remains off.

1

IFA NUMBER> STS-80-V-05

TITLE:-Y STAR TRACKER PRESSURE BITE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 340 : 14.32.00

IFA DATE: 12/05/1996

IFA STATUS: OPEN ELAPSED TIME: 015 : 18.36.14

PRACA STATUS: CLOSED : 1997-03-31 HOUSTON TIME: 08.32.00

PRCBD NUMBER: S062119 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K PR GNC-2-22-0124 M GNC-02

M MER-14 P CAR 80RF07

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.MURRAY EV15/X38242

2: P.PERKINS RIH/282-5486

0 DESCRIPTION:

During star tracker (ST) reactivation following the flight day 16 entry wave-off, the -Y ST (S/N 5) annunciated a pressure BITE for approximately 5 minutes beginning 340:14:32:10 G.m.t. (15:18:36:23 MET). After the BITE cleared, the ST functioned nominally, successfully acquiring stars. The same thing occurred after the FD 17 entry wave-off. It is expected that the BITE is real and that the pressure is near its lower BITE limit of 15.44. The ST is normally pressurized with argon gas to 17.58 psia to prevent moisture and contamination from entering the ST during entry and ground operations. The ST continued to operate nominally with no impact to flight operations.

1

IFA NUMBER> STS-80-V-06

TITLE:LEFT MAIN GEAR DOWN & LOCKED INDICATION TOGGLED

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 342 : 12.07.11

IFA DATE: 12/07/1996

IFA STATUS: OPEN
ELAPSED TIME: 017 : 16.11.25

PRACA STATUS: CLOSED : 1997-06-16
HOUSTON TIME: 06.07.11

PRCBD NUMBER: S062119
PHASE: POST LANDING

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M MER-16 M MMACS-05

P CAR 80RF08

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.DAVIS ES5/X38946

2: P.DIGGINGS RIH/X30347

0 DESCRIPTION:

Over a minute after post landing APU shutdown, the left main gear down and locked indication (V51X0125E) changed from ON to OFF. 78 seconds later it toggled back to the ON position where it remained. The indcation is a proximity-type sensor.

1

STS-080 (OV-102,FLT #21) INFLIGHT ANOMALY REPORT 08/26/98

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IFA NUMBER> STS-80-V-07

TITLE:EV2 BIOMED SIGNAL CONDITIONER

0 MISSION CONSTRAINT: SUBS
IFA TIME GMT: 334 : 02.33.00

IFA DATE: 11/28/1996

IFA STATUS: OPEN
ELAPSED TIME: 009 : 06.37.14

PRACA STATUS: UNKNOWN
HOUSTON TIME: 20.33.00

PRCBD NUMBER: S062119
PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

C AR 80RF06 M MER-13

M SURGN-01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B/SAUSER EC5/X32030

2:

0 DESCRIPTION:

During EMU checkout for EVA, the biomed signal for EV2 was lost. The signal from the electrocardiogram (ECG) is not available when this signal is lost. Since the ECG was not required for the EVA, the condition would not have impacted the EVA. In-flight troubleshooting isolated the problem to the EV2 signal conditioner. The EV2 signal conditioner was replaced with a unit from the medical kit. Postflight troubleshooting will be performed.

-JFDPO12: NORMAL TERMINATION OF PROCESSING

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STS-081 (OV-104,FLT #18) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 1

IFA NUMBER> STS-81-D-01

TITLE:PGSC PROBLEMS

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062120 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

* ********NONE FOUND******* * ********NONE FOUND*******

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1:

2:

0 DESCRIPTION:

Action Assigned by PRCBD:

JSC-MS (4-1) & Develop an end-to-end process that ensures the

JSC-DA (4-2) elimination of future onboard PGSC problems.

Report results to PRCB.

1

STS-081 (OV-104,FLT #18) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 2

IFA NUMBER> STS-81-D-02

TITLE:MCC OPERATIONAL PROBLEMS

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062120 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

* ********NONE FOUND******* * ********NONE FOUND*******

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1:

2:

0 DESCRIPTION:

Action Assigned:

JSC-DA (5-1) Assess the risk of the MCC operational problems (including the STS-81 issues) impacting a very short, E.G. 5-minute, launch window. Report results to the PRCB.

1

STS-081 (OV-104,FLT #18) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 3

IFA NUMBER> STS-81-J-02

TITLE:MIR ATTITUDE CONTROL ACTIVE DURING ORBITER CONTROL OF MATED STACK

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062120 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

* ********NONE FOUND******* * ********NONE FOUND*******

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B.BROWN/MS3

2:

0 DESCRIPTION:

MIR attitude control was active during orbiter control of mated stack. Only one vehicle should be in active control. No jets were on.

This item is being worked with RSC Energia through correspondence and weekly telecons in Phase 1 Working Group 3. Also, planned topics for joint meeting first week of March.

1

STS-081 (OV-104,FLT #18) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 4

IFA NUMBER> STS-81-V-01

TITLE:LIOH STOWAGE DOOR LATCH DIFFICULT TO OPEN

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 012 : 14.21.00

IFA DATE: 01/12/1997

IFA STATUS: OPEN ELAPSED TIME: 000 : 04.53.37

PRACA STATUS: CLOSED : 1997-06-17 HOUSTON TIME: 08.21.00

PRCBD NUMBER: S062120 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
C	CAR 81RF02	K	PR STR-4-19-4416
M	IFM-02	M	MER-01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: L.ESTES/ES2/X38945

2: E.SALLEE/BNA/282-5469

0 DESCRIPTION:

The crew reported that the aft-port latch on the LiOH stowage door was difficult to open. They were unable to open the latch by hand and a tool was used. The plan was to leave the latch open until entry day. A stress analysis was performed and it was determined that the maximum load that the LiOH door could withstand with the recumbent seat installed met full 20g crash capability, even in the event that the

latch could not be closed for entry.

Both the STS-76 and -79 crews had trouble with this latch and that work was done prior to STS-79 (PR STR-4-17-4226).

A procedure was developed that had the crew perform an on-orbit inspection of the latch and use foil tape to make mold impressions of the pin-to-hole alignment. The crew reported that when they performed the procedure, the pin got stuck mid-way to the latch position. It required such force to get it moving again that they were unable to keep it from puncturing the foil tape. There did not seem to be any problem with the pin fitting into the hole. The crew report stated that it felt as if the pin was bent, causing it to bind. No problems were reported when the LiOH door was latched closed on entry day.

The latch has been cycled on the ground and no binding was noted. KSC will troubleshoot.

1

STS-081 (OV-104,FLT #18) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 5

IFA NUMBER> STS-81-V-02

TITLE:IMU 3 X- AND Y- AXIS EXCESSIVE DRIFT

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 015 : 14.42.00

IFA DATE: 01/15/1997

IFA STATUS: OPEN ELAPSED TIME: 003 : 05.14.37

PRACA STATUS: CLOSED : 1998-01-07 HOUSTON TIME: 08.42.00

PRCBD NUMBER: S062120 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR GNC-4-19-0140	M	GNC-03

M MER-06 P CAR 81RF04

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.MURREY/EA42/38242

2: P.PERKINS/BNA/282-5486

0 DESCRIPTION:

IMU 3 (s/n 201) began exhibiting increasing X- and Y-axis drift rates and drift rate trending. The drift rates increased to the 8-10 sigma range (1 sigma is 0.006 deg/hr). The performance signature was similar to that seen previously (most recently on STS-75), where the cause of the degradation has been determined to be inadequate or contaminated lubrication in the vertical (x-y axis) gyro.

IMU 3 was taken to stand-by at 017:14:33 G.m.t. to preserve it for use during entry and landing. IMUs 1 and 2 performed nominally throughout the mission and IMU 3 was not considered to be failed. IMU 3 was taken to operate at 022:06:21 G.m.t., and as expected, its performance was similar to that seen prior to its being taken to standby. The unit supported throughtout entry.

IMU 3 will be removed this week or early next and returned to the vendor for failure analysis.

1

IFA NUMBER> STS-81-V-03

TITLE:FUEL CELL 1 INDICATED PERFORMANCE DEGRADATION

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 017 : 01.01.00

IFA DATE: 01/16/1997

IFA STATUS: OPEN ELAPSED TIME: 004 : 15.33.37

PRACA STATUS: CLOSED : 1998-03-24 HOUSTON TIME: 19.01.00

PRCBD NUMBER: S062120 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR 84V-0003 M EGIL-02

M MER-08 P CAR 81RF05

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: J.MILLER/EV2/X36908

2: B.MCKEE/BNA-H/X35448

0 DESCRIPTION:

The fuel cell 1 calculated performance (delta voltage) started degrading at a faster-than-normal rate at 017:01:01 G.m.t. The degradation rate shifted from a nominal value of approximately 0.008 V/hr to a rate of 0.018 V/hr. The third on-orbit purge was performed on all three fuel cells at 017:14:39 G.m.t. Data indicated the fuel cell 1 recovered some of its performance after this third purge, but it still appeared to be lower-than normal. Consequently, an additional (manual) purge of only fuel cell 1 was performed at 017:14:52 G.m.t. The additional purge did not appear to change the performance level of fuel cell 1. Since a fuel cell 1 problem could not be immediately ruled out, a main A and B bus tie was performed prior to the sleep period following flight day 6.

A comparison of the fuel cell 1 voltage (V45V0100A) to the main bus A voltage (V76V0100A) indicated that the fuel cell 1 voltage was reading 0.1 to 0.5 V low which would lead to an erroneous calculated degradation rate. When main bus A voltage was plotted against the fuel cell 1 predicted performance, the performance appeared nominal. Therefore, it is believed that the indicated performance degradation was caused by an offset in the fuel cell 1 voltage measurement. All other fuel cell 1 parameters indicated nominal performance throughout the mission. The main A and B bus tie was broken at 019:01:58 G.m.t.

KSC will troublshoot.

1

IFA NUMBER> STS-81-V-04

TITLE:FUEL CELL 2 CELL PERFORMANCE MONITOR SELF-TEST DURATION ERRATIC

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 020 : 08.06.00

IFA DATE: 01/20/1997

IFA STATUS: OPEN

ELAPSED TIME: 007 : 22.38.37

PRACA STATUS: CLOSED : 1998-01-07

HOUSTON TIME: 02.06.00

PRCBD NUMBER: S062120

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR FCP-4-19-0226	M	EGIL-03
M	MER-11	P	CAR 81RF07

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: H.WAGNER/EP2/X39048

2: R.GONZALES/BNA/244-5403

0 DESCRIPTION:

The fuel cell 2 (s/n 120) cell performance monitor (CPM) experienced several self-test cycles which lasted up to 3.5 minutes, whereas nominal self-test duration is about 2 seconds. CPM self-tests occcur every seven minutes. Substack delta volt values were nominal between self-test operations, indicating that FC performance was acceptable. CPM self-test operations returned to normal after the anomalous cycles, and the condition does not impact FC operations.

KSC will remove and replace the CPM.

1

IFA NUMBER> STS-81-V-05

TITLE:TIME EXECUTE COMMAND FAILED TO DISABLE KU-BAND EVA PROTECT MODE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 020 : 02.20.00

IFA DATE: 01/19/1997

IFA STATUS: OPEN ELAPSED TIME: 007 : 16.52.37

PRACA STATUS: UNKNOWN HOUSTON TIME: 20.20.00

PRCBD NUMBER: S062120 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR DR110320	M	INCO-02
M	MER-14		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B.PRUETT/EV15/35298

2: T.KELLER/LOC/335-2168

0 DESCRIPTION:

A problem was reported by INCO when a time executed command (TEC) (DSM13405) was uplinked. The TEC failed to toggle the Ku-band EVA protect mode bit in the Ku-band/S-band control word at its scheduled time. This problem appears to be a result of an incomplete implementation of Ku-band crew member protection software (CR 90850C) on OI-25.

The Ku-band crew member protection feature added a Ku-band EVA protect mode capability to the flight software (FSW). Using this feature, the ground can define a protection "box" for an EVA crewman (or for the Mir) using Orbiter pitch and roll angles. If the Ku-band antenna points into this "box" while the mode is enabled, the FSW turns off the Ku-band's traveling wave tube (TWT), preventing the Ku-band antenna from radiating within the "box".

