

X-Sender: wbihner@mail.hq.nasa.gov
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Date: Mon, 13 Jan 2003 15:27:28 -0500
To: Date:
From: Bill Bihner <wbihner@hq.nasa.gov>
Subject: STS-107 PMMT SMAR
Cc: Roy.Bridges-1@ksc.nasa.gov, Jefferson.D.Howell1@jsc.nasa.gov,
Arthur.G.Stephenson@nasa.gov, William.Parsons@ssc.nasa.gov

Good Afternoon,

Attached please find the Code Q Pre-Launch Mission Management Team Edition of the Safety and Mission Assurance Report (SMAR) for STS-107.

NOTE that the only change to this document from the FRR version is the update to the BSTRA ball status based on a special PRCB meeting on Sunday, January 12. OV-102 has been cleared to fly one additional mission, STS-107. Actions assigned by the Shuttle Program Manager will determine the longer term solution(s) to the BSTRA issue.

If there are any questions, please give me a call.

Thanks,

Bill

William J. Bihner, Jr.
NASA/QE
(202) 358-4441



STS-107 SMAR PMMT.doc

Safety and Mission Assurance Report for the STS-107 Mission

Pre-Launch Mission Management Team Edition

January 13, 2003

**Enterprise Safety and Mission Assurance Division
Office of Safety and Mission Assurance
National Aeronautics and Space Administration
Washington, DC 20546**

SAFETY CERTIFICATION FOR THE FLIGHT READINESS REVIEW

The Enterprise Safety and Mission Assurance Division at NASA Headquarters has been involved in the review of safety risk factors affecting the risk level of this Space Shuttle mission. The Enterprise Safety and Mission Assurance Division has concurred with the decision by the Space Shuttle Program Manager in approval of Element Hazard Reports to baseline the program safety risk level. Changes to the risk baseline for the Space Shuttle Program arise from mission unique requirements, mission processing problems, in-flight anomalies, component testing, new analyses, and related issues from other vehicles. Their resolution has been evaluated for risk acceptability.

The items referred to as safety risk factors are listed in this report as either unresolved or resolved. Those safety risk factors that are unresolved must be resolved with adequate supporting flight rationale prior to the flight of this Space Shuttle mission.

The Enterprise Safety and Mission Assurance Division certifies the risk acceptability of the baseline safety risks with changes identified herein pending resolution of items identified in this report as constraints and subject to resolution of any changes to risk items.

Prepared by:

Original s/b Bill Bihner

Bill Bihner
Space Shuttle Safety and Mission Assurance
Enterprise Safety and Mission Assurance Division
Office of Safety and Mission Assurance

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Change Notice

This Safety and Mission Assurance Report (SMAR) has incorporated several changes from prior editions of this document. The underlying goals of these changes are to make the document more readable and useful to senior management.

1. No changes to this document.

1 Introduction

1.1 Purpose

This Safety and Mission Assurance Report (SMAR) is produced by the National Aeronautics and Space Administration (NASA) Headquarters, Office of Safety and Mission Assurance (OSMA). The SMAR provides the OSMA Associate Administrator (AA) and the Human Space Flight AA with a summary of the changes to the Shuttle Program's safety risk baseline as approved in the formal Failure Modes and Effects Analysis/Critical Items List (FMEA/CIL) and Hazard Analysis process. Changes to the baseline since the previous flight are included to highlight their significance in risk level change. Flight rationale supporting any departure from the approved FMEA/CIL and Shuttle Program baseline is provided. The SMAR documents unresolved safety risk factors known up to this point impacting this flight.

The report is published on a mission-by-mission basis for use in the Flight Readiness Review (FRR) and is updated for the Pre-launch Mission Management Team (PMMT) Review (formerly the Launch Minus Two-Day Review), as needed.

1.2 Scope

The SMAR addresses the risk factors that represent a change from previous flights, factors from previous flights that have impact on this flight, and factors that are unique to this flight. Factors listed in the report are limited to items that affect, or have the potential to affect, Space Shuttle safety and mission assurance and have been elevated to Level I for discussion or approval. These changes are derived from a variety of sources such as issues, concerns, problems, and anomalies. It is not the intent to attempt to scour lower level files for items evaluated and closed at those levels and report them here; it is assumed that their significance is such that Level I discussion or approval is not appropriate for them. Items for which there is clearly no safety impact or potential concern will not be reported here, although items that were evaluated at some length and found not to be a concern will be reported as such.

1.3 Customers

The following are identified as the primary customers of this Safety and Mission Assurance Report:

- OSMA, Associate Administrator, Bryan D. O'Connor
- OSMA, Acting Deputy Associate Administrator, James D. Lloyd
- Office of Space Flight, Associate Administrator, William F. Readdy
- Office of Space Flight, Deputy Associate Administrator for ISS & SSP, Major General Michael Kostelnik

2 Mission Summary

2.1 Mission & Vehicle Data

Mission Data

- Launch Date: January 16, 2003
- Landing Date: February 1, 2003
- Mission Duration: 16 days
- Launch Site: KSC Pad 39A, MLP-1
- RTLS: KSC Shuttle Landing Facility
- Landing Site: KSC Shuttle Landing Facility
- TAL Site: Moron, Spain Alternate TAL Site: Zaragoza, Spain
- Inclination/Orbit: 39°/150 Nautical Miles Direct Insertion

Crew Size: 7 (click on hot links to see web-based descriptions)

Crew Position	Name	Flight Experience
Commander	<u>Rick Husband</u>	1 flight
Pilot	<u>William McCool</u>	First flight
Payload Commander	<u>Michael Anderson</u>	1 flight
Mission Specialist	<u>Kalpana Chawla</u>	1 flight
Mission Specialist	<u>David Brown</u>	First flight
Mission Specialist	<u>Laurel Clark</u>	First flight
Payload Specialist	<u>Ilan Ramon</u>	First flight

Vehicle Data

- Orbiter: OV-102 (Flight # 28, last mission STS-109, March 1-12, 2002)
- ET: ET-93 (Light Weight Tank)
- SRBs: BI-116
- RSRM Flight Set # 88
- SSME (Last Hot-fire): ME#1 (SSC Green Run), ME#2 (STS-109), ME#3 (STS-108)

-- All SSME's are Block II configuration.

- Orbiter Software Build: OI-29 (5th flight)

2.2 Mission Assurance

Priority	Mission Success Criteria
1	SPACEHAB commercial sponsored payloads
2	ESA/NASA sponsored payloads
3	NASA/ISS sponsored payloads
4	NASA/Code U sponsored payloads
5	FREESTAR
6	SIMPLEX
7	RAMBO
8	DTO's
9	DSO's

No EVA's are planned for this mission.

The following link is a detailed mission/crew timeline:

<http://mod.jsc.nasa.gov/do4/flightplan/STS107/Final/107sfin.pdf>

3 Safety Risk Factors Assessment

This section contains a summary of the risk factors and their safety assessment status. Unresolved risk items, those that could impact the safety and mission assurance of this flight and require further mitigation and statement of acceptable flight rationale, are filtered to the top of the list and appear first in these tables. Resolved risk items are those that are considered closed with acceptable flight rationale from a safety perspective.

