

## STS-113 Flight Readiness Review Minutes

The STS-113 Flight Readiness Review convened at 10:30 a.m. on Thursday, October 31, 2002, in the Mission Briefing Room at the Kennedy Space Center. The meeting was chaired by W. Readdy, Associate Administrator, Office of Space Flight.

Flight Crew, Solid Rocket Booster, Ferry Readiness, Eastern Range and DDMS did not have any issues or constraints to flight and did not make formal presentations. Readiness statements were included in the backup package.

The STS-113 FRR presenters were:

Mission Operations - R. Castle (NASA/JSC/DA8)

A. Kirasich (NASA/JSC/DA8)

T. Sobchak (NASA/GSFC/450)

R. Gest (USA/Houston/USH-421N)

Extra Vehicular Activity - M. Demaret (NASA/JSC/XA)

Space and Life Sciences - C. Fischer (NASA/JSC/SD)

Program Integration - R. Adams (NASA/JSC/MA2)

International Space Station - K. Ulrich (NASA/JSC/OC)

T. Sang (NASA/JSC/OB)

M. Santen (Boeing/Houston/HB2-20)

Payload Processing - S. Higginbotham (NASA/KSC/UB-M)

External Tank - J. Smelser (NASA/MSFC/MP31)

J. Pilet (LMSSC/MAF/D4130)

Reusable Solid Rocket Motor - T. Boardman (Thiokol/Utah/ Thiokol/Utah/L00)

Space Shuttle Main Engine - D. Adamski (Rocketdyne/Canoga Park/055-AC82)

Vehicle Engineering - P. Thorton (USA/Houston/USH-632L)

D. White (USA/Houston/USH-601M)

K. Ruta (NASA/JSC/MV5)

Shuttle Processing - C. Connolly (USA/KSC/USK-459)

M. Leinbach (NASA/KSC/PH)

J. Cipolletti (USA/KSC/USK-167)

M. Wetmore (NASA/KSC/PH)

Safety Reliability & Quality Assurance - M. Erminger (NASA/JSC/MQ)

### Mission Operations

The STS-113/11A mission to the International Space Station (ISS) will rotate the Expedition 5 and 6 crews, install the P1 truss containing thermal radiators, transfer critical equipment and supplies, install spool positioning devices on the wet ammonia quick-disconnects, perform three extravehicular activities, and deploy a small advanced technology payload after undocking. Mission requirements, integrated network activity, ascent performance, and a special topic addressing the STS-112/9A ISS arm close call with the orbiter radiator were presented. The facility readiness review included the Software Production Facility remote connectivity failure, STS-112 trajectory server problem, and high-speed tracking test data stream processing anomaly.

### Extra Vehicular Activity (EVA)

Three scheduled EVA's will mate P1 truss utility trays, connect power umbilicals, remove drive lock assembly launch pins, install spool positioning devices, and relocate the crew and equipment translation aid cart. In response to the STS-112 pistol grip tool out-of-calibration issue, STS-113 will fly two recently calibrated tools.

### Space and Life Sciences

Status was presented on crew health, exercise countermeasures, Shuttle water quality, and radiation exposure levels. Expedition 6 exercise requirements, out-of-specification acoustic levels in the Service Module, and a potential leak hazard with the Cardiology batteries were discussed.

### Program Integration

An 11-day mission has been baselined. All three EVA's will be conducted from the ISS airlock and be performed by one Shuttle EVA team. The secondary payload deployed after undocking is the Micro-Electromechanical System-Based Pico Satellite Inspector.

### International Space Station

An overview of the mission objectives and priorities was presented. Crew consumables, payload status, and on-orbit vehicle readiness were reviewed. The potential for loose ammonia quick-disconnect detent buttons was covered as a special topic.

### Payload Processing

Open work, pad stow schedules, middeck experiment requirements, and launch scrub refurbishment schedules were discussed.

### External Tank (ET)

Special topics included loss of bipod ramp foam on STS-112/ET-115. Repair of the liquid oxygen feedline using a new material and the analytical acceptance of undersized intertank stringers were considered significant processing anomalies.

### Reusable Solid Rocket Motor

An audit of STS-113 x-ray inspection films revealed all right nozzle nose cap phenolic component radial shots were missing. This could preclude the detection of critical flaws. As part of the corrective action, all tangential films were reevaluated and flight rationale was based on the detection of no defects.