This mode can be enabled or disabled from the ground using the Ku-band antenna control word. The ground has two ways of commanding the Ku-band EVA protect mode capability: the Ku-band/S-band antenna control uplink load (uplink OP code 7), and the TEC (uplink OP code 46). These two uplinks go through separate paths in the FSW: OP code 7 implemented in the module SUL and OP code 46 implemented in module PMQ. The ability to enable or disable the Ku-band EVA protect mode was added to the OP code 7 uplink (SUL), but apparently was not added to the OP code 46 uplink (PMQ). As a result, the capability to enable or disable the Ku-band EVA protect mode in the TEC software module PMQ results in a null operation. Although this is the third flight of OI-25 software, it is the first time the Ku-band EVA protect mode commanding was attempted as part of a TEC.

A software discrepancy report (DR110320) has been opened against this condition.

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STS-081 (OV-104,FLT #18) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 9

IFA NUMBER> STS-81-V-06

TITLE:PRIMARY RCS THRUSTER F3F FAIL OFF

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 021 : 06.28.00

IFA DATE: 01/21/1997

IFA STATUS: OPEN

ELAPSED TIME: 008 : 21.00.37

PRACA STATUS: CLOSED : 1997-07-29

HOUSTON TIME: 12.28.00

PRCBD NUMBER: S062120

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR FRC4-19-0435	M	MER-16
M	PROP-01	P	CAR 81RF08

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: C.BUDAH/EP2/X34561

2: B.MANHA/BNA/282-5416

0 DESCRIPTION:

During the reaction control system (RCS) hot-fire test, primary RCS thruster F3F failed off on its first attempted firing. Review of chamber pressure and injector temperature data from the firing, as well as vehicle acceleration data, indicates that the failure was most probably caused by iron nitrate contamination of the thruster's oxidizer valve. The thruster remained deselected for the remainder of the mission.

KSC has inspected the thruster F3F Pc tube for blockage and, as expected, found that it was clear. Thruster F3F and the other three thrusters on the manifold will be removed and replaced. This will require removing the FRCS model and shipping it to the HMF.

1

STS-081 (OV-104,FLT #18) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 10

IFA NUMBER> STS-81-V-07

TITLE:APU 3 CHAMBER PRESSURE SHIFTED DOWNWARD

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 022 : 14.37.00

IFA DATE: 01/22/1997

IFA STATUS: OPEN

ELAPSED TIME: 010 : 05.09.37

PRACA STATUS: CLOSED : 1998-02-10

HOUSTON TIME: 08.37.00

PRCBD NUMBER: S062120

PHASE: POST LANDING

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 84V-0008	M	MER-18
M	MMACS-02	P	CAR 81RF06

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B.IRLBECK/EP2/X38617

2: W.SCOTT/BNA/282-5455

0 DESCRIPTION:

Approximately 15 minutes after wheels stop, the APU 3 gas generator chamber pressure measurement shifted downward about 200 psi (in two steps). Data review indicates that the shift was most probably caused by a bias shift in the chamber pressure transducer. This would be the fourth transducer that has exhibited this performance in the past 18 months. This transducer gives the best indication of proper APU performance and is mandatory for launch in the LCC.

Late this week, KSC will troubleshoot to verify that it is the transducer that caused the shift.

1

STS-081 (OV-104,FLT #18) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 11

IFA NUMBER> STS-81-V-08

TITLE:UNABLE TO VIEW ODS CENTERLINE CAMERA VIDEO

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 019 : 14.12.00

IFA DATE: 01/19/1997

IFA STATUS: OPEN

ELAPSED TIME: 007 : 04.44.37

PRACA STATUS: CLOSED : 1997-07-29

HOUSTON TIME: 08.12.00

PRCBD NUMBER: S062120

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
M	INCO-01	M	MER-10

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B.EMBREY/EV2/X30184

2: W.ROWAN/LOC/X30177

0 DESCRIPTION:

After hatch closing, the crew disconnected the Mir camcorder from the

ODS TV connector and configured for the ODS centerline camera. The crew reported their attempts to view centerline camera video were unsuccessful. The crew confirmed installation of the ODS-to-Mir plug connected to the CIP J101 connector. Downlink of the centerline camera (VSU input PL2) did not provide interleaved data indicating that either the centerline camera (CTVC) was powered off, or video from the camera was not reaching the VSV. The same condition was evident with the backup centerline CTVC. The crew successfully activated the prime centerline CTVC to middeck TV port MO58F. Loss of the ODS centerline camera video was observed until 019:14:50 G.m.t. AT 019:14:53 G.m.t. the centerline camera video was recovered. The crew reported that they reseated the ODS-to-Mir plug on the CIP and power cycled the centerline camera from SSP 2. The crew reported no problems with the truss camera indicating that at least part of the Mir-to-ODS plug was always function correctly.

Questions have been sent to the crew in an effort to better understand the actions taken in restoring the video. KSC will troubleshoot.

-JFDPO12: NORMAL TERMINATION OF PROCESSING

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STS-082 (OV-103,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-82-K-01

TITLE:GH2/LH2 STORAGE AREA FIREX DELUGE INOPERATVE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062121 PHASE: PRE-LAUNCH

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR-IV6-318832

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: E.MANGO KSC/PEO

2:

0 DESCRIPTION:

DESCRIPTION/ANALYSIS:

During post launch washdown, the GH2 and the LH2 Firex Deluge Valves did not open from console command or hardware panel.

Troubleshooting found the valve failures were caused by paint clogging the silencers on the exhaust port of the control solenoid valves.

During Pad A Mod period, 8 new pneumatically operated deluge valves were installed around the pad area (LO2, LH2, GO2, Hyper Storage Areas)

LES shop performed corrosion control painting in the LH2, GH2, and LO2 areas just prior to STS-82 countdown and inadvertently painted silencers.

Crew did not recognize the new valves which resembled hex head bolts.

ACTION TAKEN:

Inspected other areas where LES shop painted and found one clogged silencer in the LO2 storage area.

All 8 "Hex-Head" type silencers were replaced wth a type less susceptible to clogging, and retest was successful.

Future corrosion control work orders will require a pre-work walkdown

Walkdown will be performed by all appropriate system engineers after a Work Corrosion Control order is complete.

1

STS-082 (OV-103,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 2

IFA NUMBER> STS-82-K-02

TITLE:PARACHUTE PROBLEM

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062121 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

* ********NONE FOUND******* * ********NONE FOUND*******

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1:

2:

0 DESCRIPTION:

No data available

1

STS-082 (OV-103,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 3

IFA NUMBER> STS-82-P-01

TITLE:HST SOLAR ARRAY SLEWS DURING AIRLOCK DEPRESS

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062121 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

P PYLD-01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: JJ.CONWELL/MT2

2:

0 DESCRIPTION:

HST solar arrays slewed at high rate during cabin depress. The Solar Array rebounded from the hard stop. The impact is possible damage to the HST Solar Arrays. The cabin airlock depress procedure was revised to limit flow of air.

1

IFA NUMBER> STS-82-P-02

TITLE:TRANSLATION AID (TA) CLEARANCE FOR PAYLOAD BAY DOOR ENVELOPE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062121 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

P PYLD-02

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: JJ.CONWELL/MT2

2:

0 DESCRIPTION:

HST customer requested that the TA be fully stowed rather than just retracted. The impact is possible damage to Payload Bay doors. The TA was fuly stowed.

1

IFA NUMBER> STS-82-P-03

TITLE:BENT PIN ON SADE-2R HARNESS

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062121 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

P PYLD-03

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: JJ.CONWELL/MT2

2:

0 DESCRIPTION:

During the mating of the SADE-2R harness, the crew noticed a bent pin. The impact is unable to mate connector. The crew obtained a spare harnes and made the SADE connections.

1

IFA NUMBER> STS-82-P-04

TITLE:+V2 AFT SHROUD DOOR LATCH BOLTS

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062121 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

P PYLD-04

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: JJ.CONWELL/MT2

2:

0 DESCRIPTION:

During +V2 shroud door closing, the bottom latch and the second from the bottom latch would not drive using nominal settings on power tool. The impact is possible inability to close aft shroud doors. The crew increased power tool drive settings and was able to successfully close doors.

1

IFA NUMBER> STS-82-V-01

TITLE:FES FEEDLINE A ACCUMULATOR TEMPERATURE TRENDING LOW

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 045 : 06.00.00

IFA DATE: 02/14/1997

IFA STATUS: OPEN ELAPSED TIME: 002 : 21.04.43

PRACA STATUS: CLOSED : 1997-05-12 HOUSTON TIME: 12.00.00

PRCBD NUMBER: S062121 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR 85V-0003 M EECOM-02

M MER-10 P CAR 82RF05

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: N.CERNA/EC3/X39045

2: C.DUMIS/BNA/X45120

0 DESCRIPTION:

The FES feedline A accumulator temperature began trending low. Prior to that time the temperature had been cycling between 60 and 75 deg F as the accumulator heater cycled on and off. The last indication of a heater cycle on system 1 was at 044:22:57 G.m.t. After the last heater system 1 cycle, the accumulator temperature remained above 45 deg F. The plan was to take no action unless the accumulator temperature dropped below 40 deg F. The nominal heater reconfiguration was performed at 047:02:37 G.m.t. Heater system 2 is functioning nominally.

1

STS-082 (OV-103,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 8

IFA NUMBER> STS-82-V-02

TITLE:AFT STARBORAD PAYLOAD BAY FLOODLIGHT FAILED

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 049 : 03.37.00

IFA DATE: 02/17/1997

IFA STATUS: OPEN ELAPSED TIME: 006 : 18.41.43

PRACA STATUS: OPEN HOUSTON TIME: 21.37.00

PRCBD NUMBER: S062121 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR 85V-0006 M EGIL-02

M MER-12 P CAR 82RF06

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: L.VAZQUEZ/EV2/X37478

2: A.FARKAS/BNA/282-5318

0 DESCRIPTION:

A mid MNA current (V6C3085A) signature was observed which was indicative of a floodlight failing and tripping the 10 amp RPC in MPC 1. The crew confirmed that the aft starboard floodlight had failed. The floodlight power switch was taken to off, and will remain off for the remainder of the mission.

The characteristic arcing indication in the current data for a failed floodlight was not present during this failure. The current ramped up slightly, from 16.5 to 17.6 amps over 0.7 seconds, then spiked to 24 amps and remaining at that value for 2.3 seconds, and finally dropped to 10 amps (total spike of 13.6 amps). Analysis of available data indicate that the most probable cause of the current spike is a failure in floodlight elections assembly (FEA)1.

-JFDPO12: NORMAL TERMINATION OF PROCESSING

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STS-083 (OV-102,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-83-B-01

TITLE:RH ETA RING HAD GAP BETWEEN FN 11 UPPER STRUT EPDM COVER AND ETA RING

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1997-04-28 HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062122 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

A A17075 A SK-83004

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: L.MORTON/USBI

2:

0 DESCRIPTION:

RH ETA ring had a gap between the FN 11 upper strut EPDM cover and ETA ring. Physical evidence indicates gap existed at the final EPDM cover installation in the VAB. The texture of cured RTV application on face of ETA ring cap and corresponding inboard face of EPDM cover indicates incomplete faying surface seal. Faying surface seal should result in paper thin cured RTV. Sooting on the FN 11 between EPDM cover and ETA ring cap shows gap existed prior to water impact. Successful reinstallation during PFA shows the cover was not damaged due to flight loads.

The gap in this area is not a flight safety issue. The ETA ring cavity filled with 855 foam and cables wrapped with blastape. The lack of discoloration from heat effects indicates temperature at this location

was less than 300 degrees F. ETA ring paint begins to discolor at 300 degrees F and ablates at 500 degrees F.

Probable causes of the gap are possible interference of EPDM rubber with upper strut fairing during installation and possible galling and/or side loading of bolt during installation.

Corrections are to brief technicians on proper cover installation and investigating change to OM to verify RTV squeeze out/flush fit up of EPDM cover.

1

STS-083 (OV-102,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-83-V-01

TITLE:FUEL CELL 2 SUBSTACK 3 DELTA V

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 094 : 07.35.00

IFA DATE: 04/04/1997

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1998-01-06 HOUSTON TIME: 02.35.00

PRCBD NUMBER: S062122 PHASE: PRE-LAUNCH

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 87V-0001	K	PR FCP-0336
M	EGIL-01	M	MER-01
P	CAR 83RF01		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: H.WAGNER/EP2/X39048

2: R.GONZALES/BNA/244-5403

0 DESCRIPTION:

When the fuel cell start-up was initiated during prelaunch operations,

the fuel cell 2 substack 3 delta voltage (delta V) remained above the OMRSD limit of 150 mV for an unusually long period of time. After the prestart reactant purge, the delta V value dropped from 500 mV to 160 mV. At the beginning of the fuel cell 2 startup, the value increased to over 400 mV and then began a gradual decrease. Prior to the fuel cell high-load calibration test, a purge was performed on fuel cell 2 in an attempt to sweep away any inerts that may have been the cause of the high delta V reading. This purge had no effect on the rate of decrease. The high load test (250 amperes) was performed and this caused the value to rapidly decrease to less than 100 mV, but when the load was returned to 150 amperes, the delta V value increased to above 100 mV. The delta V reading continued to decrease and was below 50 mV prior to flight. Waiver WK03629 was processed to accept this condition for flight.

