

20.0 WAIVERS; DEVIATIONS; AND EXCEEDANCES

20.2 FUSING CRITERIA

(Ref. Para. 7.3.1.4 and Figure 7.0.1.2-1)

Requirement: The cargo element is required to provide circuit protection in the form of fuses, resistors, or other current limiting devices on its side of the interface in order to protect cargo element and Orbiter wiring.

Exceedance The following potential violations exist (see schematic shown in Figure 7.0.1.2-1):

1. Un-insulated 20 AWG wires connected to the second brass bus bar in the relay box.
2. No fusing between the 18 AWG wire connected to the first brass bus bar before it splices into 20 AWG wires.

Rationale: 1. The lengths of the un-insulated 20 AWG wires from the bus bar # 2 to the 20 amp fuses are no greater 1/8-inch. In addition, it has been inspected to ensure it is physically separated from nearby conducting surfaces.

2. The following eight (8) insulated 20 AWG wires are routed such that they are protected from abrasion due to contact with sharp edges:
 - A. The two 23-inch wire segments are used to provide power to the SPA switch panel I/F box. For all Hitchhiker (HH) missions that use the Standard Switch Panel, (SSP) (i.e. MightySat, these wires do not conduct any current. For all HH missions that use the Small Payload Accommodation Switch Panel (SPASP), these wires conduct approximately 100 milliamps.
 - B. The two 8-inch wire segments are attached to the hot side of the K9 relay coil, the 16-inch wire segment is attached to the Y+ZL relay coil and the 22-inch wire segment is attached to the X+ZL relay coil.

These wires only draw current when:

- 1) The coils are pulsed from the SSP or
- 2) Commanded from the SPASP via the SPA switch panel I/F box in the HH avionics unit.

C. The two 21-inch fused wire segments are used to provide power to the HH avionics.

D. The length of the 18 AWG (insulated) and 20 AWG wires involved are short and in a sealed aluminum box

located

in the cargo bay operated only while in orbit.

E. The payload provided 18 AWG and 20 AWG power circuits are not safety critical.

Authority: CR/DIR A03357

Effectivity: All MightySat missions

20.3 DC POWER GROUND REFERENCE
(Ref. Paragraph 10.7.4.3.2)

Requirement: Orbiter DC power supplied to a cargo element shall be structure referenced in the Orbiter and DC isolated from structure ground at the Cargo Element by 1 megohm except as specified in Paragraph 10.7.4.1.

Exceedance: The Hitchhiker Avionics with MightySat experiment integrated has a DC isolation of 5.0 kilohms from main DC return to structure ground.

Rationale: Isolation of at least 5.0 kilohms will be maintained. This could add noise to the MightySat payload, but it will not impose noise onto the Orbiter or other payloads. Per letter from M. Wright (NASA/GSFC), when an all-up functional test with all experiments activated was performed, all of the experiments (including the Hitchhiker Avionics) functioned normally. All Orbiter/Hitchhiker signal interface isolation requirements will be applicable.

Authority: CR/DIR A03357

Effectivity: All MightySat missions.

20.4 PDI INPUT DATA CHARACTERISTICS - ATTACHED INTERFACE SHUTTLE STANDARD FORMAT

(Ref. Para. 8.2.1.1 and Table 8.0.1.2-1)

Requirement : Table 8.2.1.1 notes (5) and (8) require that any pattern of contiguous bit positions located in first or last word(s) of every minor frame (with exception of FAF320 Hex bit pattern) shall be used. Utilization of the last word(s) may preclude telemetry data streams processing at KSC.

Exceedance : Table 8.0.1.2-1 Note (2) requires sync pattern FAF320 in Hex to be used.

Rationale : The Orbiter Pulse Code Modulator (PCM) sync pattern id FAF320 Hex. The use of the same sync pattern by a payload could cause a false lock by ground facilities upon decommutation of the payload data stream. This occurs when re-establishing the telemetry data stream, which will cause a loss 5 minor frames(based on a payload telemetry rate of 8 kbps) of all Orbiter/payload data out of 100 minor frames/second. The lost data can be acquired during recorded playback.

Authority : CR/DIR A03357

Effectivity : All MightySat missions.

THIS PAGE INTENTIONALLY LEFT BLANK