

STS-114

FLIGHT READINESS REVIEW

June 29/30, 2005

Shuttle Processing

AGENDA

Presenter:
M. Wetmore

Organization/Date:
Shuttle Processing/06-29/30-05

➡ ● Shuttle Processing

- Operations

M. Wetmore
J. Taylor
M. Leinbach

- Engineering

J. Cipolletti

- Summary

M. Wetmore
M. Nappi
C. Fontana

OVERVIEW**Presenter:****M. Wetmore****Organization/Date:**

Shuttle Processing/06-29/30-05

The following Topics have been reviewed and will be presented:

- Integrated Flow Milestones
- Open Work/ Processing Differences
- Launch Countdown & Landing Status
- Launch On Need Timeline
- Requirements Status – OMRS; Time/Life Cycle
- Lost and Found Problem Reports
- Ground Launch Sequencer Status
- Unexplained Anomalies
 - MIA Word Error
 - ECO Sensor Erratic
 - ET Camera Battery
- Engineering Topics
 - Trunking Radio System and Range Safety Interference
 - ET GH2 Vent Arm



OVERVIEW**Presenter:
M. Wetmore****Organization/Date:
Shuttle Processing/06-29/30-05**

The following Topics have been reviewed and there are no issues

- Safety, Quality & Mission Assurance
- Personnel Certification/Training
- Facility Readiness
- Vehicle/GSE Modification Status
- Significant Open Work
- *STS-121/OV-104 Status
- Constraints
- Technical Operating Procedures Status
- In-Flight Anomaly Status
- Critical Process Changes
- Nonstandard Work Summary
- * Software, SCAN, and Configuration Status

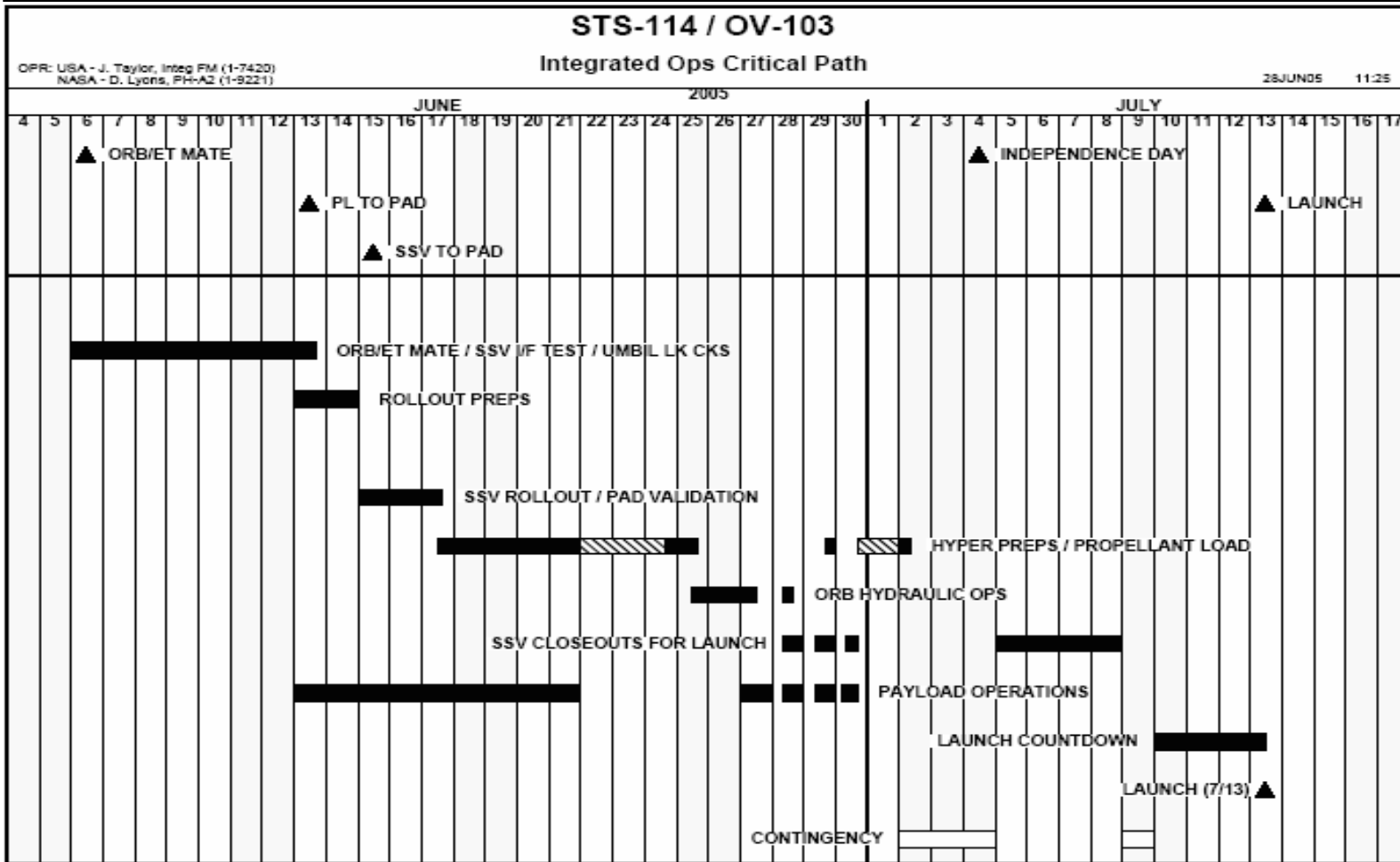
***Topics are in Backup**



OV-103/STS-114 INTEGRATED FLOW MILESTONES

Presenter:
Jim Taylor

Organization/Date:
Ground Ops/06-29/30-05



OPEN WORK/PROCESSING DIFFERENCES

Presenter:
Jim Taylor

Organization/Date:
Ground Ops/06-29/30-05

- | ● Planned | Status |
|--|---------------|
| ● MPS Fill & Drain Valves Low Pressure Actuation Test | Complete |
| ● OBSS Sensor Checkout/Installation & Grapple Fixture Installation | Complete |
| ● APU Hot Fire | Complete |
| ● Replace 6 MPS Flex hoses | Complete |
| ● Digital ET Sep Cam installation and checkout | Complete |
| ● ET LO2 Feed line Camera / Bi-Pod Heater Checkout | Complete |
| ● Frequency Response Test | Complete |
| ● Baseline Configuration Imaging – Orb, ET, SRB's | Complete |
| ● WLE Micro TAU Activation | Planned |
| ● Additional Aft Closeout Photos | Planned |
| ● Wing Leading Edge RCC Wipes | Planned |

**OPEN WORK/PROCESSING
DIFFERENCES (CONT.)**

**Presenter:
Jim Taylor**

**Organization/Date:
Ground Ops/06-29/30-05**

● Unplanned

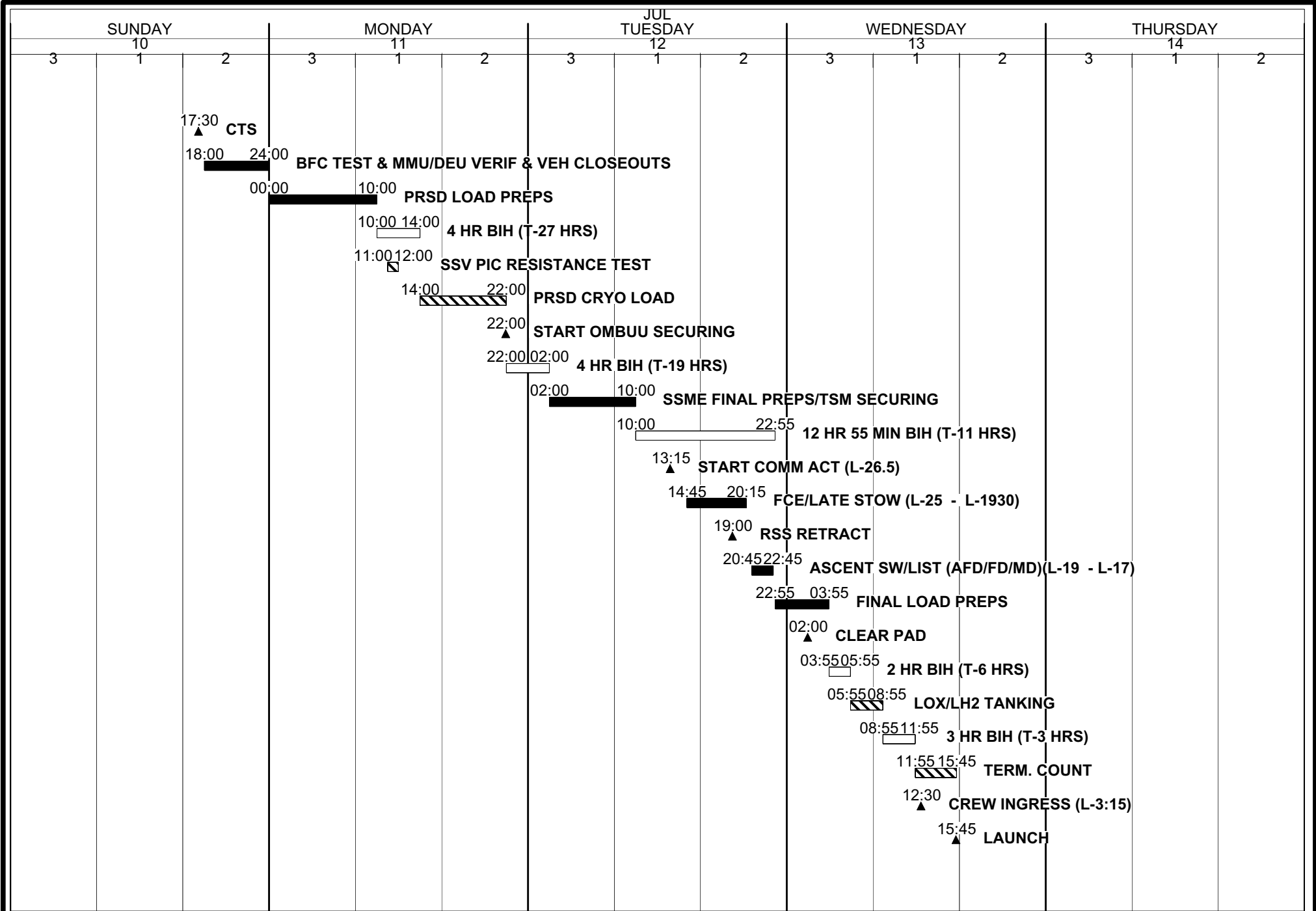
- | | |
|--|----------------------|
| ● MPS GH2 Flow Control Valves (3) R&R | Complete |
| ● Engine 3 He Reg A R&R | Complete |
| ● 2nd Tanking Test with special instrumentation | Complete |
| ● ECO Sensor Trouble Shooting and Wire R&R | Complete |
| ● MPS Point Sensor Box R&R (2X) | Complete |
| ● Replace ECO Sensor Wires in Aft | Complete |
| ● MPS CV40 R&R for Deformed Spring | Complete |
| ● FRCS Tyvek Rain Covers Fit Check | Complete |
| ● Cleanup Hydraulic Spill on Orbiter | Complete |
| ● MLGD Linkage Inspection from PLB | Complete |
| ● SSV Rollback, Orbiter Demate and Remate to New Stack | Complete |
| ● Salad Bowls R&R | Complete |
| ● PLB Keel Camera R&R | Complete |
| ● Vertical Interval Processor R&R | Complete |
| ● SSME 3 GOX Line R&R for contamination | Complete |
| ● Trunking Radio Interference with Range Safety System | CTD / Mitigation I/W |
| ● Payload EUTAS Fastener on ESP 2 | Open |

