Herschel SPIRE

DPU Handling, Packing, Storage, Shipping Procedures

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1 INTRODUCTION

1.1 Scope of the document

The purpose of this document is to define a procedure for handling, packing, storage and shipping of the DPU.

2 Handling

The scope of this procedure is to define criteria and actions to be taken into account during the handling of the DPU. The DPU contains electrostatic sensitive devices and hence the handling of the DPU has to be such as to avoid its damage or degradation as a consequence of mis-handling and Electro-Static Discharges (ESD).

2.1 Applicability

This procedure is applicable under Q.A. responsibility by authorised and qualified personnel to prevent damage or deterioration of sensitive ESD components inside the DPU :

- always in working areas, in any case in a controlled environment;
- during operations to be carried-out after the delivery phase;
- prior to electrical integration with the other instrument subsystems;
- prior to electrical integration on-board the satellite structure;
- whenever the DPU unit is handled.

2.2 Grounding Requirements

a) Grounding is required for all metal parts of fixtures and tools, storage racks, operator wrist straps, work surface and conductive floor covering (if any) whenever the DPU is handled.

b) To protect the operators from possible back surges of electricity, a 1.0 MOhm (+- 10%) resistor must be present between each wrist strap and work surface and between the work surface and its ground connector.

c) Any electrical equipment positioned on top of the static-free workstation must be hard grounded.

2.3 Handling of the DPU

The opening of the unit container (an aluminium box with suitable shock adsorbing material) and the handling of the unit itself shall be carried-out in a clean ambient (at least class 100000) at normal temperature and humidity conditions. The humidity level is very important for the build-up of Electro-Static Discharges. The qualified personnel in charge of handling:

- shall wear cotton or nylon (with conductive fibres) gloves. Gloves made of PVC shall not be used.
- Shall wear garments suitable for the ambient cleanliness level and appropriate to avoid electrostatic discharges.
- Shall take the DPU box and carry it avoiding to touch the connectors side.

Once the box is mechanically integrated on-board the spacecraft and always prior to:

- removing the dust protection covers (if it is the case),
- mating or de-mating the connectors,

the qualified operator has to positively check that he/she is at the S/C potential e.g. by means of a wire connection between his/her wrist and the spacecraft structure.

3 Packing

The DPU, wrapped in a conductive plastic bag containing also silica-gel, is contained in an aluminum suitcase with adequate shock-adsorbing material. The suitcase is not completely waterproof so that care has to be taken not to expose it at free outdoor air, particularly in rain conditions. The suitcase is provided with a key-lock and it has not to be exposed to particular mechanical shocks.

4 Storage

In the packing conditions (see point 3) the DPU suitcase can be stored in any 100000 class cleaning room without any particular precaution to be taken.

5 Shipment

In the packing conditions (see point 3) the DPU will be taken either by plane, by train or by car directly by a member of IFSI. If the DPU (inside its aluminum suitcase) is shipped it will be packed inside a carton with suitable shock adsorbing material. The estimated arrival time will be notified to the SPIRE Project Manager by electronic mail or by fax if necessary.