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
1	OV-103 17 Inch BSTRA Ball Crack (OV-103 currently in Orbiter Maintenance Down Period (OMDP) until 4/04)	Resolved for the next flight of OV-102, OV-104 and OV-105.	<p>Special Topic</p> <ol style="list-style-type: none"> 1. OMRSD inspection of OV-103 17 inch LO2 feedline revealed a crack in the ball of the Ball Strut Tie Rod Assembly (BSTRA) nearest the LO2 manifold. 2. Failure of the ball could result in: <ol style="list-style-type: none"> a. Lack of articulation capability of the feedline resulting in structural failure of the feedline b. FOD generation 	<p>Actions Taken</p> <ol style="list-style-type: none"> 1. A detailed boroscope inspection of the BSTRA joints on OV-102 was last done prior to STS-109. No discrepancies were noted. 2. Videos of the BSTRAs from the summer 2002 flowliner investigation is inconclusive for evaluating the BSTRA balls on OV-102. (Boroscope inspections of the BSTRA balls only shows about 25% of the ball.) 3. BSTRA inspections on OV-103, OV-104 and OV-105 are complete. Additionally by Jan 14, it is anticipated that 100% of the BSTRA balls on OV-103 will be inspected. 4. In a special PRCB on Jan 12, the program after reviewing test data and a preliminary PRA analysis for SSME failure due to FOD, the program agreed to write paper to allow one more flight of OV-102, OV-104 and OV-105. 5. The program has demonstrated that feedline joint articulation is not an issue and that FOD will be generated but within acceptable limits. 	None for the next three missions.	<p>Action Needed to Resolve (this flight & long-term)?</p> <p><u>This Flight:</u> Not a flight constraint for STS-107.</p> <p><u>Long-Term:</u> Program must work to develop inspection techniques, replacement criteria, and long term PRA analysis.</p>

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
2	SRB - BSM Motor FOD	Resolved	<p>Special Topic</p> <p>1. Found small paint chip particles in a propellant mix bowl that was getting ready to be used.</p> <p>2. Lead shot, from a recoilless hammer that broke while being used to empty a mixing bowl for another program.</p>	<p>1. During BSM processing at CSD, FOD was observed on the surface of the propellant. Five paint chips from the painted surfaces of the mixing bowl outer rim were found. The total weight of the five paint chips was 0.0079 grams.</p> <p>2. All STS-107 processing x-rays were reanalyzed for high density indications and no anomalies were found.</p>	None	<p><u>This Flight:</u></p> <p>1. Testing performed to determine thermal effects on BSM propellant burn on imbedded paint chips has cleared STS-107 for flight.</p> <p>2. Lead shot contamination in the BSMs is closed as a flight issue for STS-107</p> <p><u>Long-Term:</u> Review process controls with the vendor.</p>
3	EVA - Biomed Cable Damage on STS-113 (STS-113 was the last Shuttle flight; landing was on 12/7/02)	Resolved	<p>JSC One Pager:</p> <p>The biomed cables were built in the mid-1980s and some were repaired in the mid-1990s. The cables on this flight were inspected on orbit due to a loss of data. When inspected, it was found that the shielding on the cables was broken through the first layer of shielding.</p>	<p>1. Biomed cabling has been visually inspected and tested and does not have any silicone repairs.</p> <p>2. Rationale for flight is based on the fact that in the event of a short, there is insufficient power and energy within the cabling in the suit to cause sparks/ignition.</p>	None	<p><u>This Flight:</u></p> <p>1. Procedures for donning the space suit will add an inspection to ensure the EVA cable is free of the body seal closure before closing the suit.</p> <p>2. There are no planned EVA's for STS-107.</p>

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
4	SSME - Nozzle Leak Below Hatband 9 on STS-113	Resolved	<p>MSFC One Pager</p> <p>1. STS-113 launch video footage showed an external fire in the 10th bay of Nozzle 5007 near fuel feedline 5 on SSME 2050. The fire is thought to be caused by ignition of coldwall leakage and is near the vicinity of previously documented coldwall leakage.</p> <p>2. All pressure vessels in the vicinity of the fire were cooled by fuel flow; all non-cooled structures were protected by insulation.</p> <p>3. External fires were also noted on STS-44 and STS-53 with no resulting hardware damage or performance loss.</p>	<p>1. Post-flight leak checks showed the leakage was about 0.005 pounds mass per second (limit is less than 0.02 pounds mass per second). The leakage is not significant since most missions are tolerant to 3 tube ruptures at the aft manifold at about 5.7 pounds mass per second.</p> <p>2. Preliminary inspections of Engine 2050 after landing do not show any obvious signs of thermal damage.</p> <p>3. The magnitude of the coldwall leakage on STS-113 was insignificant to engine performance.</p>	None	This Flight: This is not an issue for the flight of STS-107.
5	SRB - Cleaning Solvent Specification Change	Resolved	<p>MSFC One Pager.</p> <p>1. Source Control Drawings (SCDs) for Spirit 126 and PF degreaser contain requirements limiting use of COTS products.</p> <p>2. The Spirit 126 batch failed SCD aniline point requirements.</p>	<p>1. Minor changes to SCD specs for PF degreaser allow purchase of COTS product.</p> <p>2. The basis for certification was "testing and similarity."</p>	None	None

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
6	SRB - First Flight of Pacific Scientific Forward and Aft Separation Bolts	Resolved	<p>MSFC One Pager</p> <p>1. One new aft separation bolt was utilized in Tail Service Mast (TSM) configuration on STS-112/B1115.</p> <p>2. STS-107/B1116 will be the first use of forward and aft separation bolts in flight configuration.</p> <p>3. Bolt qual testing is complete. Bolt used in TSM for STS-112 performed nominally. Inspection shows typical fracture surfaces.</p>	<p>1. Bolt qual testing was successfully completed.</p> <p>2. The single new bolt used in the TSM for STS-112 performed nominally. Post-inspection showed typical fracture surfaces.</p>	None	None

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
7	LO2 LWT Normal Mission and RTLS Ullage Pressure Curves for ET-93	Resolved	<p>MSFC One Pager</p> <p>During mission unique assessment of MPS prediction, LO2 tank pressurization analysis indicated violations for the LO2 tank nominal and RTLS missions. The worst case analysis prediction indicated a 0.15 psi violation between 82 and 102 seconds for nominal mission maximum limit, a 0.85 psi violation between 0 and 1 seconds and a 0.25 psi violation between 2 and 8 seconds for nominal mission minimum limit, and a 0.3 psi violation between 0 and 0.5 seconds and a 0.15 psi violation between 3 and 7 seconds for RTLS minimum limit.</p>	<p>An Interface Revision Notice (IRN) was implemented to revise the upper and lower pressure limits. The revised limits were presented to the Loads Panel on 12/02/02 and the IRN was approved on 12/10/02.</p> <p>The root cause for the ICD violations are due to use of Block II SSMs with a Light Weight Tank.</p>	None	<p><u>This Flight:</u> Analysis indicates critical structural margins of safety are unaffected for the proposed maximum and minimum ICD limits for STS-107/ET-93.</p> <p>STS-107/ET-93 is safe for flight.</p>

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
8	ET Vent Valve Relief Pressure	Resolved	<p>MSFC One Pager</p> <p>Review of qualification data from the new vent/relief valve supplier (Ketema) identified reduced relief pressure during pre-press. When considering scatter in the valve cracking pressure, there is reduced margin to relief during LH2 tank pre-pressurization.</p>	<p>ET-93 is the first Light Weight Tank (LWT) to fly with three Block II SSMEs. An assessment using tank specific ullage pressure transducer biases was performed. The analysis still showed positive margins between minimum relief pressure and the maximum pressure allowed during pre-press.</p>	None	<p>This Flight: Analysis of ET-93 shows positive margin between the minimum ATP predicted valve relief pressure and the maximum ullage pressure during pre-press. STS-107/ET-93 is safe for flight</p>