Status

STS-114 LCD SUMMARY

OPR: J. Spaulding (1-9306)

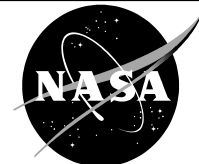
14JUN05 08:38



GROUND CAMERA SUMMARY**Presenter:****Mike Leinbach****Organization/Date:**

Shuttle Processing/06-29/30-05

- Ground Camera Assets are ready to support STS-114
- Asset supportability status:
 - Reported to the NTD from the IPWG Chair through CTS
 - Standard test team reporting protocol to the NTD from Comm Control/STM throughout Launch Countdown
 - NTD provides status to Launch Director - formal reporting at ET Load MMT (T-6 hours) and at start of T-9 minutes hold
- One Ground Camera LCC monitors the Photo Optic Control Systems (POCS) health as it applies to POCS ability to start the fixed high-speed cameras supporting liftoff/ascent imagery
- No new Launch weather LCC's associated with camera view requirements



**ISTRES AB, FRANCE
TAL ACTIVATION****Presenter:****Mike Leinbach****Organization/Date:****Shuttle Processing/06-29/30-05**

- Launch and Landing has completed all site activation work:
 - MSBLS/TACAN/HANDAR installation
 - PAPI/Ballbar/XENON installation
 - Wx ETE with JSC/SMG
 - Flight certification of MSBLS/TACAN
 - Comm setups and ETE checks
 - Post-landing exercise with French Air Force at Istres
 - TAL ground ops procedure published (S0070)
- NASA HQS signed country-to-country agreement with the French for use of Istres as a TAL site (7 Jun)



LANDING OPERATIONS STATUS

Presenter:

Mike Leinbach

Organization/Date:

Shuttle Processing/06-29/30-05

- **Launch Support**
 - **RTLS:** KSC
 - **TAL:**
 - Zaragoza (prime) Deploy at L-8 days, 7/05/05
 - Moron (Alt) Deploy at L-8 days, 7/05/05
 - Istres(Alt) Deploy at L-8 days, 7/05/05
 - **AOA:**
 - KSC(prime)
 - WSSH (alt) Deploy at L-2 days, 7/11/05

- **Mission Support**
 - KSC (prime EOM)
 - DFRC/EDW (alt EOM) Deploy at L-2 days, 7/11/05
 - WSSH

- **Site Status**
 - Working no issues
 - Ready (pending completion of scheduled work)

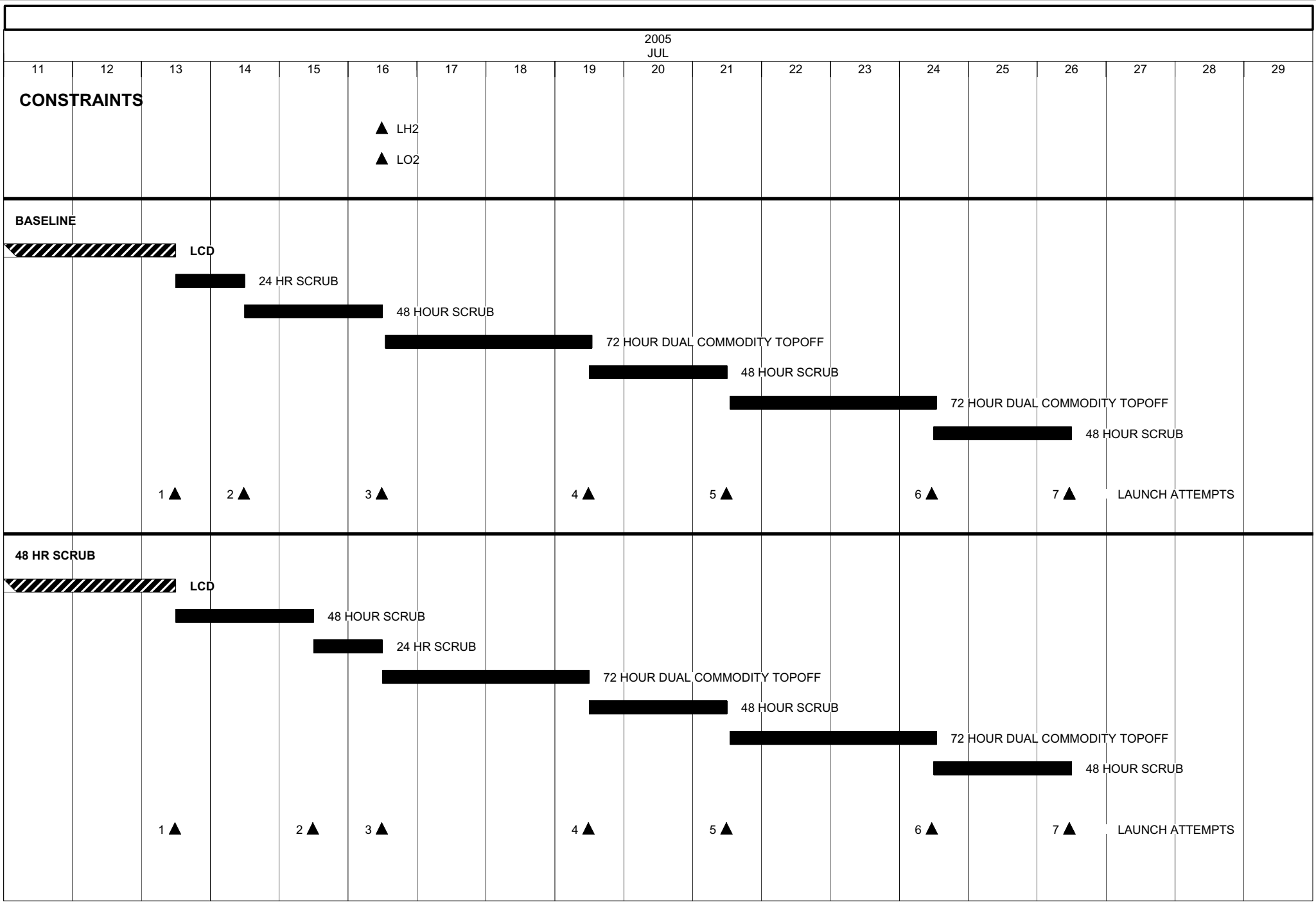


NOTE: Actual Scrub turnaround timelines will be determined realtime based on specific conditions encountered.

