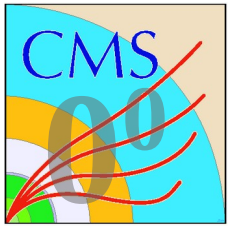


CMS ZDC Status

TREX 2025.01.31

D. Lazic
Boston University

Summary

Both Zero Degree Calorimeters have been extracted from their respective TANs and brought to surface to CMS Radiprotection area for maintenance.

The interventions took place on Friday January 24th (Sector 45) and Monday January 27th (Sector 56). The extractions went smoothly and no major problems were encountered.

(Part of) the intervention on Friday was followed by C. Burnett from HSE-OHS-PE. The cranes can be seen as machines, not lifting fixtures, so there is no need for annual inspections of the cranes, their regular maintenance is enough. He proposed several improvements of the documentation of the lifting procedure, the appropriate document (EDMS 2823793) will be updated.

On Monday we used a new tool provided by RP (an extendable bar) that allows handling of radioactive objects from a safer distance. Very useful!

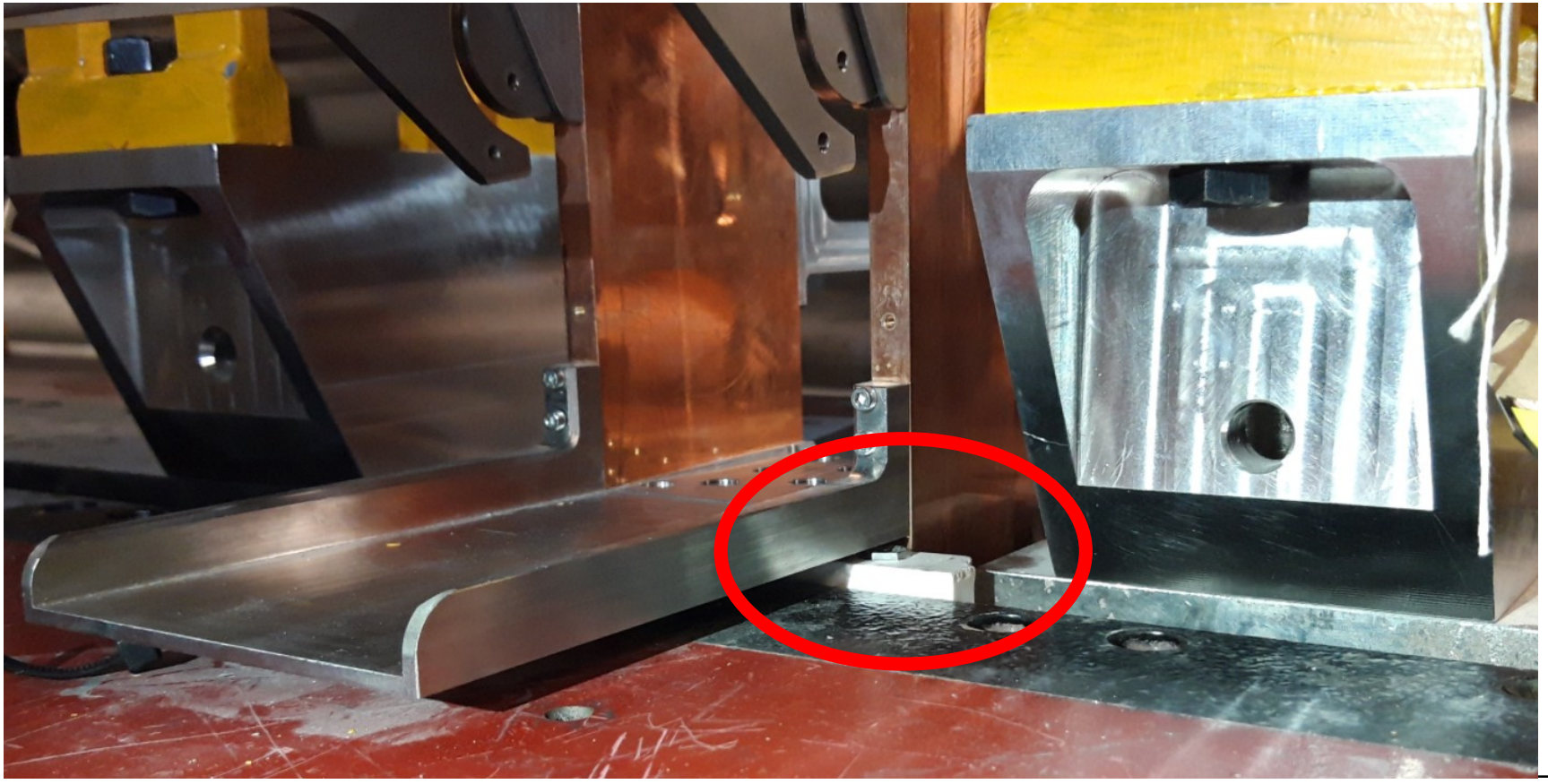
We need couple of hours more on the platform behind TANs to make the cabling of the calorimeters faster and safer.

