Adding 220V power to the CMS bunkers - ECR

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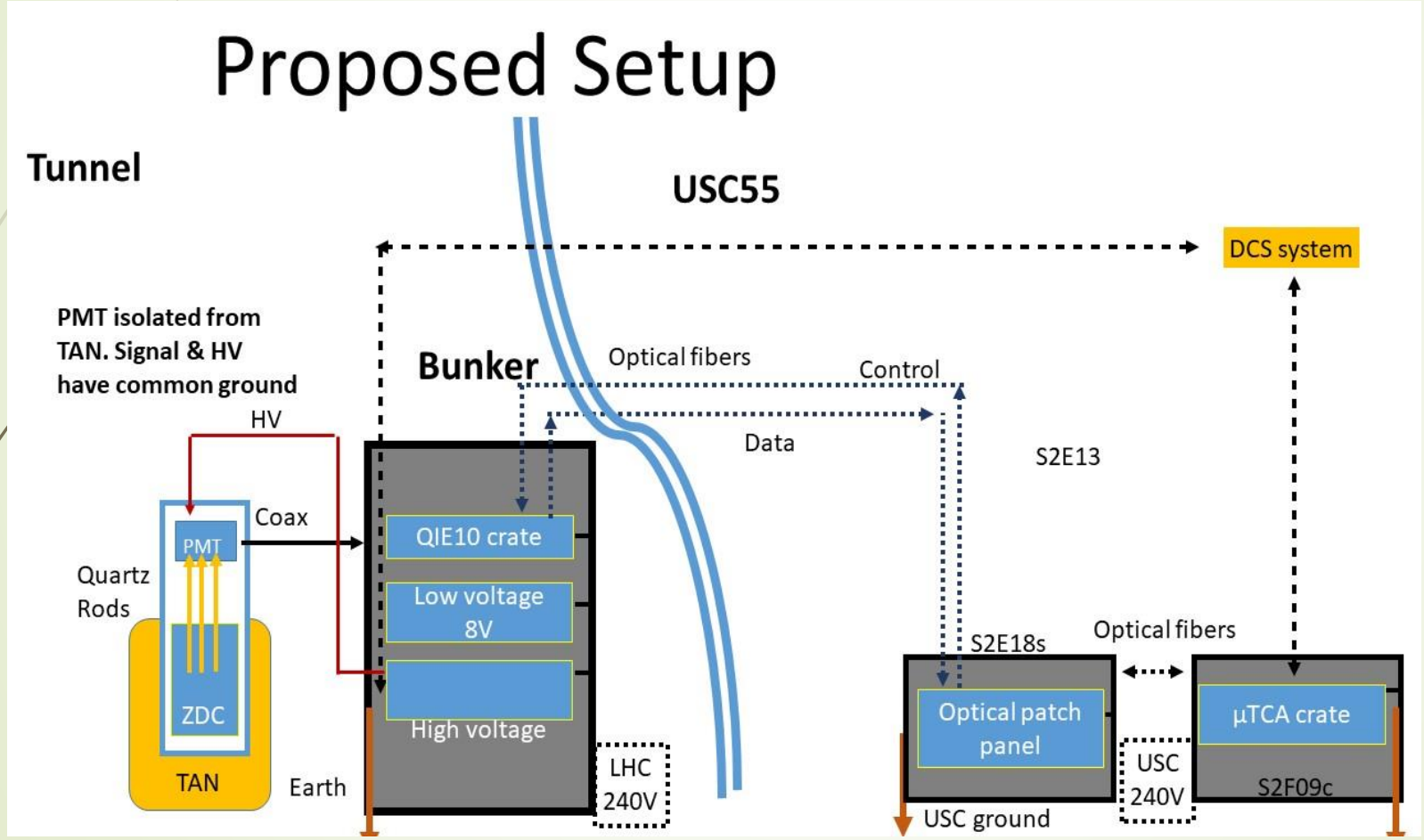
Existing situation

