STS-119
Safety and Mission Success Review

Presenter:

Christopher Knear

SAFETY AND MISSION ASSURANCE
STS-119 SARR

Presenter: Christopher Knear
Date: Jan-26-2009

Certificate of Flight Readiness (CoFR) Items Reviewed:
1.Hazard Analysis for Ground Systems
2.FMEA/CIL
3.Hardware/Software Design Certification
4.Other Risk Analysis (GORA,PFMEA)
5.Audits
6.Interface Control Documents
7.OMRSDs for Ground Systems
8.Launch Commit Criteria
9.Integrated Vehicle Readiness
10.PRACA
11.Waivers, Variances, Deviations, Exceptions
12.Material Review Board
13.Alert Notification
14.Mission Support Training
15.Critical Process Changes
16.Contingency Planning

Shuttle Items S&MA Reviewed:
STS-126 DFRC Landing/Turnaround Issue
STS-126 OAA White Room Door Anomaly
STS-124 TIR Logs Sheets
LC-39A Flame Trench Readiness
Post Flight Tile Inspection

ISS/Payload Items Reviewed:
Integrated Cargo Hazard Analysis
Ground Safety Reviews
Quality Assurance Surveillance
Independent Mission Assessment
Residual Risks

Institutional S&MA Items Reviewed:
Construction/Safety Activities at Launch Critical Facilities
Engineering Assurance
Quality Assurance

S&MA Integration Office Items Reviewed:
Range Safety

KSC S&MA performed an internal review on 01/09/2009 and identified no constraints against this milestone, and will continue to track the satisfactory completion of open work.

KSC SAFETY AND MISSION ASSURANCE DIVISION

NASA Kennedy Space Center, Kennedy Space Center, Florida

STS-119 SARR
Shuttle Processing CoFR Matrix

Presenter: Christopher Knear

Date: Jan-26-2009

Flight Preparation Element	Summary Description	Open Work	Constraint to Flight
Hazard Analysis and Reports	Hazard analysis and reports have been verified to have valid hazard causes, controls, and verification.	None	G
Critical Items List (CIL)	Critical item lists (CIL's) have been verified to have valid criticality, effects & operational controls.	None	G
HW S/W Design Certification	Certification of hardware requirements have been verified and documented.	None	G
Risk, Probabilistic Reliability, Maintainability and Supportability Analysis	Any flight specific risk, probability, reliability, maintainability, and supportability analysis findings impacting safety or mission success have been resolved.	None	G
Audits / Surveillance Findings	Any flight specific audit or surveillance findings impacting safety and mission success have been resolved.	Non-Compliance to NSTS 60538: Exception submitted by SSP Quality Manager. KSC S&MA IAT assessing current GMIP Sampling Program. Recommendation: Not a constraint	G
Interface Control Documents (ICD's)	ICD's have been verified to not invalidate certification, hazard controls, or CIL rationale.	None	G

G - Standard open work or completed | Y - Non-standard open work or exception | R - Constraint for flight

KSC SAFETY AND MISSION ASSURANCE DIVISION

NASA Kennedy Space Center, Kennedy Space Center, Florida

Space Shuttle Program

STS-119 SARR
Shuttle Processing CoFR Matrix

Presenter: Christopher Knear

Date: Jan-26-2009

Flight Preparation Element	Summary Description	Open Work	Constraint to Flight
NSTS 08171 Operations and Maintenance Requirements and Specifications Document (OMRSD)	RCNs to OMRSD have been verified to not invalidate hazard and CIL controls.	None	G
Launch Commit Criteria (LCC)	LCC changes have been verified not to invalidate hazard controls or CIL retention rationale.	None	G
Problem Reporting and Corrective Action (PRACA) Reportable Items (HW & S/W)	HW & S/W program problem reporting and corrective action reportable items applicable to this mission have been disposition.	None	G
Waivers and Deviations (Level II/Level III)	Waivers, exceptions and deviations, have been verified to be acceptable for flight and any violation of any existing certification, hazard, and CIL rationale is documented.	Pressure Vessels Waiver: Waiver is needed due to requirements clarification from HQ Recommendation: Not a constraint	G
		6 (+2 Possible) Open QPRD Waivers: Recommendation: Not a constraint	G

G - Standard open work or completed | Y - Non-standard open work or exception | R - Constraint for flight

KSC SAFETY AND MISSION ASSURANCE DIVISION

NASA Kennedy Space Center, Kennedy Space Center, Florida

STS-119 SARR
Shuttle Processing CoFR Matrix

Presenter: Christopher Knear

Date: Jan-26-2009

Flight Preparation Element	Summary Description	Open Work	Constraint to Flight
Material Review Boards (MRB's)	MRB items requiring NASA S&MA disposition have been approved.	None	G
Alerts	Alert notices have been assessed for applicability to this mission and have been disposition.	Open GIDEP Alerts: Continuously reviewed Recommendation: Not a Constraint	G
Mission Support	S&MA personnel supporting L&L, flight support, Mishap Investigation Team, and Mishap Rapid Response Team have been identified, trained, and qualified to support.	None	G
Integrated Vehicle Readiness	Verify Integrated Vehicle Readiness has been assessed through performance of GMIPS, and surveillance and any discrepancies identified have been satisfactorily dispositioned.	None	G
Critical Process Changes	Verify critical process changes have been assessed and are no safety impact to ground processing or mission success.	None	G
Contingency Planning	Verify Contingency Plans are current and in place for Launch and Landing.	None	G