STS-114

SCRUB TURNAROUND OPTIONS

OPR: J. SPAULDING 1-9306
27JUN05 08:04

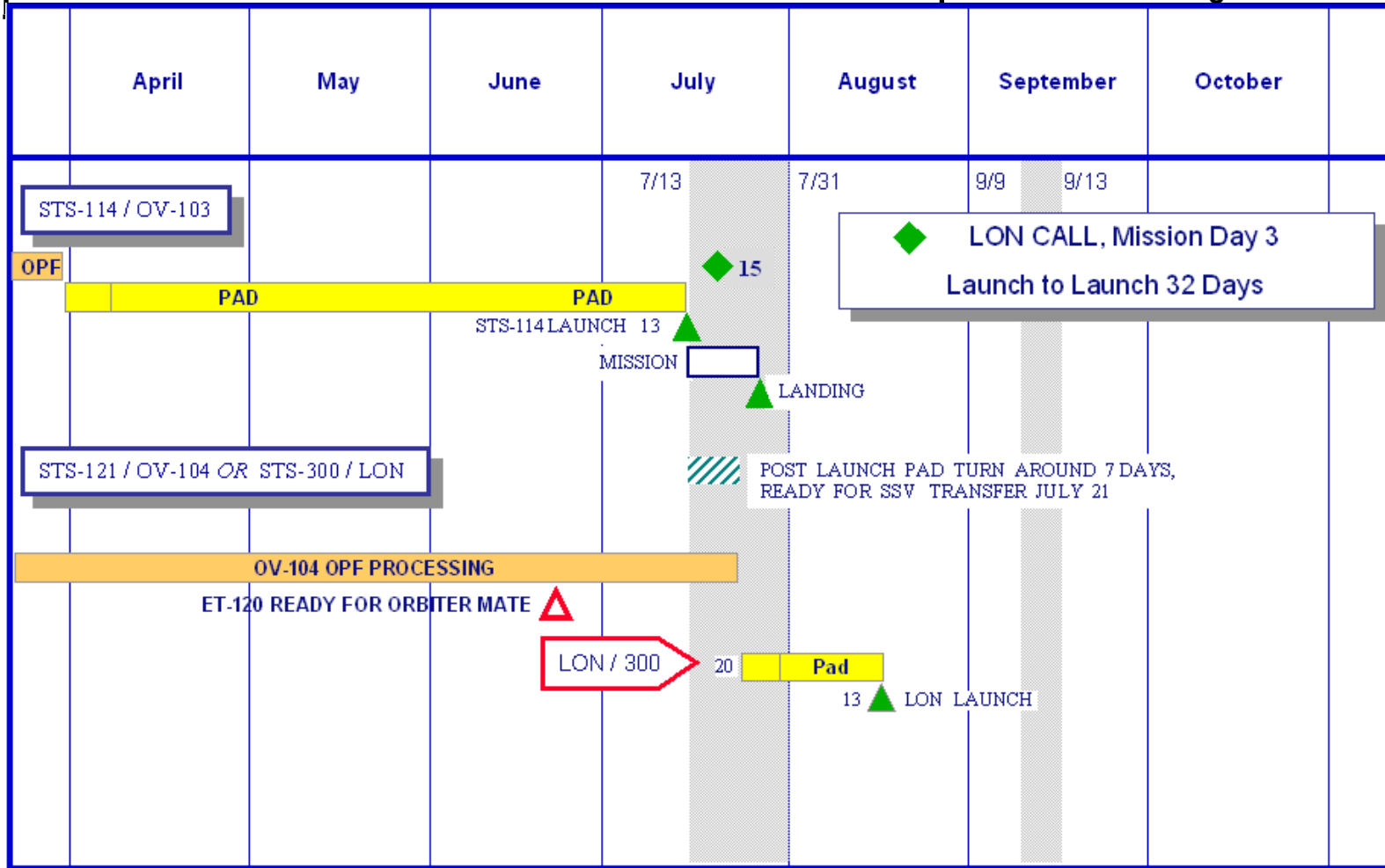


STS-114 FLIGHT READINESS REVIEW

Launch on Need (LON) Timeline STS-114 & STS-300

Presenter:
Mike Leinbach

Organization/Date:
Shuttle Processing/06-29/30-05



REQUIREMENTS STATUS	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

- RCNs in Review

KG16723R1	NAV	554.31 MSBLS AND TACAN, CLS - FRANCE	To OMRSD Working group 6/28/05
KG16794	NAV	TACAN CIRCUIT BREAK, CLS-ISTRES	To OMRSD Working group 6/28/05

REQUIREMENTS STATUS (CONT.)	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

- Open Waivers/Exceptions

Waiver/ Exception	System	Title	Status
EK10452	RCS	RRCS FUEL GHE TANK PRESSURE ACCURACY	PRCB 7/01/05
WK10457	MPS	E1 RECIRCULATION PUMP DRY SPIN TEST	PRCB 7/01/05
WK10461	PVD	HUMIDITY EXCURSION IN VAB	PRCB 7/01/05

REQUIREMENTS STATUS (CONT.)	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

- Time and Cycle Requirements (Landing +30 days)

V05AEA.023.002	WCCS Desiccant Canister	Expiration
	Overhead and Side windows	7/27/05

Plan for extending : WCCS vent ports have been capped to stop the age life time from expiring before the end of July.

C00AA0.080.XXX	OMS/RSC He system components	8/2 to 8/14
COOAA0.070.XXX	OMS/RSC He system components	8/2 to 8/14

Plan for extending : If the components expire the only two options are to write a Exception or perform the requirements in the OPF

COOAA0.170	S-Band Power Amp	8/22/05
-------------------	-------------------------	----------------

Plan for extending : Power up Pre-Amp for 2 hours will reset the time and cycle

**LOST AND FOUND (LAFs)
PROBLEM REPORTS****Presenter:****John Cipelletti****Organization/Date:****Ground Ops/06-29/30-05****Lost Items Not Found 4 (as of 06/28/05)****Summary/Conclusion for all LAF PR's**

- A thorough search of each area was unsuccessful in finding/retrieving the lost items
- System Engineering evaluations have concluded the item is not present or no adverse effect on Orbiter system operations
- A Risk Assessment is done on all LAF PRs

**LOST AND FOUND (LAFs)
PROBLEM REPORTS (CONT.)****Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-29/30-05**

- **PR LAF-3-31-0713**
 - Description
 - Tool control discrepancy for a diagonal cutter
 - Weight: 56 grams
 - Size: 4.25 X 2 inches
 - Potential Location: Forward/Crew Cabin
 - Disposition
 - Search is complete and PR is closed
 - No evidence of tool use in the Orbiter
- **PR LAF-3-31-0714**
 - Description
 - Missing Shop Aid Solenoid Cover Assembly (LV82) and (LV85) unaccounted for during First Tanking Test
 - Weight: 75 grams
 - Size: 13 cm
 - Location: Aft
 - Disposition
 - Search is complete and PR is closed

**LOST AND FOUND (LAFs)
PROBLEM REPORTS (CONT.)****Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-29/30-05**

- **PR-LAF-3-31-0715**
 - Description
 - Tool control discrepancy with Apex Tip, Serial Number WR003-224, that cannot be traced to its tool content report
 - Weight: 8.63 grams
 - Size: ¼ in drive
 - Location: Midbody
 - Disposition
 - Search is complete PR is closed
 - No evidence of tool use in Orbiter
- **PR LAF-3-31-0718**
 - Description
 - 8 blanket fasteners lost from Av Bay 6 structural enclosure
 - Weight: 1.1 grams
 - Size: .4 X .3 inches
 - Location: Aft
 - Disposition
 - Final Closure in approval loop

**GROUND LAUNCH SEQUENCER
(GLSDD)****Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-29/30-05**

Ground Launch Sequencer Configuration for STS-114

- GLSDD (KLO-82-0071A) Rev 14, Change B, June 2005
- Main Line Bypass
 - SSME-02 MFV Heater Temp's (All Block II SSME's)
 - Photo Camera Sequencer (no longer LPS controlled)
 - GCU 1 Select Indicator (N/A for 1203 GCU's)
 - Control Room Timer #4 (N/A)
 - INS-02 (OPS Recorders no longer in use)

GROUND LAUNCH SEQUENCER (GLSDD) (CONT.)

Presenter:

John Cipelletti

Organization/Date:

Ground Ops/06-29/30-05

- **GLS Masks**

- ECL-40

FCL 1 & 2 Payload Heat Exchanger Flow Rate
(FPV will be in the Interchanger position for launch)

- PAY-02

Payload Auxiliary RPC A - On
Payload Auxiliary RPC B - On
(No payload power required for launch)

- PAY-03

Payload Aft Main C Power - On
(No payload power required for launch)

- DPS-23

LH DDU GOOD
RH DDU GOOD
(MEDS Installed)

GROUND LAUNCH SEQUENCER (GLS) (CONT.)	Presenter: John Cipelletti
	Organization/Date: Ground Ops/06-29/30-05

Ground Launch Sequencer Configuration for STS-114

- GLSDD (KLO-82-0071A) Rev 14, Change B, June 2005

- New GLS Changes

<u>Change No</u>	<u>Description</u>
RCN SS16797	Moves the time period for turning off the LO2 bellows heaters from T-1 min 52 sec to T – 9 min and Counting
LCN 01173	Modifies LO2 Bellows Heaters Current monitoring ending effectivity from T-1min 52 sec to T – 9 min and counting
LCN 01172	Change MPS Maximum Limit -281.7 degF from N/A

GROUND LAUNCH SEQUENCER (GLS) (CONT.)	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

- New GLS Changes (Cont.)

<u>Change No</u>	<u>Description</u>
RCN OV15649 R6	RSYS transfer for DDU measurements when MEDS installed
ECP 1406	Software Change for SSME Advanced Health Management Controller
ESR K89479	GLS LO2 Prepress Purge Termination Update
PRCBD S072380CY	Swing Arms LCC Update
RCN OV15649 R6	DDU RSYS Change from DPS to FCL
ESR K17222 R2	ET Camera

<h2>GROUND LAUNCH SEQUENCER (GLS) (CONT.)</h2>	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

- GLS Changes (Cont.)

<u>Change No</u>	<u>Description</u>
ESR K89466 R1	ET Bipod Heater Redesign
PRCBD S072380DB	LH2 Ullage Pressure Control Band Update
PRCBD S072380DG	SRB Bus C Power Anomaly
ESR K89386	LDB Hardwire Safing Sequences for Vent Doors
ESR K89381	MPS Revision to GLS Sequencing/Safing
PRCBD S072380DL	PRSD ECS O2 Effectivity Change
RCN KS16219 R3	GO2 Vent Hood Purge/Retract Update
ESR K89506	C3/C4 Console Failure during a Launch Abort
S072380DT	H2 Burn

GROUND LAUNCH SEQUENCER (GLS) (CONT.)	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

- GLS Changes (Cont.)