Sector 45

Friday 24th

Steel bars

Presence of a shim under the BRAN reduces the available space for the insertion of the absorber bars. **Could it be replaced with a smaller piece?**



Sector 56

January 27th

“The Tool”

Lowering objects into the TAN is always complicated due to uneven surface of the gaps. The bars and/or calorimeters occasionally get stuck.

Instead of wiggling the (highly radioactive) absorber bars by hand, the new tool allows to do it from a much safer distance!

Very useful! Thank you!

Outstanding work in the tunnel

IMPACT 246035: Rerouting cables of CMS ZDCs

Description:

In the current situation high voltage and signal cables are routed through the arms of the mini crane making the insertion and removal of the calorimeters rather awkward. The last two metres of the cables will be rerouted around the crane to make future interventions easier. We will use this access to put new labels on selected cables and replace few damaged HV connectors.

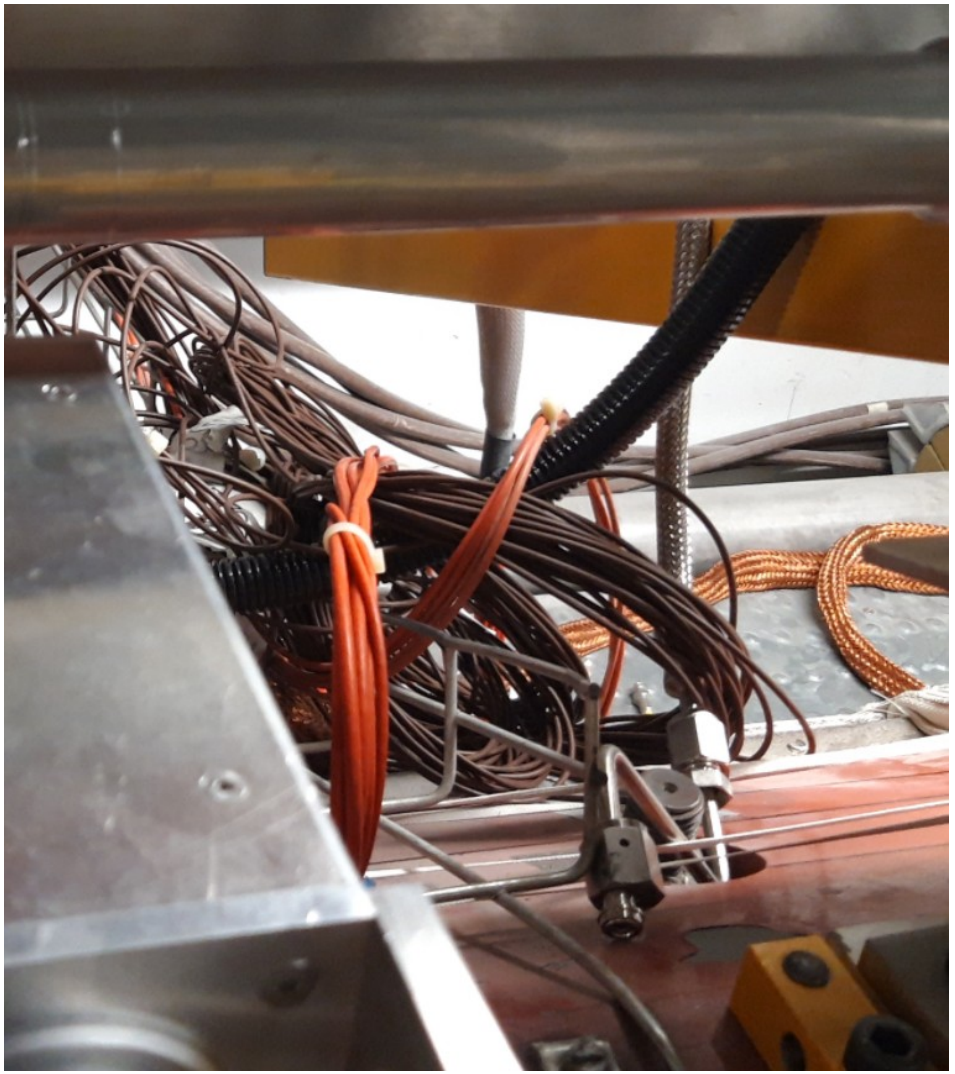
Why separate IMPACT?

