FLIGHT READINESS STATEMENT
STS-102/ET-107
EXTERNAL TANK PROJECT
PRE-FLIGHT REVIEW

EXTERNAL TANK ET-107/STS-102, AS IDENTIFIED IN THE EXTERNAL TANK PROJECT PRE-FLIGHT REVIEW DATED JANUARY 25, 2001, IS CONSIDERED READY TO SUPPORT FLIGHT UPON ACCEPTABLE DISPOSITION OF OPEN/PLANNED WORK AND/OR OPEN ACTIONS.

N. E. OTTE/MP31

for J. BULLMAN/ED10

FOR P. M. MUNAFO/ED30

for A. O. GOODSON/QS01

Jody A. Singer for A. A. McCOOL/MP01

For P. K. McCONNAUGHEY/ED20

for D. A. KROSS/ED40

for C. E. SINGER/TD01

J. W. SMELSER/MP31, CHAIRMAN

January 25, 2001

Pre-Flight Review

Space Shuttle External Tank

STS-102/ET-107

LOCKHEED MARTIN

107pfr.4250.01/01

Agenda

Dawn Diecidue

Overview

Prior Mission Performance Summary

- ***STS-97/ET-105***

Current Mission/External Tank Highlights

- ***STS-102/ET-107***

Mass Properties Status

Changes

Senior Management Review NCDs: None

SRM&QA Assessment

KSC Processing

Verification/Certification

Mission Unique Assessment

Readiness Statement

Appendices

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Overview

This review for STS-102/ET-107 includes:

- Items specific to mission STS-102
- First time differences not previously flown and/or reviewed
  - No first time "out-of-family" non-conformances

FRR Series

• Michoud Operations Pre-Flight Review	12/13/2000
• ET/SRB Mate Review	12/15/2000
• ET Project Pre-Flight Review	01/25/2001
• Space Shuttle Vehicle FRR	02/15/2001 (Under review)
• Pre-launch Mission Management Team Review	02/27/2001 (Under review)

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Prior Mission Performance Summary

STS-97/ET-105, 11/30/2000 Launch

System	***Performance***
• ***OMRSD***	• During slow fill pressurization, the LH2 98% #2 sensor failed 'wet' intermittently • The sensor was bypassed in the LH2 software and loading continued using LH2 98% #1 sensor and LH2 100% minus sensor • OMRS exception EK03990 was approved to accept the LH2 98% #2 sensor failing during the replenish liquid level sensor checks and during drain/turnaround operations • Sensor returned to 'dry' state until liquid reached sensor • Sensor passed subsequent OMRS checks and functioned nominally throughout remainder of loading and ascent • Post-landing troubleshooting of Orbiter OV-105 point sensor electronics package and level sensor wiring showed no anomalies • PR was closed with most probable cause is intermittent short or open circuit in ET sensor or associated wiring
• ***Instrumentation***	• See above
• ***LCC***	• No ET LCC violations
• ***MPS***	• Nominal

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Prior Mission Performance Summary

STS-97/ET-105, 11/30/2000 Launch

System	***Performance***
• ***ET Hazardous Gas***	• No ET violations
• ***TPS***	• Ice team reported a very clean vehicle – Two cracks noted in Intertank stringer valleys – One crack at -Y vertical strut – Acceptable per NSTS 08303
• ***ET Disposal***	• Nominal
• ***Film Review - Prelaunch***	• No ET related issues identified
• ***Orbiter Tile Damage***	• Foam performance in-family of NCFI flights – Lower surface hits • Diameter > 1" = 10 • Total = 78
Film Review - Post Flight	• Crew photos from cockpit - Insufficient light/poor resolution – No anomalies observed • Umbilical well photos (35 mm) - Insufficient light/poor resolution – No anomalies observed

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Mission/External Tank Highlights

STS-102/ET-107 (as of 01/23/2001)

