

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06041	In-Flight Anomaly Number --	Contractor Report Number E-070	JSC# --	KSC# --
Problem Title LO2 ULLAGE SENSOR, FAILED NOISE TEST				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 1R
HCRIT --	Sys_Lvl Y	Misc Codes A B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LO2 ULLAGE SENSOR	PART# PD7400098-079	SER/LOT# 680	MANUFACTURER GULTON, SCD
Test/Operation A - ATP	Prevailing Condition F - FUNCTIONAL	F / U F	Fail Mode EV - NOT-TO-SPEC	Cause DHA - DES-HDW-AGE
System ELECTRICAL	Defect CR - CORROD	Material B - CIRCBD	Work Contact S. BRAGG	Fail Date 01/20/1983
Received at MSFC 01/21/1983	Date Isolated --	FMEA Reference 3.1.1.9	IFA: Mission Phase --	Mission Elapsed Time --
Location VENDOR		Symptom EV - NOT-TO-SPEC		Time Cycle --
Effectivity Text HWT-6, LWT-1 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/13/1995	CN RSLV SBMT 01/21/1983	Defer Date --	Add Date --	R/C Codes 4 - TEST -- --
Assignee				
Design L. GUZINSKY	Chief Engineer --	S & MA D. NEWMAN	Project P. DICKERSON	Project MGR --
Approval				
Design	Chief Engineer	S & MA	Project	Project MGR

L. GUZINSKY	--	D. NEWMAN	P. BRIDWELL	--	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 02/04/1983	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description 1/24/83 - DURING ATP TESTING AT VENDORS LOCATION, SENSOR FAILED NOISE TEST. REQUIREMENT IS LESS THAN 250 OHMS. SENSOR READS 34 OHMS AT 20 PSI. (NOTE: SENSOR WAS RETURNED TO THE VENDOR FOR RETEST BECAUSE SHELF-LIFE REQUIREMENT EXPIRED. REF MARS T-10482, MEMO'S 3741-83-011, 3530-83-016, 3530-83-241					
Contractor Investigation/Resolution CAUSE: THE NOISE DISCREPANCY THAT WAS EXPERIENCED IS ATTRIBUTED TO NORMALLY EXPECTED CONTACT RESISTANCE BUILD-UP. THIS IS TYPICAL OF POTENTIOMETRIC DEVICES WHEN THE SENSOR'S WIPER MECHANISM HAS NOT BEEN CYCLED OVER IT'S ASSOCIATED ELEMENT WINDING FOR AN EXTENDED PERIOD OF TIME. 1/21/83 - REQUESTED BACK-UP DATE REF RAPIDFAX #2. 1/21/83 - THIS CRIT 1R PROBLEM IS NOT CONSIDERED A LAUNCH CONSTRAINT BECAUSE THE FAILURE INVESTI- GATION CONCLUDED THAT THE SENSOR IS NOT DEFECTIVE, BUT EXHIBITS THE NOISE DISCREPANCY DUE TO VERY SLIGHT OXIDIZATION TYPICAL TO POTENTIOMETRIC DEVICES WHICH HAVE NOT BEEN CYCLED FOR AN EXTENDED PERIOD OF TIME. THIS LAUNCH CONSTRAINT DECISION HAS BEEN CO-ORDINATED WITH THE ET PROJECT OFFICE. JAMES B. ODOM 1/27/83 RESOLUTION - A REVIEW OF THE SENSOR'S HISTORY REVEALED THE UNIT PASSED NOISE TESTING DURING THE ORIGINAL ATP WITHOUT INCIDENT. THE SENSOR WAS RETURNED TO THE VENDOR FOR NOISE TESTING BECAUSE THE SHELF-LIFE REQMNT HAD EXPIRED. THE SENSOR FAILED INITIALLY DURING RETEST HOWEVER AFTER (1) FULLCYCLING OF ITS WIPER/ELEMENT, THE DISCREPANCY WAS NOT REPEATABLE. AS A FINAL ASSURANCE UNIT IS ACCEPTABLE, A FULL AUTO-CAL WAS PERFORMED ON THE					

SENSOR & COMPARED TO THAT OF THE ORIGINAL ATP. THIS REVIEW SHOWED NO DETERIORATION OF THE SENSOR. THE CONCLUSION OF F.A. INVESTIGATION IS THAT THE OBSERVED NOISE DISCREPANCY IS NORMAL FOR A POTENTIOMETRIC DEVICE WHICH HAS NOT BEEN CYCLED FOR AN EXTENDED PERIOD OF THE TIME RECURRENCE CONTROL - IN THE FUTURE UNITS RETURNED TO THE VENDOR, FOR RETEST DUE TO SHELF LIFE EXPIRATION, WILL BE CYCLED (3) TIMES. THE 3RD CYCLE ONLY WILL BE SUBJECT TO ACCEPTANCE CRITERIA WITH THE PREVIOUS CYCLES NOTED FOR HISTORICAL DATA REF MEMO 3530-83-016 & 3530-82-241) EFFECTIVITY - HWT-6, LWT-1 & SUBS, CORRECTIVE ACTION - NONE REQ'D, CYCLING OF SENSOR REMOVED SLIGHT OXIDIZATION, SENSOR MEETS ALL ACCEPTANCE CRITERIA. HWT-6 THRU LWT-2 HAVE NOT EXPERIENCED NOISE PROBS AS THE TYPES OF TESTS PERFORMED CYCLE THE SENSORS HARMLESSLY REMOVING ANY OXIDE RESIDUE. 1/27/83 - CLOSURE DISTRIBUTED

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06041	IFA# --	Contractor RPT# E-070	JSC# --	KSC# --	EICN# --
Asmnt Part# PD7400098-079	Asmnt Part Name L02 ULLAGE SENSOR	Asmnt Serial/Lot# 680			
HCRIT CD --	FCRIT CD 1R	CAUSE CD DHA - DES-HDW-AGE	FAIL MODE EG - SIG HI OR LO		
Asmnt FMEA 3.2.1.1	Asmnt FM 1	FMEA CSE C	FMEA SCSE 1		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# 80931003730-009	Correlated Part# --	Correlated Part# --			
Associated LRU# N/A	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06077	In-Flight Anomaly Number --	Contractor Report Number E-071	JSC# --	KSC# --
Problem Title LO2 LEVEL SENSOR, TERMINAL CRACKED				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 1R
HCRIT --	Sys_Lvl Y	Misc Codes A B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LO2 LEVEL SENSOR	PART# 74L4-1	SER/LOT# 9	MANUFACTURER SIMMONDS
Test/Operation A - ATP	Prevailing Condtion N - INSPECTION	F / U F	Fail Mode UC - UNSAT	Cause MA - MFG-ASY
System ELECTRICAL	Defect DC - BROKEN	Material E - EL C/W	Work Contact S. BRAGG	Fail Date 01/04/1983
Received at MSFC 01/27/1983	Date Isolated --	FMEA Reference 3.1.1.1	IFA: Mission Phase --	Mission Elapsed Time --
Location SIMMONDS		Symptom UC - UNSAT		Time Cycle --
Effectivity Text LWT-1 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/13/1995	CN RSLV SBMT 04/04/1983	Defer Date --	Add Date --	R/C Codes 2 - MFG -- --
Assignee				
Design L. GUZINSKY	Chief Engineer --	S & MA D. NEWMAN	Project P. DICKERSON	Project MGR --
Approval				
Design L. GUZINSKY	Chief Engineer --	S & MA D. NEWMAN	Project P. BRIDWELL	Project MGR --

PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 04/27/1983	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -----	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: 1/27/83 - DURING VISUAL EXAM PER PARA 6.1.2 OF ATP-946, A TERMINAL (SIMMONDS P/N 1500173) WAS FOUND TO BE CRACKED IN THE AREA OF THE 180 DEG BEND (REF SIMMONDS DWG 40010-0000-01). NOTE: THIS DISCREPANCY AFFECTS LEVEL SENSORS MC432-0205-0013 & MC432-0205-0019 (GFP/RI). CAUSE - THE CRACKS DEVELOPED DURING COLD FORMING OPERATIONS OF THE UNANNEALED TERMINAL. FAILURE ANALY DETERMINED THAT THE MTRL (301 CRES FULL HARD) HAD NOT BEEN ANNEALED PRIOR TO COLD FORMING OPERATIONS, RESULTING IN FORMING TEARS					
Contractor Investigation/Resolution 2/7/83 - LWT-1 CONSTRAINT IS LIFTED BASED ON THE FOLLOWING RATIONALE: STRESS & FRACTURE ANALYSES DETERMINED THAT THE SENSOR TERMINALS WOULD HAVE TO BE CRACKED 90% OF TERMINAL THICKNESS TO FAIL AT THE STRESS LEVEL OF 16 KSI & -423 DEGS F. AT THE LOW STRESS LEVEL OF FLT THERE IS NO CRACK GROWTH & THE CRACKS WILL NOT PRESENT A PROB. THIS CHANGE HAS BEEN CO-ORDINATED WITH THE E.T. PROJECT OFFICE - _____P. BRIDWELL 2-9-83_____. 4/5/83 RESOLUTION - DURING VENDOR ATP A TERMINAL WAS FOUND TO BE CRACKED IN THE AREA OF A 180 DEG BEND. FAILURE ANALY DETERMINED THE CRACKS DEVELOPED DUE TO COLD FORMING THE MTRL TO A POINT WHICH EXCEEDS THE RECOMMENDED BEND RADIUS FOR 301 FULLY HARDENED STAINLESS STEEL. THE VENDOR HAS TAKEN ACTION TO ANNEAL ALL TERMINALS PRIOR TO BENDING OPERATIONS. IN ADDITION ALL TERMINAL WILL RECEIVE 100% INSPECTION AT A MINIMUM OF 3X WITH QC VERIFICATION AT THE DETAIL PART LEVEL. 4/7/83 - CLOSURE DISTRIBUTED					
MSFC Response/Concurrence					

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06077	IFA# --	Contractor RPT# E-071	JSC# --	KSC# --	EICN# --
Asmnt Part# 74L4-1	Asmnt Part Name L02 LEVEL SENSOR	Asmnt Serial/Lot# 9			
HCRIT CD --	FCRIT CD 1R	CAUSE CD MAP - MFG-ASY-INST	FAIL MODE MS - STRUCT		
Asmnt FMEA 3.1.2.2	Asmnt FM 2	FMEA CSE A	FMEA SCSE 4		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# N/A	Correlated Part# --	Correlated Part# --			
Associated LRU# N/A	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06195	In-Flight Anomaly Number --	Contractor Report Number E-072	JSC# --	KSC# --
Problem Title LO2 ECO SENSOR MALFUNCTIONED, LOW RESISTANCE SHORT				
EICN# --	ELEMENT ET	Contractor MMSS	FSCM# --	FCRIT 1R
HCRIT --	Sys_Lvl N	Misc Codes A B (X) C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE EXTERNAL TANK	PART# 82601000000	SER/LOT# LWT-1	MANUFACTURER MMC
HARDWARE LRU	NOMENCLATURE EXTERNAL TANK	PART# 82601000000	SER/LOT# LWT-1	MANUFACTURER MMC
HARDWARE NCA	NOMENCLATURE ELECTRICAL WIRE	PART# MMSE 659003	SER/LOT# N/A	MANUFACTURER MMC
Test/Operation L - FLD	Prevailing Condition F - FUNCTIONAL	F / U F	Fail Mode EL - SHORT	Cause MAW - MFG-ASY-WORK
System ELECTRICAL	Defect DC - BROKEN	Material E - EL C/W	Work Contact C. CAMPBELL	Fail Date 01/20/1983
Received at MSFC 02/24/1983	Date Isolated --	FMEA Reference 3.1.2.11	IFA: Mission Phase --	Mission Elapsed Time --
Location KSC		Symptom EL - SHORT		Time Cycle --
Effectivity Text LWT-4 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/13/1995	CN RSLV SBMT 05/02/1983	Defer Date --	Add Date --	R/C Codes 5 - TRNG -- --
Assignee				
Design L. GUZINSKY	Chief Engineer --	S & MA D. NEWMAN	Project P. DICKERSON	Project MGR --
Approval				

Design L. GUZINSKY	Chief Engineer --	S & MA D. NEWMAN	Project P. BRIDWELL	Project MGR --	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 05/18/1983	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: LO2 (ECO) LEVEL SENSOR #3 MALFUNCTIONED DURING CHECKOUT OPERATIONS OF STS-6. SUBSEQUENT TROUBLE- SHOOTING ISOLATED PROB TO LWT-1. PROB WAS IDENTIFIED TO BE A LOW RESISTANCE TO GROUND ON ONE OF THESENSOR'S CIRCUITS (WIRES REF DES. 303W16). CAUSE: FAILURE MODE WAS LOW RESISTANCE SHORT OF CABLE'S CONDUCTOR TO CABLE SHIELDING BRAID. CAUSE WAS IDENTIFIED AS DAMAGE TO THE SHIELDING WHICH PENETRATED THE KAPTON INSULATION OF THE CONDUCTOR RESULTING IN A SHORT WHEN THE CABLE TRAY FILLED WITH RAIN WATER. FURTHER INVESTIGATION DETERMINED THE CABLE DAMAGE WAS CAUSED BY THE USE OF AN "EXACT0-KNIFE" DURING MAF MFR'G					
Contractor Investigation/Resolution 2/24/83 - LWT-1 CONSTRAINT IS LIFTED BASED ON THE FOLLOWING RATIONALE: MAF AR K3025 ISSUED TO KSC REWORKED & RETESTED THE DEFECTIVE CABLE. ECO SENSOR CIRCUITS #1, #2, & #4 WERE INSPECTED. THESE CABLES WERE FOUND TO HAVE DAMAGE TO THEIR SHIELDS, BUT SHORTS DID NOT EXIST; HOWEVER, THESE CABLES WERE ALSO REWORKED & RETESTED. THIS CHANGE HAS BEEN COORDINATED WITH THE PROJ. OFFICE - ____G. P. BRIDWELL____. 4/21/83 - ET-6 CONSTRAINT IS LIFTED BASED ON THE SAME RATIONALE AS STATED ABOVE FOR LWT-1. THIS CHANGE HAS BEEN COORDINATED WITH THE ET PROJ. OFFICE - ____G. P BRIDWELL____. 5/3/83 RESOLUTION - LO2 ECO SENSOR MALFUNCTION, DURING STS-6 CHECKOUT, WAS DUE TO A SHORTED CABLE. THE SHORT RESULTED FROM RAINWATER ACCUMULATION IN THE CABLE TRAY COMBINED WITH WIRE INSULATION DAMAGE. PERSONNEL USING AN EXACTO KNIFE TO STRIP CABLE SHIELDING TO					

PERFORM A CABLE SPLICE PENE- TRATED THE INNER CABLE CONDUCTOR INSULATION. REMEMDIAL ACTION: LWT-1 - MAF ARK3025 ISSUED TO KSC REWORKED & RETESTED CABLES. CABLES FOR SENSORS #1, #2 & #4 ALSO REWORKED & TESTED AS PRECAUTION. HWT-6 & LWT-2 - MAF ARK3025-M2 ISSUED TO KSC INSPECTED CABLES NO DEFECTS FOUND. CABLES REWORKED & TESTED AS PRECAUTION. LWT-3 - DC&R E-83-018 AT MAF INSPECTED CABLE CIRCUITS DAMAGE FOUND. CABLES WERE REWORKED & TESTED. RECURRENCE CONTROL - LWT-4 THRU LWT-6 - LIASION CALL 3001 (BOOK M330) CHANGED ENGR'G TO ELIMINATE STRIPPING & PROVIDED SEALED SPLICES. LWT-7 & SUBS - ECO SENSORS & TEMP SENSORS ARE DELETED. ADDITIONALLY 'PRODUCTION TIP" ISSUED PROHIBITING USE OF KNIVES FOR STRIPPING FLT HARDWARE. PERSONNELTRAINING COURSES & CERTIFICATION ON CABLE FAB IMPLEMENTED. 5/4/83 - CLOSURE DISTRIBUTED

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06195	IFA# --	Contractor RPT# E-072	JSC# --	KSC# --	EICN# --
Asmnt Part# MMSE 659003	Asmnt Part Name ELECTRICAL WIRE	Asmnt Serial/Lot# N/A			
HCRIT CD 3	FCRIT CD 1R	CAUSE CD MAW - MFG-ASY-WORK	FAIL MODE EL - SHORT		
Asmnt FMEA 3.1.7.2	Asmnt FM 2	FMEA CSE A	FMEA SCSE 2		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06335	In-Flight Anomaly Number --	Contractor Report Number E-073	JSC# --	KSC# --
Problem Title LO2 100% LOADING LEVEL SENSOR				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 1R
HCRIT --	Sys_Lvl Y	Misc Codes A (1) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE EXTERNAL TANK	PART# 82601000000	SER/LOT# LWT-1	MANUFACTURER MMC
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LO2 LEVEL SENSOR	PART# MC432-0205-0019	SER/LOT# 429	MANUFACTURER SIMMONDS
Test/Operation L - FLD	Prevailing Condtion F - FUNCTIONAL	F / U F	Fail Mode EL - SHORT	Cause U - UNKNOWN
System ELECTRICAL	Defect XU - UNK	Material A - CIRC T	Work Contact S. BRAGG	Fail Date 04/04/1983
Received at MSFC 04/19/1983	Date Isolated --	FMEA Reference 3.1.1.5	IFA: Mission Phase --	Mission Elapsed Time --
Location KSC		Symptom EL - SHORT		Time Cycle --
Effectivity Text NONE				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 11/23/1990	CN RSLV SBMT 02/28/1984	Defer Date --	Add Date --	R/C Codes 0 - EXPL -- --
Assignee				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project R. ABRAHAM	Project MGR --
Approval				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project R. ABRAHAM	Project MGR --

PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 03/22/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description					
REF: DURING LAUNCH COUNTDOWN OF LWT-1 AT KSC, THE 100% LEVEL LOX SENSOR #1 INDICATED WET (OPEN CIRCUIT) WHEN IT SHOULD HAVE INDICATED DRY. THE MALFUNCTION DID NOT DELAY LAUNCH					
Contractor Investigation/Resolution					
5/17/83 - LAUNCH CONSTRAINT IS LIFTED BASED ON THE FOLLOWING RATIONALE: ALL FAILURES OF THE 100% LEVEL SENSORS HAVE OCCURRED AFTER 10 HRS OF THE REPLENISH MODE. FOR STS-7 & SUBS THE ANTICIPATED TIME ON THE 100% SENSOR IS LESS THAN 10 HRS, ALSO THERE IS REDUNDANCY BETWEEN 100% NO. 2 & 100.15% PROBABILITY OF THE 3 SENSORS FAILING IS 1 IN 500. OTHER SENSORS, LO2 ECO & LH2 ARE IN A MUCH LESS ADVERSE ENVIRONMENT. THERE HAS BEEN NO FAILURES OF THE ECO SENSORS. THE LH2 SENSORS ARE REDUNDANT& NO FLT FAILURES HAVE OCCURRED. THIS CONSTRAINT STATUS HAS BEEN COORDINATED WITH THE ET PROJECT OFFICE - ____G. P. BRIDWELL 5-17-83____. 7/22/83 - LAUNCH CONSTRAINT FOR STS-8 IS LIFTED BASED ON THE FOLLOWING RATIONALE: SAME AS STS-7 STATED ABOVE. THIS CHANGE HAS BEEN COORDINATED WITH THE ET PROJ. OFFICE - ____G. P. BRIDWELL 9/9/83 - LAUNCH CONSTRAINT FOR STS-009 IS LIFTED BASED ON THE FOLLOWING RATIONALE: SAME AS STS-7 & 8 STATED ABOVE. THIS CHANGE HAS BEEN COORDINATED WITH THE ET PROJ. OFFICE - ____G. P. BRIDWELL 11/21/83 PRB STATUS - TEST DATA BEING ANALYZED. TRANSDUCER TO BE DISASSEMBLED & INSPECTED. 1-6-84 - LAUNCH CONSTRAINT FOR STS-11, LWT-3 IS LIFTED BASED ON THE SAME RATIONALE AS STATED ABOVE FOR STS-7, 8 & 9. THIS CHANGE HAS BEEN COORDINATED WITH THE E.T. PROJ. OFFICE - ____G. P. BRIDWELL 1-10-84____. 2/23/84 - STS-13, LWT-5 LAUNCH CONSTRAINT IS LIFTED BASED					

ON THE SAME RATIONALE AS STATED ABOVE FOR STS-11, LWT-3. THIS CHANGE HAS BEEN COORDINATED WITH THE E.T. PROJECT OFFICE - ____G. P. BRIDWELL 2-24-84____. 3/2/84 CAUSE - UNKNOWN; INVESTIGATION CONCLUDED FAILURE TO BE EITHER RANDOM IN OCCURRENCE DURING PREFLT OPERATIONS OR ORBITER ELECTRONICS FAILURE. 3/2/84 RESOLUTION - DURING LAUNCH COUNT-DOWN OF STS-6, LWT-1 AT KSC THE #1 100% LO2 LEVEL SENSOR FAILED WET & STAYED WET. LEVEL SENSORS SAME LOCATION ON HWT-1 & HWT-2 FAILED SIMILARLY PRIOR TO LAUNCH. ALL 3 VEHICLES SUCCESSFULLY LAUNCHED UTILIZING THE REDUNDANT SENSORS. SINCE FAILURE ANALYSIS WAS NOT POSSIBLE, A REVIEW OF FAILURE HISTORY & ENGR'G EVALUATION WERE PERFORMED. NEITHER OF THE TASKS NOR THE SUBSEQUENT MSFC SIMULATION TESTS WERE ABLE TO DETERMINE THE CAUSE OF FAILURE. IT'S BEEN CONCLUDED THAT EITHER THE FAILURES WERE RANDOM IN OCCURRENCE DURING PRELAUNCH OR DUE TO ORBITER ELECTRONICS FAILURE. RECURRENCE CONTROL - NONE; UNEXPLAINED ANOMALY. 3/5/84 - CLOSURE DISTRIBUTED

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06335	IFA# --	Contractor RPT# E-073	JSC# --	KSC# --	EICN# --
Asmnt Part# 74L4-1	Asmnt Part Name LO2 100% LEVEL SENSR	Asmnt Serial/Lot# N/A			
HCRIT CD --	FCRIT CD 1R	CAUSE CD U - UNKNOWN	FAIL MODE EL - SHORT		
Asmnt FMEA 3.6.1.1	Asmnt FM 1	FMEA CSE AA	FMEA SCSE N/A		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06364	In-Flight Anomaly Number --	Contractor Report Number T-031	JSC# --	KSC# --
Problem Title SOFI APPLICATION, OVERSPRAY				
EICN# --	ELEMENT ET	Contractor MMSS	FSCM# --	FCRIT 3
HCRIT --	Sys_Lvl N	Misc Codes A (6) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LO2 TANK	PART# 80971118409	SER/LOT# N/A	MANUFACTURER MMC
Test/Operation M - MFG	Prevailing Condition N - INSPECTION	F / U UC	Fail Mode UC - UNSAT	Cause MAW - MFG-ASY-WORK
System TPS	Defect CE - EXTRA	Material F - INSUL	Work Contact H. CHANLER	Fail Date 03/31/1983
Received at MSFC 04/19/1983	Date Isolated --	FMEA Reference 1.2.3	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom UC - UNSAT		Time Cycle --
Effectivity Text LWT-8 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 09/10/1992	CN RSLV SBMT 10/22/1985	Defer Date --	Add Date --	R/C Codes 2 - MFG -- --
Assignee				
Design B. DAVIS	Chief Engineer --	S & MA R. JACKSON	Project J. CAVALARIS	Project MGR --
Approval				
Design	Chief Engineer	S & MA	Project	Project MGR

B. DAVIS	--	R. JACKSON	J. CAVALARIS	--	
PAC Assignee G. MILLER	PAC Review Complete GM	MSFC Closure Date 02/25/1986	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: DURING SOFI APPLICATION PER PI-1512-2 & 1523, MASKING IS BLOWN OFF THE SUBSTRATE BY THE SOFI SPRAY GUNS. THIS CAUSES REWORK IN ORDER TO REMOVE SOFI FROM THE AREAS THAT SHOULD HAVE BEEN MASKED. MASKING HAS IN THE PAST BEEN FOUND IMBEDDED IN THE SOFI AS A RESULT OF THIS PROB					
Contractor Investigation/Resolution 4/19/83 CAUSE - UNDER INVESTIGATION. 3/8/84 PRB STATUS - OCCURS AT RANDOM. FIXED ON SPOT. NO CONSTRAINTS. AN EVALUATION OF THE NEW HAND MASKING TOOLS (FOR LO2 TANK BRACKETS) VS THE SOFT VACUUM FORMED MASKING TOOLS BEING DESIGNED (FOR THE INTERTANK) WILL BE PERFORMED. A DETERMINATION WILL THEN BE MADE REGARDING THE BEST TOOLS TO USE ON THE LH2 TANK. THE ECD FOR CAPS CLOSURE IS 9-30-84. 9/6/84 PRB STATUS - MMC EXPECTS TO COMPLETE TESTING 12-31-84 & IMPLEMENT NEW TECHNIQUE BY 6-1-85. 12/12/84 INVESTIGATION STATUS: (TAKEN FROM CAPS T-031A) - INVESTIGATION INTO THE CAUSES OF MASKING ADHESION FAILURE HAS DETERMINED THAT THE PRIMARY CAUSES OF TAPE ADHESION FAILURE DURING SOFI SPRAYS ARE CONTAMINATION UNDERNEATH TAPE & THE TEARING OF TAPE INSTEAD OF CUTTING. (WHEN THE TAPE IS TORN IT IS DISTORTED. WHEN THE TANK IS HEATED DURING A SOFI SPRAY THE TAPE RETURNS TO ITS ORIGINAL FLAT CONFIG. & DISENGAGES ITSELF FROM THE TANK). ENGR'G IS DEVELOPING A NEW TYPE OF MASKING THAT DOES NOT RELY ON TAPE FOR ADHESION. ESO 3610-84-006 HAS BEEN INITIATED TO DEVELOP THE NEW TOOLING RESPONSIBILITY ESTIMATED COMPLETION DATE IS 1-10-85. 3/6/85 STATUS AT PRB MTG 2-25-85 AS FOLLOWS - C/A INVOLVES USE OF VACUUM TOOLS INSTEAD OF MASK-					

ING TAPE. TOOL FOR LH2 IS ON BOARD. MMC WAITING TO RECEIVE LO2 TOOL ECD FOR CAPS CLOSURE IS APPROX 1 MONTH. 6/5/85 PRB STATUS 4-16-85 MTG - CA INVOLVES USE OF VACUUM FORM TOOLS INSTEAD OF MASKING TAPE. HAVE LH2 TOOL. LO2 TOOL TO BE AVAILABLE ON 4-19-85. ECD FOR CAPS CLOSURE IS 6-30-85. 6/5/85 PRB STATUS 5-16-85 MTG - CA INVOLVES USE OF VACUUM FORM TOOLS INSTEAD OF MASKING TAPE. HAD LH2 TOOL. LO2 TOOL RECENTLY REC'D (3 WKS LATE). NEED WINDOW IN PRODUCTION SCHEDULE TO VERIFY TOOLS. ECD FOR CAPS CLOSURE EXTENDED TO 7-30-85. 7/2/85 STATUS AT PRB MTG 6-20-85 AS FOLLOWS - VERIFICATION OF VACUUM FORM TOOLS BY 6-28-85. MMC EXPECTED TO HAVE THIS CAPS CLOSED BY 7-18-85. 8/15/85 PRB STATUS - NEW TOOLING CHECKED OUT & FOUND TO BE UNACCEPTABLE. CAPS BEING UPDATED TO INITIATE A REVISION TO PROCESS INSTRUCTIONS (PI'S) TO REQUIRE CUTTING OF MASKING TAPE INSTEAD OF TEARING IT. 10/23/85 - PROBLEM RESULTED FROM SOFI DUST CONTAMINATION WHICH PREVENTED THE TAPE FROM STICKING, AND TEARING, INSTEAD OF CUTTING THE TAPE. RESOLUTION - THE CAUSE OF THE TAPE ADHESION FAILURES DURING SOFI SPRAY OPERATIONS WAS CONTAMINATED SUBSTRATES AND THE TEARING OF MASKING TAPE. WHEN THE TAPE WAS TORN, IT BECAME DISTORTED. DURING THE SPRAY OPERATIONS THE TAPE WAS HEATED AND RETURNED TO ITS ORIGINAL FLAT CONFIGURATION. THIS RESULTED IN TAPE ENDS STICKING OUT WHICH WERE THEN BLOWN OFF OF THE TANK BY THE SOFI SPRAY GUNS. PI'S 1512-2 AND 1523 ARE BEING REVISED BY PAC AND A PRODUCTION TIP WAS ISSUED TO ASSURE VERIFICATION OF SUBSTRATE CLEANLINESS AND CUTTING OF TAPE. RECOMMEND THIS PROBLEM REPORT BE CLOSED. 1/11/85 RESOLUTION (ADDENDUM) - IT WAS DETERMINED AS FAR BACK AS 7-8-83 (SEE CLOSURE STATEMENT OF TASK II TO THIS CAPS) THAT CONTAMINATION UNDERNEATH THE TAPE, COUPLED WITH DISTORTION OF TAPE CAUSED BY TEARING, WAS THE CAUSE OF FAILURE. THE INTERIM CORRECTIVE ACTION WAS TO VERIFY CLEAN- LINESS OF SUBSTRATE PRIOR TO MASKING, AND TO REQUIRE THAT TAPE BE CUT INSTEAD OF BEING TORN. THIS CORRECTIVE ACTION HAS BEEN USED SUCCESSFULLY ALL THE WHILE MMC WAS TRYING TO DEVELOP MASKING TOOLS EFFORT TOWARD DEVELOPMENT OF MASKING TOOLS WAS CANCELLED 7-3-85 BECAUSE THE NEW MASKING TOOLS CREATED SHADOWING PROBLEMS RESULTING IN UNDERSPRAY, AND THIN FOAM AREAS ON THE TANK. AT THIS POINT IN TIME MMC DECIDED TO REVISE PI'S 1512-2 AND 1523 TO INCLUDE VERIFICATION OF SUBSTRATE CLEANLINESS PRIOR TO MASKING, AND TO REQUIRE CUTTING THE TAPE INSTEAD OF TEARING IT. PRODUCTION TIP 073 WAS ISSUED ON 7-16-85 AS AN INTERIM CORRECTIVE ACTION. THE MMC ADVANCED MANUFACTURING TECHNOLOGY (AMT) GROUP IS REVISING PI'S 1512-2 AND 1523 ON A CONVENIENCE BASIS PAC AMT 3993-85-0376 WILL TRACK THIS ACTION TO COMPLETION. INsofar AS THE DESCRIBED CORRECTIVE ACTION HAS BEEN PROVEN SUCCESSFUL, AND THE FACT THAT MMC HAS A CLOSED LOOP SYSTEM FOR IMPLEMENTING CHANGES, IT IS RECOMMENDED THAT THIS PROBLEM REPORT BE CLOSED. 12/17/85 RESOLUTION (ADDENDUM) - PI'S 1512-2 AND 1523 HAVE BEEN REVISED AND ARE NOW IN PLACE IN THE SYSTEM. COPIES ARE FILED WITH THIS PROBLEM REPORT RECOMMEND CLOSING THIS PROBLEM REPORT

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System ASSESSMENT ADDENDUM REPORT

MSFC Report#	IFA#	Contractor RPT#	JSC#	KSC#	EICN#
A06364	--	T-031	--	--	--
Asmnt Part#	Asmnt Part Name	Asmnt Serial/Lot#			
N/A	SOFI ON ET	N/A			
HCRIT CD	FCRIT CD	CAUSE CD	FAIL MODE		
--	1	MAW - MFG-ASY-WORK	UC - UNSAT		
Asmnt FMEA	Asmnt FM	FMEA CSE	FMEA SCSE		

5.5.2.2	2	B	3
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --
Correlated Part# --	Correlated Part# --	Correlated Part# --	
Associated LRU# --	Associated LRU# --	Associated LRU# --	
MAJOR DESIGN CHANGES			
APRV DATE --	DESCRIPTION OF CHANGES --		
ASSESSMENT TEXT			

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06655	In-Flight Anomaly Number --	Contractor Report Number E-074	JSC# --	KSC# --
Problem Title INTERNAL SLEEVE SEPARATED, RSS CONN				
EICN# --	ELEMENT ET	Contractor MMSS	FSCM# --	FCRIT 1R
HCRIT --	Sys_Lvl Y	Misc Codes A (1) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE COAXIAL TEE CONN	PART# UG-107B/U	SER/LOT# N/A	MANUFACTURER AMPHENOL
Test/Operation M - MFG	Prevailing Condtion F - FUNCTIONAL	F / U F	Fail Mode EA - FAILS OFF	Cause MA - MFG-ASY
System ELECTRICAL	Defect DD - DETACH	Material E - EL C/W	Work Contact C. LYNCH	Fail Date 05/09/1983
Received at MSFC 06/17/1983	Date Isolated --	FMEA Reference 3.2	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom UC - UNSAT		Time Cycle --
Effectivity Text NONE				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/13/1995	CN RSLV SBMT 12/07/1983	Defer Date --	Add Date --	R/C Codes 2 - MFG -- --
Assignee				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project R. ABRAHAM	Project MGR --
Approval				
Design	Chief Engineer	S & MA	Project	Project MGR

G. PLATT	--	D. NEWMAN	R. ABRAHAM	--	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 12/22/1983	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: DURING TESTING OF RSS ANTENNA CABLE ASSYS IN THE MAF HARNESS FAB SHOP, A UG-107B/U COAXIAL TEE BECAME PARTIALLY DISASSEMBLED DURING DEMATE. AN INTERNAL SLEEVE SEPARATED FROM THE CONNECTOR. EVALUATION OF THIS PROB CONCLUDED THAT IT IS POSSIBLE FOR THE CABLES TO BE ASSEMBLED WITH SLEEVES MISSING FROM THE COAXIAL TEE CONNECTORS					
Contractor Investigation/Resolution CAUSE - VENDOR ERROR. PART WAS NOT PROPERLY SWAGED. 6/7/83 - STS-7, ET-6 LAUNCH CONSTRAINT IS LIFTED BASED ON THE FOLLOWING RATIONALE: ENGR'G & RELI- ABILITY ANALY HAVE DETERMINED THAT TESTING AT KSC WOULD HAVE IDENTIFIED A RSS PROB. ADDITIONALLY DYNAMICS TESTING SHOWED DISCREPANT PART REMAINED INTACT WITH NO SHORTS. THEREFORE THE AS-TESTED & VERIFIED CONNECTORS ON ET-6 ARE ACCEPTABLE FOR FLT. THIS CHANGE HAS BEEN COORDINATED WITH PROJ. OFFICE - ____G. P. BRIDWELL____. 7/22/83 - STS-8, LWT-2 LAUNCH CONSTRAINT IS LIFTED BASED ON THE SAME RATIONALE AS STATED ABOVE FOR STS-6; THIS CHANGE HAS BEEN COORDINATED WITH THE ET PROJ. OFFICE - ____G. P. BRIDWELL____. 9/9/83 - STS-9, LWT-4 LAUNCH CONSTRAINT IS LIFTED BASED ON THE SAME RATIONALE AS STATED ABOVE FOR STS-7. THIS CHANGE HAS BEEN COORDINATED WITH THE ET PROJ. OFFICE - ____G. P. BRIDWELL____ 11/21/83 PRB STATUS - ENGR'G ANALY DETERMINED TESTING AT KSC ADEQUATE TO IDENTIFY A FUNCTIONAL PROB REGARDLESS OF SLEEVE DISCREPANCY. MCC WILL CLOSE 11-30-83. 12/9/83 RESOLUTION - THE DISCOVERY OF A DEFECTIVE COAXIAL TEE CONNECTOR OCCURRED IN THE MAF HARNESS FAB SHOP. THE DEFECT WAS THE RESULT OF THE VENDOR'S FAILURE TO					

PERFORM AN ASSY OPERATION DURING MFR OF THE DEFECTIVE CONNECTOR. ENGR'G EVALUATION OF THE DEFECT DETERMINED THAT THE NORMAL TEST PROCEDURES ACCOMPLISHED AT KSC WOULD DETECT ANY ADVERSE ELECTRICAL EFFECTS OF A DEFECTIVE CONNECTOR. VIB. TESTING OF THE DEFECTIVE CONNECTOR FOUND THAT THE NORMAL TEST PROCEDURES ACCOMPLISHED AT KSC WOULD DETECT ANY ADVERSE ELECTRICAL EFFECTS OF A DEFECTIVE CONNECTOR. VIB. TESTING OF THE DEFECTIVE CONNECTOR FOUND THAT THERE WERE NO ADVERSE MECHANICAL EFFECTS RESULTING FROM AN INSTALLED DEFECTIVE CONNECTOR. AS A RESULT OF THE ENGR'G EVALUATION OF THE ELECTRICAL EFFECTS & THE VIB. TESTING, NO CONSTRAINTS WERE PLACED ON ANY DELIVERED VEHICLES. DC&R INSPECTIONS WERE PERFORMED AT MAF ON EVERY CONNECTOR IN THE PLANT & NO ADDITIONAL DEFECTIVE CONNECTORS WERE FOUND. RESOLUTION - MAF QUAL REC'G ACCEPTANCE PLAN WAS REVISED TO INSPECT THE INCOMING PARTS FOR THE DEFECT. THE VENDOR HAS ADDED INSPECTION STEPS TO THE CONNECTOR MFR'G PROCESS IN ORDER TO PREVENT A RECURRENCE. MAF TESTING WOULD NOT HAVE DETECTED PROBS CAUSED BY A MISSING/LOOSE SLEEVE, BECAUSE THE RSS ANTENNAS WERE STILL BEING INSTALLED AT KSC. AT THIS TIME THE ANTENNAS ARE BEING INSTALLED AT MAF, BUT THE SUBJECT TEST HAS NOT YET BEEN APPROVED BY KSC RANGE SAFETY. APPROVAL OF MAF UTILIZING THESE RSS FREQUENCIES IS ANTICIPATED FOR LWT-11 & UP. 12/12/83 - CLOSURE DISTRIBUTED

