

Failure Modes and Effects Analysis/Critical Items List

Document Number: JSC-38378 Document Rev. No.: C Document Date: 8/26/97
Title: Risk Assessment Executive Summary Report (RAESR) for the USA SAFER

Item Name: Hand Controller Module (HCM) Qty: 1 FMEA Number: US-SFR-340
Item Part Number: SED33106098 ORU Name: SAFER
Subsystem Name: HCM ORU Part Number: SED33105900-311
Function: Converts mechanical motion into electrical commands in order to control electronic logic.

Item Type Designator: C PG/IP Identifier: N/A
Reference Designator/Find No.: N/A Drawing Number: SED33106098
Logistics Control Number: N/A

End Item Name: SAFER
End Item Capability: Six degrees of freedom through 24 thrusters, each rated at 0.8 ± 0.08 lbs. force in vacuum.
End Item Function: Provides emergency EVA self-rescue for separated crewmember.
ISS Zone: EVA Shuttle Zone: EVA

Criticality

Critical Item:	Yes: _____	No: <u>X</u>	Criticality Category:	ISS 1R	Shuttle 1R/3
Success Paths:	Success Paths Remaining:				

Failure (Mode, Cause, Detection, Corrective Action)

Failure Mode: HCM fails to terminate AAH command.
Failure Mode Code:
Failure Cause: Switch Failure, EEE part failure, short/open circuit, contamination, software error, radiation event, EMI.
Failure Detection:
Flight: IVA – IVA checkout.
EVA – Uncommanded motion. AAH/Thruster LEDs remain illuminated after switch release.
Ground: Functional Test.
Time To Detect Quantity: 10 Time To Detect Units: Seconds
Correcting Action: IVA – If failure is detected during IVA checkout, use back-up SAFER if available.
EVA – Cycle power. If not successful, no other corrective action.
Remarks: None
Failure Effect Phase: EVA Operations Affected Stage(S): EVA Operations

Failure Effect

On ORU/Assembly:
First/Second Failure: Inadvertent EVA crewmember separation.
Third (this) Failure: None.
On Subsystem/Next Assembly: None.
On End Item/Segment: Software will disable AAH. Possible loss of mission objectives if SAFER required for EVA.
On Crew/ISS: None.
Time To Effect Quantity: 1 Time To Effect Units: Minutes

Redundancy Screen

ISS (Shuttle)			
Checkout Pre-Launch (A):	Pass		
Checkout On-Orbit (B):	N/A		
Detection Flight Crew:	Pass	Or	Detection Ground Crew: Fail
Loss Of Redundancy From A Single Cause (C):	N/A		