

# **MER Shift Reports**

**STS-107**

**Day 3 Shift 1**

**STS-107 ESD SYSTEMS SHIFT REPORT  
DAY 3 SHIFT 1  
GMT 018/17:00**

Energy Division Subsystems (MPS, RCS, OMS, FC/PRSD, APU, Hydraulics and EPDC) continue to function satisfactorily with the following notes or exceptions:

**HYD** – All HYD/WSB parameters are operating within their expected ranges. There have been no additional circulation pump runs for thermal conditioning or bootstrap re-pressurization.

The WBS's were configured to the B controllers at approximately GMT 017/15:00

**Total Circ Pump Runs**

<b>Thermal</b>	<b>Accumulator Recharges</b>
Sys 1: 1 for elevon Park	0
Sys 2: 0 runs	0
Sys 3: 0 runs	0

**FC/PRSD** - Subsystem performance is nominal.

The first on-orbit fuel cell purge was a manual purge performed at 017:16:26 GMT (01/00:47 MET).

O2 tank 7 heater A troubleshooting was performed last night. The O2 tank 4 and 5 heater switches were placed to OFF, then O2 tank 7 A heater switch was put to AUTO. The A1 and A2 heaters immediately came on and proceeded through a nominal heater cycle. The pressure decreased to allow another heater cycle. This verified that the AUTO function for the tank is working, so O2 tank 4 and 5 heaters were put back to AUTO and O2 tank 7 heater A was turned off. The plan now is to use the tanks per the nominal plan. Tanks 4 and 5 will continue to be used to depletion then go to the pallet tanks, using tanks 6 and 7 in paired auto operation. The heater current sensor checkout will be performed on O2 tank 7 during one of its heater cycles.

**EPDC - STS-107 EPDC FD3 Shift Report**

The only problem being worked by EPDC is the intermittent "sluggish" AC2 phase B current response. Per the last report, there were three occurrences: vent doors 8 & 9, PLB port door drive, and the KU band deploy. Continued data review by MER EPDC, MOD and KSC has uncovered several occurrences of "miniature" signals of the same type

(phase B dropping, phases A and C increasing). Most of these occurrences were less than one second in duration, and the phase B drop was between 0.2 and 0.3 amp.

There were two smaller signatures found during load cycling on January 13. One was associated with cycling vent doors 8 & 9, and the other load was unknown (probably another vent door). In both cases, the load was about 500 milli-amps per phase. AC2 phase B would deliver about 250 milli-amps for less than a second, then recover to the 500 milli-amp value.

During the early prelaunch countdown, there were several occurrences with no loads being cycled. Phase B would drop 0.2 to 0.3 amp, then recover in about 1 second. On-orbit, several other "miniature" signatures were experienced. These are sometimes triggered by the water loop pump cycling on AC2.

From the data so far, the culprit seems to be the AC2 phase B inverter or the wiring between the AC2 phase B inverter and panels L4 and MA73C.

Richard Phillips  
ESD Team Lead

MER FLIGHT CREW EQUIPMENT- GFE/CFE  
STS-107 SHIFT REPORT

TO: MER MANAGER

SUBJECT: FD03; 2nd SHIFT REPORT

GMT: 018:17:00

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**EVENTS:**

Red team post sleep.  
Blue team blood drawn and stored.

**FORWARD ACTIONS:**

None at this time.

**CHITS (Monitoring / Working / Waiting for Closure):**

There are only 4 CHITs in the system, all CLOSED. NONE belong to Flight Crew Equipment.

**HARDWARE STATUS:**

There have been no FCE anomalies recorded this reporting period. It is assumed all FCE is performing nominally.

  
Christian Stevenson

1/18/03

Flight Crew Equipment- GFE/CFE

# Thermal

**Thermal 1st Shift Landing Report  
STS-107  
January 18, 2003 11AM (018/17:00 GMT)**

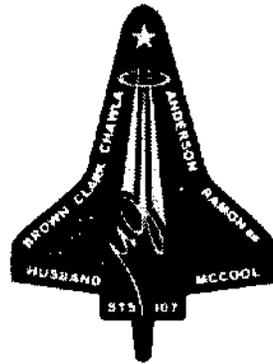
The performance of orbiter thermal systems is nominal and all subsystem temperatures are operating within acceptable limits. The beta angle is currently  $-59.3$  deg and decreasing.

