Warm cabling status

April 21st 2017

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Outline

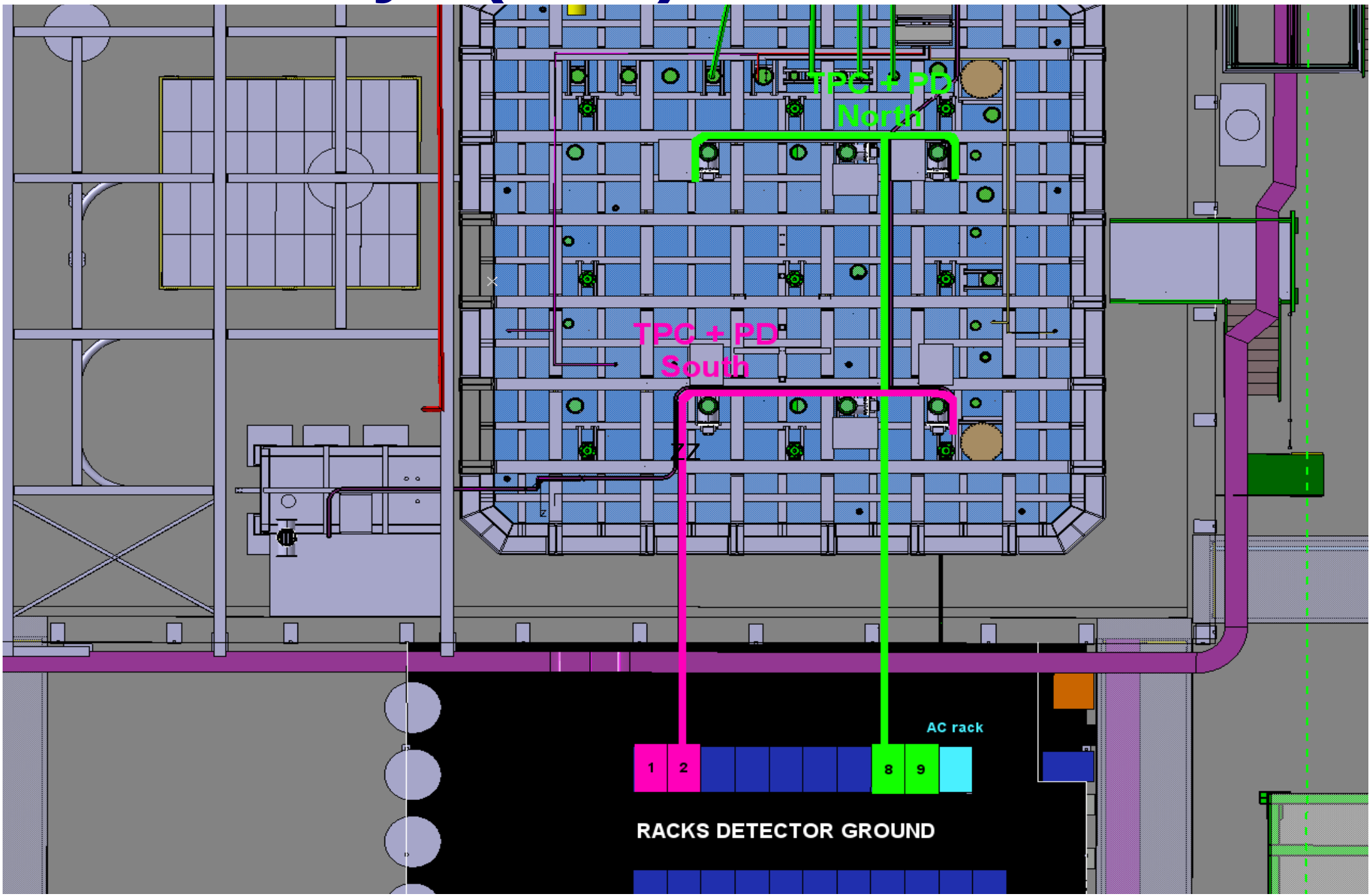
- Cable tray discussion: existing and missing
- Warm cables
- Installation
- Naming scheme
- Hardware database
- Summary

