

**SSME / A/CIL**  
**REDUNDANCY SCREEN**

Component Group: Ducts and Lines  
CIL Item: N700-02  
Part Number: RS007298  
Component: Adapter Standpipe  
FMEA Item: N700  
Failure Mode: Internal structural failure.

Prepared: D. Early  
Approved: T. Nguyen  
Approval Date: 7/25/00  
Change #: 1  
Directive #: CCBD ME3-01-5638

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Phase	Failure / Effect Description	Criticality Hazard Reference
SMC 4.1	Fire from LOX impact or rubbing. Loss of vehicle.	1 ME-C3S, ME-C3M, ME-C3A,C
	Redundancy Screens: SINGLE POINT FAILURE: N/A	

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**SSME FMEA/CIL**  
**DESIGN**

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Design / Document Reference

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**FAILURE CAUSE: A: Parent material failure or weld failure.**

THE ADAPTER ASSEMBLY (1) IS MAUFACTURED UTILIZING INCONEL 718 TUBE AND BAR. INCONEL 718 WAS SELECTED FOR ITS STRENGTH, RESISTANCE TO STRESS CORROSION, CORROSION RESISTANCE, HIGH/LOW CYCLE FATIGUE CHARACTERISTICS, AND WELDABILITY (2). MATERIALS ARE HEAT TREATED TO DEVELOP FULL MATERIAL STRENGTH AND HARDNESS (2). ALL MATERIALS USED IN THE DUCT FABRICATION ARE LOX COMPATIBLE (2). THE ADAPTER STANDPIPE USES MACHINED RADII TO REDUCE STRESS CONCENTRATIONS AND MINIMIZE THE POSSIBILITY OF CRACK INITIATION. THE FLANGE WEBS DISTRIBUTE LOADS TO PREVENT STRESS RISERS AND HIGH STRAINS. MINIMUM FACTORS OF SAFETY FOR THE ADAPTER ASSEMBLY MEET CEI REQUIREMENTS (3). HIGH AND LOW CYCLE FATIGUE LIFE OF THE ADAPTER ASSEMBLY MEET CEI REQUIREMENTS (4). THE ADAPTER ASSEMBLY PARENT MATERIAL WAS CLEARED FOR FRACTURE MECHANICS/NDE FLAW GROWTH, SINCE THEY ARE NOT FRACTURE CRITICAL PARTS (5). TABLE N700 LISTS ALL THE FMEA/CIL WELDS AND IDENTIFIES THOSE WELDS IN WHICH THE CRITICAL INITIAL FLAW SIZE IS NOT DETECTABLE, AND THOSE WELDS IN WHICH THE ROOT SIDE IS NOT ACCESSIBLE FOR INSPECTION. THESE WELDS HAVE BEEN ASSESSED AS ACCEPTABLE FOR FLIGHT BY RISK ASSESSMENT (6).

(1) RS007298; (2) RSS-8582, RSS-8575; (3) RSS-8546, CP320R0003B; (4) RL00532, CP320R0003B; (5) NASA TASK 117; (6) RSS-8758

**SSME FM CIL  
INSPECTION AND TEST**

Component Group: Ducts and Lines  
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Failure Causes	Significant Characteristics	Inspection(s) / Test(s)	Document Reference
A	ADAPTER		RS007298
	MATERIAL INTEGRITY	MATERIAL INTEGRITY IS VERIFIED PER DRAWING REQUIREMENTS.	RS007298
	SURFACE INTERGITY	DETAILS ARE PENETRANT INSPECTED PER SPECIFICATION REQUIREMENTS.	RA0115-116
	HEAT TREAT	HEAT TREAT IS VERIFIED PER SPECIFICATION REQUIREMENTS.	RA0611-020
	WELD INTEGRITY	ALL WELDS ARE INSPECTED TO DRAWING AND SPECIFICATION REQUIREMENTS PER WELD CLASS. INSPECTIONS INCLUDE: VISUAL, DIMENSIONAL, PENETRANT, RADIOGRAPHIC, ULTRASONIC, AND FILLER MATERIAL, AS APPLICABLE. (LAST TEST)	RL10011 RA0607-094 RA0115-116 RA0115-006 RA1115-001 RA0115-127

Failure History: Comprehensive failure history data is maintained in the Problem Reporting database (PRAMS/PRACA)  
 Reference: NASA letter SA21/88/308 and Rocketdyne letter 88RC09761.

Operational Use: Not Applicable.

**SSME FMEA/CIL**  
**WELD JOINTS**

Component Group: Ducts and Lines  
 CIL Item: N700  
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 FMEA Item: N700

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Component	Basic Part Number	Weld Number	Weld Type	Class	Root Side Not Access	Critical Initial Flaw Size Not Detectable		Comments
						HCF	LCF	
STANDPIPE	RS007298	1,3,4,5	GTAW	II	X			
STANDPIPE	RS007298	2	GTAW	I	X			