TCS determined that the "A" T/S on OMS crossfeed zone 1 is dithering.

On the attitude timeline, TCS made attitude change recommendations for tire thermal conditioning to EECOM via a STEP transmittal letter. The recommendations have not been incorporated as the ATL state vectors after  $\sim 3/12$  MET are still being replanned. MOD Pointing had projected that he would have the state vector replan thru the end of mission available at  $\sim 8$  days MET (mid-mission).

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Diana Coronado



## DPS PASS FSW, MEDS & H/W MER Shift Report

STS-107

Date: 1/18/2003

GMT: 018/17:00:00

Shift: 1st

### SYSTEM STATUS / ISSUES BEING WORKED

- All DPS systems performing nominally.

DPS Team Lead: Tom Swartley

Signature: Tom Swartley

# ORBITER ECLSS

## STS-107 ECLSS SHIFT REPORT

### FLIGHT DAY 4

### SHIFT 1

All ECLSS systems are performing nominally.

Consumables:	Supply water	319.7 lb.
	Waste water	68.3 lb.
	Orbiter Nitrogen	244.4 lb.

Group Leader  
GMT 018/08:53

AVIONICS  
FLIGHT CONTROL / GNC DAILY REPORT

01/18/03

STS-107  
Daily Report  
Flight Day 2

Flight controls and GNC systems are performing nominally.  
Printed out the elevon positions for the period of the ice hit at about 80 to 85 seconds into the flight for the  
MER Manager.

*Chuck Beatty*  
*Jan. 18, 2003*

STS-107 (OV-102 FLT 28)  
1/18/03  
10:00 AM  
On-Orbit Shift Report

All HYD/WSB parameters are operating within their expected ranges. There have been no additional circulation pump runs for thermal conditioning or bootstrap re-pressurization. The WSBs were configured to the "B" controllers at approximately GMT 017/15:00.

**Total Circ Pump Runs**

<b>Thermal</b>	<b>Accumulator Recharges</b>
Sys 1: 1 for elevon Park	0
Sys 2: 0 runs	0
Sys 3: 0 runs	0

At this time the HYD/WSB group is working no issues.

Jeff Goza            HYD/WSB SSE

STS-107  
MER Comm and Track Shift Report.  
GMT 018:15:00  
Shift 1

All comm and track systems are operating nominally.

*Ken McCrary*

MER Comm & Track

**MER Shift Reports**

**STS-107**

**Day 3 Shift 2**

## STS-107 EPDC FD3 Shift Report

The only problem being worked by EPDC is the intermittent "sluggish" AC2 phase B current response. Per the last report, there were three occurrences: vent doors 8 & 9, PLB port door drive, and the KU band deploy. Continued data review by MER EPDC, MOD and KSC has uncovered several occurrences of "miniature" signals of the same type (phase B dropping, phases A and C increasing). Most of these occurrences were less than one second in duration, and the phase B drop was between 0.2 and 0.3 amp.

There were two smaller signatures found during load cycling on January 13. One was associated with cycling vent doors 8 & 9, and the other load was unknown (probably another vent door). In both cases, the load was about 500 milli-amps per phase. AC2 phase B would deliver about 250 milli-amps for less than a second, then recover to the 500 milli-amp value.

During the early prelaunch countdown, there were several occurrences with no loads being cycled. Phase B would drop 0.2 to 0.3 amp, then recover in about 1 second. On-orbit, several other "miniature" signatures were experienced. They are sometimes triggered by the water loop pump cycling on AC2.

From the data so far, the culprit seems to be the AC2 phase B inverter or the wiring between the AC2 phase B inverter and panels L4 and MA73C.

