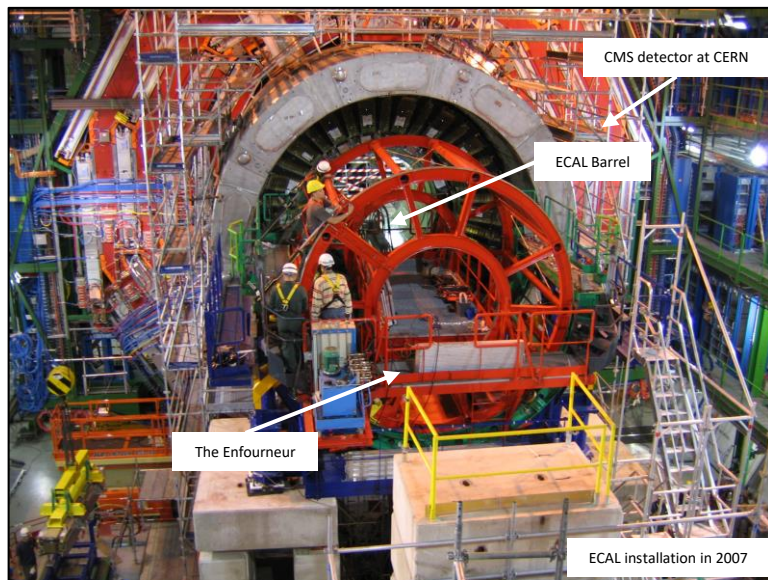


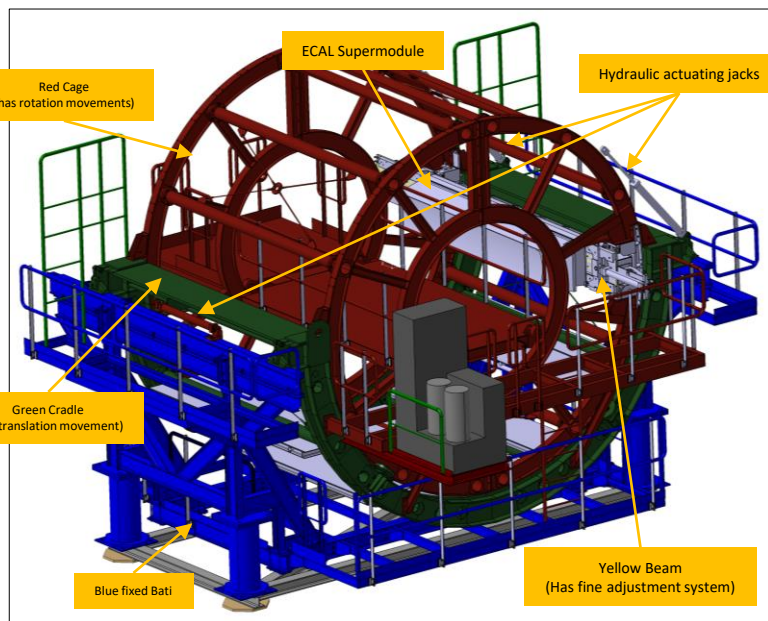
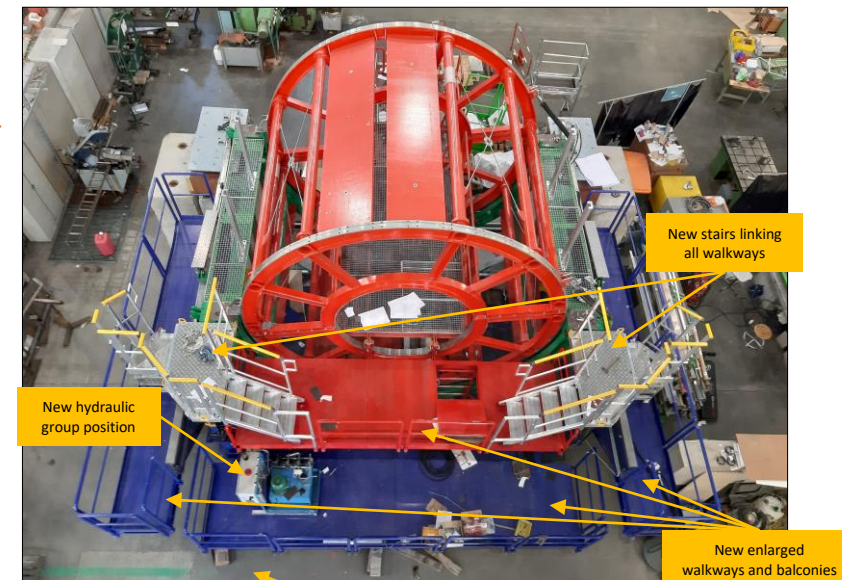
The Enfourneur is a 20tons tool used to install the Electromagnetic Calorimeter (ECAL) barrel of CMS experiment at CERN



Modification of the Enfourneur

Reason of modification:

- Comments collected from previous operations of the Enfourneur
- Enlarge all the balconies and walkway to increase the working area of the operators
- Facilitate the access between the walkways and balconies
- Renew the hydraulic routing of the Enfourneur to reduce energy loss
- Meet the up-to-date machinery safety regulations



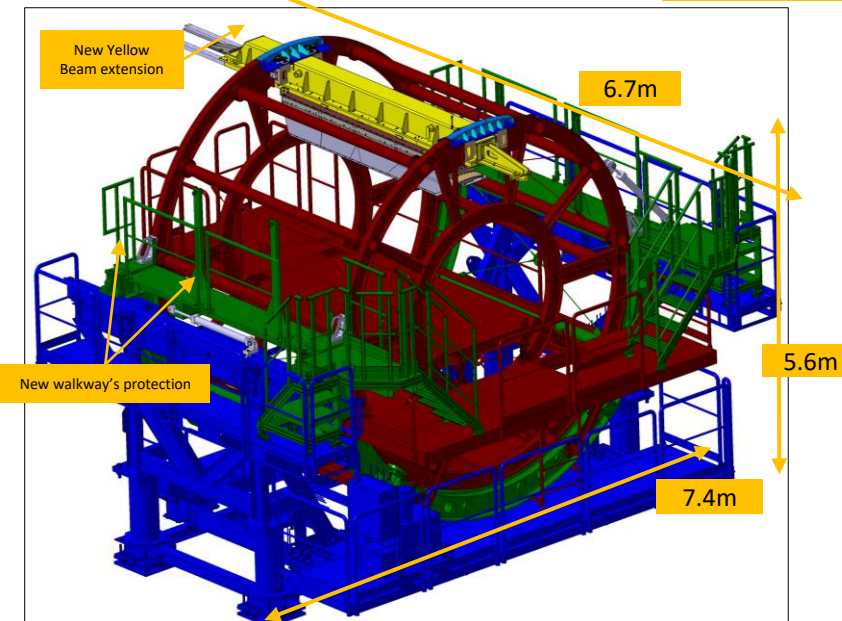
3d model of the Enfourneur (before modification)

Principle of modification:

- All the modifications are designed in compliance to Eurocode 3 ad 9
- The walkways and the balconies are designed with lifting elements which are compliant to the European lifting norms
- The new modified items are designed following finite element analysis

Result of modification:

- The new enlarged walkways and balconies are more comfortable to the operators, with stairs that link them together
- The 4.5tons red cage has new optimized blocks with safety installations for the operators
- The hydraulic group position was changed, and rigid tubes and cable chains are implemented to reduce the oil energy loss in the system
- Several validation tests were made with positive feedbacks
- The modified Enfourneur fulfills all the specified needs



3d model of the Enfourneur (after modification)