Mission	***STS-102***
Launch	***03/01/2001 (Under review)***
• Window	TBD
• Pad	39-B
• Orbiter	Discovery (OV-103)
• Orbital Inclination	51.6 degrees/177 nautical miles
• ET Photo Coverage	• Crew photos from cockpit window • Umbilical well cameras (35mm)
Primary Payload	• ISS eighth flight (5A.1) – Deliver second resident crew and return first resident crew – Provide logistics and resupply • Leonardo Multi-Purpose Logistics Module (MPLM) – First of three pressurized modules that will serve as "moving vans," carrying laboratory racks filled with equipment, experiments and supplies
Landing	***Under review***
• Time	TBD
• Location	KSC
External Tank	***ET-107***
DD250 Acceptance	10/12/1999
Shipped to Launch Site	03/22/2000

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Overview

Prior Mission Performance Summary

Current Mission/External Tank Highlights

ET-107 Mass Properties — ***Rick Spring***

Changes

Senior Management Review NCDs: None

SRM&QA Assessment

KSC Processing

Verification/Certification

Mission Unique Assessment

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STS-102/ET-107 Mass Properties Status

Specification Weight = 58,432 lbs.

ET-107 Weighing

- ET 107 was weighed at MAF on December 1, 1999 using the Weigh Tronix weighing system

  - Predicted Weight 58,321 lbs.
  - As-weighed 58,336 lbs.
  - Delta to Predicted +15 lbs.

Mission Planning

- MMC-ET-SE40, ET Project - Mass Properties Weight and Balance Report, was submitted October 27, 2000 to support mission planning
- Coordination with Level II on January 23, 2000 indicates approximately 1124 lb performance margin for STS-102

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Overview

Prior Mission Performance Summary

Current Mission/External Tank Highlights

Mass Properties Status

Change ***Jim Feeley***

- ***Resize foam thickness on LO2 tank ogive***

Senior Management Review NCDs: None

SRM&QA Assessment

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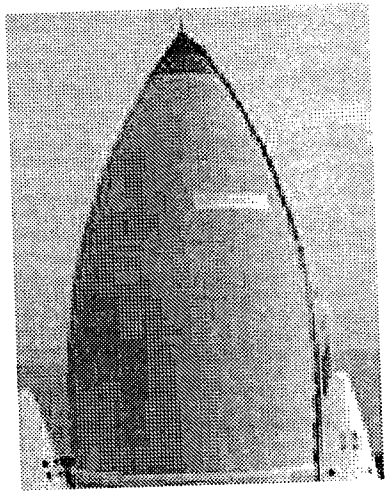
Resize Foam Thickness on LO2 Tank Ogive

Change

- Resized foam thickness on LO2 tank ogive
  - Decreased minimum net sprayed foam thickness on the +Z LO2 tank
  - Minor increase in net sprayed foam thickness on the aft –Z LO2 tank (0.02")

Background

- Producibility
  - Eliminate TPS rework (sanding) effort associated with potential negative contour deviations on the +Z LO2 tank adjacent to the Station 536 O2 weld
    - Could cause TPS cracking during tanking resulting in potential scrub or TPS debris
  - Eliminate minor violations of minimum TPS thickness on –Z LO2 tank



Reworked (sanded) area at Station 536

(STS-95/ET-98 shown)

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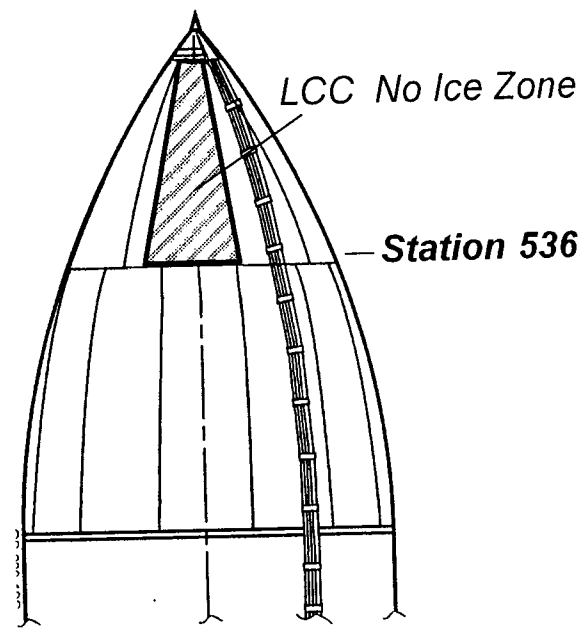
Resize Foam Thickness on LO2 Tank Ogive