The fuel cell 2 substack 3 delta volts began to increase on-orbit. Analysis of the data determined that the health of the fuel cell was suspect. The fuel cell 2 substack 3 delta V data indicated that a cell in the substack had a performance degradation approching 300 mV, which could lead to the failure of the fuel cell. The decision was made to shut down and safe the fuel cell and terminate the mission early. Fuel cell 2 shutdown and safing was initiated at approximately 096:19:07 G.m.t. (01:23:46:MET). The fuel cell was R&Red post flight.

1

IFA NUMBER> STS-83-V-02

TITLE:HIGH-LOAD FES INBOARD DUCT TEMPERATURE LOW DURING ASCENT

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 094 : 19.32.00

IFA DATE: 04/04/1997

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.11.28

PRACA STATUS: CLOSED : 1997-11-10 HOUSTON TIME: 14.32.00

PRCBD NUMBER: S062122 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR 87V-0012 M EECOM-01

M MER-05 P CAR 83RF02

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: NAN CERNA/EC3/X39045

2: C.DUMIS/BNA/X45120

0 DESCRIPTION:

During ascent, the FES high-load duct temperatures dropped off sharply. The inboard duct temperature dropped to approximatley 62 deg F (normally remains above 190 deg F) by 094:19:32 G.m.t.(approximately 12 minutes MET). The heaters were reconfigured from system-A-only to systems A and B at approximately 12 minutes MET, and the temperatures eventually recovered. Throughout the occurrence, the evaporator outlet tempertures were stable. No further problems with the FES were noted during the flight. KSC will investigate to see if heater is debonded.

1

IFA NUMBER> STS-83-V-03

TITLE:PRIMARY THRUSTER F3F FAIL OFF

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 097 : 16.38.00

IFA DATE: 04/07/1997

IFA STATUS: OPEN ELAPSED TIME: 002 : 21.17.28

PRACA STATUS: CLOSED : 1998-03-05 HOUSTON TIME: 11.38.00

PRCBD NUMBER: S062122 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K FRC2-0524 M MER-11

M PROP-01 P CAR 83RF05

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.JONES/EP2/39031

2: B.MANHA/BNA/282-5416

0 DESCRIPTION:

During the reaction control system (RCS) hot-fire test, primary RCS thruster F3F failed off on its first attempted firing. The thruster had a good driver out but the chamber pressure (Pc) reached only 11 psia. There was no indication of leakage. Pc tube blockage is considered to be an unlikely cause of the fail off, but can only be ruled out by postflight inspection. The most likely cause of the failure is improper operation of the thruster fuel or oxidizer valve. The thruster was deselected for the remainder of the mission. The FRCS pod will be removed and the thruster, along with other 3 thrusters on manifold, R&Red.

1

IFA NUMBER> STS-83-V-04

TITLE:-Z STAR TRACKER PRESSURE BITE

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 097 : 18.04.00

IFA DATE: 04/07/1997

IFA STATUS: OPEN

ELAPSED TIME: 002 : 22.43.28

PRACA STATUS: CLOSED : 1997-10-27

HOUSTON TIME: 13.04.00

PRCBD NUMBER: S062122

PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K PR GNC-0133 M GNC-01

M MER-12 P CAR 83RF07

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.MURRAY/EV15/X38242

2: P.PERKINS/BNA/282-5486

0 DESCRIPTION:

Following a reactiviation of the -Z star tracker at approximately 097:18:04 G.m.t. (02:22:44 MET), a pressure BITE was annunciated for approximately 11 minutes. After the Bite cleared, the star tracker functioned nominally, successfully acquiring stars. The star tracker is normally pressurized with argon gas to 17.58 psia to prevent moisture and contamination from entering the star tracker during entry and ground operations. There was no impact to flight operations.

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STS-083 (OV-102,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-83-V-05

TITLE:-Y STAR TRACKER BCE BYPASS

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 097 : 18.16.00

IFA DATE: 04/07/1997

IFA STATUS: OPEN

ELAPSED TIME: 002 : 22.55.28

PRACA STATUS: CLOSED : 1997-10-27

HOUSTON TIME: 13.16.00

PRCBD NUMBER: S062122

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 87V-0006	M	GNC-01
M	MER-13	P	CAR 83RF07

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.MURRAY/EV15/X38242

2: P.PERKINS/BNA/282-05486

0 DESCRIPTION:

The -Y star tracker was bypassed by the PASS. The crew performed the malfunction procedures, which included an I/O reset, port model and

power cycle of MDM FF3, as well as a power switch and circuit breaker cycle of the -Y star tracker. The -Y star tracker was not recovered. Note that prior to this occurrence, both star trackers had been powered off due to the loss of fuel cell 2. The star trackers had been powered on for approximately 12 minutes when the bypass occurred.

1

STS-083 (OV-102,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 7

IFA NUMBER> STS-83-V-06

TITLE:SIDE HATCH TEST PORT SEAL LEAK/DAMAGE PRELAUNCH

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 094 : 18.15.00

IFA DATE: 04/04/1997

IFA STATUS: OPEN

ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1997-06-26

HOUSTON TIME: 13.15.00

PRCBD NUMBER: S062122

PHASE: PRE-LAUNCH

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 83V-0144	M	MER-02
P	CAR 83RF04		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: C.CAMPBELL/ES5/X38948

2: D.TRAN/BNA/282-5431

0 DESCRIPTION:

During the prelaunch cabin-leak check, the closeout crew reported a problem with the KC103-16 nose seal at the end of the test port fitting used to pressurize the cabin. The seal came off when the pressurization probe was removed. The seal was replaced and the cabin-leak check was completed nominally. Because seal replacement caused an additional cabinleak check, there was excessive O2 in the midbody. This high reading and the ensuing discussion to clear for flight caused a 20 minute 32 second launch delay.

1

STS-083 (OV-102,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 8

IFA NUMBER> STS-83-V-07

TITLE:FUEL CELL 2 H2 REAC VALVE FAILED TO CLOSE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062122 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M EGIL-02

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: M.HENDERSON/DA8/X34930

2:

0 DESCRIPTION:

When the fuel cell 2 reactant valves were closed to shutdown and safe FC2, the FC2 H2 reactant valve failed to close. The FC2 O2 reactant valve closed and the shutdown and safing was completed. At approximately 097:01:23 G.m.t. (02:06:03 MET), the crew cycled the FC2 reactant valve switch to close and the valve closed nominally.

1

STS-083 (OV-102,FLT #22) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 9

IFA NUMBER> STS-83-V-08

TITLE:PPOV CAMERA OUT OF FOCUS

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN

ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN

HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062122

PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

* ********NONE FOUND******* * ********NONE FOUND*******

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.EDMISTON/VP4/X30956

2: S.MCMILLAN/VF3/X35913

0 DESCRIPTION:

It was determined that the HUD TV camera was out of focus during decent and landing of STS-83.

A possible cause is a procedure error. The camera was probably not focused when the crew installed it on the HUD prior to entry.

Testing will be done to assure there was no hardware failure.

-JFDP012: NORMAL TERMINATION OF PROCESSING

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STS-084 (OV-104,FLT #19) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 1

IFA NUMBER> STS-84-E-01

TITLE:AREA OF EROSION ON FUEL PREBURNER THERMAL LINER

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1997-06-18 HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062123R1 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

A A033952 A A17127

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: T.CHOAT MSFC/RKDN, X6830

2:

0 DESCRIPTION:

During routine post-flight (STS-84) inspections of Engine 2029 (Phase II engine) an area of erosion (0.400 x 0.800 x 0.200 inches) on the Fuel Preburner (FPB) Thermal Liner was identified. This area of erosion is greater than any previously experienecd in flight although it is less than that experieced in ground test. Note: The erosion of the face plate is within flight experience and not the subject of this IFA.

1

STS-084 (OV-104,FLT #19) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 2

IFA NUMBER> STS-84-E-02

TITLE:ABNORMAL DISCOLORATION AND MINOR EROSION ON 1ST STAGE NOZZLE VANES

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1997-07-23 HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062123R1 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

A A17134 A UCR A033957

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: T.CHOAT MSFC/RKDN X6830

2:

0 DESCRIPTION:

During routine post-flight (STS-84) inspections of Engine 2029, 10 consecutive 1st stage nozzle vanes of the 17 total in the High Pressure Oxidizer Turbo Pump (HP)TP) had abnormal discoloration and minor erosion. This is the first occurrence of such erosion in the flight program. Data review post-flight noted a higher than normal rise in HPOTP ch. A turbine discharge temperature indicating the problem happened during engine shutdown. Ch B did not show this abnormal rise in temperature and no other data anomalies were noticed in the review. Inspection of the preburner found no injector damage which could explain a localized high termperature condition on the 10 vanes during shutdown.

In an effort to identify a source of LOX during shutdown the Oxidizer Preburner Oxidizer Valve and the HPOTP have been returned to the factory for investigation. Inspections of the powerhead are being conducted at KSC. Note: This engine is to be sent back to Canoga Park for Block II retrofit.

Until the source of this localized high temperature shutdown condition is identified and corrected, the normal post-flight inspections will screen for this condition and closure of this IFA should not be a

constraint for future flights.

1

IFA NUMBER> STS-84-V-01

TITLE:CAMERA C BLURRED IMAGE (GFE)

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 137 : 16.39.00
IFA DATE: 05/17/1997
IFA STATUS: OPEN ELAPSED TIME: 002 : 08.31.12
PRACA STATUS: UNKNOWN HOUSTON TIME: 11.39.00
PRCBD NUMBER: S062123 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER
K PR COM-4-20-0233 M INCO-03
M MER-09

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B.EMBREY/EV2/X30184
2: W.ROWAN/LOC/X30177

0 DESCRIPTION:

There was a circular-shaped blurred-area at the center of the camera C (CTVC s/n 202)image. The blur was not evident early in the mission. The blurred area became larger and smaller as the camera was zoomed, indicating that the problem was not the lens. TV lab analysis of the video confirmed that material on the lens was the cause of the problem. The material could be from outgassing within the lens assembly or foreign material on the extenal surface of the lens. The mission impact was degraded camera C video images.

1

IFA NUMBER> STS-84-V-02

TITLE:LOW FRCS OXIDIZER TANK ULLAGE PRESSURE ON THE B-LEG REGULATOR

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 142 : 01.04.00

IFA DATE: 05/21/1997

IFA STATUS: OPEN

ELAPSED TIME: 006 : 16.56.12

PRACA STATUS: CLOSED : 1997-07-31

HOUSTON TIME: 20.04.00

PRCBD NUMBER: S062123

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR FRC4-A0036	M	MER-11
P	CAR 84RF03		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.JONES/EP2/X39031

2: S.ARRIETA/BNA/X36435

0 DESCRIPTION:

During separation from the Mir, a period of high FRCS utilization, the forward RCS oxidizer ullage pressure dropped into the 233 to 234 psia range on several occasion. The ullage pressure should be maintained in the 239 to 259 psia range. The FRCS oxidizer tank was configured to the B-leg regulator at the time of the occurrence. Low regulation pressure with this regulator is a known condition, having been seen during previous flights and on the ground. Waiver WK 03613 was taken during the STS-84 flow for this condition. Under similar high flow rate conditions during the previous flight of OV-104 (STS-81), the lowest regulated pressure was 238 psia, 5 psia higher than that seen during this mission.

This regulator will be tested post flight to determine if corrective action prior to STS-86 is required. The intent going into the STS-84 mission was to remove and replace the regulator at OMDP (post STS-86).