The intervention is minor and **independent** of the ZDC removal, but the TAN is radioactive and an access for about 15-20 minutes to the platform on the Cryo side is needed...

... therefore an independent IMPACT.

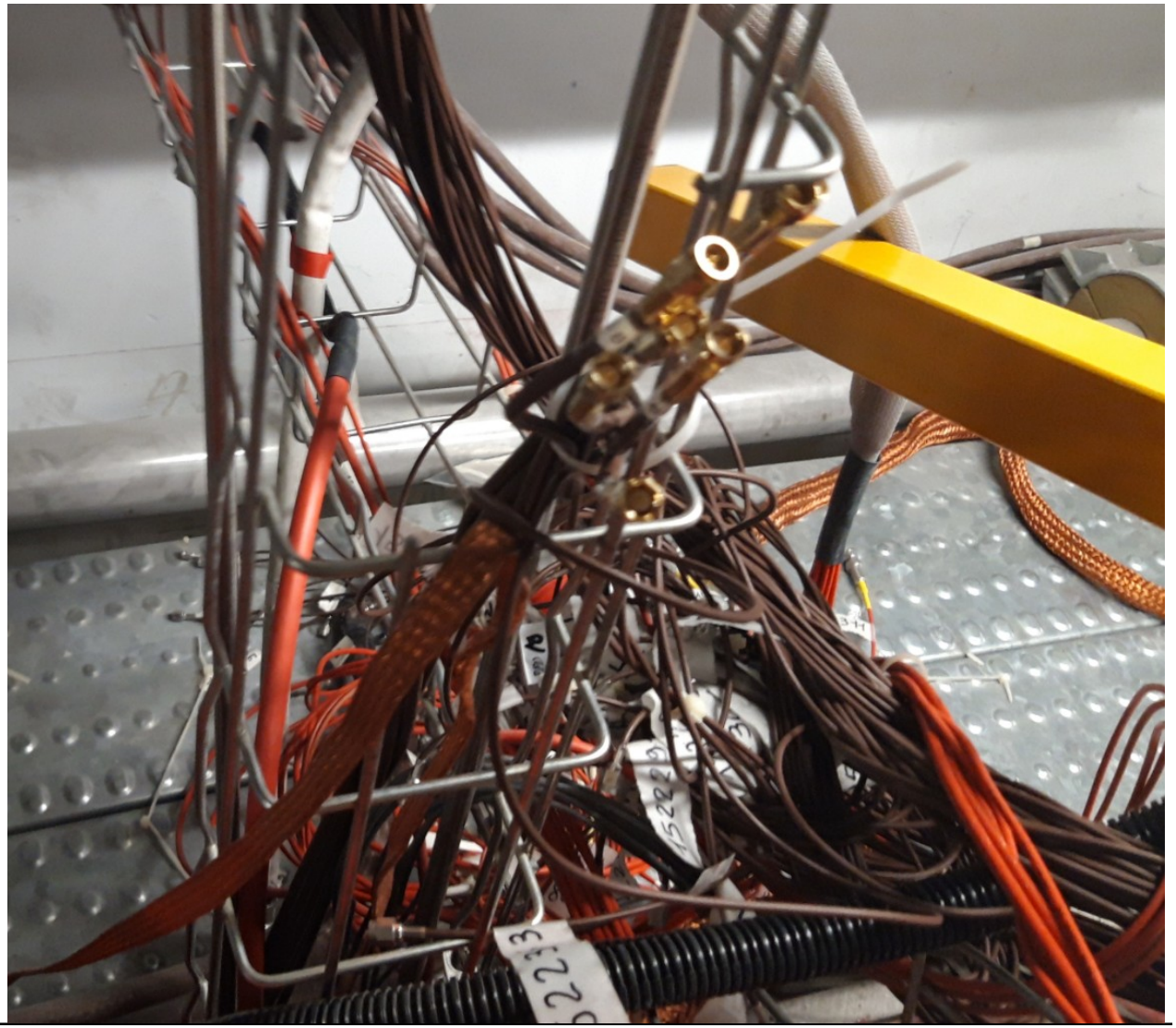
Not very pleasant access

