

Minutes and Actions of
Module Loading Feedback (MLF)
Phone conference – 27th of June 2005
&
Site Qualification Task Force (SQTF)
Phone Conference – 30th of June 2005

Module Feedback Meeting - MLF

Present: A. Andreatza, G. Darbo, C. Gemme, P. Gerlach, M. Garcia-Sciveres, J. Grosse-Knetter, F. Hüggling, V. Kostyukhin, A. Rozanow, T. Stahl, D.B. Ta, W. Walkowiak (+ somebody joining later).

CPPM:

Sasha reported that the last two staves loaded after the shutdown due to omega delamination and MCC encapsulation problems were the S4098 and 4041. Staves are 4098 is L1/L2 whereas 4041 is B quality, S4098 has all MCC not encapsulated and S4041 has some Genova encapsulated MCC's. The module buffer in CPPM counts 28 modules. The stave S4031, that has all MCC encapsulated, with about half from Genova, will be thermal cycled intensively to compare Genova form Bonn MCC encapsulation (the stave has 6 Genova, 6 Bonn and 1 Dortmund assembled modules).

The stave made for the System Test will be still thermal cycled this week and it will be sent to Genova next week to be used by Paolo for ROD software development.

Genova:

Claudia reported that there are 17 Layer-2 modules. 13 have been already selected for this week stave. In addition there are 6 modules with encapsulated MCC (they will be sent to Siegen for thermal stress test).

Wuppertal:

Peter reported that they have 14 B-layer modules ready to go on stave: 8 already cut from the support card, 6 passed the receiving test. They have already started loading the B-layer S4100 stave that was modified at CERN with "collars". The other 2 staves with collar received from CERN are not usable (?). Reason of that was not clarified.

There are other 5 B-layer modules and 1 Layer-2 module in Wuppertal. Many more modules are back in Bonn for MCC reworking. All of them will become Layer-2 modules.

One module (510607) that had a very low bow (1.8 μm) before flex cut, after the cut got a bow very large ($\sim 200\mu\text{m}$); reason is unknown.

Site Qualification Task Force - SQTF

Present: G. Darbo, K. Einsweiler, M. Garcia-Sciveres, P. Gerlach, M. Gilchriese, D. Giugni, F. Hügging, V. Kostyukhin, G. Lenzen, A. Rozanov, E. Vigeolas, D.B. Ta.

Module Loading Site Qualification TF - SQTF

Agenda.

1. Pollution/corrosion of Al pipes (status / what to do)
2. Delamination (next steps)
3. Cabling (new Bonn scheme / how to proceed)
4. Staves available for bi-stave integration (where they are, what repair to do, ...)
5. Integration manpower and qualified expertise needed at CERN next weeks.

Items not discussed because of lack of time.

6. Stave / bi-stave storage.
7. Sector activity news
8. Transport box and cooling extensions

1. Pollution/corrosion of aluminum cooling pipes

We had a long discussion on the suspect of corrosion that many staves have shown in the internal part of aluminium cooling pipes and in the caps. Several facts have been reported/discussed:

1. To braze the two extremities with the tread for cooling fittings a metallurgical process of the surface of the pipe and of the corresponding parts was made. A thin layer of nickel ($\sim 10\ \mu\text{m}$) was plated on both ends of the parts to braze. Also a layer of zinc is placed in between nickel and aluminium. Is it the corrosion due to exposed zinc caused by damage of the nickel layer? Is the corrosion due to galvanic effect triggered by humidity or presence of water after the “joule test”?
2. The evidence for corrosion is the presence of white stuff, especially on the extremities of the pipe. The caps are the place where most of the deposit appears. A few photos of the worst cases are:
http://www.ge.infn.it/ATLAS/SQTF/Minutes/Minutes_05-06-30_aux/hydroxide1.jpg
http://www.ge.infn.it/ATLAS/SQTF/Minutes/Minutes_05-06-30_aux/hydroxide2.jpg
http://www.ge.infn.it/ATLAS/SQTF/Minutes/Minutes_05-06-30_aux/hydroxide3.jpg
3. Chemical analysis of the white stuff made at CERN indicates that the deposit is mainly oxide or hydroxide of aluminum (hydrogen cannot be detected by the analysis methodology used). Short report from the analysis is:
http://www.ge.infn.it/ATLAS/SQTF/Minutes/Minutes_05-06-30_aux/Result_chemical_analysis.rtf

4. From visual inspection, it results that about 50 % of the pipe extremities show some evidence of white stuff. The caps are more affected in a percentage of 75%. The impression of Vadim is that it was not present in the staves as received from Plyform, while Eric claims that he also saw cases before “joule test”.
5. Danilo proposed to make a test in a corrosion chamber where accelerated corrosion test is performed in presence of highly corrosive atmosphere. Results are then extrapolated, by using tables, to other conditions. This test should tell us how fast is the corrosion we are seeing.

Main (practical) questions are:

1. How clean the pipes?
2. Is the corrosion going on and is triggered by what?
3. Is it a pipe production defect causing the corrosion?
4. Can some pipes be seriously damaged and can show leak?
5. How to store the staves? always in a very dry environment?

Actions:

1. Eric, with help of LBL (Eric will send pipe samples to them), will look for answers to the former questions.
2. Eric will also contact the firm producing the pipes to know better the brazing process they used and to receive some hints from them.