Cable trays

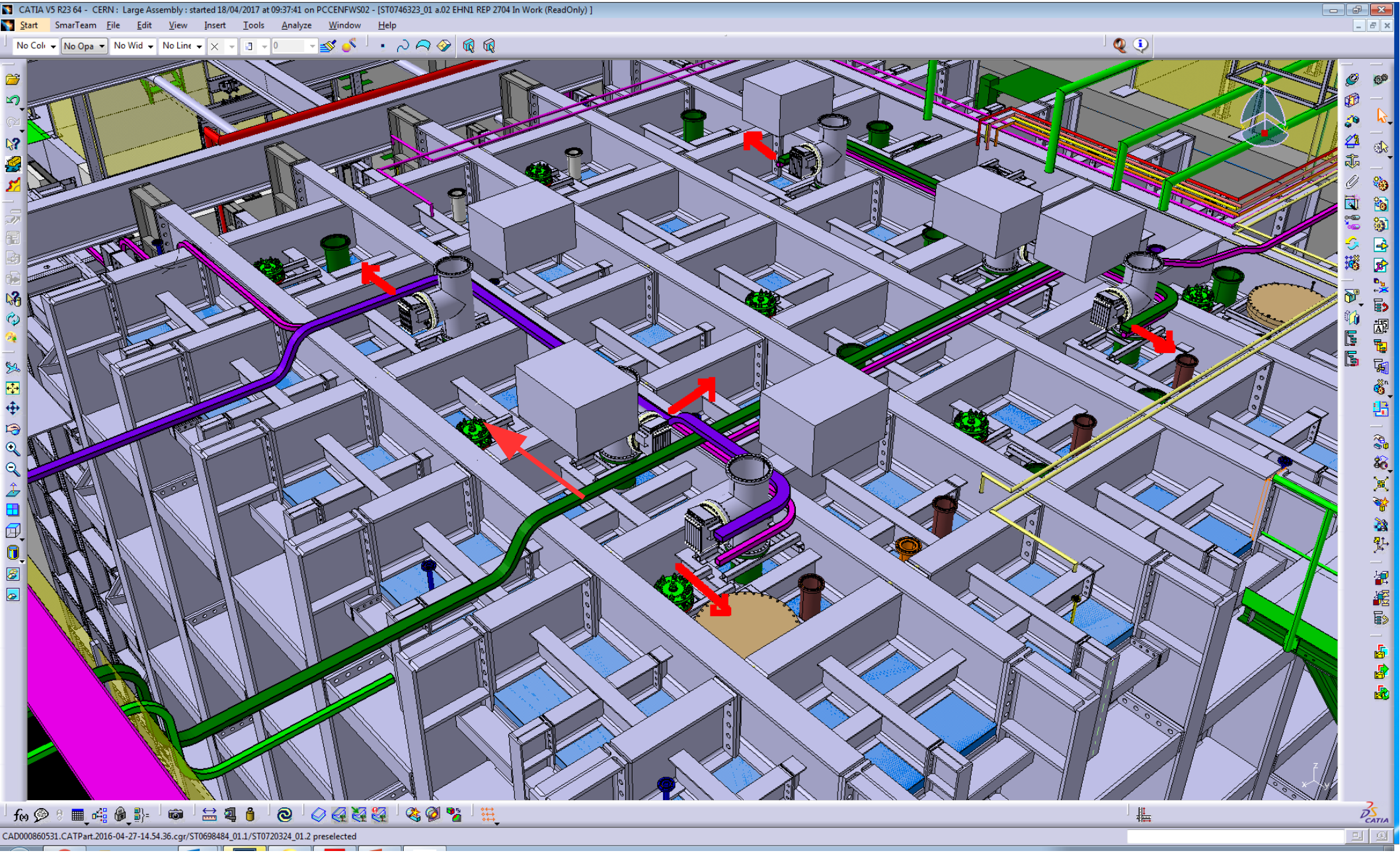
- TPC trays shared by: APA, CE, PD, FC and electron diverter
- Changes to be made to TPC trays:
  - More space between the WIECs/flanges and trays, so the WIECs slots can be slid out and so that tools can be used around the feed-through flanges
  - Any other? If not these will be frozen today so cable length estimations can be given
- For the other system trays, freeze layout after cryogenic instrumentation review (so end of next week)