Issue

- Subsequent thermal analysis indicated that thickness reduction resulted in an inability to meet the launch probability requirement of NSTS 07700, Vol. X, para 3.2.1.2.14
  - Launch holds due to ice formation shall not occur more than 5% of the time on annual basis
- Performed an evaluation of the Probability Model to reduce analysis conservatism using revised parameters (inclusion of wind factors)
  - Reduced foam thickness results in a potential minor decrease in launch probability due to additional susceptibility to pre-flight ice formation (93.3% vs 95% required)
- Previously presented at STS-101/ET-102 Pre-Flight Review (03/17/00) and ET/SRB Mate Review (01/20/00)
- Waiver to NSTS 07700, Vol. X, para 3.2.1.2.14 approved for ET-102 & ETs 107-110 (PRCBD S071290, 03/10/00)
- Foam thickness increased on ET-111 to eliminate waiver condition



LO2 Tank
(+Z Shown)

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Resize Foam Thickness on LO2 Tank Ogive

Documentation Impact

- Revised EIS to reflect weight impact of -20 lbs
- Revised HCS to reflect new part numbers
- Revised ICD to reflect new foam configuration

Basis for Certification

- Analysis
  - Structural:
    - No increase to design ascent temperatures/FS unchanged
    - Reentry requirements maintained
  - Propulsion: LO2 mass requirement maintained
    - Negligible impact due to heat loss
  - Aero: No impact to aero waviness requirement
- Inspection - Final Inspection Team routinely monitors the External Tank for ice formation that would violate a Launch Commit Criteria (LCC)
  - If ice formation were predicted prelaunch, the final inspection team walkdown would initiate an assessment using the tools defined in the LCC to determine if ice is present
- Design change presented at ICB on 9/20/00
- Waiver presented at PRCB on 03/10/00

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Mass Properties Status
Changes
Senior Management Review NCDs: None
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Terry McKeough

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SRM&QA Assessment

as of 01/23/2001

Item	***Status***
• ***ALERTS***	• None open
• ***MRB Assessment***	• Review complete - No issues/no impact to hazard controls
• ***Hazard Assessment***	• Review complete - All hazard reports were re-assessed and hazard controls verified
• ***CIL Retention***	• Review complete - No issues/no changes to CIL retention rationale
• ***Corrective Action Problem Summary (CAPS)***	
• S-083, Post proof NDE concerns	• ET-107 cleared for all post-proof NDE issues • CAPS in work at MAF, ECD 07/01/01
• S-085, Sanded/shaved Al 2195 welds	• Fleet cleared - Rationale accepted at PRCB, 12/04/00 • Pending corrective action, ECD 02/01/01
• P-093, GH2 vent disconnect leak	• Fleet cleared - All previously assembled GH2 vent disconnects successfully passed ATP • Pending root cause determination, ECD 02/19/01

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Juan Ramirez

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KSC Processing

as of 01/23/2001

Discrepancy Reports (DRs)/Problem Reports (PRs) Review

- PR/MRB discrepancies/dispositions similar to previously flown vehicles
  - All KSC/MRBs have been reviewed by MAF Reliability for potential SMR
  - No items were elevated to the SMR

Limited Life Component/ET Status

- All within required life through scheduled launch date plus 90 days

OMRSD Exception/Waiver

- LH2 feedline contamination (WK03970)
  - During a routine borescope inspection of the ET-107 LH2 tank feedline system, two pieces of material (0.375" x 0.003" metallic sliver and 0.212" x 0.053"cloth fiber) were observed that exceeded the 400 micron level requirement
    - Both particles were discovered downstream of the LH2 tank siphon screens
  - After coordination with the MPS and the SSME community, it was determined that this contamination issue poses no safety-of-flight concern
    - No compatibility issue with either object
    - MPS can tolerate the ingestion of these particles with no deleterious effect on performance

