

DSS system milestones, schedule and risks

Jack Fowler
DSS Review
08-Nov-2016

Outline

- Milestones
- Design completion, production/procurement and installation schedule.
- Risks and mitigation

Current ProtoDUNE milestones

Task	milestone			June	July	August	September	October	November	December
	Original Deadline	Projected Completion	Actual Completion	2016						
EHN1 Milestones										
Beneficial Occupancy of EHN1	Aug-16		Sep-16			◆	◆			
Complete cryostat exoskeleton SP	Nov-16								◆	
Clean Room Installation Complete	Jan-17									
Complete membrane cryostat SP	Apr-17									
Clean Room Infrastructure Complete	Apr-17									
Racks in Barracks available for Electronics Installation	May-17									
Racks on Detector available for Electronics Installation	May-17									
APA Cold Test Box available	May-17									
TCO closed	Jan-18									
Cryogenic Plant Finished	Feb-18									
Manhole closed ready to start cryo-commissioning	Feb-18									
Cryostat Filled	Apr-18									

- The DSS will be installed after the membrane and clean room are complete. This is expected to begin in Apr/May 17.
- Installation and survey is expected to take 3 weeks.

Scheduling and planning for DSS

- Design review - Nov 16
- Complete design - Dec 16
- Order SS beams - Jan 17 (8 weeks)
- Order trolley assemblies - Jan 17 (4 weeks)
- Order DSS hanger assembly components - Jan 17 (8 weeks)
- Partial assembly of DSS at PSL - Mar 17 (4 weeks)
- Arrival of DSS components to CERN in - Apr 17
- Complete membrane and clean room in EHN1 - Apr 17
- Installation of DSS in - Apr/May 17

Risks

- Effects from cooldown are not predicted properly.
 - DSS adjustment may compensate for some displacement.
- Unable to obtain required access during installation.
 - TPC trial assembly at Ash River, MN is evaluating various types of access equipment.
- Need to dismount flange support assembly after TPC installation due to mechanical issue or leak.
 - Leak test before installation at production site and after delivery to CERN.
 - Increase purge rate to feed thru.
 - Pot volume of bellows if leak occurs
- Issues with material/designs codes and standards.
- Changes in the TPC design affect loads or motions of the DSS.
- Parts cleaned for use in TPC have no lubricant in moving joints and may seize or bind during installation or contraction.
 - Evaluate coatings like Armaloy, plating, titanium nitride, molybdenum disulfide, tungsten disulfide

TPC trial assembly

Hanging CPA panels from DSS bridge beam at Ash River



Summary

- The installation of the DSS is the first major subsystem to be installed inside the cryostat.
- We are following the very good progress of the cryostat construction in EHN1.
- Design must be finished by the end of this year in order to procure components for installation in Spring 2017.
- Most risks are identified and being mitigated as much as possible during the completion of the DSS design.
- The trial assembly of the TPC is allowing us to test many of the functions of the DSS and evaluate various load conditions and the deformations.