During the ZDC installation in TS2 we had either to lean over the hot(!) TAN in order to get to the HV and signal cables or to access them from the platform behind TAN (requiring a special dispensation for work above QRL).



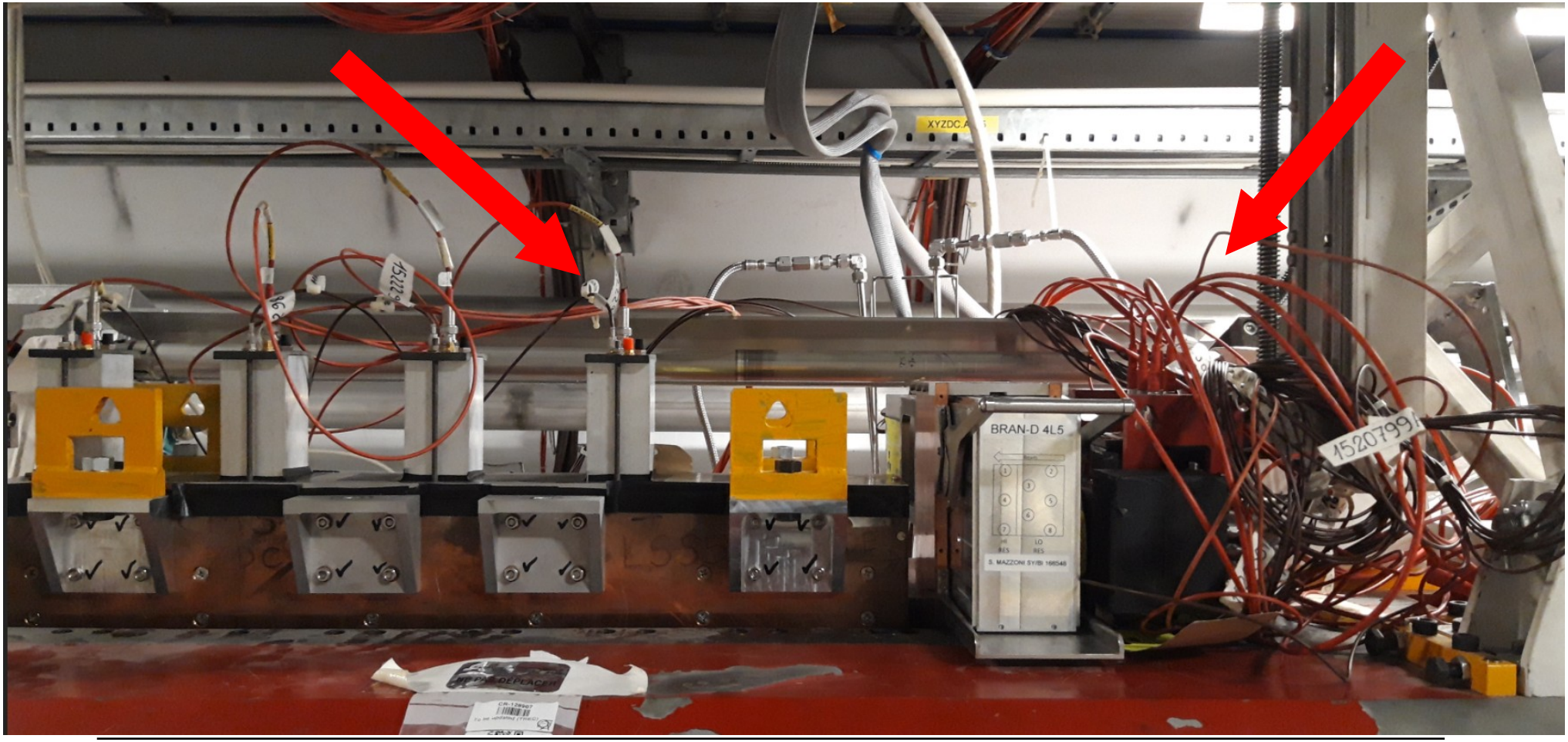
Not very pleasant view...

