

Long, JA (Judy)

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Sent: 13 February 2001 10:29
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Subject: FIRST/SPIRE&PACS/Sorption Coolers - January 2001 Progress Report

FIRST - SPIRE & PACS Sorption Coolers - January 2001 Progress Report

Bonjour,

GENERAL

- The general design of the SPIRE and PACS sorption coolers is done. Subcontractors have been contacted for the detailed drawings (selection process).
- Reliability analysis (FMECA) : Expected to be available in february (done by LGM Consultant)
- Quality assurance : "Bureau Veritas" has been selected to support SBT for these tasks.

COOLER DESIGN

- The overall design of the cooler is done. The external structure has been reviewed and modified. In particular the two titanium brackets that support the pump and evaporator are not anymore bolted to the structure. Decision has been made to electrom beam weld them to the structure. A couple of view are attached to this message.

The volumic numerical modeling of this structure, done with the ANSYS software, uses about 291 000 elements and 450 000 nodes. The results are satisfactory and indicate resonant frequencies of the order of 1 kHz without the cooler heart. The addition of the cooler heart is not expected to significantly affect these numbers (at least will remain way above 500 Hz). The number of elements/nodes is being reduced now (to a level where the predicted behaviour will still remain consistent with the initial calculations) to decrease the CPU time (about 4 hours per calcul in spite of using DecAlpha workstation) and accomodate the cooler "heart". The full set of resonant frequencies will then be extracted , as well as the stresses in the Kevlar cords during the Vtest, etc....

- The 3D drawings of the STM are done.

ACTIONS LIST

- None

VARIOUS

- Kevlar creep : still ongoing - behaviour as expected so far
- Straps : we are pursuing our experimental campaign
- Tensiometer : to be done

DOCUMENTS STATUS

These are the documents which were written specifically for SPIRE/PACS.

*** CEA-SBT**

* Title : "SPIRE SORPTION COOLER DEVELOPMENT PLAN"

PL/SBT/SPIRE/2000-01 Issue : 2 - Revision : 1

modification : STM models added

* Title : "SPIRE SORPTION COOLER SPECIFICATIONS"

GS/SBT/SPIRE/2000-01 Issue : 2 - Revision : 5

modification : Thermal spec. on cooler slightly revisited

TECHNICAL NOTES SERIES

* Title : "THERMAL COUPLING OF THE SORPTION PUMP TO THE COLD HEAT SINK.
HEAT SWITCH VERSUS PASSIVE LINK"

TNS1 Issue : 1 - Revision : 1

modification : none

* Title : "DISCUSSION ON 4 LITERS VERSUS 6 LITERS UNIT & ULTIMATE
TEMPERATURE IMPROVEMENT"

TNS2 Issue : 1 - Revision : 0

modification : none

*** MSSL + CEA-SBT**

* Title : "ICD 1.1/1.3 STRUCTURE/COOLER"

SPIRE-MSS-PRJ-000331 Issue : 0 - Revision : 2

modification : none

Best Regards
Lionel Duband







