MYRRHA - CERN collaboration day,
27 February 2020

Proposal: ”Beam Dumps”

CERN Participants: M. Calviani, T. Stora, J. Vollaire

MYRRHA Participants: D. Ene, U. Dorda, J. Engelen, L. Popescu

Topic:

- 17 MeV – 4 mA – beam dump

Goal(s):

D1: Revision of the available technical documentation AND input on technical infrastructure

D2: Production of a CDR, inclusion of the technical infrastructure constraints (remote handling, waste management, shielding, etc.)

Timeline:

- **D1: during 2020 / early 2021**
- **D2: end 2022 (?)** *depending on definition of CDR

CERN support for this project is (0 = nice, ……., 5 = crucial): 4 → 5

Topic:

- Design of the full power dump (400 kW)

Goal(s):

D0: Revision of the available technical documentation

D1: Input on technical infrastructure

D2: Production of a CDR, inclusion of the technical infrastructure constraints (remote handling, waste management, shielding, etc.)

Timeline:

- **D0: during 2020**
- **D1: during 2021-2022?**
- **D2: 2024 (?) in parallel to D1?** *depending on definition of CDR

CERN support for this project is (0 = nice, ……., 5 = crucial): 4 → 5

Topic:

- ISOL facility beam dump(s)

Goal(s):

D1: Technical review of the design of the ISOL beam dumps

Timeline:

- **D1: 2023**

CERN support for this project is (0 = nice, ……., 5 = crucial): 3

Potential expertise sharing

- Energy deposition, neutronics and RP studies to bne done at MYRRHA
- FEM analysis and dump design, folding into operational and building experience, to be done at CERN

Collaboration proposal

Benefits for MYRRHA:

- Design and validation of MYRRHA beam dumps, ISOL, 17 MeV, 100 MeV (full power and tuning)
- Access to technology of diffusion bonding of dissimilar materials for beam intercepting devices

MYRRHA contribution:

To be defined, could be MYRRHA resource(s) coming at CERN or could be direct financial contribution to pay for a full-time staff at CERN

FELL resources in case scope of activity is limited

Design works would require material budget to CERN

MYRRHA technical contact:

Daniela Ene, Ulrich Dorda

Benefits for CERN:

Collaborate and further expand expertise on high intensity beam dumps is core business for CERN - interesting for future beam intercepting devices in the context of long-term future for the Organisation

CERN contribution:

Manpower to be defined depending – fraction of experienced staff.

0.2-0.5 FTE in case of FELL supervision and depending on the scope extent

CERN technical contact:

M. Calviani (TBC) or A. Perillo-Marcone or F.-X. Nuiry