

Tracker Refurbishment

What was done...

Over the past 3-4 months Trackers 1 and 2 have been refurbished. What does this mean?

The trackers were removed from their sarcophagi (one at a time) and laid out on a table in the dark room. The waveguides were unfurled from the support mast and they were inspected. To inspect them a UV free light source was attached to the 128 way bulkhead connector and the light path was followed along the waveguides. We were looking for bright 'starbursts' along the fibre, this would indicate a fracture in the fibre. Small starbursts were ignored but in tracker 2 there were broken fibres and where this was the case the complete internal waveguide was replaced. 2 were replaced in total.

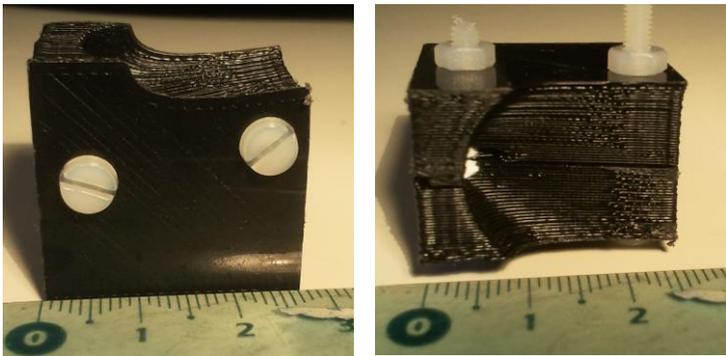
What was done...

Pictures of the illuminated Light guides, courtesy of Adam Dobbs

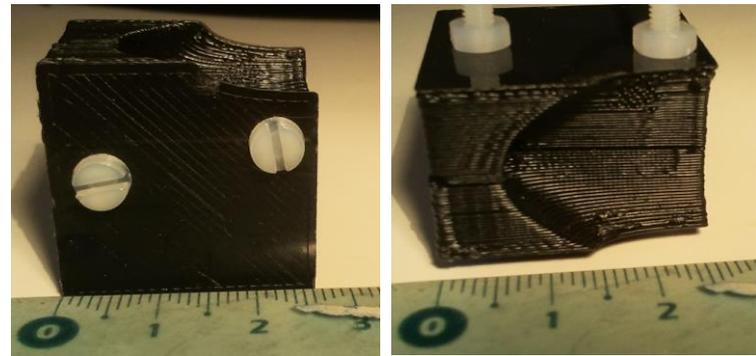


What was done...

The LED calibration system was installed on both detectors and we have Ed Overton to thank for that as he was given a very tight deadline in deed to 'come up with the goods'.



Type I: When viewed from the side (right image) have a large dip from the light cone which goes from ~7mm to 27mm.



Type II Modules: When viewed from side (right image) light cone indent is much smaller (from 15mm to 26mm). Also the cone from above looks squashed or 'pointy'.

What was done...

Finally the lightguides and the LED fibres were re-attached to the support mast, the whole assembly wrapped in UV film and restored to its sarcophagi.

Many thanks to Adam, Craig, Eamonn, Ed and Kevin, Mark and Simon Plus anyone I've forgotten.