Larry Minter  
Pete Peterson

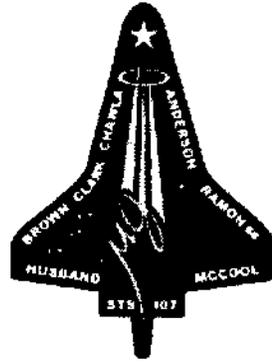
**STS-107 ESD SYSTEMS SHIFT REPORT**  
**DAY 3 SHIFT 2**  
**GMT 019/00:00**

Energy Division Subsystems (MPS, RCS, OMS, FC/PRSD, APU, and Hydraulics) continue to function satisfactorily with the following notes or exceptions:

**OMS/RCS** - In work, to be updated later.

**APU** - All APU heaters are functioning nominally on the 'A' string. All APU on-orbit parameters are nominal.

Tom Davies  
ESD Team Lead



## DPS PASS FSW, MEDS & H/W MER Shift Report

STS-107

Date: 1/18/2003

GMT: 019/01:00:00

Shift: 2nd

### SYSTEM STATUS / ISSUES BEING WORKED

- All DPS systems performing nominally.

DPS Team Lead: Michael Banks

Signature: Michael J. Banks

# ORBITER ECLSS

## STS-107 ECLSS SHIFT REPORT

### FLIGHT DAY 4

### SHIFT 2

All ECLSS systems performing nominally.

Consumables:	Supply water	323 lb.
	Waste water	74 lb.
	Orbiter Nitrogen	243 lb.

Karen Thacker  
GMT 019/00:36

**MER FLIGHT CREW EQUIPMENT- GFE/CFE  
STS-107 SHIFT REPORT**

**TO:** MER MANAGER

**SUBJECT:** FD03; 3rd SHIFT REPORT

**GMT:** 019:01:00

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**EVENTS:**

Red team post sleep.  
Blue team blood drawn and stored.

**FORWARD ACTIONS:**

None at this time.

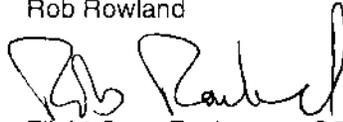
**CHITS (Monitoring / Working / Waiting for Closure):**

There are only 4 CHiTs in the system, all CLOSED. NONE belong to Flight Crew Equipment.

**HARDWARE STATUS:**

There have been no FCE anomalies recorded this reporting period. It is assumed all FCE is performing nominally.

Rob Rowland



Flight Crew Equipment- GFE/CFE



**STS-107 MER Thermal 2<sup>nd</sup> Shift Report**

**019/01:00 GMT, 19:00 CST 01/18/2003**

All thermal systems are performing nominally and all temperatures are within acceptable limits.

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Steve Tidwell/Dave Russell

MER Shuttle Safety Console  
STS-107 FD 3 Shift 2  
GMT 019:01:00

The MER Safety Console is not working any safety of flight issues.

Ross Engle

**MER Shift Reports**

**STS-107**

**Day 3 Shift 3**

# ORBITER ECLSS

## STS-107 ECLSS SHIFT REPORT

### FLIGHT DAY 4

### SHIFT 3

All ECLSS systems are performing nominally.

Consumables:	Supply water	326.6 lb.
	Waste water	78.4 lb.
	Orbiter Nitrogen	240.2 lb.

Group Leader  
GMT 019/09:10

# STS-107

## OMS/RCS Day 3 Shift 2 Report

INITIATOR: Fitzgerald  
 DATE: January 18, 2003

MET: 02/11:31  
 GMT: 019/03:10  
 CENTRAL TIME: 09:10 PM CST

	Left		Right		Forward	
	Oxidizer	Fuel	Oxidizer	Fuel	Oxidizer	Fuel
PFS %	85.6	85.6	85.4	85.2	72.4	69.4
Interconnect Usage	0.000		0.000			

