CRITICAL ITEMS LIST

Reference Designator: N/A
Part Name (Qty): Gas Container (1)
Drawing Reference: SED33105590

Project: Government Furnished Equipment
LRU Name (Qty): ACES Coverall (1)
LRU Part No.: SED33105590

Subsystem: CES
Effectivity: All Orbiters

Failure Mode Number 7.1.2	Criticality 1R/2	Failure Effect	Retention Rationale

FUNCTION

Retain the pressure in the entire body area below the neck for low atmospheric pressure physiological protection.

Failure Mode and Cause
Mode: Gas container leakage/rupture

Cause:
1. Defective material
2. Defective/leaking vent flapper valve
3. Defective/leaking bio-medical pass-thru port/plug
4. Defective/leaking pressure sealing closure

Redundancy Screens	Remaining Paths - 1
A-Pass B-N/A C-Pass	Requires previous critical Orbiter failure (decompression) for suit pressurization

Mission Phase	Time to Effect	Time to Correct
Abort	Seconds	N/A

END ITEM

ACES counter pressure garment unable to maintain pressure and provide physiological protection against low atmospheric pressure

Mission

N/A

Crew/Vehicle

Loss of crewmember

Interface

N/A

1. DESIGN FEATURES TO MINIMIZE FAILURE MODE

A. The gas container material (tri-laminate Gore-tex) is ultrasonically sealed
B. The restraint layer and coverall are exterior to the gas container and act as protective covers
C. Designed with a burst pressure at least 2.5 times operational pressure of 3.5 psig (9.0 psi)

2. TEST OR ANALYSIS TO DETECT FAILURE MODE

A. Acceptance Test (P528/CEE-1054)

1. Coverall structural test, 7.0 psig (2 times operational) for 15 minutes (no damage)
2. Coverall leakage test, 3.5 psig (400 sccm max)

B. Certification (JSC 38024)

1. Overpressure test at 9.0 psig for 60 seconds with subsequent leakage test
2. Full pressure ensemble cycle tested, 500 cycles
3. Pressure sealing closure cycle tested, 4000 cycles
4. Manned hypobaric chamber testing at 75,000 ft, rapid decompression from 29,000 to 65,000 ft.

C. Turnaround Testing (P528/CEE-M1011)

1. Coverall structural test at 36 months, 7.0 psig for 5 minutes (no damage)
2. Coverall leakage test, 3.5 psig for 5 minutes (1600 sccm max)

Prepared BY: R.E. Hoppes

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Subsystem: CES
Effectivity: All Orbiters

Failure Mode Number 7.1.2	Criticality 1R/2	Failure Effect	Retention Rationale
FUNCTION Retain the pressure in the entire body area below the neck for low atmospheric pressure physiological protection.		**END ITEM** ACES counter pressure garment unable to maintain pressure and provide physiological protection against low atmospheric pressure **Mission** N/A **Crew/Vehicle** Loss of crewmember **Interface** None	**1. INSPECTION** **A. Acceptance Inspection (P528/CEE-1145)** 1. Government source inspection for seam assembly, cementing, sewing procedures during assembly 2. Visual inspection of restraint, link net for defects during assembly **B. Turnaround Inspection (P528/CEE-1061)** 1. Inspection of seams, restraint layer, pressure sealing closure for physical damage/structural integrity (PIA) **4. FAILURE HISTORY** None. The ACES gas container construction techniques are virtually identical to other full pressure suits currently in use by DOD for over 30 years. **5. OPERATIONAL USE** A. Operational effect of failure - possible loss of crewmember B. Crew action - None C. Crew training - Crew trained in proper use of ACES D. Mission constraint - None - Mission terminated prior to use of this equipment E. Inflight checkout - None - Crew could inspect coverall for damage but probably not repairable
Failure Mode and Cause Mode: Gas container leakage/rupture Cause: 1. Defective material 2. Defective/leaking vent flapper valve 3. Defective/leaking bio-medical pass-thru port/plug 4. Defective/leaking pressure sealing closure			
Redundancy Screens A-Pass B-N/A C-Pass	**Remaining Paths - 1** Requires previous critical Orbiter failure (decompression) for suit pressurization		
Mission Phase	**Time to Effect**	**Time to Correct**	
Abort	Seconds	N/A	

Prepared BY: P.E. Hooper Superseding Date: N/A Approved By: B.W. Sauser July 9, 1994