→ except camera cable trays, might be able to share existing trays

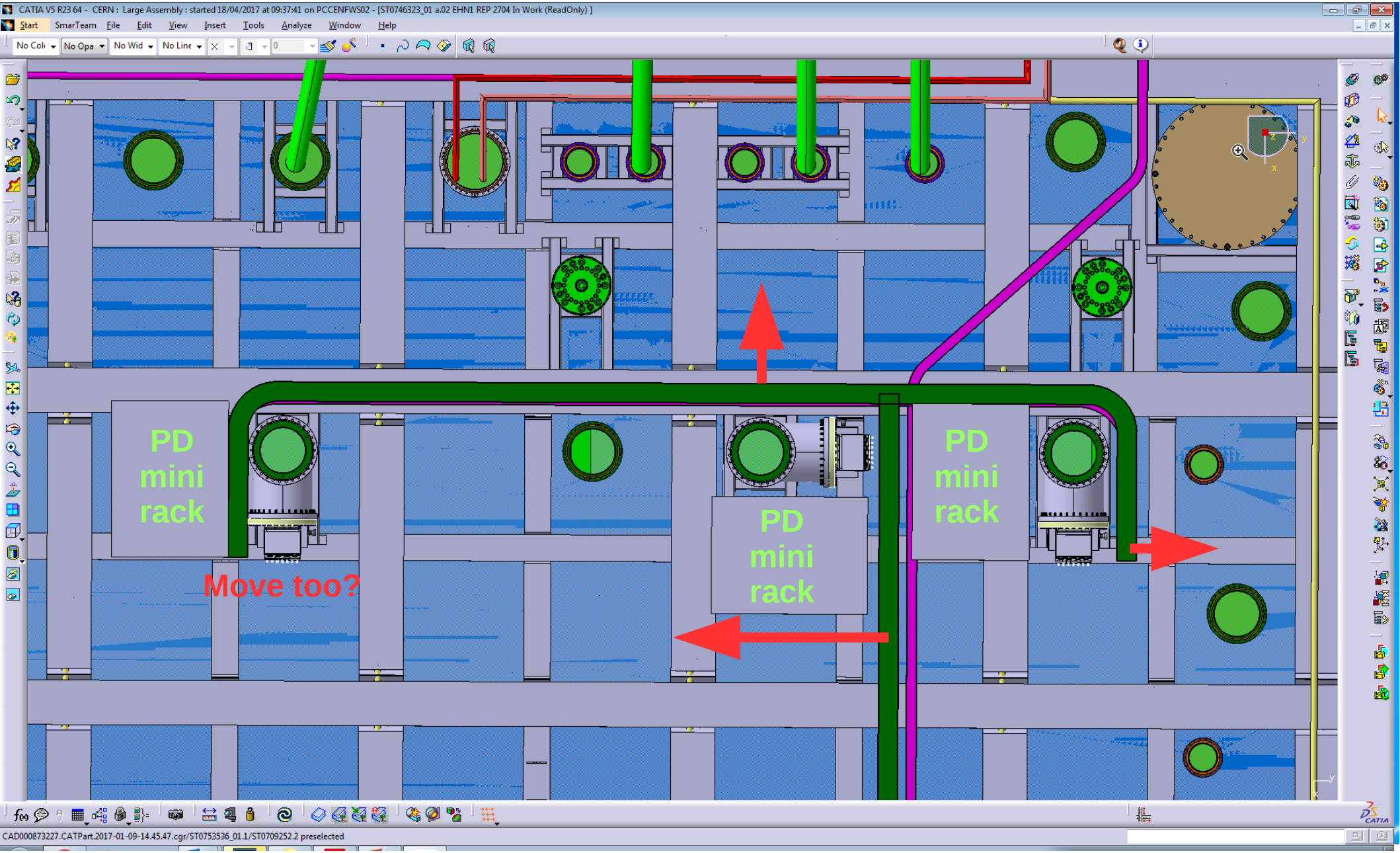
Cable trays (TPC)



