

CIL 199901

APR 27 1999

EO 1-SAA09PPAB13-003



USA Ground Operations CIL Sheet

Critical Item: HVDS Monitor Unit

NASA Part No: 80K51815 (79K08420-H2)

Mfg/Part No: Energetics Science Div., Becton-Dickinson Co. / Ecolyzer Model 7660 (MMH/MMH)

System: Hypergol Vapor Detection System

Criticality Category: 1S

Total Quantity: 6

Find No.	Qty	Area	PMN	Baseline	Drawing / Sheet
A129918	1	Pad-A	S70-1221-03	013.00	79K08420 / 1-15
A129918	1	Pad-B	S70-1221-03	013.00	79K08420 / 1-15
A129924	1	Pad-A	S70-1221-03	013.00	79K08420 / 1-15
A129924	1	Pad-B	S70-1221-03	013.00	79K08420 / 1-15
A129925	1	Pad-A	S70-1221-03	013.00	79K08420 / 1-15
A129925	1	Pad-B	S70-1221-03	013.00	79K08420 / 1-15

Function:

Detect the presence of hypergol fuel vapors.

Failure Mode No. Failure Mode	Failure Cause Failure Effect	Detection Method Time to Effect	Crit Cat
09PPAB13-003.004	HVDS monitor unit component failure.	LPS monitoring	1S
Erroneous output	Sensor will not transmit appropriate signal indicating presence of hypergol vapor	Immediate	

ACCEPTANCE RATIONALE

Design:

Procured item built for NASA

- Capabilities and characteristics
 - Minimum detectable sensitivity
 - Zero drift
 - Span drift
 - Accuracy
 - Noise
 - Operating temperature range
 - Operating relative humidity

- 2% of full scale*
- +/- 10%
- +/- 10%
- 5% full scale
- 1% full scale maximum
- 0° to 35° C
- 10% to 95%

* Note: Range vs. PPM for 2% of full scale.

Range	MMH	PPM
0-2	0.04	
0-20	0.40	
0-200	4.00	

Test:

- OMRSD File VI, Vol. I requires that the sample flow rate will be verified prior to each use.
- OMRSD File VI, Vol. I requires that the zero setting in air and the analog response to surrogate gas will be verified prior to each use.
- OMRSD File VI, Vol. I requires that the sample line ID is verified prior to each use.
- OMRSD File VI, Vol. I requires that the sample line's integrity be verified through a leak check prior to each use.

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Inspection:

- The sensor certification is verified to be current prior to each flow and the certification date recorded to avoid operation beyond certification period.
- The sample lines are cleaned and dried prior to each sensor installation.
- The OMI requires that personnel be stationed on the RSS during loading operations; those personnel provide a visual monitoring of the operation.
- During the break between loading operations of oxidizer (N2O4) and fuel (MMH), a survey will be taken of the units to assess the operational status of each and make repairs if needed, prior to continuing.

Failure History:

- Current data on test failures, unexplained anomalies, and other failures experienced during ground processing activities can be found in the PRACA database. The PRACA database was researched and the following data was found on this component in the critical failure mode.
- KSC PRACA failure history (May 29, 1984 through June 30, 1991) indicated twenty one HVDS Monitor Units failures. Of those failures, 6 were insufficient or no flow (pump or cell), 10 were cell failure (actual fluid visible in flowmeter), and 5 were general failure (electronic).
- The GIDEP failure data interchange system has been researched and no failures of this component were found.

Operational Use:

Correcting Action	Timeframe
There is no action which can be taken to mitigate the failure effect.	Since no correcting action is available, timeframe does not apply.