24th January 2003

To:Renato SPIRE-RAL-NOT-001510

From: John Delderfield

cc: Ken, Eric, Doug, Astrid, Glenn

DPU to S/C Interface.

1553 I/F

On 16/1 I wrote:

Please supply simple drawing to go in the IID-B showing BU-61580 and the location of the Spire side transformer.

I need to feed these data via ECR for consideration in the Spire IID-B.

This provides the background for what needs to be measured on the DPU interface pins.

I'm afraid whinging about lack of facilities, time and resource is formally irrelevant.

However, conversely, measuring how the roundness of a sphere is generally a worthless operation.

I propose that none of the low level 1553 interface characteristics be measured at instrument level, as you suggest, provided that:

a. the I/F modules provide this characteristic directly
b. the I/F modules are properly traceable to SCC deliveries that require they be 1553 compliant
c. there are no NCRs open on this I/F that suggest possible hardware problems
d. the power supply provided to the module is measured and telemetered to adequate precision and accuracy in the DPU.
e. the temperature of the module is measured and telemetered to adequate precision and accuracy in the DPU.

These conditions being met, Spire System will use its best efforts to defeat the wishes of anyone who insists on the use of logic analysers etc. as part of routine test requirements.

We can divide the above into two parts, first what is the design and second what tests are needed on it at which stage. You wrote back on the same day:

For the interface with the S/C I suggest you find the block diagram in page 38 and 41 of the document SPIRE DPU Hardware User Manual Issue 1: the transformers are shown in page 41 (42 in the pdf file). I am attaching here the zipped document and also a picture that better indicates what you are looking for.

The type of transformer is the one suggested by DDC (manufacturer of the BU-61580), qualified for space applications (type HLP-6002 produced by BTC USA), selected by the CPPA and purchased via the CPPA.

This squarely answers point b. above. It also provides block diagrams and two plans of the implementation, one diagrammatic and one photographic. However I cannot find a circuit diagram for the area of BU-61580V1-300 RevB through the transformers to the DPU connector. Please supply this together with answers to points d. and e., either by reference within your compendious documentation or explicitly.

Contd. Over.

Power Supply Turn on/off Characteristic.

On 16/1 I wrote:

The DPU is required to be empowerable via an LCL. I have specified that for SPIRE all unit level grounding testing shall routinely use this feature in their EGSE power supplies. Problems with turn-on/off can be very subtle, such as sporadically corrupted EPROM. Please would you comply, which maybe means your making up a little circuit as Alcatel are being very mean with any loans.

What is in a way worse is that the DPU is apparently acting as it own slow-turn-on controller. But it is only worse in so far as this is something else we have to agree with Alcatel.

Please furnish current versus time profiles at min/max volts and min/max DPU temperatures.

These 4 curves should first be measured with a plotted hard supply voltage switching and secondly repeated with an LCL doing the switching.

I need to feed these data via ECR for consideration in the Spire IID-B.

Again on the same day you replied:

For the inrush current measurements please refer to the EIDP package that I sent to Judy last Monday, namely the document DPU-RP-CGS-031 DC/DCConverter (SPIRE) Test Report Issue 1; you will get the information in Annex 8 & 9 in pages 58 and 59. In order to speed up your search I am attaching here the zipped document.

&

If you have a look at the inrush current measurement you will realize that the LCL will be surely at rest...
The slow start works very well and I do not think we need a test LCL to borrow from ALCATEL.
Comments welcome.

I have now had a chance to read through sections 11.7 to 11.10 of DPU-RP-CGS-031.

For me this unfortunately raises more questions for me than it answers.

A. Section 11.7 clearly shows that a LISN **IS** used for the turn-on measurement results presented (conduced equalling conducted). Which LISN is used?…have you already borrowed one from Alcatel!
B. The set of measurements without the LISN are not included, and please could the HERSCHEL/ Planck EMC working group's recommendation of both (at least to characterise the design) be performed as I requested.
C. The turn-on characteristic shows, on top of the rising current edge, one drop in current at 26Volts and two at 29 Volts, just as if something is limiting. Please explain what is the cause.
D. Please also plot the applied voltage waveform at the unit connector interface against time on the same graph.
E. An I_{nom} of 1.24A at 26V or 1.12A at 29V comes to input powers of 32.2W and 32.48W respectively. The problem is that the power budget for Spire DPU is 15.3W. So, do these measurements apply to a Spire flight type unit at all? If not, please supply the applicable data. If yes, please fill in an NCR.

I hope that we can soon resolve all these points, and I can then put some good up to date data in the IID-B.

Thanks

John