



EDMS: 2508012

Heat Loads for HL-LHC scope (P1/P5) – Internal Review

Scope of the review:

The scope of the review is to scrutinize the heat loads definition in order to proceed with the HL-LHC cryogenic refrigerator invitation to tender forecast for mid-2021. It shall take into account all the users cooling requirements (IT+D1, D2, crab cavities and cold powering of the high-luminosity insertions IR1 and IR5) and the parasitic heat loads due in particular to the distribution systems considering adequate margins and any constraints already present in the cryogenic architecture.

The review does not include the thermal and hydraulic design for each cooling loops.

Mandate to the review panel:

The mandate given to the review panel is as follows:

- Assess that all heat loads related with users cooling or with the cryogenic distribution system are taken into account for all the operating modes taking into consideration beam parameters, design luminosity and design energy.
- Verify that the last design version was considered in particular for the users and that the margin is only considered once and take into consideration the maturity of the design.
- Make sure that the local cryogenic capacity is adequate, and that local margins are considered accordingly.
- Ensure that the global overcapacity margins on the refrigerator capacity are adequate to fulfil the HL luminosity ramp up program and take into account any deviation from the heat load specification for the users, with mitigation in place when necessary.

➔ Recommend actions on open points or missing aspects.

Members of the review panel:

1. Chair: Laurent Tavian
2. CRG expert (U. Wagner)
3. VSC representative (C. Garion)
4. MSC-WP3 representative (Delio Ramos)
5. MSC-WP6a representative (A. Ballarino)
6. BE-ABP representative (Elias Metral)
7. SY-RF (WP4) representative (Vittorio Parma)
8. SY-STI (A. Lechner)

Linkperson: S. Claudet (WP9 Leader) - **Sc. Secretary:** V. Gahier



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Dates and Place:

Date: 27 April, 2021 (TBC by all)

Remote only.

Draft Agenda

Introduction by Chairman of review panel <i>5 min</i>	8:30-8:35	L. Tavian
Introduction to the HL-LHC cryogenics architecture <i>15 min</i>	8:35-8:50	S. Claudet
Methodology; Heat loads history and mechanisms 20 min + 10 min QA	8:50-9:20	S. Claudet, V. Gahier, P. Zijm
Inner triplet heat loads 15 min + 5 min QA	9:20-9:40	P. Zijm, V. Gahier, M. Sisiti for WP9 H. Prin, D. Ramos, L. Williams, Y. Leclercq for WP3
D2 design heat loads 10 min + 5 min QA	9:40-10:05	A. Lees, M.Sisti, A.Perin for WP9 H. Prin, D. Ramos for WP3
Cold powering heat loads 10 min + 5 min QA	10:05-10:20	V. Gahier for WP9 J. Fleiter, Y. Leclercq for WP6a
Crab cavities heat loads 10 min + 5 min QA	10:20-10:35	K. Brodzinski, L. Delprat for WP9 O. Capatina, T. Capelli, F. Carra, L. Dassa for WP4
Break	10:35-10:45	
Beam induced heat loads 15 min + 10 min QA	10:45-11:10	G. Iadarola
Collision induced heat loads 15 min + 10 min QA	11:10-11:25	M. Gilarte
Summary table / refrigeration requirement 10 min	11:25-11:35	V. Gahier
Wrap up discussion 20 min	11:35-11:55	all
Lunch	12:30-14:00	
Close session + Complements	afternoon	Panel