

Minutes of the second HL-LHC/CRG Instrumentation meeting

Date: 28th of January 2020

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List of Participants:

Johan BREMER, Krzysztof BRODZINSKI, Juan CASAS-CUBILLOS, Serge CLAUDET, Gerard FERLIN, Vanessa GAHIER, Michele SISTI, Nikolaos TRIKOUPIS, Nicolas VAUTHIER.

Excused:

Antonio PERIN, Rob VAN WEELDEREN

Agenda:

- 1) General introduction, *S. Claudet*
- 2) HL-LHC Cryo-instrumentation Radiation Environment, *M. Sisti*
- 3) CRG-CI sensor range and accuracy, *J. Casas*
- 4) Instrumentation needs (quantity and date) for users and cryo-line, *M. Sisti, K. Brodzinski, V. Gahier, G. Ferlin*

Presentation #1 – General introduction – S. Claudet

The Minutes of the previous meeting was approved.

Presentation #2 – HL-LHC Cryo-instrumentation Radiation Environment – M. Sisti

The status of the radiation environment studies done so far was shared, together with references of the existing documents.

Presentation #3 – CRG-CI sensor range and accuracy – J. Casas

Take-aways from the presentation are:

- Availability of 5 different type of Cernox, presenting different accuracies with respect to temperature range. Model CX-1050 was selected for LHC, for optimum accuracy in the desired temperature range.
- Availability of non-calibrated Cernox (ITER case); potential use for low accuracy application as well as 100 K – 300 K range.

ACTION: *To clarify the Cernox accuracy in the 100 K – 300 K range.*

- Two types of pressure transmitter being used today (nominal pressure 4 bar and 20 bar). Max pressure is a selection criterion as well.
- The status of definition of cryo-instrumentation for HiLumi was presented, with a strong focus on thermometers.

ACTION: *To clarify the minimum requirements to be specified to start the selection process.*

Presentation #4 – Instrumentation needs (quantity and date) for users and cryo-line y – M. Sisti, K. Brodzinski, V. Gahier, G. Ferlin

The expected cryo-instrumentation needs in terms of quantities and dates were presented for the following users:

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- IT+D1 - Q2 quantity and sensor application to be clarified; electronics and accuracy for potential use of un-calibrated sensor to be added.
ACTION: To update the document.
- SC-Link – 2 K TT non needed. Use of Pt TT to be confirmed; PT100 drift under study (N. Trikoupis).
ACTION: To update the document.
- RF – Ten cryo-modules to be manufactured. Beam screen heaters to be investigated wrt electro-magnetic field, TT quantity to be refined.
ACTION: To update the document.
- QXL – TT application (cold finger, LHe or vacuum) to be clarified, EH technology to be defined.
ACTION: To update the document.
- HEL – Expected need date is 2022.
- Refrigerator and QUI - Expected need date is 2022, TT rough estimation: 60 sensors (2 x 2 x 15).

AOB:

A summary will be prepared and provided to CRG-CI (J. Casas) for next actions, namely the planning for procurement and the TT quantity estimation for the Orsay’s meeting.

ACTION: To prepare and share with CI the summary for quantities and need dates

Tentative date for the next meeting is April 2020.

List of actions:

<i>Description</i>	<i>Owner</i>	<i>Due date</i>
1. To present simplified graphs or tables illustrating the existing range and achieved accuracy.	CRG-CI specialists	Next meeting
2. To present the corresponding dose for magnets and QXL	M. Sisti	Next meeting
3. To identify the instrumentation needs in terms of quantity and need date	IT+D1: M. Sisti TT: R.v.Weelderen D2: A. Perin RF: K. Brodzinski Cold Powering: V. Gahier	Next meeting
4. To clarify the Cernox accuracy in the 100 K – 300 K range	J. Casas	Next meeting
5. To clarify the minimum requirements to be specified to start the selection process	J. Casas	Next meeting
6. To update the documents following the meeting discussion	IT+D1: M. Sisti Cold Powering: V. Gahier RF: K. Brodzinski QXL: M. Sisti	27.Feb.2020
7. To prepare and share with CI the summary for quantities and need dates	S. Claudet	Done 04.Feb.2020