### ORBIT

1. **The left OMS crossfeed zone 1 A heater thermostat** began to dither at approximately 017/03:00 GMT. It is clear that the zone 1 A heater is operating because the associated temperature (V43T6218A) is being maintained at approximately 60.5°F. Otherwise the crossfeed heater system is performing nominally and without the thermal crosstalk noted during the last flight of this orbiter (corrected by modifications to the heater system since STS-109).
2. **Crossfeed Line Repress using the LOMS B crossfeed valves**, occurred at 018/03:58 GMT.
3. **On a previous shift (overnight last night), MOD/Prop noted that the Left OMS GN2 Accumulator pressure** (V43P4549C) was dropping at approx. 0.1 psi/hr (see attached first plot, ~017/05:00 GMT). They were concerned this could be a leak, especially since prior to OV-102's OMDP, this engine had a "phantom" GN2 leak. (The GN2 package on this engine was removed and replaced with a different GN2 package during OMDP. No leak was noted during the last flight of this orbiter.) Since the original report last night, the accumulator pressure has stabilized (after ~018/06:00 GMT, see first plot). The pressure drop appears to have been caused by the thermal environment of the accumulator. As shown in the first plot, the pressure drop follows the temperature drop reflected in the left engine ox valve and left OMS fuel injector temperatures (V43T4641A and V43T4643A, respectively); the pressure cycling corresponds to the engine cover heater cycling (V43T4720A). The temperature drop was expected since this is currently the cold side of the orbiter.

OMS/RCS Engineering has run PVT quantity calculations for the LOMS GN2 accumulator (see second plot). Since the GN2 accumulator does not have its own temperature transducer, the accumulator quantity must be computed using the engine ox valve temperature (V43T4641A), engine cover temperature (V43T4720A), or the average of the two. As shown on the second plot, the initial leak rate (based on the engine cover temperature) was 4.6 scch, eventually leveling out at approximately 0.4 scch. Using the engine valve temperature, the leak rate is negligible. Even if this were truly a leak, at this point the measured rates are much lower than the OMRSD limit of 30 scch. No action is required at this time.

### Data Review

1. OMS and RCS system data has been reviewed up through 018/22:30 GMT. System performance continues as expected with no anomalies noted.
2. All vernier jet firing through 018/19:38:58.1GMT have been reviewed. There have been no anomalous pulses.

# STS-107

## OMS/RCS Day 3 Shift 2 Report

RCS PRESSURIZATION LEG

FRCS: A

LRCS: A

RRCS: A

23 of 38 primary thrusters have been fired. No new primary thrusters have been fired since the previous report:

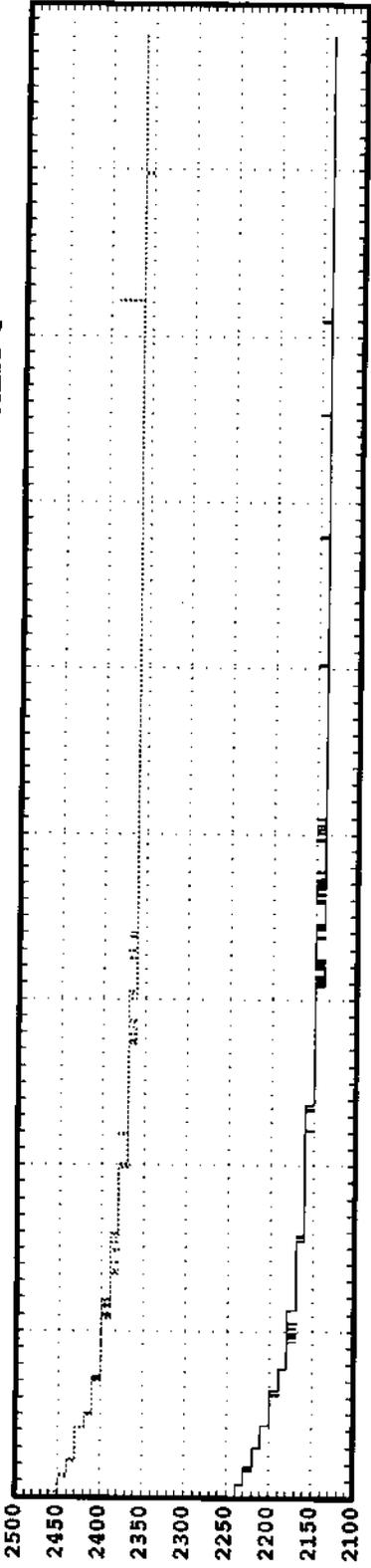
F1F		L1A	X	R1A	X
F2F		L3A	X	R3A	X
F3F		L1L		R1R	
F1L		L2L		R2R	
F3L	X	L3L	X	R3R	X
F2R		L4L		R4R	
F4R	X	L1U	X	R1U	X
F1D	X	L2U		R2U	
F2D	X	L4U		R4U	
F3D	X	L2D	X	R2D	X
F4D	X	L3D	X	R3D	X
F1U	X	L4D	X	R4D	X
F2U	X				
F3U	X				