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
9	Flowliner Corrosion Resistant Steel (CRES) Issue	Resolved	<p>JSC One Pager</p> <p>Following STS-110 an OV-104 MPS LH2 propellant feedline flowliner was found to have cracks at three slot locations. Weld repairs were performed on the Inconel 718 flowliners. The repaired flowliner flew successfully on STS-112. STS-112 post-flight inspections revealed no cracks.</p> <p>Inspections on OV-102 revealed cracks in the LH2 downstream flowliner which is made from CRES 321.</p>	<p>OV-102 Actions Complete:</p> <ol style="list-style-type: none"> Crack repair welds, post NDE, & clean-up of 3 observed OV-102 flowliner cracks are complete. Polishing of LH2 gimbal joint downstream and upstream flowliner slots is complete. The LH2 feedline NDE inspections are complete and good. The BSTR joint was clear with no issues (ball not inspected), the bellows to gimbal weld was clear with 0.54 margin of safety at cryogenic proof pressure, the bellows was cleared for 51 missions using conservative analysis technique, and the gimbal ring was cleared for 100 plus missions. Teardown and inspection of the LH2 qualification test and MPTA feedlines was completed with no issues. 	None	<p>This Flight: Based on the successfully completed crack repair welds, polishing of LH2 flowliner slots, internal feedline NDE inspections, and coupon testing, OV-102 was cleared for OPF rollout and flight.</p>

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
10	STS-113 Right Orbiter Manuvering System (OMS) Bi-Propellant Valve Open Indication	Resolved	<p>JSC One Pager.</p> <ol style="list-style-type: none"> At the end of the OMS burn, the right ball valve 2 continued to indicate open. The indication dropped only 0.5% so that the reading was 95.8% when it should be 0%. Per the flight rules, the right OMS was declared usable only for deorbit. All remaining on-orbit OMS burns were performed using the single engine left OMS only. 	<p>Although the root cause is still under investigation, there is rationale for flight:</p> <ol style="list-style-type: none"> Failure of an OMS engine ball valve to close is crit 1R/2. Subsequent failure of the second ball valve in series could result in loss of propellant; however, controls are in place to minimize propellant loss real time via isolation. The ball valves and Linear Variable Differential Transducers (LVDT) on OV-102 have no history of problems in 28 flights. The LVDTs on OV-102 have flown only one mission since they were last cleaned. A safe deorbit burn is still possible with either a failed open ball valve or failed LVDT. 	None	This Flight: None

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
11	STS-113 Flash Evaporator System (FES) Primary B Controller Failure	Resolved	JSC One Pager. The FES shut down during a FES water dump on the PRI B controller. Attempts to restart on PRI B were unsuccessful.	1. Ice formation was the suspected cause on STS-113. A core flush procedure was successfully performed. The FES continued to operate nominally on the PRI A controller for the remainder of the flight. 2. The root cause of the failure is a leaking spray valve on the "B" system. The spray valve assembly has been removed and replaced.	None	This Flight: None A newly refurbished FES was installed in OV-102 at OMM and has successfully passed ATP and OMSRD testing. All the controller and control modes were verified.

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
12	STS-113 O2 leak in the Mid-Body	Resolved	<p>JSC One Pager.</p> <ol style="list-style-type: none"> The mid-body and payload bay Hazardous Gas Detection System sample lines showed high levels of O2 during pre-launch. The levels measured 130 to 15 ppm and they should be approximately zero. Troubleshooting isolated the leakage to Pressure Control System (PCS) System 2 between the valve panel and the 576 bulkhead. Post-scrub inspection of the hardware found a blowing leak, 550 scim, on the flex hose on the upper side of the flex hose braid at the 576 bulkhead fitting. The flex hose braiding showed signs of bird caging deformation, typically an indication the flex hose has been subjected to an applied external load. 	<ol style="list-style-type: none"> The leaking secondary O2 flex hose as well as the primary O2 and secondary N2 flex hoses, were removed and replaced. Failure analysis was performed on the leaking flex hose. The findings indicated the presence of cracks and fatigue striations in some flex hoses, which are a result of relatively low frequency reverse bending fatigue. Leak checks confirmed that the hoses were good for flight. There were no other problems with this system during the remainder of the STS-113 flight. <p>The O2 and N2 lines on STS-107 were inspected and leak-checked with no issues for flight.</p>	None	<p>This Flight: None</p> <p>Long Term: Inspections and inspection frequency, and criteria for replacement will need to be developed.</p>

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
13	STS-109 Freon Coolant Loop 1 Flow Degradation (STS-109 was OV-102's last flight, 3/1/02 - 3/12/02)	Resolved	<p>JSC One Pager.</p> <p>1. On STS-109, several seconds after Main Engine Cut Off (MECO), the freon coolant loop (FCL) 1 aft coldplate flow rate decreased from 304 lb/hr to 226 lb/hr.</p> <p>2. The FCL 1 interchanger flow and payload heat exchanger flow increased at the same time, which confirmed a restriction in the aft coldplate branch.</p>	<p>1. The flow rate was stable following this event.</p> <p>2. The flight rule states that the minimum flow rate in the aft coldplate branch is 211 lb/hr actual, 236 lb/hr allowing for measurement uncertainty, for a one FCL entry.</p> <p>3. It was determined by analysis that FCL 1 would be able to provide sufficient cooling for the mission if FCL 2 failed and the mission continued as planned.</p> <p>4. The debris that caused the flow restriction was removed; X-ray and visual inspections verified acceptable system cleanliness.</p> <p>The contamination responsible for the STS-109 anomaly was removed from OV-102. OV-102 FCL 1 ACP leg orifice, FPM, and pump inlet filters were replaced. X-rays verified no additional contamination.</p>	None	This Flight: None.

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
14	EOM Nosewheel Steering Flight Rule Change	Resolved	JSC One Pager Loss of both tires on one main gear strut and/or loss of one nosegear tire could result in loss of orbiter directional control during landing rollout with possible lateral runway departure culminating in structural breakup.	Flight rule change recognizes that KSC runway -- with recent load bearing shoulder improvements -- is now better than EDW or NOR.	None	This Flight: Flight rule will be STS-107 specific until the rule can be incorporated into the "all flights" document.
15	First Flight of Two AMECs	Resolved	JSC One Pager This is just a procedural notification. The Advanced Master Event Controller (AMEC) has flown as a single unit on 13 other flights. There were no anomalies on any of those flights.	The AMECs installed in OV-102 successfully completed acceptance testing and were subjected to over 1000 hours of burn-in testing at SAIL. They passed OMSRD testing with no anomalies. There are two AMEC LRUs per orbiter and each AMEC has two cores. Each core is capable of performing the separation functions for the Shuttle.	None	None

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
16	SRB - AmphenoI Connector Pin Lack of Retention.	Resolved	<p>MSFC One Pager</p> <p>1. Inspections of Integrated Electronic Assembly (IEA) cables in the Solid Rocket Booster Assembly and Refurbishment Facility (ARF) revealed two cables with defective sockets that caused intermittent contact.</p> <p>2. AmphenoI connectors on OV-102 are located on the SRB upper strut cables (BUS A&B), cable end which mates to the aft IEA.</p>	<p>1. This is a connector issue that was discovered during a bench test. One of the sockets on the connector was open and would not retain the pin.</p> <p>2. Further investigations discovered another cable assembly with the same connector problem. Will identify a root cause and contact the vendor (Amphenol).</p> <p>3. The root cause was isolated to two particular contacts. All STS-107 contacts were inspected and none were found to be bad.</p>	None	This Flight: No issues for STS-107

