

Minutes of APA Consortium meeting

15th April 2024

Chicago update - Ed Blucher

APA 1 is half completed, but on the process cart for repair.

APA 2: Frame prep is complete; will go onto winder on Thursday

APA 3: Frame is in Chicago. Do not yet have all the parts needed for frame prep.

APA1:

Unintended movement of the winder's Z arm that damaged ~10 X wires and the mesh on the A side. Also damaged the V-layer wires, but these are replaceable. The X wires are not replaceable. Several additional wires on either side of the break area will also likely be removed to remove any risk that there are other wires there that could have been damaged.

The problem seems to have been a bug in the code for the command `move_type 99`. They have now corrected this bug, and shared the fix with Daresbury.

Other lessons learnt: Do not measure tensions on the z-axis side of the winder; and always move the head down to $y=0$ before using the `move_type 99`.

Proposed repair: This APA will be used as one of the 25 south-wall-facing top APAs. There will also be a repair to the mesh: this is being discussed with Kevin at the moment. There is plenty of time to do this repair: this APA will be completed after APA 2 is wound.

Daresbury update - Sotiris Vlachos

There are lots of new people joining the effort - ~10 new techs working in the factory now, who are all in the process of being trained.

2 APAs are being wound at the moment. Winding on winders 1 and 2, because winders 3 and 4 are currently out of service (nothing serious - just some minor repair work that is needed to those winders).

One of these two in-progress APAs: X-layer finished and tensions measured and the 3-4 wires that needed replacing have been.

Other APA: currently winding the V layer; likely to finish the winding this week.

These two APAs are still being wound fully on the winder. We do not yet have the complete new process carts in order to test the off-winder tension testing.

ProtoDUNE-II: Pip Hamilton

Cryostat will be full by the end of April.

Commissioning the APAs will therefore likely happen in the 1st week of May.

Provisional commissioning plan shown in Pip's slides, along with a description of what we want to monitor in terms of stability and performance.

The hands-on operation of the shifts will be in the hands of the DAQ group.

Alberto asks about the measurement of the temperature gradient during cool-down. It would be good to look at these measurements.

Beam will be on from 10th to 16th June and 8th July to 18th August.

Cold tests cannot take place while the beam is on.

We also cannot get APAs into the clean room while the beam platform is in place. We therefore need to identify a schedule window, and the effort, to modify the cleanroom to allow us to lower APAs into the clean room on the other side of the beam pipe.

For future cold tests, it is important that we plan for lessons learnt from previous APA cold tests. Pip has a slide of these lessons - in particular these revolve around record keeping. Pip would like a planning meeting in Daresbury later in May to go through this.

It will also be important to have two DWA units ready to go at CERN, and which are approved for use. There must also be a supply of spare parts.

Pip has a slide detailing the effort we need to send for these cold tests - we need all institutions to offer effort.

Geometry board assembly: Anthony Ezeribe

Anthony's slides describe the step that has been observed between the tooth-strip and the geometry boards, which can be up to 330 μm due to the design tolerances in the drawing - although the biggest step found so far is 220 μm .

At Daresbury, we have done some tests on this step by winding wires over a 200 μm step and applying pressure, and this shows no impact on the wire.

The Production Board has asked if we can reduce the step down to 150 μm . Currently, 61% of boards would pass this new tolerance.

A change request is being formulated to look at the options for addressing this request, as described in Anthony's slides.

9 boards have now been assembled with the modified jig, and all show the step to be within the required new tolerance.

Justin asks about the direction and the step, and whether the same direction of step is seen at W&M. This is something that we will have to discuss with Jeff Nelson this week.

Kevin also points out that the width of the APA is important - relevant if we add any additional kapton tape.