... you have to extract ZDC cables ***without disturbing the others*** and move them to the front of the TAN (Transport side).



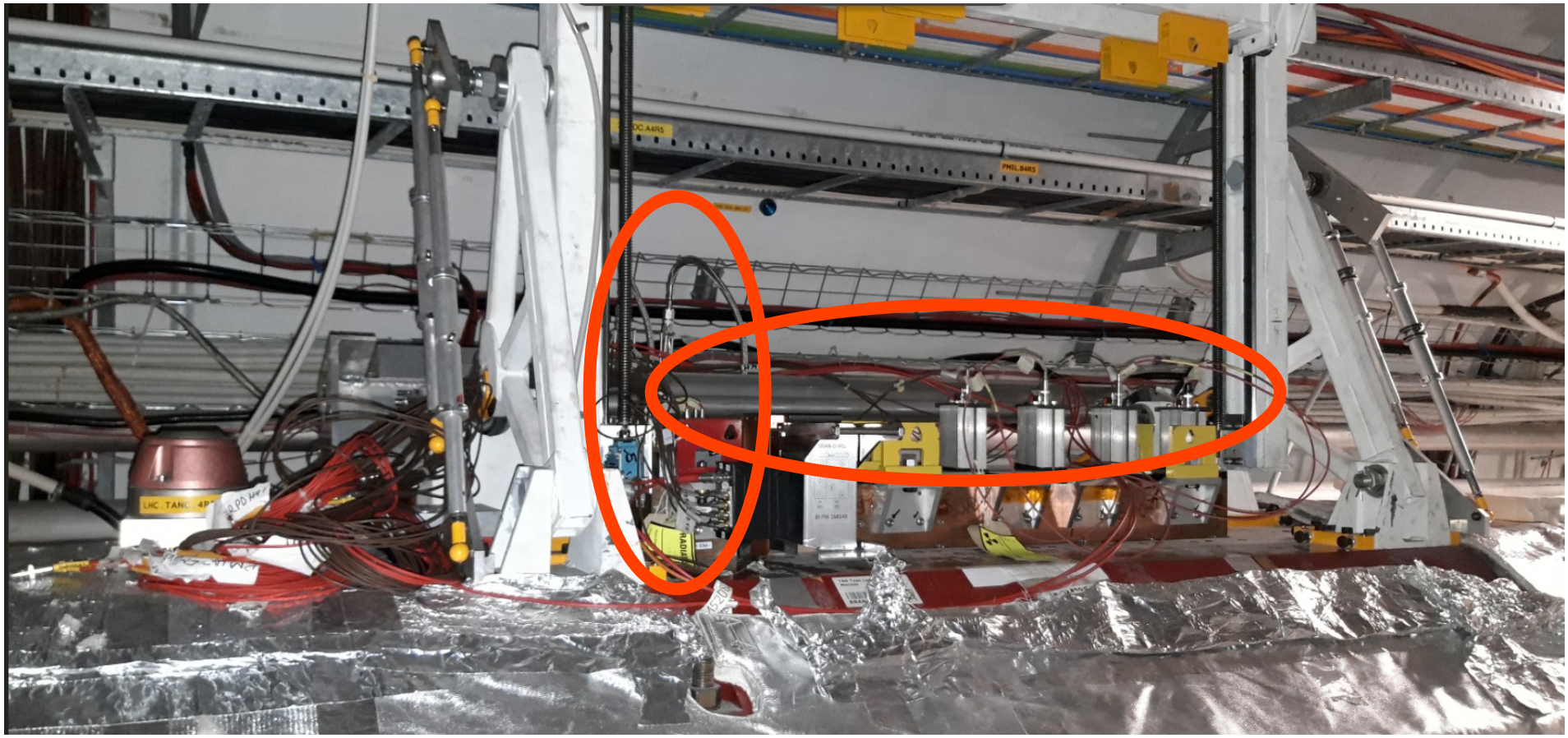
The shortest intervention

The shortest path to the Transport side of TAN is between the arms of the mini-crane...



Conflict

... but it conflicts with ZDC removal and absorber bar insertion, so at the end of