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STS-084 (OV-104,FLT #19) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-84-V-03

TITLE:CAMERA A BLURRED IMAGE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 142 : 12.30.00

IFA DATE: 05/22/1997

IFA STATUS: OPEN ELAPSED TIME: 007 : 04.22.12

PRACA STATUS: UNKNOWN HOUSTON TIME: 07.30.00

PRCBD NUMBER: S062123 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K PR COM-4-20-0234 M INCO-06

M MER-13

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B.EMBREY/EV2/X30184

2: W.ROWAN/LOC/X30177

0 DESCRIPTION:

There was a circular-shaped blurred-area at the center of the camera A (CTVC s/n 216) image. The blur was not evident early in the mission. The blurred area became larger and smaller as the camera was zoomed, indicating that the problem was on the lens. This anomaly is similar to the camera C blurred image identified in MER-09.

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STS-084 (OV-104,FLT #19) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-84-V-04

TITLE:MS4 SEAT INTERFERENCE WITH THE A-HATCH HANDHOLD

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 144 : 07.22.00

IFA DATE: 05/24/1997

IFA STATUS: OPEN ELAPSED TIME: 008 : 23.14.12

PRACA STATUS: CLOSED : 1997-09-02 HOUSTON TIME: 02.22.00

PRCBD NUMBER: S062123 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
M	MACS-02	M	MER-15
P	CAR 84RF07		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: J.RAGAN SP4/X33646

2: A.LOZANO/EA42/X36339

0 DESCRIPTION:

During deorbit preparations, the crew noted that there was an interference between the A-hatch handhold and the mission specialist 4 lightweight seat (seat 6 position). During ascent, the seat back is inclined two degrees forward and there is no interference. However, the seat back is rotated ten degrees aft for entry and the interference exists. The handhold was unbolted and removed to provide clearance for the seat. This was the first flight of a lightweight seat on a vehicle with an internal airlock. This interference was a known problem, but at the time it was understood that a lightweight seat would not flight on a vehicle with an internal airlock.

The decision has been made to fly STS-86 (the next flight of OV-104) without the handhold. Options for OV-102 flight with lightweight seats are being evaluated.

-JFDPO12: NORMAL TERMINATION OF PROCESSING

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STS-085 (OV-103,FLT #23) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-85-V-01

TITLE:R-OMS STANDBY YAW ACTUATOR SLOW DRIVE RATE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 219 : 04.34.00

IFA DATE: 08/06/1997

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: OPEN HOUSTON TIME: 23.34.00

PRCBD NUMBER: S062125 PHASE: PRE-LAUNCH

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 91V-0003	M	MER-01
P	SPR/CAR 85RF01		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: V.LEVY/EG/30874

2: V.PURKEY/282-5381

0 DESCRIPTION:

During prelaunch operations, the right OMS standby yaw actuator rate was observed to be low during the OMS profile test. The actuator drive rate has a minimum requirement of 2.9 deg/sec and is only allowed to change by a maximum of 1.0 deg/sec between comparable tests. During the prelaunch gimbal profile test, the standby drive rate differed from the previous comparable test by more than 1.0 deg/sec. During subsequent testing to investigate this condition, a drive rate of 2.5 deg/sec was observed, which was below the minimum rate of 2.9 deg/sec that is specified in the Operational Maintenance Requirements and Specification Document (OMRSD). The Launch Commit Criteria (LCC) allows the loss of one channel (active or standby) on either the left or right side. After the OMS 2 maneuver, the gimbal check was performed again. At that time,

the drive rate was sufficient to avoid a fault detection and annunciation (FDA) message. The standby drive rate of the actuator was below nominal levels, but it is considered usable for steering during an OMS maneuver, should an active channel be lost. KSC will remove and replace the actuator without performing troubleshooting post-flight.

1

STS-085 (OV-103,FLT #23) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-85-V-02

TITLE:R-RCS OX MANIFOLD 5 LOSS OF OPEN POSITION

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 219 : 14.41.00

IFA DATE: 08/07/1997

IFA STATUS: OPEN

ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: CLOSED : 1998-01-12

HOUSTON TIME: 09.41.00

PRCBD NUMBER: S062125

PHASE: ASCENT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 91V-0004	M	MER-02
M	PROP-01	P	SPR/CAR 85RF02

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.JONES/EP2/X39031

2: S.ARRIETA/BNA/X36435

0 DESCRIPTION:

Just prior to liftoff, the right RCS oxidizer manifold 5 isolation valve open discrete measurement began toggling. From the data, it can be seen that the open discrete changed from 1 to 0 (loss of open indication) at 219:14:40:56 G.m.t. (approx T-4 sec), changed back to 1 at 219:14:40:58 G.m.t. (approx T-3 sec), and changed back to 0 at 219:14:40:58 (approx T-2 sec). At 219:14:42:31 G.m.t. (00:00:01:31 MET), the open indication returned for six seconds after which the open indication was lost until

219:15:00:00 G.m.t (00:00:19:00 MET). Throughout ascent, the corresponding closed discrete measurement indicated 0 (not closed). The open discrete measurement toggling caused an RM dilemma and master alarm on two occasions during ascent. The measurement continued to indicate open til 220:20:38:03 G.m.t (01:05:57:03 MET), when the open discrete measurement again changed from 1 to 0 following initiation of the NC 4 burn. The redundancy management (RM) fault message "RM DLMA MANF" occurred at 220:20:38:06 G.m.t (01:05:57:06 MET). Following the NC5 maneuver, the valve position indicator continued to indicate not-open. The right RCS manifold 5 status was overridden open and vernier operation resumed. This problem was not an impact to the mission.

RCS oxidizer manifold 5 isolation valve was not cycled during the postflight "RCS, OMS Valve Test" which will aid troubleshooting of the VPI by preserving as much information/evidence as possible. There was no change in the loss of the OPEN indication of this valve during entry and landing.

1

STS-085 (OV-103,FLT #23) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 3

IFA NUMBER> STS-85-V-03

TITLE:TRANSIENT DEU 1 MEMORY PARITY

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 227 : 15.41.00

IFA DATE: 08/15/1997

IFA STATUS: OPEN

ELAPSED TIME: 008 : 01.00.00

PRACA STATUS: CLOSED : 1997-10-07

HOUSTON TIME: 10.41.00

PRCBD NUMBER: S062125

PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K PR DIG-3-24-0309

M DPS-01

M MER-13

P PR/CAR 85RF04

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: K.DUNN/EV2/X38367

2: D.PECK/BNA/282-5324

0 DESCRIPTION:

GPC 1 annunciated a CRT BITE 1 message. The DEU BITE status words and poll header word indicated a critical BITE due to a DEU 1 (s/n 19) memory parity error. The crew reassigned CRT 1 to GPC 1 and the BITE indication returned because this action doesn't clear the BITE status register (BSR). The crew worked the malfunction procedure 5.4b (CR BITE 1), and at block 12, the BITE status words were nominal, indicating that the BITE condition had cleared. Therefore, the crew reassigned CRT 1 to GPC 1 and the BITE has not repeated.

No post-flight troubleshooting is required by KSC. The DEU will be removed and replaced.

1

STS-085 (OV-103,FLT #23) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-85-V-04

TITLE:FCL EVAPORATOR OUTLET TEMP OSCILLATIONS ON FES PRIMARY B CONTROLLER

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 230 : 07.26.00

IFA DATE: 08/18/1997

IFA STATUS: OPEN

ELAPSED TIME: 010 : 16.45.00

PRACA STATUS: OPEN

HOUSTON TIME: 02.26.00

PRCBD NUMBER: S062125

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
M	MER-14	P	SPR/CAR 85RF05

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: N.CERNA/EC3/X39045

0 DESCRIPTION:

When the FES Pri B controller was activated (both Hi Load and Topping Evaporators) after the secondary FES checkout, the FCL evaporator outlet temperatures oscillated as the temperature neared the control band. There were eight prominent cycles. Similar oscillations occurred on STS-82 (OV-103/22), but the amplitude and number of cycles were less (only 3 cycles). On STS-85 the initial cycle peaked at approximately 46 deg F. On STS-82, the initial cycle peaked at approximately 44 deg F. On STS-82, the oscillation damped out after about two minutes. On STS-85 the oscillations lasted approximately six minutes.

On STS-85, the oscillations did not occur at the initiation of radiator cold soak (FES Pri B topping evaporator). This signature suggests that the problem is associated with the midpoint sensor, and is typical for a temperature sensor having poor contact with the sensor well. The poor contact is frequently caused by loss of thermal grease around the sensor.

KSC will perform troubleshooting.

-JFDPO12: NORMAL TERMINATION OF PROCESSING

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STS-086 (OV-104,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-86-K-01

TITLE:LH2 CONSOLE SOFTWARE DID NOT RESPOND PROPERLY TO CURSOR CONTROL

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062126 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR 86V-0085

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: E.MANGO/KSC-L&L

2:

0 DESCRIPTION:

Real-time troubleshooting of the problem pointed to a potential software coding error in the LH2 sub-display sotware. Parallel troublshooting in the Ground Software Processing Facility (GSPF) isolated the problem to a coding error in the software. Further review determined that the suspected software code was not part of the cryogenic load control sequencer and would not affect valve positioning. However, as a preliminary caution, contingency plans were developed to cover any manual cursor controlled valve positioning that did not respond properly. Understanding the cause of the problem, the test team proceeded with cryogenic loading and terminal countdown. Post launch data analysis pinpointed the exact cursor action that caused the sub-display software to take the erroneous path. The software has been modified, validated, and configured to support STS-87.

1

STS-086 (OV-104,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 2

IFA NUMBER> STS-86-K-02

TITLE:SLF RUNWAY 33 MSBLS CONFIGURATION CHANGE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062126 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K PR C70-1116-00-003-0252

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: E.MANGEO/KSC-L&L

2:

0 DESCRIPTION:

Runway 33 MSBLS configuration changed from "transmit" to "standby" on planned EOM landing day without notification to the STA pilot, NASA Tower, LCC personnel or MCC personnel. The MSBLS was taken to stand-by to support DTO 700-12 GPS Ground Data Collection. The ground GPS equipment was installed into MSBLS shelter without KSC authorizing paper. During electrical connections the JSC GPS equipment smoked when plugged into shelter power supply.

1

STS-086 (OV-104,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 3

IFA NUMBER> STS-86-V-01

TITLE:FUEL CELL 2 SUBSTACK 1 DELTA VOLTS TRANSIENT

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 269 : 02.35.00

IFA DATE: 09/25/1997

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.41

PRACA STATUS: CLOSED : 1998-01-21 HOUSTON TIME: 21.35.00

PRCBD NUMBER: S062126 PHASE: ASCENT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
E	EGIL-01	K	IPR 92V-0001
M	MER-01	P	CAR 86RF03

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: L.MUSTIN DNY 922-2587

2: R.GONZALES BNA244-5403

0 DESCRIPTION:

The Fuel cell 2 substack 1 cell performance monitor (CPM) delta voltage output exhibited an unusual increase. The substack 1 delta volts increased into the 300 to 500 mV range for a period of about 15 seconds (500 mV for 2 seconds), then decreased in the 100 to 200 mV range for about 20 seconds. The entire event lasted about 1 minute and the substack 1 delta volts reading prior to and after the event was in the 6 parameters indicated that there was a fuel cell problem.

Because of this ascent event, main buses A and B were bus tied at 269:02:46 G.m.t and, as a precaution, they remained tied until deorbit preparations. After the first landing attempt was waved-off, the buses were re-tied and the tie was broken during the following day's deorbit preparations. The CPM performed nominally for the remainder of the mission and the fuel cell 2 substack 1 delta voltage remained in the 2 to 8 mV range.

The data indicate that this event was most probably caused by an instrumentation problem, and was not the result of a physical or chemical problem within the substack.

An instrumentation test to be performed on the vehicle is scheduled for 10/24. This test will perform a wire wiggle to check the instrumentation string from FC 2 to MDM OF1. The fuel cell will be removed from OV-104 for OMDP (as planned) and if no problems are found in the vehicle testing, it will be returned to IFC for instrumention testing. That testing will focus on a potential loose wire between the substack (pins 1 and 17) and the CPM or the CPM itself.

1

STS-086 (OV-104,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 4

IFA NUMBER> STS-86-V-02

TITLE:PRIMARY THRUSTER L3D FAILED OFF

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 269 : 02.43.00

IFA DATE: 09/25/1997

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.08.41

PRACA STATUS: OPEN HOUSTON TIME: 21.43.00

PRCBD NUMBER: S062126 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 92V-0009	M	MER-02
M	PROP-01	P	CAR 86RF01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.JONES/EP2/X39031

2: S.ARRIETA/BAN/X36435

0 DESCRIPTION:

Primary RCS thruster L3D failed off during its first commanded firing following external tank (ET) separation. During the firing, the chamber pressure did not rise above 4 psi and the thruster was deselected due to this low Pc indication. The thruster was not used during the remainder of the mission.