  OMRS waiver approved 11/16/00, PRCR S053294QA

KSC Processing - Status

as of 01/23/2001

Changes

- ET modifications
  - Mod Kits 0
  - DC&R 0
  - Bldg 45 1
  - FEC 1

  - OMRSD/LCC 0
  - Facility 0
  - Software 0

SIM Launch (S0044) *TBD*

SIM Load (S0056) *TBD*

MPS 2" disconnect poppet inspection

Intertank thrust panel and + Z stringer panel foam venting

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Mass Properties Status

Changes

Senior Management Review NCDs: None

SRM&QA Assessment

KSC Processing

Verification/Certification ***Dawn Diecidue***

Readiness Statement

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Verification/Certification

as of 01/23/2001

Item	**Status**
NSTS 07700, Volume X, Book 1, Baseline	**Complete - No issues**
• Revision M, Change 268	
Certification Documentation	
• Certificates of Qualification (COQ)	No new items
• Hardware Certification Sheets (HCS)	Approved by MSFC, 01/03/01
• Documentation update - Part numbers revised	
- Design change processed in 1998 to reconfigure LO2 PAL ramp to prevent low foam over Intertank stringer (H36809-066)	
• Profile was reduced when the RSS was deleted	
- HCS updates were overlooked	
• T503T, Ice/frost foam (PDL-1034)	
• T504T, Closeout foams (SS-1171)	
• T507T, Closeout foams (BX-250)	

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Verification/Certification

as of 01/23/2001

Item	***Status***
New Deviations/Waivers	

• **LH2 feedline contamination**
  • Specified requirements
  - CEI MMC-ET-CM02a (End Item Spec)
  - MMC-ET-RA12 (Contamination Control Plan)
  - MSFC-SPEC-164 (Cleanliness requirements)
  - OMRSD, File II/Volume I (Integrated)
  - SE-S-0073, Table 6.1 (Fluid Procurement and Use Control Specification)
  - ICD-2-12001 (Orbiter Vehicle)
	Previously discussed as *OMRSD Waiver*
	• DAR MMC-ET-240 approved 11/29/00, CCBD 9668
	• OMRSD waiver approved 11/16/00, PRCBD S053294QA
	• CR S058410H presented to ICB on 01/09/01 - Pending Level II approval

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Mission Unique Assessment

as of 01/23/2001

Item	***Status***
Review of MRB actions using updated loads	No new loads or environments requiring assessment have been identified at this time
MPS Preflight Prediction Package	ECD 02/14/2001 (UR)

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Readiness Statement

The External Tank, ET-107, is hereby certified and ready for STS-102 flight pending completion/closure of open and planned work

107pfr.4250.01/01

LOCKHEED MARTIN

Appendices

A: Minor Changes

B: SRM&QA Assessment

- NCD Assessment Criteria
- LH2 Feedline Contamination Cause and Corrective Action

C: KSC Processing

- PR/MRB Summaries
- Modification Summaries/Status
- Limited Life Component Status
- OMRSD Changes (RCNs): None
- Software Changes: None
- Facility Modifications: None

D: Approved Level II Waivers/Level III Deviations

Change Presentation Criteria

- Changes for Presentation
  - *Type I Documentation*
  - *Requirements*
  - *Configuration* (affects part interchangeability)
  - *Materials* (requires SE16 revision)
  - *Technical Changes to Processes* (STPs)
- Changes for inclusion in Appendix
  - *Minor configuration* (affects part interchangeability)
  - *Minor updates* - Does not affect part interchangeability, materials or processes
    - Revise point of incorporation
    - Drawing clarification
    - Non-flight hardware installation/removal
    - Datum changes
    - Update usage/List of Materials
    - Drawing incorporation errors
    - Manufacturing aid
    - Drawing errors
    - Fastener type/grip
    - Producibility
    - Update vendor list
    - Laboratory test procedures
    - Materials
- All Class I and Class II changes have been reviewed by the MSFC Resident Office
- All Class II STP/STM/Standard/Code sheet changes have been submitted to the MSFC Materials, Processes and Manufacturing Department for concurrence