G - Standard open work or completed	Y - Non-standard open work or exception	R - Constraint for flight

SAFETY AND MISSION ASSURANCE
STS-119 SARR
Readiness Statement

Presenter	
Christopher Knear	
Date	Page
Jan-26-2009	6

Readiness Statement – "KSC Safety and Mission Assurance is ready to support the STS-119 Launch and Landing."

Mark Wiese
Chief, KSC S&MA Launch Vehicle Processing Division

David Barker
Chief, KSC Institutional S&MA Division

FOR Maynette Smith
Chief, KSC S&MA ISS & Spacecraft Processing Division

Michael D. Campbell
Chief, KSC S&MA Integration Office

Back Up

11) Waivers, Variances, Deviations, and Exceptions QPRD Waivers

Government Mandatory Inspection Point (GMIP) = NASA QAS buy point
Designated Inspection Point (DIP) = Contractor Quality buy point

Hardware Type Waiver Number	Missed GMIP/DIP	System	Comments	Effectivity
Flight SRB –XX-XXX	DIP	SRM Electrical	Integrity seal broken without quality present	BI-135R, STS-119
Facility FAC-08-001	DIP	Crane Operations	Work order (WO) did not include DIP on installation steps for brakes on VAB #2 325 ton crane. WO has been updated.	**No constraint** to use. Successful proof load tests have verified brake function.
GSE GSE-08-001	GMIP & DIP	HMF Hypergolic Systems	QMI's did not include GMIP & DIP on OMRSD inspection steps for GSE throat plugs. QMI's have been updated.	**No constraint** to use of throat plugs. ORMSD requirements have been satisfied. Inspection attributes detectable by trained technician. Plugs not in use have been re-inspected.
GSE GSE-08-002	DIP	Propellant Systems	Job plan did not include DIP on inspection steps of carrier plates. Job plans have been updated. Work will be performed with Quality during S0024 for STS-119.	**No constraint** for use of carrier plates. Current use will be after inspections during S0024.
GSE GSE-08-003	DIP	Vehicle Physical Interface Systems	Job plan did not include DIP on OMRSD test & inspection steps of QD/filter assemblies. Job plans have been updated.	**No constraint** for use. ORMSD requirements have been satisfied. Test & inspection attributed are detectable by trained technician.

11) Waivers, Variances, Deviations, and Exceptions QPRD Waivers (Cont'd)

Hardware Type Waiver Number	Missed GMIP/DIP	System	Comments	Effectivity
GSE GSE-08-004	GMIP	Mobile Support Equipment	Job plan did not include DIP on OMRSD filter inspection steps. Job plans have been updated.	**No constraint** for use. ORMSD requirements have been satisfied. Test & inspection attributed are detectable by trained technician.
GSE GSE-08-005	DIP	Crawler/Transporter	Job plan did not include DIP on assembly & inspection steps.	**No constraint** for crawler use. Requirements are being evaluated for possibility of lowering criticality. Technicians have extensive engine maintenance training.
GSE GSE-XX-XXX	GMIP/DIP	LO2/LH2 Carrier Plates	Work performed without Quality support.	In work to determine quality coverage required, and rework verses waiver options.
GSE GSE-XX-XXX	GMIP	MLP LH2 Transfer Line	Work performed without Quality support.	In work to correct work instructions & to verify OMRSD requirements have been satisfied.

NO ISSUES / CONCERNS

KSC Safety Variance: Pressure Vessels / Systems (PV/S)

- **Abbreviated integrity assessment required by recent release of NASA-STD-8719.17 and KNPR 8715.3 Rev G**
  - Adequate resources have not been allocated to KSC to comply with new requirements in time for launch
  - If wavier is not approved, all systems will have to be removed from service until completion of certification/recertification.

- **Rationale for waiver**
  - Existing PV/S certifications per KNPR 8715.3 Rev C-1 are adequate to insure current operational capability
  - All in-service inspections and regular preventative maintenance are current for KSC PV/S
  - PV/S have not changed, only the requirements for recertification
  - Likelihood of a system failing is minimized by ASME design criteria, in-service inspections, safety walk downs, and normal periodic preventative maintenance.