The L3D injector temperature data profile was indicative of a normal firing suggesting that the thruster did in fact fire. The data also showed that the L3D chamber pressure (Pc) slowly decreased from approximately 18 psia to 4 psia over a seven minute period during ascent, whereas the drop should have occurred in approximately 1.5 minutes. Note that even though the 18 psia ground indication was higher than normal, it was discounted as a problem because it appeared to be an instrumentation bias and the LCC allows ambient +/- 10 psia. The indicated L3D Pc remained in the 3 to 4 psia range throughout the mission indicating that there was a bias in the measurement. Following landing, the L3D Pc remained at 4 psia for just over 1 hour, after which it slowly rose to appproximately 15 psia over an 18 minute period. The data from ascent and entry and the fail-off during the ET separation firing may be the result of a plugged Pc tube.

KSC will perform a borescope inspection of the thruster chamber. Since OV-104 is going to OMDP, LP03 will be sent to the HMF for its OMDP and the inspection will be done there (11/97). All thrusters are scheduled to be removed and sent to the WSTF for normal OMDP processing. Therefore, any additional investigation of this failure that may be necessary will be performed at the WSTF.

1

STS-086 (OV-104,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 5

IFA NUMBER> STS-86-V-03

TITLE:APU 2 GAS GENERATOR BED HEATER B HIGH CYCLE FREQUENCY

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 274 : 22.04.00

IFA DATE: 10/01/1997

IFA STATUS: OPEN ELAPSED TIME: 005 : 19.29.41

PRACA STATUS: OPEN HOUSTON TIME: 16.04.00

PRCBD NUMBER: S062126 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M MER-14 M MMACS-02

P CAR 86RF04

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: T.FARKAS/562-922-4487

2: W.SCOTT/BNA/282-5455

0 DESCRIPTION:

Following APU heater reconfiguration, the APU 2 gas generator (GG) bed system B heater cycled at a high frequency. Proper GG bed temperature (V46T0222A) was maintained in the nominal 360 to 425 deg F control band. As a result of the high frequency cycling, the injector temperature (V46T0274A) remained nearly constant at 359 deg F following the heater reconfiguration.

A signature similar to the one seen on this mission has been seen previously on this APU (s/n 402). It is believed to be caused by the GG bed temperature sensor, which is used by the APU controller to control the heater, being very close to the B heater. This results in very frequent heater cycling and a dithering appearance in the injector temperature. This frequency has increased since it was first noted on STS-50 (7 flights).

The APUs were previously scheduled to be removed after this flight (OV-104 OMDP) and returned to Sundstrand. Special testing will be performed on the heater to determine the cause of this signature. It will then be determined if corrective action is required.

1

IFA NUMBER> STS-86-V-04

TITLE:FORWARD STARBOARD FLOODLIGHT FAILED TO ILLUMINATE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 271 : 20.28.00

IFA DATE: 09/28/1997

IFA STATUS: OPEN ELAPSED TIME: 002 : 17.53.41

PRACA STATUS: OPEN HOUSTON TIME: 15.28.00

PRCBD NUMBER: S062126 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 92V-0002	M	EGIL-02
M	MER-10	P	CAR 86RF02

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: D.GASPAR/562-922-0047

2: A.FARKAS/BNA/282-5318

0 DESCRIPTION:

The forward payload bay floodlights were powered on at approximately 271:20:28. The forward starboard floodlight (no. 2) failed to illuminate. The crew confirmed that the starboard floodlight was not illuminated but the port floodlight was. A data plot of the mid main B currents indicated no signature of the floodlight activation. A 1.5 amp increase indicative of the FEA current draw was seen. The crew cycled the forward starboard floodlight switch and the data again showed no signature of the floodlight turning on. The floodlight had been used successfully during PLBD opening. Floodlights 1 through 5 are the new design. FEA 2, which powers floodlight 2, is also the new design.

KSC did a visual inspection of the floodlight and found a cracked bulb. The floodlight will be replaced.

1

IFA NUMBER> STS-86-V-05

TITLE:PCS 1 14.7 PSIA REGULATOR EARLY FLOW TERMINATION

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 275 : 02.40.00

IFA DATE: 10/01/1997

IFA STATUS: OPEN ELAPSED TIME: 006 : 00.05.41

PRACA STATUS: OPEN HOUSTON TIME: 20.40.00

PRCBD NUMBER: S062126 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
M	EECOM-01	M	MER-13
P	CAR 86RF07		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: D.SANDERSFELD/562-9223772

2: I.ANDU/BNA/X39324

0 DESCRIPTION:

A repressurization of the combined Orbiter/Mir stack was started at 275:01:52 G.m.t. using PCS 1 providing N2 and PCS 2 providing O2. The initial pressure was approximately 12.6 psia. The N2 flow rate began to rapidly decrease 43 minutes later, with the cabin pressure at approximately 14.3 psia, as the regulator transitioned from high to low flow (should occur at 14.6 psia). The repressurization was terminated by the crew at 275:02:40 G.m.t. The crew reported that ice had formed on the pressure control system panel. Following a crew sleep period, the stack repressurization resumed at 275:13:02 using PCS 2. This repressurization was nominally completed in 32 minutes with the pressure increasing to 14.62 psia, which is the control pressure for this PCS 2 14.7 psia (cabin) regulator. The PCS 1 regulator was then enabled at 275:13:34 G.m.t. (00 6:11:00 MET) and the repressurization continued nominally to PCS 1 14.7 psia, which is the control pressure for this PCS 1 14.7 psia regulator.

Is believed that chilling of the regulator as a result of the long duration high flow (~187 lb/hr) caused the early transition from high to low flow. At the time of the event, the N2 supply tank temperatures were in the -10 to -50 deg F range. Two possible explanations have been given for the early transition. The first is that the bellows in the high flow portion of the regulator lost elasticity at the low temp temperatures which caused the poppet to return to its original (closed) position. The second is that chilling of the reference chamber in the low flow portion of the regulator caused the regulator set point to change.

A postflight N2 sample was requested as well as a test to verify the high flow capability of the regulator (scheduled for the week of 10/27). This request was included in chit J5081 identifying ECLSS work to be performed prior to OV-104 being ferried to Palmdale. Also, testing will be performed at JSC to better understand the failure/capability of the cabin regulators and to verify the emergency capability of the 8 psia regulators.

1

STS-086 (OV-104,FLT #20) INFLIGHT ANOMALY REPORT 08/26/98

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IFA NUMBER> STS-86-V-06

TITLE:WSB 3 VENT HEATER FAILURE ON THE B CONTROLLER

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 278 : 21.59.00

IFA DATE: 10/05/1997

IFA STATUS: OPEN ELAPSED TIME: 009 : 19.24.41

PRACA STATUS: OPEN HOUSTON TIME: 15.59.00

PRCBD NUMBER: S062126 PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M MER-15 M MMACS-03

P CAR 86RF05 U UA-4-A0039

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: B VANMETER/562-9222228

2: J.WILTZ/BNA-H/X39009

0 DESCRIPTION:

During the time period between the first and second landing opportunities, the WSB 3 vent temperature number 2 (V58T0366A) went off scale low (122 deg F). Nominally, the vent heater should have cycled back on at around 145 deg F. The system was operating on the B controller at the time, and this signature indicated that the B heater had failed off. The system was switched to the WSB 3 A controller at 278:22:28 G.m.t and a rise in vent temperature was observed a short time later. Nominal cycling of the A vent heater was observed. The B vent heater was tried again following the waived-off entry attempt and on entry day. In both instances, the B vent heater remained failed.

This problem also occurred just prior to STS-76's entry deorbit burn, when the WSB 3 vent temperature went off scale low with WSB 3 on the B controller. The system was switched to the WSB 3 A controller and a rise in vent temperature was observed a short time later. In order to better characterize the problem, after about 30 minutes and nominal heater cycles on the A controller the system was switched back to the B controller. Nominal cycling of the B vent heater was observed for the remainder of the flight. The problem was not found during post-flight troubleshooting and was flown as-is. The problem had not repeated until this STS-86 occurrence.

KSC is planning to verify if the heater is still failed. Troubleshooting in this problem will be performed when the vehicle is at Palmdale.

IFA NUMBER> STS-86-X-01

TITLE:EVA SAFETY TETHER SPOOL BRAKE JAM

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062126 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

* ********NONE FOUND******* * ********NONE FOUND*******

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.SCHWARZ/JSC-MS4,B/U 14

2:

0 DESCRIPTION:

The EVA safety tether reel spool brake jammed in place due to contamination or thermal effects. This failure mode has not been seen in previous extensive EVA use. There is no acceptance thermal test currently required for safety tethers (qual only:-100F). Egress was cold case/night pass. A thermal test is in work to attempt to duplicate the failure with flight unit s/n 1015 and a disassembly planned after the thermal test. A drawing review shows potential interference fit at brake pivot (.0003 worst case).

All three safety tethers returned to JSC for acceptance thermal test to -180 degress F, hardware passed. After the thermal test the tether will be disassembled. A design change such as adding a vespel bushing to the brake pivot shoulder bolt may be required to resolve the problem for long term use.

-JFDPO12: NORMAL TERMINATION OF PROCESSING

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STS-087 (OV-102,FLT #24) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-87-P-01

TITLE:SPARTAN ACS FAILURE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062127 PHASE:

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
M	PYLD-09	M	SPTN 201-04

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.STUCKEY/JSC-MT

2:

0 DESCRIPTION:

During deploy, SPARTAN did not perform the pre-programmed pirouette maneuver following derigidization. An attempt to regrapple the payload resulted in a tip-off rate of approximately 2 deg/s in the +X direction, and the crew was unable to capture SPARTAN before the prop bingo limit was reached. The crew was instructed to backaway from SPARTAN. A rendezvous and manual capture of SPARTAN was performed on FD6.

The impact was a total loss of SPARTAN science mission. It has been determined that there is no evidence of a SPARTAN payload malfunction. All indications are that the spacecraft is healthy and performed as expected in the off-nominal conditions.

Post-flight investigation will focus on the SPARTAN pre-deploy

procedures and PGSC software.

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STS-087 (OV-102,FLT #24) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-87-T-01

TITLE:ORBITER TPS DAMAGE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062127 PHASE:

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
*	********NONE FOUND*******	*	********NONE FOUND*******

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: R.ADAMS JSC-MS4

2:

0 DESCRIPTION:

Numerous TPS hits were identified during STS-87 post landing inspection. A total of 308 hits were identified. One hundred, thirty-two hits had a major dimension of 1 inch or larger. Both total number of TPS hits and number of hits 1" or larger are "out-of-family" when compared to previous missions.

All hardware but ET and SRB nosecaps were inspected post flight and no potential contributors/debris sources were identified. Ice was eliminated as a potential debris source.

A review of photographic evidence indicated the ET intertank TPS loss provided the debris source that caused the Orbiter tile damage. Orbiter

unbilical well cameras showed that ET (+Z side) & SRB nosecaps were very clean. Some damaage was visible on the +y side of the ET intertank near the forward ET/SRB attach hardware.

The handheld crew photos of the ET post separation verified damage on the ET intertank. It was localized to the ET intertank thrust panel region on both sides. The ET Project concurred that TPS loss was extensive and out-of-family. The ET (-Z side) other than thrust panel area was clean.

Team activities are now focused on the ET thrust panel area as the debris source. ET has established an investigation team to address the thrust panel TPS loss.

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STS-087 (OV-102,FLT #24) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 3

IFA NUMBER> STS-87-V-01

TITLE:SIDE HATCH TEST PORT SEAL CAME OFF DURING CABIN LEAK CHECK

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 323 : 18.48.00

IFA DATE: 11/19/1997

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: OPEN HOUSTON TIME: 12.48.00

PRCBD NUMBER: S062127 PHASE: PRE-LAUNCH

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 87V-0164	K	PR ECL-2-24-1189
M	MER-01	P	CAR 87RF01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: C.CAMPBELL/ES5/X38948

2: D TRAN/BNA-H/282-5431

0 DESCRIPTION:

During the prelaunch cabin leak checks, the KC103-24 teflon seal at the end of the orbiter test port used to pressurized the cabin came off. The seal was replaced and the cabin leak check was completed satisfactorily. The problem delayed the cabin leak check, thus initiating a concern over the residual O2 concentration in the aft compartment. However, the aft compartment O2 readings did drop below the 500-ppm level just prior to the end of the planned hold period, and the countdown was resumed at the planned time.