LEFT OME GN2 CALC INPUT PARAMETERS

M E W S SAMPLE RATE: 120 (sec/sample)  
 FORMAT: GN2 CALC INPUT DATA: GN2 ACCUM

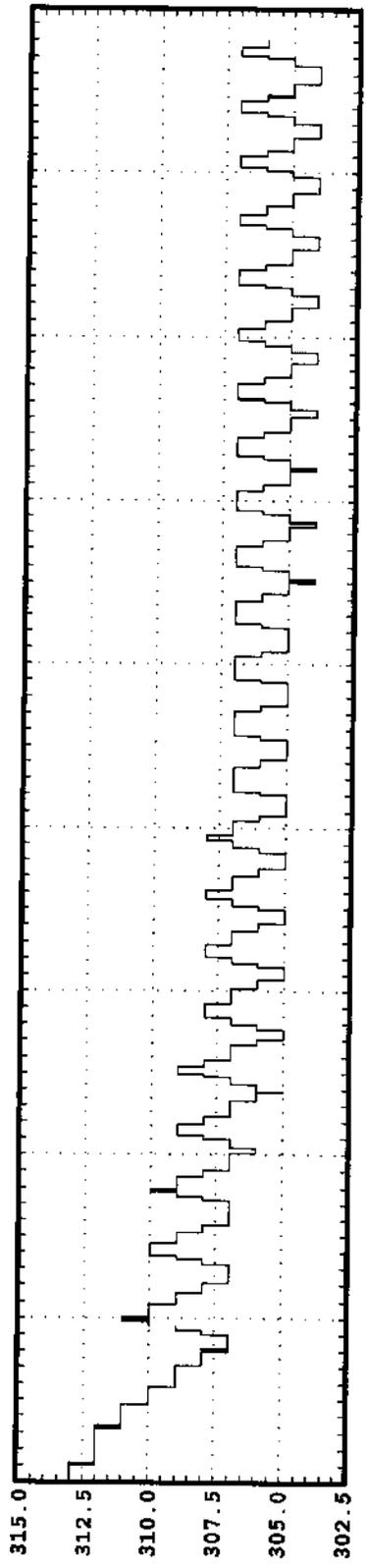
Subsystem: oms  
 Flight: STS-107

1-OMS-L ENG PNEU SUPPLY PRESS 1



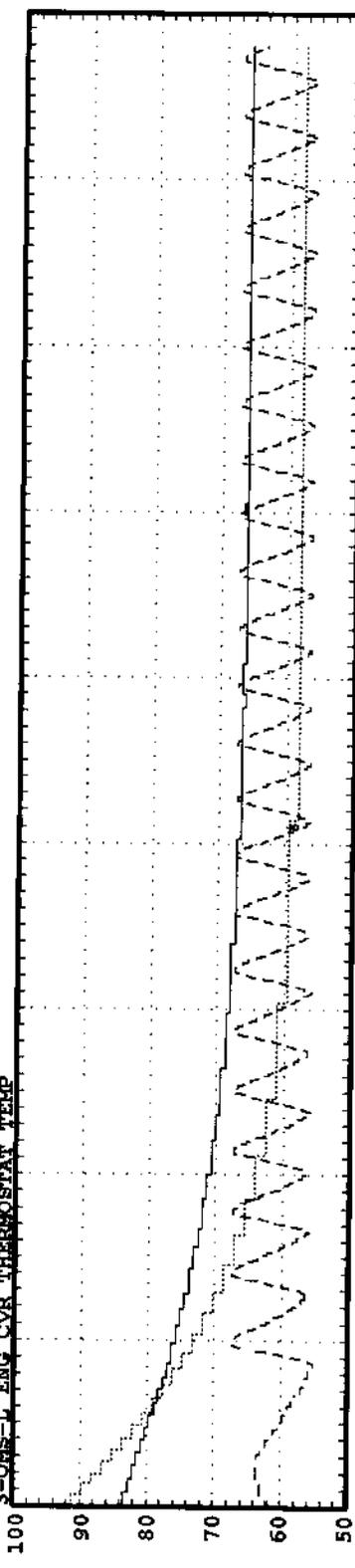
V43P4547C  
 PSIA  
 V43P4548C  
 PSIA

1-OMS-L ENG RELTR OUT PRESS



