NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		104FM02Y		
BRIEF/WAIST ASSEMBLY, ITEM 104 ---------- 0104-210605- 07/08/09/10/11/12 (1)	1/1	Loss of primary axial restraint bracket housing. Defective material; bracket.	END ITEM: Loss of primary/secondary axial restraining capability. GFE INTERFACE: Suit gas leakage to ambient. Depletion of primary oxygen supply and SOP. Rapid depressurization of SSA beyond SOP makeup capability. MISSION: Abort EVA. CREW/VEHICLE: Loss of crewman. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - Adjustable Bracket (P/N 10271): The BSC adjustable primary bracket housings are fabricated from 15-5 stainless steel heat treated to H1075. They are machined, heat treated, ultrasonic cleaned, and passivated. Analysis has shown that the bracket exhibits a minimum safety factor of 2.16 against ultimate over a S/AD limit load of 911 lbs. NASA Materials has reviewed the bracket housing design and has determined it is not fracture critical. (ref. NASA memorandum from EM2 to ES2, "Extravehicular Mobility Unit (EMU) Fracture Control", April 1997) B. Test - Acceptance: Component - See Inspection. PDA: The following test is conducted at the Lower Torso Level in accordance with ILC Document 0111-710112: 1) Proof pressure test at 8.0 +0.2 -0.0 psig to verify no structural damage. Certification: The adjustable waist assembly was successfully tested (manned) to duplicate operational life (Ref ILC Document 0111-712381). The following use, reflecting requirements of significance to the waist assembly, was documented during certification: Requirements / S/AD / Actual Flexion/Extension: 1234 / 2600 Rotations: 2466 / 5000 Walking Steps: 4320 / 8640 Pressure Cycles: 300 / 604 Don/Doff Cycles: 98 / 204 The waist assembly was successfully subjected to a BTA ultimate pressure of 13.2 psid during certification testing (Ref. ILC Doc. 0111-712381). This is 1.5 times the maximum BTA operating pressure of 8.8 psid. In addition, adjustable waist successfully completed load testing to 1822 lbs. (two times externally induced limit loads) on primary restraints and 2680 lbs. On the secondary restraints without yielding the bracket. C. Inspection - Components and materials manufactured to ILC requirements at an approved supplier are documented from procurement through shipping by the supplier. ILC incoming receiving inspection verifies that the materials received are as identified in the procurement documents, that no damage has occurred during shipment, and that the supplier certifications have been received which provides traceability information. All machined brackets are inspected using either the Dye Penetrant or Magnetic Particle Technique. During certification testing, the bracket successfully completed testing to a

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		104FM02Y		factor of safety of 2.0 without yielding against a S/AD limit load of 911 lbs. The following MIP's are performed during the waist manufacturing process to assure the failure causes are precluded from the fabricated item: 1) The presence of screws, thread lock adhesive, and proper torque are verified during assembly at the EMU processing facility. D. Failure History - None. E. Ground Turnaround - During ground turnaround in accordance with the FEMU-R-001, the BSC (while installed in the LTA) is subjected to a visual inspection for structural integrity. F. Operational Use - Crew Response - EVA: When CWS data confirms SOP activation, abort EVA. Special Training - Standard training covers this failure mode. Operational Considerations - Flight rule A15.1.2-2 of "Space Shuttle Operational Flight Rules", NSTS-12820 defines go/no go criteria related to EMU pressure integrity. Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems. Pre/Post EVA: If during airlock operations, repress airlock. Otherwise consider third EMU, if available. EMU no go for EVA.

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-104 LOWER TORSO ASSEMBLY (LTA)

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____
HS - Project Engineering

_____
HS - Reliability

_____ 4/24/02
HS - Engineering Manager

Approved by: _____ 2MAY02
NASA – SSA/SSM

_____ 5/24/02
NASA – EMU SSM

_____ 5.29.02
NASA - S & MA

_____ 5-30-02
NASA - MOD

_____ 6/04/02
NASA - Crew

_____ 6/3/02
NASA - Program Manager

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-104 LOWER TORSO ASSEMBLY (LTA)

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: 3/27/02
HS - Project Engineering

Approved by:
NASA – SSA/SSM

M. Snyder
HS - Reliability

5/14/02
NASA – EMU/SSM

for
HS - Engineering Manager

5/17/02
NASA - S & MA

5/23/02
NASA - MOD

6/04/02
NASA - Crew

6/3/02
NASA - Program Manager