CRITICAL ITEMS LIST

Reference Designator: N/A
Part Name (Qty): Neck Seal [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 7.1.1	Criticality 1R/2	Failure Effect	Retention Rationale
Function Permits gas tight seal between breathing cavity and suit compartment. Provides for positive pressure of breathing oxygen and separation of breathing oxygen and ventilation air.		**End Item** Premature depletion of emergency oxygen system supply **Mission** N/A **Crew/Vehicle** Loss of crewmember **Interface** None	**1. DESIGN FEATURES TO MINIMIZE FAILURE MODE** A. Neck seal fabricated of neoprene material, same as material in use by the Air Force high altitude suits and Launch entry suit since STS-26. B. Neck seal designed to experience only 1.5 inches of water differential pressure. C. Capable of withstanding 7.0 psig. **2. TEST OR ANALYSIS TO DETECT FAILURE MODE** A. Acceptance Test (P528/CEE-1052) 1. Breathing cavity leak test at 1.5 inches of water (spec: 100 sccm) 2. Neck seal sized for individual crewmembers B. Certification (JSC 38024) 1. Neck seal part of full pressure ensemble pressure cycling to 500 cycles 2. Manned hypobaric testing to 75,000 ft., rapid decompression from 29,000 to 65,000 ft., verified to maintain positive pressure in breathing cavity C. Turnaround Testing 1. Breathing cavity leak test at 1.5 inches of water (spec: 100 sccm)
Failure Mode and Cause Mode: Neck seal fails/leakage Cause: 1. Defective material 2. Oversizes during donn and doff			
Redundancy Screens A- Pass B- N/A C- Pass	**Remaining Paths - 1** Previous Orbiter failure requiring pad egress and use of emergency oxygen system		
Mission Phase	**Time to Effect**	**Time to Correct**	
Pad Egress	Seconds	N/A	

Prepared BY: P.E. Hooper

Supersedes Date: N/A

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Effectivity: All Orbiters

Failure Mode Number	Criticality	Failure Effect	Retention Rationale
7.1.1	1R/2		

Function

Permits gas tight seal between breathing cavity and suit compartment. Provides for positive pressure of breathing oxygen and separation of breathing oxygen and ventilation air.

Failure Mode and Cause

Mode: Neck seal failure/leakage

Cause:

1. Defective material
2. Overstress during donn and doff

Redundancy Screens	Remaining Paths - 1
A-Pass B-N/A C-Pass	Previous Orbiter failure requiring pad egress and use of emergency oxygen system

Mission Phase	Time to Effect	Time to Correct
Pad Egress	Seconds	N/A

End Item

Premature depletion of emergency oxygen system supply

Mission

N/A

Crew/Vehicle

Loss of crewmember

Interface

None

3. INSPECTION

A. Acceptance Inspection (F528/CEE-1145)

1. Government source inspection during fabrication and installation in suit
2. Visual inspection of seams and pressure sealing surface of neck seal

B. Turnaround Inspection

1. Verification of neck seal sized to individual crewmember
2. Inspection of neck seal seams on breathing cavity and sealing integrity (PIA)

4. FAILURE HISTORY

None. This style neck seal is currently in use by the Air Force in high altitude pressure suits and the LES since STS-26.

5. OPERATIONAL USE

A. Operational effect of failure - possible loss of crewmember
B. Crew action - None
C. Crew training - crew trained in the correct use of ACES
D. Mission constraints - None - Crew could inspect neck seal before donning suit
E. Inflight checkout - None - Crew could inspect neck seal before suit donning. A small tear could possibly be repaired with general purpose tape

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