- CMS ZDC purpose is to measure very forward photons and neutrons produced in in heavy ion collisions.
- CMS ZDC is installed in TAN at +/- 140 m from IP5
- During Run 1 and Run 2 CMS electronics were installed in CMS control room (level 1) :
  - Impact1 : Very long cables of HV
  - Impact2: The HV cables are acting as antennas and bring noise into CMS control room (USC55)
  - Impact3: Blow fibers in the existing ducts, last one basically we had 20 m of black fibers (need to control with multimode fibers)
  - Impact4: For Run 4 (timidly for Run 3) we plan to reduce the noise in USC55

Reason for change

- Main worry is the grounding:
  - No contact with the USC55
  - More feasible to have the QIE's and HV in the bunker near detector
- AUG: we would like to have it installed
- Power for Racks: we plan to install mini-racks which will host HV and QIEs
- RP issues: Bunkers have a low radiation.
  - Fibers will come from top of the rack
  - Fibbers will shorter
  - Fibbers will be well away from beam

Proposed set-up



Current situation and future plans

We would like to have theses in the bunkers.
We are foreseeing several Phases

- Phase 1: installation of 220 V plugs outlets
- Phase 2: installation of the internet plugs, optical fibers (single and multi mode of optical fibers on the two existing duct)
- Phase 3: installation of mini-rack (QIE , HV, and LV)

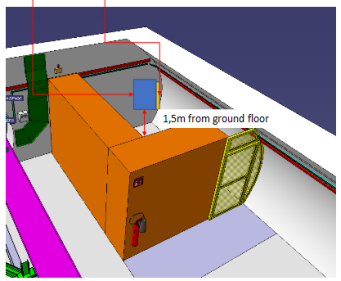
The timeline of these phases, as we all know is depending of budget, funding's men powers, supervising etc..
We are optimistic to have the Phase 1 and 2, by this year, before May 2021 – budget reasons
For Phase 3, we would like to have a first trial for Run 3

Work done by J.L Grenard

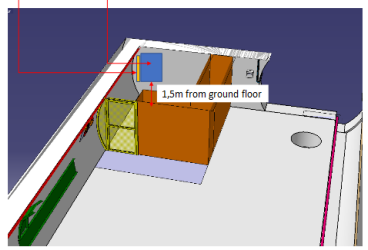
Current studies of integration

•Integration studies for installation of mini-racks in the bunkers (proposal from M. Amparo Gonzalez De La Aleja Cabana, J.L. Grenard)

UJ57 bunker
Rack and 220V sockets

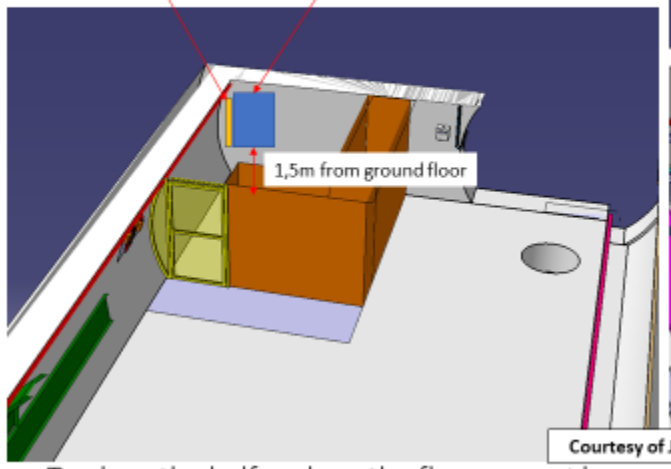


UJ53 bunker
220V sockets and 1/2rack

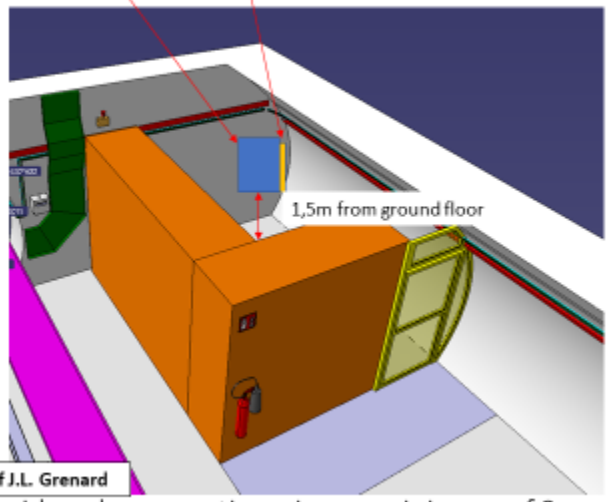


Requirements from EN-HE point of view:

UJ53 bunker
220V sockets and 1/2rack



UJ57 bunker
Rack and 220V sockets



- To place the half-rack on the floor cannot be considered as an option, since a minimum of 2 sarcophagui (max 4) are foreseen to be stored inside the bunkers.

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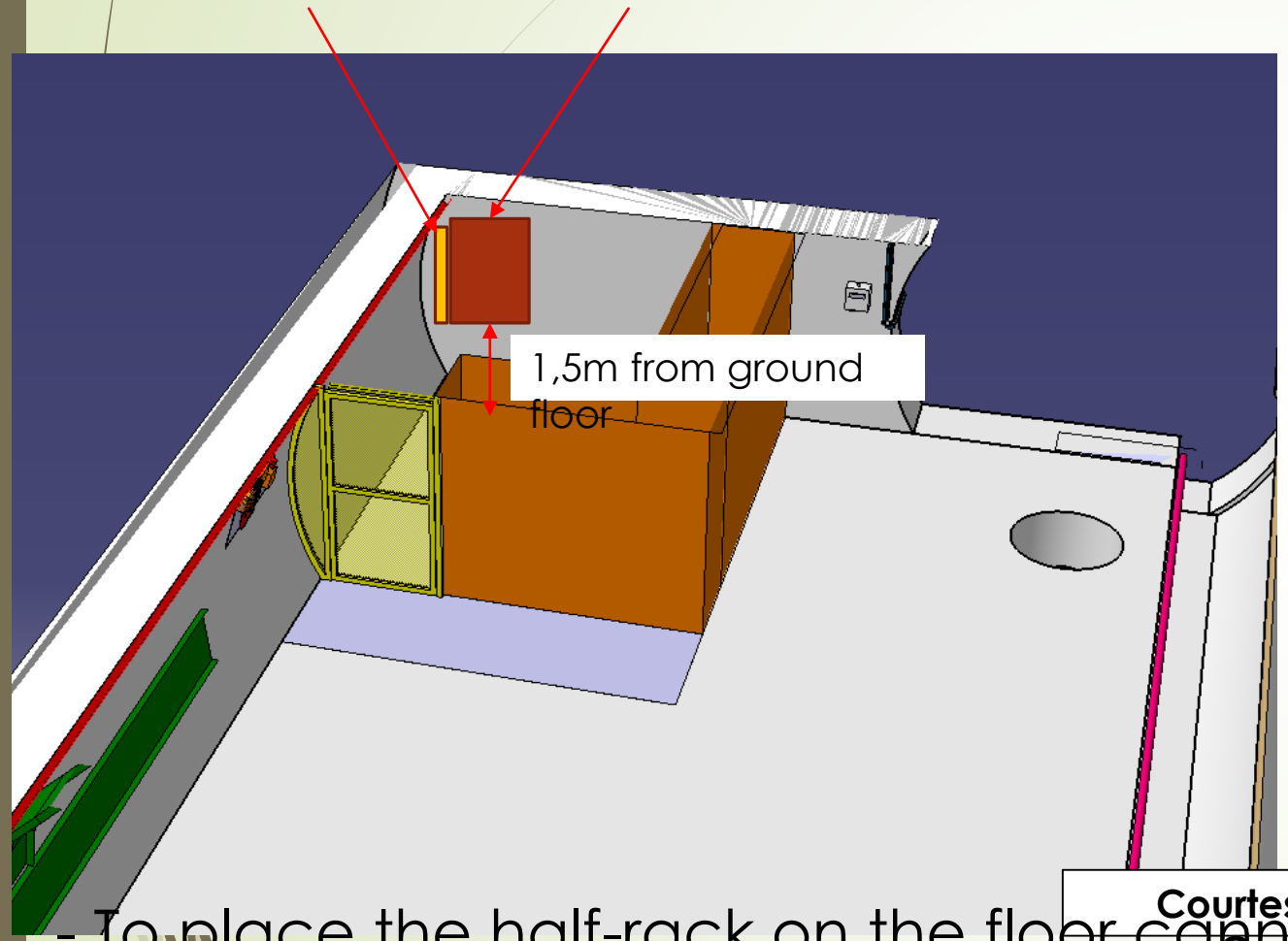
UJ53 bunker
220V sockets and 1/2rack