<u>Change No</u>	<u>Description</u>
S072380DU R2	Deletes the T-1/15 minute check of the Main engine MFV downstream temperatures for the non-Block II Engines
S072380EL	Adds ET LO2 Feed-line Bellows current monitoring and dead-face requirements
MS16758	Adds requirement for GLS to turn-off the LO2 bellows heaters at T-1/52 minutes
S072380ED R1	Monitoring the LDB active FEP to T-10 seconds and the stand-by LDB FEP to T-31 seconds per the LCC time period effectivity Update
S072380EE R1	GLS verifies GOX Vent Arm GN2 Purge Termination prior to raising the hood
S072380DZ R1	Limits modified for AvBay Cooling including limits for cabin fan flow in AV Bay 3A
S072380DP	Limits for the ET Bipod Web and Slot temperature were modified

GROUND LAUNCH SEQUENCER (GLS) (CONT.)	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

- GLS Changes (Cont.)

<u>Change No</u>	<u>Description</u>
S072380CY R1	Swing Arms LCC Update
S072380DH	Solid State Mass Memory Unit Upgrade
S072380DP	Change Limits for ET Bipod
S072380ED	LDB LCC Update
S072380EE	GOX LCC
S072380DZ	Avionics Bay Cooling Update
ESR K89325	G9 Safing commanding to DEU2 if DEU1 fails
ESR K89442	PCL to prevent cycling critical valves during Load
ESR K89482	GLS Revision to close SSME GN2 Vent Valves

UNEXPLAINED ANOMALIES**Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-29/30-05**

- Closed –1
 - IPR-114V-0244
 - IDP 4 Reported a MIA Word Error
 - UA Board approved
- Open – 1
 - IPR-114V-0314
 - ECO Sensors Erratic during Tanking Test
 - Awaiting Final UA Board Approval
- Pending UA- 1
 - IPR-114V-0388
 - ET Camera Battery failed to come “ON”

**UNEXPLAINED ANOMALIES
MIA WORD ERROR****Presenter:****John Cipelletti****Organization/Date:****Ground Ops/06-29/30-05**

IPR-114V-0244: Integrated Display Processor (IDP) 4
Reported a Multiplexer Interface Adapter (MIA) Word Error

- Observation
 - IDP 4 Reported a MIA Word Error
- Most Probable Cause
 - Transient condition internal to IDP4 that resulted in either improper receipt of one or more IUA bits, or false reporting of an Address Mis-compare error
- Risk
 - Using the SSP Risk Assessment Scorecard resulted in a worse case Consequence score of 1 and a Risk Likelihood score of 2 for a total Risk Management score of 2 (Green)

UNEXPLAINED ANOMALIES

ECO SENSORS ERRATIC

Presenter:

John Cipolletti

Organization/Date:

Ground Ops/06-29/30-05

- Observation
 - LH2 Low Level Cut Off (LLCO) sensor 3 and 4 failed Wet
 - Occurred April 14, 2005 during S0037 ET tanking test
- Concern
 - Failure to cutoff SSME in a fuel depletion situation
- Actions Taken
 - Performed checkout of all hardware associated with original failure including the Point Sensor box
 - Troubleshooting indicated no anomalies associated with failure
 - Fault tree established to understand and eliminate causes
 - Replaced Orbiter wiring runs associated with original failure
 - Some wiring abandoned in place with new wiring field routed
 - Point Sensor Box replaced with a spare unit

UNEXPLAINED ANOMALIES ECO SENSORS ERRATIC (CONT.)

Presenter:

John Cipelletti

Organization/Date:

Ground Ops/06-29/30-05

- Actions Taken (Cont.)
 - Demated/inspected monoball connectors
 - Second ET tanking test performed May 20, 2005
 - Voltage and current instrumentation installed
 - Original failures of sensors did not reoccur
 - OV-103 demated from ET-120 and mated to ET-121 due to ET diffuser replacement

- Most Probable Cause
 - Loss of continuity within both the LLCO Sensors #3 and #4 circuitry which manifested as a result of Thermal effects. These thermal effects may have been induced by either exposure of associated hardware to cryogenic temperatures or heating effects within the Point Sensor Electronic Box resulting from the increased steady state circuit current experienced when ET sensors are submersed in cryogenic liquid

UNEXPLAINED ANOMALIES ECO SENSORS ERRATIC (CONT.)	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

- Flight Effects
 - LLCO sensors are backup for nominal engine cut off
 - Sensors are armed in flight based on mass calculation
 - Once armed, two sensors indicating DRY will result in an early shutdown of the SSME's
 - For a failure of these two sensors to impact flight operations, a hydrogen leak sufficient to cause a low level cut off and a third sensor failure would have to occur

UNEXPLAINED ANOMALIES ECO SENSORS ERRATIC (CONT.)

Presenter:

John Cipelletti

Organization/Date:

Ground Ops/06-29/30-05

- Flight Rationale
 - New Hardware
 - All hardware related to the failure has been replaced
 - Retest
 - All Orbiter hardware thoroughly tested and no anomalies noted
 - Redundancy
 - Four sensors protect against a low level cut off (two required)
 - An additional failure causing a hydrogen leak large enough to require a low level cut off would need to occur
 - LLCO #1/#2 go thru different connectors than LLCO #3/ #4
 - While all four sensors go through the same Point Sensor Box, each sensor has its own independent circuitry inside the box

**UNEXPLAINED ANOMALIES
ET CAMERA FAILED TO TURN ON****Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-29/30-05**

- **Observation**
 - On 6-20-05 during S0009, the ET Camera open loop functional test failed; IPR114V-0388

- **Actions Taken**
 - Troubleshooting determined that the battery had discharged below the 22.7 VDC threshold voltage required to operate the camera system (nominal voltage is 28/29 VDC)
 - Battery recharged on 6-21-06. A successful camera activation and verification of video was accomplished on 6-25-05. No excessive battery discharge

- **Concerns**
 - The mechanism that allowed the battery discharge has not been identified
 - The possibility exists that there could be an unidentified problem with the ET Camera System

**UNEXPLAINED ANOMALIES
ET CAMERA FAILED TO TURN ON
(CONT.)****Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-29/30-05**

- Action Planned
 - Recharge the battery at first opportunity, note battery voltage before and after
 - Proceed with processing IPR 114-V0388 as an Unexplained Anomaly (UA)
 - Recharge the battery at last opportunity prior to S0007 pad closeout, note battery voltage before and after

ENGINEERING TOPICS**Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-29/30-05**

- Trunking Radio Interference With Range Safety System
- ET Vent Arm

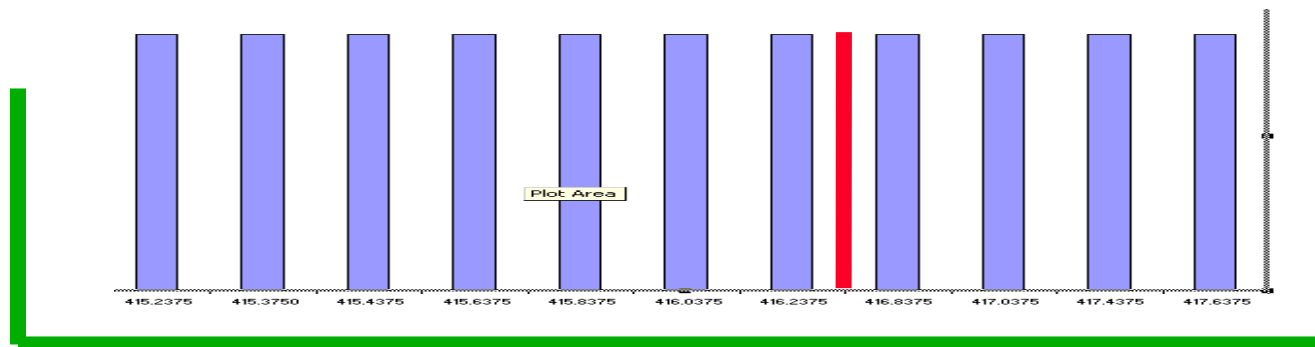
**ENGINEERING TOPICS
TRUNKING RADIO SYSTEM****Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-27-05**

- Observation
 - Signal dropouts observed during the second STS-114 ET Tanking Test
 - Observed after Pad-B re-opened and safety personnel allowed to enter
 - Range Safety System Integrated Receiver/Decoder (IRD) Automatic Gain Control (AGC) measurements experienced dropouts in signal level below nominal
 - Lowest AGC level of IRD observed was approx. 0.7 volts:
 - LCC violation occurs when signal drops to 2.1 volts or below
 - IRD was captured by the Range Safety Checkout System

**ENGINEERING TOPICS
TRUNKING RADIO SYSTEM (CONT.)**

**Presenter:
John Cipolletti**
**Organization/Date:
Ground Ops/06-29/30-05**

RSS IRD Receiver - Bandwidth is centered upon 416.5 MHz but has a bandpass of +/- 3 MHz. It is therefore able to detect radio transmissions from TRS handhhelds & mobiles



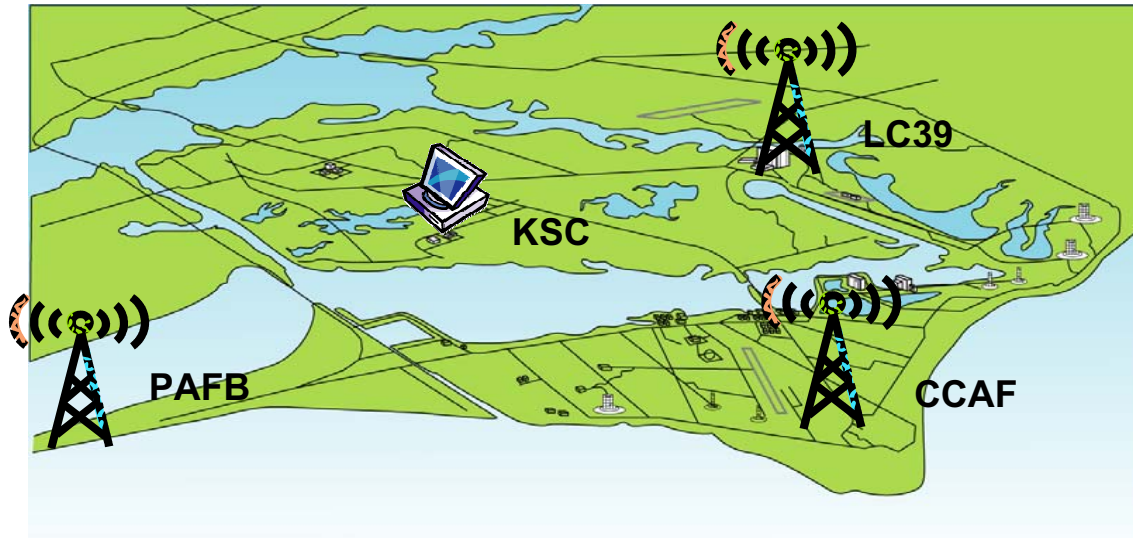
ENGINEERING TOPICS TRUNKING RADIO SYSTEM (CONT.)