Installation of the Mice Trackers into the Spectrometer Solenoids

Geoff Barber

7 Nov2013

Mice CM37

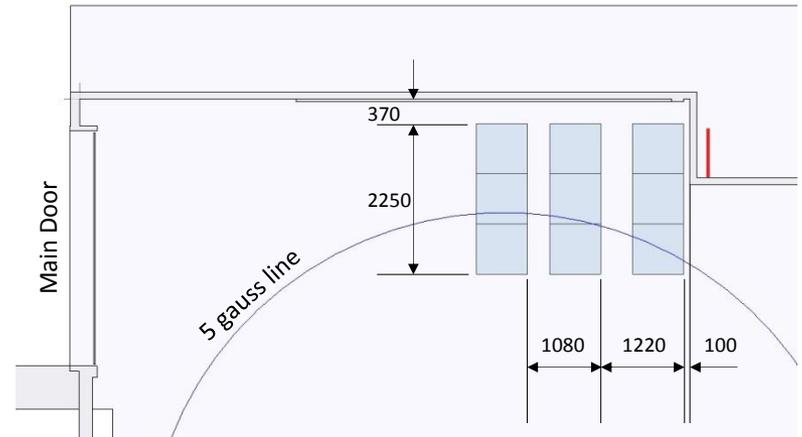
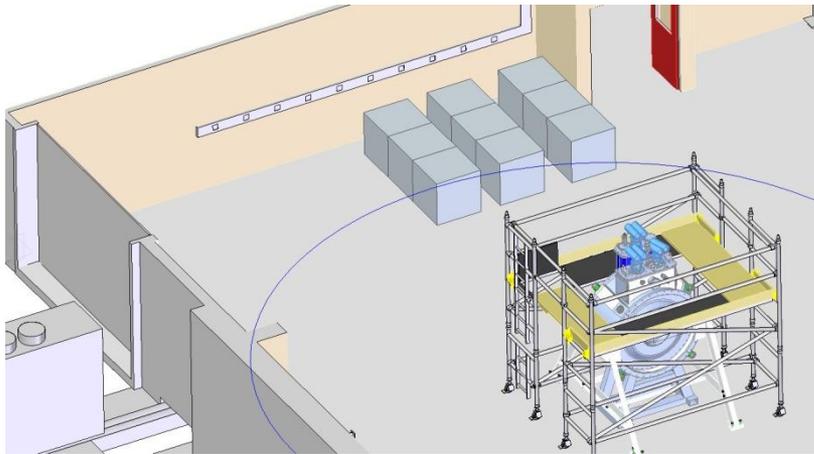
Pre-ambule

It has been decided that the tracker installation will take place in R9. Whilst this will give a pleasant working environment it does not come without problems. All of the work will need to be co-ordinated with work on the AFC's, we will not be allowed to work when the AFC's are powered for example. All tools will need to be registered into and out of the area. There will need to be a named person who will be responsible for all work carried out and no work will be allowed if that person is not there. We will not have control over the lighting so this means all work will need to be carried out inside a light tight enclosure (again). In the next few slides you will see that this gives limited space to work but we are getting use to this now as people working on the tracker refurbishment will know. What that taught us is that you try to work with the minimum equipment and the minimum number of people in the area at any given time (and I need to DIET).

All that said the following is an outline of the procedures and things still to be discussed.

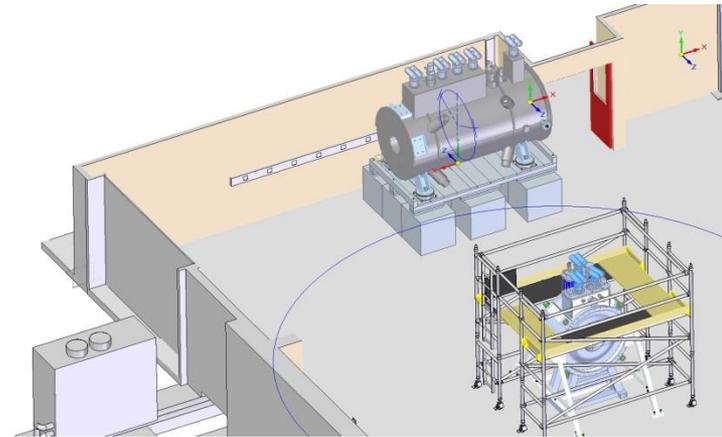
Sequence Of Operations 1

We have Made a start in R9 (both AFC's are now installed but a safety procedure needs to be written and agreed) the first job was to install the working platform. This consists of a series of concrete blocks that will supports the Spectrometer Solenoid. The layout uses 750 x 750 x 2250mm concrete blocks as this is a standard size.