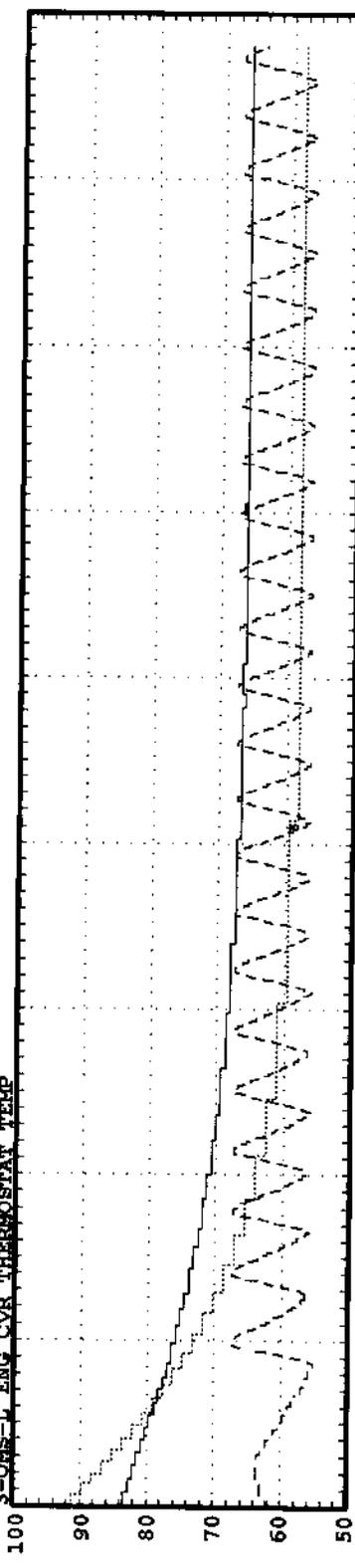
V43P4549C  
 PSIA

1-OMS-L ENG OX VLV TEMP



V43T4641A  
 DEGF  
 V43T4643A  
 DEGF  
 V43T4720A  
 DEGF

2-OMS-L ENG FUEL INJECTOR TEMP

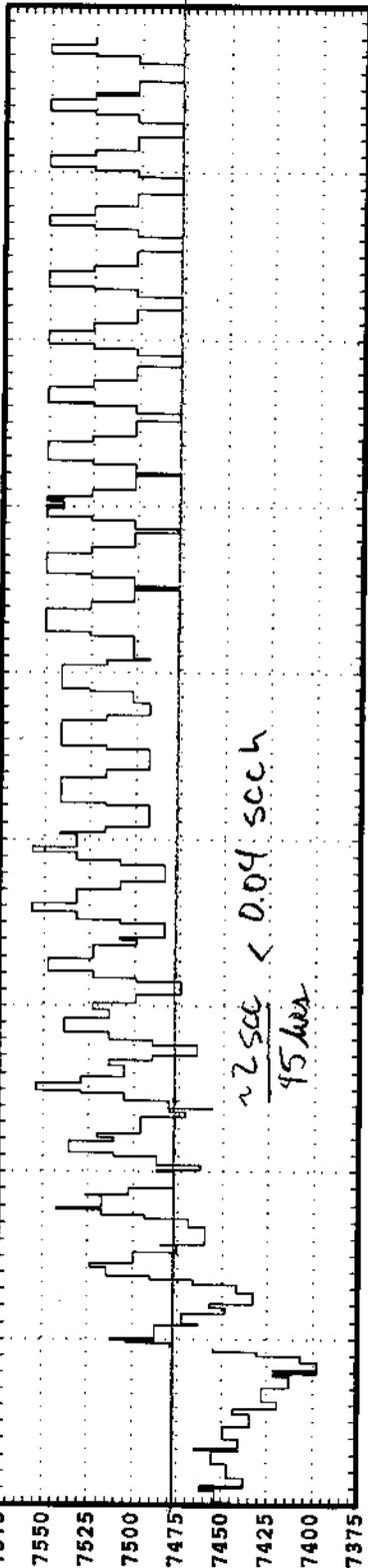


GMT  
 2003\_017:00:00.000  
 2003\_017:05:00:00.000  
 2003\_017:10:00:00.000  
 2003\_017:15:00:00.000  
 2003\_017:20:00:00.000  