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
17	<p>Body Flap Accuator Corrosion</p> <p>(Problem discovered while processing OV-104)</p>	Resolved	<p>Special Topic</p> <p>Internal corrosion (on the actuator housing gear teeth and the output shaft) was detected on the OV-104 body flap actuators while at the vendor (Hamilton Sundstrand) for external corrosion repairs.</p>	<p>1. The most probable cause of the actuator corrosion is water/moisture intrusion. A Magnetic Particle Inspection performed on the corroded OV-104 BF actuators revealed no cracks. Shaft corrosion was shallow and not a concern. The gear corrosion will not cause a near term failure of the BF actuator. The robust design of the BF actuator provides for load sharing between gear teeth. In the event of a weakened gear tooth, the load is redistributed within the other gears.</p> <p>2. Following OV-102's last flight (STS-109) close-out inspections found no corrosion or anomalies on the BF actuators.</p> <p>3. When OV-103 - the fleet leader - was looked at very recently, another actuator was found with corrosion.</p>	None	<p><u>This Flight:</u> None. Close-out photos verified no corrosion on OV-102</p> <p><u>Long Term:</u> Program will address actuator corrosion as a long-term flight issue.</p>

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
18	EVA - STS-113 EVA Crew-member Boot Fit	Resolved	JSC One Pager This is a procedural issue. The crew member trained with the proper suit which had been tailored following feedback from his flight on STS-92. When the suit was prep'd for the STS-113 mission, USA added the one inch spine growth length to the leg part of the suit and not the body section.	The crew member was able to swap suit parts on orbit and by his third EVA, he had a suit that fit properly.	None	This Flight: NASA will work with USA to make sure that the suit meets crewmember requirements if needed for a contingency Long Term: NASA will work with USA to elaborate the procedures for proper suit fit.
19	STS-113 Post-Flight Observation - Foreign Material in RSRM Nozzle-to-Case Joint Radial Bolt Hole	Resolved	MSFC One Pager A stainless steel washer (foreign object) was observed during the disassembly of STS-113 (RSRM-86) in the bottom of one of the nozzle-to-case joint radial holes. This could have potentially impacted joint clamping and seal integrity.	The root cause of the [problem] has been determined to be a radial plug which became disassembled during removal; the washer was inadvertently not removed; and the condition was not detected by the assembly personnel. A PAS report has been generated to track corrective actions. There are no joint performance issues; adequate bolt preload verified by process controls and seal integrity verified by leak test.	None	This Flight: No issues.

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
20	STS-113 Post-Flight Observation - Flashing on RSRM Nozzle-to-Case Joint Packing with Retainers	Resolved	MSFC One Pager Post-flight assessments of STS-113 (RSRM-86) observed rubber flashing on the sealing element of five nozzle-to-case joint packing-with-retainers. Foreign material on these packing-with-retainers could impact the redundant sealing function on the nozzle-to-case joint.	The root cause and corrective actions are still being evaluated. A PAS report has been generated. The rationale for flight is based on leak checks (that verify seal integrity at high and low bolt torque and pressure), the packing-with-retainers are in high compression during motor operation, and engineering flaw testing demonstrated high tolerance for packing-with-retainer element defects.	None	This Flight: No issues
21	SSME Controller Coolant Duct Redesign - 1st Flight ECP	Resolved	MSFC One Pager The change is being incorporated to mitigate two issues: The controller coolant duct is in a congested area and there have been problems associated with maintaining the proper clearance to the powerhead; and the soft aluminum material is susceptible to handling damage.	The basis for certification is similarity; hotfire testing (over 29 starts and 17,030 seconds); and VCR 586 approval on 10/22/01.	None	This Flight: No issues

#	Issue	Status this flight	Description	Actions Taken	Risk Level Change	Action Needed to Resolve (this flight & long-term)?
22	Orbital Debris and Micrometeoroid Risks	Resolved	Program calculates Orbital Debris risk probability for each mission	<ol style="list-style-type: none"> Odds of Critical Penetration (OCP): 1/370 (Program requirement 1/200). Odds of Radiator Leak Penetration (ORLP): 1/315 (Program Requirement 1/61). 	<ol style="list-style-type: none"> Risk level is within Program's risk acceptance range for Orbital Debris and Meteoroid exposure. Note that the risk level is slightly lower compared to STS-113, the previous mission (OCP was 1/244 and ORLP was 1/253). 	<p><u>Long Term:</u> The Program should continue to assess methods to further reduce the risk of orbital debris and micrometeoroids.</p>

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Bill Bihner, 03:34 PM 1/7/2003 -0500, STS-107 FRR SMAR

X-Sender: wbihner@mail.hq.nasa.gov

X-Mailer: QUALCOMM Windows Eudora Version 4.3.2

Date: Tue, 07 Jan 2003 15:34:44 -0500

To: pruttedg@hq.nasa.gov, jloyd@hq.nasa.gov, mgreenfi@hq.nasa.gov,
boconnor@hq.nasa.gov, wreaddy@hq.nasa.gov, mkosteln@hq.nasa.gov,
mcard@hq.nasa.gov, wfrazier@hq.nasa.gov, rpatrica@hq.nasa.gov,
Amanda.Goodson@msfc.nasa.gov, bob.peercy@west.boeing.com,
john.branard@kmail.ksc.nasa.gov, lbriscoe@ems.jsc.nasa.gov,
jmullin@hq.nasa.gov, rglanvil@ems.jsc.nasa.gov,
jyoung@ems.jsc.nasa.gov, dwhittle@ems.jsc.nasa.gov,
judith.hooper-1@ksc.nasa.gov, charlie.chesser@msfc.nasa.gov,
steve.turner@maf.nasa.gov, merminge@ems.jsc.nasa.gov,
Gregory.R.Lain@maf.nasa.gov, Alex.C.Adams@msfc.nasa.gov,
Daniel.J.Mullane@msfc.nasa.gov, David.J.Spacek@msfc.nasa.gov,
William.Higgins-1@ksc.nasa.gov, Shannon.Bartell-1@ksc.nasa.gov,
william.j.harris1@jsc.nasa.gov, Roy.Malone@msfc.nasa.gov,
fgregory@hq.nasa.gov, Humberto.Garrido-1@ksc.nasa.gov,
dominic.l.gorie1@jsc.nasa.gov, len.sirota@hq.nasa.gov,
spitotti@mail.hq.nasa.gov, yolanda.y.marshall@nasa.gov,
ronald.d.ditemore@nasa.gov, linda.j.ham@nasa.gov,
Craig.B.Clokey@USAHQ.UnitedSpaceAlliance.com,
mkowales@mail.hq.nasa.gov, pcounts@hq.nasa.gov, bwatkins@hq.nasa.gov,
whill@hq.nasa.gov, dwhitehe@hq.nasa.gov, sortega@hq.nasa.gov,
awest@hq.nasa.gov

From: Bill Bihner <wbihner@hq.nasa.gov>

Subject: STS-107 FRR SMAR

Cc: Roy.Bridges-1@ksc.nasa.gov, Jefferson.D.Howell1@jsc.nasa.gov,
Arthur.G.Stephenson@nasa.gov, William.Parsons@ssc.nasa.gov

Good Afternoon,

Attached please find the Code Q FRR-Edition Safety and Mission Assurance Report (SMAR) for STS-107.