Sequence Of Operations 2

The next operation was to place the SS onto the concrete blocks. This was carried out by an outside company (King Lifting) due to the weight limit of the R9 crane



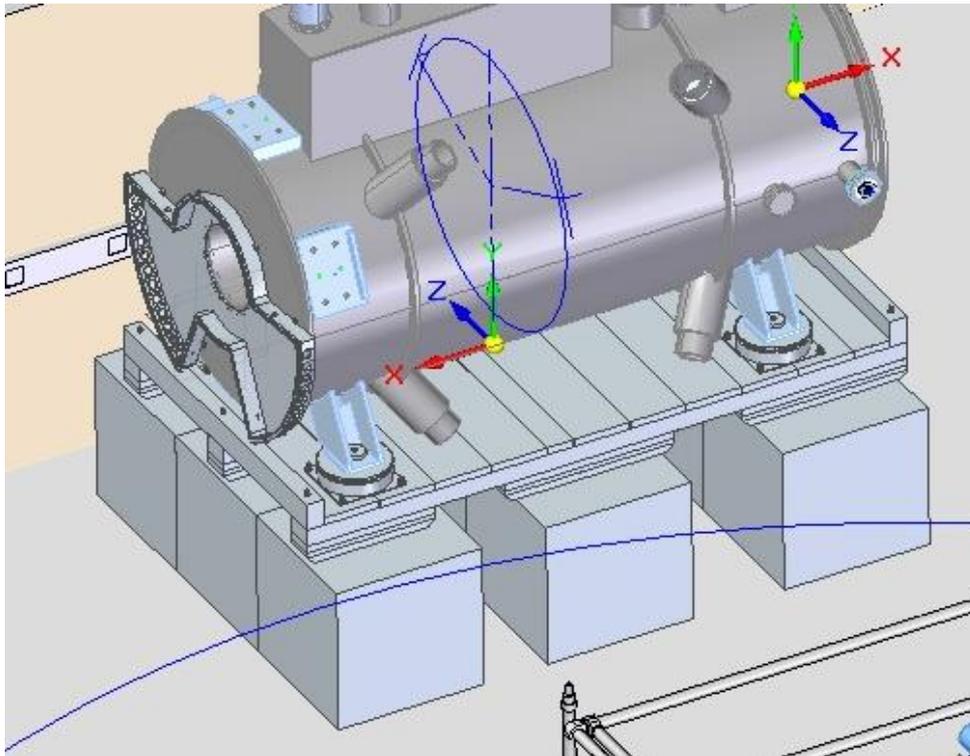
Now in position the the bore will need to be cleaned and may require surveying as there appears to be 'high spots' in the region of the weld and score marks along its length.

What are the implications for the leak testing?



Sequence Of Operations 3

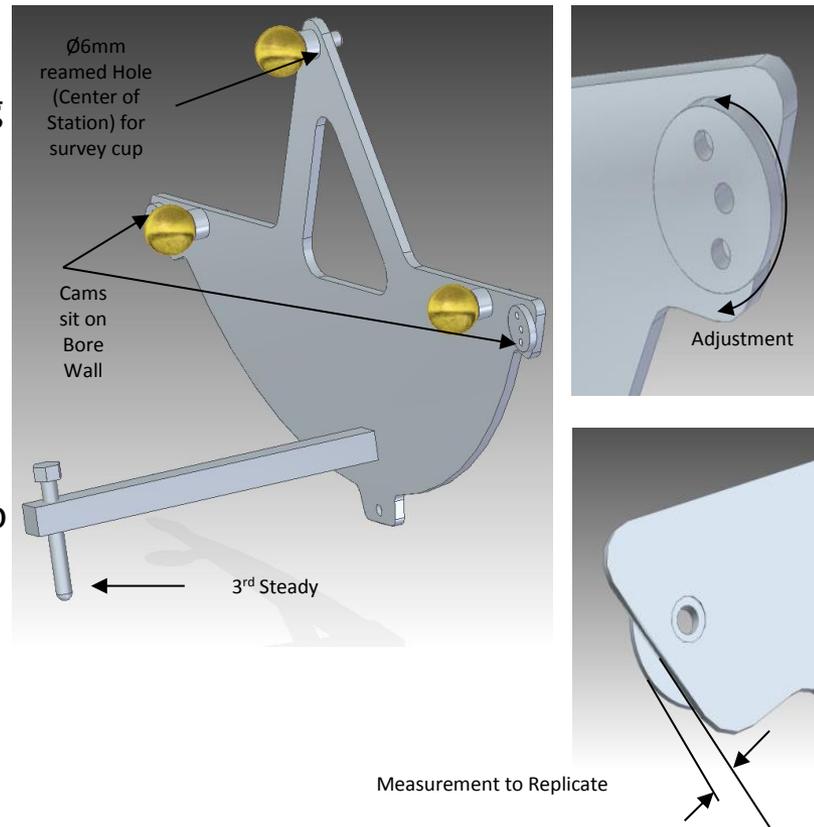
Once the SS is ready the Patch Panel can be fitted and sealed.