 2003\_018:00:00.000  
 2003\_018:05:00:00.000  
 2003\_018:10:00:00.000  
 2003\_018:15:00:00.000  
 2003\_018:20:00:00.000  
 2003\_018:25:00:00.000

LEFT OME ACCUMULATOR GN2 QTY - CALC

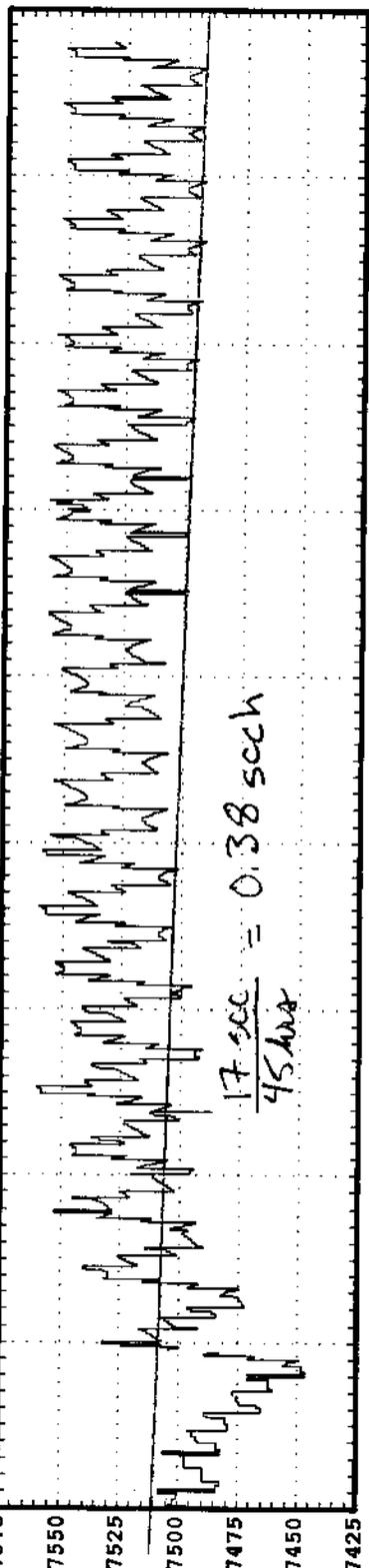
M E W S SAMPLE RATE: 120 (sec/sample) Subsystem: oms  
 FORMAT: L GN2 LOW CALC DATA: GN2 ACCUM Flight: STS-107

