

# 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: Manual Isolation Valve      Qty: 1      FMEA Number: US-SFR-070  
 Item Part Number: B-2570-01      ORU Name: SAFER  
 Subsystem Name: Propulsion      ORU Part Number: SED33105900-311  
 Function: Provides ability to isolate GN<sub>2</sub> supply from remaining propulsion system (after pyrotechnic isolation valve has been activated).

Item Type Designator: C      PG/IP Identifier: N/A  
 Reference Designator/Find No.: N/A      Drawing Number: SLD33105974  
 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:       Criticality Category:      ISS      Shuttle  
 Success      Success Paths Remaining:      1R      1R/3  
 Paths:

### Failure (Mode, Cause, Detection, Corrective Action)

Failure Mode: Manual Isolation Valve fails closed.  
 Failure Mode Code:  
 Failure Cause: Contamination, piece-part failure.  
 Failure Detection:  
 Flight: IVA – IVA checkout.  
           EVA – No GN<sub>2</sub> pressure to thrusters.  
 Ground: Functional Test.  
 Time To Detect Quantity: 30      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 – None.  
 Remarks: The manual isolation valve remains open at all times during the EVA unless inadvertent thrust occurs while tethered.  
 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 GN<sub>2</sub> flow.  
 On Subsystem/Next Assembly: None.  
 On End Item/Segment: Possible loss of mission objectives if SAFER is required for EVA.  
 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					