Failure Modes and Effects Analysis/Critical Items List

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Title: Risk Assessment Executive Summary Report (RAESR) for the USA SAFER

Item Name: Valve Driver Assembly (VDA) **Qty:** 1 **FMEA Number:** US-SFR-260
Item Part Number: SED33107325 **ORU Name:** SAFER
Subsystem Name: Avionics **ORU Part Number:** SED33105900-311
Function: Provides power/command to thruster solenoid valve and NSI, thruster response feedback to LED thruster cue.

Item Type Designator: C **PG/IP Identifier:** N/A
Reference Designator/Find No.: N/A **Drawing Number:** SED33107325
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

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

Failure (Mode, Cause, Detection, Corrective Action)

Failure Mode: VDA fails to terminate power to thruster solenoids.
Failure Mode Code:
Failure Cause: EEE part failure, short/open circuit, contamination, software error, radiation event, EMI.
Failure Detection:
Flight: IVA – IVA checkout.
EVA – Degraded flight control, uncommanded motion.
Ground: Functional Test.
Time To Detect Quantity: 10 **Time To Detect Units:** Seconds
Correcting Action: IVA – If a failure is detected during the IVA checkout, the back-up 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: Uncommanded thrust.
On Subsystem/Next Assembly: None.
On End Item/Segment: Hinders/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		