the run you have to disconnect the cables and put them back to the rather inconvenient place!

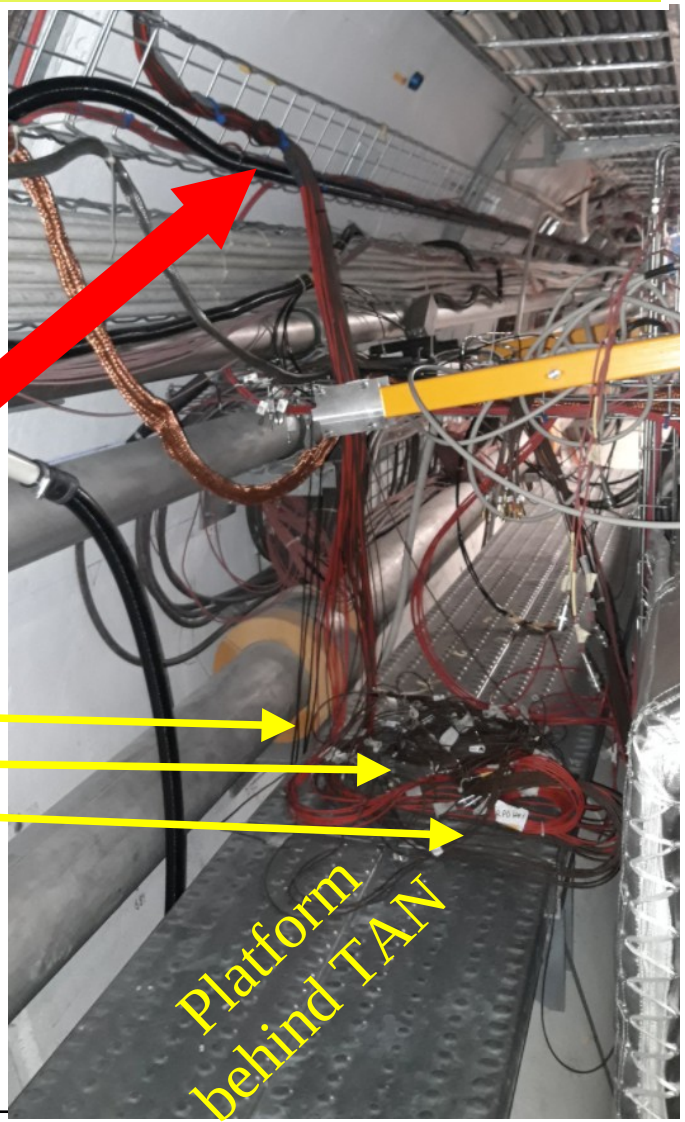


What will be done?

The first step will consist of accessing the work platform behind TAN to assess the available slack between the cable tray and the front of the TAN. Then the cable bundles will be routed around the crane and secured in place.