Sequence Of Operations 4

X - Y Alignment

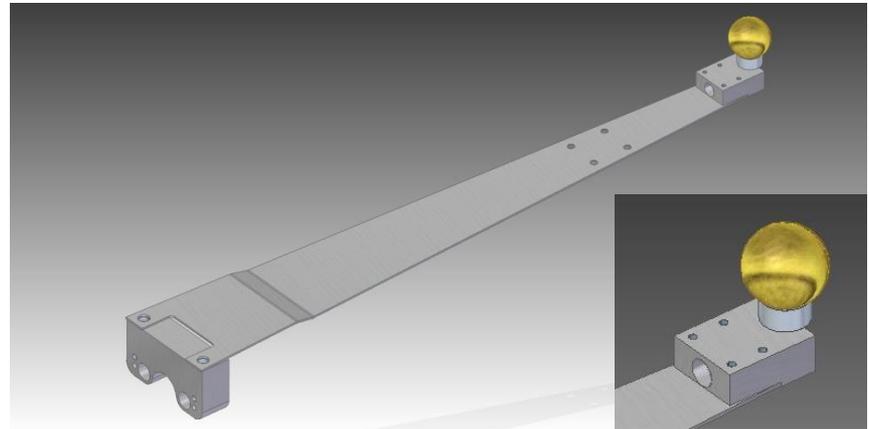
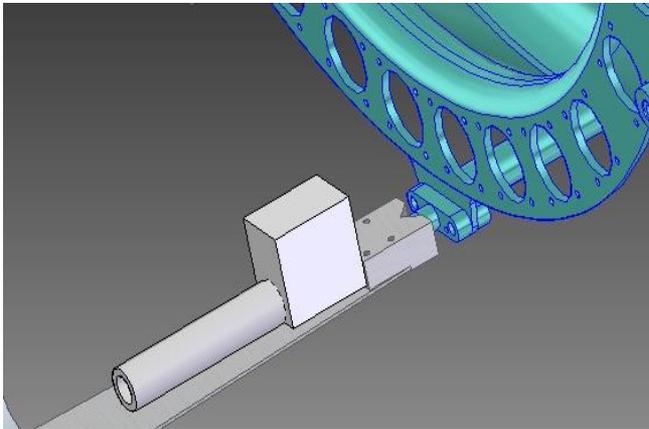
When patch panel installation is completed the survey of the bore is carried out and using the x – y Alignment tool at both tracker/bore support positions the tracker feet adjustment can be ascertained and replicated on the tracker before installation. This ensures that the tracker will be on the best x-y axis possible. It is achieved by fitting a survey ball at the position of the center of station. The two other balls may or may not be required to set the tool horizontal (will discuss with John Palin next week).