### Space Shuttle Main Engine

Major components, ignition margins, predicted performance, and redline margins were presented.

### Vehicle Engineering

STS-111 and STS-112 anomalies (including the left orbital maneuvering system engine nitrogen regulator leakage, flash evaporator system B isolation valve failure, primary thruster L4D failure) have been addressed. Although not a constraint to the STS-113 flight, numerous reaction control system thruster failures are the subject of a special investigation. There are no first-flight modifications flying on STS-113.

Special topics included the main propulsion system flow liner crack repairs on OV-105 and orbiter/ET aft attach shell assembly "salad bowl" damage (new shells have been installed on OV-105 for the STS-113 flight).

### Shuttle Processing

Main propulsion system oil contamination cleaning, forward reaction control system tile rework, pyrotechnic system continuity/isolation tests and T-0 umbilical connector inspection/replacement were considered unplanned processing tasks.

### Safety, Reliability and Quality Assurance

Significant assessments have been performed on the STS-112/9A ISS arm close proximity event, 9A spool positioning device configuration problem, STS-112 System A pyrotechnic failure, orbiter/ET aft attach shell assembly "salad bowl" damage, ET

intertank undersized stringer issue, STS-112 bipod ramp foam loss, and solid rocket motor right nozzle nose cap missed X-ray inspection.

### Action Items

No actions were assigned.

### Exceptions

There were five Space Shuttle Program certificate of flight readiness (CoFR) exceptions: T-0 system A pyrotechnic failure (Program Integration), orbiter/ET attach shell assembly damage (Program Integration), ball fitting height dimension interface control document violation (External Tank), orbiter/ET attach shell assembly testing and analysis (Vehicle Engineering), and facilities inspection/testing in support of the T-0 pyrotechnic failure (Shuttle Processing).

The exceptions will be closed with final flight rationale at the STS-113 Prelaunch Mission Management Team meeting.

Mr. Readdy polled the principal managers and organizations; all responded ready to support the STS-113 mission.



James D. Halsell, Jr.  
Colonel, USAF  
Manager, Launch Integration

2 Enclosures:

1. Agenda
2. Exception Log

**STS-113  
Flight Readiness Review  
October 31, 2002**

**Agenda**

<b>Introduction</b>	<b>Manager, Launch Integration</b>
<b>Mission Operations</b>	<b>Director, Mission Operations APM, Flight Operations, SFOC</b>
<b>EVA</b>	<b>Manager, EVA Project</b>
<b>Flight Crew</b>	<b>Director, Flight Crew Operations</b>
<b>Space and Life Sciences</b>	<b>Director, Space and Life Sciences</b>
<b>Program Integration</b>	<b>Flight Manager Manager, Space Shuttle KSC Integration Manager, Space Shuttle Systems Integration Manager, Space Shuttle Customer and Flight Integration APM, Program Integration, SFOC</b>
<b>International Space Station</b>	<b>Manager, International Space Station Program</b>
<b>Payload Processing</b>	<b>Director of ISS/Payloads Processing</b>
<b>External Tank</b>	<b>Manager, External Tank Project</b>
<b>RSRM</b>	<b>Manager, Reusable Solid Rocket Motor Project</b>
<b>SRB</b>	<b>Manager, Solid Rocket Booster Project APM, SRB Element, SFOC</b>
<b>SSME</b>	<b>Manager, Space Shuttle Main Engine Project</b>
<b>Vehicle Engineering</b>	<b>Manager, Space Shuttle Vehicle Engineering APM, Orbiter Element, SFOC APM, Flight Software, SFOC APM, FCE/EVA, SFOC</b>
<b>Ferry Readiness</b>	<b>Ferry Operations Manager</b>
<b>Shuttle Processing</b>	<b>Director of Shuttle Processing APM, Ground Operations, SFOC APM, Integrated Logistics, SFOC</b>
<b>Range</b>	<b>United States Air Force</b>
<b>DDMS</b>	<b>Director, DDMS</b>
<b>Space Shuttle SR&amp;QA</b>	<b>Manager, Safety, Reliability and Quality Assurance</b>
<b>Exception/Action Summaries</b>	<b>Manager, Launch Integration</b>
<b>Readiness Poll</b>	<b>Associate Administrator, Office of Space Flight</b>