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06655	IFA# --	Contractor RPT# E-074	JSC# --	KSC# --	EICN# --
Asmnt Part# 80933003704-060	Asmnt Part Name ET RSS CABLE	Asmnt Serial/Lot# N/A			
HCRIT CD --	FCRIT CD 1R	CAUSE CD MA - MFG-ASY	FAIL MODE MS - STRUCT		
Asmnt FMEA N/A	Asmnt FM N/A	FMEA CSE N/A	FMEA SCSE N/A		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06656	In-Flight Anomaly Number --	Contractor Report Number T-032	JSC# --	KSC# --
Problem Title SOFI TENSILE TESTING ERRORS				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 3
HCRIT --	Sys_Lvl N	Misc Codes A B (X) C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE TENSION TESTOR	PART# T34K230	SER/LOT# N/A	MANUFACTURER MMA
Test/Operation L - FLD	Prevailing Condition F - FUNCTIONAL	F / U UC	Fail Mode MSI - INSULATION	Cause ETT - EI-TEST-EQUP
System TPS	Defect --	Material F - INSUL	Work Contact J. GUZMAN	Fail Date 05/01/1983
Received at MSFC 06/07/1983	Date Isolated --	FMEA Reference 1.2	IFA: Mission Phase --	Mission Elapsed Time --
Location KSC		Symptom MI - INSULATION		Time Cycle --
Effectivity Text LWT-5 & SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 05/16/1990	CN RSLV SBMT 09/15/1983	Defer Date --	Add Date --	R/C Codes 3 - F/TE -- --
Assignee				
Design B. DAVIS	Chief Engineer --	S & MA D. NEWMAN	Project G. CAVALARIS	Project MGR --
Approval				
Design B. DAVIS	Chief Engineer --	S & MA D. NEWMAN	Project P. BRIDWELL	Project MGR --

PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 10/28/1983	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: TENSILE TEST FAILURES OF SOFI, WHICH WERE INITIALLY THOUGHT TO BE DUE TO MTRL PROPERTIES, PROVED TO BE DUE TO A COMBINATION OF FACTORS IN THE TEST ITSELF. THIS HAS RESULTED IN UNNECESSARY MRB ACTION & THE EXPENDITURE OF MANHRS TO INVESTIGATE THE CAUSES OF THE TEST FAILURES (REF F/A T-57792)					
Contractor Investigation/Resolution CAUSE - (1) TOOLS ARE INADEQUATE, (2) PERSONNEL NOT USING CORRECT TECHNIQUES. 10/5/83 - RESOLUTION - THE PROBLEM OF POOR BOND TENSION TEST VALVES DUE TO TOOLING AND TECHNIQUE DIFFICIENCIES BECAME APPARENT DURING THE INVESTIGATION INTO CPR-488 FAILURE ON LWT-8 LH2 BARRELL CELL C IN THAT CASE, FALSE READINGS OF LOW STRENGTH FOAM INDICATED THE PROBLEM WAS MUCH MORE EX- TENSIVE THAN WAS ACTUALLY THE CASE, AND COMPLICATED FAILURE ANALYSIS. RECURRENCE CONTROL: (1) TOOLING USED TO OBTAIN TEST SAMPLES MODIFIED EXTENSIVELY TO ASSURE BETTER QUALITY TEST SPECIMENS. INSPECTION OF SAMPLE CUTTERS TO ASSURE QUALITY SAMPLES ARE ANALYZED. (2) TECHNIQUE FOR USE OF TPS MEASURING EQUIPMENT ASSURED BY CLASSES FOR PERSONNEL ON PROPER USE OF EQUIPMENT. 10/4/83 - CLOSURE DISTRIBUTED					
MSFC Response/Concurrence					

MSFC Report# A06656	IFA# --	Contractor RPT# T-032	JSC# --	KSC# --	EICN# --
Asmnt Part# T34K	Asmnt Part Name TENSION TESTER	Asmnt Serial/Lot# N/A			
HCRIT CD --	FCRIT CD 3	CAUSE CD ETT - EI-TEST-EQUIP	FAIL MODE MI - INSULATION		
Asmnt FMEA N/A	Asmnt FM N/A	FMEA CSE N/A	FMEA SCSE N/A		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06743	In-Flight Anomaly Number --	Contractor Report Number T-034	JSC# --	KSC# --
Problem Title VOIDS IN FOAM				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 2
HCRIT --	Sys_Lvl Y	Misc Codes A (2) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE EXTERNAL TANK	PART# 82601000000	SER/LOT# LWT-4	MANUFACTURER MMC
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LH2 AFT DOME SOFI	PART# 80974048409	SER/LOT# N/A	MANUFACTURER NCFI
Test/Operation M - MFG	Prevailing Condition N - INSPECTION	F / U --	Fail Mode MXC - FLOW ANOM-CV	Cause MPE - MFG-PRC-ENVR
System TPS	Defect CX - VOID	Material F - INSUL	Work Contact J. GUZMAN	Fail Date 06/20/1983
Received at MSFC 06/28/1983	Date Isolated --	FMEA Reference 1.2.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom MI - INSULATION		Time Cycle --
Effectivity Text LWT-23 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 03/17/1992	CN RSLV SBMT 10/11/1984	Defer Date --	Add Date --	R/C Codes 1 - DES -- --
Assignee				
Design B. DAVIS	Chief Engineer --	S & MA D. NEWMAN	Project G. CAVALARIS	Project MGR --
Approval				
Design	Chief Engineer	S & MA	Project	Project MGR

B. DAVIS	--	D. NEWMAN	G. CAVALARIS	--	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 10/26/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -----	Software Fail CD --	SUBTYPE --	Software Closure CD --	
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: VOIDS IN FOAM OVER BOSSES AROUND LH2 AFT DOME SIPHON MANIFOLD. THE VOIDS WERE FOUND ON LWT-4 & LWT-7 & HAVE BEEN LIMITED TO THE BOSSES NEAREST THE APEX OF THE DOME. THESE VOIDS WERE WITHIN THE AREA TO BE CLOSED OUT. WITH SLA & BX250 FOAM					
Contractor Investigation/Resolution CAUSE - TENDENCY OF FOAM TO LIFT-OFF SHARP CORNERED PROTUBERANCES WHEN SPRAYED IN THE THICK LAYERS. 11/8/83 - STS-9, LWT-4 LAUNCH CONSTRAINT IS LIFTED BASED ON THE FOLLOWING RATIONAL. DEBOND IN BOSS AREA WOULD PRESENT NO PROB DURING LAUNCH, BOSS HAS ADEQUATE HEAT SINK TO PREVENT UNACCEPTABLE TEMP RISE CORE SAMPLES FOR TEST WOULD REQUIRE CLOSE OUT THAT COULD RESULT IN INFERIOR, CLOSEOUT THAN EXISTING IN PRESENT "VOIDS IN FOAM" CONDITION. THERMAL & STRESS AGREE EXISTING CONDITION SHOULD REMAIN INTACT AS IS. THEREFORE THIS LAUNCH CONSTRAINT IS LIFTED. THIS CHANGE HAS BEEN CO-ORDINATED WITH THE E.T. PROJ OFFICE - ____G. P. BRIDWELL 11-9-83____. 11/21/83 PRB STATUS - LOOKING AT OPTIONS IN PROCESS TO ELIMINATE VOIDS - TANKING TEST CLEARED LWT-4,REVISED CAPS IN PROCESS TO EXPAND ANALY & C/A. MSFC TO RECEIVE REVISED CAPS NEXT WK 1/6/84 - LAUNCH CONSTRAINT FOR STS-11, LWT-3 IS LIFTED BASED ON THE SAME RATIONALE AS STATED ABOVE FOR STS-9, LWT-4. THIS CHANGE HAS BEEN COORDINATED WITH THE ET PROJ. OFFICE - ____G. P. BRIDWELL 1-10-84____ 2/23/84 - STS-13, LWT-5 LAUCH CONSTRAINT IS LIFTED BASED ON THE SAME RATIONAL AS STATED ABOVE FOR LWT-4. THIS CHANGE HAS BEEN COORDINATED WITH THE E.T. PROJECT OFFICE - ____G. P. BRIDWELL 2-24-84____.3/8/84 PRB					

STATUS - FOUND VOIDS IN NCFI FOAM OVER BOSSES AROUND LH2 AFT DOME SIPHON MANHOLE (LWT-4 & LWT-7). THERMAL ANALY DETERMINED THAT THE METAL THICKNESS OF THE BOSSES PROVIDES ADEQUATE THERMAL PROTECTION (HEAT SINK) IF VOIDS EXIST & POTENTIAL DIVOTS OCCURRED AFTER LAUNCH INSPECTION OF LWT-5 & 6 IS NOT WARRANTED SINCE POSSIBLE VOIDS ARE LESS DETRIMENTAL THAN THE REPAIR REQ'D IF FURTHER INSPECTION IS MADE. MMC TO PROVIDE THERMAL ANALY DATA TO MSFC (SEE ENCLOSURE 2, PRB ACTION ITEM ET-32). THREE DESIGN CHANGE OPTIONS ARE BEING CONSIDERED FOR RC: (1) CONTINUOUS BX-250 FOAM RAMP; (2) MACHINING THE BOSSES TO LESS ABRUPT SQUARENESS; & (3) INCREASING CLOSEOUT RADIUS. COST EVALUATIONS OF THE 3 OPTIONS ARE IN WORK. 4/19/84 - STS-14, LWT-6 LAUNCH CONSTRAINT IS LIFTED BASED ON SAME RATIONAL AS PREVIOUSLY STATED FOR LWT-4 & 5. THIS CHANGE HAS BEEN COORDINATED WITH THE ET PROJECT OFFICE - ____G. P. BRIDWELL____. 9/6/84 - PRB STATUS, ECD FOR CAPS CLOSURE 9-21-84 - DWG TO BE REVISED. 9/13/84 - STS-17, LWT-8 LAUNCH CONSTRAINT IS LIFTED BASED ON RATIONALE PREVIOUSLY STATED FOR LWT-4 & 5. THIS DECISION HAS BEEN CO-ORDINATED WITH THE ET PROJECT OFFICE - ____G. P. BRIDWELL____. 10/11/84 RESOLUTION - TPS ENGR'G ANALYSIS DETERMINED THAT VOIDS OVER THE MANHOLE BOSSES DO NOT CON- STITUTE AN UNACCEPTABLE CONDITION EVALUATION OF DESIGN OPTIONS TO ELIMINATE MRB REPAIR RESULTED IN ENLARGEMENT OF THE BX250 MANHOLE - CLOSEOUT (REF B017002). BX250 DOES NOT HAVE A MARKED TEND- ENCY TO LIFTOFF WHEN SPRAYED OVER SHARP CORNERS AS DOES NCFI FOAM. THERMAL REQMENTS OF THE CLOSEOUT AREA ARE LESS SEVERE BECAUSE OF THE GREATER THICKNESS OF BOSSES & SURROUNDING AREA, AS COMPARED TO THE REST OF THE AFT DOME. STATUS - LWT-4 THRU 22 ACCEPTABLE AS IS FOR USAGE, ENGR'G ANALYSIS DETERMINED VOIDS ARE LESS DETRIMENTAL THAN REPAIR, VOIDS DETECTED DURING NORMAL OPERATIONS. WILL BE REPAIRED WITH BX250. RECURRENCE CONTROL - LWT-23 & SUBS - ENLARGED BX250 CLOSEOUT WILL BE ACCOMPLISHED

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06743	IFA# --	Contractor RPT# T-034	JSC# --	KSC# --	EICN# --
Asmnt Part# 80974048409	Asmnt Part Name LH2 AFT DOME SOFI	Asmnt Serial/Lot# N/A			
HCRIT CD --	FCRIT CD 3	CAUSE CD MPE - MFG-PRC-ENVR	FAIL MODE MI - INSULATION		
Asmnt FMEA 5.1.1.2	Asmnt FM 2	FMEA CSE B	FMEA SCSE 3		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06789	In-Flight Anomaly Number --	Contractor Report Number S-060	JSC# --	KSC# --
Problem Title LH2 BARREL #1 OUT OF ROUND				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 3
HCRIT --	Sys_Lvl N	Misc Codes A (1) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE EXTERNAL TANK	PART# N/A	SER/LOT# N/A	MANUFACTURER MMC
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER MMC
HARDWARE NCA	NOMENCLATURE LH2 BARREL ASSY #1	PART# 80914800900	SER/LOT# N/A	MANUFACTURER MMC
Test/Operation M - MFG	Prevailing Condtion N - INSPECTION	F / U UC	Fail Mode MS - STRUCT	Cause MA - MFG-ASY
System STRUCTURAL	Defect MC - MISFIT	Material S - STRUCT	Work Contact C. VOGEL	Fail Date 03/04/1983
Received at MSFC 07/07/1983	Date Isolated --	FMEA Reference 1.1.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom MS - STRUCT		Time Cycle --
Effectivity Text LWT-17 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/10/1995	CN RSLV SBMT 06/04/1984	Defer Date --	Add Date --	R/C Codes 2 - MFG -- --
Assignee				
Design J. NICHOLS	Chief Engineer --	S & MA D. NEWMAN	Project M. PESSIN	Project MGR --
Approval				
Design J. NICHOLS	Chief Engineer --	S & MA D. NEWMAN	Project G. BRIDWELL	Project MGR --

PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 06/29/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -----	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: HYDROGEN TANK BARREL NO. 1 HAS AN OUT-OF-ROUND CONDITION ON THE 4 PANELS ADJACENT TO THE LONGERONS. THE PANELS FLATTEN TO A CURVATURE GREATER THAN 165.5 RADIUS OF DESIGN IN A LOCALIZED AREA APPROX. 3 FT WIDE BY 5 FT LONG. THE DESIGN REQ'S THE OSL DIA OF THE BARREL BE 331.000 TRUE WITHIN .125					
Contractor Investigation/Resolution CAUSE - SUSPECTED CAUSE IS INCOMPLETE FORMATION OF PANEL CURVATURE IN THE 3X5 AREA WHILE THE HB1 WELD LAND HAS LITTLE OR NO FORMATION. OTHER POSSIBLE CAUSES ARE: A) WELD OPERATIONS; B) CHILL BAR ADLIGNMENT; C) PANEL TO LONGERON ALIGNMENT PRIOR TO WELDING. 3/8/84 PRB STATUS - INVOLVES 4 PANELS ADJACENT TO THE LONGERONS. CAUSED BY A CUMULATIVE EFFECT OF MFR'G PROCESSES INCLUDING PANEL CURVATURE FORMATION, WELD SETUP & WELD SHRINKAGE. CONSIDERING ESTABLISHING CRITERIA FOR USE-AS-IS. ALSO LOOKING AT PANEL FORMING TECHNIQUE. MMC EXPECTS TO HAVE CAPS CLOSED BY 4-2-84. 6/4/84 RESOLUTION - PANEL FORMATION WAS DETERMINED TO BE A SIGNIFICANT CONTRIBUTOR TO THE OUT-OF- ROUND CONDITION SEEN IN BARREL NO. 1 ADJACENT TO THE LONGERONS. CURVATURE IS INITIALLY FORMED INTO THE PANELS WITH A BUMP PRESS. IMPROVEMENTS WERE INITIALLY MADE TO THIS PROCESS IN CAPS S-056 WHICH INCORP'D SHIMS TO PROVIDE BETTER FORMATION IN THE MEMBRANE AREA. ADDITIONAL ACTION WAS TAKEN HERE IN CHANGING THE PROCESS TO FORM TO A TIGHTER RADIUS (158") ENGR'G INVESTIGATIONS REVEALED THAT PANELS FORMED TO THE SMALLEST RADIUS, PERMITTED BY ENGR'G TOLERANCES, I.E., 151.00" RADIUS, IMPROVED THE WELD LAND CONTOUR WITHOUT ADVERSELY IMPACTING THE LONGERON TO PANEL					

FIT SINCE ENOUGH FLEX WAS AVAILABLE IN THE PANELS TO ENSURE A PROPER FIT. ANALY CONDUCTED DURING THIS CAPS DETERMINED THAT THE AVG DEVIATION FOR PANELS FORMED PER CAPS S-056 PROCEDURES (AFTER WELDING IN 5015 FIXTURE) WAS .129". WITH PANELS FORMED TO THE TIGHTER RADIUS PER THIS CAPS (S-060) THE AVG DEVIATION AFTER WELDING WAS .098. THIS AVG IS BELOW THE TOLERANCE OF .120" BUT BECAUSE OF RANDOMNESS EVERY BARREL FAB'D HAS HAD SOME VIOLATIONS & THUS A MARS. EVERY MARS WRITTEN FOR THIS HAS BEEN DISPOSITIONED USE-AS-IS & THUS THE FINAL ACTION SHALL BE THE PURSUIT OF A TOLERANCE CHANGE. CORRECTIVE ACTION SUMMARY - LWT-5 THRU 16 SHIMS ADDED TO FORMING (CAPS S-056). RECURRENCE CONTROL - LWT-17 & UP - S-056 ACTION PLUS FORMING (CAPS S-060) PANELS TO 158" RADIUS. LWT-17-19 BARRELS HAVE BEEN ASSEMBLED, USING PANELS FORMED TO THE 151.00" RADIUS, RESULTING IN AN EASIER & QUICKER MATE WITH A MINIMUM OF PROBS

