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: Thruster Inline Filter Qty: 4 FMEA Number: US-SFR-130

Item Part Number: 12267-556 ORU Name: SAFER

Subsystem Name: Propulsion ORU Part Number: SED33105900-311

Function: Prevents contamination in GN₂ from reaching thrusters.

Item Type Designator: C PG/IP Identifier: N/A

Reference Designator/Find No.: N/A Drawing Number: SED33105904

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 Remaining:

Paths:

Failure (Mode, Cause, Detection, Corrective Action)

Failure Mode: Thruster inline filter clogs.

Failure Mode Code:

Failure Cause: Contamination.

Failure Detection:

Flight: IVA – None.

EVA – No/degraded thruster response to input commands.

Ground: Functional Test.

Time To Detect Quantity: 10 Time To Detect Units: Seconds

Correcting Action: None

Remarks: Stabilization of SAFER (AAH) and maneuver capability may be available depending on the amount of filter

blockage.

Failure Effect Phase: EVA Operations Affected Stage(S): EVA Operations

Failure Effect

On ORU/Assembly:

First/Second Failure: Inadvertent EVA crewmember separation.

<u>Third (this) Failure:</u> Relief valve vents high pressure GN2. Loss of GN2 flow to thrusters.

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