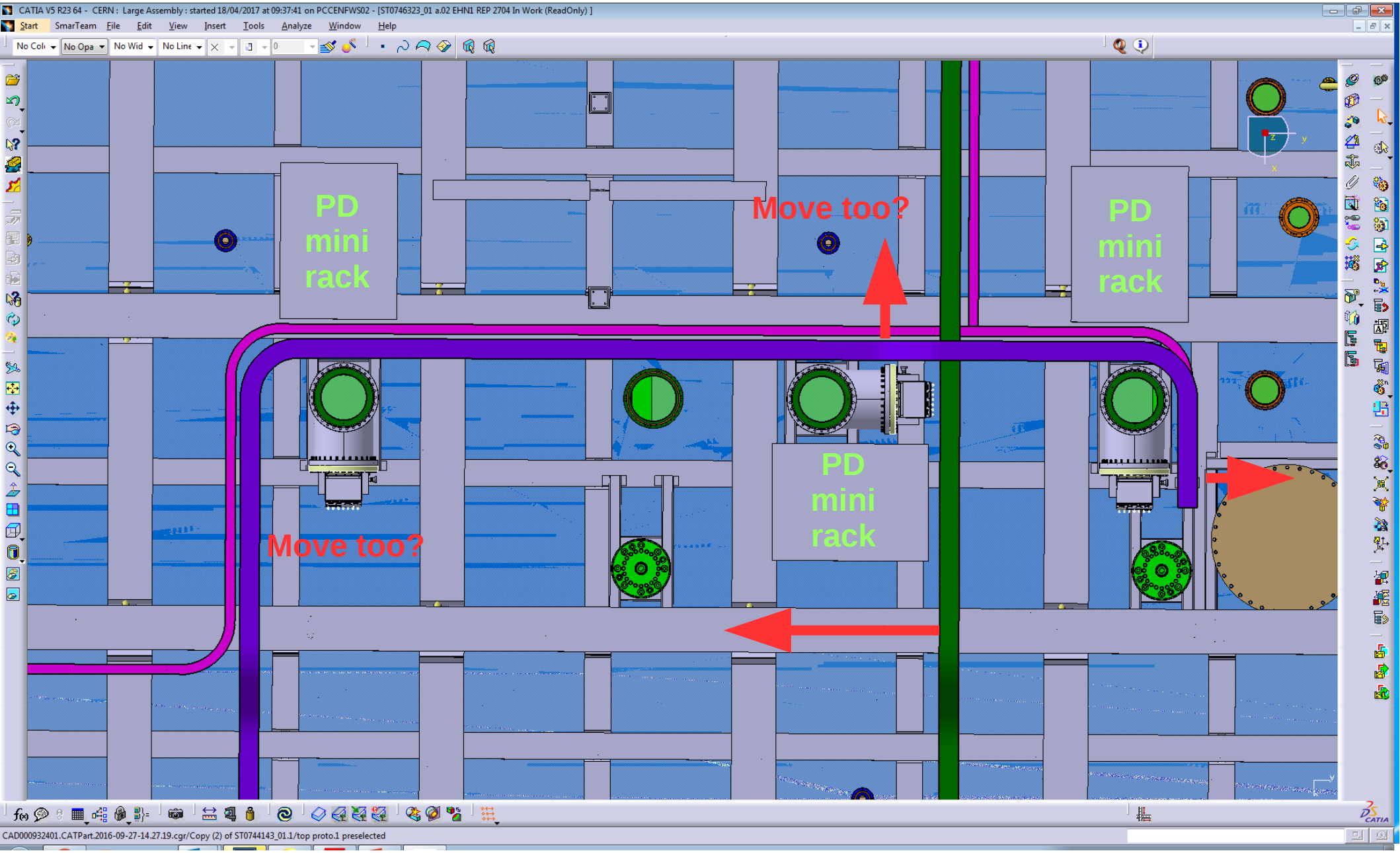
TPC 3D


CATIA V5 R23 64 - CERN : Large Assembly : started 18/04/2017 at 09:37:41 on PCCENFWS02 - [ST0746323_01 a.02 EHN1 REP 2704 In Work (ReadOnly)]
Start
SmarTeam
File
Edit
View
Insert
Tools
Analyze
Window
Help
CAD000860531.CATPart.2016-04-27-14.54.36.cgr/ST0698484_01.1/ST0720324_01.2 preselected

