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Herschel Planck

SPIRE-ALE-COM-002923

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TITLE: SPIRE LAUNCH LOCK DEVICE OPERATIONS

[Ref1] Herschel PM#42, H-P-TASF-MN-9155, section 9
[Ref2] SPIRE Launch Lock Electrical implementation, H-P-ASP-CR-0968
[Ref3] SPIRE Launch Lock Box, H-P-ASP-CR-0969
[Ref4] two e-mails from B. Demolder to G. Jahn, 21 and 22/06, computation assumptions as complement for Ref3.
[Ref5] Impacts due to SPIRE Launch Lock Electrical Implementation, H-P-TN-AI-0160/1

Gentlemen,
following PM#42 (Ref1), TAS-F have issued Change Requests to TAS-I (Ref.2) and Astrium (Ref.3+4) for the implementation of the SMEC launch lock commanding device.

On the SVM side, a solution has been proposed by TAS-I (Ref.5) that poses some integration difficulties, but which has been considered as a suitable solution.

One problem remains on the operational constraints of such a device.

We are proposing the following way forward, and ask ESA to provide their go-ahead for such an implementation:

1) Device ON:
Configuration: S/C on the launcher, S/C ON, SPIRE OFF.
Timeline (T_0 = opening of launch window):

- T_0 – TBD (from 1 or 2 hours):
  - send S/W telecommands to successively:
    - close LCL 25
    - close associated relays (one HL command)
    - close LCL 26
    - close associated relays (one HL command)
  - read CDMU HK telemetry (LCL 25 and 26 statuses and current measurements, relay status).
    - If TM within expected range: switch ON procedure successful.
    - if TM not within expected range: NCR (urgent!), potentially blocking for launch.

2) Device OFF:
TAS-F are proposing a manual operation as baseline:
Timeline (T_1 = TM and TC linked acquired, nominally at separation + 18 min):

- send S/W telecommands to successively:
  - open LCL 25
  - open associated relays (one HL command)
  - open LCL 26
  - open associated relays (one HL command)
- read CDMU HK telemetry (LCL 25 status, LCL 26 current measurement, HCL status)
  - If TM within expected range: switch OFF procedure successful.
  - if TM not within expected range: NCR (urgent!), potentially dangerous for the cryostat.

In order to speed up the switch OFF, an alternative has been envisaged: trigger an OBCP upon reception of the separation event. The OBCP would open the LCLs relays. This option is however not recommended since it is not SPF tolerant (e.g. opening of UMB1).

ASED are currently checking (Ref 3 and 4) the thermal impact on the cryostat of such an operation.

The overall sequence is proposed to be checked during IST, as part of the launch sequence.

We kindly remind that an informal action was placed on ESA (see Ref.1) and not answered yet: "to assess and inform industry whether the current launch lock wiring can be modified/cut without impacting the coming tests on SPIRE."

Looking forward to receiving your comments and/or go-ahead for the above.

Best regards,

Yvan ROCHE D. MONTET

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