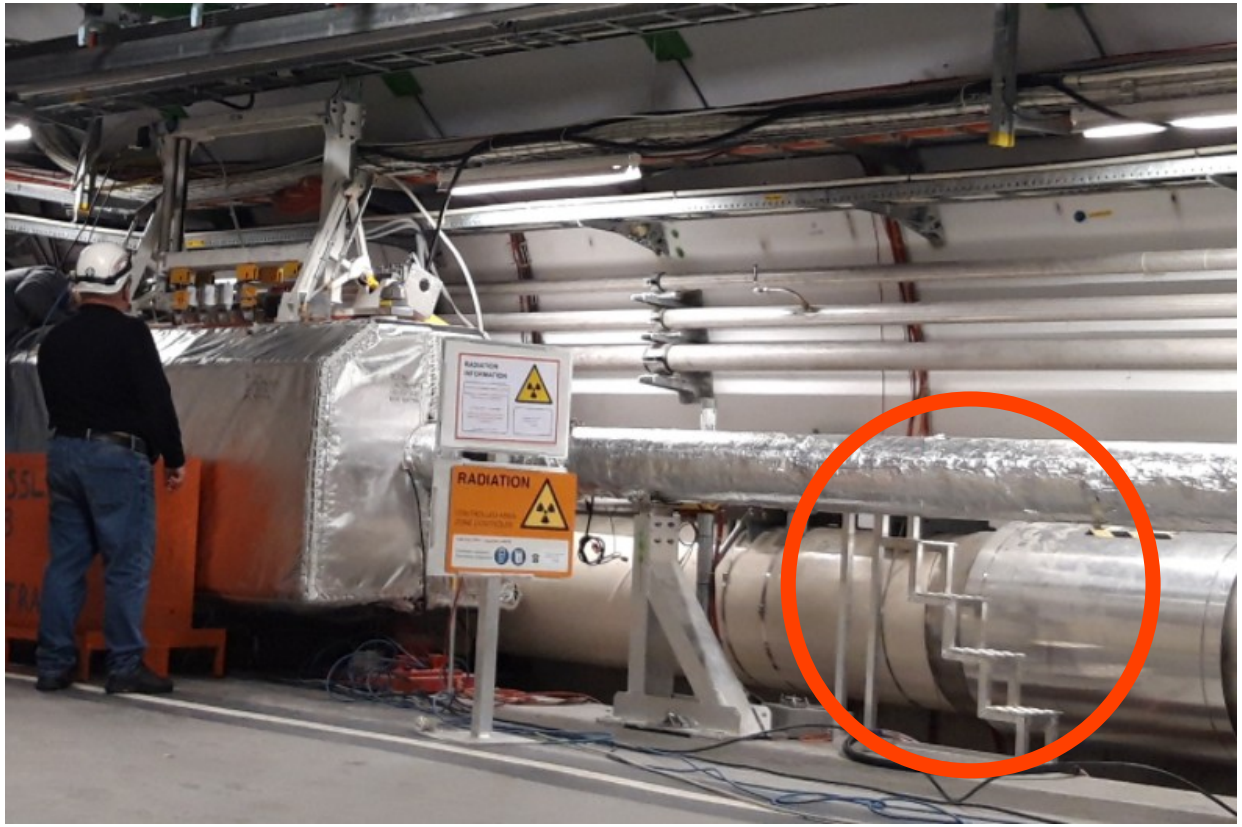
The cables remain attached to the cable tray on the wall! Non-ZDC cables remain untouched!

The intervention consists of moving the "loose" part of the cable bundles (yellow arrows) around the crane.



Platform

Platforms behind TANs were built for this kind of interventions and the access is quite simple by using the stairs.



Who, how..?

The platform is wide enough and the job simple enough for one person (fully equipped with the standard PPE)!