# CoFR EXCEPTION LOG

REQUIREMENT/ EXCEPTION NUMBER	ELEMENT	DESCRIPTION OF EXCEPTION	DUE DATE
<p><b>CoFR REVIEW DATE:</b> 10-31-02</p> <p><b>STS FLT NO.</b> <b>STS-113</b></p>			
001	PROGRAM INTEGRATION	<p>REQUIREMENT: NSTS 08117, SECTION 8.5.18.1 (aa) ALL ANOMALIES THAT POTENTIALLY IMPACT PROCESSING, LAUNCH, MISSION SUCCESS, OR LANDING HAVE BEEN REPORTED AND SUCCESSFULLY RESOLVED WITH NASA.</p> <p>EXCEPTION: T-0 SYSTEM A HOLD DOWN POST (HDP) AND ET VENT ARM SYSTEM (ETVAS) PYROTECHNIC FAILURE</p>	STS-113 PMMT
002	PROGRAM INTEGRATION	<p>REQUIREMENT: NSTS 08117, SECTION 8.5.18.1 (bb) A POST-FLIGHT ASSESSMENT OF THE ACTUAL SSV FLIGHT SYSTEMS PERFORMANCE HAS BEEN CONDUCTED AND ALL DISCREPANCIES HAVE BEEN RESOLVED.</p> <p>EXCEPTION: ORBITER/ET ATTACH SHELL ASSEMBLY (SALAD BOWL) DAMAGE</p>	STS-113 PMMT
003	EXTERNAL TANK	<p>NSTS 08117, PARA. 8.5.4.1 i - ET AS-BUILT CONFIGURATION SATISFIES RELEASED ENGINEERING BASED ON DATA PROVIDED BY SFOC.</p> <p>IN A REVIEW OF ET-116 EO3 BALL FITTING DATA, THE BALL HEIGHT DIMENSION WAS FOUND TO BE IN VIOLATION OF THE ICD-2-12001 PARAGRAPH 3.1.1.1 REQUIREMENT. THE ET-116 EO-3 MAXIMUM BALL HEIGHT IS 4.4734 INCHES AND FALLS OUTSIDE THE BALL HEIGHT VERSUS RADIUS ENVELOPE AS DEFINED ON FIGURE 3.1-3.11 IN THE ICD. THE MAXIMUM ALLOWABLE HEIGHT IS 4.470 INCHES.</p>	STS-113 PMMT REVIEW

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004	ORBITER	<p>NSTS-08117 PARAGRAPH 8.5.18.1AA ALL ANOMALIES THAT POTENTIALLY IMPACT PROCESSING, LAUNCH, MISSION SUCCESS, OR LANDING HAVE BEEN REPORTED AND SUCCESSFULLY RESOLVED WITH NASA.</p> <p>THE CAUSE OF THE DAMAGE FOUND DURING THE OV-104, STS-112 POST-FLIGHT INSPECTION OF THE ET/ORBITER AFT ATTACH SHELL ASSEMBLIES (SALAD BOWLS) HAS NOT BEEN IDENTIFIED. TEST AND ANALYSIS IS REQUIRED TO DETERMINE ANY POTENTIAL SAFETY OF FLIGHT ISSUES OR MISSION IMPACT. PRESENT RESOLUTION OF THIS ISSUE TO THE STS-113 PMMT.</p>	STS-113 PMMT
005	SHUTTLE PROCESSING	<p>NSTS-08117 PARAGRAPH 8.5.8.1C FLIGHT, GSE, AND FACILITIES TEST REQUIREMENTS LEVIED ON SHUTTLE PROCESSING ARE PERFORMED, OR ARE PLANNED TO BE PERFORMED, PER APPROVED TOPS.</p> <p>THE FOLLOWING FAULT TREE ACTIONS REMAIN OPEN AND NEED TO CLOSE TO BE READY TO SUPPORT LAUNCH:</p> <ul style="list-style-type: none"> <li>- REMOVAL AND ANALYSIS OF MLP-3 6743A1W5 (240') CABLE RUN (INSPECTION, X-RAY AND CONTINUITY)</li> <li>- REMOVAL AND ANALYSIS OF OV-104 54W1 AND 50W88 (MEC TO T-0) WIRE RUN (INSPECTION AND X-RAY)</li> </ul>	STS-113 PMMT