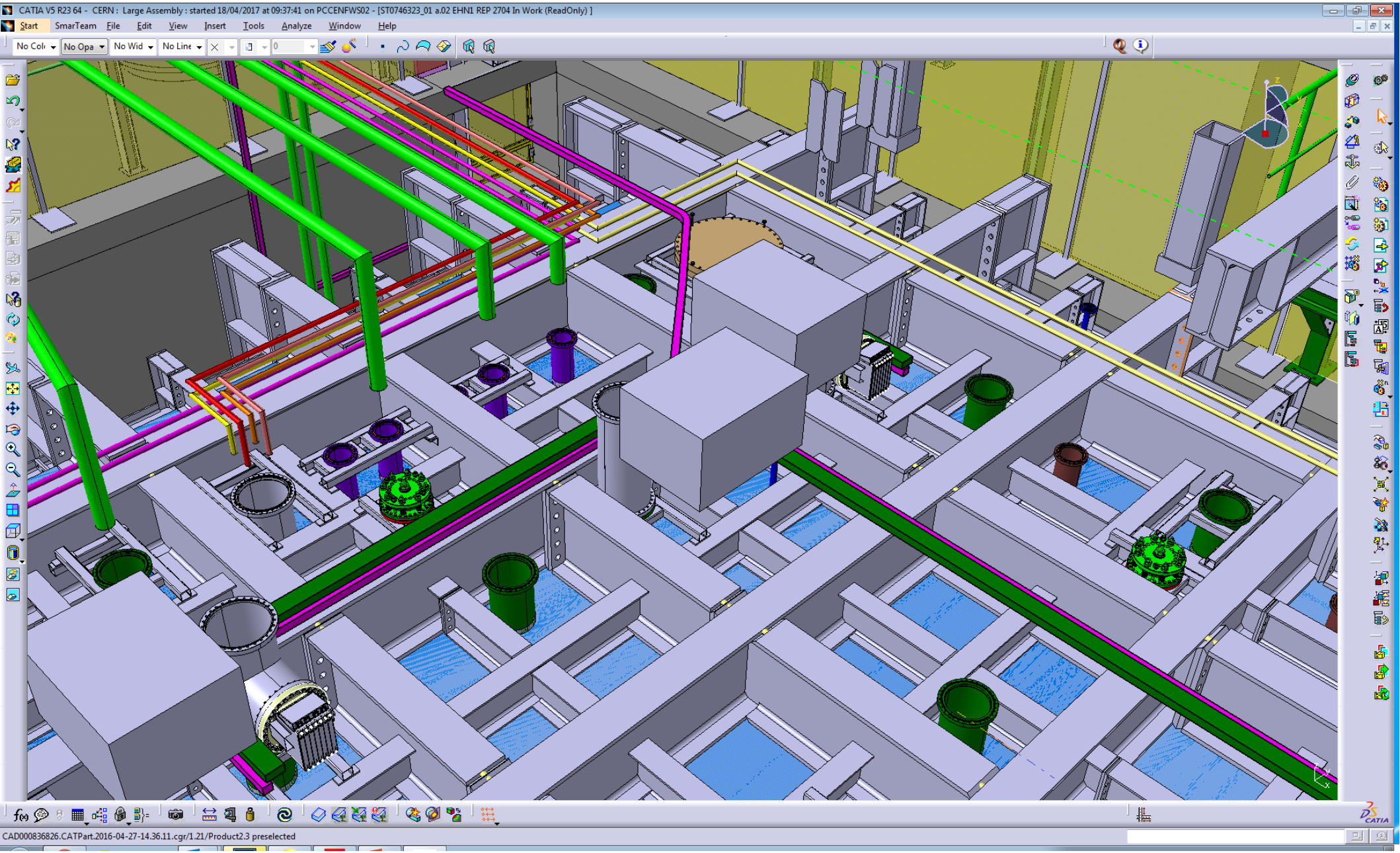
TPC North / Beam Left / Jura



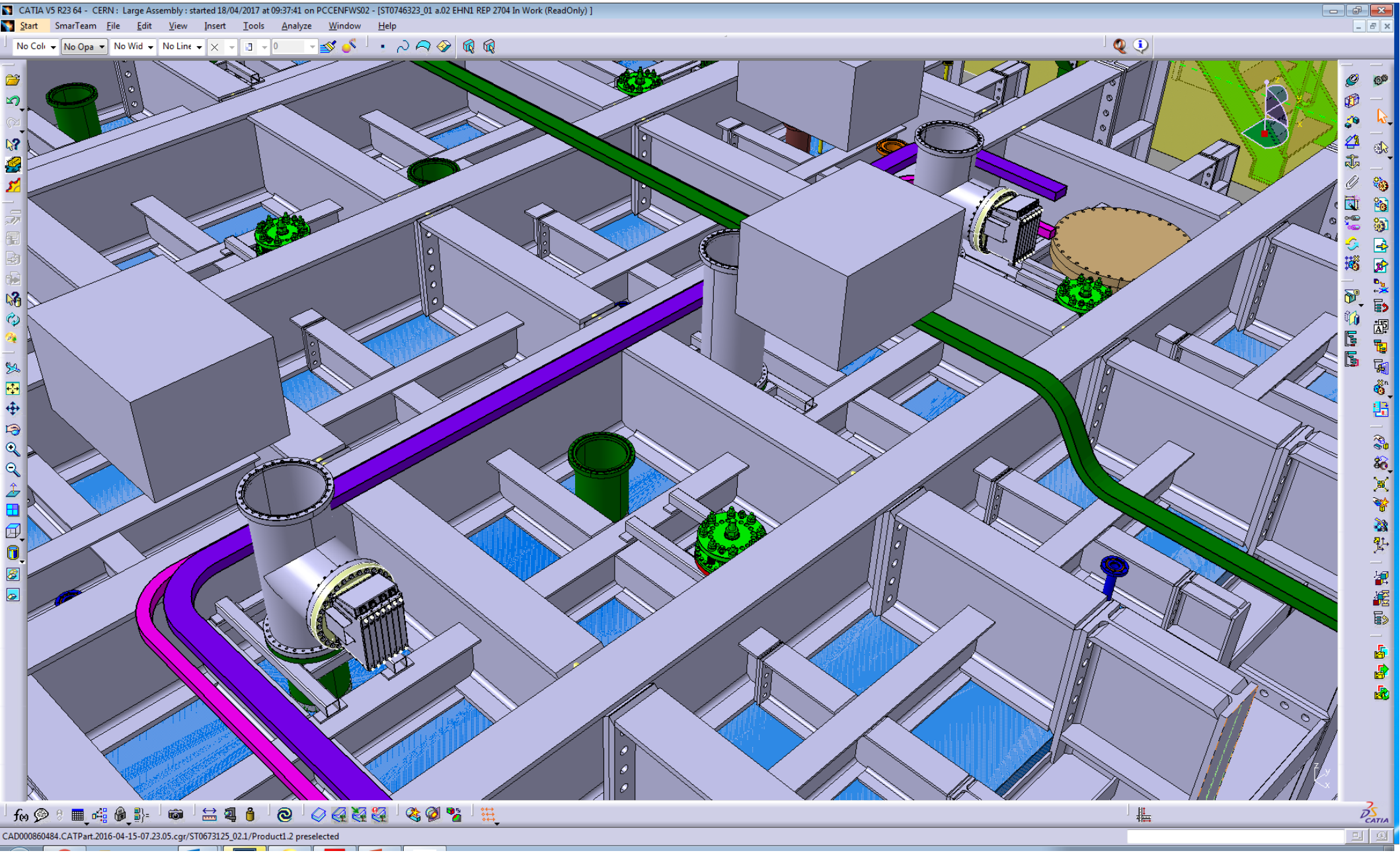
TPC South / Beam Right / Lake



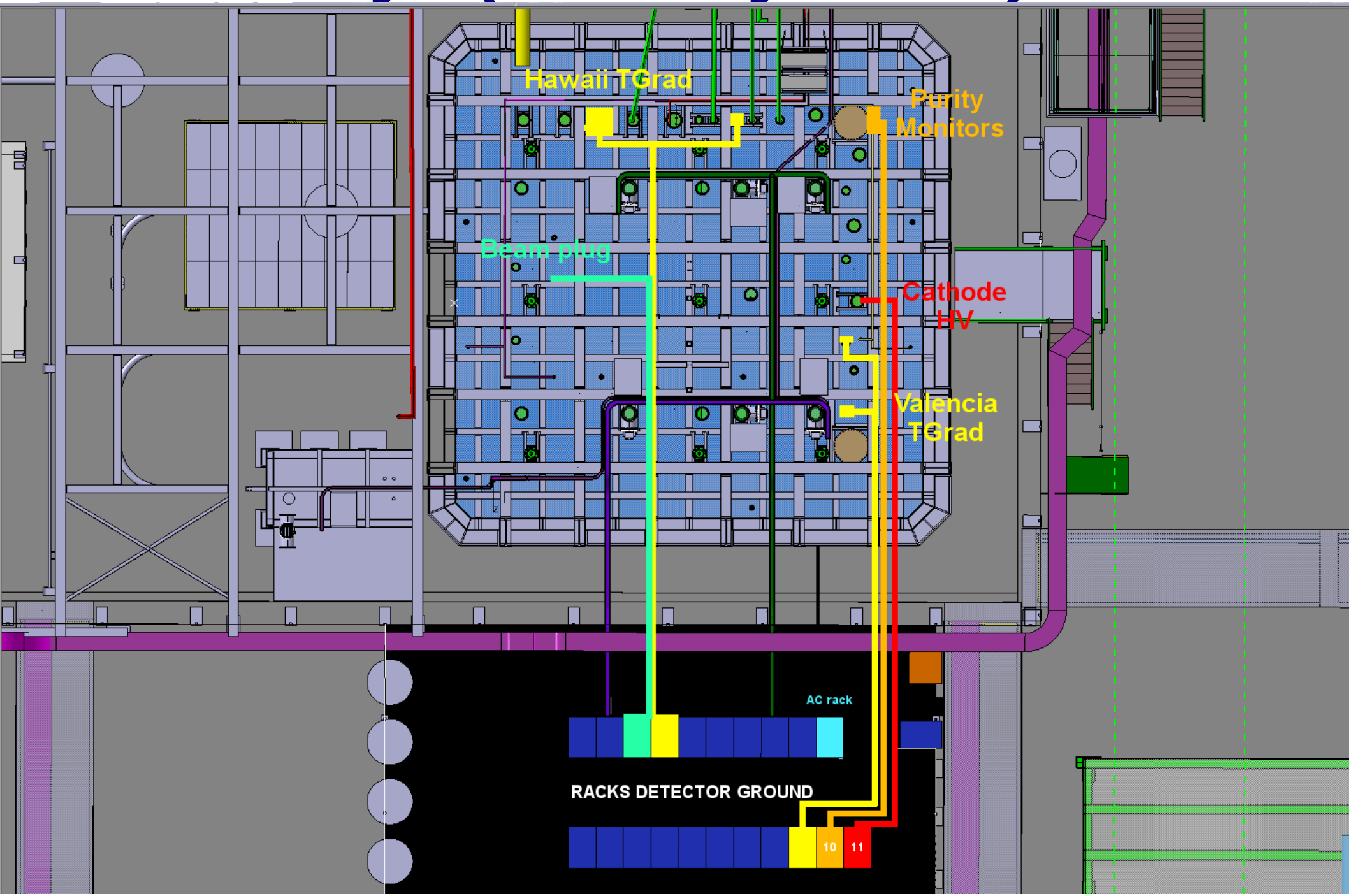