If there are any questions, please give me a call.

Thanks,

Bill

William J. Bihner, Jr
NASA/QE
(202) 358-4441



STS-107 SMAR FRR.doc

ERMINGER, MARK D. (JSC-NC) (NASA), 10:29 AM 2/4/2003 -0600, MIB Ideas

From: "ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>
To: "H - O'Connor Bryan (boconnor@mail.hq.nasa.gov)"
<boconnor@mail.hq.nasa.gov>
Cc: "h - Rutledge Pete (h - Rutledge, Pete)" <prutledg@hq.nasa.gov>,
"H - Kowaleski Mark (mkowales@mail.hq.nasa.gov)"
<mkowales@mail.hq.nasa.gov>
Subject: MIB Ideas
Date: Tue, 4 Feb 2003 10:29:15 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

See attached



Columbia MIB Suggestions for Bryan O'Conner.doc

Jonathan B. Mullin, 09:45 AM 2/10/2003 -0500, Fwd: Feb 8

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 09:45:57 -0500
To: prichard@hq.nasa.gov
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: Fwd: Feb 8

Pam, Close Hold. Response Records. Regards, Jon
From: "Kee-1, Wayne" <Wayne.M.Kee@nasa.gov>
To: TAE2 All <TAE2@kscems.ksc.nasa.gov>
Cc: "Mullin, Jonathan" <jmullin@mail.hq.nasa.gov>
Subject: Feb 8
Date: Mon, 10 Feb 2003 08:23:42 -0500
X-Mailer: Internet Mail Service (5.5.2653.19)

Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"



Feb 8 Log.doc

Feb 8		
Feb 8	0001	Debris truck arrived from Lufkin to Nose Dock 6.
Feb 8	0730	All went to STS-107 Memorial Service at Base Chapel.
Feb 8	0915	5 Satellite phones being sent to Mike Stevens in Lufkin via helo.
Feb 8	0930	E Bay search complete, no significant items.

Feb 8	1145	Shipment from Hempill to Jasper will pick up escort then to Barksdale.
Feb 8	1200	Mr. O'Keefe in building
Feb 8	1425	Mr. Borsi was called by Mr. C. Burch concerning additional security manpower for debris sites in Texas. Mr. Borsi agreed to send 2 Space Gateway Support personnel, already assigned to Barksdale AFB, to Lufkin for additional security.
Feb 8	1430	Don Eldred called to let us know that he has taken the radar altimeter from Central Security Control to Nosedock #6. Lt Col Kelley has delivered a safe and the radar altimeter will be stored there.
	1655	Nesbit from the Lufkin Command Post called and said that CLB had ask he pass on to us that two trucks had left there with an ETA here of 1915 - 1930. (RIDDLE).


Feb 8	1800	Cal Burch notified us that his new
Feb 8	2000	Truck arrived with debris. Sabine County was marked on bags. Reported that two other trucks had come in around 1730.
Feb 8	2300	Delivery to Nosedock

Jonathan B. Mullin, 09:48 AM 2/10/2003 -0500, Fwd: Feb 9

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 09:48:21 -0500
To: prichard@hq.nasa.gov
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: Fwd: Feb 9

Close Hold. Response Records. Regards, Jon
From: "Kee-1, Wayne" <Wayne.M.Kee@nasa.gov>
To: "Mullin, Jonathan" <jmullin@mail.hq.nasa.gov>,
"Brophy-1, JoAnn" <JoAnn.L.Brophy@nasa.gov>,
"Perry-1, Sheila" <Sheila.M.Perry@nasa.gov>,
"Klotz-1, Patrick" <Patrick.M.Klotz@nasa.gov>,
"Stevens-2, Michael B (Fire and Emer Services)" <Michael.B.Stevens@nasa.gov>,
"Oakland-1, Dann" <Dann.E.Oakland@nasa.gov>,
"Burch-1, Michele" <Michele.J.Burch@nasa.gov>
Subject: Feb 9

Date: Mon, 10 Feb 2003 08:34:57 -0500
X-Mailer: Internet Mail Service (5.5.2656.59)
Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

 Feb 9 Log.doc

Feb 9		
Feb 9	0700	USA Security John Day leaving for reassignment to new Carswell site.
Feb 9	0930	TMF closed. Flight out to Dover.
	1030	Per instructions from Bill Ayotte, remove Mark Borsi and Greg Crews from the "Can Escort" part of the ND#6 EAL and replace them with Walter Young. New EAL ND#6 updated, published, and distributed.
Feb 9	1035	Received Telephone call from Cal Burch who relayed the following information: Rob Schmidt was deploying today to Carswell at 091500 to provide security for that collection and identification point. His cell # is Jeff Williams will be the Chief at that site. Jeff's phone is 817-862-2038/9; fax is 817-731-3338; secure voice is Cal's new number is Cal also gave me the new numbers for the Security Operation in Lufkin: Cal is at 936-631-3618; Gary is at 3619; Ron Simons is at 3621; and Mike Stevens is at 3640. Cal also recommended that toner cartridges for Xerox machines be treated as sensitive and destroyed accordingly. (Riddle)
Feb 9	1515	Nose Dock reported Truck arrival from San Augustine.
Feb 9	1633	Received shipment from Toledo Bend, LA
Feb 9	1650	Received Shipment from Hemphill
Feb 9	1720	TMF opened
Feb 9	1935	Delevery from Palestine to Nose Dock 6

Kee-1, Wayne, 08:25 AM 2/10/2003 -0500, Log of Events

From: "Kee-1, Wayne" <Wayne.M.Kee@nasa.gov>
To: "Mullin, Jonathan" <jmullin@mail.hq.nasa.gov>
Subject: Log of Events
Date: Mon, 10 Feb 2003 08:25:09 -0500
X-Mailer: Internet Mail Service (5.5.2656.59)



Log of Events(Updated)2.doc

Log of Events
 NASA/KSC Security, LE, and EP Office
 MIT Barksdale AFB, LA

Date	Time	Event
Feb 1		Shortly after 9 a.m. local time; Shuttle Columbia lost
Feb 1	7:20 p.m.	C-141 departs SLF to Barksdale AFB LA.
Feb 1	8:30 p.m.	C-141 arrives Barksdale AFB LA in brief by Mr. Dave Whittle
Feb 1	11:30 p.m.	Team departs to Airport, obtained 5ea 4x4 rental vehicles
Feb 2	12:30 a.m.	Team meets with Mike Leinbach to formulate Shuttle hazards list
Feb 2	6:30 a.m.	Day begins at LRS Facility, Barksdale AFB, LA. We have two large rooms, USAF assisting with computer work stations, and Gary/Mark establishing contacts with other agencies
Feb 2	8:20 a.m.	ROBERT SCHMIDT assigned to check physical security at Hangar 1, BAFB accompanied by Capt. Zhea, USAF Security Police
Feb 2	9:30 a.m.	Periodic checks with NASA rep onsite at Lufkin Texas
Feb 2	10:50 a.m.	Received word from USAF that Hangar 1 is no longer a viable. Location for the debris, possible new location is Nose Dock 6.
Feb 2	12:40	Potential debris reported at 1307 Highland St. in BAFB housing. Team responded with Security forces, HAZMAT check, nothing detected, item determined to be chipped paint, non-shuttle related. Area was secured before arrival of detection equipment (Fooks).