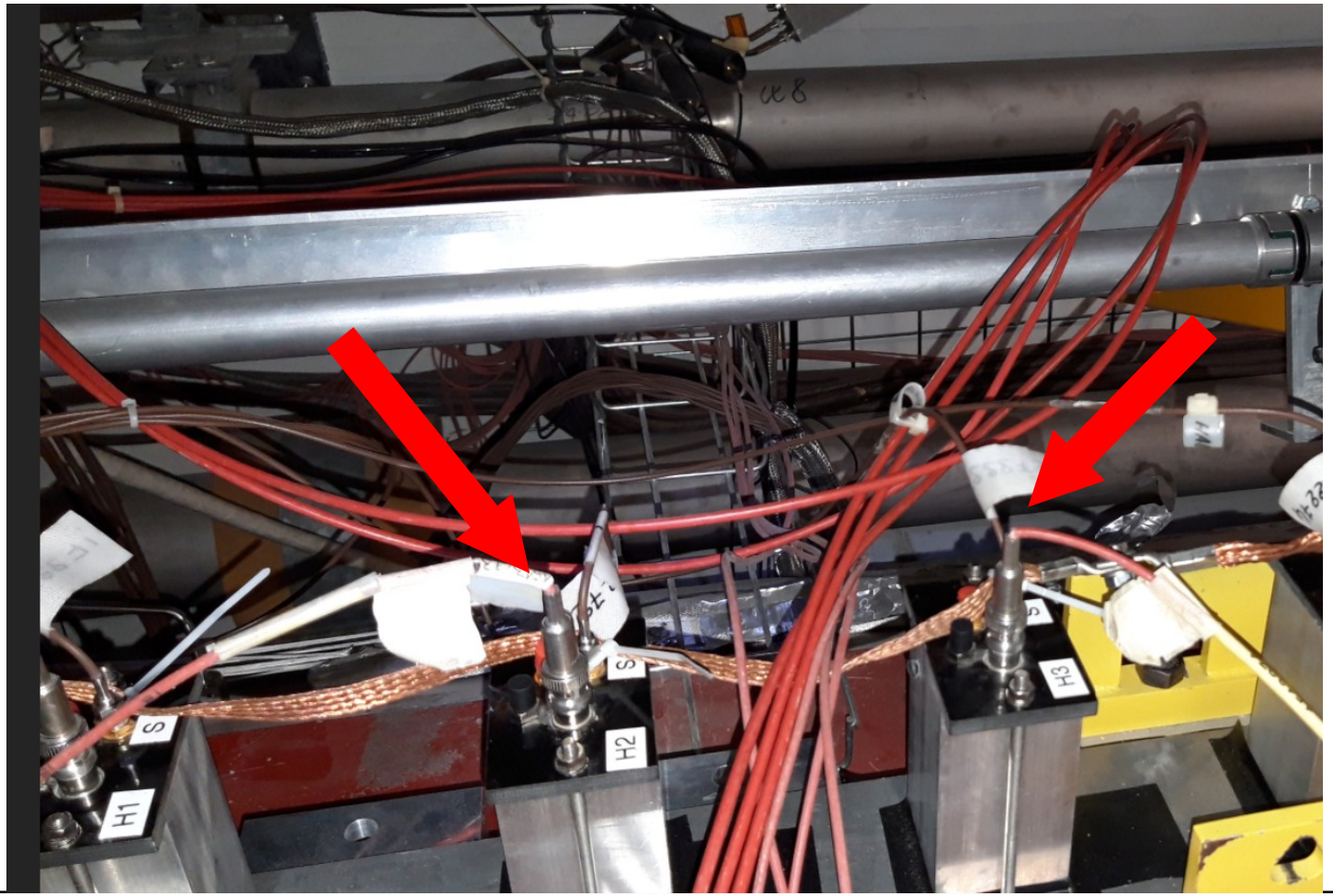
The required tooling: cable ties and wire cutters.

The second person may assist from the Transport side.

Duration: there should be no more than two-three bundles to move per side. Even with generous contingency 15-20 minutes (per side) should be enough!

Something else

We found couple of HV connectors that require replacement. It will be done on the “safe” side of TAN behind lead shielding.



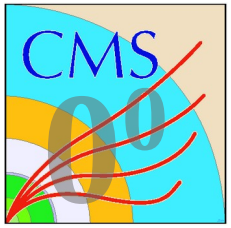
Scheduling

YETS is by far the best time to do this kind of intervention - TANs are much cooler than during Technical Stops!

I believe that it will be better to perform this intervention before the bake-out of the beam pipes, but I am open for suggestions. It is nice to finish the job early in case of problems, but the longer we wait, the cooler will TAN be...

Caveat: installation of HV connectors requires a trained technician, I will need a couple of days of advance warning to “liberate” one.

P.S. If we do the intervention after the bake-out I could leave the cable bundles on top of the TAN, further simplifying the future interventions!



Questions?

Suggestions?