The seal was recovered and it looked good. Dimensional inspections of the other Orbiters' test ports will be performed.

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STS-087 (OV-102,FLT #24) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-87-V-02

TITLE:KU-BAND RF POWER OUTPUT TELEMETRY ERRATIC

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 324 : 14.51.00

IFA DATE: 11/20/1997

IFA STATUS: OPEN ELAPSED TIME: 000 : 19.05.01

PRACA STATUS: OPEN HOUSTON TIME: 08.51.00

PRCBD NUMBER: S062127 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 90V-0001	M	MER-06
P	CAR 87RF04		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: A CHU/EV3/X31445

2: M.O'HARE/BNA-H/282-5398

0 DESCRIPTION:

The Ku-Band RF power output telemetry measurement (V74E2511A) was

erratic. During these time periods the White Sands Ground Station reported a good Ku-Band downlink signal. This parameter should be relatively stable at about 4.5 Vdc: however, during the cited times the uncalibrated signal varied from 0 to 4.3 Vdc. The erratic output repeated a third time for several minutes.

A similar signature occurrred on this same DA on STS-43 and STS-45. CAR 43RF05 recorded repairs made that were thought to have fixed the problem. These repairs included the repair of a broken shield on a coaxial cable and the repair of a connector that had excessive bonding material resulting in an improperly mated condition. It then flew on STS-83 and -94 with no problems.

1

STS-087 (OV-102,FLT #24) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-87-V-03

TITLE:PRIMARY THRUSTER R2D HEATER FIELD OFF

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 327 : 08.00.00

IFA DATE: 11/23/1997

IFA STATUS: OPEN

ELAPSED TIME: 003 : 12.14.01

PRACA STATUS: OPEN

HOUSTON TIME: 02.00.00

PRCBD NUMBER: S062127

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 90V-0003	M	MER-08
M	PROP-01	P	CAR 87RF05

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.JONES/EP2/X39031

2: B.MANHA/BNA/282-5416

0 DESCRIPTION:

It was determined that the primary thruster R2D heater had failed off. A review of the data indicate that the heater had probably been failed

off throughout the mission and the thruster injector temperatures had been maintained above 75 deg F by the external environment and thruster firings. Throughout the mission, the injector temperatures were maintained above 45 deg F by the external environment and the RCS stinger heater.

Thruster valves are certified for operation down to 40 deg F (32 deg F injector), but failure hisory indicates increased risk of thruster valve leakage below 50 deg F. Injector temperatures are expected to be at approximately 42 deg F when the thruster valve temperature equals 50 deg F. RM will deselect the thruster as failed leak the oxidizer injector temperature drops below 30 deg F or the fuel injector temperature drops below 20 deg F.

KSC will perform postflight troubleshooting.

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STS-087 (OV-102,FLT #24) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 6

IFA NUMBER> STS-87-V-04

TITLE:TANK A/B CHECK/RELIEF VALVE HIGH CRACKING PRESSURE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 324 : 02.20.00

IFA DATE: 11/19/1997

IFA STATUS: OPEN ELAPSED TIME: 000 : 06.34.01

PRACA STATUS: OPEN HOUSTON TIME: 20.20.00

PRCBD NUMBER: S062127 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR WWM-2-25-0036	M	EECOM-01
M	PROP-01	P	CAR 87RF09

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.JONES/EP2/X39031

2: B.MANHA/BNA/282-5416

0 DESCRIPTION:

The supply water inlet pressure reached 39.58 psia when supply water tank A reached full quantity and tank A/B check/relief valve cracked open. The supply water storage inlet pressure increased from 33.21 psia to 39.58 psia over a 5 minute period before the relief valve opened. The pressure rise to crack the check valve was around 6 psid, where past flights show a range from 0.4 to 0.8 psid for crack pressure. The relief valve cracking specification is between 0.8 and 2.5 psid and the valve reseats at 0.8 psid. The check/relief valve will stay open until the tank A quantity level drops below full. During the time that the A/B check/relief valve was stuck closed fuel cell water flowed through the alternate path into tank B.

The supply water inlet pressure went from 31.65 psia to 33.00 psia in 33 seconds before the check/relief valve was reopened. This is a 1.35 psid cracking pressure. The valve will be replaced.

-JFDPO12: NORMAL TERMINATION OF PROCESSING

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STS-088 (OV-105,FLT #14) INFLIGHT ANOMALY REPORT 08/21/00
PAGE 1

IFA NUMBER> STS-88-I-01
TITLE:SSME NOZZLE ABLATOR FOUND BETWEEN ORBITER TILES

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 000 : 00.00.00
IFA DATE:
IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00
PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00
PRCBD NUMBER: S062128 PHASE:

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
*	********NONE FOUND*******	*	********NONE FOUND*******

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: MATT RILEY/BNA
2:

0 DESCRIPTION:
Two pieces of SSME nozzle ablator were found laying on Orbiter tiles on the body flap upper surface at the hinge line during STS-88 post flight inspection. Size of ablator was 6" x 3/4" x 3/8" and 4" x 3/4" x 3/8". No impact damage was reported on the adjacent tiles. Portions of the STS-95 SSME nozzle ablator were also missing but not found.

Background:
Ablator is bonded to engines 2 and 3 to prevent the recurring problem of nozzle blueing. Ablator used on STS-88 and STS-95 (1st flight). Ablator is located circumferentially from 45 degree inboard to 90 degree outboard from the bottom.

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STS-088 (OV-105,FLT #14) INFLIGHT ANOMALY REPORT 08/21/00
PAGE 2

IFA NUMBER> STS-88-V-01
TITLE:CAMERA B PAN DRIVE ANOMALY (GFE)

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 339 : 02.04.00
IFA DATE: 12/05/1998
IFA STATUS: OPEN ELAPSED TIME: 000 : 17.28.26
PRACA STATUS: UNKNOWN HOUSTON TIME: 20.04.00
PRCBD NUMBER: S062128 PHASE: PRE-LAUNCH

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	IV6-343137	A	PV6-343137
C	MER-04	K	VJCS-5-13-0270
K	088V-0079	K	099V-0007
M	INCO-001		

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: BERNIE EMBREY/EV2/X30184
2:

0 DESCRIPTION:
Crew reported a binding problem with Camera B pan drive. The crew first attempted to pan Camera B from 'directed at Camera C' to an alignment directed at Camera A (pan left). Process was repeated with same results. Camera C was activated to view Camera B activities, but no cable-related binding was apparent. Binding occurred at high rate only, not low at low rate. Camera B video is operating but pan operations are being minimized. On flight day 8, troubleshooting was performed on camera B and the binding at fast rate was experienced again. At the slow rate the camera B was able to pan. Video was taken to troubleshooting this problem. A PR VJSC-5-13-0270 was open on this camera during the STS-88 flow on a similar problem. KSC will troubleshoot the problem prior to camera removal.

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STS-088 (OV-105,FLT #14) INFLIGHT ANOMALY REPORT 08/21/00
PAGE 3

IFA NUMBER> STS-88-V-02
TITLE:APU 2 DRAIN LINE PRESSURE DECREASE (ORB)

0 MISSION CONSTRAINT: SUBS
IFA TIME GMT: 340 : 22.33.00
IFA DATE: 12/06/1998
IFA STATUS: OPEN
ELAPSED TIME: 002 : 13.57.26
PRACA STATUS: UNKNOWN
HOUSTON TIME: 16.33.00
PRCBD NUMBER: S062128
PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	IV6-346009	A	PV6-346009
C	MER-07	K	APU-5140233
K	099V-0002	M	MMACS-002
P	88RF08-0		

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: TIBOR FARKAS/BNAD/9224487
2: ED POLEWARCZYK/BNAH/X5378

0 DESCRIPTION:
APU 2 Drain Line Pressure 1 & 2 (V46P0290A & V46P0291A) have decreased from approximately 15.5 psia prelaunch to 11.1 psia at GMT 340:22:33. A similar decrease occurred during STS-89 that was attributed to a slight leak of the relief valve. However, this is the first flight of the burst disk located between these pressure measurements and the relief valve. The data showed initially a small GN2 leak of 1.3 pi/day and the decay rate decreased to approximately .5 psi/day. A post flight troubleshooting plan has been developed.

1
STS-088 (OV-105,FLT #14) INFLIGHT ANOMALY REPORT 08/21/00
PAGE 4

IFA NUMBER> STS-88-V-03
TITLE:THRUSTER R2D FAILED LEAK (ORB)

0 MISSION CONSTRAINT: SUBS
IFA TIME GMT: 348 : 21.41.00
IFA DATE: 12/14/1998
IFA STATUS: OPEN
ELAPSED TIME: 010 : 13.05.26
PRACA STATUS: UNKNOWN
HOUSTON TIME: 15.41.00
PRCBD NUMBER: S062128
PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	PV6-346327	C	MER-16
K	RP01-28-1153	M	PROP-001
P	88RF09-0		

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: DAVE PERRY/BNAD/9224018
2: STEVE ARRIETA/BNA/2825436

0 DESCRIPTION:
During the RCS Hotfire test, RCS jet R2D was declared failed leak by RCS RM due to evaporative cooling. The fuel injector temperature drapped below the RM limit of 20 degrees F and reached a minimum of 18.8 degrees F. The temperature recovered to nominal immediately following the hotfire pulses. The RCS jet has been deselected and will remain so for the duration of the flight unless another right pod down jet fails. KSC will perform a remove and replace of all the thrusters on that manifold.

1
STS-088 (OV-105,FLT #14) INFLIGHT ANOMALY REPORT 08/21/00
PAGE 5

IFA NUMBER> STS-88-V-04
TITLE:OMS POD STARBOARD KEEL WEB HEATER FAILED OFF (ORB)

0 MISSION CONSTRAINT: SUBS
IFA TIME GMT: 348 : 13.44.00
IFA DATE: 12/14/1998
IFA STATUS: OPEN
ELAPSED TIME: 010 : 05.08.26
PRACA STATUS: UNKNOWN
HOUSTON TIME: 07.44.00
PRCBD NUMBER: S062128
PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	IV6-346331	A	PV6-346331
C	MER-17	K	P-RP01-1312
K	RP01-28-1158	K	099V-0012
M	PROP-002	P	88RF10-0

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: DAVE PERRY/BNAD/922-4018
2: STEVE ARRIETA/BNAH/X5436

0 DESCRIPTION:
The starboard keel web heater (V43T5700A) had been cycling on system "A" consistently at a low point of 58 degrees F on this and other missions for this pod (RP01). At 348:13:44 the heater did not activate at 58 degrees F but continued to decrease to about 54 degrees F. The attitude had been mostly -ZLV -XVV at low beta angle so the attitude is fairly symmetric for the pods. The port side keel web (V43T4700) cycled five times while the starboard side heater did not. A review of all past flight data showed the 54 degrees F on this flight was the coldest on-orbit for system "A". There was a 0.68 hr biased starboard side sun attitude (biased 45 degrees to the aft) flown after the drop to 54 degrees F which caused a 1 bit rise. The starboard ox tank reached 70 degrees F so the starboard heaters were switched to the B string to maintain the tank temperatures above 70 degrees F. KSC will perform troubleshooting.

1

IFA NUMBER> STS-88-V-05
TITLE:RIGHT RCS 1/2 TANK ISOLATION VALVES FAILED TO CLOSE (ORB)

0 MISSION CONSTRAINT: SUBS
IFA TIME GMT: 350 : 04.26.00
IFA DATE: 12/15/1998
IFA STATUS: OPEN
ELAPSED TIME: 011 : 19.50.26
PRACA STATUS: UNKNOWN
HOUSTON TIME: 22.26.00
PRCBD NUMBER: S062128
PHASE: POST LANDING

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	IV6-346209	A	PV6-346209
C	MER-18	K	OEL-5-141681
K	099V-0010	M	PROP-003
P	88RF11-0		

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: MEL CORTEC/BNAD/922-3640
2: MARK FUGITT/BNAH/282-5458

0 DESCRIPTION:
During the post-landing RCS and OMS valve test, the Right RCS AC Motor Valve 1/2 tank Isolation Valves talkback indication failed to indicate closed when commanded from the "open" to the "closed" position. The crew reported the talkback remained indicating "open". The switch was taken back to the "open" and then to the "closed" position with no joy on either the talkback nor telemetered valve positions indicators. Preliminary analysis of the data indicates that the problem is either in the aft MCS no. 3, the cockpit switch, or the copper path from the switch to AMCA no. 3. Tank iso valves were closed via LPS command. Panel 07 t/b indicated closed, however, the VPI did not indicate closed. Repeated valve cycle during offload with same results. troubleshooting will continue.