TPC 3D – North manhole



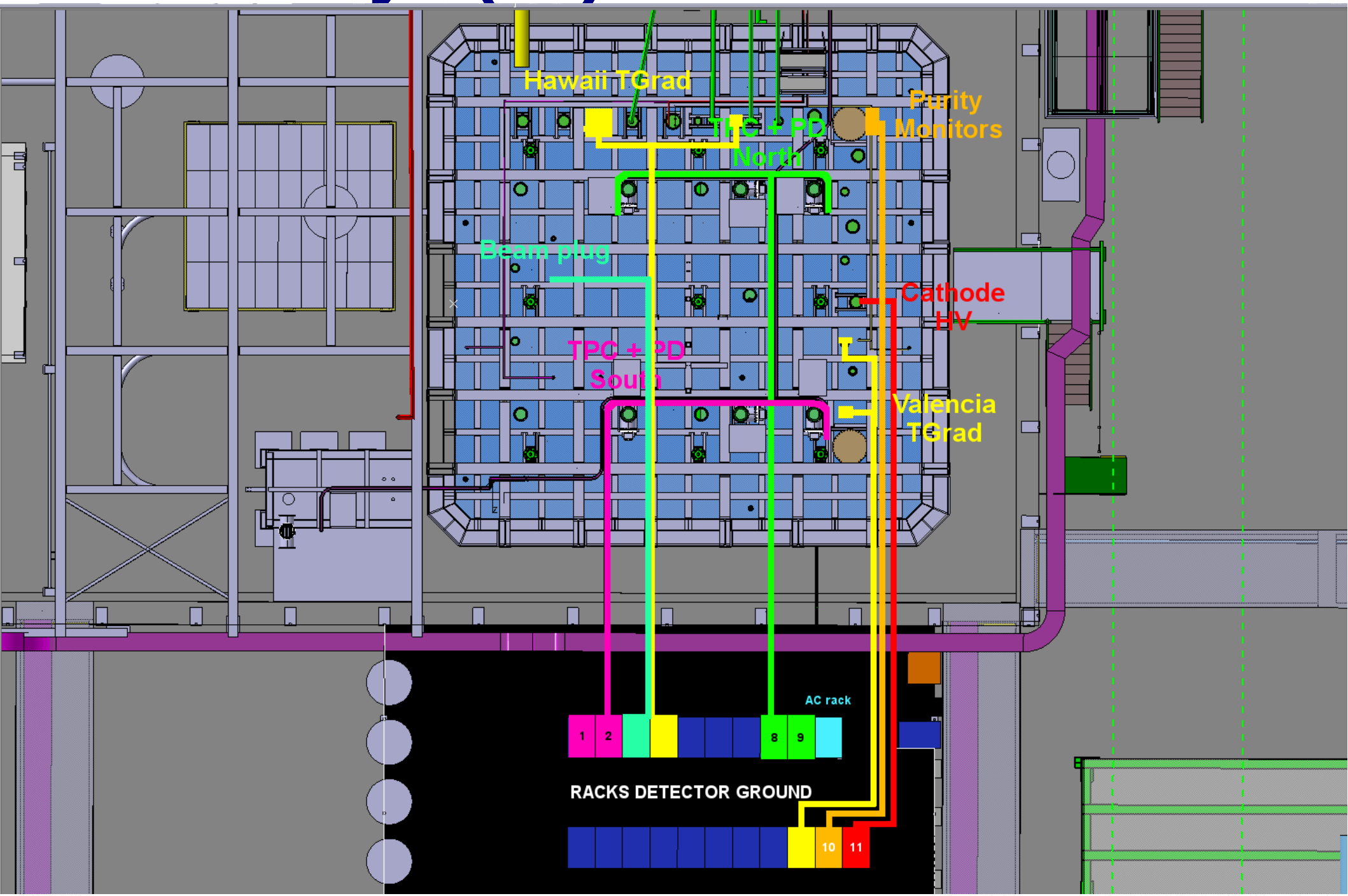
TPC 3D – South manhole



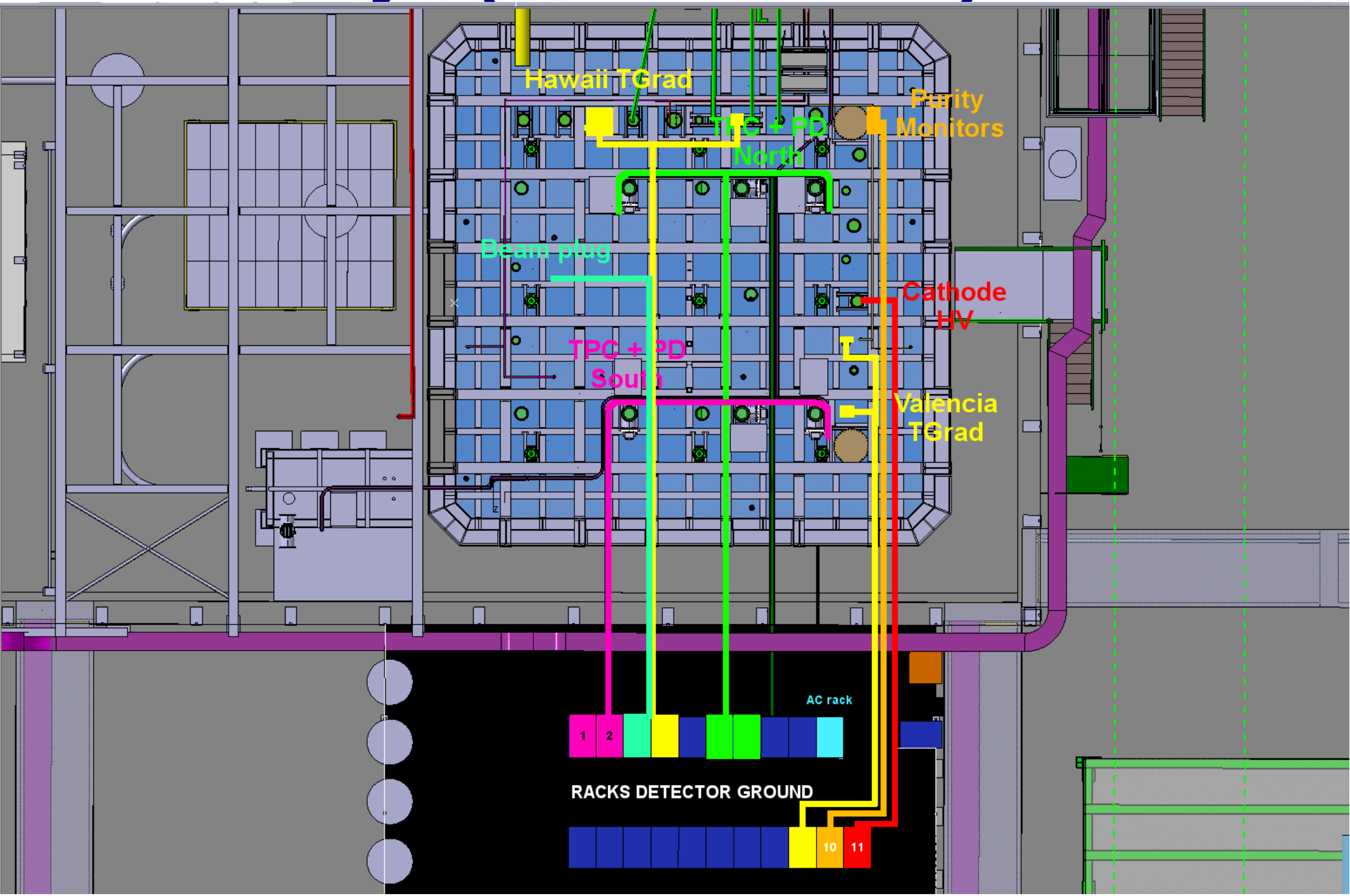
Cable trays (other systems)



Cable trays (all)



Cable trays (moved North)



Warm cables

- Responsibilities split as follows:

1) EP/DT-DI is taking care of the warm cables, connectors and cabling between the slow control cryostat flanges and the racks on detector ground.

