

SRB CRITICAL ITEMS LIST

SUBSYSTEM: THRUST VECTOR CONTROL

ITEM NAME: Gas Generator

PART NO.: 5905078
Alt: 5905067
Alt: 58727
Alt: 5903456

FM CODE: A01

ITEM CODE: 20-01-16

REVISION: Basic

CRITICALITY CATEGORY: 1

REACTION TIME: Seconds

NO. REQUIRED: 2

DATE: March 1, 2002

CRITICAL PHASES: Final Countdown

SUPERCEDES: March 31, 2000

FMEA PAGE NO.: A-57

ANALYST: R. Imre/ S. Finnegan

SHEET 1 OF 4

APPROVED: S. Parvathaneni

CN 044

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FAILURE MODE AND CAUSES: Fails to operate (System A and/or B) caused by:

- o Contamination

FAILURE EFFECT SUMMARY: Fire and explosion will lead to the loss of mission, vehicle and crew.

REDUNDANCY SCREENS AND MEASUREMENTS: N/A

RATIONALE FOR RETENTION:

A. DESIGN

- o The Gas Generator is designed and qualified in accordance with end item specification 10SPC-0050. (All failure causes)
- o Catalyst is Shell 405. (Contamination)
- o Catalyst will suffer no functional loss or physical deterioration from exposure to ammonia chloride, freon, trichloroethylene or isopropyl alcohol. (Contamination)
- o Hydrazine is filtered through two 25 micron filters upstream of the gas generator per 10REQ-0021, para. 2.3.2.1. (Contamination)
- o Gas generator surfaces exposed to Hydrazine are cleaned to level 125 of ES013. (Contamination)
- o Qualification testing verified design requirements as reported in Sundstrand Qualification Test Report AER-1539-6 Rev. B. (Contamination)
- o Fluid procurement is controlled per SE-S-0073. (Contamination)

B. TESTING

- o Acceptance testing is performed per General Dynamics OTS Aerospace ATP TP 0600 prior to installation in the APU. (Contamination)
- o Acceptance testing is performed per Sundstrand ATP TS 2409 on all new flight units. This includes a hotfire Acceptance Test decontamination and precision cleaning of the fuel system. (Contamination) CN 044
- o During refurbishment and prior to reuse, the gas generator is subjected to the same Sundstrand ATP standards as new units per Sundstrand ATP TS 2409. (Contamination)
- o Hydrazine is verified for cleanliness and composition (purity and particulate count) prior to introduction to on-board flight hardware per 10REQ-0021, para. 2.3.2.1 and OMRSD File V, Vol. 1, requirement number B42AP0.010. (Contamination)
- o GN2 is verified for cleanliness and composition (purity and particulate count) prior to introduction to on-board flight hardware per 10REQ-0021, para. 2.3.2.2 and OMRSD File V, Vol. 1, requirement number B42AP0.012. (Contamination)
- o TVC system functional test is performed during hotfire operations to demonstrate proper function per 10REQ-0021, para. 2.3.16. (Contamination)
- o Helium (influent) is verified for cleanliness and composition (purity and particulate count) per 10REQ-0021, para. 2.3.2.5 prior to fuel pump shaft seal leak check. (Contamination)
- o Helium is verified for cleanliness and composition (purity and particulate count) prior to introduction to on-board flight hardware per 10REQ-0021, para. 2.3.2.5.
- o GN2 (from MLP portable panels) is verified for cleanliness and composition (purity and particulate count) prior to introduction to on-board flight hardware per OMRSD File V, Vol. 1, requirement number B42AP0.012. (Contamination)

The above referenced OMRSD testing is performed every flight.

C. INSPECTION

VENDOR RELATED INSPECTIONS

- o Verification of proper operation per SIP 1491 by USA SRBE PQAR. (Contamination)
- o Witnessing of acceptance test per SIP 1128 at Sundstrand and SIP 1491 at General Dynamics OTS Aerospace by USA SRBE PQAR. (Contamination)
- o Verifications that are required on new units are performed on refurbished units per SIP 1491 by USA SRBE PQAR. (Contamination) CN 044

- o Vendor inspection and test records are verified per SIP 1491 by USA SRBE PQAR. (Contamination)
- o Material certifications are verified by USA SRBE PQAR per SIP 1491. (Contamination)
- o Critical Processes/Inspections:
 - None

KSC RELATED INSPECTIONS

- o Hydrazine cleanliness and composition (purity and particulate count) are verified prior to introduction to on-board flight hardware per 10REQ-0021, para. 2.3.2.1 and OMRSD File V, Vol. 1, requirement number B42AP0.010. (Contamination)
- o GN2 cleanliness and composition (purity and particulate count) are verified prior to introduction to on-board flight hardware per 10REQ-0021, para. 2.3.2.2 and OMRSD File V, Vol. 1, requirement number B42AP0.012. (Contamination)
- o Proper function of TVC system is demonstrated during hotfire operations per 10REQ-0021 to include hotfire, para. 2.3.16. (Contamination)
- o Helium (influent) is verified for cleanliness and composition (purity and particulate count) prior to fuel pump shaft seal leak check per 10REQ-0021, para. 2.3.2.5. (Contamination)
- o Helium cleanliness and composition (purity and particulate count) are verified prior to introduction to on-board flight hardware per 10REQ-0021, para. 2.3.2.5. (Contamination)
- o GN2 (from MLP portable panels) is verified for cleanliness and composition (purity and particulate count) prior to introduction on-board hydrazine circuits per OMRSD File V, Vol. 1, requirement number B42AP0.012. (Contamination)
- o TVC Couplings (Both SRB and GSE) are inspected each time prior to mating per 10REQ-0021 para. 2.3. After transfer to SPC they are inspected prior to mating per File V, Vol. I, requirement number B42GEN.070. (Contamination).
- o GN2 (from servicing cart) is verified for cleanliness and composition (purity and particulate count) prior to introduction to on-board hydrazine circuits per OMRSD File V, Vol. 1, requirement number B42AP0.012. (Contamination)
- o Hydrazine (from servicing cart) is verified for cleanliness and composition (purity and particulate count) prior to introduction on-board hydrazine circuits per OMRSD File V, Vol. 1, requirement number B42AP0.010. (Contamination)

D. FAILURE HISTORY

- o Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

- o Not applicable to this failure mode.