1

IFA NUMBER> STS-88-V-06
TITLE:LEFT OMS ENGINE BIPROPELLANT VALVE #1SLOW AND REDUCED TRAVEL (ORB)

0 MISSION CONSTRAINT: SUBS
IFA TIME GMT: 350 : 02.48.04
IFA DATE: 12/15/1998
IFA STATUS: OPEN
ELAPSED TIME: 011 : 18.12.30
PRACA STATUS: UNKNOWN
HOUSTON TIME: 20.48.04
PRCBD NUMBER: S062128
PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	PV6-346442	C	MER-19
K	LP04-21-0857	P	88RF12-0

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: DAVE PERRY/BNAD/922-4018
2: STEVE ARRIETA/BNAH/X5436

0 DESCRIPTION:
During the deorbit burn, the left OMS engine (s/n 109) bipropellant valve #1 exhibited a slow opening time of approximately 1 second. This opening time was twice the length of time taken by previous firings (approximately 0.5 seconds). For the previous flight of OV-105 STS-89, the opening time was faster at 0.4 seconds. The requirement for opening time is not more than 0.8 seconds. The open position of the valve for the deorbit burn was 95% whereas the open position for previous firings was 98%. The closed position of the valve for the deorbit burn was 1.5% whereas the closed position for previous firings was minus 2.1%. Removal and replacement of OMS engine is possible.

1

IFA NUMBER> STS-88-V-07
TITLE:PRESSURE HYDRAULIC SYSTEM 1

0 MISSION CONSTRAINT: SUBS
IFA TIME GMT: 337 : 08.53.42
IFA DATE: 12/03/1998
IFA STATUS: OPEN
ELAPSED TIME: 000 : 00.00.00
PRACA STATUS: UNKNOWN
HOUSTON TIME: 02.53.42
PRCBD NUMBER: S062128
PHASE: PRE-LAUNCH

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
A	IV6-345773	A	PV6-345773
C	MER-01	K	V070-5-A0007
K	V070-5-13-0168	K	088V-0165
P	88RF13-0		

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: VIET PHO/BNAD/5629222884
2: ANDY FARKAS/BNAH/282-5318

0 DESCRIPTION:
During the final countdown for the 12/03/98 launch, a master alarm was annunciated for a Launch Commit Criteria (LCC) violation and the countdown was held at that point. The hydraulic system 1 supply pressure B dropped to 1636 psia, well below the 2400 psia master alarm trigger point, during transition from low pressure to normal pressure. The backup flight system (BFS) did not receive the fault message because the pressure recovered prior to the second data scan below the lower limit. Data analysis confirmed the expected switching valve operation, as well as confirming an insufficient flow demand to cause the pressure drop. A review of the flight data indicated that the system 1 depressurization valve was momentarily energized at the time of the pressure drop. Troubleshooting and switch tests on the vehicle documented that switch tease was the most likely cause of the momentary actuation of the depressurization valve. The troubleshooting showed that the hydraulic system 1 depressurization switch had good stability

in the normal pressure position. Proper remote power controller (RPC) operation with the switch in the normal pressure position was verified on this vehicle during the STS-89 mission. Based on the results of the data evaluation and the vehicle tests, the decision was made to make no changes to the vehicle and fly as-is for STS-88 second launch attempt.

Since the switch was found to be position sensitive, KSC troubleshooting is being scheduled for the switch with the possible removal and replacement of the switch.

1

STS-088 (OV-105,FLT #14) INFLIGHT ANOMALY REPORT 08/21/00
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IFA NUMBER> STS-88-V-08
TITLE:ACTEX HOSE WRONG CONNECTOR

0 MISSION CONSTRAINT: SUBS
IFA TIME GMT: 338 : 13.45.00
IFA DATE: 12/04/1998
IFA STATUS: OPEN
ELAPSED TIME: 000 : 05.09.26
PRACA STATUS: UNKNOWN
HOUSTON TIME: 07.45.00
PRCBD NUMBER: S062128
PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
C	MER-03	K	PR DR BM833135
M	EECOM-001		

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: KS CHHIPWADIA/EC/483-7633
2: TRACEY RIVERMAN/BNAH/0004

0 DESCRIPTION:
Upon installing the GIRA hardware, the crew discovered an incompatible connection between the ACTEX (Activated Carbon Ion Exchange) Cartridge and the ACTEX Hose Assembly. The ACTEX Hose Assembly was built with a 1/4 inch male QD instead of the nominal 1/4 inch female QD per the drawing 528-2106-1. The ACTEX cartridge was assembled correctly, and all labels were correct.

An IFM procedure is being developed to replace the male QD at the end of the ACTEX Hose with a female QD from the RED-RED hose, part of the Contingency Hose and Cable Kit. The IFM was performed on FD2.

No KSC action required.

1

STS-088 (OV-105,FLT #14) INFLIGHT ANOMALY REPORT 08/21/00
PAGE 10

IFA NUMBER> STS-88-X-01
TITLE:ANOMALOUS SAFER GN2% AND TANK P READING

0 MISSION CONSTRAINT: SUBS
IFA TIME GMT: 000 : 00.00.00
IFA DATE:
IFA STATUS: OPEN
ELAPSED TIME: 000 : 00.00.00
PRACA STATUS: UNKNOWN
HOUSTON TIME: 00.00.00
PRCBD NUMBER: S062128
PHASE:

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
*	********NONE FOUND*******	*	********NONE FOUND*******

0 CLOSURE INITIATED BY:
RESPONSIBLE MANAGERS 1: JEFF DUTTON/XA/483-2841
2:

0 DESCRIPTION:
During the SAFER DTO on EVA3, the crew reported that the SAFER read 0 Tank P. After this report he was able to fly the SAFER to a handrail. After repress the SAFER read GN2% 48 and tank P 2614. The EVA Project Office has chartered a team to investigate this issue headed by XA/Allen Flynt.

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1
          STS-088 (OV-105,FLT #14) INFLIGHT ANOMALY REPORT                08/21/00
                                                                          PAGE  11
  IFA NUMBER> STS-88-X-02
  TITLE:LOST HARDWARE

0 MISSION CONSTRAINT:            SUBS          IFA TIME GMT: 000 : 00.00.00
                                               IFA DATE:
  IFA STATUS:    OPEN                          ELAPSED TIME: 000 : 00.00.00
  PRACA STATUS: UNKNOWN                        HOUSTON TIME: 00.00.00
  PRCBD NUMBER: S062128                        PHASE:
0 TYPE       TRACKING NUMBER          TYPE       TRACKING NUMBER
   *    ********NONE FOUND*******      *    ********NONE FOUND*******
0 CLOSURE INITIATED BY:
  RESPONSIBLE MANAGERS 1: JEFF DUTTON/XA/483-2841
                       2:
0 DESCRIPTION:
   During STS-88, three pieces of hardware were lost during EVAs 1 and 2.
   There is no obvious common hardware issue between the three occurrences.
   The EVA PRoject Office has chartered a team to investigate this issue
   headed by XA/Steve Poulos.

-JFDPO12: NORMAL TERMINATION OF PROCESSING
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1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 1

IFA NUMBER> STS-89-K-01

TITLE:FSS GN2 750 PSIG FACILITY SUPPLY REGULATORS CREEPING

0 MISSION CONSTRAINT: 0090 SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062129 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR-89V-0252

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: E. MANGO

2:

0 DESCRIPTION:

Contingency crew isolated secondary 750 psig leg. Supported launch with primary system only. Dome regulator replaced post launch due to a regulator seat failure. Seat failure under analysis. Additional troubleshooting also found black powder residue in the lines at the regulator. Investigating source and extent of powder residue.

1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 2

IFA NUMBER> STS-89-K-02

TITLE:LOSS OF BOTH LPS GPC FEPS

0 MISSION CONSTRAINT: 0090 SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062129 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR-89V-0258

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: E.MANGO

2:

0 DESCRIPTION:

During the standby GPC FEP table reload a parity error was detected on the active GPC FEP. This caused both FEP's to fail. Active FEP was recovered within 3 minutes. FEP tables were reloaded and verified. Supported terminal count in a standard GPC FEP configuration. FEP configuration under reveiw to reduce the potential of a similar event.

1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 3

IFA NUMBER> STS-89-K-03

TITLE:VESTIBULE VENT VALVE ASCENT CONFIGURATION

0 MISSION CONSTRAINT: 0090 SUBS IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062129 PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR 89V-0172 TPS

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: D.GERLACH JSC-CA4

2: E.MANGO KSC

0 DESCRIPTION:

After a large air leak was noticed during the post-MIR docking vestibule leak check, it was determined that 3 of 4 vestible vent valves were open. They should have been closed. The open valves were: vestibule vent valve 1 and vestibule vent isolation valves 1 and 2. The crew closed the circuit breakers used to power the valves and successfully closed the valves.

VITT will update the ascent switch list to perform a prelaunch check of these valve positions for future flights.

1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 4

IFA NUMBER> STS-89-K-04

TITLE:EXCESSIVE TIME TO EXECUTE LDB COMMAND TRANSACTIONS

0 MISSION CONSTRAINT: 0090 SUBS

IFA TIME GMT: 000 : 00.00.00

IFA DATE:

IFA STATUS: OPEN

ELAPSED TIME: 000 : 00.00.00

PRACA STATUS: UNKNOWN

HOUSTON TIME: 00.00.00

PRCBD NUMBER: S062129

PHASE:

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

K IPR-00X-4148

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: E.MANGO KSC

2:

0 DESCRIPTION:

Post launch review of integration console commands indicated the average time to execute an LDB command was 0.262 sec. Normal average is 0.165 sec. GLS could issue a cutoff if timing checks indicate above 0.500

sec. Investigation cannot repeat the condition. Troubleshooting continuing with the most likely cause being the integration console hardware.

1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-89-V-01

TITLE:GPC 3 MODEL SWITCH STANDBY DETENT FAILURE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 023 : 03.44.00

IFA DATE: 01/22/1998

IFA STATUS: OPEN ELAPSED TIME: 000 : 00.55.45

PRACA STATUS: OPEN HOUSTON TIME: 21.44.00

PRCBD NUMBER: S062129 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR88V-0003	M	DPS-01
M	MER-01	P	SPR/CAR 89RF01

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: D.BUENDIA/BNA-H/922-4494

2: A.FARKAS/BNA-H/282-5318

0 DESCRIPTION:

When the crew was configuring GPC 3 as a G2 "freeze dry" GPC, they reported that when taking the GPC 3 mode switch from the run to the standby position, there was no detent in the standby position and the switch went into the halt position. Subsequent mode switch changes confirmed that the freeze dry procedure had failed because GPC put-away processing was not completed when the mode switch was inadvertently taken to halt. Jiggling the switch seemed to provide sporatic contact in the standby position.

On FD2, a HISAM dump of GPC 3 was performed. GPC 3 was then successfully IPL'ed and put into the G2 redundant set. The GPC 3 mode switch was placed in the run position for the remainder of the mission. A broken detent spring, which results in loss of detent in the standby and halt position, is the most likely cause of the anomaly. A leverlock bushing holds the switch in the run position.

KSC troubleshooting of switch operation is complete. The switch relacement is being scheduled. Panel O6 will be removed and shipped to NSLD. The switch will be removed and replaced. Failure analysis will be performed on the removed switch.

1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 6

IFA NUMBER> STS-89-V-02

TITLE:MPS LH2 4" DISCONNECT FAILED TO PNEUMATICALLY CLOSE

0 MISSION CONSTRAINT: 0090 SUBS

IFA TIME GMT: 023 : 02.56.00

IFA DATE: 01/22/1998

IFA STATUS: OPEN

ELAPSED TIME: 000 : 00.07.45

PRACA STATUS: OPEN

HOUSTON TIME: 20.56.00

PRCBD NUMBER: S062129

PHASE: ASCENT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 88V-0002	M	MER-03
P	SPR/CAR 89RF04		

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: J.KREMER/BNA-D/922-1445

2: T.REITH/BNA-H/2825328

0 DESCRIPTION:

Data review indicates that following SSME shutdown, the LH2 4" disconnect failed to pneumatically close within the required time. The

actual closing time was 11.75 seconds signal to switch compared to the OMRSD File IX requirement of 2.8 seconds maximum (typical times are around 1.7 seconds). The disconnect is commanded closed shortly after MECO. The open indicator was not lost until approximately 11.5 seconds later. This coincides with Orbiter umbilical retract which occurs at 11.4 seconds after the MECO command. It appears that the disconnect closed mechanically in the backup mode as the Orbitor umbilical plate separated from the ET umbilical.