Sequence Of Operations 5

Φ and Z Alignment

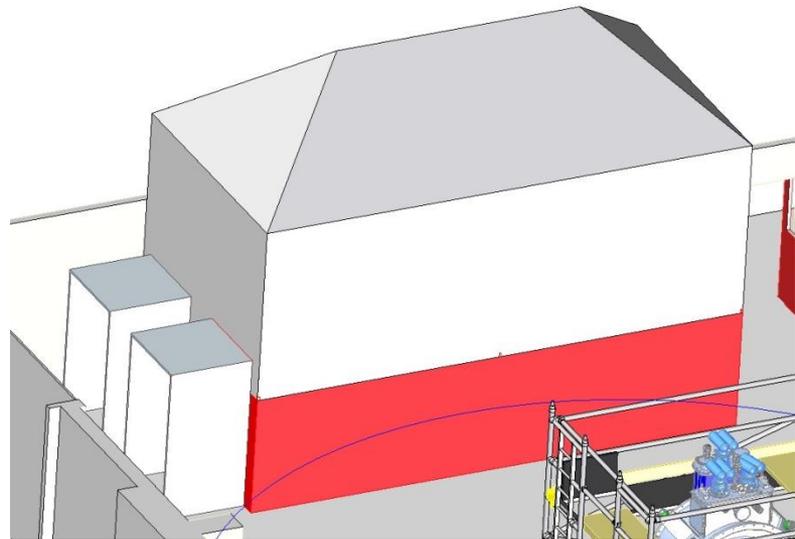
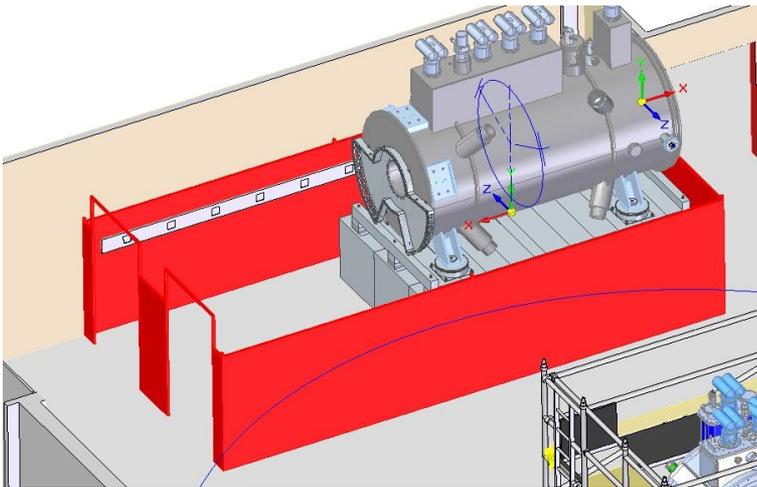
The ϕ and z alignment relies on a hemispherical bracket on the tracker being pulled into a Vee block that is mounted and fixed from the patch panel. This block needs to be aligned then doweled (this procedure is carried out when the patch panel is fitted so that the drilling for the dowels is done whilst the tracker is not present). Z is just a straight measurement but ϕ will need to be surveyed. To do this a survey ball is held in the Vee block as the diagram shows.