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06789	IFA# --	Contractor RPT# S-060	JSC# --	KSC# --	EICN# --
Asmnt Part# 80914800900	Asmnt Part Name LH2 BARREL ASSY #1	Asmnt Serial/Lot# N/A			
HCRIT CD --	FCRIT CD 1	CAUSE CD MA - MFG-ASY	FAIL MODE MS - STRUCT		
Asmnt FMEA 6.2.1.1	Asmnt FM 1	FMEA CSE A	FMEA SCSE 3		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06816	In-Flight Anomaly Number --	Contractor Report Number E-077	JSC# --	KSC# --
Problem Title LH2 ULLAGE PRESSURE TRANSDUCER STUCK				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 1R
HCRIT --	Sys_Lvl Y	Misc Codes A (1) B C D E F G (X) H I J K L M N O		
HARDWARE EIM	NOMENCLATURE EXTERNAL TANK	PART# 82601000000	SER/LOT# HWT-6	MANUFACTURER MMC
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LH2 ULL PRES TRNSDCR	PART# PD7400098-039	SER/LOT# 0000764	MANUFACTURER GULTON
Test/Operation L - FLD	Prevailing Condtion F - FUNCTIONAL	F / U F	Fail Mode EA - FAILS OFF	Cause ETE - EI-TEST-ENVR
System ELECTRICAL	Defect XU - UNK	Material B - CIRCBD	Work Contact J. ADAMS	Fail Date 06/18/1983
Received at MSFC 07/26/1983	Date Isolated --	FMEA Reference 3.1.2.9	IFA: Mission Phase --	Mission Elapsed Time --
Location KSC		Symptom EA - FAILS OFF		Time Cycle --
Effectivity Text LWT-2 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 06/18/1992	CN RSLV SBMT 01/04/1984	Defer Date --	Add Date --	R/C Codes 4 - TEST -- --
Assignee				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project R. ABRAHAM	Project MGR --
Approval				

Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project R. ABRAHAM	Project MGR --	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 01/20/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -----	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: LH2 ULLAGE NO. 2 PRESS. SENSOR STUCK AT 33 PSIA FROM T +120 SECS TO T +390 SECS. THIS ALLOWED THE LH2 ULLAGE PRESS. TO DROP TO 31.8 PSIA, WHICH IS 0.2 PSI BELOW THE MINIMUM OPERATING CONTROL BAND. MMC IS CURRENTLY INVESTIGATING THE SENSOR PROB					
Contractor Investigation/Resolution CAUSE - EXACT CAUSE OF THE STS-7 IN-FLT ANOMALLY CANNOT BE DETERMINED AT THIS TIME. C/A WILL ADDRESS SCREENING FOR THE MOST PROBABLE FAILURE MODES. 7/22/83 - STS-8, LWT-2 LAUNCH CONSTRAINT IS LIFTED BASED ON THE FOLLOWING RATIONALE: LWT-2 PRESSURESENSOR HAS BEEN TESTED THRU THE PRESS. CHANGES EXPERIENCED DURING FLT CONDITIONS WITH NO DISCREPANCIES. THIS CHANGE HAS BEEN COORDINATED WITH THE ET PROJ. OFFICE - ____G. P. BRIDWELL____. 9/27/83 - STS-9, LWT-4 LAUNCH CONSTRAINT IS LIFTED BASED ON THE SAME RATIONALE AS STATED FOR STS-8 ABOVE, LWT-4 HAS ALSO BEEN TESTED UNDER FLIGHT PRESSURE CHANGE CONDITIONS. THIS CHANGE HAS BEEN CO-ORDINATED WITH THE ET PROJECT OFFICE - ____G. P. BRIDWELL____. 11/21/83 PRB STATUS - ONLY ITEM OPEN IS INSPECTION OF LWT-3; EXPECT TO CLOSE 11-30-83. 1/4/83 RESOLUTION - DUE TO THE IN-FLT NATURE OF THE ORIGINAL FAILURE & THE FACT THAT NO SIMILAR FAILURES WERE KNOWN TO HAVE OCCURRED, THE CAUSE OF THE FAILURE COULD NOT BE POSITIVELY IDENTIFIED. THEORETICAL ANALY OF THE TRANSDUCER FAILURE MODES, INDICATED THAT INTERNAL CONTAMINATION OF THE TRANSDUCER COULD RESULT IN SUCH A FAILURE. REVIEW OF THE VENDOR'S MFR'G PROCESSES FOUND					

THAT ADEQUATE SAFEGUARDS ALREADY EXIST TO INSURE THAT COMPLETED TRANSDUCERS ARE FREE OF CONTAMINATION. RECURRENCE CONTROL - IN ORDER TO PREVENT A RECURRENCE OF THE FAILURE, THE VENDOR'S ACCEPTANCE TEST PLAN NOW INCLUDES A TEST IMPROVEMENT TO SCREEN FOR FAILURES SIMILAR TO THAT WHICH OCCURRED IN FLT. ALL TRANSDUCERS PRODUCED PRIOR TO THE ATP IMPROVEMENT, & NOT YET FLOWN, WERE TESTED IN A MANNER SIMILAR TO THAT USED IN THE IMPROVED ATP. THIS TESTING HAS NOT DISCOVERED A SINGLE SIMILAR FAILURE. 1/5/84 - CLOSURE DISTRIBUTED

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System

ASSESSMENT ADDENDUM REPORT

MSFC Report# A06816	IFA# --	Contractor RPT# E-077	JSC# --	KSC# --	EICN# --
Asmnt Part# PD7400098-039	Asmnt Part Name GH2 ULL PRES TRNSDCR	Asmnt Serial/Lot# 764			
HCRIT CD --	FCRIT CD 1R	CAUSE CD U - UNKNOWN	FAIL MODE EQ - OUTPUT ERROR		
Asmnt FMEA 3.4.1.1	Asmnt FM 1	FMEA CSE E	FMEA SCSE 1		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06858	In-Flight Anomaly Number --	Contractor Report Number S-062	JSC# --	KSC# --
Problem Title MISALIGNMENT SRB FITTINGS, EB-1 TO EB-7				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 1
HCRIT --	Sys_Lvl N	Misc Codes A (0) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE EXTERNAL TANK	PART# 82601000000	SER/LOT# LWT-6	MANUFACTURER MMC
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LH2 TANK	PART# 80911000000	SER/LOT# LWT-6	MANUFACTURER MMC
Test/Operation M - MFG	Prevailing Condtion N - INSPECTION	F / U UC	Fail Mode MS - STRUCT	Cause DH - DES-HDW
System STRUCTURAL	Defect MD - M SIZE	Material S - STRUCT	Work Contact C. VOGEL	Fail Date 05/03/1983
Received at MSFC 07/18/1983	Date Isolated --	FMEA Reference 1.1.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom MU - MECH TOLRNCE		Time Cycle --
Effectivity Text LWT-6 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/10/1995	CN RSLV SBMT 08/21/1987	Defer Date --	Add Date --	R/C Codes 2 - MFG -- --
Assignee				
Design J. WHITE	Chief Engineer J. NICHOLS	S & MA R. JACKSON	Project M. PESSIN	Project MGR --
Approval				
Design B. DAVIS	Chief Engineer J. NICHOLS	S & MA R. JACKSON	Project M. PESSIN	Project MGR --

PAC Assignee J.EL-IBRAHIM	PAC Review Complete JE	MSFC Closure Date 09/24/1987	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -----	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: 1) INTERTANK/LH2 MISALIGNMENT WAS DISCOVERED IN CELL 'A'. THE FWD SRB FITTING (EB-1) WAS MIS- ALIGNED WITH THE AFT SRB FITTING (EB-7) OUT-OF-TOL BY .090. 2) LH2 TANK WELDMENT MISALIGNMENT, BARRELS RELATIVE TO AFT DOME & FWD DOME RELATIVE TO AFT DOME WERE FOUND MISALIGNED SUBSEQUENTLY LH2 BARREL #3 WAS FOUND MISCLOCKED .270 & THE FWD DOME MIS- CLOCKED BY .164 ON LWT-8					
Contractor Investigation/Resolution R/C: 1) MMC HAS IMPROVED CLOCKING AND TACK WELDING PROCEDURES DURING MANUFACTURING 2) MMC HAS IMPLEMENTED SCRIBE LINE CLOCKING PROCEDURE TO PREVENT MISALIGNMENT. CAUSE: 1) THE CAUSE OF MISALIGNMENT OF THE SRB FITTINGS, FORWARD TO AFT, WAS DETERMINED TO BE MISCLOCKING OF THE LH2 FORWARD DOME. 2) MISALIGNMENT SEEN IN THE LH2 BARREL AND T-RING ASSEMBLY WAS CAUSED BY INADEQUATE ASSEMBLY PROCEDURE. OPTICAL ALIGNMENT OF BARRELS AND T-RINGS WAS SUS- CEPTIBLE TO MISALIGNMENT DUE TO THE AWKWARD POSITIONING OF THE INSTRUMENTS. THE ACCURACY OF THE LINE OF SIGHT USED BY INSPECTION AFTER COMPLETION OF ASSEMBLY WAS AFFECTED BY THE POSITIONING OF THE.875 FEEDLINE HOLE ON THE FORWARD DOME. 9/6/84 - PRB STATUS, MMC TO HOLD CAPS OPEN TO REVIEW LWT 23 & 24 TECHNIQUE & ALIGNMENT. CHECKING MISUSE OF TOOLING. 3/6/85 STATUSED AT PRB MTG 2-25-85 AS FOLLOWS - MFG NOW USING REVISED CLOCKING PROCEDURE. MMC WANTS TO MONITOR ONE MORE TANK TO ASSURE PROCEDURES ARE OK. ECD FOR CLOSURE IS APPROX 5-6 WKS. 3/13/85 ET CLEARANCES - LWT-6 CLEARED USE AS IS, DAR MMC-ET-153 ISSUED LWT-7 NO MARS LWT-8,9, & 11 THE LH2 TANK MISCLOCKING WAS ACCEPTABLE WITH SPECIAL SRB FITTINGS & LO2 FEEDLINE					

FITTINGS. LWT-10 THE LH2 TANK MISCLOCKING WAS ACCEPTABLE WITH USE-AS-IS MRB DISPOSITION. LWT-12 LH2 TANK FWD DOME CLOCKED WITHIN TOLERANCES LWT-13 LH2 TANK FWD DOME CLOCKED WITHIN TOLERANCES. LWT-14 LH2 TANK FWD DOME CLOCKED WITHIN TOLERANCE 1871, T-FRAME MISCLOCKED (USE-AS-IS) LWT-15 LH2 TANK FWD DOME CLOCKED OUT OF TOLERANCE; (MRB UA1) LWT-16 LH2 TANK FWD DOME CLOCKED WITHIN TOLERANCE; 1623 T-FRAME & BBL. #1 MISCLOCKED (USE-AS-IS). LWT-17 LH2 TANK FWD DOME CLOCKED WITHIN TOLERANCE; T-FRAME BARREL MISCLOCKING (USE-AS-IS). LWT-18 LH2 FWD DOME CLOCKED WITHIN TOLERANCE; T-FRAME & BARREL MISCLOCKED (USE-AS-IS WITH SPECIAL LO2 FEEDLINE FITTING). LWT-19 LH2 FWD DOME CLOCKED WITHIN TOLERANCE; T-FRAME & BARREL MISCLOCKED (UAI WITH SPECIAL LO2 FEEDLINE FITTINGS). LWT-20 LH2 FWD DOME CLOCKED WITHIN TOLERANCE; ALL T-FRAMES CLOCKED WITHIN TOLERANCE; ONE BARREL LOCATION CLOCKED SLIGHTLY OUT (UAI). LWT-21 LH2 FWD DOME CLOCKED WITHIN TOLERANCE; ALL T-FRAMES & BARRELS CLOCKED WITHIN TOLERANCE. LWT-22 LH2 FWD DOME CLOCKED WITHIN TOLERANCE; TWO T-FRAMES OUT OF TOLERANCE, ONE BARREL SLIGHTLY OUT OF TOLERANCE (USE-AS-IS). LWT-23 LH2 FWD DOME CLOCKED WITHIN TOLERANCE; TWO T-FRAME OUT-OF-TOLERANCE, THREE BARRELS OUT-OF-TOLERANCE. LWT-24 LH2 FWD DOME CLOCKED WITHIN TOLERANCE. THREE RING FRAMES OUT-OF-TOLERANCE, THREE BARRELS OUT-OF-TOLERANCE. LWT-25 LH2 FWD DOME CLOCKED WITHIN TOLERANCE. T-RING STA. 1623 .019 00T & BBL. #3 .032 00T (BOTH UAI). 6/5/85 PRB STATUS 4-16-85 MTG - THIS PROBLEM HAS BEEN IDENTIFIED AS A .375 IN. DIA. HOLE BEING MISLOCATED. WILL CHANGE FORWARD DOME CLOCKING & TACK WELDING PROCEDURES. TO REMAIN OPEN UNTIL FIX IS VERIFIED. 6/5/85 PRB STATUS 5-16-85 MTG - FIRST PROBLEM ON CAPS RELATIVE TO MATING WITH SRB HAS BEEN COR- RECTED. THE 2ND PROBLEM INVOLVING LH2 TANK WELDMENT MISALIGNMENT/MISCLOCKING HAS NOT BEEN RESOLVED CAUSE(S) ARE UNKNOWN . 7/2/85 STATUSED AT PRB MTG 6-20-85 AS FOLLOWS - THERE IS AN ECR PENDING AGAINST THE BARREL PANELS. AT THE 5-16-85 PRB MTG AN ACTION ITEM (PRB ET-38) WAS GIVEN TO H JACOB/MMC/D3741 TO PREPARE A PRESENTATION TO CLARIFY THE CAUSE(S) OF THE LH2 TANK WELDMENT MISALIGNMENT/MISCLOCKING PROBLEM & TO BETTER DEFINE THE R/C ACTIONS. MR. JACOBS/MMC HAS PREPARED THE DATA, & MSFC WILL TRY TO ARRANGE FOR IT TO BE PRESENTED TO MR. J. NICHOLS/EE31 AT MMC ON 6-21-85. 8/15/85 PRB STATUS - CAPS ACTION ITEM TO INVESTIGATE SCRIBE-LINE ALIGNMENT TECHNIQUE INSTEAD OF OPTICS METHOD IS STILL OPEN MR. J. FINCHER/MMC TO ARRANGE MEETING WITH MR. NICHOLS/MSFC FOR BRIEFING ON R/C ACTIONS. ECD FOR CLOSURE OF THIS CAPS IS 10-20-85 10/25/85 PRB STATUS 10-17-85 - EACH DISCREPANCY IS WORKED ON A MARS HAVE TO CUSTOM MAKE PARTS TO ATTAIN PROPER ALIGNMENT. LATEST ACTION REQUIRES USE OF SCRIBE LINES ON COMPONENTS TO AID IN CLOCKING OF BARRELS. ECD IS 11-30-85. 11/21/85 PRB STATUS - SCRIBE LINE TOOLING IS COMPLETE AND WILL BE VERIFIED ON LWT-39. ECD IS FEBRUARY 1986. 1/16/86 PRB STATUS - NO CHANGE FROM STATUS OF 11-21-85 ABOVE ALTHOUGH ECD IS CHANGED TO 2-28-86. 3/20/86 PRB STATUS - SCRIBE LINE TECHNIQUE DID NOT SOLVE PROBLEM. FIRST LH2 TANK WELDED AFTER IMPLEMENTATION OF SCRIBE LINE PRODUCED AN OUT-OF-TOLERANCE TANK. MMC NOW INVESTIGATING A METHOD FOR VERIFYING CLOCKING BY USING THE FEEDLINE HOLES IN THE FORWARD AND AFT DOMES AS REFERENCE POINTS. ECD IS 5-30-86. 4/17/86 PRB STATUS - NEW TASKS OPENED TO INVESTIGATE SCRIBE LINE CLOCKING OF BARRELS AND T-RINGS; VERIFICATION OF HOLE ALIGNMENT - DOME FIXTURES; AND FORWARD DOME CHECK TOOL. ECD IS 6-18-86. 5/15/86 PRB STATUS - INVESTIGATION IS ONGOING. ECD CHANGED TO JULY 1986. 6/19/86 PRB STATUS - DEFERRED UNTIL NEXT PRB. MEETING RAN OUT OF TIME. 7/15/86 PRB STATUS - LWT-40 IS COMPLETED. PUTTING FWD DOME ON LWT-41. VERIFYING HOLE ALIGNMENT ON AFT DOME. THIS IS A PRODUCTION PROBLEM. CHECKED TWO DOMES, NEED ONE MORE CHECK TO VERIFY PROCEDURE. 5/28/87 - STATUS UPDATE - ASSESSMENT OF TOOLS, OPERATIONS, AND ENGINEERING RELATED TO CLOCKING OF BARRELS, DOMES, AND T-RINGS. ECD 7/25/87. 8/24/87 CLOSURE UPDATE - REF. CAPS S-062 C. TASK I GENERAL A. LWT-6 EXTERNAL TANK WAS FOUND TO BE MISCLOCKED IN CELL "A". A SHOP AID WAS THEN FABRICATED AND THE SRB BEAM WAS MEASURED RELATIVE TO THE INTERTANK FLANGE; THE +Y SIDE WAS .015

