CHANGE NOTICE

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THIS NOTICE INFORMS RECIPIENTS THAT THE DOCUMENT IDENTIFIED BY THE NUMBER (AND REVISION LETTER) SHOWN IN BLOCK 4 HAS BEEN CHANGED. THE PAGES CHANGED BY THIS CDCN BEING THOSE FURNISHED HEREWITH AND CARRYING THE SAME DATE AS THIS CDCN. THE PAGES OF THE PAGE NUMBERS AND DATES LISTED BELOW IN THE SUMMARY OF CHANGED PAGES COMBINED WITH NON–LISTED PAGES OF THE ORIGINAL ISSUE OF THE REVISION SHOWN IN BLOCK 4 CONSTITUTE THE CURRENT VERSION OF THIS DOCUMENT.

13. CDCN No.	14. Pages Changed (Indicate Deletions)	S*	A*	15. Date
011	Revision and History page	X		3/13/2001
	Pages 3–2 and 3–4	X		
	Page C–17.	X		
	Order of Incorporation DCN 009, 010, 011			

16. Technical Concurrence (Contracting Agency)	Date

* "S" indicates supersedes earlier page. "A" indicates added page.

REVISION AND HISTORY PAGE

REV.	DESCRIPTION	PUB. DATE
	Draft Revision B – SDR Version "Reference SSCBD 000008"	03–22–94
B	Revision B (Reference SSCBD 000008 R1, Eff. 6–3–94) Revised to Transition from Freedom to ISS. Changes include extensive simplification of requirements and scope.	09–30–94
C	Revision C (SSCD 000263, Eff. 09–04–96) Administration Update	01–29–97
	DCN 001 incorporates ECP 263 (Supplemental Release)	06–06–97
	DCN 002 incorporates SSCN 000588	05–13–98
	DCN 003 incorporates SSCN 000777	07–21–98
D	Revision D incorporates SSCN 001102	07–21–98
	DCN 004 incorporates SSCN 001405	01–12–99
	DCN 005 incorporates SSCN 001462	06–09–99
	DCN 006 incorporates SSCN 001662	06–09–99
	DCN 007 incorporates SSCN 001920	08–25–99
	DCN 008 incorporates SSCN 002107	08–27–99
E	Revision E incorporates SSCD 002345 Eff. 08–06–99	11–22–99
	DCN 009 incorporates SSCD 003213 Eff. 06–28–00	04–13–01
	DCN 010 incorporates SSCD 003690 Eff. 11–08–00	04–13–01
	DCN 011 incorporates SSCD 003746 Eff. 11–15–00	04–13–01

ERU: /s/Beth Mason 04–13–01

3.2.1.2 CLASS R BONDING (HIGH FREQUENCY POTENTIALS, ANTENNAS)

A Class R bond shall be applied where electronic devices require a low noise, near equipotential environment, a minimum potential drop or where the bond is part of a safety mandated, high frequency (minimum delay time) function such as fault clearing in the presence of an Intervehicular Activity (IVA) or Extravehicular Activity (EVA). See appendix C for exceptions (EMECB TIA–0038, EMECB TIA–0106, and EMEP TIA–0251) to this paragraph. **DCN 011**

3.2.1.2.1 IMPEDANCE

All electrical and electronic units or components which use or produce electromagnetic energy shall be installed to provide a continuous low impedance path from the equipment enclosure to the conductive structure. The supplier shall demonstrate by test or analysis that the proposed bonding method results in a dc resistance of less than 2.5 milliohms across each faying surface in the bond path from enclosure to structure and an impedance of less than 100 milliohms up to a frequency of 1 megahertz. The bond from the equipment enclosure to the mounting plate furnished with the equipment shall also comply with these requirements, except that a suitable ground strap may be used across any necessary vibration isolators or other environment isolators. The impedance of the ground strap (length to width ratio no greater than 5 to 1) is not included in this measurement but the impedance of the faying surface to mating surface of the strap is. See appendix C for exception (EMECB TIA–0166) to this paragraph.

Bonds shall be noted on equipment and structure drawings that show bond surface preparation locations. All Orbital Replaceable Unit (ORU) to mounting surface and structural Class R bonds shall be tested for impedance during acceptance testing, or use processes that have been proven by coupon test to meet this bonding requirement, or have been specifically accepted by the EME Control Board. DC resistance measurements of bonds may be replaced by other in process measurements within a certified process.

The accepted process should address: Materials control, including types of acceptable materials for cleaning, surface prep, sealing, etc.; cleaning methods, including methods for cleaning faying surfaces prior to bonding, coating, etc.; surface preparation, including removal of paints and other nonconductive coatings, machining of surfaces to meet smoothness specifications, etc.; coatings and corrosion control, including definition of acceptable corrosion control coatings, methods for controlling corrosion, acceptable methods for controlling galvanic corrosion, etc,; quality assurance; and process control. The process should have supporting test data to verify repeatability and alternating current (ac) impedance. The list of EME accepted processes shall be maintained in D684–10263–01.

