

PROJECT REPORT

ON THE

MODIFICATION OF THE NEW VACUUM TANK CAGE

By

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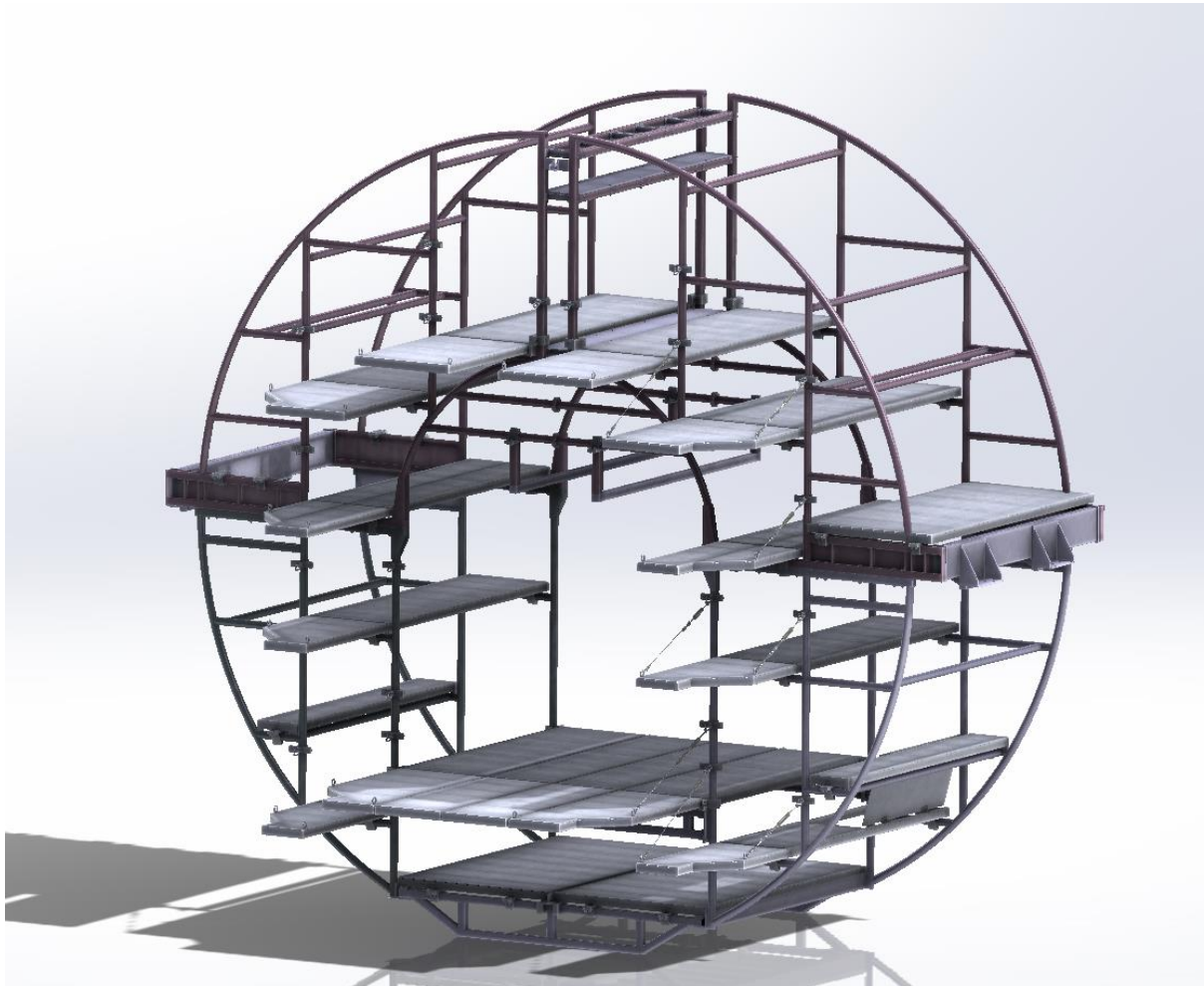
The vacuum tank cage, often referred to as the Surkov cage, is a structure for the CMS detector's vacuum tank. It is put in the vacuum tank, where authorized workers can then use it to access different parts of the vacuum tank while remaining on it. The vacuum tank cage is comparable to the scaffolding seen in structures since it is used to elevate and support personnel and equipment while the vacuum tank is being built, repaired, or cleaned.

Since the new cage in this project is composed of aluminium rather than the old cage's steel, alterations have been made to its parts. The design of new walkway sheets (Platforms), clamps for the walkway sheets, and reinforcement connections for the walkway sheets were the next design revisions that were made. The new vacuum tank cage has already been produced, so the first task in this project was to measure the produced cage to ensure that it was the proper size in relation to the cage CAD model that was provided. Then, starting with the design of all walkway sheets, the numerous alteration designs were created. The platforms were created such that they don't change all that much from what the workers used when using the old cage. The design of the various clamps, including the square clamps, rectangle clamps, and hybrid clamps, was then completed to be utilized for attaching walkway sheets to the cage. Last but not least, the reinforcements' design was carried out utilizing parts like turnbuckles, wire rope, and wire greenhouse, which serves as a clamp for the wire rope.

I had to work with materials that are readily available to CERN in order to develop components that would function perfectly with the new cage; this helped to direct my design notions. Solidworks software was used for the design and analysis of the numerous Cage component parts. The individual components and assemblies were then transformed into STEP files to enable viewing and editing in other CAD programs.

Working on this project allowed me to hone my intuition, creativity, and teamwork skills since in addition to my supervisor, who helped me throughout the project, I was also able to consult

other engineers and technicians for assistance. Not to mention how the assignment required me to get more familiar with and proficient with more capabilities of the Solidworks software. I had a great time working on the project, even though it hasn't been finished yet because producing the various components would take more time.



*Figure 1: Modified Vacuum tank Cage*