

OCT 21 1994

SAA29CL01-030

B/L: 554.50, 554.75

SYS: TACAN

Critical Item: DC Power Cable Assembly (2 Items Total, one per site)

Find Number: W15

Criticality Category: 1

SAA No: 29CL01-030

System/Area: TACAN/TALS

NASA

PMN: U72-1317-01/

Part No: None

Name: DC Power Cable Assembly

Mfg/ E-System/

Drawing/ T.O. 31R4-2TRN26-2/

Part No: 004514

Sheet No: 3-36

Function: Provide electrical connection between power supply Unit 11 and control Transfer Group Unit 4.

Critical Failure Mode/Failure Mode No:

- 1) Fail open/29CL01-030.021
- 2) Fail short/29CL01-030.022

Failure Cause:

- 1) Metal fatigue
- 2) Insulation deterioration

Failure Effect: Loss of power to Control Transfer Group Unit 4 resulting in loss of control transfer, monitor and antenna control capabilities and loss of azimuth and ID to the Orbiter. Each failure could cause loss of life and/or vehicle. Detection method is visual. Time to effect is immediate from 250 nautical miles to 20 nautical miles.

ACCEPTANCE RATIONALE

Design:

- All cables are housed in an environmentally controlled enclosure to prevent premature cable failure due to heat and corrosion.
- Cable is overall shielded consisting of 4 # 18 AWG stranded copper conductors with 34 strands per conductor. Cable estimated load is 20 amps via 2 # 18 AWG conductors. Current rating for 2 # 18 AWG wire is 36 amps.
- Wire pin connections are soldered.
- Connectors are keyed for polarization.

*Attachment
5050234PK*

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- Connectors have cable strain relief that supports cable connection and minimizes single strand stress, which could result in a cable failure.
- Once installed, these cables remain installed and are not disturbed during normal operation. This will reduce the potential for a failure occurring during operational use.
- The TACAN AN/TRN-26 is a portable tactical air navigation system designed for use at remote landing strips and forward operating areas by the US Air Force.

Test:

- TACAN activation is required T-3 hours before the start of Ground Launch Sequence. This activation will provide assurance that the system is functioning as required.
- OMRS File VI requires a system validation test prior to each use of TACAN for Orbiter landing.
- NSTR 07700, Vol. X, requires an annual validation test that verifies proper reception of signal by in flight aircraft to determine ground interference and system alignment quality.

Inspection:

- Prior to TACAN activation a pre-operation checkout (inspection) is performed per OMI Z3109-A.

Failure History:

- Current data on test failures, unexplained anomalies and other failures experienced during ground processing activity can be found in PRACA database. The PRACA database was researched and no failure data was found on this component in the critical failure mode.
- The GIDEP failure data interchange system was researched and no failure data on this component was 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.

*Attachment
4050234DK*