

# Crab Cavities Technical Coordination XXXVII



**Location:** 376/1-020

**Date:** 2nd October 2017, week 40

**Time:** 10h30

**Scope:** coordination and alignment of tasks involved in the preparation of the cryomodule test, follow up of master plan.

**Attendees:** Aurelio Berjillos, Frank Gerigk, Rama Calaga, Serge Claudet, Alick Macpherson, Ofelia Capatina, Marco Garlaschè, Kurt Artoos, Eduardo Cano, Karl Schirm, Giovanna Vandoni, Carlo Zaroni, Alejandro Castilla, Krzysztof Brodzinski, Mateusz Sosin

**Master schedule:** EDMS 1747466

**Logbook:** <http://elogbook.cern.ch/eLogbook/eLogbook.jsp?lgbk=387>

**Indico:** <https://indico.cern.ch/event/669334/>

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## Planning update:

Aurelio presents the last update of the planning. Marco says that MME is trying to work with a schedule with one extra week in advance, i.e. survey and transport will be finished by the 17<sup>th</sup> of November. In this case, everything would be ready for cryo activities the 20<sup>th</sup> of November, with the cryomodule already in M7 (instead of the 22<sup>th</sup> of November, as previously planned). Frank says that we should change the planning to reflect this change.

Aurelio explains that in this new version of the schedule the weekend is included for cool down. Serge explains that warmup does not need to start before the 18<sup>th</sup> December. The exact duration of warmup with respect to the SM18 stop is still to be defined, CRG is working on clarifying this point. (Off the meeting, Serge communicated the following: RF tests will be possible until the 18<sup>th</sup> December, then progressive warmup of all SM18 devices, finishing no later than the 22<sup>nd</sup> Dec)

Serge reports a discussion with Rende Steerenberg: it seems rather unlikely that there will be extra time available in December. However, LHC start is delayed by one week in 2018 and in light of these it is possible to ask for one extra week also for work in SPS.

Giovanna explains that in any case AVS (supplier of transfer table) will start working after the Christmas break, towards the 11<sup>th</sup>-12<sup>th</sup> January.

Krzysztof says that Olivier has now worked out the detailed breakdown of works in M7, which has been communicated to Alick. Francesco - via Ofelia - passes the message that MME can give support to cryo for the welds and connections in case they need extra resources.

## Cryomodule assembly:

Marco reports on the current status and short term plans. The assembly steps are following the forecasts. At the moment, step 8 is finished and step 9 is to be finished. The mounting of the BCAM tubes has just been performed. The analysis of the string modal behaviour is carried out today (2<sup>nd</sup> of October). During this week, the finalization of the RF measurements, the waveguide disassembly, the

cold MLI assembly and the string check and cleaning will take place. The EUCAS ceremony has left some grease vapour condensation from cooking on site. In general, everything is going fine.

## Tests for SM18 CM cool-down:

Rama provides a general overview of the tests in SM18 and SPS, except the tests with beam. The RF tests will be in the shadow of cryo and mechanical qualifications, which are mandatory for SPS installation. Weeks 2 and 3 of 2018 are accounted for in case any additional RF measurements are needed. Rama will detail the plan and sequence and give a priority ranking. He informs that the first 3 actions listed in the slide should be mandatory. The other ones can be performed in the SPS in case they are not done in SM18.

Regarding data acquisition and FESA classes software, the goal is to get all the software by December.

Rama also overviews the results of the warm measurements, which are continuously on-going. The values are in line with the expectations.

## Bunker integration and draft planning:

Alick presents the planning of the M7 preparation. He lists the activities being addressed and a full 3D integration model.

All mechanical installations prior to installation of the valve box in M7 have been done as confirmed by Pirotte. All racks and cable trays are installed. All the on-going service infrastructures installation is described in the slides.

Alick details also the installation of the cryomodule, which will be moved with an ORMIG. In this regard, Ofelia asks whether there is a spreader, how it is and how is the load distributed. The use of a spreader would require higher height and has to be properly integrated. Ofelia also ask about the minimum speed and acceleration of the cryomodule during this transport. Alick says that he will get the information about these actions: details and transport choreography are still being worked out.

The feet used to support the cryomodule in M7 are those that will be installed in the SPS and will be transferred to the SPS once the test is finished. The feet will be installed in the bunker and the cryomodule will be lowered on them.

The mechanical installation of the valve and service boxes is now scheduled for week 43. Commissioning is starting on the 7<sup>th</sup> November. The detailed planning of cryo, done by A. Lees, is integrated in Serge's planning.

Frank says that Philippe Baudrenghien and Luca Arnaudon should report in one of our next meetings on readiness of controls and LLRF.