Feb 2	1:06 p.m.	Communication with NASA Security at Lufkin continues.
		ASA Security request security access list for two locations, (1) The Nose Dock 6 and (2).
Feb 2	2:20 p.m.	Dave King briefing Mark and Gary on what to expect at the Texas sites, in regards to security.
Feb 2	3:15 p.m.	If you need MIT badges call Lt. Grenier.
Feb 2	3:20 p.m.	150 MIT badges were delivered to Gary for follow-on teams.
Feb 2	4:04 p.m.	Requested a fax machine; Michele said it would be here tomorrow; we are to call Orwin Johnson, 256-651-4715 to get the technician to hook the fax machine up.
Feb 2	6:55 p.m.	
Feb 2	7:00 p.m.	Generated new access list to TMF, delivered by Roger.
Feb 2	9:00 p.m.	Nose Dock 6 became operational, received first piece of shuttle debris.
Feb 3		
Feb 3	7:00 a.m.	Advised by BAFB Battle staff to provide 3 copies of TMF EAL to them, if any new EAL's are generated. They will deliver the EAL's to the respective Security Forces posts.
Feb 3	8:00 a.m.	Chad Johnston, FEMA is working on getting a helo for our Transport. Chad can be contacted at 479-264-1198.

Feb. 3	1612	Talked to Dr. Davis at JSC, reference EPA request to stop Recovery due to PPE requirements, Dr. Davis said we were given bad information.
Feb. 3	1645	Rob updated DCA list, Edition 6
Feb. 3	1730	Sim cards for Sat. phones to arrive at Hotel at 8:00 p.m.
Feb. 3	1732	Ebay search revealed no contraband (STS-107)
Feb. 3	2330	Received two STU-III telephone units from Phil Rounds at IIRKTN
Feb. 4		
Feb. 4	0630	STU-III phones issued. #1 and key to Dave Whittle, #2 and key to CIAB room for Adm. Gehman, received by Lt. Ensinger. Hand receipts are in file.
Feb. 4	0645	DCA list updated by Rob, edition 7, placed in file with TMD edition Five
Feb. 4	0730	Roger to TMF for morning site visit and coordination.
Feb. 4	0745	Took call from Mike Cardinale, reference PPE and procedures. Received email with recovery team protocols for handling debris. Passed the guidelines on to Larry Ostarly of USA who is lead for teams in field.
Feb. 4	0750	FBI S/A Bland checks in.
Feb. 4	1005	Continuing dialog with Brad Waits on mutual recovery agreements.
Feb. 4	1007	Made request through also USA to have Industrial Hygienist respond to Barksdale AFB Center, Emergency Preparedness Coordinator.
Feb. 4	1010	KSC Satellite phones issued Unit 14 Gary Fooks, Unit 17 S. Seberta, Unit 18 Brad Reinhardt.

Feb. 3	9:50 a.m.	Both the TMF and DCA list have been updated, Edition's 3 provided to USAF Security.
Feb. 3	10:15 a.m.	Shredders requested for both situation rooms (Mark).
Feb. 3	10:16 a.m.	Helo request for Waco/Crawford from Lufkin was cancelled. (See above).
Feb. 3	10:18 a.m.	TMF and DCA list updated to Edition 4.
Feb. 3	10:20 a.m.	<p>First contact with local FBI office, Special Agent Cliff Bland. Special Agent Bland presented the following contact names and numbers.</p> <p>Special Agent Cliff Bland Office 221-8439</p> <p>Special Agent Mark Gant (ASAC) Office (504) 816-3600</p> <p>Special Agent Mike Kinder (SSRA)</p>
Feb. 3	11:15 a.m.	Mike B. Stevens informed us that sim cards for Sat phones will be at the hotel by 8:00 p.m., Wayne or Mark Borsi must be there to receive them.
Feb. 3	11:15 a.m.	Teams dispatched to DFW area, Lufkin and local Barksdale area. Teams will be removing debris and bringing to BAFB DCA.
Feb. 3	11:33 a.m.	S/A Langevin completes investigative inquiry of missing documents. Documents are correct.
Feb. 3	11:41 a.m.	John Day, USA Security, assigned to check E-Bay twice a day. STS-107 mission patches for sale @ \$107.00.
Feb. 3	12:23 p.m.	Made request of Phil Bounds for secure comms for CAIB facility.
Feb. 3	12:28 p.m.	FBI S/A Bland advises local ERT in route to assist debris recovery from reservoir site.
Feb. 3	1520	Received call via Jeff Davis, JSC Medical Director, that EPA was stating that they wanted to shut down recovery operations due to improper PPE. Stated EPA wanted teams in full level "A" ensemble for recovery.
Feb. 3	1555	Elevated previous EPA request to Mark Wallace of FEMA, who was on a telecon with EPA, there is no problem, EPA request unfounded. Relayed to JSC Medical Director.

Feb. 4	1140	John Day (USA) completed EBAY search, 4,841 listings with no debris listing to date.
Feb. 4	1530	Agent Diand visited our command center (FBI liaison).
Feb. 4	1600	Meeting with Capt. Zhea and LTC Hickman requesting NASA Security Support for guard post at dock 6 TMF.
Feb. 4	1700	STU-III key locked in file cabinet.
Feb. 4	1610	Mark request RRT support from KSC, talk with M. L. Stevens.
Feb. 4	1625	Tim Imka agrees to work request for manpower overnight.
Feb. 4	1745	Gary Fooks called to let us know that he might be able to free up 6 personnel due to possible site reduction at this locations.
Feb. 5		
Feb. 5	0630	Received call from Tim Imka reference support, Mark needs to call him ASAP reference personnel issues.
Feb. 5	0737	Roger now assumes responsibility for DCA, and all EAL's
Feb. 5	0744	Made contact with Maj. Ogden for US flag to be placed in Ops Center.
Feb. 5	0930	Mark and Roger responding to airport to turn in Rob's car and pick up Cal and Michael L.
Feb. 5	1015	Ehav search reveal negative unauthorized debris sales (Day)
Feb. 5	1105	Gary test fax from LUFKIN to us, works fine.
Feb. 5	1105	Mark, Roger, Cal and Michael L. on the way back from AP.
Feb. 5	1350	Cal makes TDY decisions. Borsi out Sunday 2/9, Langevin out Tuesday 2/11; Riddle in 2/8, Storey in 2/10, Wayne out 2/7.
Feb. 5	1400	Insured that all data and images permanently removed from TMF computer.