Minor Changes

Change No.	Discipline	Description	Effectivity
H36809-116	Structural	Added view to clarify the forward ogive part marking location. Clarification made to aid production and quality inspectors	ET-107 & sub
H36809-228	Structural	Revised washer call-out on LO2 cable tray support. AN960 washers no longer available, being replaced by NAS1149. Equivalent and used for all new designs	ET-107 & sub
H36809-244	TPS	Added note 18 to allow use of alternate foam per STP1513 (BX-250) on LO2 aft dome	ET-107 & sub
H36809-256	TPS	Added note 16 to allow use of alternate foam per STP1513 (BX-250) on LH2 forward dome	ET-107 & sub
H36809-284	TPS	Revised drawing notes on intertank TPS trim drawing to eliminate conflicting requirements. SRB attach fitting area, interface with automated and hand trim	ET-107 & sub
H36809-322	TPS	Trim Intertank foam aft of GUCP fitting to prevent contact with GSE hardware	ET-107 & sub
H36809-449	Structural	Extend chamfer on inboard LH2 feedline support fitting edge to eliminate interference at mating joint with aft crossbeam assembly	ET-107 & sub
H36809-465	TPS	Added drawing note to ink stamp serial number on 'Barrymount' cap TPS application	ET-107 & sub
H36809-472	Structural	Revised minimum filet radii on Intertank sheet metal stringers to avoid scrapping numerous parts or requiring numerous NCDs to accept parts 'as is'. Supplier requested –due to sheet stock near minimums prior to forming, exceeded minimums after forming	ET-107 & sub

Minor Changes

Change No.	Discipline	Description	Effectivity
H36809-473	Structural	Revised Weld Acceptance Manual to define LH2 tank locations that cannot comply to 35° radiographic angle perspectives and identify specific HFL welds which require post proof inspection	ET-107 & sub
H36809-474	Structural	Delete unnecessary dimension on channel assembly drawing. Channel is part of fairing for vertical strut to SRB cable tray	ET-107 & sub
H36809-479	Materials	Revised Manufacturing process for Inconel parts on bipod-strut collar, fitting, and pin. Drawing specifies making parts from Inconel 718 per AMS5663, which is already heat treated. For producibility, machine from Inconel 718 AMS 5662 then heat treat per AMS 5663	ET-107 & sub
H36809-482	TPS	Revised drawing ink stamp note #4 to remove words 'serial number' and insert 'lab ticket number' on pre-molded SLA panels for LO2 and LH2 cable tray supports. (SN required only when TPS application makes an assembly)	ET-107 & sub
H36809-483	Structural	Revised cable tray drawing to show proper quantity (from 1 to 3) of detail fillers in sheet 1 parts list	ET-107 & sub
H36809-484	Materials	Revised primer touch-up requirement on bolt catcher assembly TPS application drawing. Vendor changed color from white to black, all else remains same	ET-107 & sub
H36809-485	Structural	The extrusion number was added to LO2 tank vortex baffle assembly drawing 80912651012-024 per the request of materiel group.	ET-107 & sub
H36809-487	Materials	Clarify heat treat and forming sequence. Form upper SRB fairing half first, then age to T-6 condition	ET-107 & sub

Minor Changes

Change No.	Discipline	Description	Effectivity
H36809-488	Structural	Revised LO2 umbilical cable tray drawing to show proper quantity (from 1 to 2) of splice plates in sheet 1 parts list	ET-107 & sub
H36809-496	Materials	Revise sheet 1 note #7 of nose cone vent valve support tube which calls out "Penetrant Inspect per STP 2501, Type 1, Method A". Previously had no reference to specific 'Type' or 'Method'	ET-107 & sub
H36809-504	Structural	Revise ball fitting drawing with chamfer to facilitate easier drilling of hole. Supplier requested. Prior builds made to the requirements of this change.	ET-107 & sub
H36809-508	Structural	Add note to define "Class" of chemical film being applied. Note: "Apply per STP3001 class1A". Drawing already requires chemical film application on LO2 cable tray plate.	ET-107 & sub
H50001 –811	TPS	Revise the TPS closeout of the aft interface LO2 umbilical cable tray to clarify graphically the actual closeout configuration and delete a dimension that serves no function at this closeout location (double dimensioning).	ET-107 & sub
H50001 –814	TPS	Revise note to reflect current method of marking numbers on LO2 feedline crossbeam TPS. "Use ink stamp" rather than "stencil".	ET-107 & sub

