

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) Grip Qty: 1 FMEA Number: US-SFR-300
 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: <input type="checkbox"/>	No: <input checked="" type="checkbox"/>	
Success Paths:			Criticality Category: ISS 1R Shuttle 1R/3
			Success Paths Remaining:

Failure (Mode, Cause, Detection, Corrective Action)

Failure Mode: Hand Controller Module (HCM) Grip fails to initiate thruster 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 – No commanded motion. Thruster LED does not illuminate.
Ground: Functional Test.
Time To Detect Quantity: 10 **Time To Detect Units:** Seconds
Correcting Action: IVA – If the IVA checkout detects a failure, the backup SAFER (if available) will be used.
 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: No commanded motion.
On Subsystem/Next Assembly: None.
On End Item/Segment: Prevents self rescue.
On Crew/ISS: Possible loss of EVA crewmember.
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			