Sequence Of Operations 6

Assembly of the light tight enclosure

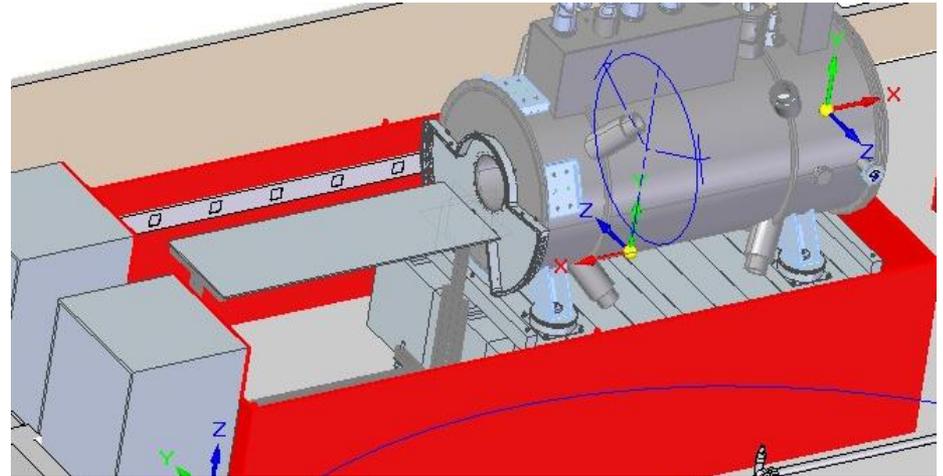
As stated the work will need to be carried out in a UV excluded environment, this means in this instance a tent. The tent consists of a sub base to get the height required, The tent itself and then there are two entrance chambers (to stop light ingress). Two are required as there will not be enough room inside to allow people to easily get from one side to the other whilst the installation platform is in place. Filtered lighting is now installed inside.



Sequence Of Operations 7

Preparation for the installation

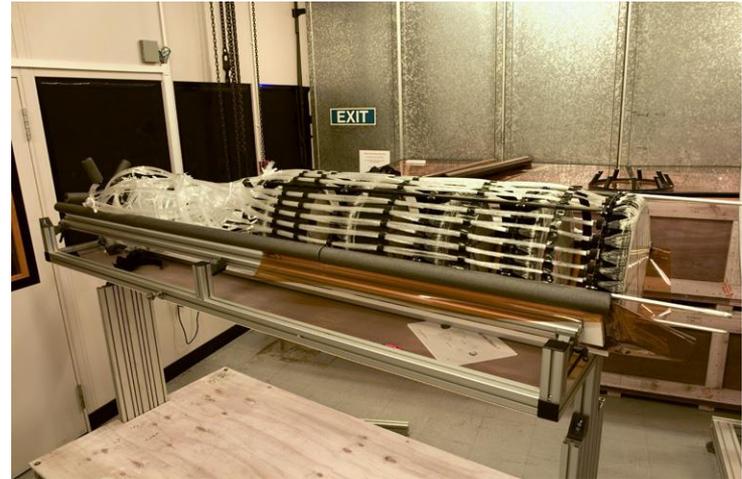
Once we have a secure working environment the tracker can be brought into the area and secured at the side of the SS on a support (to be made) and then the installation platform is installed and levelled. Once this has been done the tracker can be removed carefully from its tube and placed on the installation platform. The tracker still has its fibres and LED waveguides attached to the support mast (exists but not yet modelled, see photos on slide 9). This is the time to adjust the four cam support feet to replicate the dimensions given by the x – y alignment jig and the last chance to fit the Hall probes if they are available and to check that the LED system is behaving itself. Once all of this has been done the tracker is slid into the SS.



Sequence Of Operations 8

Fitting the Waveguides

With the tracker inside the SS the ϕ Z bracket is fitted using dowels. The tracker is now in its final position. In the case of Tracker one the diffuser support crown will need to be installed. The internal waveguides are removed from the support mast one at a time and routed to their position in the patch panel perimeter. Craig has raised the issue of the orientation of the connector in the patch panel, as there is only one possible rotational position that the internal/external waveguides can connect and the external waveguides do not wish to accommodate any twist it will be essential to fit the internal waveguide bulkhead connectors with the correct position. I don't think that we can accommodate the cryo-coolers in the tent so some form of orientation plate will need to be made. We need a meeting of all the interested parties to thrash this out.



Sequence Of Operations 9

Closing Up

With the tracker inside the SS, all of the bulkhead connectors fitted and secure patch panel cover is fitted. Before the final fitting it is the final check to ensure that the connector numbering on the patch panel corresponds to the correct connector. Once reassured it is simply a matter of fitting the patch panel cover, all of the light tight caps to the connectors (if not already done) and fitting the gas inlet and outlet.