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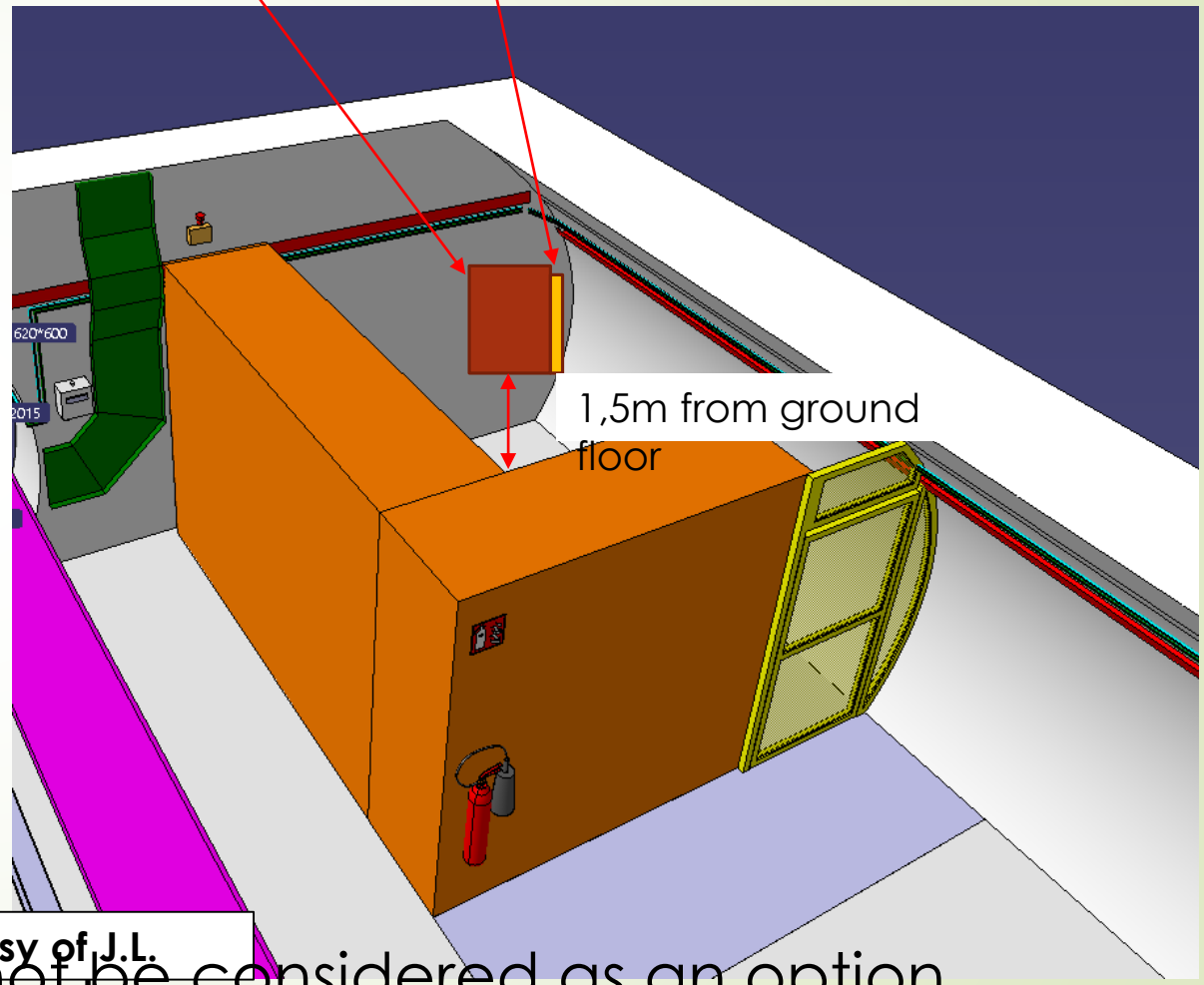
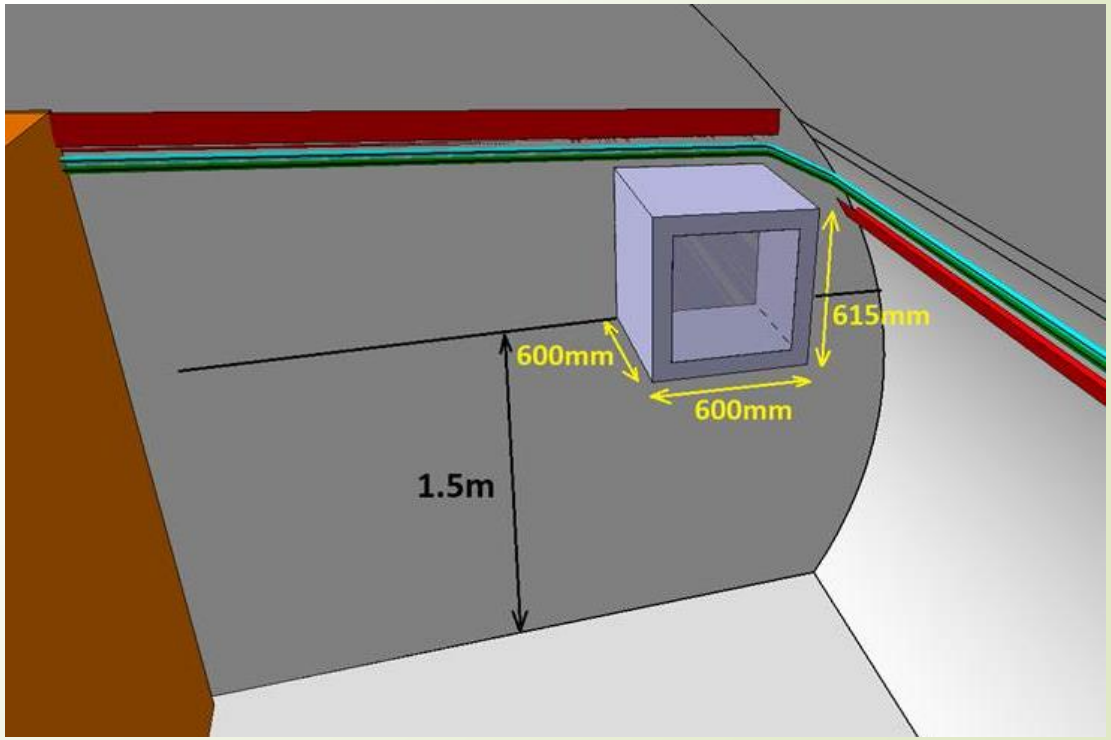