Minor Changes – STD/STM/STP/AVL

Change No.	Document	Description
H36809-425	Standard for 25L5, 25L6, 25L8, & 25L9 Hilok collars	Added note to standard for 25L5, 25L6, 25L8, & 25L9 Hilok collar dimensions to be met after anodizing, prior to lubrication. Permits use of Alclad washer on 25L5. Necessary due to canceled military and federal documents.
H36809-446	Material Code Sheet Y1A4	Revise material code sheet Y1A4 to delete note #2. This clarifies type of penetrant remover solvent to be used. (NASA ph2 NEQA audit finding #15.)
H36809-469	STMH718	Revised STMH718 to clarify in-process and receiving acceptance for nose cone application including specimen conditioning, humidity, post cure end temperature, and test data.
H36809-470	STP7524	Revised STP7524 to reinstate accept/reject criteria inadvertently deleted in last revision and quantify post cure termination temperature to support composite manufacturing of nose cone.
H36809-491	Standards 34L4, 34L5, 34L6, & 34L7	Revised standards 34L4, 34L5, 34L6, & 34L7 to remove 0.0020 burr from ID of bushing sleeve to permit easier fastener installation. No specific application, these are repair sleeves.
H36809-495	STP 5002	Revise STP 5002 para 2.1. This clarifies type of penetrant remover solvent to be used. (NASA ph2 NEQA audit finding #15.)
H36809-501	Materials Code Sheet J677	Addendum to Material Code Sheet (MCS) to extend shelf life of wiring harness marking pens from 1 yr to 3 yrs to prevent production delays.

NCD Assessment Criteria

Assessment of all MRB Items

- Adequacy of technical dispositions
- Completeness of required repair/retest
- First time occurrences/SMR
- Verification of margin of safety assessment/documented
- Review of impact to hazards
- Engineering review for impact to loads
- Engineering review for reduced extrusion to plate weld allowables

LH2 Feedline Contamination Cause and Corrective Action

Probable Cause:

- Root cause cannot be positively determined
  - Particulates were not retrieved for analysis
  - Suspect handling damage at MAF, or insufficient cleanup of the edge radius of the cruciform during deburring procedures at the supplier
  - Suspect fibrous material snagged edge of cruciform or metallic sliver during cleaning operations

Corrective/Preventative Action:

- Sufficient steps are in place to verify no contamination or damage
- As an enhancement, MAF planning revised to require an inspection of all surfaces of cruciform for raised metal prior to cleaning and assembly
- Crew meetings held with the practitioners to emphasize the importance of maintaining cleanliness prior to final installation of the siphon screens

ET-107 DR/PR/OMRSD Waiver/Exceptions

as of 01/23/2001

System	Discrepancy	Problem	MRB Items	Exceptions/ Waivers
• Electrical	0	0	0	0
• Propulsion/ Pneumatics	0	4	0	1
• Structures	0	2	0	0
• Thermal (TPS)	2	4	1	0
Total	2	10	1	1

ET-107 PR/MRBs, Thermal

PR No./Status	Title/Description	Disposition
PET-107-TS-0003	• Five areas of foam (SS-1171) below minimum thickness of 1.0" on the aft hardpoint closeout • Total area affected = 7.3 sq. in.	MRB approved for "use as is" • Thermal evaluation determined remaining TPS thickness will maintain thermal requirements

ET-107 KSC Modification Summary/Status

Item	Title	Status
• ***Field Engineering Changes***		
– FEC KET-0068	Intertank +Z stringer area foam venting	Work complete
• ***Non Standard Work***		
– J5295	MPS 2" disconnect poppet inspection	Work complete

ET-107 Limited Life Components

Cycle Sensitive

Description	Part No.	Serial No.	Limit	Required	Remaining
LH2 Manhole Cover Assy	80914081488 -509	0000749870	14	2	14
LO2 Tank Mechanical Assy	80912002000 -500	0000781990	14	2	14
LH2 Tank Mechanical Assy	80914002000 -500	0000770640	14	2	14
LO2 Manhole Cover Assy	80911001205 -509	0000807690	14	2	14
LO2 Fwd Ogive Cover Plate	80911001207 -509	0000806490	14	2	14
LH2 Manhole Cover Assy -Aft	80911001444 -509	0000793600	14	2	14

ET-107 Limited Life Components

Age Sensitive

Description	Part No.	Serial No.	Limit	Initiation	Expiration
External Tank	80901000000-500	00000100	6 Yrs	10/99	10/2005