Presenter:

John Cipelletti

Organization/Date:

Ground Ops/06-29/30-05



Mobile Units
20-40 Watts



Handheld Units
1.5 Watts

- In excess of 2,000 units broadcast on one of the channels between 415.2 MHz and 419.5 MHz. (KSC has 12)

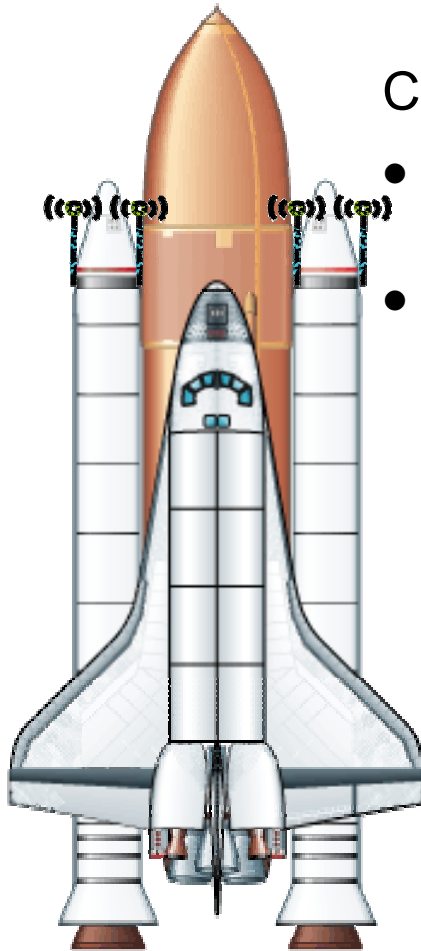
ENGINEERING TOPICS TRUNKING RADIO SYSTEM (CONT.)

Presenter:

John Cipolletti

Organization/Date:

Ground Ops/06-29/30-05



Concerns

- Booster Integrated Receiver Decoder (IRD) is tuned to 416.5 ± 3 MHz or 413.5 to 419.5 MHz
- All portable trunking radio channels transmit within the IRD's pass band
 - Automatic Gain Control (AGC) may be driven below LCC levels
 - Commands may be corrupted in flight prior to decoding by IRD

**ENGINEERING TOPICS
TRUNKING RADIO SYSTEM (CONT.)****Presenter:****John Cipelletti****Organization/Date:****Ground Ops/06-29/30-05**

- Summary
 - A Team has been formed to investigate this issue
 - Team Leader (NASA Launch Director)
 - Actions in work
 - Work continues to analyze results of testing
 - Mitigation options are being explored
 - KSC has proposed (during sensitive RSS operation):
 - Use of alternative radio communications systems (older style handhelds) within the immediate “zone of exclusion”
 - Restricting frequencies used by Trunking radios, that are outside of the “immediate zone of exclusion” to those that are least offensive to the RSS
 - Comprehensive STS 114 mitigation plan will be presented at L-2 MMT briefing
 - Long term permanent solution is being sought

**ENGINEERING TOPICS
ET GH2 VENT ARM ISSUE
(ADAMS MODEL)****Presenter:****John Cipelletti****Organization/Date:****Ground Ops/06-29/30-05****• Issues**

- Initial model was used to help investigate and understand STS-108 incident when the ET GH2 Vent Arm actually struck the Pad structure liberating debris
- With a limited data set, basic model was modified to add greater fidelity
 - This version of the model was used to determine the actual “opening” required to prevent the ET GH2 Vent Arm from contacting the structure again
 - This was based on worst case loads of 34.4 knots from 0 to 100 degrees
- During certification of the ADAMs model using a larger data set and making further refinements to achieve a higher correlation to the existing data set the model now indicates that the new opening is not wide enough based on worst case load of 34.4 knots from 0 – 100 degrees
 - Certified model indicates based on worst case load (ETVA-4), the maximum allowable winds for the modified opening (18.56 inches) has to be decreased to prevent contact with the Pad structure. (24 knots from the NE)
 - Certified model also indicates that in certain environments there is a vehicle/Pad clearance issue at winds greater than 24 knots from the NE

ENGINEERING TOPICS ET GH2 VENT ARM ISSUE (ADAMS MODEL) (CONT.)	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

- **Issues (Cont.)**
 - As a result of the model's certification and the increased opening, additional analysis was performed on the system's components to verify structurally no changes in design requirements would occur (SW-E-0002 requirements)
 - A kinematics' stress analysis was performed on all the structural components
 - Two components were found to be less than the design factor of safety for yield (2:1) per SW-E-0002 at the current opening and winds of 24 knots from the NE
 - SW-E-0002 waiver has been processed that accepts this condition of less than 2:1 for yield with winds of 23 knots from the NE
 - As a result LCC GSE-24 is being changed to reflect this maximum allowable wind (23 knots from NE)

**ENGINEERING TOPICS
ET GH2 VENT ARM ISSUE
(ADAMS MODEL) (CONT.)**

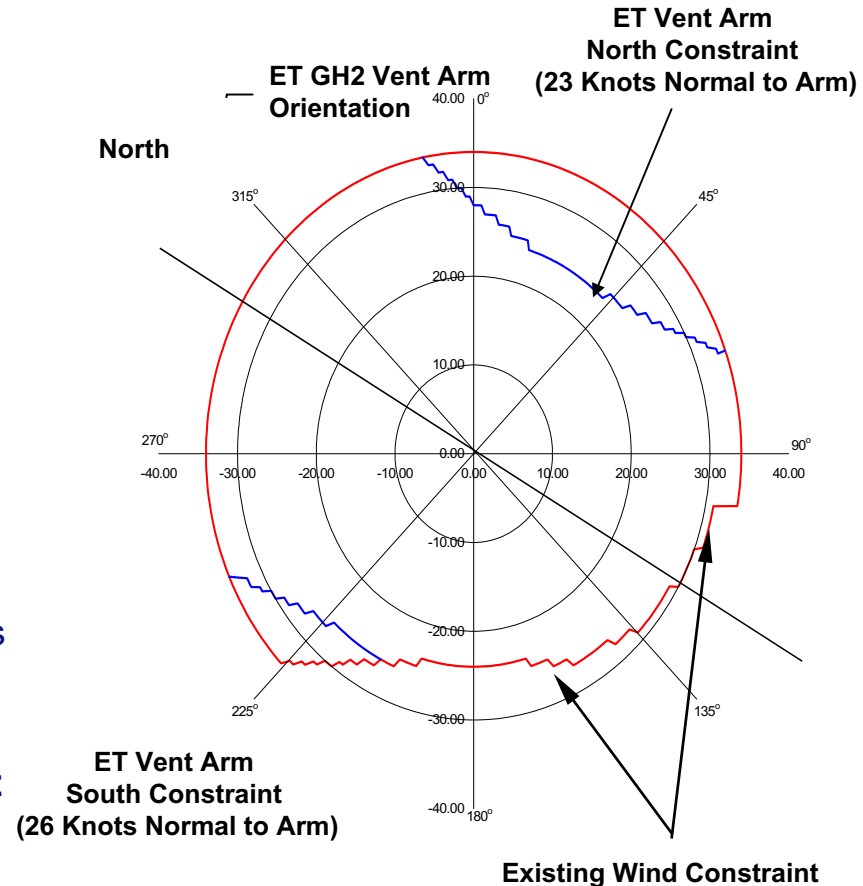
Presenter:

John Cipelletti

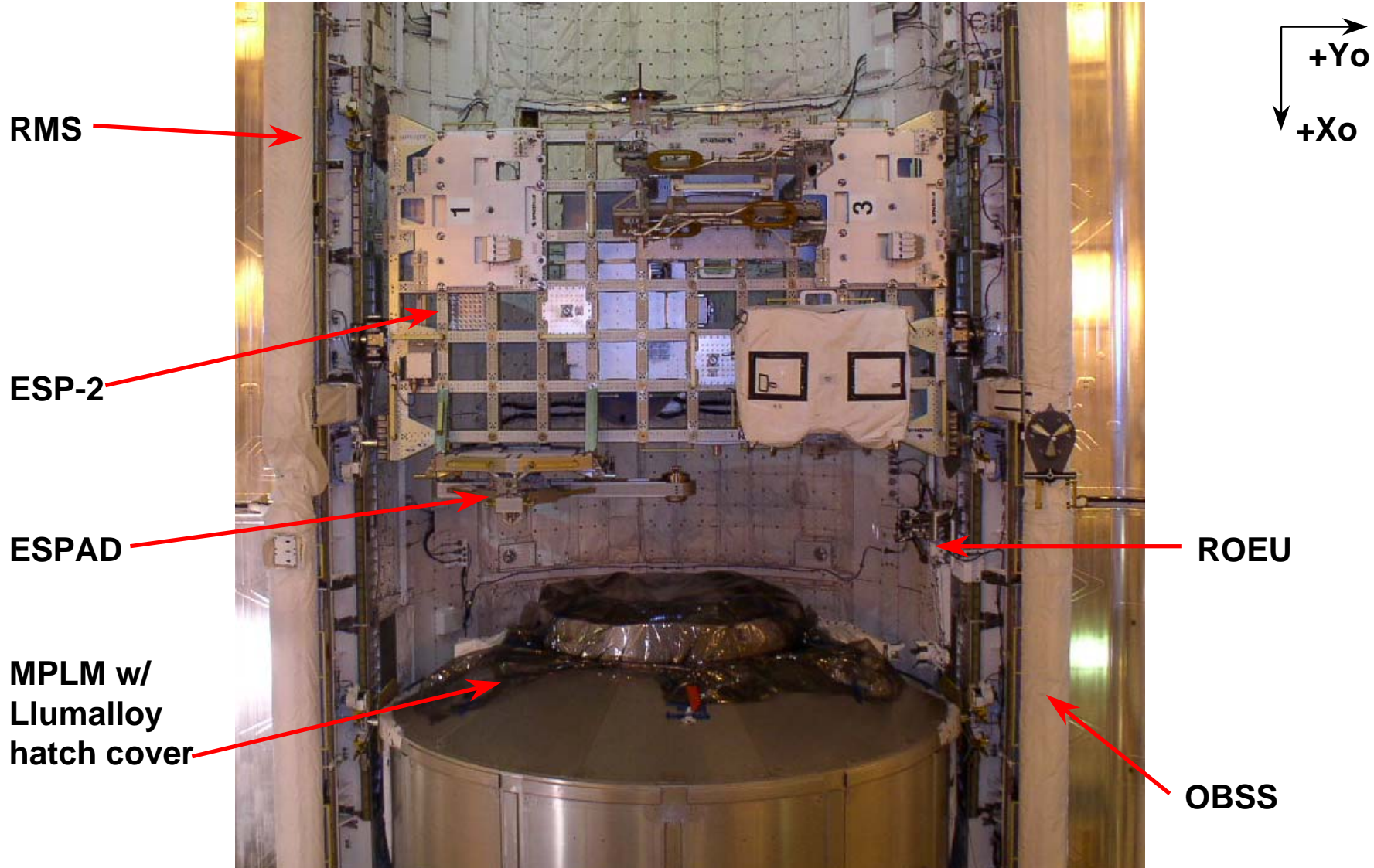
Organization/Date:

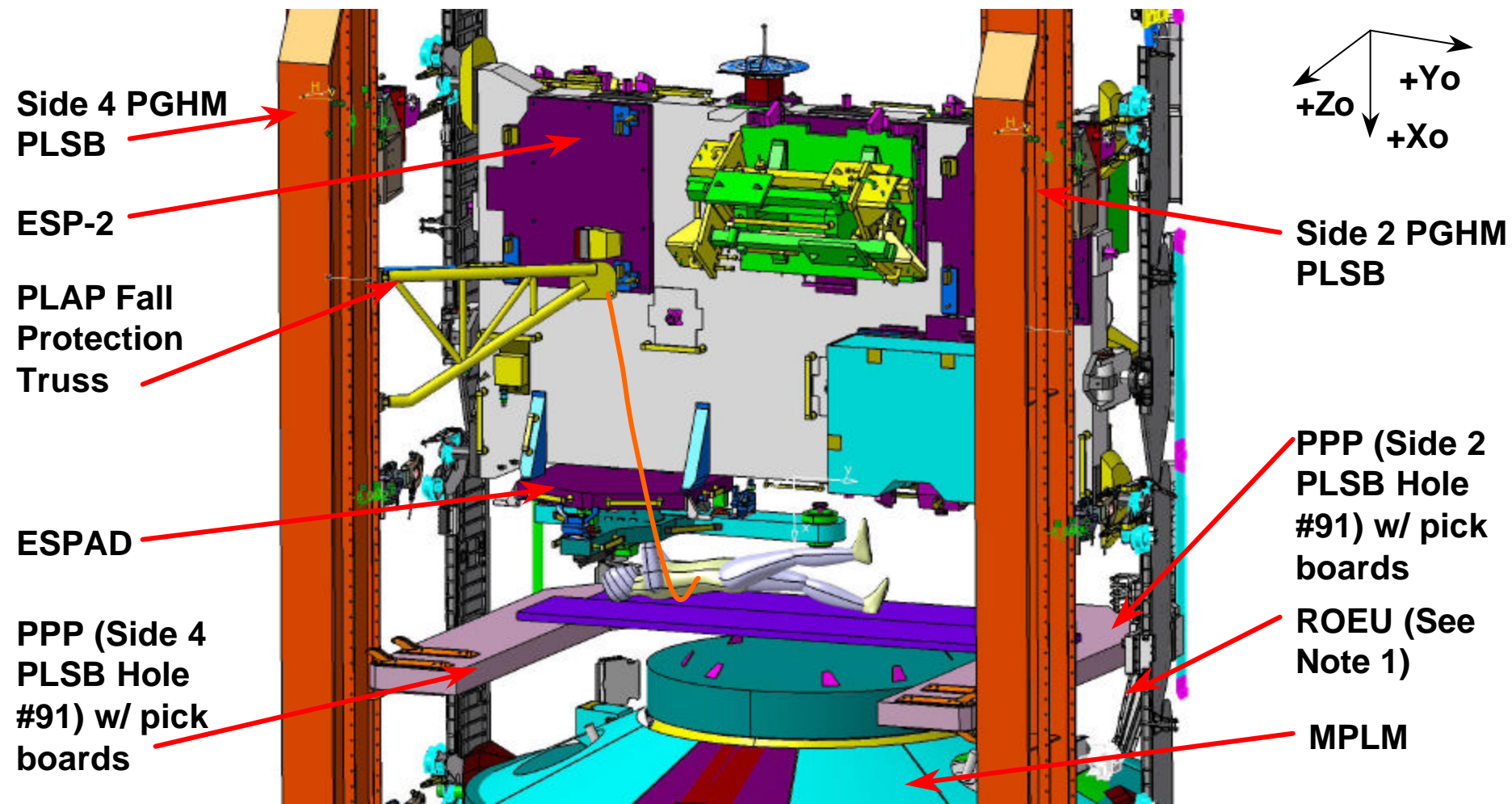
Ground Ops/06-29/30-05

- **For STS-114 & subs - limit winds from NE and SW that exceed set wind criteria**
 - LCC GSE-24 (approved 06/23/05)
- **Evaluate loading / stresses for Trunnion Assembly – complete**
 - Analysis indicated that two components are less than design factor of safety (2:1)
- **NESC review ET GH2 Vent Arm ADAMS Model (in work)**



STS-114 CURRENT PLB CONFIGURATION

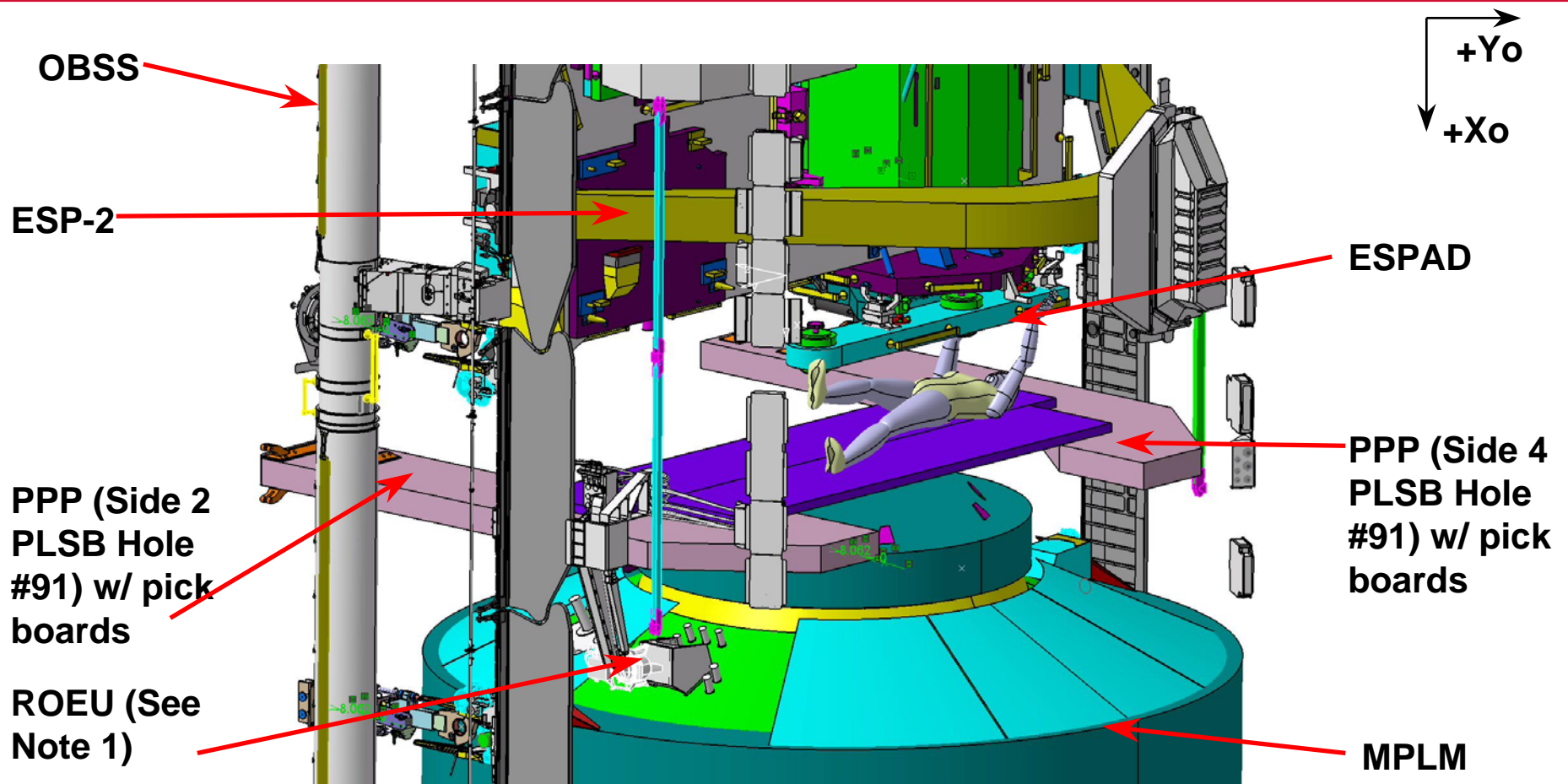




NOTES:

1. ROEU must not be mated for this access to maximize clearance with PPP.
2. Vertical clearance between PPP and MPLM is ~4 inches, vertical clearance between PPP and ROEU is ~4 inches.