Courtesy of J.L. Grenard

- To place the half-rack on the floor cannot be considered as an option, since a minimum of 2 sarcophagui (max 4) are foreseen to be stored inside the bunkers.

½ rack characteristics (installation LS3):

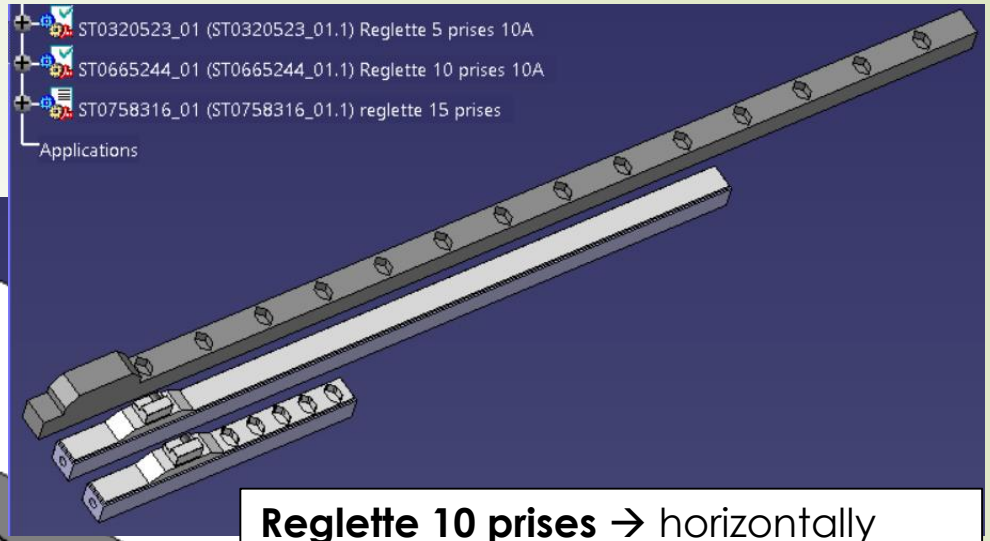
- To be placed 1.5m above the floor.
- It would be preferable to have the rack in the most radiation quite part of the bunker, perhaps the corner, near the wall.
- Dimensions considered so far: *600x600x615mm* volume reservation.
- There is a CAEN HV main frame and then individual cards that produce the HV.
- The front end electronics is in a standard VME crate with a small patch panel above it to allow for strain relief of the cables.
- The rack can be air cooled with fan.
- Supporting solution to attach the rack on the wall will need to be found.



Electrical Plug-in characteristics (LS2):

- To be placed 1.5m above the floor.
- To be close to the rack.
- Type reglette: 10 prises

Full integration proposal (UJ57):



Reglette 10 prises → horizontally oriented
Proposal: to be installed 1.5 m above the floor, on the adjacent wall (perpendicular)
Proposed distance from the corner: 30 cm

Volume reserved ½ rack

1,5 m

1,5 m

UJ57 bunker

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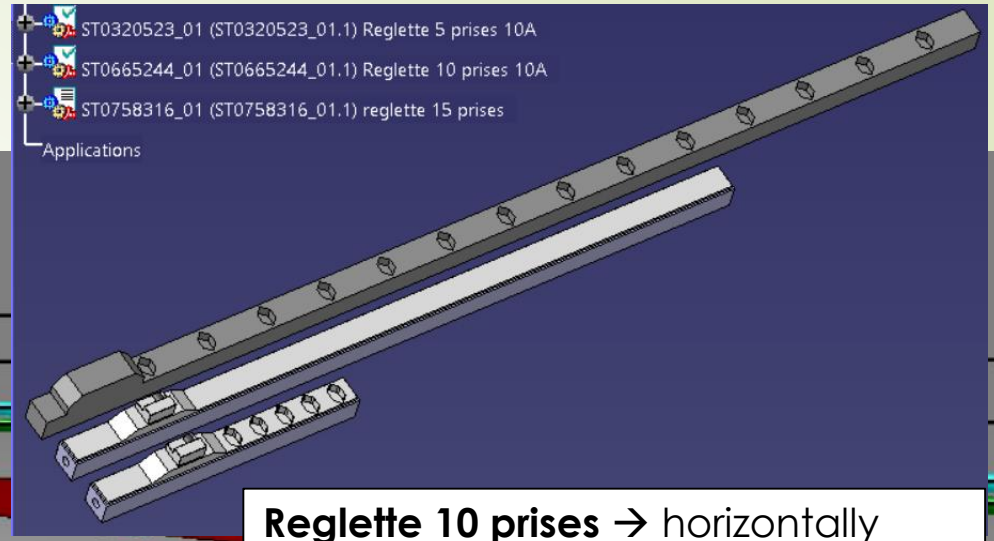