FROM NOMINAL AND THE -Y WAS .080. THE RELIABILITY OF THIS MEASUREMENT IS, HOWEVER, UNKNOWN BECAUSE IT WAS BASED UPON A NEWLY DESIGNED AND FABRICATED SHOP AID. THIS SHOP AID WAS SUBSEQUENTLY USED TO CHECK AN INTERTANK SUBASSEMBLY DURING FABRICATION, THE SRB BEAM WAS VERIFIED TO BE ALIGNED WITH .015. THE PROCEDURES THAT ALIGN THE BEAM IN THE INTERTANK INVOLVE HARD TOOLING, THUS MINIMIZING THE LIKELIHOOD OF ERROR. PROCEDURES THAT ALIGN THE HYDROGEN TANK FORWARD DOME INVOLVE OPTICS BEFORE TACKING. AN OPTICAL CHECK IS ALSO MADE AFTER WELDING IS COMPLETED. ON LWT-6, THE ORIGINAL ALIGNMENT WAS WITHIN .020 AND THE CHECK AFTER WELDING WAS VERIFIED PER REQUIREMENTS TO BE WITHIN .075. B LWT-8 LH2 TANK WELDMENT WAS CHECKED AND THE FOLLOWING MISALIGNMENTS RELATIVE TO THE AFT DOME WERE VERIFIED: POSITION MISALIGNMENT TOLERANCE FORWARD DOME .164 .075 BARREL NO. 3 .270 +/- .120 1623.8 CHORD .3 (APPROXIMATELY) +/- .120 THE FORWARD DOME ALIGNMENT TECHNIQUE BASICALLY ALIGNS REFERENCE POINTS NEAR +Y AND -Y PARALLEL TO THE AFT DOME REFERENCE PLANE. THE DOME IS THEN LOCKED IN PLACE ON ONE SIDE (+Y) WITH A PAIR OF TACK WELDS AND ALIGNMENT IS VERIFIED. TACK WELDING THEN PROCEEDS AROUND THE CIRCUMFERENCE. WITH THIS PROCEDURE, IT IS ESSENTIAL THAT THE OFF-SET BETWEEN THE COMPONENTS TO BE WELDED BE MINIMIZED OVER THE LENGTH OF THE WELD PRIOR TO ALIGNING. THIS MAY BE VERY DIFFICULT TO ACCOMPLISH AND MISALIGNMENT CAN OCCUR. THE ALIGNING OF LWT-9 FORWARD DOME WAS MONITORED. AN OFF-SET OF APPROXIMATELY .200 AT THE BOTTOM WAS NOTED DURING ALIGNMENT. THIS MAY HAVE BEEN SIGNIFICANT SINCE A MISCLOCKING OF .150 WAS FOUND AFTER TACKING AND WELDING. THE ABOVE IS CONSIDERED TO BE ONE OF MANY POSSIBLE CAUSES FOR MISALIGNMENT THAT NEEDS TO BE INVESTIGATED. TASK II LH2 ALIGNMENT THE FORWARD TO AFT DOME PROCEDURES FOR LWT-6 WERE ACCOMPLISHED ON THE 5019 FIXTURE. THE COMPLETED WELDMENT WAS THEN RECHECKED WITH EXTERNAL OPTICS AND FOUND TO BE WITHIN .020. ALIGNMENT PROCEDURES HAVE SINCE CHANGED SUCH THAT THE INITIAL ALIGNMENT IS ACCOMPLISHED ON THE 5068 WITH EXTERNAL OPTICS. LWT-8, WHICH FOLLOWED THIS PROCEDURE, WAS INITIALLY ALIGNED WITHIN .015 BEFORE TACKING. THE RECHECK AFTER WELDING DETERMINED THAT THE FORWARD DOME WAS MISCLOCKED WITH A READING OF .164 THIS CAPS SHALL BE CONCERNED WITH LH2 FORWARD DOME AND BARREL ALIGNMENT PROCEDURES FOR LWT-8 AND UP. INVESTIGATIONS INCLUDED THE FOLLOWING: A DETERMINED POSSIBLE FAILURE MODES IN THE OPTICAL ALIGNMENT TECHNIQUE THAT CAN INTRODUCE ERROR IN CLOCKING. B. INVESTIGATED THE AFFECTS OF TACKING AND WELDING ON ALIGNMENT. C. INVESTIGATED THE LOWER AFT SRB ALIGNMENT RELATIVE TO THE UPPER. CLOSURE STATEMENT CLOCKING AND TACKING PROCEDURES HAVE BEEN CHANGED ON THE FORWARD DOME INSTALLATION. THE PROBLEM HAS BEEN CORRECTED SINCE LWT-12 (REFERENCE MPP 80914000000, LWT-12). TASK III SRB - INTERTANK ALIGNMENT THE SRB IS ALIGNED TO THE INTERTANK WITH HARD TOOLING. INSPECTION OF THIS TOOLING WITH EXTERNAL OPTICS TO VERIFY ITS ALIGNMENT (MAY BE DONE IN CONJUNCTION WITH THE PI AND PM OF MAY, 1983). INSPECT THE INTERTANK - SRB ALIGNMENT FOR THE DURATION OF THIS CAPS UTILIZING THE SHOP AID WHICH ATTACHES TO THE FLANGE AT +Y AND -Y (THIS MEASUREMENT IS TO BE MADE IN THE 1ST POSITION ASSEMBLY). CLOSURE STATEMENT NO ALIGNMENT PROBLEM WITHIN THE INTERTANK WAS DETECTED (REFERENCE MEMORANDUM FROM G. SCARBOROUGH TO C. VOGEL, DATE JUNE 4, 1987). TASK IV CELL A - ALIGNMENT PROCEDURE EVALUATE TOOLING SETUP AND PROCEDURES FOR PROBLEM AREAS AND RECOMMEND IMPROVEMENT. CLOSURE STATEMENT TOOLING CHANGES WERE MADE IN THE PLUMB BOB FIXTURING USED WITH OPTICS (REFERENCE MEMORANDUM FROM T. CLAUSING TO C. VOGEL, DATED JUNE 11, 1987). TASK V T-RING AND BARREL ALIGNMENT SINGLE POINT UNDER THE FIXTURE OPTICS WAS ADDED TO THE 5019 WELD FIXTURE TO PROVIDE MORE ACCURATE T-RING AND BARREL ALIGNMENT. AN IMPROVEMENT WAS SEEN SUBSEQUENT TO THE CHANGE (LTS 20 AND 21). LATER EFFECTIVITIES, HOWEVER, AGAIN SHOWED A PROBLEM. IT IS SUSPECTED THAT THIS WAS RELATED TO PROCEDURES, THUS, THE FOLLOWING CHANGES SHALL BE MADE: PHASE I. THE LWT-25 LH2 (80914090960) MPP SHALL BE REDLINED TO SPECIFICALLY REQUIRE THAT THE CLOCKING SCRIBE MARKS INSTALLED DURING OPTICAL ALIGNMENT BE PLACED AT THE BOTTOM NEAR THE LINE OF SIGHT. THE

SCRIBE LINE SHALL BE APPLIED WITH A VIBRO MARKER AND SHALL BE APPROXIMATELY 2" LONG. A REDLINE SHALL ALSO STIPULATE HOW THE TACK WELDING OPERATION SHALL BE DONE. PHASE II. THE LWT-25 MPP, IN CONJUNCTION WITH PHASE I ABOVE, SHALL BE REDLINED FOR QC INSPECTION VERIFICATION OF THE FOLLOWING: - PROPER SCRIBE LINE APPLICATION PRIOR TO ANY ROTATION - SCRIBE LINE ALIGNMENT AFTER TACKING - SCRIBE LINE ALIGNMENT AFTER WELDING CLOSURE STATEMENT LWT-25 MPP WAS REDLINED AS INSTRUCTED. THE CABLE TRAY HOLES AND FEEDLINE HOLES WERE GROUPED TIGHTER TO THE LINE OF SIGHT FOR LT-25 THAN ON LWTs 22, 23, AND 24. THE MPPs FOR SUBSEQUENT BUILDS REFLECT THAT THE SCRIBE LINE BE APPLIED NEAR THE LINE OF SIGHT, MPPs HAVE ALWAYS, HOWEVER, REFLECTED THAT SCRIBE LINES BE VERIFIED AFTER TACKING FOR RELATIVE MOVEMENT (AND THIS HAS NOT BEEN A PROBLEM) (REFERENCE MPP 80914090960, LWT-25). TASK VI SCRIBE LINE CLOCKING OF BARRELS AND T-RINGS ALIGNMENT PROCEDURES WERE TIGHTENED UP AS OF LWT-25, HOWEVER, THIS PROVED TO BE INSUFFICIENT TO PROVIDE A CONSISTENTLY ACCEPTABLE PRODUCT. LWT-28 WAS CHECKED ON THE 5068 FIXTURE FROM TWO POSITIONS TO VERIFY THAT THE ORIENTATION OF THE INSTRUMENTS WAS NOT PROVIDING ERRONEOUS INFORMATION (IT WAS GOOD). AS OF LWT-30, CLOCKING DATA FROM LWT-17 AND UP WERE ANALYZED FOR FEASIBILITY OF CLOCKING WITH REAPPLIED SCRIBE LINES. TOOLING WAS ORDERED FOR THIS AND THE SCRIBE LINES WERE ADDED SUPPLEMENTARY TO OPTICS ON LWT-39 FOR EVALUATION. PRELIMINARY RESULTS ON LWT-39 SHOWS THAT THE SCRIBE LINES ARE A VIABLE FORM OF CLOCKING. THE SCATTER OF THE HOLE PATTERN IS ACCEPTABLE BUT THE PATTERN MOVES OFF AWAY FROM THE LINE OF SIGHT, THUS, CREATING AN OUT OF TOLERANCE CONDITION (THE SAME EFFECT OCCURRED WITH OPTICAL CLOCKING). THIS DRAWS SUSPICION TO THE PLACEMENT OF .875 AND .375 HOLES IN THE FORWARD AND AFT DOME CHORDS. EVALUATE THE EFFECTIVENESS OF PREAPPLIED SCRIBE LINES FOR CLOCKING BARRELS AND T-RINGS. REDLINE MPPs AND LWTs 40 AND 41 TO ACCOMPLISH THE EVALUATION CLOSURE STATEMENT REVISIONS WERE MADE TO LWTs 40 AND 41 MPPs. EVALUATION SHOWS THAT SCRIBE LINE ALIGNMENT IS A VIABLE PROCESS (REFERENCE MPP 80914090960 M009, ATTACHMENTS). TASK VII VERIFICATION OF HOLE ALIGNMENT - DOME FIXTURES THE .875 DIAMETER HOLE ON THE FORWARD DOME CHORD AND THE .375 DIAMETER HOLE ON THE AFT DOME CHORD ARE USED IN CLOCKING THE BARRELS AND T-RINGS. THE POSITIONS OF THESE HOLES RELATIVE TO OTHER FEATURES ON THEIR RESPECTIVE DOMES MAY HAVE AN EFFECT ON THE OVERALL CLOCKING READINGS MADE ON THE LH2 TANK. THE POSITIONING OF THE .875 HOLE RELATIVE TO THE Y AXIS BOLTING RING HOLES ON THE FORWARD DOME, AND THE .375 HOLE RELATIVE TO THE SRB ATTACH POINTS ON THE AFT DOME, DETERMINE THE CLOCKING RELATIONSHIP BETWEEN TWO SETS OF REFERENCES 1) .875 AND .375 HOLES FOR BARREL AND T-RING CLOCKING, AND 2) BOLTING RING HOLES AND SRB ATTACH POINTS FOR DOME CLOCKING. THE RELATED TOOLING USED IN DRILLING THE FORWARD AND AFT DOMES SHALL BE CHECKED USING A THEODOLITE INSTRUMENT AT THE FOLLOWING LOCATIONS: T02A7016: PROVIDE ANGLE READINGS FROM THE CENTER LINE OF THE FOLLOWING LOCATIONS TO +Z: S-2-3, S-3-3, R-14-5, R-13-5, R-14-4, R-15-4, -Z T02A7018: PROVIDE ANGLE READINGS FROM THE CENTER LINE OF THE FOLLOWING LOCATIONS TO +Z: +Y LOWER SRB PINHOLE; +Y UPPER SRB PINHOLE; .375 DIAMETER HOLE (REFERENCE 80914961960, SHEET 9, SECTION U-U), -Y LOWER SRB PINHOLE, -Y UPPER SRB PINHOLE. CLOSURE STATEMENT ANGULAR READINGS ON THE GIVEN FEATURES WERE TAKEN. NO SIGNIFICANT DEVIATIONS FROM NOMINAL WERE SEEN ON THE 7018. ON THE 7016 FIXTURE, REFERENCING OFF OF THE Z AXIS, ALL OTHER POINTS IDENTIFIED TO BE CHECKED RANGED FROM .0080 DEGREES TO .0149 DEGREES FROM NOMINAL (REFERENCE PA WORKSHEETS 96159 AND 123936). TASK VIII FORWARD DOME CHECK TOOL (.0875 HOLE) DESIGN AND FABRICATE A CHECK TOOL (SHOP AID) THAT WILL VERIFY THE PROPER LOCATION OF THE .875 DIAMETER HOLE IN THE 1129 CHORD TO THE S-2-3 AND S-3-3 HOLES IN THE BOLTING RING. VERIFY HOLE LOCATION ON LWTs 39, 40, AND 41 WITH THIS TOOL. CLOSURE STATEMENT THE .875 DIAMETER FEEDLINE PINHOLE ON LWTs 39, 40, AND 41 WAS CHECKED WITH THE FABRICATED TOOL. OFFSETS TOWARDS THE +Y AXIS OF .027, .070, AND .087 WERE FOUND, RESPECTIVELY (REFERENCE MPPs 80914004000-020 AND 80914001950-009). TASK IX IMPROVEMENTS TO BARREL

SCRIBE LINE APPLICATION TOOL EVALUATE THE EFFECTIVENESS OF THE BARREL SCRIBE LINE TOOL, T05A5102-24-101, GIVEN THAT THE TOOLING HOLE IN THE TRIMOFF AREA IS NOT EXISTENT IN SOME PANELS. THE TOOLING HOLE IS IN LINE WITH THE CABLETRAY HOLES AND IS AN ADDITIONAL FEATURE AIDING IN SETTING UP THE TOOL. CLOSURE STATEMENT THE NEW SCRIBE LINE TOOL, T05A5102-24-101, APPLIES A SCRIBE LINE WITH AN ACCURACY OF +/- .03 EVEN WITHOUT THE USE OF THE TOOLING HOLE. THE OLD TOOL HAD AN ACCURACY OF APPROXIMATELY +/- .180 DUE TO DIFFICULTIES IN HANDLING IT. THE INCONSISTENCY IN PROVIDING THE ADDITIONAL TOOLING HOLE IN SOME PANELS HAS BEEN CORRECTED FOR LWT-53 AND UP (ALL PANELS SHALL HAVE THAT TOOLING HOLE), REFERENCE MEMORANDUM DATED 1/5/87, FROM R. WHITE TO C VOGEL). TASK X VERIFICATION OF SCRIBE LINE CLOCKING ON LWT-45 ANALYSIS FROM TASK VI ON PREAPPLIED SCRIBE LINE VERSUS OPTICAL ALIGNMENT INDICATED THAT ALIGNMENT SOLELY BY SCRIBE LINE FROM THE AFT DOME, UP TO AND INCLUDING BARREL 4, WOULD BE AN IMPROVEMENT OVER OPTICAL ALIGNMENT ANALYSIS OF HISTORICAL DATA BACK TO LWT-20 ALSO SUPPORTS THIS POSITION BY A PURELY ANALYTICAL ANALYSIS, THE OPTICAL METHOD WOULD BE IDEAL, HOWEVER, THERE PROVES TO BE COM- PROMISING FACTORS ASSOCIATED WITH THE ACTUAL PERFORMANCE OF THE TASK ON THE 5019 WELD FIXTURE THAT ULTIMATELY AFFECTS THE OUTCOME. SCRIBE LINE ALIGNMENT SHALL BE INCORPORATED INTO THE BUILD OF LWT-45 LH2 AFT DOME/BARREL WELDMENT. EVALUATE THE EFFECTIVENESS OF SCRIBE LINE ALIGNMENT. THE EVALUATION SHALL BE ALLOWED TO CONSIDER THE ADDITIONAL EFFECTS OF HOLE POSITIONING ON THE FORWARD AND AFT DOMES. CLOSURE STATEMENT LWT-45 WAS Clocked BY SCRIBE LINE (BARRELS AND T-RINGS). VERIFICATION OF Clocking AFTER COMPLETION OF ASSEMBLY DETERMINED THAT ALL POSITIONS WERE IN TOLERANCE. IN ADDITION TO IMPLEMENTING SCRIBE LINE Clocking, A MEASUREMENT TO VERIFY THE RELATIVE POSITION OF THE .875 FEEDLINE HOLE ON THE FORWARD DOME (STATION 1129) RELATIVE TO THE INTERFACE BOLTING FLANGE WAS IMPLEMENTED. THIS MEASUREMENT PROVIDED MORE ACCURATE PLACEMENT OF THE STATION 1129 REFERENCE POINT FOR THE LINE-OF- SIGHT USED IN VERIFYING Clocking (REFERENCE MPP 80914090960 M009, LWT-45. TASK XI MEASUREMENT ON LWT-46 AFT DOME MAKE A MEASUREMENT DETERMINING THE DISTANCE BETWEEN THE .375 HOLE (USED AS A REFERENCE IN Clocking BARRELS AND T-RINGS) AND THE 3.250 UPPER SRB HOLE (USED AS A REFERENCE IN Clocking THE FORWARD DOME). NOTE: THE Clocking SCRIBE LINE IS APPLIED TO THE AFT DOME BY THE T02A7512 TOOL SECURED TO THE .375 HOLE. CLOSURE STATEMENT THE LENGTH BETWEEN THE .375 AND 3.250 HOLES ON LWT-46 WAS MEASURED AT 112.371 THIS DOME HAD A MEASURED CIRCUMFERENCE OF 1040.280, THUS THE NOMINAL SHOULD BE 112.324. THE DELTA FROM NOMINAL (.047) WAS WITHIN THE STACKUP OF TOLERANCES (+/- .070; REFERENCE PA WORKSHEET 132593). TASK XII VERIFICATION OF TOLERANCES ON FORWARD DOME ENGINEERING SHALL VERIFY THE TOLERANCES ON THE FORWARD DOME FOR THE POSITION OF THE .875 FEEDLINE HOLE RELATIVE TO THE INTERFACE BOLTING FLANGE HOLES, AND THE BIPOD HOLES RELATIVE TO THE FLANGE HOLES, AND THE .875 HOLE RELATIVE TO THE BIPOD HOLES. VERIFICATION OF ICD REQUIREMENTS SHALL ALSO BE MADE ON THE BIPOD ATTACH POINTS. CLOSURE STATEMENT THE FORWARD DOME TOLERANCES ARE THE FOLLOWING F/L TO BOLT FLANGE HOLE (+/- .050), BIPOD TO BOLT FLANGE HOLE (+/- .050), F/L TO BIPOD (+/- .060) (REFERENCE MEMORANDUM FROM D. WHITCHURCH TO C. VOGEL, DATED JULY 9, 1987). CAUSE AND CORRECTIVE ACTION SUMMARY THIS CAPS ADDRESSED TWO PRIMARY PROBLEMS. THE MISALIGNMENT OF THE FORWARD TO AFT SRB FITTINGS, AND THE MISALIGNMENT OF THE BARRELS AND T-RINGS IN THE LH2 TANK. THE FIRST, SRB MISALIGNMENT, WAS CAUSED BY MISCLOCKING THE LH2 FORWARD DOME. THE PROBLEM WAS CORRECTED BY IMPROVING Clocking AND TACK WELDING PROCEDURES. HIGHER MANDREL PRESSURES WERE IMPLEMENTED TO MINIMIZE OFFSET BETWEEN THE FORWARD DOME AND BARREL #4 PRIOR TO TACK WELDING TACK WELDING WAS CHANGED TO BEGIN DIRECTLY AT THE BOTTOM AND WORK UPWARDS SYMMETRICALLY ON EITHER SIDE AS FAR AS POSSIBLE PRIOR TO ROTATING THE TANK. CORRECTIVE ACTION WAS IMPLEMENTED AS OF LWT-12. THE SECOND PROBLEM, LH2 BARREL AND T-RING MISALIGNMENT, WAS CAUSED BY MULTIPLE FACTORS. THE OPTICAL ALIGNMENT USED IN THE 5019 WELD FIXTURE

