DUNE-SP
Technical Integration

Consortium to Consortium Mechanical Interface Actions Post Ash River Oct. 2019

January 23rd, 2020

Kyle Zeug

Introduction

- What were the C-to-C mechanical interface action items following the October 2019 Ash River Workshop?
  - The following slides were created from a document in this EDMS location: 2250305
  - Not covered here:
    - Installation
    - Inter consortium tooling
- A very brief summary of mass data

C-to-C Mechanical Interface Action Items (1/4)

- Consortium to Consortium: APA to TPC CE
- Location(s): Head end of upper APA, two ends of head tube
- Description: CE cable bundle from lower APA exits APA conduit. Cable load is carried by APA
- Interfacing hardware: CE cable bundle grip and APA tie off point
  - May include a cable (bundle) guide feature at the end of conduit
- Needing Resolution:
  - Monday: 3-

Monday:

1- APA Doublet was hanging on assembly frame, **numerous successful tests** raising and lowering the long cable thru the slotted conduit. Cable bundle was in a 50 foot x 1-1/2" mesh. Went very well no issues **conduit will be installed before shipping to DUNE**.
2- Need to order two more low slotted conduits with a flared end, minor adjustment to the length of the conduit. **Need to Ash River by the first week in December**
3- Tested Dan's cable strain relief hook on top of APA, needs some design modifications
4- Dan made a modification to the actuator to better stabilize it when lowering, minor tweak to improve this
5- Added protection panels on bottom APA and first section of top APA, no real issues putting panels on and off but design should be improved, less fasteners needed. Small hoist to control the C channels when removing needs to be tried using a tool to control the motion.
6- Measured optimum work platform for installation of bottom CE boards, should be about 40".
7- Ordered unistrut and bolts for cable tray installation, it arrived on Tuesday

C-to-C Mechanical Interface Action Items (2/4)

- Consortium to Consortium: APA to PDS
- Location(s): Foot tubes
- Description: PDS cables (upper foot tube) connected to PDS junction block (lower foot tube)
- Resolved on December 18th, 2019:
  - ~~Tues: 1-a.~~
  - ~~Tues: 1-b.~~
  - ~~Tues: 1-c.~~
  - ~~Tues: 1-d.~~
  - ~~Tues: 1-e.~~
  - ~~Tues: 2-~~

Tuesday:

1- PD cable tests

- a. Need more clearance on connectors, Dave has redesigned connector location to give more clearance, also added a 6th cable temp sensors.
- b. New connectors work well, Dave will switch to these.
- c. New design for the cable tie constraint to hold cables in two bundles one on each side
- d. Issue with orientation of the PD cables between the top APA, they need to be held in a vertical position so the cable does not kink add protection around opening in sheet metal guide.
- e. Bottom of the lower PD rail interferes with the APA linkage, this needs to be fixed in the top PD rail on the bottom idea.

2- Guide pins: The guide pins did not engage early enough to stop damage to the PD connectors , redesign to engage sooner and be tapered to center

3- Tried installing APA linkage with the protection panels in place. **This step cannot be done** blind. Protection panel

C-to-C Mechanical Interface Action Items (3/4)

C-to-C Mechanical Interface Action Items (2/4)

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- Location(s): Foot tubes
- Description: PDS cables (upper foot tube) connected to PDS junction block (lower foot tube)
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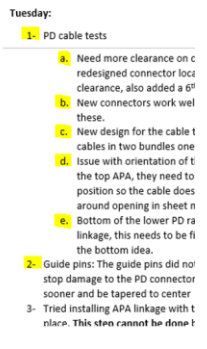
  - ~~Tues: 1-d.~~
  - ~~Tues: 1-e.~~
  - ~~Tues: 2-~~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C-to-C Mechanical Interface Action Items (4/4)

- Consortium to Consortium: TPC CE to Others
- Location(s): APA yoke and cable tray
- Description: Quantity and position of cables in the tray
- Needing Resolution:
  - Thurs: 1-
    - Will be continued at BNL cabling mockup

Thursday

1- The cable tray brackets and unistrut supports were mounted on the yoke. Usage of a wider cable tray will be investigated as it is unclear how to move the cables from one side to the other.
2- The bolt for the latch cannot be installed or removed after the unistrut cable tray support is installed. It will be investigated if the nut on the latch pin can be eliminated.
3- The cable trays were installed. A means to mark the cable trays for the location on the rails and the point where the cables go for the CE boxes should be identified.
4- The cable tray mounting clips were in CERN so cable ties were used.
5- The top CE cables were laid in the trays with no issues. A reel should be identified for storage and transport.
6- The new bottom APA cable assembly was spooled from a 31" reel transport reel to the deployment reel. Protection of the coldbox end of the cables needs designed.
7- The new lower APA assembly was fed through the conduit. The new assembly has a break in the mesh where the extra length is collected. This needs protected as it goes over the sheave. A strap should be integrated in the cable

Summary of Detector Mass Data

Consortia	Mass Data
TPC CE	Mass Data Received
HV	Mass Data Received
PDS	Not Received
APA	Not Received

- Information will be kept and maintained at EDMS 2281422
- Planning on having APA data this week
- Planning on having PDS data next week