2. Dealamination fix

The delamination fix (see report in the last SQTF meeting) has been slowdown by some procurement of peek “collars”, illness of Danilo and from an unfortunate production error that made the last 72 collars unusable. New collars will be available only the beginning of next week. When collars will be available, loaded stave S4030, that shows delamination on one side will be fixed. After connectivity test at CERN, it will be sent back to Genova for a full qualification. The re-qualification should check in particular way the thermal performance of the last module that was affected by delamination and the possible damage of bumps. If the procedure worked fine, a second stave delaminated S4029 will be fixed as well. For the other loaded staves the decision on fixing or not is still pending on results.

Several bare staves have been modified either to accept (i.e. holes for screws and conductive glue grinding) or with collars: 3 staves with holes and 7 with full collars have been shipped to the 3 loading sites. The status is the following:

1. Genova: S4039, holes, not loaded yet.
S4066, collar, loaded will be qualified week 4/7/2005.
S4102, collar, yellow quality, cannot be used for loading.
2. Marseille: S4098, holes, loaded and qualified.
S4041, collar, loaded, will be qualified 4/7/2005, B-layer and maybe downgraded to L2 because of mix potted/not potted modules.
S4097, started loading.
3. Wuppertal: S4043, holes, loaded and qualified (?).
S4088, collar, with aplanarity exceeding specs, accepted for loading after better analysis, it will be loaded.

S4098, collar, aplanarity of 106 μm , it may be not accepted for loading S4100, collar.

The situation of the staves reworking and of their qualification is becoming more and more difficult. Reasons being: PDB has no information of collars, PDB is often not used for shipments, communication of status of staves happens only by emails that are tens per week and difficult to use to track history. In the future we must make an effort in being systematic to updating the status of each stave weekly and to make it available (on the WEB) to everybody. Each of the 4 labs has the information of which stave has been loaded, tested, collars, etc., but if it is not available to everybody is impossible to have a status of production. Many times have been asked to update the spreadsheet that collects the status of the staves (see:

http://www.ge.infn.it/ATLAS/SQTF/StaveProduction/Summary_All.xls), but many times it did not happen!.

From now on we must keep rigorous procedures of documenting things and define responsibilities. The proposal is:

1. Bare staves: before using bare staves for loading, applying collars, etc. Vadim must be informed and he must agree in their use.
2. Shipments: one person per lab must be responsible for shipments of loaded or bare staves.
3. Summary Spreadsheet. Every Friday each lab responsible has to update the file Summary_All.xls and send it to Giovanni. Also the new “rework plan” sheet must be filled in. The spreadsheet to update is:
http://www.ge.infn.it/ATLAS/SQTF/StaveProduction/Summary_All.xls.
4. Stave Spreadsheet. The spreadsheets of the single staves must be uploaded to the RawDB when stave is complete. The template is:
<http://www.ge.infn.it/ATLAS/SQTF/Templates/StaveQualTemplate.v2.1.8.xls>

3. Cabling. New Bonn scheme.

It was decided to restart stave cabling at CERN with the new procedure proposed by Bonn at the last ID week. For the restarting of the activity it is necessary to have either Wolfgang or Walter at CERN. Also technicians from Genova should be at CERN to learn the procedure. In addition, staves qualified for bi-stave integration must be ready. It was decided to restart cabling the week of the 11/7/2005.

4. Staves available for next bi-stave integration.

The staves that can be available for integration the week of the 11/7/2005 must have or must be prepared for the delamination collar. With those constraints the staves that could be available are:

1. S4098 from Marseilles.
This stave is prepared for collar and is fully qualified with not encapsulated MCC. It will be transported to CERN the week of the 4/7/2005. Collar will be put at CERN and connectivity test will be made then.
2. S4041 from Marseilles.
This stave has collar. It is made with B quality modules, MCC not encapsulated from Bonn and encapsulated from Genova. It may be used for Layer 2.

3. S4066 from Genova.

This stave has collar. Full qualification will be made the week of 4/7/2005. It will be transported at CERN the week of 11/7/2005.

4. S4043 from Wuppertal.

This could be another candidate for integration. It is prepared for collar.

For integration of bi-staves it is necessary to provide bi-stave storing capability at CERN.

5. *Integration manpower and qualified expertise needed at CERN next weeks.*

The stop, for several weeks, of the integration activity at CERN had seen, as consequence, the stop of the manpower shifts from the labs. To resume the shifts it is necessary to do a plan that considers the manpower needed in the labs, persons on holiday, and coordinate the different laboratories. Long term planning is still difficult. Next week no technical manpower from labs is necessary. The week of 11/7/2005 Genova will provide two technicians.

In the last PDSG was proposed to have a review of the integration at CERN in the week of the 11/7/2005. Kevin should organize it.

6. *A.o.B.*

The stave S4055 that was sent from Bonn to CERN for repairing the fittings was not correctly packaged for transport and some damage occurred. Main reason of the damage was forcing the screws in the farend supports used to fix the stave in the transport box. The stave had the omega off from nominal, and the farend supports used were of the old kind. The new farend supports have the opening for the omega larger to accommodate for the larger variability of cooling pipe position. The old farend support must be modified to continue their use in the transport boxes.

Because of the long discussion occurred, the other items in the agenda were not discussed. In particular Sector activity was completely skipped. We apologise with the LBL group.

Next SQTF phone-conference: Thursday 14th of July at 17:30.

Next MLF phone-conference: Monday 4th of July at 17:15.