

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE**  
**NUMBER:M8-1SS-E052 -X**

**SUBSYSTEM NAME:** ECLSS - ISS NITROGEN TRANSFER SYSTEM

**REVISION:** 1 10/22/97

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**PART DATA**

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|     | <b>PART NAME</b>                      | <b>PART NUMBER</b>   |
|-----|---------------------------------------|----------------------|
|     | <b>VENDOR NAME</b>                    | <b>VENDOR NUMBER</b> |
| LRU | :LINES & FITTINGS                     | M072-643415          |
| LRU | :LINES & FITTINGS                     | V828-643053          |
| LRU | :LINES & FITTINGS                     | M072-643416          |
| LRU | :LINES & FITTINGS                     | V076-643036          |
| LRU | :LINES & FITTINGS                     | ME276-0054-1001      |
| SRU | :LINES & FITTINGS<br>MULTIPLE SOURCES | MULTIPLE P/N'S       |

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

ISS NITROGEN TRANSFER LINES, FITTINGS, & QUICK DISCONNECTS

**QUANTITY OF LIKE ITEMS:** 1

ONE SET PER SUBSYSTEM

**FUNCTION:**

PROVIDES A SINGLE SUPPLY PATH OF NITROGEN FROM THE PAYLOAD BAY MMU INTERFACE PANEL TO A QUICK DISCONNECT LOCATED AT THE DOCKING BASE/PMA INTERFACE. NITROGEN LINES BETWEEN THE MMU INTERFACE PANEL AND DOCKING BASE ARE MOUNTED OUTSIDE OF THE EXTERNAL AIRLOCK. NITROGEN LINES THAT EXTEND FROM THE DOCKING BASE BULKHEAD TO THE ISS ARE ROUTED INSIDE THE DOCKING BASE AND ISS PMA.

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NUMBER: M8-1SS-E052-X**

**REFERENCE DOCUMENTS:** V828-643053  
VS28-643001  
V076- 643036  
M072-643415  
M072-643416

**FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE  
NUMBER: M8-1SS-E052-03**

**REVISION#:** 0 04/05/02

**SUBSYSTEM NAME:** ECLSS - ISS NITROGEN TRANSFER SYSTEM  
**LRU:** ISS NITROGEN TRANSFER LINES  
**ITEM NAME:** LINES, FITTINGS, & QUICK DISCONNECTS  
**CRITICALITY OF THIS FAILURE MODE:** 1R3

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**FAILURE MODE:**  
FAILS TO DISCONNECT

**MISSION PHASE:** OO ON-ORBIT

**VEHICLE/PAYLOAD/KIT EFFECTIVITY:** 103 DISCOVERY  
104 ATLANTIS  
105 ENDEAVOUR

**CAUSE:**  
CORROSION, MECHANICAL SHOCK, PHYSICAL BINDING/JAMMING OF QUICK DISCONNECT  
AND/OR RELEASE RING, MATERIAL DEFECT

**CRITICALITY 1/1 DURING INTACT ABORT ONLY?** NO

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**REDUNDANCY SCREEN** A) PASS  
B) PASS  
C) PASS

**PASS/FAIL RATIONALE:**

A)

B)

C)

**METHOD OF FAULT DETECTION:**  
LOSS OF ABILITY TO DISCONNECT THE QD WITHOUT THE USE OF TOOLS

**CORRECTING ACTION:** MANUAL

**CORRECTING ACTION DESCRIPTION:**

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THE GN2 TRANSFER FLEX HOSE HAS QUICK DISCONNECTS ON EACH END. IF THE QD ON THE ORBITER END OF THE HOSE CANNOT BE DISCONNECTED, THEN THE QD ON THE ISS END OF THE HOSE CAN BE DISCONNECTED (WITHOUT THE USE OF TOOLS).

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**- FAILURE EFFECTS -**

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**(A) SUBSYSTEM:**

LOSS OF ABILITY WITHOUT THE USE OF TOOLS TO DISCONNECT THE GN2 TRANSFER HOSE TO THE ISS FROM THE QUICK DISCONNECT LOCATED AT THE DOCKING BASE/PMA INTERFACE.

**(B) INTERFACING SUBSYSTEM(S):**

LOSS OF ABILITY TO QUICKLY DISCONNECT AND REMOVE THE GN2 TRANSFER LINE HOSE, CLOSE THE HATCHES AND UNDOCK.

**(C) MISSION:**

FIRST FAILURE - NO EFFECT

**(D) CREW, VEHICLE, AND ELEMENT(S):**

FIRST FAILURE - NO EFFECT

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE FOLLOWING SCENARIO:

FIRST FAILURE - LOSS OF ABILITY TO QUICKLY DISCONNECT THE FAILED QD BY HAND AND TO REMOVE THE GN2 TRANSFER HOSE WITHOUT THE USE OF TOOLS.

SECOND FAILURE - EMERGENCY SITUATION (I.E. FIRE) ON THE ISS WHICH REQUIRES THE ORBITER TO QUICKLY UNDOCK FROM THE ISS.

THIRD FAILURE - LOSS OF ABILITY TO QUICKLY DISCONNECT THE GN2 TRANSFER HOSE FROM THE ISS SIDE BY HAND WITHOUT THE USE OF TOOLS SO THAT THE HATCHES BETWEEN THE ORBITER AND ISS CAN BE CLOSED TO ALLOW RAPID UNDOCKING.

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**- TIME FRAME -**

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**TIME FROM FAILURE TO CRITICAL EFFECT: SECONDS**

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**- APPROVALS -**

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| SS&R ENGINEERING   | : T. K. KIMURA   | : /S/ T. K. KIMURA   | 4/5/02 |
| DESIGN ENGINEERING | : KEVIN J. KELLY | : /S/ KEVIN J. KELLY | 4/9/02 |