This disconnect was replaced during the STS-89 flow as part of the recycle program to eliminate 4" disconnects with chrome flaking problems. Possible explanations include failure in the pneumatic system to provide closing pressure to the actuator (a solenoid or electrical wiring problem) or mechanical binding/icing within the disconnect pair. This anomaly has no impact on the remainder of the mission.

Postlanding video revealed the LH4" actuator to be fully retracted. Also video found the flapper seal cracked which was a result of the mechanical closing of the valve. KSC troubleshooting plan is in place. During troubleshooting, signature traces were taken and the data review is in work. Next action is to have NSLD check the sector gear alignment. The valve will be removed and replaced.

1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

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IFA NUMBER> STS-89-V-03

TITLE:VERNIER THRUSTER L5D OXIDIZER TEMPERATURE ERRATIC

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 026 : 03.19.00

IFA DATE: 01/25/1998

IFA STATUS: OPEN ELAPSED TIME: 003 : 00.30.45

PRACA STATUS: OPEN HOUSTON TIME: 21.19.00

PRCBD NUMBER: S062129 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 88V-0004	M	MER-07
M	PROP-01	P	SPR/CAR 89RF02

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.JONES/EP2/X39031

2: S.ARRIETA/BNA/282-5436

0 DESCRIPTION:

The oxidizer injector temperature (V42T2525C) on vernier RCS thruster L5D began to behave erratically. The indicated temperature rapidly decreased to below the 130 deg F leak detection limit resulting in the automatic deselection of L5D by RM. A review of the data confirmed that the erratic temperature indication was an instrumentation problem and not an actual oxidizer leak. The indicated oxidizer injector temperature remained offset low in the 75 to 125 deg F range until approximately 026:06:07 G.m.t., when it recovered. It subsequently failed again at 026:11:30 G.m.t. and then failed and recovered several times during the remainder of the mission. When the failure initially occurred, attitude control of the Orbiter/Mir stack was passed to the Mir. Due to Mir propellant concerns attitude control was passed back to the Orbiter at approximately 026:07:48. Note that TDRS-Z had been brought up to provide complete orbit coverage so that vernier leak detection could be performed by the ground.

To recover partial vernier leak detection using the fuel injector temperatures, a general purpose computer (GPC) memory (GMEM) write procedure was developed and uplinked to change the oxidizer injector temperature leak detection limit of all vernier thrusters from 130 deg F to off-scale-low. A BITE 4 read test of MDM FA1 was performed with nominal results.

This same anomaly occurred on STS-68 and STS-67. Extensive troubleshooting was unable to duplicate and isolate the anomaly. The thruster was removed and replaced after STS-68.

A non invasive troubleshooting plan has been developed. An inspection of the vehicle/thruster connector is being scheduled. After wiggle testing of the connector, the vehicle connector will have the sockets pertaining to the temperature measurement pulled and replaced. Failure analysis will be performed on the removed sockets. BNA will sponser a pre-approved GMEM prior to the next flight of OV-105.

1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 8

IFA NUMBER> STS-89-V-04

TITLE:VERNIER DRIVER F5 RPC 2 FAILED OFF

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 027 : 02.06.00

IFA DATE: 01/26/1998

IFA STATUS: OPEN

ELAPSED TIME: 003 : 23.17.45

PRACA STATUS: OPEN

HOUSTON TIME: 20.06.00

PRCBD NUMBER: S062129

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 88V-0006	M	MER-09
M	PROP-02	P	SPR/CAR 89RF05

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: L.BARTLOW/BNA-D/922-5632

2: V.PURKEY/BNA-H/282-5381

0 DESCRIPTION:

Reaction jet driver forward-2 (RJDF2) F5 RPC 2 failed off. Shortly

after this happened, thruster F5R was commanded to fire, resulting in an F5R fail off due to the lack of driver power, and loss of vernier thruster attitude control of the mated vehicle. After cycling the vernier driver switch and then turning on the forward reaction jet logic and driver power for the forward primary thruster, RJDF2 F5 RPC 2 power was restored. Vernier thruster F5R was re-selected and vernier control of the mated vehicle attitude was re-established.

The fail off of the RJDF2 F5 RPC 2 is believed to have been caused by a failure in the latch circuit in the forward load contro assembly 3. As a result, the RJDF2 logic power switch for forward RCS manifolds 4 and 5 remained on while the Orbiter was docked to the Mir. Following undocking, to troubleshoot this failure, the RJDF2 logic power switch was taken to off to test the latch with the vernier driver power. Vernier logic power remained on indicating that the latch forward mainifold 5 logic and driver power experienced another dropout. The logic switch had been off about 39 minutes before the logic power dropout. The logic switch was taken back to on approximately 1 minute after the dropout, prior to getting a forward vernier firing. Troubeshooting plan has been developed and agreed to by JDC, KSC, and Downey.

1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

PAGE 9

IFA NUMBER> STS-89-V-05

TITLE:RIGHT RCS FUEL HELIUM ISOLATION VALVE B FAILED TO OPEN

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 027 : 13.47.00

IFA DATE: 01/27/1998

IFA STATUS: OPEN

ELAPSED TIME: 004 : 10.58.45

PRACA STATUS: OPEN

HOUSTON TIME: 07.47.00

PRCBD NUMBER: S062129 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 88V-0005	M	MER-10
M	PROP-03	P	SPR/CAR 89RF06

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: S.JONES/EP2/X39031

2: S.ARRIETA/BNA-D/282-5436

0 DESCRIPTION:

During the planned RCS regulator reconfiguration, the right RCS fuel helium isolation valve B failed to open. The valve position indication (VPI) telemetry indicated that the valve did not move (the close VPI (V42X3127X) stayed on and the open VPI (V42X3126X) stayed Off). The crew reported a barberpole talkback. The right RCS helium press B switch was cycled from open to close and back to the open position. The fuel helium isolation valve B still did not open. The switch was then taken to close and the right RCS was returned to the A regulators (the right RCS helium press A switch was taken to open).

A similar problem with this valve (LV301) occurred during the STS-75 processing flow when the valve did not indicate closed after being commanded closed. After 2/5 minutes of applying the closed command, the valve finally indicated closed. Extensive troubleshooting over several subsequent flows could not reproduce the problem. Closed as an UA with the most probable cause being the BPI. During entry, the crew switched the RRCS He'A' and 'B' isolation valves to Manual Open. The'B' indicator showed a 'barberpole', and the 'B' leg was subsequently switched to GPC. The 'B' valve Open indication remained Off following the switch positioning, and the Closed indication remained On. This continued for the duration of entry. During KSC troubleshooting, the valve was found to be hard closed. KSC plans to break the Orbiter/Pod connections and troubleshoot vehicle wiring. If no problem is

discovered, then the Pod will be removed. At the HMF, continuity checks will be performed on the Pod wiring prior to commiting to a valve replacement.

1

IFA NUMBER> STS-89-V-06

TITLE:-Z STAR TRACKER PRESSURE FAIL BITE

0 MISSION CONSTRAINT: SUBS IFA TIME GMT: 028 : 07.38.00

IFA DATE: 01/28/1998

IFA STATUS: OPEN ELAPSED TIME: 005 : 04.49.45

PRACA STATUS: OPEN HOUSTON TIME: 01.38.00

PRCBD NUMBER: S062129 PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	PR GNC-5-13-0088	M	GNC-01
M	MER-011	P	SPR/CAR 89RF03

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: K.BARRY/BNA-D/922-0483

2: P.PERKINS/BNA-H/282-5486

0 DESCRIPTION:

The -Z star tracker annunciated a pressure fail BITE. The BITE has remained on since that time. The star tracker is normally pressurized with argon gas to 17.58 psia to prevent moisture and contamination from entering the star tracker during entry and ground operations. The BITE indicates that the -Z star tracker pressure has leaked below 14.7 psia There is no impact to flight operations.

This star tracker (S/N 11) had to be repressurized during the STS-89 flow.

KSC will perform troubleshooting. Removal and replacement of the

hardware is scheduled for mid-March.

1

STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-89-V-07

TITLE:S-BAND ANTENNA SWITCH ELECTRONICS SYSTEM 2 FAILURE

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 023 : 03.38.00

IFA DATE: 01/22/1998

IFA STATUS: OPEN

ELAPSED TIME: 000 : 00.49.45

PRACA STATUS: OPEN

HOUSTON TIME: 21.38.00

PRCBD NUMBER: S062129

PHASE: ON-ORBIT

0 TYPE	TRACKING NUMBER	TYPE	TRACKING NUMBER
K	IPR 88V-0012	M	INCO-01
M	MER-02	P	SPR/CAR 89RF07

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: C.HSU/BNA-D/922-5538

2: J.STAFFORD/BNA-H/282-5317

0 DESCRIPTION:

The BFS GPC was commanding the lower left forward (LLF) S-band antenna, but the upper left forward (ULF) antenna was being selected. At the time, the S-band antenna switch electronics system 2 was being used. After the SM GPC was configured and the BFS was taken down, the ULF antenna continued to be selected although the SM GPC was commanding the LLF antenna. The ground subsequently commanded the LLF antenna, but still the ULF antenna was selected. The antenna switch electronics system 1 was selected and the LLF antenna was selected.

On FD2, antenna switch electronics system 2 was reselected for a short time to perform troubleshooting. The crew used the panel switch to

select all eight S-band antennas. No anomalies were noted. Following this troubleshooting, system 1 was reselected. On FD 4, the system was again reselected for a short time to perform additional troubleshooting. The GPC mode of antenna selection was verifed utilizing a multiple stored program command to cycle through the switch positions. No anomalies were noted. Following this troubleshooting, system 1 was reselected. For further troubleshooting in the GPC mode, system 2 was reselected for one orbit on FD 7 and several orbits on FD 8 and again, no problems noted. KSC postflight troubleshooting is being scheduled.

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STS-089 (OV-105,FLT #12) INFLIGHT ANOMALY REPORT 08/26/98

IFA NUMBER> STS-89-V-08

TITLE:D HATCH INTERFERENCE WITH AIR DUCT

0 MISSION CONSTRAINT: SUBS

IFA TIME GMT: 023 : 05.30.00

IFA DATE: 01/22/1998

IFA STATUS: OPEN

ELAPSED TIME: 000 : 02.41.45

PRACA STATUS: UNKNOWN

HOUSTON TIME: 23.30.00

PRCBD NUMBER: S062129

PHASE: ON-ORBIT

0 TYPE TRACKING NUMBER TYPE TRACKING NUMBER

M MER-04

0 CLOSURE INITIATED BY:

RESPONSIBLE MANAGERS 1: T.COOK/BNA-D/922-2068

2: C.HOFFMAN/BNA-H/244-5121

0 DESCRIPTION:

After removing the airlock floor stowage bag, the crew reported they were able to open the D hatch to a position approximately 6 inches above the support pads on the floor of the airlock. The crew reported interference with the forward portion of the D hatch that would not

allow the hatch to rest on the support pads. They reported that they removed the stowage bag pallet and disconnected the air duct from the inlet side of the hard duct in the external airlock. The crew stated they were able to complete the opening of the hatch. With the hatch in the proper position, the crew reinstalled the air duct.

The airlock is an ISS configured external airlock which has electrical shrouds below the forward hatch area that cause the air duct 'tee' to be rotated towards the center of the airlock. In the OV-104 configuration the electrical shrouds were not installed and the 'tee' was parallel to the airlock wall.

The D hatch was checked in the 9A trainer and the hatch could not be open fully because of air duct interference. Also the hatch could not be close without removing the air duct. The air duct was installed per a crew preference request. The air duct was not in place for CEIT or during MVAK operations, this is why interference was not discovered. BNA reported the next time this interference would show up would be STS-88. The EVA configuration could cause a similar interference. A tech order is being written to document the need to demate the fan package duct at the airlock tee location prior to aft hatch opening or closing. The crew procedures are being developed to be inplace by STS-88.

-JFDP012: NORMAL TERMINATION OF PROCESSING