Krzysztof mentions that the 5 days cooldown of the shield may be too long. Rama asks Krzysztof if they could aim to the 13<sup>th</sup> or 14<sup>th</sup> of December for being at 4.5 K and if it is strictly necessary to go to 2 K, as it is not mandatory for RF.

Cryo answers that they need to know if the Service Box can deliver 2 K, so they have to go until that temperature. Nevertheless, Krzysztof says that the goal is keeping a thermal gradient of  $\Delta T < 50$  K and the time scheduled for cooldown based on this assumption is conservative.

Rama also mentions that maybe we should have the standard system for radiation monitoring ready and asks whether a millisecond radiation monitoring is necessary. This information is to be checked with Luca Arnaudon.

For vacuum, Alick says that cables for ion pumps are installed in case of need. However, no ion pumps are foreseen on the cryomodule in the SPS, but only on adjacent beam vacuum chambers. The idea is to install them on beam vacuum of the cryomodule in M7, if needed. Ion pumps are not integrated in the plot shown in the slide.

Rama asks if electrical and network connections for some RF instrumentation (network analyser, a couple of laptops, etc.) can be placed close to the cryomodule in the tunnel. Alick explains that there may be safety limitations to access and that personnel safety is paramount. Rama says that the idea would be to leave the monitoring equipment and remotely control it, not accessing the M7 bunker during cool-down. Alick confirms that doing that is fine.

### SPS installation planning:

Giovanna informs about the SPS state. She presented a draft of the installation planning at the SPS Coordination meeting of D. McFarlane last week. She says that they are currently working out the details of the planning by now and would soon need some more certainty on the end of access to the SPS.

Two new issues on the SPS installation are mentioned (in addition to the magnet measurement campaign): 3 kickers need to be substituted upstream of the crab zone and transported away along the crab-cavity worksite. For the time being, this would mean only transport and no co-activity. A meeting will be held this afternoon (2<sup>nd</sup> of October) in which they may know what the mutual implications of the kickers substitution would be. In another issue, VSC stated that the group hierarchy has excluded that VSC would do the leak checks on the cryomodule beam and insulation vacuum. Giovanna is now checking this issue with VSC.

Quite a good progress has been done on the interlocks. Functional Specification is being finalized, with some robust and flexible interlock scheme; the document will be distributed for expert's check this week.

Regarding co-activity, Serge mentioned a discussion with T. Otto, who is in charge of reviewing the protocol for access, including the SPS. Complexity is added due to the number of different teams involved from all departments. The risk analysis of cryo due to the small amount of helium is being reevaluated, but needs to be converted into a procedure. Frank asks Serge to inform in case there is a blocking on the risk issues.

### AOB:

BE/CO want to switch off controls one week before Christmas. It is important to check that it does not give issues on SM18.

Ofelia claims the urgent necessity of additional storage space, as we are in the middle of the assembly stage. The storage space (in 162) was temporarily given by Olivier Brunner, but it has to be given back by mid-October. Frank can ask Olivier about the space and about other storage opportunities. Rama tells everyone that we should make sure that the movement is not done twice. Marco points out that this additional storage space should be an area with controlled (or at least difficult) access.

## Action list:

### General and Planning:

ID	Action	Who	Opened	Closed	Result, Comment
49	Define detailed test sequence of Cryomodule in SM18	Rama	27.2.2017		Presented at the CC Review, Rama elaborates the details with all actors. To be presented at TCC, end Sept
56	Bottom-up planning of SPS activities for YETS	Giovanna	8.5.2017		In work, deadline: SPS Coordination Meeting
61	Report on readiness of controls software and hardware	Rama	30.8.2017		With Eric, Philippe, Andy, Luca, in 1-2 months
62	M7 integration plan and inputs/outputs from/to other groups	Alick	11.9.2017		For the next CCTC on 2 October
63	Interlocks definition and strategy	Giovanna	11.9.2017		
64	Cryogenic cooldown before/after Xmas break	Giovanna with CRG	11.9.2017		
67	Operativity of SM18 during Christmas break	?			
68	Details and priority of RF tests in SM18 (+SPS)	Rama			

### Documentation:

ID	Action	Who	Opened	Closed	Result, Comment
44	MTF to be updated with actions on RF conditioning. RF test reports to be placed in correct node.	Carlo	30.1.2017		Input needed by Alick. Karl will follow this up too. Reminder sent by Carlo.

### Space:

ID	Action	Who	Opened	Closed	Result, Comment
57	Follow-up of space in bldg. 2002	Frank	8.5.2017		B.2002 will be cleared (G. Mcmonagle) before Dec17, for SRF use
65	New storage space urgently required. Verify availability of bldg. 150	Frank	2.10.2017		
66	Storage space also needed for the DQW toolings	Frank, Rama	2.10.2017		

*Minutes taken by Eduardo, Carlo and Giovanna*

*Next meeting: Monday 16th October 2017*