

Version 5 update and planning for V6

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New items

- **All png views have been changed to better reflect the more traditional views used by other stakeholders. West to the left, east to the right and North up.**
- **2051561 Cavern N - Chamber EN: Warm Cryostat SP - Detector Mezzanine Racks**
 - **Inside this element, we have added “Cavern_N_-_Chamber_EN_-_Warm_Cryostat_SP_-_Additional_Electrical_Equipment_-_ST1165144.nwd”. This includes a first version of electrical conduit to route power to the detector transformers and barracks on the mezzanine.**

Major changes I

- **2051561 Cavern N - Chamber ES: Warm Cryostat SP - Detector Mezzanine Racks and Services**
 - The solid model place holder for the detector mezzanine was replaced with a more detailed structural representation. A first iteration of structural analysis was performed to produce a first pass depth of the supporting beam structures.
 - The depth dimension of the racks was increased, and the racks were centered in the Y-direction on the detector mezzanine structure.
- **2051559 Cavern N - Chamber EN: Warm Cryostat SP - Mezzanine Proximity Cryogenics**
 - Additional 4 x SPC 4 generators
 - Additional lines on Purge Pipe system to reach condensers
 - Layout modification on GAr lines, LAr transfer lines, N2 Gas lines, N2 liquid transfer lines and valve box system
 - 1 of 4 cryo modules has been removed (LN2 Phase Separator, LAr Condenser pump, New Condenser and Desuperheater)

Major changes II

- **2051558 Cavern N - Chamber EN: Warm Cryostat SP - Mezzanine Platform and Access**
 - Offices and racks moved to create more free space on front mezzanine
 - Additional electrical equipment conduits (connecting the racks behind offices to the racks on the detector mezzanine)
- **2051896 Cavern N - Chamber EN: Warm Cryostat SP - Internal Cryogenics**
 - Complete new layout for the cool down pipes (to avoid interference with the detector). This design is currently under a new revision and will be updated in version 6.

Major changes III

- **2059036 Cavern N - Chamber EN: Warm Cryostat SP - DSS**
 - Improved Trolley design that shortens the distance between rollers that interface with the DSS beam and connects to the APA at a central point instead of the Tees.
 - New Yoke-to-DSS connection. This will be designed with vertical adjustability for positional presets to the predicted deflection of the DSS beams. This will improve the positioning of the APAs vertically when in their final position.
 - Modified the DSS rail-to-DSS rail connection that should facilitate the removal of the linkage hardware when the beams are loaded during installation.
 - New Feedthrough-to-DSS rail connection
 - Rearrange the position of the bellows in the DSS design to better accommodate the possible use of height
 - Added possibility for motorised height adjustment similar to that used in the Dual phase detector in ProtoDUNE.

Major changes IV

- **2065464 Cavern N - Chamber EN: Warm Cryostat SP - Detector APA**
 - New connection to DSS – see above comments for DSS.
- **2065465 Cavern N - Chamber EN: Warm Cryostat SP - Cathodes and Field Cages**
 - New Ground Plane-to-DSS Rail interface & supports – see comments for DSS
 - Still to be determined is the trolley design and the need for removal after installation.
 - For future evaluation, the connection of the field cage end walls to the DSS beam.

Version 6

- **New HV model with hinge connections between FC and APA**
- **New cooldown model from cryogenics**
- **Update mezzanines and layout to accommodate DAQ, power and cooling**
- **How to handle various phases of construction and installation?**
 - **Separate model structure**

Calendar

- Daresbury Factory Design Review (January 22-23)
- APA Shipping Box Review at Liverpool (January 24)
- Collaboration Meeting at CERN (January 27-31)
- Far Site Installation Workshop at CERN (February 2-4)
- Cold Electronics ASIC/FEMB Review at CERN (February 5-7)
- Review of Responses to IPR Recommendations at FNAL (February 7-8)
- FS I & I Review @ FNAL (February 27)
- Cold Electronics Systems Review at BNL (March 10-11)
- RRB Meeting at FNAL (April 2-3)
- LBNF/DUNE Director's Review at FNAL (April 28 – May 1)
- HV System Review at CERN (May 11-12)
- DSS Review at CERN (May 13-14)
- Collaboration Meeting at SURF (May 18-22)
- PD System Review at FNAL (May 27-28)
- APA Final Design Review (June?)
- DOE IPR at FNAL (July 14-16 - TBC)