3.2.1.3.4 PIPE AND HOSE BONDING

All conductive pipes, tubes, and hoses that carry fluids shall have a mechanically secure conductive connection to conductive structure that shall measure 1 ohm or less. The pipe, tube, or hose installation shall not be the primary path for electrical power under normal or fault conditions. Nonconductive plumbing installations shall be designed so that the static voltage generated by fluid flow will not exceed 350 volts at any point outside the pipes, tubes, or hoses.

3.2.1.3.5 TRADITIONALLY HOMOGENEOUS STRUCTURAL MATERIALS

The traditionally homogeneous class of structural materials includes glass, quartz, surface coatings, polymers, plastics, etc. These materials cover a wide range of conductivities. In each case where Class S applies (in all cases where none of the other classifications applies), the bond methodology shall assure that no conductive surface area greater than 200 square centimeters is without a bond path from conductive layer to conductive structure. The bond resistance from the connection point to conductive structure shall be less than 1 ohm. For example, a metalized thermal blanket may have the dielectric surface exposed to the plasma as long as the metalized layers are grounded to conductive structure. See appendix C for exceptions (EMECB TIA–0136 and EMEP TIA–0279) to this paragraph. **DCN 011**

3.2.1.3.6 MULTILAYER INSULATION

Conductive layers shall be bonded together in at least two locations. The bonding resistance from those locations to structure shall be less than 1 ohm. See appendix C for exceptions (EMECB TIA–0120 and EMEP TIA–0236) to this paragraph. **DCN 010**

3.3 PROCESSES, METHODS, AND PROCEDURES

3.3.1 SELECTION OF MATERIALS

Materials and parts for electrical bonding shall be as specified herein. Materials specified in this document shall also be selected in accordance with SSP 30233.

3.3.2 STANDARD PARTS

Standard parts (Military Standard (MS), Army Navy (AN), or Joint Army Navy (JAN)) that comply with the requirements of this document shall be used for electrical bonding wherever suitable for the purpose intended and shall be identified on drawings by part numbers. Commercial standard parts such as screws, bolts, washers, nuts, and cotter pins that comply with the requirements of this document shall be permitted for electrical bonding in place of standard parts (MS, AN, or JAN).

Relaxation of the bond requirement between the Acme screw housing and the baseplate to 5 milli–Ohms should provide adequate relief for remaining BCDUs. This is not a common outage. Of the 14 BCDUs which have been tested thus far, this is the only unit which has exhibited this outage. **DCN 009**

EMEP TIA–0236 **DCN 010**

C.3.2.1.3.6 MULTILAYER INSULATION **DCN 010**

Exemption: The S1 and P1 Radiator Junction Box Thermal Blanket Assemblies (CI 222080A, PN 1F81289) are not required to meet the bonding requirements of SSP 30245, paragraph 3.2.1.3.6, using a structure terminating ground strap and are approved as designed. **DCN 010**

Rationale: Because exposed surface of the Radiator Junction Box Thermal Blanket Assembly is made of beta cloth and because it has been shown beta cloth is essentially nonconductive, an accumulated surface charge will not discharge upon contact. The total area of the blanket is 235 square inches or 1.632 square feet. **DCN 010**

EMEP TIA–0251 **DCN 011**

C.3.2.1.2 CLASS R BONDING (HIGH FREQUENCY POTENTIALS, ANTENNAS) **DCN 011**

Exemption: The Ku Band Power Supply is allowed to adhere to bonding requirements as specified 3.2.1.1, (as opposed to 3.2.1.2) for the Centerline Berthing Camera System (CBCS) application as designed. **DCN 011**

Rationale: For the CBCS application of the Ku Band power supply only, it is not necessary for the power supply to be R bonded to the Space Station structure via a ground strap. The power supply has both a return and ground shield that is routed through its cable harness and can therefore meet the requirements for Class H bonding as specified in 3.2.1.1, without modification to the existing design. This is a temporary installation that only is used when attaching another pressurized module to the existing on orbit segment. **DCN 011**

EMEP TIA–0279 **DCN 011**

C.3.2.1.3.5 TRADITIONALLY HOMOGENEOUS STRUCTURAL MATERIALS

Exemption: The Brackets Emergency Light Strips (EEL) (PNs 683–56422–5–001003, 683–56422–5–001004, 683–56422–5–001005, and 683–56422–5–001006) are not required to meet the bonding requirements of 3.2.1.3.5. **DCN 011**

Rationale: This bracket does not need to be bonded because of its small size (even if the requirement is being exceeded). **DCN 011**

In addition, the actual exposed surface is very low (it is the area not covered by the EEL) and it is not conductive. Thus, a discharge should not occur. **DCN 011**