WAS INADEQUATE. IT WAS IMPROVED WITH A REDESIGN AS OF LWT-20, BUT THAT EFFORT ALSO PROVED TO BE INADEQUATE. REPEATABILITY WAS POOR, POSSIBLY DUE TO THE AWKWARD POSITION OF THE INSTRUMENTS DIRECTLY UNDERNEATH THE TANK. CORRECTIVE ACTION WAS TAKEN BY IMPLEMENTING SCRIBE LINE CLOCKING (IMPLEMENTED LWT-45). ANOTHER FACTOR RELATING TO THE PROBLEM WAS THAT THE .875 FEEDLINE HOLE ON THE FORWARD DOME WAS OFFSET RELATIVE TO THE INTERFACE BOLTING FLANGE HOLES. THE OFFSET WAS SUFFICIENT ENOUGH TO CONTRIBUTE TO THE MISLOCKING PROBLEM. CORRECTIVE ACTION WAS TAKEN BY IMPLEMENTING A CHECK TO DETERMINE THE ACTUAL OFFSET OF THE .875 HOLE ON THE FORWARD DOME. THE READING WAS INCORPORATED INTO THE REFERENCE LINE FROM WHICH THEN CLOCKING IS MEASURED. CORRECTIVE ACTION WAS IMPLEMENTED AS OF LWT-45. CONCURRENTLY, PRODUCTION IMPLEMENTED STEPS TO ASSURE IMPROVED ALIGNMENT BETWEEN THE .875 FEEDLINE HOLE AND THE INTERFACE BOLTING FLANGE HOLES ON THE FORWARD DOME. THE EFFECTIVENESS OF THE CORRECTIVE ACTION TAKEN FOR THE FIRST PROBLEM, SRB MISALIGNMENT, WAS CONFIRMED BY NUMEROUS BUILDS FROM LWTS 12 THROUGH 45. THE CORRECTIVE ACTION TAKEN FOR THE SECOND PROBLEM, LH2 BARREL AND T-RING MISALIGNMENT, IS DEEMED TO BE EFFECTIVE BASED UPON EVIDENCE SEEN ON LWT-45. THE MEASUREMENTS TAKEN ON LWT-45 CONFIRMED THAT THE PROCESS WAS BROUGHT UNDER CONTROL. LWT-45 WAS IN TOLERANCE FOR ALL BARRELS AND T-RINGS AND NO LONGER WAS THERE DATA POINT SCATTER AS SEEN ON PRIOR EFFECTIVITIES. THERE ARE FOURTEEN DATA POINTS PER EFFECTIVITY MEASURED IN DETERMINING CLOCKING OF BARRELS AND T-RINGS. THE LARGE NUMBER OF DATA POINTS REFLECTS RATHER ACCURATELY THE LEVEL OF CONTROL THE CLOCKING PROCESS HAS. THUS, LWT-45 PROVIDES SUFFICIENT EVIDENCE OF CORRECTIVE ACTION

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System ASSESSMENT ADDENDUM REPORT

MSFC Report# A06858	IFA# --	Contractor RPT# S-062	JSC# --	KSC# --	EICN# --
Asmnt Part# 80911000000	Asmnt Part Name LH2 TANK	Asmnt Serial/Lot# LWT-6			
HCRIT CD --	FCRIT CD 1	CAUSE CD DH - DES-HDW	FAIL MODE MS - STRUCT		
Asmnt FMEA 6.2.1.1	Asmnt FM 1	FMEA CSE D	FMEA SCSE 2		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06905	In-Flight Anomaly Number --	Contractor Report Number T-035	JSC# --	KSC# --
Problem Title STAINS ON LH2 BARREL				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 1
HCRIT --	Sys_Lvl N	Misc Codes A (1) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE EXTERNAL TANK	PART# 82601000000	SER/LOT# N/A	MANUFACTURER MMC
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LH2 TANK	PART# 80914005940	SER/LOT# LWT-8	MANUFACTURER MMC
Test/Operation M - MFG	Prevailing Condition N - INSPECTION	F / U UC	Fail Mode MSI - INSULATION	Cause MPE - MFG-PRC-ENVR
System TPS	Defect CN - CONTAM	Material F - INSUL	Work Contact J. GUZMAN	Fail Date 06/28/1983
Received at MSFC 07/21/1983	Date Isolated --	FMEA Reference 1.2.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom UC - UNSAT		Time Cycle --
Effectivity Text LWT-6 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 06/18/1992	CN RSLV SBMT 03/27/1984	Defer Date --	Add Date --	R/C Codes 2 - MFG -- --
Assignee				
Design B. DAVIS	Chief Engineer --	S & MA D. NEWMAN	Project G. CAVALARIS	Project MGR --
Approval				
Design	Chief Engineer	S & MA	Project	Project MGR

B. DAVIS	--	D. NEWMAN	G. CAVALARIS	--	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 04/26/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description					
REF: MARS T-59355 STAINS ON LH2 BARREL AFTER CLEANING IN CELL 'P' MANUAL CLEANING OF STAINS RESULTED IN PRIMER FAILURES WHICH WERE DETECTED IN CELL 'C' PRIOR TO SOFI INSTALLATION					
Contractor Investigation/Resolution					
CAUSE - WATER COLLECTING IN BUTTON GROOVES & SPILLING ACROSS BARREL A AS TANK ROTAES DURING DRY CYCLE. 7/25/83 - THIS CRIT 1 PROB IS NOT CONSIDERED A CONSTRAINT AGAINST STS-8, LWT-2 BECAUSE LWT-2 WAS CLEANED IN CELL 'E' & PRIMER ADHESION HAS BEEN VERIFIED BY THE WET TAPE TEST, RET T-030. THIS DECISION HAS BEEN COORDINATED WITH THE E.T. PROJ OFFICE - ____G. P. BRIDWELL 7-28-83____. 11/8/83 - CONSTRAINT AGAINST STS-9, LWT-4 LIFTED AS STATED ABOVE FOR STS-8, LWT-2. THIS CHANGE HAS BEEN CO-ORDINATED WITH THE E.T. PROJ OFFICE - ____G. P. BRIDWELL 11-9-83____ 1/6/84 - CONSTRAINT AGAINST STS-11, LWT-3 IS LIFTED AS STATED ABOVE THIS CHANGE HAS BEEN COORDI- NATED WITH THE E.T. PROJ. OFFICE - ____G P. BRIDWELL 1-10-84____. 2/27/83 - THIS CRIT 1 PROB IS NOT CONSIDERED A LAUNCH CONSTRAINT AGAINST STS-13, LWT-5, BECAUSE LWT-5 WAS CLEANED IN CELL 'E' & PRIMER ADHESION WAS VERIFIED BY THE WET TAPE TEST REF T-030 THIS DECISION HAS BEEN CO-ORDINATED WITH THE E.T. PROJ. OFFICE - ____G P. BRIDWELL 3-5-84____. 3/5/84 PRB STATUS - STAINS CAUSED BY WATER AFTER CLEANING IN CELL "C". WATER POOLS IN GROOVES NEAR WELD LANDS & RUNS ACROSS BARREL AS TANK ROTATES DURING DRY CYCLE. RC INVOLVES HALTING TANK ROTATIONAFTER WASH & MANUALLY DRYING WITH +Z DOWN. NO IMPACT ON TANKS PRIOR TO LWT-6 WHICH WERE CLEANED IN VERTICAL POSITION IN					

CELL"E". CLOSING THE CAPS WAS DELAYED UNTIL COMPLETION OF 6 MO. STUDY AWAITING RELEASE OF ENGR'G TEST REPORT FOR ATTACHMENT TO CLOSE CAPS (SHOULD CLOSE BY 3-15-84). 3/27/84 - REC'D CLOSED CAPS. RESOLUTION - ONCE THE CAUSE OF STAINING WAS IDENTIFIED THE FOLLOWING PROCESS CHANGES WERE MADE TO PREVENT SUCH STAINS: 1. REDUCED TANK ROTATION SPEED TO ALLOW RINSE WATER TO DRAIN OFF FASTER. 2. STOP TANK ROTATION IMMEDIATELY AFTER VERIFICATION OF WATER-BREAK FREE SURFACE, INSTEAD OF ROTATION THROUGHOUT DRY CYCLE. THIS ALSO AIDS IN DWG WATER FROM THE TANK SURFACE. 3. RINSE WATER TEMP. WAS RAISED TO MAX. ALLOWED BY PI5009 IN AN EFFORT TO FURTHER SPEED DRYING. ALSO STP/PI 5009 WAS REVISED TO INCLUDE INSTRUCTIONS FOR MAUAL IN-PROCESS REWORK OF SUCH STAINS CLERANCE OF VEHICLES: LWT-6 - NO STAINS - CLEANED MANUALLY. LWT-7 - SMALL DISCOLORED AREAS MANUALLY CLEANED - WET TAPE VERIFIED. LWT-8 - LARGE AREAS OF STAINS CLEANED MANUALLY - PRIMER DEBONDS CAUSED BY DEOXIDIZER RESIDUE, PRIMER REPAIR & VERIFICATION BY WET TAPE TEST REF MARS T-59355. LWT-9 - PRIMER APPLIED OVER WATER STAINS, AFTER ONE MONTH ONLY WORST CASE DEGRADED PRIMER ADHESION. PRIMER REPAIRED & VERIFICATION BY WET TAPE TEST REF MARS T-51361. LWT-10 - FAINT SCATTERED WATER STAINS. LESS PRONOUNCED THAN MINOR STAINS ON LWT-9 WHICH HAD NO EFFECT ON PRIMER ADHESION. LWT-11 & 12 - NO WATER STAINS 3/28/84 - CLOSURE DISTRIBUTED

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06905	IFA# --	Contractor RPT# T-035	JSC# --	KSC# --	EICN# --
Asmnt Part# 80914005940	Asmnt Part Name LH2 TANK	Asmnt Serial/Lot# LWT-8			
HCRIT CD --	FCRIT CD 1	CAUSE CD MPE - MFG-PRC-ENVR	FAIL MODE MI - INSULATION		
Asmnt FMEA 5.2.2.1	Asmnt FM 1	FMEA CSE B	FMEA SCSE 6		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06907	In-Flight Anomaly Number --	Contractor Report Number E-075-1	JSC# --	KSC# --
Problem Title LO2/LH2 LEVEL SENSORS CONTAMINATION				
EICN# --	ELEMENT ET	Contractor MMSS	FSCM# --	FCRIT 3
HCRIT --	Sys_Lvl N	Misc Codes A (1) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE --	PART# --	SER/LOT# --	MANUFACTURER --
Test/Operation L - FLD	Prevailing Condtion N - INSPECTION	F / U UC	Fail Mode UC - UNSAT	Cause MAE - MFG-ASY-ENVR
System ELECTRICAL	Defect CN - CONTAM	Material A - CIRC T	Work Contact L. CLANTON	Fail Date 06/30/1983
Received at MSFC 07/22/1983	Date Isolated --	FMEA Reference 3.1.1.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom UC - UNSAT		Time Cycle --
Effectivity Text LWT-9 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/14/1995	CN RSLV SBMT 01/16/1984	Defer Date --	Add Date --	R/C Codes 3 - F/TE -- --
Assignee				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project R. ABRAHAM	Project MGR --
Approval				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project W. BUNN	Project MGR --

PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 05/23/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -----	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: DURING REC'G INSPECTION OF LEVEL SENSORS, 74L4-1(LO2) & 74L4-2(LH2), CONTAMINATION WAS DISCOVERED IN THE INNER BAG. FIFTEEN LO2 SENSORS FAILED CLEANLINESS VERIFICATION, CAUSING CONCERN FOR CLEANLINESS OF GFP MC-432-0205-0019 SENSORS. ALL GFP SENSORS ALSO FAILED CLEANLINESS TEST					
Contractor Investigation/Resolution CAUSE - VENDOR ERROR (CLEANING FACILITY INADEQUATE). 11/21/83 PRB STATUS - CLEARED BY GOV'T NONCOMPLIANCE, (GNC) MMC HAS CLOSEOUT INFO ON PQR ITEMS. 2/1/84 - REQ. GNC BACK-UP DATA. 2/7/84 - REC'D BACK-UP DATA 2/8/84 RESOLUTION - DURING REC'G INSPECTION, LEVEL SENSORS (74L4-*) WERE DISCOVERED CONTAMINATED INSIDE THE INTER-BAG. FURTHER INVESTIGATION & INSPECTION FOUND ALL LEVEL & ECO SENSORS AT MAF CONTAMINATED DUE TO INADEQUATE VENDOR CLEANING FACILITIES. LWT-2 THRU LWT-8 SENSORS WERE CLEANED FOR 'USE-AS-IS' BY GOV'T NONCOMPLIANCE, DC&R INSPECTION & SCAR. REF (GNC-ET-9-2R1, DC&R E-83-023). RATIONAL FOR ACCEPTABLE 'USE-AS-IS' BASED ON 800 MICRON (LO2) & 400 MICRON LH2 PROPELLANT FILTER'S ABILITY TO CONTAIN CONTAMINATION WITH NO AFFECT ON SSME OPERATION. FILTER SCREEN FLOW WILL NOT BE AFFECTED BY SMALL QUANTITY OF CONTAMINATION. RECURRENCE CONTROL - BEGINNING WITH LWT-9 ALL SENSORS WILL BE CLEANED AT MAF OR IN THE VENDORS NEWLY CERTIFIED FACILITY. REF SCAR 5378750. 3/1/84 - PER TELECON BETWEEN MR. PLATT & MR. VANBEEK THE FOLLOWING ENGR'G QUESTIONS WERE RESOLVED - 1) IS INSPECTION OF ELE. WIRE UNDER MAGNIFICATION PRIOR TO FINAL ASSY FOR FIBROUS CONTAMINATION BEING PERFORMED - YES MMC DOES THIS INSPECTION					

2) RESPONSIBILITY FOR SENSOR CLEANING SHOULD BE SPECIFIED - RESULTS:
 VENDORS WILL HAVE SOLE RESPONSIBILITY FOR CLEANING. 4/11/84 - REC'D
 REVISED CAPS; THIS STATEMENT (2) WAS NOT CLARIFIED IN THE CAPS
 HOWEVER, VERBAL CLARIFICATION WAS PROVIDED BY TELECON

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System
 ASSESSMENT ADDENDUM REPORT

MSFC Report# A06907	IFA# --	Contractor RPT# E-075-1	JSC# --	KSC# --	EICN# --
Asmnt Part# 74L4-X	Asmnt Part Name L02/LH2 LEVEL SENSRS	Asmnt Serial/Lot# N/A			
HCRIT CD --	FCRIT CD 1R	CAUSE CD EIC - EI-CONTAM	FAIL MODE UC - UNSAT		
Asmnt FMEA 3.1.2.2	Asmnt FM 2	FMEA CSE A	FMEA SCSE 1		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06908	In-Flight Anomaly Number --	Contractor Report Number E-075-2	JSC# --	KSC# --
Problem Title LO2 AND LH2 LEVEL SENSORS OVEN-DRIED AT EXCESSIVE TEMP				
EICN# --	ELEMENT ET	Contractor MMSS	FSCM# --	FCRIT 3
HCRIT --	Sys_Lvl N	Misc Codes A (7) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LEVEL SENSOR	PART# 74L4-*	SER/LOT# N/A	MANUFACTURER SIMMONDS
Test/Operation M - MFG	Prevailing Condtion E - ENVIRONMENT	F / U UC	Fail Mode UC - UNSAT	Cause MAW - MFG-ASY-WORK
System ELECTRICAL	Defect HD - OVRHTD	Material A - CIRC T	Work Contact L. CLANTON	Fail Date 06/30/1983
Received at MSFC 07/22/1983	Date Isolated --	FMEA Reference 3.1.1.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom UC - UNSAT		Time Cycle --
Effectivity Text NONE				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 10/07/1987	CN RSLV SBMT 01/16/1984	Defer Date --	Add Date --	R/C Codes 3 - F/TE -- --
Assignee				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project J. BREWER	Project MGR --
Approval				
Design	Chief Engineer	S & MA	Project	Project MGR

G. PLATT	--	D. NEWMAN	J. BREWER	--	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 03/29/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: DURING CLEANING OF 74L4-* (74L4-1 LO2 AND 74L4-2 LH2) CLEANING A DRYING OVEN WENT OUT OF CONTROL & OVERHEATED SEVEN LEVEL SENSORS TO A TEMP OVER 610 DEG F. FORTY-TWO (42) ADDITIONAL LEVEL SENSORS WERE PROCESSED THRU THE OVEN BEFORE THE OVEN WAS SUSPECTED OF OVERHEATING SENSORS ARE QUALIFIED AT360 DEG. F					
Contractor Investigation/Resolution CAUSE - DISCREPANT FURNACE. 11/21/83 PRB STATUS - CLEARED BY (GNC) GOV'T NONCOMPLIANCE, MMC HAS CLOSEOUT INFO ON PQR ITEMS. 2/1/83 - REQ BACK-UP DATA. 2/7/83 - REC'D BACK-UP DATA. 2/8/84 RESOLUTION - SENSOR OVERHEATING (TO +610 DEG F QUAL AT 360 DEG F) RESULTED FROM 'OUT OF CONTROL' OVEN DUE TO DEFECTIVE SAFETY CONTROLS & POOR (PERSONNEL) JUDGEMENT BY USING OVEN WITH DEFECTS. DAMAGE WAS LIMITED TO 7 SENSORS IN OVEN AT TIME OF INCIDENT, HOWEVER ALL 49 SENSORS (INCLUDING 42 SUSPECT) WERE RETURNED TO VENDOR. FURNACE MONITOR CHART FOR 1 MO. PRIOR TO INDICATED NO PREVIOUS FAILURE. RECURRENCE CONTROL - OVEN HAS BEEN REPAIRED & RECERTIFIED. THE OVEN STD OPERATING PROCEDURE HAS BEEN POSTED. PERSONNEL HAVE BEEN MADE AWARE OF THE PROB. ALSO, SAFETY PERFORMED AN AUDIT ON ALL OVENS AT MAF TO DETERMINE IF ANY OTHERS ARE SUSCEPTIBLE TO OVERHEATING; NONE WERE FOUND. TELECON W. VAN BEEK 3-22-84 OVEN NO LONGER USED AT MAF - GP					
MSFC Response/Concurrence					