Age Sensitive Pyrotechnics - 10 Years Life/Requires Lot Verification Tests After 4 and 7 Years

Description	Part No.	Lot No.	Serial No.	Latest Retest	Expiration
Separator Assy GUCP	PD5000020-059	AAH	0001160	02/24/1998	01/2002
Cartridge Assy	PD5000020-030	AAH	0001329	02/24/1998	01/2002
Cartridge Assy	PD5000020-030	AAH	0001330	02/24/1998	01/2002

Level II Waivers - Baseline

Document / Requirement	Authority	Paragraph	Waiver No.	Effectivity
NSTS 07700, Volume V, Information Management Requirements				
Generic part name, type, common designation, and part manufacturer H4 code are not required for EEE parts status print out	PRCBD S000127B 06/28/88	Table C.5 Item 2SR-10	6	ETs 49 & up
Data required in limited life status report is supplied in acceptance data package	PRCBD S000127B 06/28/88	Table C.6 Item 2SR-7	8	ETs 49 & up
Requirement to deliver element pressure vessel historical data to EPO will remain at contractor facility	PRCBD S000127B 06/28/88	Table C.6 Item 2SR-7	10	ETs 49 & up

Level II Waivers - Baseline

Document / Requirement	Authority	Paragraph	Waiver No.	Effectivity
NSTS 07700, Volume X, Book 1, Space Shuttle Flight and Ground System Specification, Requirements				
Electrical bonding	PRCBD S040732M 09/09/88	3.6.14	378	ETs 23, 27-29, 31 & up
Soldering, circuit boards, and connectors	PRCBD S040732M 09/09/88	3.6.15.1.1	379	ETs 23, 27-29, 31 & up
PD7400106 circuit boards	PRCBD S040732M 09/09/88	3.6.15.2.1	382	ETs 23, 27-29, 31 & up
Pressure transducer circuit boards	PRCBD S040732M 09/09/88	3.6.15.2.1	383	ETs 23, 27-29, 31 & up

Level II Waivers - Baseline

Document / Requirement	Authority	Paragraph	Waiver No.	Effectivity
NSTS 07700, Volume X, Book 1, Space Shuttle Flight and Ground System Specification, Requirements				
Launch Probability	PRCBD S071290R1 04/10/00	3.2.1.2.14.1	682	ETs 102, 107 - 110
Applicability of Space Shuttle Manned Spacecraft Criteria and Standards (NSTS 08080-1)	PRCBD S061451 08/08/00	Table 2.0	683	ET-96 & up
NSTS 07700-10-MVP-01, Shuttle Master Verification Plan - Volume I, General Approach and Guidelines				
Environmental acceptance of ET components	PRCBD S002130H 03/07/89	3.7.1	13	ETs 23, 27-29, 31 & up

Level II Waivers - Baseline

Document / Requirement	Authority	Paragraph	Waiver No.	Effectivity
SL-E-0001 – Specification Electromagnetic Compatibility Requirement				
Wire marking is not applicable to the ET	PRCBD S040732K 09/27/89	3.2.5	3	ETs 23, 27-29, 31 & up
SW-E-0002 – Ground Support Equipment General Design Requirements				
Factor of safety applied to yield for feet on ground half of GUCA	PRCBD S087020L 08/17/88	3.4.2.1	21	ETs 23, 27-29, 31 & up
NSTS 08171, Operations Maintenance and Requirements Specification Document				
Perform borescope inspection of LH2 tank siphon screens	PRCBD S053294QA 11/16/00	T41QAL.140	WK03970	ET-107

Level III Deviations

Document / Requirement	Paragraph	DAR No.	Effectivity
CPTO1M09A, External Tank Contract End Item Specification – Part I			
• Photographic evidence shows a loss of foam from both +Y and –Y Intertank Thrust Panels • Analysis concluded a low probability of debris impact on Orbiter critical area	3.2.1.1.17	236	ETs 106 – 108
• LH2 feedline contamination – Two pieces of material downstream of the LH2 tank siphon screens that exceeded the 400 micron level requirement – Coordination with the MPS and the SSME community, it was determined that this contamination issue poses no safety-of-flight concern	3.3.10	240	ET-107