UJ57 bunker

Volume reserved ½ rack

~299.812mm

~527.069mm

~1570.162mm

~1546.993mm

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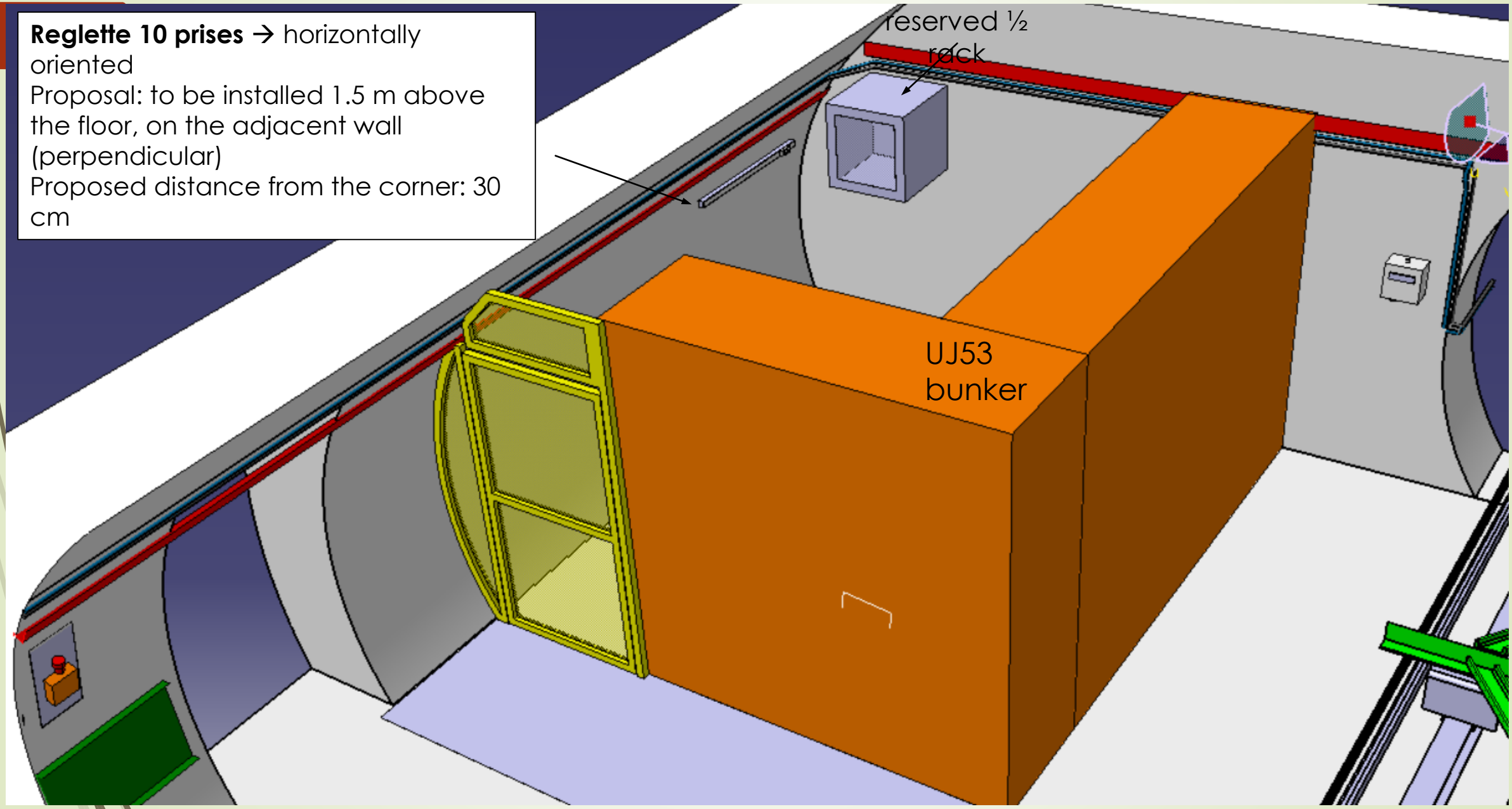

Conclusion

- CMS - ZDC has a heavy schedule for Run 3 and Run 4
- CMS – ZDC has to deal with tigheten installation, commissioning and operation windows
- These windows have to be integrated in the general CMS schedule, which puts pressure to many groups (DAQ, DQM etc..)
- But we are happy to take the challenge ☺ ☺ ☺

- Thank you, any questions?

Previous position of ZDC racks Run1&Run2