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06908	IFA# --	Contractor RPT# E-075-2	JSC# --	KSC# --	EICN# --
Asmnt Part# 74L4-X	Asmnt Part Name L02/LH2 LEVEL SNSRS	Asmnt Serial/Lot# N/A			
HCRIT CD --	FCRIT CD 1R	CAUSE CD MAW - MFG-ASY-WORK	FAIL MODE MT - P/T HI OR LO		
Asmnt FMEA 3.1.2.2	Asmnt FM 2	FMEA CSE A	FMEA SCSE 4		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06909	In-Flight Anomaly Number --	Contractor Report Number E-075-3	JSC# --	KSC# --
Problem Title HELICOIL TANGS NOT BROKEN OFF TWO LEVEL SENSORS				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 3
HCRIT --	Sys_Lvl N	Misc Codes A (1) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LO2 LEVEL SENSOR	PART# MC432-0205-0019	SER/LOT# 0000101	MANUFACTURER SIMMONDS
Test/Operation L - FLD	Prevailing Condtion N - INSPECTION	F / U UC	Fail Mode UC - UNSAT	Cause MAW - MFG-ASY-WORK
System ELECTRICAL	Defect CE - EXTRA	Material S - STRUCT	Work Contact L. CLANTON	Fail Date 06/30/1983
Received at MSFC 07/22/1983	Date Isolated --	FMEA Reference 3.1.1.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom UC - UNSAT		Time Cycle --
Effectivity Text NONE				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 10/07/1987	CN RSLV SBMT 01/16/1984	Defer Date --	Add Date --	R/C Codes 0 - EXPL -- --
Assignee				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project J. BREWER	Project MGR --
Approval				

Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project J. BREWER	Project MGR --	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 04/26/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: DURING NASA REVIEW OF LEVEL SENSORS AT MAF TWO (2) LEVEL SENSORS HAD EXPOSED HELICOIL WIRES, ONE SENSOR HAD (2) TANGS NOT BROKEN OFF WHILE OTHER SENSORS HAD (2) TANGS PROTRUDING OUTWARD					
Contractor Investigation/Resolution CAUSE - VENDOR ERROR, WORKMANSHIP. 11/21/83 PRB STATUS - CLEARED BY (GNC) GOV'T NONCOMPLIANCE, MMC HAS CLOSEOUT INFO ON PQR ITEMS. 2/1/84 - REQUESTED BACK-UP SCAR & GOV. NONCOMPLIANCE. 2/8/84 - REC'D BACK-UP INFO. HOWEVER NO SCAR EXISTS. 2/15/84 - REQUESTED SCAR MENTIONED IN CAPS (E-075A). NO SCAR EXISTS THEREFORE, REQUESTED CAPS BE CORRECTED 3/1/84 - INQUIRED ABOUT STATUS OF REVISED CAPS. 3/27/84 - INQUIRED ABOUT STATUS OF REVISED CAPS. 4/2/84 - PER RAPI-FAX REQUESTED REVISED CAPS. 4/11/84 - REC'D REVISED CAPS (E-075B) WITH REVISED STATEMENT (PARA. 3 PG 10) SCAR DELETED. 4/12/84 RESOLUTION - DISCREPANT HELI-COIL, TANGS NOT REMOVED, RESULTED DUE TO VENDOR PERSONNEL ERROR MFG PROCEDURE REQ'D TANG REMOVAL. SENSORS FOR LWT-2 THRU LWT-7 WERE ACCEPTED FOR 'USE-AS-IS' PER GNC-ET-9-3. BASED ON FINDINGS OF DC&R E-83-025 & DC&R E-83-026, ONE SENSOR OUT OF 82 INSPECTED DID NOT HAVE THE TANG REMOVED. STRESS ANALY INDICATES THAT TANGS WILL NOT BECOME DISLODGED DURING PROPELLANT LOADING OR FLT, THEREFORE THIS IS NOT A CONTAMINATION ISSUE. RECURRENCE CONTROL - NONE REQ'D; VENDOR PROCEDURE IS ADEQUATE, PERSONNEL HAVE BEEN INSTRUCTED, CON- SEQUENTLY UNITS BEGINNING WITH LWT-8 SHOULD HAVE ALL TANGS REMOVED					

MSFC Response/Concurrence**MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT**

MSFC Report# A06909	IFA# --	Contractor RPT# E-075-3	JSC# --	KSC# --	EICN# --
Asmnt Part# MC432-0205-0019	Asmnt Part Name L02 LEVEL SENSOR	Asmnt Serial/Lot# 101			
HCRIT CD --	FCRIT CD 1R	CAUSE CD MAW - MFG-ASY-WORK	FAIL MODE UC - UNSAT		
Asmnt FMEA 3.1.2.2	Asmnt FM 2	FMEA CSE A	FMEA SCSE 4		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06910	In-Flight Anomaly Number --	Contractor Report Number E-075-4	JSC# --	KSC# --
Problem Title LH2 LEVEL SENSOR FAILED D.C. RESISTANCE TEST				
EICN# --	ELEMENT ET	Contractor MMSS	FSCM# --	FCRIT 3
HCRIT --	Sys_Lvl N	Misc Codes A (1) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LH2 LEVEL SENSOR	PART# MC432-0205-0013	SER/LOT# 269A	MANUFACTURER SIMMONDS
Test/Operation L - FLD	Prevailing Condtion F - FUNCTIONAL	F / U F	Fail Mode EN - OPEN	Cause U - UNKNOWN
System ELECTRICAL	Defect EP - ELVAL	Material B - CIRCBD	Work Contact L. CLANTON	Fail Date 06/30/1983
Received at MSFC 07/22/1983	Date Isolated --	FMEA Reference 3.1.1.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom EN - OPEN		Time Cycle --
Effectivity Text LWT-9 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 01/11/1995	CN RSLV SBMT 01/16/1984	Defer Date --	Add Date --	R/C Codes 0 - EXPL -- --
Assignee				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project J. BREWER	Project MGR --
Approval				
Design	Chief Engineer	S & MA	Project	Project MGR

G. PLATT	--	D. NEWMAN	J. BREWER	--	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 04/27/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: WHILE PERFORMING DC&R-83-023 (CLEANLINESS VERIFICATION), LH2 LEVEL SENSOR FAILED D.C. RESISTANCE TEST. TEST REQMNTS WERE FOR TOTAL STANCE BETWEEN 130 TO 165 OHMS. THE SENSOR READ INFINITE RESI RESISTANCE (OPEN CIRCUIT)					
Contractor Investigation/Resolution CAUSE - TENSILE FAILURE OF PLATINUM WIRE & DAMAGE DIRECTLY ADJACENT TO THE BREAK - CAUSE UNKNOWN. 11/21/83 PRB STATUS - CLEARED BY (GNC) GOV'T NONCOMPLIANCE, MMC HAS CLOSEOUT INFO ON PQR ITEMS. 2/1/83 - REQ BACK-UP DATA. 2/7/84 - REC'D BACK-UP DATA. 2/15/84 - REQUESTED ADDITIONAL BACK-UP DATA NOT INCLUDED IN PREVIOUS REQUEST - R.C. DATA, DOCUMENT- TATION OF ADDITIONAL VENDOR INSPECTION TESTS - NONE WERE IMPLEMENTED - CAPS STATEMENT IN ERROR - CAPS TO BE REVISED. 3/1/84 - PER TELECON WITH MMC REQUESTED REVISED CAPS DATA. 3/27/84 - PER TELECON WITH MMC REQUESTED REVISED CAPS DATA. 4/1/84 - PER RAPIFAX REQUESTED REVISED CAPS & BACK-UP DATA. 4/11/84 - REC'D REVISED CAPS (E-075B) WITH REVISED STATEMENT (3RD STATEMENT PG 9). 4/12/84 RESOLUTION - FAILURE ANALY T-51483 REVEALED A TENSILE FAILURE OF THE PLATINUM WIRE & WIRE DAMAGE ADJACENT TO BREAK. NO OBVIOUS CAUSE. SINCE BROKEN WIRE WAS FOUND AT COMPONENT LEVEL & A MIN. OF (3) CHECKS ARE PERFORMED AFTER INSTALLATION, NONE OF THE SENSORS PRESENTLY INSTALLED ARE SUSPECT RECURRENCE CONTROL - NONE REQ'D, EVALUATION OF VENDORS WELDING PROCESS & INSPECTION CRITERIA OF WIRE ELE. WELDS VERIFIED; THEY ARE ADEQUATE					

MSFC Response/Concurrence**MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT**

MSFC Report# A06910	IFA# --	Contractor RPT# E-075-4	JSC# --	KSC# --	EICN# --
Asmnt Part# MC432-0205-0013	Asmnt Part Name LH2 LEVEL SENSOR	Asmnt Serial/Lot# 269A			
HCRIT CD --	FCRIT CD 1R	CAUSE CD U - UNKNOWN	FAIL MODE EN - OPEN		
Asmnt FMEA 3.6.1.1	Asmnt FM 1	FMEA CSE A	FMEA SCSE 2		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06911	In-Flight Anomaly Number --	Contractor Report Number S-061	JSC# --	KSC# --
Problem Title PEAKING AND MISMATCH LH2 AND LO2 WELDS				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 3
HCRIT --	Sys_Lvl N	Misc Codes A (5) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE EXTERNAL TANK	PART# N/A	SER/LOT# N/A	MANUFACTURER MMC
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LH2 & LO2 TANK	PART# 80904000000	SER/LOT# N/A	MANUFACTURER MMC
Test/Operation M - MFG	Prevailing Condtion F - FUNCTIONAL	F / U UC	Fail Mode UC - UNSAT	Cause MAT - MFG-ASY-EQUP
System STRUCTURAL	Defect XN - NA	Material H - WELD	Work Contact C. VOGEL	Fail Date 03/25/1983
Received at MSFC 07/22/1983	Date Isolated --	FMEA Reference 1.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom UC - UNSAT		Time Cycle --
Effectivity Text UNK				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/10/1995	CN RSLV SBMT 06/11/1985	Defer Date --	Add Date --	R/C Codes 2 - MFG -- --
Assignee				
Design J. WHITE	Chief Engineer --	S & MA D. NEWMAN	Project M. PESSIN	Project MGR --
Approval				
Design J. NICHOLS	Chief Engineer --	S & MA D. NEWMAN	Project M. PESSIN	Project MGR --

PAC Assignee G. MILLER	PAC Review Complete GM	MSFC Closure Date 07/29/1985	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -----	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: PREVIOUS CAPS S-039 PEAKING & MISMATCH VIOLATIONS ARE A GENERAL PROB ASSOCIATED WITH WELDING IN MANY AREAS, AS A RESULT, A CONSIDERABLE AMOUNT OF EFFORT IS EXPENDED IN MAG-HAMMERING THESE AREAS					
Contractor Investigation/Resolution CAUSE - TOOLING, PROCEDURES & ENGR'G ARE UNDER INVESTIGATION. 3/5/84 PRB STATUS - THIS IS AN ODD CAPS WHICH WAS OPENED AS A CATCH ALL FOR PEAKING & MISMATCH VIOLATIONS. ALL BUT 5 OF THE NUMEROUS TASKS LISTED ON ADDENDUMS TO THE CAPS HAVE BEEN COMPLETED. MMC EXPECTS TO COMPLETE THESE & CLOSE THE CAPS BY 8-15-84. SINCE GOOD PROGRESS IS BEING MADE, D. NEWMAN/SA32 STATED HE WILL CLEAR THIS DATE WITH THE MSFC ET PROJ MGR WHO HAS BEEN CONCERNED WITH THIS CAPS BEING KEPT OPEN SO LONG 9/6/84 - PRB STATUS, CAPS IS FOR FOR TRACKING PURPOSES REQUESTED BY JOHN WHITE ACTION ITEM ET-34 TO DISCUSS ACTION NECESSARY TO CLOSE 1/15/85 - ALL TASKS IN THIS CAP ARE CLOSED EXCEPT B-III, PEAKING & MISMATCH. DATA-PLASMA; & BIV - CORRELATION OF BOSORS TO TEST COUPON NEW ESTIMATED COMPLETION DATE AT MMC IS OCT. 1985 PER TD-1012. 3/6/85 STATUSED AT PRB MTG 2-25-85 AS FOLLOWS - PRB QUESTIONS WHY THIS CAPS CANNOT BE CLOSED. PRB ACTION ITEM ET-36 WAS ACCEPTED BY D NEWMAN/MSFC/SA-32 TO INQUIRE INTO CLOSING THIS PROBLEM. 6/5/85 PRB STATUS - 4-16-85 MTG - NOT DISCUSSED IN DETAIL. CAPS IS IN MMC CLOSURE CYCLE. 6/5/85 PRB STATUS 5-16-85 MTG - NOT DISCUSSED IN DETAIL. CAPS IN MMC CLOSURE CYCLE. WILL BE SENT TO MSFC SHORTLY. 6/26/85 INVESTIGATION - TASK I - GENERAL INVESTIGATION INTO THE PEAKING & MISMATCH PROBLEM WAS DIVIDED INTO 2 MAJOR CATEGORIES: CATEGORY A - EFFORTS TO IMPROVE					

PEAKING & MISMATCH CONTROL. CATEGORY B - EFFORTS TO IMPROVE THE DEFINITION OF TOLERANCES OR TO IMPROVE THE PEAKING & MISMATCH DISCREPANCY REPORTING SYSTEM. CATEGORY A INCLUDED ALL EFFORTS WHICH WOULD BE EXPECTED TO ACTUALLY REDUCE PEAKING & MISMATCHING SEEN IN HARDWARE. CATEGORY B ANALYZED THE REQMENTS THAT THE HARDWARE HAS TO MEET. SUBJECT OF CATEGORY A EFFORTS ARE SET FORTH IN TASK A-I THROUGH TASK A-V, & TASK AX. RESULTS OF THESE INVESTIGATIONS ARE SHOWN BELOW

TASK A-I - MSRMNTS WERE TAKEN BY QUALITY PERSONNEL, USING THE AIMS 65, ON THE LO2 TANK 0-2 WELD MADE ON THE 5018 FIXTURE TO DETERMINE THE AMOUNT OF PEAKING THAT OCCURS DURING BUILD. RESULTS OF THESE MSRMNTS FOLLOW. THIS TASK COMPLETED 10-30-83. LO2 TANK, 0-2 WELD PEAKING & MISMATCH: BEFORE - TACKING AFFECT OF MANDREL PRESSURE CHANGE ON PEAKING & MISMATCH (AVG'D) BASED ON SAMPLING 20% OF AREA: MAN. PRESSURE 20 PSI 40 PSI PEAKING 2.2 DEG 3.1 MISMATCH .027 INCHES .014 TRENDING OF PEAKING & MISMATCH (AVG'D OVER 100% OF AREA) DURING WELDING OPERATION OPERATION MAN. PRESSURE PEAKING MISMATCH AFTER TACK 40 PSI 2.5 DEG .008 IN. AFTER SEAL 40 PSI 4.2 DEG .012 IN. AFTER PEN 40 PSI 6.7 DEG .015 IN. AFTER FILL 0 PSI 7.1 DEG .020 IN. RESULTS OF PEAKING VS. MANDREL PRESSURE 0-2 WELD: MANDREL PR LWT AVG PEAKING AVG MISMATCH (SEAL, PEN, FILL) 14 9.2 DEG .019 IN. 50,60,60 PSI 15 7.2 DEG .018 IN. 45,20,20 PSI 16 5.9 DEG .015 IN. 35,20,20 PSI

TASK A-II - PEAKING & MISMATCH DATA BANK - TO BE ABLE TO MONITOR TRENDS A PROGRAM WAS GENERATED TO MONITOR PEAKING & MISMATCH ON THE 5018 & 5019 WELD FIXTURES. DATA WAS OBTAINED & STORED IN THE DATA BANK. THIS TASK WAS COMPLETED 8-1-84. TASK A-III - PEAKING & MISMATCH MSRMNTS - PEAKING & MISMATCH MSRMNTS, INCLUDING A COMPARISON OF COMBINATION GAUGE & COMPUTERIZED GAUGE (AIMS-65), WERE EVALUATED BY QUALITY ENGR'G. PRELIMINARY REPORT RESULTS WERE PUBLISHED IN REPORT 3743-83-140. ADDITIONALLY, A NEW OPERATING MANUAL FOR THE AIMS-65 WAS DEVELOPED & PUBLISHED. ALSO, AN AUTOMATIC PEAKING & MISMATCH INSTRUMENT THAT IS INTEGRATED WITH THE MSFC CIRCUMFERENTIAL WELD FIXTURE WAS DEVELOPED. THIS WAS A PORTION OF THE EFFORT UNDER TD-1054. TASK A-IV - CIRCUMFERENTIAL MSRMNTS - MSRMNTS WERE TAKEN ON THE 5018 & 5019 FIXTURES & CIRCUMFERENTIAL GROWTH WAS CONFIRMED. THE BARREL CIRCUMFERENCE GREW 0.230 IN. WITH A 20 PSI INCREASE IN MANDREL PRESSURE (INITIAL 20 PSI, FINAL 40 PSI). TASK A-V - PRESENT TOOLING & PROCEDURES - MFR'G ENGR'G DEVELOPED A PLAN FOR IDENTIFYING & EVALUATING POSSIBLE MODS TO EXISTING TOOLING & PROCEDURES TO REDUCE PEAKING & MISMATCH AT THE 5018, 5019, & 5012 (0-1). THIS EFFORT WAS COORDINATED WITH TASKS A-I, A-II, & A-IV & WAS PUBLISHED ON AN INTEROFFICE MEMO 9-15-83. ENGR'G PERFORMED AN ANALYSIS TO ESTABLISH WORSE CAST CONTOUR DEVIATIONS WHICH WOULD RESULT IN A FACTOR-OF-SAFETY OF 1.0 & A MARGIN-OF-SAFETY OF 0.0 (FS = 1.0/MS = 0). THIS TASK WAS COMPLETED & CRITERIA ESTABLISHED PER MEMO 3521-84-108. QUALITY CONTROL PROVIDED STRESS ENGR'G WITH CONTOUR MSRMNTS, & PEAKING & MISMATCH READINGS ALONG THE 0-2 & 0-3 WELDS. THE PHASING OF THE READINGS WAS AFTER HEAT REPAIR & AFTER MAG-HAMMER REPAIR. READINGS WERE TAKEN ON LWT-18, -19, -20, & -21. TASK WAS COMPLETED 7-15-84. QUALITY ENGR'G ADDED STATEMENTS TO THE MPP'S FOR LWT-19, -20, & -21 DIRECTING INSPECTION TO MAKE MSRMNTS ON THE FWD & AFT OGIVES FOR CONTOUR ADJACENT TO THE 0-2 WELD, & ON THE AFT OGIVE ADJACENT TO THE 0-3 WELD. MSRMNTS WERE TAKEN USING THE 612.180-IN. RADIUS OSL TEMPLATE EVERY 12 IN. ALONG THE CIRCUMFERENCE & EVERY 2 IN. ALONG THE TEMPLATE. READINGS WERE MADE AFTER HEAT REPAIR & AFTER MAG HAMMERING TO WITHIN DWG PEAKING TOLERANCE OF 6.5 DEGS FOR 0-2 WELD, & 4.7 DEGS FOR 0-3 WELD. STRESS ENGR'G & RELIABILITY ASSURANCE REVIEWED LWT-6 THRU LWT-15 MARS (0-2 & 0-3 WELDS) WITH RESPECT TO PEAKING & MISMATCH CONDITIONS. IT WAS FOUND THAT IN THE ORIGINALLY WELDED CONDITION EXTENSIVE OUT PEAKING WAS FOUND ON THE 0-2 & 0-3 WELDS (EXCEPTION LWT-13, 0-2). NO PROBLEM EXISTS AFTER MAG-HAMMER REPAIRS