ESPAD ACCESS (KEEL SIDE)



NOTES:

1. ROEU must not be mated for this access to maximize clearance with PPP.
2. Vertical clearance between PPP and MPLM is ~4 inches, vertical clearance between PPP and ROEU is ~4 inches.

STATUS

USA | NASA

OPR: USA - J. Taylor, INTEG FM (1-7420)
NASA - D. Lyons, PH-A2 (1-9221)

C | C

C=Concur NC=Non-Concur

CONCURRED

Creation Date: 29 JUNE 05
Revised Date:
Revision:

STS-114 / OV-103
EUTAS Fastener Rework - Option #1

1 2 3 4 5 6 7 8

▲ PAPER / HARDWARE AVAILABLE

█ OPEN PLBDs/DEPLOY RMS/OBSS/DEMATE ROEU

█ ESTABLISH ESP2 ACCESS

█ REWORK FASTENERS (INSTL PLUGS)

█ REMOVE ESP2 ACCESS

█ PGHM FWD / MATE ROEU

█ MPLM IVT

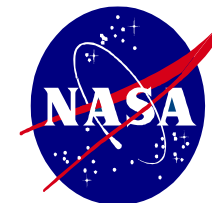
█ DELTA PL/PLB CLOSEOUTS

▲ DELTA SHARP EDGE INSP

▲ PLBDs CLOSED FOR FLT



Kennedy Space Center Shuttle Processing Team



STS-114 Readiness Statement

This is to certify that appropriate CoFR items from NSTS-08117 Appendices H and R, Flight Preparation Process Plan, have been reviewed and dispositioned. Subject to completion of planned work and resolution of any identified constraints, KSC Shuttle Processing and Supporting Organizations are ready to support Launch Operations.

SICharles J. Fontana

Charles J. Fontana
APM, Integrated Logistics,
USA.

SIMark J. Nappi

Mark J. Nappi
APM, Ground Operations,
USA.

SIMichael E. Wetmore

Michael E. Wetmore
Director of Shuttle
Processing, NASA

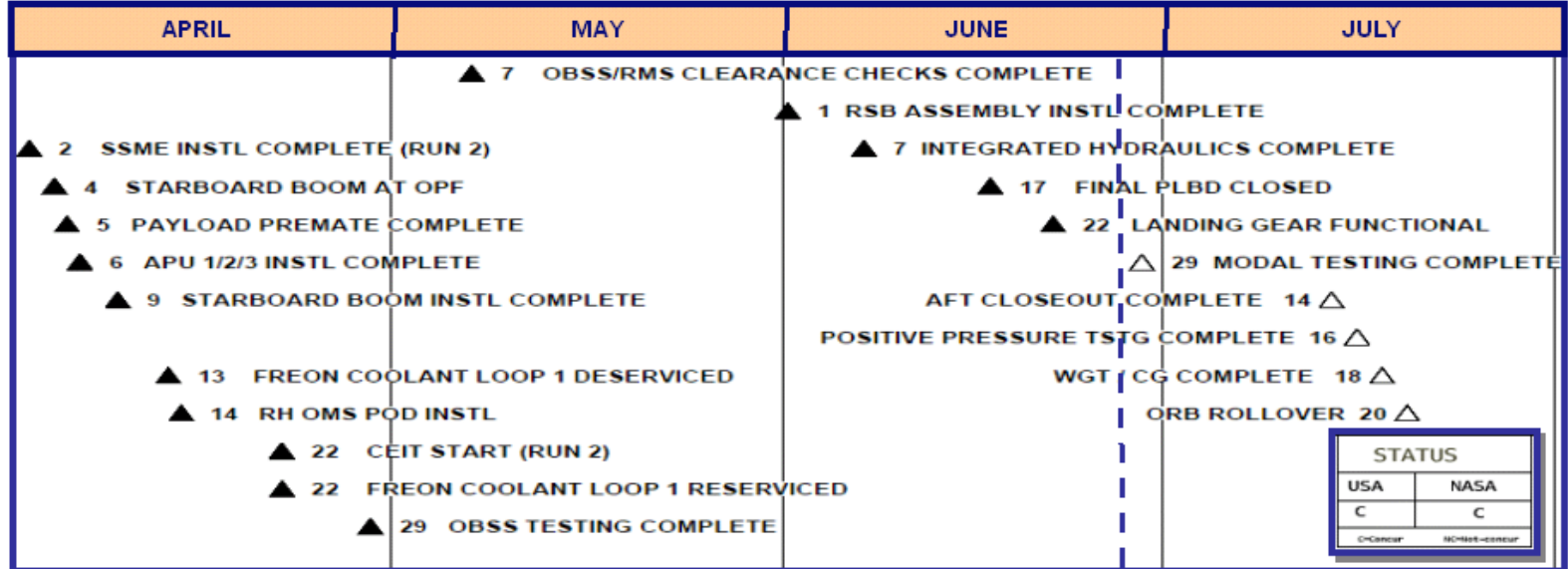


STS-114
FLIGHT READINESS REVIEW
BACK UP

June 29/30, 2005

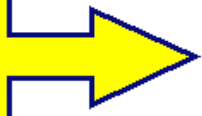
Shuttle Processing

<h1>STS-121/OV-104</h1> <h2>PROCESSING MILESTONES</h2>	Presenter: Mike Leinbach
	Organization/Date: Shuttle Processing/06-28/29-05



- REPLANNED WORK**

 - MPS Leak/Functional - C
 - FWD Sep Bolt Installation - C
 - SORG Installation - C
 - Potable Water Servicing - C
 - FES Functional - C
 - Boom Installation - C
 - ET Door Functional - C
 - APU 2 Installation - C
 - APU 2 Fuel Line Connect - C
 - RPOD Installation - C
 - Landing Gear Functional - C



- New Work (April / May/June/July)**

 - DTO 852 RMS WSGIS Installation/Ck-out - C
 - Wire Tray Cover Inspection/Rework - C
 - ADTA Replacements - C
 - LON Crew Equipment Fit Check - C
 - Freon Coolant Loop 1 Line Repair - C
 - FC-1 Heater R&R - C
 - LOME Flange Bolt R&R - C
 - FCMS Harness R&R - C
 - Modal Testing - Preps I/W
 - Av Bay 5 Cold Plate R&R (NEW)

STS-121/OV-104	Presenter: Mike Leinbach
	Organization/Date: Shuttle Processing/06-28/29-05

STS-121 / OV-104A

OV-104 Overall Flow

Program
Milestone

G →

OPF R/O: 7/20/05

Activity / Remarks

Critical Path

OPF
Milestone

Orbiter System Testing

G →

System testing in work

Open Processing Paper

Y ↑

Work volume/open paper trending down

TPS Installation

G →

Bond plan rebaselined, installations in work

MLG/NLG Rigging Issue

Y ↑ to G

Landing Gear Functional Completed June 23, Closeout in work

Potential Significant Growth

Av Bay 5 Cold Plate

U/R

Point Sensor Box Removed, Cold Plate R&R (NEW)

**SOFTWARE, SCAN, and
CONFIGURATION STATUS****Presenter:****John Cipelletti****Organization/Date:****Ground Ops/06-28/29-05**

- LPS Application Software and PCGOAL Displays
- Software Modifications after Program Established Post-Freeze (Roll to the Pad)
 - LPS GOAL Software
 - Approved and Released
 - PRCBD S072380ED, GOX Vent Hood Purge Termination (GLS)
 - PRCBD S072380EE, Launch Data Bus FEP Data Validity (GLS)
 - PRCBD S072380DP, Change Max Slot Temp and Min Web Limits for ET Bipod (GLS)
 - PRCBD S072380DZ, Avionics Bay Cooling Update (GLS)
 - IPR 114V-0320, No cursor command to turn north circuit heaters to auto mode from direct (PVD)
 - ESR K89466, ET Bipod (EPDC, GLS)
 - RCN SS16490R1, LOX Loading 2004 Scrub (LO2)
 - IPR 114V-0317, Program did not reinitiate helium bubbling during terminal count safing (LO2)
 - ESR K16632, Replace 400 HZ Power Supplies on MLP1, 2 & 3 (EPDC)
 - ESR 0.3345, ET L02 Bellows Heater Mod (EPDC, Master)
 - PRCBD S072380EL, ET L02 Feedline Bellows Heater Current and Deadfacing Anomaly (GLS)
 - PRCBD S072380DU, Removal of References to Non-Block II (GLS)
 - IPR 114V-0304, RCL Anomaly (MPS/SSME)

**SOFTWARE, SCAN, and
CONFIGURATION STATUS (CONT.)****Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-28/29-05****LPS Application Software and PCGOAL Displays (Cont.)**

