Warm cryostat next

27-5-2015

Possible future optimizations

Efforts are underway to reduce the profile of the floor beams. Apart from the potential savings in steel mass and perhaps even in cavern height, the increased (bending) flexibility might decrease the corner moment, thus enabling a simpler connection.

Furthermore, a lighter roof, possibly even without moment connections (pinned) to the side wall(s), are an option for future optimisations.

Bracing systems for lateral beam stability could be re-assessed and potentially simplified in the future with lighter cross bracing members. The required bracings, for later stability, between roof beams should also be studied to optimise the longitudinal force transfer between the short side walls.

The pitch (today of 1.6 m) could possibly be slightly increased, the grid size enlarged and the stainless steel membrane made thinner, all depending on lower applicable safety factors that might be agreed for a second iteration of the design studies.

Next !

- ✓ To adapt the design to the final choice of the mechanical safety factors. Here the potential is to lower substantially the weight of the structure and the price.
- ✓ To rethink the possibility of organzing a third containment barrier, changing the steel base material to a Nickel type of steel.
- ✓ To optimize the size and complexity of all bolted connections, in order to simplify the in-situ assembly
- ✓ To insert in the design the requirements coming from the active detectors in terms of support, accessibility during assembly and services, in particular on top of the vessel.
- ✓ To optimize the thickness of the floor and the roof as proposed Section 6.6.
- ✓ To finalyze the seismic calculation, once the right spectra and acceleration informations are becoming available.
- ✓ To workout with the LBNF/CF group all aspects related to the lowering down of material and the logistics underground, including all aspect related to the manipulation of big objects underground and the availability of dedicated special tools.

- To continue to maintain and update the detailed CAD model, which will allow to easily prepare all tendering design specifications.

- To give all mechanical specifications for verification by an independent engineering consultant, in particular to make sure that all US construction norms are respected.

- To give to the company holding the licence for the membrane cryostat the mandate to do a full-fledged feasibility study, before embarking in the final engineering design.

- To start making definitive plans for contract preparation for procurement of material and installation work in 2017