   → this means temperature sensors, pressure transducers

2) Each group either purchases their cables:

   - directly, making sure they meet CERN safety requirements
   - purchase through CERN (EP/DT-DI can provide technical assistance)

     → must provide team account number

     → EP/DT-DI is not purchasing any cables/connectors for the detector itself (TPC, photon detectors, motorisation, …)

3) Termination of the cables can be done at CERN if preferred

   → EP/DT-DI can make an offer if you are interested in this

4) For coherency, EP/DT-DI takes care of all the cabling from the outer flanges (detector and slow control) to the racks on detector ground and within these racks themselves.

Warm cables

- Once the cable tray layout is frozen, we can estimate cable lengths

  → how precise should these estimations be?

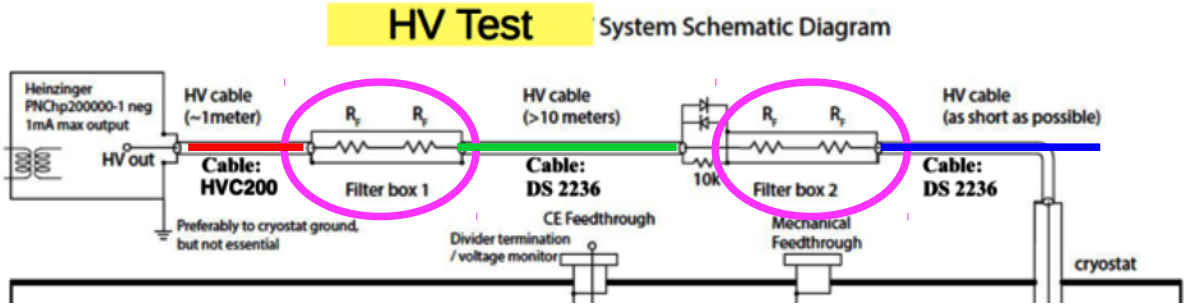
  → cannot wait until the real cable trays are laid out, length estimation will be based on the 3D model only so must consider some error

- Would it be preferable to terminate the cables at CERN?

  → would allow some flexibility, ship longer cables and cut down it needed

Cathode HV cables

- SP HV will have 2 filters (see docdb 2036 for more details)



- 3 cables: from PS to 1st filter (as short as possible), from 1st to 2nd filter (the longer the better), from 2nd filter to FT (as short as possible)

  → 2nd and 3rd cables provided by either DP (F. Sergiampietri) or Fermilab

  → 1st cable is the one included with the PS (currently ~14m long)

- Bending radius ~ 25-30cm

  → working on filter support and cable routing (similar to 35T)

Installation

- CERN EP/DT-DI (Giovanna) is in charge of the installation
- Iterative process, mostly driven by detector installation and roof equipment delivery arrival

  → is this the way we want to proceed? Or wait until all the equipment is in place and then cable all at once?

- No defined schedule yet, will be proposed by Giovanna when more information is available

  →warm cabling for DP scheduled to start by end of October and last 30 days

  → provide timing requirements so that a more specific schedule can be made

Labeling scheme

- Because of the large number of cables, we must make sure every cable can be uniquely identified

  → labels will be unavoidably long…

- Each label will be split in 4 parts (recorded in database):
  - a unique alphanumerical tag ie SHV####
  - where the cable is coming from ie which feed-through (using naming convention described by R. Acciarri)

    https://indico.fnal.gov/getFile.py/access?contribId=2&resId=0&materialId=slides&confId=14056
  - where the cable is going ie rack / crate / slot / channel
  - information related to what the cable is carrying ie TPC bias HV, LV, etc
  - could add color coding to easily identify feedthroughs (?)

Hardware database

- Purpose: Store in a single place all hardware related information

  → “map” of the detector

- This includes:
  - Labels (official and other naming schemes)
  - Identifiers (serial #, production site)
  - Length (for cables), connections (FT, rack, crate, etc) and/or location
  - Dates: arrival, installation
  - Test information → link to test documents, both at production site and at CERN
  - Known issues/comments
  - Link to specific database or traveler document

Hardware database

- Had meetings with the groups that are known to be working on their own database (PD, APA and CE)

  → currently reviewing information provided by the different groups

- Will work with Fermilab (S. White / T. Junk) for the actual format and tools to fill/access the database

  → Steve has already helped with the PD database structure

- Will need at least 1 person (or more) dedicated to fill it out…

Summary

- Warm cabling is at a preliminary stage

  → no defined dates for delivery nor installation

  → contact Giovanna to provide time requirements

- Need to finalize cable routing to be able to proceed

  → TPC cable tray layout will be frozen by the end of this workshop, and the remaining ones by the end of next week

- Working on hardware database but will need at least 1 person dedicated to keeping up to date