Feb. 5	1400	Tim Imka confirms movement of two officers and a supervisor from KSC to Barksdale. Team meeting scheduled at 0717 tomorrow.
Feb. 5	1625	Received call from Rob, transfer complete at Dover, Rob due to arrive at OIA tonight around 2300.
Feb. 5	1645	Ebay search reveal no debris for sale -- John Day.
Feb. 5	1655	Mark investigated (by phone call) on a report of a broken white helmet that blew across the road in front of her about 3 hours outside of Phoenix. Talked to her on the phone, did not seem credible, passed BOLO on to local officials.
Feb. 5	1800	Roger and Mark taking USA Safety and Industrial Hygiene to Nose Dock 6 for site survey.
Feb 6		
Feb. 6	0640	Roger updated DCA Edition 10 and EAL edition 3 lists.
Feb. 6	0745	Roger escorting the 7 person SGS Security Police team (one supervisor, Dave Stokey) to AF Sec. Police HQ. Langevin, Captain Zhea, and Borsi brief team on mission to guard TMF and Nose Dock 6.
Feb. 6	0815	Michele Burch confirms S/A Schmidt home
Feb. 6	0815	Roger shows the team around the sites. SGS to start duty at 1200. 3 officers on 12 hour shifts.
Feb. 6	0815	Helicopter transport to Fort Polk (for Mark) has been canceled due to weather. Should be rescheduled for tomorrow, same time.
Feb. 6	0940	Cal reported that they are being transitioned into the Command Center. In LUFKIN and will be moving from the Civic Center to the Bank of America Bldg. Over the weekend.
Feb. 6	0945	Sgt. McGee reports that complete wipe of TMF computer is complete and that no recoverable data remains.
Feb 6	1130	New log of events sent up to Mr. Dave Saleeba, NASA HQ.
Feb 6	1240	Houston Chronicle printed that a Top Secret part is somewhere among shuttle debris. Mark passed this on to PAO
Feb 6	1245	COMSEC custodian arrived from USA, Donald B. Eldred
Feb 6	1255	Act of kindness for 5 of our team members who had lunch at a local Café (Beams) outside the BAFB Westgate, owner would not let us pay, just merely said "I hate to profit from your tragedy"
Feb 6	1345	Jennifer from Lufkin called Mark Borsi stating that the truck loaded with debris is headed here with ETA of 3 hours
Feb 6	1400	Begin coordination of sensitive procurement with Amy Voigt JSC Counsel at BAFB site, and Bob Stevens with HQ Code G.
Feb 6	1440	Roger coordinated new access list with USAF Security Forces
Feb 6	1445	Michael L. informed us that he and Cal would be in Lufkin possibly through Tuesday, and will probably try to get a direct flight from Houston to OIA
Feb 6	1450	Trucks are in route from Lufkin, Palestine and Nacogdoches to Nose Dock 6, possible COMSEC in Nacogdoches truck.
Feb 6	1556	Confirmed trucks from Nacogdoches is rolling. Trucks from Palestine is not.
Feb 6	1631	Correction to previous entry: The truck from Palestine left at approximately

X-Sender: wbihner@mail.hq.nasa.gov

X-Mailer: QUALCOMM Windows Eudora Version 4.3.2

Date: Mon, 13 Jan 2003 15:33:37 -0500

To: prutledg@hq.nasa.gov, jloyd@hq.nasa.gov, mgreenfi@hq.nasa.gov,
boconnor@hq.nasa.gov, wreaddy@hq.nasa.gov, mkosteln@hq.nasa.gov,
mcard@hq.nasa.gov, wfrazier@hq.nasa.gov, rpatrica@hq.nasa.gov,
Amanda.Goodson@msfc.nasa.gov, bob.peercy@west.boeing.com,
john.branard@kmail.ksc.nasa.gov, lbriscoe@ems.jsc.nasa.gov,
jmullin@hq.nasa.gov, rglanvil@ems.jsc.nasa.gov,
jyoung@ems.jsc.nasa.gov, dwhittle@ems.jsc.nasa.gov,
judith.hooper-1@ksc.nasa.gov, charlie.chesser@msfc.nasa.gov,
steve.turner@maf.nasa.gov, merminge@ems.jsc.nasa.gov,
Gregory.R.Lain@maf.nasa.gov, Alex.C.Adams@msfc.nasa.gov,
Daniel.J.Mullane@msfc.nasa.gov, David.J.Spacek@msfc.nasa.gov,
William.Higgins-1@ksc.nasa.gov, Shannon.Bartell-1@ksc.nasa.gov,
william.j.harris1@jsc.nasa.gov, Roy.Malone@msfc.nasa.gov,
fgregory@hq.nasa.gov, Humberto.Garrido-1@ksc.nasa.gov,
dominic.l.gorie1@jsc.nasa.gov, len.sirota@hq.nasa.gov,
spitotti@mail.hq.nasa.gov, yolanda.y.marshall@nasa.gov,
ronald.d.dittemore@nasa.gov, linda.j.ham@nasa.gov,
Craig.B.Clokey@USAHQ.UnitedSpaceAlliance.com,
mkowales@mail.hq.nasa.gov, pcounts@hq.nasa.gov, bwatkins@hq.nasa.gov,
whill@hq.nasa.gov, dwhitehe@hq.nasa.gov, sortega@hq.nasa.gov,
awest@hq.nasa.gov

From: Bill Bihner <wbihner@hq.nasa.gov>

Subject: STS-107 PMMT SMAR

Cc: Roy.Bridges-1@ksc.nasa.gov, Jefferson.D.Howell1@jsc.nasa.gov,
Arthur.G.Stephenson@nasa.gov, William.Parsons@ssc.nasa.gov

Good Afternoon,

Attached please find the Code Q Pre-Launch Mission Management Team Edition of the Safety and Mission Assurance Report (SMAR) for STS-107.

NOTE that the only change to this document from the FRR version is the update to the BSTRA ball status based on a special PRCB meeting on Sunday, January 12. OV-102 has been cleared to fly one additional mission, STS-107. Actions assigned by the Shuttle Program Manager will determine the longer term solution(s) to the BSTRA issue.

If there are any questions, please give me a call.

Thanks,

Bill

William J. Bihner, Jr.
NASA/QE
(202) 358-4441



STS-107 SMAR PMMT1.doc

		1600. The truck from Nacogdoches has not left at this time. This was due to a problem with the manifest.
Feb 6	1632	Maj. Ogden called liaison for sensitive procurement. Owner is out of loop until Monday but will consider proposal. Maj. Ogden will determine value of replacement.

Feb 7		
Feb 7	0630	2 Ryder trucks with debris arrived last night. All small items were tagged; larger items (structure and tanks) were not bagged. All items were sniff-checked 0.0ppm on all.
Feb 7	0730	Dover AFB snowed in; flight from Barksdale cancelled.

Feb 7	1030	Borsi in route to Helo for trip to Ft Polk then to Lufkin TX
Feb 7	1115	Report of several people inside Nose Dock 6 complaining of headache. EH will sample air for CO and NO.
Feb 7	1140	Mark Borsi arrived Ft Polk Reviewed site of engine debris impact on Ft Polk. Reviewed security of engine debris storage on Ft. Polk. Debris will remain until search is completed.
Feb 7	1340	Borsi departing Ft Polk enroute to Angelino then to Lufkin by ground. Met with NASA security personnel. Secured GPS coordinates for debris that fell in Toledo Bend to transfer to AF Radar personnel
Feb 7	1400	EH samples in Nose Dock 6 resulted in 0.0 ppm of CO and NO
Feb 7	1406	2 Trucks departed Nacogdoches
Feb 7	1545	1 Truck departed Palestine
Feb 7	1600	Riddle landed enroute to Barksdale.
Feb 7	1730	Borsi Returned
Feb 7	1740	Nose Dock 6 reported they had two trucks already unloaded
Feb 7	1800	Ebay search complete, no items of interest
Feb 7	1830	Nose Dock reported another truck off loades. (From Palestine?)

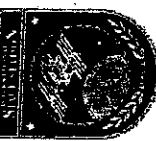
X-Sender: rpatrica@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 13:02:22 -0500
To: jlloyd@hq.nasa.gov, prutledg@hq.nasa.gov
From: Richard Patrican <rpatrica@hq.nasa.gov>
Subject: ISS Decision Tree Team 1.ppt
Cc: gwhite1@hq.nasa.gov, mkowales@hq.nasa.gov, prichard@hq.nasa.gov,
mcard@hq.nasa.gov, rpatrica@hq.nasa.gov, wbihner@hq.nasa.gov

For Your information, direction ISS analysis is going to understand their posture and identification of key points in time for when decisions are needed. To be pulled together by tomorrow.