1-LOMS GN2 Accum Qty: Eng Vlv T



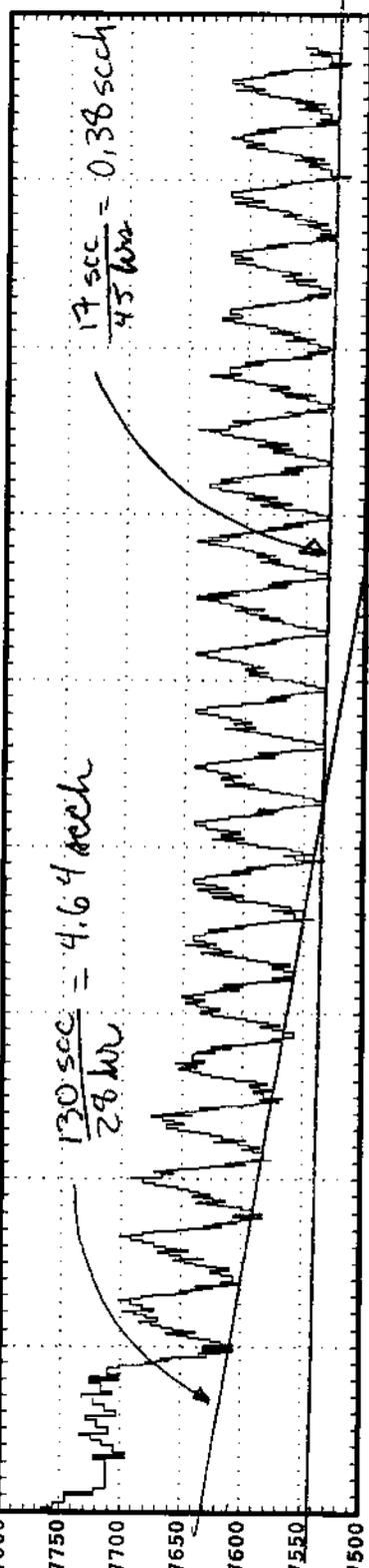
M43Q4004A  
SCC\_70F

1-LOMS GN2 Accum Qty: Vlv/Eng Cvr T



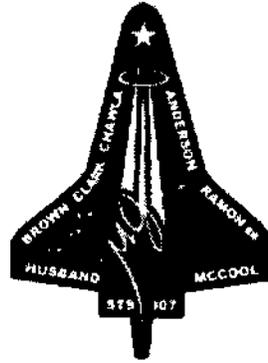
M43Q4005A  
SCC\_70F

1-LOMS GN2 Accum Qty: Eng Cvr T



M43Q4006A  
SCC\_70F

GMT  
 2003\_017:00:00.000 2003\_017:05:00.000 2003\_017:10:00.000 2003\_017:15:00.000 2003\_017:20:00.000 2003\_018:00:00.000  
 2003\_017:00:00.000 2003\_017:10:00.000 2003\_018:00:00.000 2003\_018:10:00.000 2003\_018:20:00.000 2003\_018:30:00.000  
 2003\_017:00:00.000 2003\_018:00:00.000 2003\_018:10:00.000 2003\_018:20:00.000 2003\_018:30:00.000



## DPS PASS FSW, MEDS & H/W MER Shift Report

STS-107

Date: 1/19/2003

GMT: 019/09:00:00

Shift: 3rd

### SYSTEM STATUS / ISSUES BEING WORKED

- All DPS systems performing nominally.

DPS Team Lead: Chris Thames

Signature: 

MER FLIGHT CREW EQUIPMENT- GFE/CFE  
STS-107 SHIFT REPORT

TO: MER MANAGER

SUBJECT: FD04; 1st SHIFT REPORT

GMT: 019:09:00

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**EVENTS:**

LSP1 waved. Move to red team FD04.

**FORWARD ACTIONS:**

**CHITS (Monitoring / Working / Waiting for Closure):**

There are only 5 CHiTs in the system, 4 CLOSED, 1 OPEN (info only). NONE belong to Flight Crew Equipment.

**HARDWARE STATUS:**

There have been no FCE anomalies recorded this reporting period. It is assumed all FCE is performing nominally.



Gerard Szymczak  
Flight Crew Equipment- GFE/CFE

MER Shuttle Safety Console  
STS-107 FD 3 Shift 3  
GMT 019:09:20

The MER Safety Console is not working any safety of flight issues.

Jeff Peters



## **Thermal 3<sup>rd</sup> Shift Report**

STS-107, January 19, 2003  
3 AM, MET 02/17:21 (19/09:00 GMT)

All temperatures are within acceptable limits and all thermal systems are operating nominally.

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Shannon Belknap / Dave Norman