FEB 08 1990

Critical Item: Hydrogen Leak Detectors (17 Items per pad)

Find Number: A125534 thru 125550

Criticality Category: 1S

SAA No: 09SYW7-001

System/Area: Fixed Hydrogen Leak Detection at H.P. GH2 Facility, Pad 39 A/B

NASA Part No: 79K13445-1

PMN/ Name: S70-1220 Hydrogen Leak Detector Sensor

Mfg/ Part No: Rexnord Model 880

Drawing/ Sheet No: 79K13445 1

Function: Monitor the high pressure GH2 Facility equipment, at pad 39 A/B, for hydrogen leaks.

Critical Failure Mode/Failure Mode No: Low or no output/09SYW7-001.001

Failure Causes: Structural failure of an internal piece part or failure of a discrete component within the sensor.

Failure Effect: System could fail to detect a hydrogen leak which could result in a fire and/or explosion with loss of life.

Acceptance Rationale

Design: These hydrogen leak detection sensors meet the design requirements of NASA specification 79K08419, "Specification for Hydrogen Leak Detection Sensors" (S70-1220) which include:

- o Explosion proof housing
- o Solid state device with over voltage and reverse polarity protection
- o Analog output of 0-5V DC (0-40,000 ppm hydrogen concentration)
- o Repeatability ± 5% of full scale with identical input conditions
- o Operating Temperature -40° to +158°F
- o Response time - 1 second for 90% change
- o Capable of indefinitely sustaining a short circuit on the output pins without damage to the unit
- o Over voltage protection

Hydrogen Leak Detectors (Continued)

These units are used in commercial applications by semi-conductor manufacturers, mines and other areas where combustible gas may be present.

Test: 79K11321 requires unit to be calibrated semi-annually.

File VI requires a system test to be performed prior to each mission and at component replacement. (OMI M3020)

Inspection: Inspection and preventative maintenance is performed on the hydrogen leak detectors quarterly. (OMI V3541)

Failure History:

- There were 601 PV-6 PRACA reports reviewed against the Hydrogen Leak Detection Sensors 79K13448. There were 13 PR's identified in the "fail low" failure mode which were detected during the test/ calibration type OMIs. There are no known failures in the Critical Failure Mode during system operation.
- The GIDEP failure data interchange system has been researched and no failures of this component were found.

Operational Use:

- Correcting Action:

  There is no action which can be taken to mitigate the failure effect.

- Timeframe:

  Since no correcting action is available, timeframe does not apply.