ISS Decision Tree Team 11.ppt

Rich Patrican
Manager, International Space Station
Office of Safety and Mission Assurance
Headquarters Office 5X35
Phone: 202-358-0569
Fax: 202-358-2772



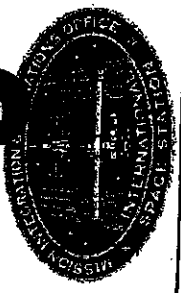
ISS Decision Tree Team Mission Integration and Operations

February 2003

OC/S Creasy OA/D. Fender



Decision Tree Team Action



- **Address three cases:**
 - **Option 1: Minimal ULF1 slip, approximately 1 month**
 - ULF1 rotates Exp 6/7 crew
 - **Option 2: 6 month slip**
 - 6 Soyuz rotates Exp. 6/7 crew
 - ULF 1 rotates Exp. 7/8 crew
 - **Option 3: 12 month slip**
 - 6 Soyuz rotates Exp 6/7 crew
 - 7 Soyuz rotates Exp 7/8 crew
 - ULF 1 rotates Exp 8/9 crew
- **For each case identify key decision points and dates**
- **Develop initial decision tree by 2/5/03**

Team Actions

- > Indicates Team needs to answer the following questions by 3:00pm 2/5/03

IMT 7& 8 Lead M. Gard, M. Sanchez, P. Hasbrook

- > What are the decision points to flying Increment 7 on 6 Soyuz
 - > Training and schedule impacts
 - > 3 vs 2 crew iteration

EVA Impact

What would be the proposed manifest impacts to 6S and 11P

- > What are the decision points for flying Increment 8 on 7 Soyuz
 - > Training and schedule impacts
 - > 3 vs 2 crew iteration

What would be the proposed manifest impacts to 6S and 11P

EVA Impact

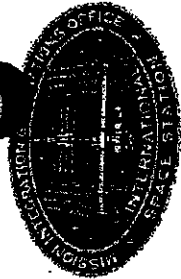
- > What are the decision points and impacts to substituting new increment crew

Consumables Lead K. Laurini

- > Verify on orbit crew provision and resource consumable status (inventory audit)
 - > Identify resource limits, i.e. when will they run out
 - > Establish new water plan / assumption
 - > Conduct a 2 crew versus 3 crew trade to quantify consumable savings
 - > Evaluate four Progress in 12 months option (11P 6/8, 12P 8/30, 13P 11/20, 14P 1/30)
- Establish minimum core up mass requirement for 6S and 11P manifest candidates
Make usage rate reduction recommendations



Team Actions



> Indicates Team needs to answer the following questions by 3:00pm 2/5/03

ULF-1 Lead F. Booker

- > Impact to flow from a 2 week, 6 month and 12 month slip
 - Identify cargo limited life items and MPLM closeout constraints
- > IELK's status

12A.1 Lead S. Castle/A. Perry

- > Determine if Spacehab has enough assets to perform 12A.1
Identify hardware, schedule impacts or threats from STS-107
Answer: Spacehab has the assets to support

Russian Office Lead G. Dorth

- > Develop a 6S and 11P shipping plan and schedule



Team Actions



> Indicates Team needs to answer the following questions by 3:00pm 2/5/03

CHeC's Lead C. Stegemoeller

- > Develop an integrated medical prescription for exercise that maintains acceptable crew health and preserves current assets
- Develop medical operations staging impacts form moving crew rotation to Soyuz

Viper Lead J. Arend

- > Identify altitude and attitude strategy for 2 week, 6 month and 12 month options
- > Reboost decision point

Payloads Lead L. Roe

Develop interim research plan based on limited up mass
Develop manifest options and candidates for 6S and 11P

FPWG Lead D. Thomas, J. Larochele, J. Coggeshall
Define 13A.1 and follow on manifest impact

Crew Office / MOD / SA Lead W. Lawrence, C. Stegemoeller
Identify 2 vs 3 crew impacts and risks

Bill Bihner, 08:07 AM 1/21/2003 -0500, Fwd: FW: STS-107 Long Range Tracking Video Screening

X-Sender: wbihner@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 21 Jan 2003 08:07:03 -0500
To: "Bryan O'connor" <boconnor@hq.nasa.gov>
From: Bill Bihner <wbihner@hq.nasa.gov>
Subject: Fwd: FW: STS-107 Long Range Tracking Video Screening
Cc: Pete Rutledge <prutledg@hq.nasa.gov>,
Mark Kowaleski <mkowales@hq.nasa.gov>

Bryan,

Just FYI in case you have not heard about this. Will get an update on this when I go to this morning's MMT call.

Bill

From: "ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>
To: "JOHNSON, M. S. (SCOTT) (JSC-NC) (NASA)" <m.s.johnson@nasa.gov>
Cc: "MAYER, FRED F. (JSC-NC) (SAIC)" <fred.f.mayer1@jsc.nasa.gov>,
"H - Kowaleski Mark (E-mail)" <mkowales@mail.hq.nasa.gov>,
"H - Bihner Bill (E-mail)" <wbihner@mail.hq.nasa.gov>
Subject: FW: STS-107 Long Range Tracking Video Screening
Date: Fri, 17 Jan 2003 12:57:45 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

- > JSC STS-107 Launch Screening - Long Range Tracking Videos
- >
- > January 17, 2003
- >
- > JSC Image Science and Analysis Group Human Exploration Science Office / SX
- >
- > ANOMALY
- >
- > ET204, ET208, ET212 - During ascent at approximately 81 seconds MET, a
- > large light-colored piece of debris was seen to originate from an area
- > near the ET/Orbiter forward attach bipod. The debris appeared to move
- > outboard in a -Y direction, then fell aft along the left Orbiter fuselage,
- > and struck the leading edge of the left wing. The strike appears to have
- > occurred on or relatively close to the wing glove near the Orbiter
- > fuselage. After striking the left wing the debris broke into a spray of
- > white-colored particles that fell aft along the underside (-Z side) of the
- > Orbiter left wing. The spray of particles was last seen near the LSRB
- > exhaust plume.
- >
- > Still views and a movie loop of this event are being placed on our web
- > site for viewing at the following address:
- >
- > <http://sn-isag.jsc.nasa.gov/shuttleweb/mission_support/sts-107/launch_vid

- > > eo/107launchvideo.shtml>
- >
- > The times of this event are as follows:
- >
- > Debris first seen near ET/Orbiter forward attach: 016:15:40:21.699 UTC
- > Debris contacted left wing:
- > 016:15:40:21.882 UTC
- >
- > Screening of the high speed and high resolution long range tracking films
- > that may show more detail of this event will begin on Saturday morning,
- > January 18th.
- >
- > Normal Observations Noted Included:
- >
- > Vapor off the SRB stiffener rings, recirculation, SRB plume brightening,
- > and slag debris after SRB separation.
- >
- > NOTES:
- >
- > The long range video tracking views had very soft focus possibly due to
- > clouds and haze.
- >
- > SRB separation occurred at approximately 016:15:41:06.558 UTC as seen on
- > camera ET208.
- >
- > Five long range tracking videos were received and screened. Timing data
- > was received on all of the videos received except ET207.
- >
- > The launch film screening will be conducted on Saturday and Sunday and a
- > report will be sent to distribution on Monday, January 20, 2003.
- >
- > Jon Disler / SX3-LM
- > Joe Caruana / SX3-LM
- > Eric Nielsen / SX3-HEI
- >
- >
- >