

Removal and Re-installation Of The Diffuser From/Into The Upstream Spectrometer Solenoid

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Removal

To remove the diffuser from the tracker patch panel the following needs to be taken into account.

Because the fibres degrade in UV light this causes complications. The diffuser has to be removed using the main hall crane, however the problem is that the crane is equipped with a powerful light that illuminates the area below the crane, as this is a safety requirement it can neither be disabled or masked. This can be solved by suspending a hand operated block and tackle from the main crane. Everything can be approximately positioned under normal lighting conditions then 'switch off' the main crane (and light) before the diffuser is removed. To do this we will not only need to light the immediate working area with UV filtered lights but also illuminate a safe passage** into and out of the hall from the working area. This means that for the work period when the tracker fibres are exposed (less than 1 hour) no one other than the installation team will be allowed in the hall. We need also to think about the hall Safety lighting, when disabled people will need to have filtered helmet lights to appease H&S?

The diffuser is lifted using a counterbalanced lifting bracket that needs to be fitted (fitting can be carried out under normal lighting). This needs to be set up so that it is balanced when the bolts are removed to avoid any sudden movements up or down. Guide bars are fitted in place of 3 of the retaining flange bolts these are there to ensure no deviation from the bore centre happens during withdrawal.

Once ready we ask for the lights to be turned off, this is done using a walkie-talkie link and this link also enables us to have the lights turned back on when finished or should an emergency require it.

The remaining bolts are then removed, adjusting the counterbalance as required, and the diffuser slid out carefully ensuring that it does not hit any of the tracker light guides.

Once safely clear the flange cover and o'ring can be fitted, when this is in place and secured the hall lights and the main crane can be turned back on. The diffuser is taken to the end of the hall and packed for transport to Oxford.

While the work on the diffuser is being carried out at Oxford the upstream patch panel can be checked for any other leaks as this was not possible before and rectified as necessary.

The sequence could be as follows:

1. Clear the working area around the patch panel (shielding, ToF1 etc.)
2. Gather all equipment in the hall and check all is ready
3. Set up the lighting
4. The intermediate hoist is fitted to the main crane and positioned, the main crane is then isolated at the wall and the key and controls are locked away by Mark Surman
5. The counterbalanced lifting bracket is fitted and adjusted as required
6. Replace 3 flange bolts with the guide bars
7. When all is ready the hall is cleared and the doors clearly signed to keep people out
NOTE* that doors must not be locked and the PPS must not be enabled
8. Turn on the UV filtered lights and radio to kill the hall lighting
9. Remove the rest of the flange bolts with care ensuring the whole unit is in balance
10. Carefully withdraw the diffuser from the patch panel without touching the light guides
11. Once withdrawn remove the guide bars and fit the patch panel flange.
12. Hall lights can now be turned on and the diffuser removed using the main crane

Re-Installation

To install the diffuser into the tracker patch panel is reverse of the above.

Things to note

- All o'rings should be checked
- A risk assessment and method statement should be submitted
- The week before all lighting should be found and tried to ensure it still works and if the UV filters have been removed they should be replaced
- The people allowed into the hall should be the minimum required (NO spectators)

** I suggest Site lighting is used, we have some portable lighting (depending on its suitability for the fitment of UV filters) we will probably need to purchase more; (we will need it during any further intervention inside the patch panels in the future).

Please feel free to comment on the above.