

SPIRE

SUBJECT: SPIRE Critical Items List

PREPARED BY: E C Sawyer

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1. SCOPE

This document lists all items that are deemed important by the project team. It is designed to be an easy to reference list of “things to be careful about”.

It is aimed at the AIT phase after delivery of SPIRE to the Spacecraft.

2. CRITICAL ITEMS

Item No	Item	Criticality	Ref/comments
1	High pressure gas in the cooler	Potential safety hazard	HSO-SBT-TN-076
2	Cooling/heating rate	Damage can occur to the SMEC if the FPU is cooled or warmed too quickly. Maximum rate of change of temperature are: <ul style="list-style-type: none">• 5K/hour, between room temperature and 200K,• 10K/hour, between 200K and 100K.• 50K/hour below 100K	IID-B
3	Temperature gradients	The SPIRE FPU incorporates CFRP feet on the FPU and detector boxes and these are very sensitive to temperature gradients, Maximum permissible gradients are listed below. <ul style="list-style-type: none">• Ambient to 200K, maximum delta T is 35K between BSM and LTA.• 200K to 100K, maximum delta T is 40K between BSM and LTA.• Below 100K, No restriction	IID-B
4	Pumpdown/re-pressurisation rate	SPIRE has thin filters in various locations within the FPU. These can be damaged if the cryostat is pumped down too quickly. Max pump down or re-pressurisation rate is 50mb/min	IID-B
5	ESD sensitivity	Certain parts of the instrument, particularly the FPU are very sensitive to ESD. All normal ESD precautions should be taken when handling the instrument, especially when any connectors are open.	SPIRE-RAL-NOT-002028

6	FPU cone and bipod legs	The bipod legs on two corners of the instrument are very thin section and easily damaged. Care must be taken at all times not to put side loads into these items. These are at risk at all times when the FPU is not attached to a rigid plate.	SPIRE-RAL-PRC-002802
7	Red Tag items	<p>The following red tag items are fitted to the FPU when delivered.</p> <ol style="list-style-type: none">1. An aperture cover – To be removed at the latest opportunity prior to closure of the cryostat.2. Alignment cube – To be removed after alignment activities has ended and prior to closure of the cryostat.3. Temporary grounding strap – Removed during the Cryoharness Integration Procedure.4. Shorting plugs – Removed during the Cryoharness Integration Procedure. <p>When removed all red tag items shall be bagged and stored in the dedicated “red tag box”.</p> <p>The following red tag items are fitted to the Warm units when delivered:</p> <p>DPU, connector covers DCU, connector covers Lifting handles FCU, connector covers Lifting handles</p>	SPIRE-RAL-PRC-002802
8	L0 straps, handling	The undersides of the L0 straps form the thermal interface to the spacecraft helium tank pods. Their surfaces are flat and soft gold plated, these surfaces can easily be damaged and the thermal performance of the instrument may suffer as a result.	SPIRE-RAL-PRC-002802
9	SMEC latching	The SMEC must be latched during rotation of the spacecraft. The SMEC should be latched at the end of an on ground test campaign. The SMEC should be checked to ensure it is latched before spacecraft rotation and before launch.	IID-B