- **Pending Approval**
 - PR LCA-4050, Program BWE08 does not provide capability to turn-off bellows heaters manually (EPDC)
 - Software Verification Complete awaiting Post-Freeze Waiver
 - RCN SS16797, Move LO2 Bellows Heater Deactivation Time Period (GLS, EPDC)
 - Requirements Approved at PRCB 06-17-05
 - LCN 01173, Change LO2 Bellows Heater Current Monitoring Ending Time Period (GLS, EPDC)
 - Requirements Approved at PRCB 06-17-05

- **PCGOAL Displays**
 - Approved and Released
 - ESR K89466, ET Bipod (EPDC-PCGOAL)
 - Pending Approval (Software Verification Complete)
 - ESR 0.3345, ET L02 Feedline Bellows Heater Mod (L02 and EPDC PCGOAL)

SOFTWARE, SCAN, and CONFIGURATION STATUS (CONT.)	Presenter: John Cipelletti
	Organization/Date: Ground Ops/06-28/29-05

- Ground Launch Sequencer Configuration for STS-114

- GLSDD (KLO-82-0071A) Rev 14, Change B, June 2005
- GLS Changes
 - Approved at 06-17-05 PRCB, software changes in-work

<u>Change No</u>	<u>Description</u>
RCN SS16797	Moves the time period for turning off the LO2 bellows heaters from T-1 min 52 sec to T – 9 min
S072380FA	Modifies LO2 Bellows Heaters Current monitoring ending effectivity from T-1min 52 sec to T – 9 min

- GLS Changes (Requirements in Development, pending PRCB approval)

<u>Change No</u>	<u>Description</u>
LCN 01172	Change MPS Maximum Limit -281.7 degF from N/A

**SOFTWARE, SCAN, and
CONFIGURATION STATUS (CONT.)**

Presenter:

John Cipolletti

Organization/Date:

Ground Ops/06-28/29-05

Ground Launch Sequencer Configuration for STS-114 (Cont.)

- Significant GLS Changes Since LRR

<u>Change No</u>	<u>Description</u>
S072380DU R2	Deletes the T-1/15 minute check of the Main engine MFV downstream temperatures for the non-Block II Engines
S072380EL	Adds ET LO2 Feed-line Bellows current monitoring and dead-face requirements
MS16758	Adds requirement for GLS to turn-off the LO2 bellows heaters at T-1/52 minutes
S072380ED R1	Monitoring the LDB active FEP to T-10 seconds and the stand-by LDB FEP to T-31 seconds per the LCC time period effectivity Update
S072380EE R1	GLS verifies GOX Vent Arm GN2 Purge Termination prior to raising the hood
S072380DZ R1	Limits modified for AvBay Cooling including limits for cabin fan flow in AV Bay 3A
S072380DP	Limits for the ET Bipod Web and Slot temperature were modified

**SOFTWARE, SCAN, and
CONFIGURATION STATUS (CONT.)****Presenter:****John Cipolletti****Organization/Date:****Ground Ops/06-28/29-05**

- Critical Math Models and Analytical Tools Certification Status
 - Level III CCB Approved
 - FRCS Partial Load Verification Tool (PC PLOD)
 - Certified 04-20-05
 - Level III CCB Pending Approval (Required for STS-114)
 - ET GH2 Vent Line Umbilical Drop Dynamics (ECD 06-30-05)
 - APU Neural Network Tool (ANNT) (ECD 06-30-05)
 - Fuel Cell Advisory Tool (FCAT) (ECD 06-30-05)
 - High Speed Display (HSD) (ECD 06-30-05)
 - Level IV Ground Systems Configuration Control Board
 - SRB Field Joint Heater Umbilical Outer Moldline
 - DRA released 05-25-05
 - SRB Holddown Support Post Outer Moldline
 - DRA Released 05-25-05
 - Fixed Service Structure (FSS) Outer Moldline
 - ECD DRA Release 06-17-05

<h1>Hazard Report Summary</h1>	Presenter: John Cipolletti
	Organization/Date: Ground Ops/06-29/30-05

Likelihood	Probable			
	Infrequent			
	Remote	2	2	54
	Improbable	8	5	84
		Marginal	Critical Severity	Catastrophic

Total Hazard Reports = 155

- **Green Hazard Reports = 99**
- **Yellow Hazard Reports = 56**

Hazard Report Summary

Presenter:

John Cipolletti

Organization/Date:

Ground Ops/06-29/30-05

Hazard Report #	Ground Operations Hazard Titles	Controlled				Accepted Risk							
		Controlled Risk	Controlled Marginal	Controlled Marginal	Controlled Critical	Accepted Risk	Accepted Marginal	Accepted Marginal	Accepted Critical				
LL-0002	VAB Cranes and/or Lifting GSE Failure	7	0	0	0	4	0	0	0				
LL-0004	Inadvertent Ignition of RSRM in RPPF	22	0	0	0	10	0	10	0				
LL-0005	Inadvertent Ignition of RSRM in VAB	24	0	0	0	10	0	14	0				
LL-0007	Lack of Adequate PCR Fire Suppression	1	0	0	0	0	0	0	0				
LL-0017	Failure of H2 Detectors for Fuel Cell Servicing at Pad	1	0	0	0	4	0	4	0				
LL-0018	Undetected Accumulation of Toxic Vapors at Landing	0	0	0	0	5	0	5	0				
LL-0034	Inability to Detect Hypoglycic Vapor during Loading	0	0	0	0	1	0	1	0				
LL-0050	Insufficient Hardware Sealing Panels at HWF	0	0	0	0	0	0	0	0				
LL-0059	Overpressurization of Orbiter Purge Ducts/Compartments	1	0	1	0	2	0	2	0				
LL-0076	Hydrogen Leak during Tanking	0	0	0	0	8	0	8	0				
LL-0077	Loss of Vehicle due to Disturbance at Launch	0	0	0	0	4	0	3	0				
LL-0122	Lack of Lightning Protection for SSV during Rollout/Retrace	0	0	0	0	1	0	1	0				
LL-0123	Rental Crane Topples during Dust Hoisting Operation	1	0	0	0	3	0	3	0				
LL-0128	Fire Damage to CHRSV	7	0	0	0	1	0	1	0				
GSE-1	Gross Hypoglycic Leakage from Orbiter Systems after Servicing	0	0	0	0	0	0	0	0				
LL-0009	Improper Procedure for Installing Inertank Access Kit	1	0	1	0	0	0	0	0				
LL-0019	Ice May Fall from GVA Exhaust Vents	0	0	0	0	1	0	1	0				
LL-0035	Failure of MDO Hoist Single Upper Limit Switch	1	0	0	0	0	0	0	0				
LL-0037	Dropping of FRCS Platform Handrails	1	1	0	0	0	0	0	0				
LL-0040	Personnel Working on ET Vent Arm Could Drop Tools	1	1	0	0	0	0	0	0				
LL-0041	Hydrogen Vent Arm Improperly Extended	1	0	0	0	0	0	0	0				
LL-0048	Bronto Aerial Platform Could Topple	1	0	0	0	0	0	0	0				
LL-0049	Aerial Platform Boom or Column Could Drift	1	1	0	0	0	0	0	0				
LL-0054	Overload Portable Access Stand for AR Sling Attachment	1	1	0	0	0	0	0	0				
LL-0055	Access Stand Used during Orbiter/ET Mate Could Damage Flight Hardware	1	0	0	0	0	0	0	0				
LL-0057	Orbiter/SCA Damage from MEO Platforms	1	0	0	0	0	0	0	0				
LL-0059	OPF Crew Compartment Access Gap Leaves Opening	1	0	0	0	0	0	0	0				
LL-0060	Failure of Tether Winches Lifting FRCS Platform	1	0	0	0	0	0	0	0				
LL-0061	Inadequate Platform Access at MDO	1	0	0	0	0	0	0	0				
LL-0062	Falling Hazard from Fixed Platform to Service Platform at MDO	1	1	0	0	0	0	0	0				
LL-0074	Uncontrolled Acceleration Forces Applied to Hi-Ranger	0	0	0	0	0	0	0	0				
LL-0080	TSM Lower Release Pin Deformation May Cause Premature Disconnect	1	1	0	0	0	0	0	0				
LL-0091	Failure of Pillow Blocks on Platforms 11A-3 and 11A-4	1	1	0	0	0	0	0	0				
LL-0111	Possible Damage from Leaking Platform Actuators	1	1	0	0	0	0	0	0				
LL-0130	Orbiter Damage due to OPF Platform Free-Fall	1	1	0	0	0	0	0	0				
LL-0132	No Safety Handrails on OPF 13 Platforms	1	1	0	0	0	0	0	0				
LL-0133	Use of Temporary Access Platforms to Lower FRCS Cavity	1	1	0	0	0	0	0	0				
LL-0134	Damage to Resistors, TPS, Payload from Tools	1	0	0	0	0	0	0	0				
LL-0135	ET Separation Bolt Could Fail	1	0	0	0	0	0	0	0				
LL-0136	ET Vent Deceleration Unit Failure	4	0	0	0	4	0	0	0				
LL-0138	Loss of Gaseous Helium Injert during LOR Slow Fill	2	0	0	0	2	0	0	0				
LL-0139	Failure to Remove Pins Before Flight in TOW	1	0	0	0	0	0	0	0				
LL-0140	Failure of LPS during LOR Fill	1	0	0	0	0	0	0	0				
LL-0145	Sealing Arm System Could Leak Hydraulic Fluid	1	0	0	0	0	0	0	0				
SA439F10	OPF Crane Could Drop Access Bridge	0	0	0	0	0	0	0	0				
SPC-005	RSRM GSE Dropping Onto Flight Hardware	0	0	0	0	0	0	0	0				
Risk Distribution Totals		109	2	0	0	84	0	0	2	54	0	0	0

99 96
155