- **SA-B recommends proceeding with processing waiver and approving as soon as reasonably possible.**

KSC SAFETY AND MISSION ASSURANCE DIRECTORATE

Launch Vehicle Processing Division

NASA Kennedy Space Center, Florida

STS-126 OAA White Room Anomaly

Presenter: Malcolm Glenn

Date: 01/26/09

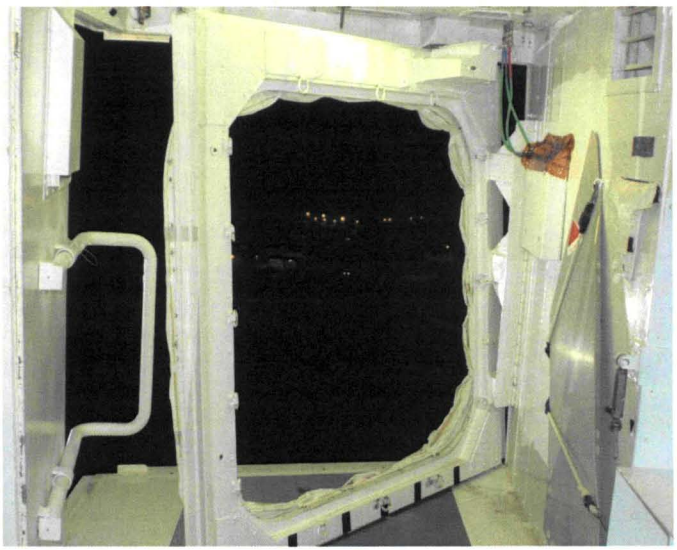
RISK TYPE: Mission Assurance, Safety

HAZARD REPORTS: N/A

CRITICALITY: N/A

ORGANIZATION: KSC S&MA

ASSIGNED TO: Malcolm Glenn / KSC / SA-B



RISK DESCRIPTION / STATEMENT:

- Orbiter Access Arm (OAA) White Room dock seal carrier door not secured in full open position for launch
- Potential debris strike to vehicle
- Potential damage to facility/GSE

BACKGROUND

- NASA QC noted suspect I/E hatch tile damage once door was opened and further inspection was performed
  - Caused an interruption to closeout procedures
  - Dock seal carrier door securing procedure overlooked

RATIONALE & RECOMMENDATION

- Launch Director (LD) formed Resolution Team - Corrective Actions implemented
- Rewrote Launch Countdown steps for White Room closeout to follow more logical flow, including more NASA QC buys
  - Added step to perform final White Room configuration inspection, including Closeout (C/O) Crew lead notification to NTD
  - Improved coordination between C/O Crew and NASA QC for tracking steps, including use of laminated checklist
- SA-B Assessment
  - SA-B Human Factors performed initial assessment of White Room C/O and concurs with corrective actions
  - SA-B participated in LD Resolution Team

NOT A CONSTRAINT TO STS-119

KSC SAFETY AND MISSION ASSURANCE DIRECTORATE

Launch Vehicle Processing Division

NASA Kennedy Space Center, Florida

II.C.XX Pad 39A Flame Trench Damage	Presenter	
	Date 09/17/08	Page 1

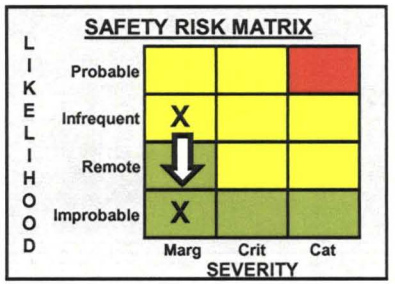
RISK TYPE: Safety

HAZARD REPORTS: N/A

CRITICALITY: N/A

ORGANIZATION: KSC S&MA

ASSIGNED TO: Doug Folkes / KSC / SA-B1



RISK DESCRIPTION / STATEMENT:

- The liberation of Flame Trench Wall refractory material at T-0 causes damage to KSC ground facility.

BACKGROUND

- During Launch of STS-124 from Pad A, approximately 3500 bricks from the SRB Flame Trench east wall were liberated. Follow on investigation had determined brick-to-wall anchoring system/bonding degradation was one of the main contributors to failure. Loss of bricks from the Flame Trench sidewalls was unprecedented and unexpected. Corrective action was to inspect/evaluate and repair the East and West SRB Flame Trench walls. Fondu Fyre Panel design option was used for repair.

RATIONALE / RECOMMENDATION

- There has been no previous loss of material to this extent. The configuration of the pad, water flow and exhaust direction and location of the MLP between the Flame Trench and flight hardware protects the shuttle from debris exposure.
- Damage to the north bridge crossover from Flame Trench debris was evaluated and determined to be a highly unlikely event with a worst case consequence being minor damage to the KSC ground facility.
- Implementation of the design modifications and repairs have reduced the likelihood of damage from possible (Infrequent) to (Improbable) with a Severity of (Marginal).

- ***A repeat occurrence of the post STS-124 Pad A Flame Trench Damage is Unlikely.***

STS-400 LON

- STS-127/400 will be the Launch On Need vehicle for STS-119
- 14 April – OV-105 rollover to VAB
- 21 April – STS-400 rollout to Pad
- 13 May – STS-400 launch date
  - KSC verified that STS-400 could support a 13 May launch date based on an early 90 day CSCS capability estimate,
  - Some flexibility to launch earlier exists if CSCS changes