

## **PBC Task Force on ECN3 beam delivery and related infrastructure/consolidation scenarios for post-LS3 operation**

### Mandate

A few proposals have been put forward for post-LS3 experiments in the North Area ECN3 cavern and they demand for an increase in intensity. The corresponding beam requirements have implications for the primary and secondary beam line equipment and technical infrastructure that are the object of a planned consolidation as part of the NA-CONS Project spanning up to LS4.

Within the PBC Study, the Task Force is mandated to analyse ECN3 intensity upgrade scenarios concerning beam delivery and related infrastructure, considering solutions compatible with consolidation plans and post-LS3 experimental scenarios. A particular attention shall be put on early NA-CONS implementation actions which would have to be reviewed for an updated Run3/LS3 baseline for the concerned areas.

The task force shall:

- Identify and agree on the most relevant scenarios consistent with the intensity requirements of the available ECN3 experimental proposals (maintaining compatibility with post-LS3 possible EHN1/EHN2 users/experiments) including possible performance ramp-up options.
- Evaluate the required infrastructure modifications to the primary and secondary lines up to and including the TDC2/TCC2 areas.
- Identify commonalities among the various scenarios and staging options considering a possible implementation in line with the present LS3 schedule and the NA-CONS programme and highlighting the possible impact on and constraints by the present consolidation plans.
- Provide a first summary of the findings (possible scenarios, timeline, resources) by the end of 2022, final report by the first quarter of 2023.

The task force shall report to the PBC A&T Committee.

The summary of the findings will also be presented at the IEFC by the end of 2022

### Scope of the analysis

The analysis should focus on the compatibility with and/or impact on the NA-CONS programme for 2-3 intensity driven post-LS3 beam delivery scenarios:

- Necessary modifications to primary and secondary beam lines including relevant target areas, considering in particular the present TCC2 situation, likely requiring a TCC2-light consolidation.
- Overview of the short-term NA-CONS activities planned for Run 3/LS3 for which imminent decisions are required by the end of 2022.
- Possible baseline changes for NA-CONS/EL-CONS Phase-1 for TT20/TCC2/P42/K12 up to the ECN3 interface (e.g. possible powering reconsideration for BA81 and/or BA82).
- Consistency with additional (experiment driven) staged modifications to ECN3 (including related EL, CV and CE requirements) while maintaining post-LS3 operation compatibility for the rest of the North Area complex.
- Required safety system modifications, e.g. access system and sectorization (including ventilation) to allow staged installation for the TCC8 target and ECN3 experimental areas while delivering physics to EHN1/EHN2 after LS3.

and should include:

- Beam lines (primary and secondary, including beam instrumentation)
- Target complex/TAX implications and relevant options
- Loss management and mitigation (extraction/transfer)
- Beam delivery scenarios (TT20, ECN3, EHN1, EHN2)
- Machine protection considerations (targets/TAX)
- Radiation protection – prompt radiation (standard operation, accidents), residual radiation, air and soil activation
- Cooling and Ventilation including respective cooling tower strategies/requirements
- Powering schemes and electrical distribution
- Integration and civil engineering implications
- Access, Fire/Gas detection
- Resources and timelines constraints

## Composition

During its mandate the task force will draw resources mainly from the PBC BDF & Conventional Beams WG (these will focus on the support to the conceptual study of the experiment specific set-up in ECN3 and TCC8, during this time) and it will require the contribution of the NA-CONS project management and technical experts for the aspects specific to NA-CONS (including EL-CONS).

Co-Chairs: M. Brugger (PBC-CB WG, BE/EA), M. Fraser (PBC-BDF WG, SLAWG, SY/ABT)

Scientific Secretary: Rebecca Ramjiawan (PBC Fellow, SY/ABT)

Core-team representatives:

- NA-CONS: Y. Kadi (PL), R. Folch (Engineering), T. Zickler (Powering)
- TT20/P42 beam studies: Y. Dutheil, F. Velotti (SY/ABT, BE/OP)
- TCC2/P42 and impact on secondary beam studies: J. Bernhard, M. van Dijk (BE/EA)
- Target stations, TAXs design: M. Calviani, F. Sanchez-Galan, L. Salvatore Esposito, R. Ximenes Franqueira, J.-L. Grenard (SY/STI, BE/EA)
- Radiation Protection: C. Ahdida, E. Nowak, H. Vincke (HSE/RP)
- Alignment: C. Vendevre (BE/GM)
- Power Converters: P. Schwarz (TE/MSC)

Informed in all communications, as well as required for specific subjects:

- G. Arduini (PBC)
- V. Kain - Operation (BE/OP)
- F. Roncarolo, T. Lefevre, C. Zamantzas – Instrumentation (EABIWG, SY/BI)
- H. Bartosik – Proton sharing (PBC ACWG, BE/ABP, BE/OP, SY/ABT)
- C. Pasquino, F. Sanches-Galan – Vacuum (TE/VSC, BE/EA)
- P. Bestman – Alignment (BE/GM)
- D. Lafarge – Handling and Transport (EN/HE)
- F. Gallezzi, M. Lazzaroni – Integration (EN/ACE)
- Y. Body, S. Deval – Cooling & Ventilation, EN/CV) – NA-CONS
- E. Cano Gonzalez or M. Parodi (EL-CONS, EN/EL -> – NA-CONS
- I. Josifovic, Y. Gaillard – Power Converters (SY/EPC, TE/MSC)
- B. Morand or P. Ninin – Access system (EN/AA) – NA-CONS
- I. Romera Ramirez, J. Uythoven – Machine Protection (TE/MPE)
- K. Balazs – Civil Engineering (SCE-DOD)
- D. Ricci, G. Gros (EN/EL)
- R. Alia Garcia (R2E)
- D. Banerjee, A. Roldan Baratto (BE/EA)
- L. Gatignon (EP-UFT)
- I. Karpov, G. Papotti (SY-RF)
- A. Lafuente Mazuecos (EP-AIO)
- N. Solieri (SY/STI)