THIS TASK WAS COMPLETED 8-31-84 & RESULTS WERE PUBLISHED ON MEMO'S 374-84-118 & 3521-84-063. MSFC QUALITY MEASURED CONTOUR, PEAKING, & MISMATCH AT THE 0-2 & 0-3 WELDS ON STATION. CONTOUR MSRMNTS WERE TAKEN USING A 612.180-IN. RADIUS OSL TEMPLATE EVERY 12 IN. ALONG THE

CIRCUMFERENCE & EVERY 2 IN. ALONG THE TEMPLATE. PEAKING & MISMATCH READINGS WERE MADE EVERY 6 IN. ALONG THE CIRCUMFERENCE. ACCUMULATED DATA WAS PROVIDED TO MMC STRESS ENGR'G FOR INCLUSION IN THE DATA BASE THIS TASK WAS COMPLETED 7-30-84. MFR'G ENGR'G REVIEWED TOOLING CHANGES ON THE 5018 THAT MAY HAVE AFFECTED CONTOUR, PEAKING, & MISMATCH CONDITIONS ON LWT-6 THRU LWT-15 (0-2 & 0-3 WELDS). RESULTS OF THIS REVIEW WERE SUBMITTED TO RELIABILITY ASSURANCE FOR COMPARISON OF TOOLING CHANGES VS. TANK DEFECTS. THIS TASK WAS COMPLETED 9-15-84. TASK AX - ANALYSIS OF MISMATCH ON 0-1 - TOOLING ASSOCIATED WITH THE T03A5012 TOOL WAS INVESTIGATED TO RESOLVE A SIGNIFICANT MISMATCH PROBLEM ON LWT-26 & LWT-28. THE T03A5012 TOOL WAS INSPECTED & REALIGNED (LOWER MANDREL ALIGNMENT & UPPER MANDREL HEIGHT ALIGNMENT). THE LWT-29 OGIVE MISMATCH WAS CHECKED & FOUND TO BE IN TOLERANCE COMING OFF THE FIXTURE SUBJECT OF CATEGORY "B" EFFORTS ARE SET FORTH IN TASKS B-I THRU B-V RESULTS OF THESE INVESTIGATIONS ARE SHOWN BELOW. TASK B-I - PEAKING & MISMATCH DATA & MAG-HAMMER EFFECTS - CURVES SHOWING THE EFFECTS OF PEAKING & MISMATCH ON TIG WELD MECHANICAL PROPERTIES WERE GENERATED UNDER TD 1012. THE EFFECT OF MAG-HAMMERING TO REMOVE PEAKING & MISMATCH WAS ALSO EVALUATED UNDER THE SAME TD. RESULTS OF THESE INVESTIGATIONS WERE DOCUMENTED ON MEMO 3516-83-279. ADDITIONALLY, THE PEAKING & MISMATCH DATA BASE WAS EXTENDED TO THAN 10 DEGS PEAKING & GREATER GREATER THAN 0.090-IN. MISMATCH. COMPLETED 9-15-83. TASK B-II - WELD ACCEPTANCE MANUAL-TIG - A BOSOR5 ANALYSIS FOR 5018 & 5019 WELDS WAS PERFORMED TO ESTABLISH PEAKING, MISMATCH, & STRESS INTERACTION CURVES THIS ANALYSIS WAS COMPLETED IN MARCH 1983. ALSO, A TIG WELD ACCEPTANCE MANUAL BASED ON FLOW SIZE, STRESS, LOCATION, & PEAKING & MISMATCH VALUES FOR SELECTED WELDS WAS DEVELOPED. THIS WAS COMPLETED 11-30-83 & DOCUMENTED ON B01640. A FEASIBILITY STUDY FOR INCREASING PEAKING & MISMATCH TOLERANCES IN STABILITY CRITICAL AREAS ON 5018 & 5019 WELDS WAS PERFORMED. IT WAS DETERMINED THAT INCREASING TOLERANCES IS FEASIBLE & WAS DOCUMENTED ON MEMO'S 3512-83-070 & 3512-83-087. A WELD ACCEPTANCE MANUAL SHALL BE GENERATED ON REMAINING MAJOR WELDS NOTE: THIS TASK IS CLOSED BASED UPON AN AGREEMENT BETWEEN MSFC & MMC TO CLOSE THIS CAPS & CONTINUE TRACKING PROBLEM ON TD-1012. TASK B-III - PEAKING & MISMATCH DATA-PLASMA - VARIABLE POLARITY PLASMA ARC (VPPA) WELDING CURVES SHALL BE DEVELOPED UNDER TD-1012. CURVES SHALL SHOW THE EFFECTS OF PEAKING & MISMATCH ON WELD MECHANICAL PROPERTIES. NOTE: THIS TASK IS CLOSED BASED UPON AN AGREEMENT BETWEEN MSFC & MMC TO CLOSE THIS CAPS & CONTINUE TRACKING PROBLEM ON TD-1012. TASK B-IV - CORRELATION OF BOSOR5 TO TEST COUPON. NOTE: SAME AS TASK B-III NOTE. TASK B-V - MASS REPORTING SYSTEM - AN INVESTIGATION WAS CONDUCTED INTO THE FEASIBILITY OF MODIFYING MARS (MARTIN ANOMALY REPORTING SYSTEM) WRITTEN ON PEAKING & MISMATCH PROCEDURES SO AS TO REDUCE OVERALL TIME. THIS RESULTED IN A REVISION TO THE STD REPAIR PROCEDURE (SRI) TO DEFINE WHEN A MARS WRITTEN ON PEAKING & MISMATCH MAY BE PROCESSED AS NON-MRB OR MRB. COMPLETED 7-18-83. RESOLUTION - INVESTIGATION HAS DETERMINED THAT THE PEAKING & MISMATCH VIOLATIONS OF WELD JOINTS WERE CAUSED BY INADEQUATE TOOLING, INADEQUATE PROCEDURES, & EXCEEDINGLY TIGHT TOLERANCE. MUCH WORK HAS BEEN DONE TO REDUCE THE INCIDENCE OF PEAKING & MISMATCH WELD VIOLATIONS. INCLUDED ARE: DEVELOPMENT OF A PEAKING & MISMATCH COMPUTERIZED DATA BANK; DEVELOPMENT OF A NEW OPERATING INSTRUCTIONS MANUAL FOR THE USE OF THE AIMS-65 COMPUTERIZED PEAKING & MISMATCH MACHINE; THE 5012 TOOL MANDRELS WERE REALIGNED; & A WELD ACCEPTANCE MANUAL BASED ON FLOW SIZE, STRESS, LOCATION, ETC., WAS DEVELOPED. ALTHOUGH ALL TASKS ASSIGNED ON THIS CAPS HAVE NOT BEEN CLOSED MSFC & MMC AGREED TO CLOSE THIS CAPS & TRACK UNFINISHED TASKS ON TD-1012. RECOMMEND THIS PROBLEM REPORT BE CLOSED

MSFC Response/Concurrence

ASSESSMENT ADDENDUM REPORT

MSFC Report# A06911	IFA# --	Contractor RPT# S-061	JSC# --	KSC# --	EICN# --
Asmnt Part# 80904000000	Asmnt Part Name L02 & LH2 TANKS	Asmnt Serial/Lot# N/A			
HCRIT CD --	FCRIT CD 1	CAUSE CD MAT - MFG-ASY-EQUIP	FAIL MODE MS - STRUCT		
Asmnt FMEA 6.2.1.1	Asmnt FM 1	FMEA CSE D	FMEA SCSE 1		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06921	In-Flight Anomaly Number --	Contractor Report Number E-075-5	JSC# --	KSC# --
Problem Title LO2 LEVEL SENSOR BAFFLE INSTALLED REVERSED				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 3
HCRIT --	Sys_Lvl N	Misc Codes A (1) B C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE LRU	NOMENCLATURE N/A	PART# N/A	SER/LOT# N/A	MANUFACTURER N/A
HARDWARE NCA	NOMENCLATURE LO2 LEVEL SENSOR	PART# MC432-0205-0019	SER/LOT# LWT-002	MANUFACTURER SIMMONDS
Test/Operation L - FLD	Prevailing Condtion N - INSPECTION	F / U UC	Fail Mode EV - NOT-TO-SPEC	Cause MAW - MFG-ASY-WORK
System ELECTRICAL	Defect MA - ME ADJ	Material D - DIE	Work Contact L. CLANTON	Fail Date 06/30/1983
Received at MSFC 07/22/1983	Date Isolated --	FMEA Reference 3.1.1.1	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom EV - NOT-TO-SPEC		Time Cycle --
Effectivity Text LWT-11 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/13/1995	CN RSLV SBMT 01/16/1984	Defer Date --	Add Date --	R/C Codes 1 - DES -- --
Assignee				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project J. BREWER	Project MGR --
Approval				

Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project J. BREWER	Project MGR --	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 04/26/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description					
REF: DURING NASA REVIEW OF LEVEL SENSORS AT MAF (8) EIGHT SENSORS WERE DISCOVERED WITH BAFFLE INSTALLED IN REVERSE					
Contractor Investigation/Resolution					
CAUSE - VENDOR ERROR, WORKMANSHIP. 11/21/83 PRB STATUS - CLEARED BY (GNC) GOV'T NONCOMPLIANCE, MMC HAS CLOSEOUT INFO ON PQR ITEMS. 2/1/84 - REQ. GNC BACK-UP DATA. 2/7/84 - REC'D GNC BACK-UP DATA BUT NO SCAR 2/15/84 - REQUESTED SCAR MENTIONED IN CAPS (E-075A PG STATEMENT 3 PG 10). NO SCAR EXISTED; THEREFORE, REQUESTED VENDOR DWG CHANGE DOCUMENTATION & CORRECTION OF CAPS STATEMENT. 3/1/84 - PER TELECON MMC INQUIRED ABOUT STATUS OF CAPS REVISION & DWGS. 3/27/84 - PER TELECON WITH MMC REQUESTED REVISED CAPS & DWGS FOR RC BACK-UP. 4/2/84 - PER RAPI-FAX REQUESTED CAPS REVISION & BACK-UP. 4/11/84 - REC'D REVISED CAPS & COPIES OF VENDOR DWG CHANGES. 4/12/84 RESOLUTION - THE BAFFLE PLATE WAS INSTALLED IN REVERSE IN 35 OF 65 SENSORS INSPECTED PER DC&R E-83-026 & IN 30 OF 42 SENSORS INSPECTED PER DC&R E-83-025. THE HIGH FREQ. OF BAFFLE REVERSAL INDICATES SOME PREVIOUS VEHICLES HAVE FLOWN WITH REVERSED BAFFLES. BAFFLE REVERSAL DOES SLIGHTLY INCREASE THE RESPONSE RATE BUT REMAINS WITHIN READING ACCURACY REQ'D. ALSO, BAFFLE REVERSAL RESULTS IN LESS ELE. PROTECTION. GNC - (GOV'T NONCOMPLIANCE) ET-9-4 ACCEPTS SENSORS ON LWT-2 THRU LWT-10 FOR USE-AS-IS. RECURRENCE CONTROL - LWT-11 & SUBS, ALL BAFFLES WILL BE CORRECTLY INSTALLED AS DOCUMENTED IN VENDOR DWG CHANGE CLARIFYING CORRECT BAFFLE ORIENTATION					

VENDOR INSTALLATION PROCEDURE DOCUMENT WAS ACCEPTABLE. (REF DWGS
ENCLOSED IN ORIGINAL PROB FOLDER)

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System
ASSESSMENT ADDENDUM REPORT

MSFC Report# A06921	IFA# --	Contractor RPT# E-075-5	JSC# --	KSC# --	EICN# --
Asmnt Part# MC432-0205-0019	Asmnt Part Name L02 LEVEL SENSOR	Asmnt Serial/Lot# LWT-002			
HCRIT CD --	FCRIT CD 1R	CAUSE CD MAW - MFG-ASY-WORK	FAIL MODE UC - UNSAT		
Asmnt FMEA 3.1.2.2	Asmnt FM 2	FMEA CSE A	FMEA SCSE 4		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					

MSFC Problem Reporting and Corrective Action (PRACA) System
WHOLE RECORD REPORT(+ ADDENDUM)

MSFC Record # A06929	In-Flight Anomaly Number --	Contractor Report Number E-076	JSC# --	KSC# --
Problem Title ACOUSTICAL FILTER NOT STAKED				
EICN# --	ELEMENT ET	Contractor MMMSS	FSCM# --	FCRIT 1R
HCRIT --	Sys_Lvl Y	Misc Codes A (1) B (X) C D E F G H I J K L M N O		
HARDWARE EIM	NOMENCLATURE EXTERNAL TANK	PART# 82601000000	SER/LOT# LWT-3	MANUFACTURER MMC
HARDWARE LRU	NOMENCLATURE ELEC INSTL COVER	PART# 80931003729	SER/LOT# N/A	MANUFACTURER MMC
HARDWARE NCA	NOMENCLATURE ACOUS FILTER FITTING	PART# 80931003756-041	SER/LOT# N/A	MANUFACTURER MMC
Test/Operation M - MFG	Prevailing Condtion N - INSPECTION	F / U UC	Fail Mode EV - NOT-TO-SPEC	Cause DH - DES-HDW
System ELECTRICAL	Defect CE - EXTRA	Material D - DIE	Work Contact J. ADAMS	Fail Date 07/20/1983
Received at MSFC 07/26/1983	Date Isolated --	FMEA Reference 3.3	IFA: Mission Phase --	Mission Elapsed Time --
Location MAF		Symptom EV - NOT-TO-SPEC		Time Cycle --
Effectivity Text LWT-2 AND SUBS				
Vehicle Effectivity Codes				
Vehicle 1 --	Vehicle 2 --	Vehicle 3 --	Vehicle 4 --	Vehicle 5 --
Mission Effectivity Codes				
Mssn 1 --	Mssn 2 --	Mssn 3 --	Mssn 4 --	Mssn 5 --
Estimated Completion Dates				
MSFC Approved Defer Until Date --	Contractor Req Defer Until Date --	LVL 3 Close --	Remark / Action --	
Investigation / Resolution Summary				
Last MSFC Update 02/13/1995	CN RSLV SBMT 01/04/1984	Defer Date --	Add Date --	R/C Codes 1 - DES -- --
Assignee				
Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project R. ABRAHAM	Project MGR --
Approval				

Design G. PLATT	Chief Engineer --	S & MA D. NEWMAN	Project R. ABRAHAM	Project MGR --	
PAC Assignee M. GLASS	PAC Review Complete MG	MSFC Closure Date 01/25/1984	Status C - CLOSED	F/A Completion --	
Problem Type --	SEV --	Program Name --	REVL --	OPRINC --	
FUNC MOD --	Software Effectivity -- - - - - -	Software Fail CD --		SUBTYPE --	Software Closure CD --
RES PERSON L2 --	Approval Signature L3 --				
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Related Document Type --	Related Document ID --				
Related Document Title --					
Contractor Status Summary					
Reliability/Quality Assurance Concerns, Recommendations:					
Problem Description REF: A NO. OF ACOUSTIC FILTER FITTINGS HAVE BEEN IMPROPERLY ASSEMBLED FILTER WAS NOT STAKED IN PLACE. LOOSENESS COULD PERMIT FILTER TO FALL OUT CAUSING LO2 ULLAGE PRESS. TRANSDUCER FAILURE					
Contractor Investigation/Resolution CAUSE - DWG NOT CLEAR, ASSEMBLER MISINTERPRETED DWG STAKING FILTER INSTEAD OF UPSETTING FILTER FITTING METAL TO CONTAIN FILTER. * PER L COLON/MMC, ON 1-13-84, LWT #3 INSPECTED, 4 OF 4 OK; LWT #7 & #8 REPAIRED. 7/22/83 - STS-008, LWT-2 LAUNCH CONSTRAINT IS LIFTED BASED ON THE FOLLOWING RATIONALE: TRANSDUCER FITTING WAS VERIFIED PROPERLY STAKED WITH FILTER IN PLACE BY PHYSICAL INSPECTION AT KSC. THIS CHANGE HAS BEEN COORDINATED WITH THE E.T. PROJ OFFICE - ____G. P BRIDWELL____. 9/27/83 - STS-009 LWT-4 LAUNCH CONSTRAINT IS LIFTED BASED ON THE SAME RATIONALE AS STS-8, THE TRANSDUCER FILTER WAS PHYSICALLY INSPECTED FOR PROPER STAKING AND FOUND CORRECTLY STAKED. CHANGE HAS BEEN CO-ORDINATED WITH E.T. PROJECT OFFICE - ____G. P. BRIDWELL____ 11/21/83 PRB STATUS - ONLY ITEMS OPEN IS INSPECTION OF LWT-3 EXPECTED TO CLOSE 11-30-83. 1/4/83 RESOLUTION - THE FILTER FITTINGS WERE IMPROPERLY ASSEMBLED BECAUSE THE ENGR'G DWG WAS SUFFICIENTLY CLEAR IN THE AREA THAT COVERED THE STAKING OF THE PARTS. THE ENGR'G DWG HAS BEEN COR- RECTED. IN ADDITION, THE MFR'G PROCESS PLAN HAS BEEN AMENDED TO INCLUDE SPECIFIC INSTRUCTIONS FOR THE STAKING OPERATION. ALL FILTER FITTINGS ASSEMBLED PRIOR TO THE DWG CHANGE, THAT HAD NOT YET BEEN					

FLOWN, WERE INSPECTED TO INSURE THAT THE STAKING HAD BEEN PROPERLY PERFORMED. 1/9/84 - CLOSURE DISTRIBUTED

MSFC Response/Concurrence

MSFC Problem Reporting and Corrective Action (PRACA) System

ASSESSMENT ADDENDUM REPORT

MSFC Report# A06929	IFA# --	Contractor RPT# E-076	JSC# --	KSC# --	EICN# --
Asmnt Part# 80931003756-041	Asmnt Part Name ACOUS FILTER FITTING	Asmnt Serial/Lot# N/A			
HCRIT CD --	FCRIT CD 1R	CAUSE CD MAP - MFG-ASY-INST	FAIL MODE EG - SIG HI OR LO		
Asmnt FMEA 3.2.1.1	Asmnt FM 1	FMEA CSE E	FMEA SCSE 4		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Asmnt FMEA --	Asmnt FM --	FMEA CSE --	FMEA SCSE --		
Correlated Part# --	Correlated Part# --	Correlated Part# --			
Associated LRU# --	Associated LRU# --	Associated LRU# --			
MAJOR DESIGN CHANGES					
APRV DATE --	DESCRIPTION OF CHANGES --				
ASSESSMENT TEXT					