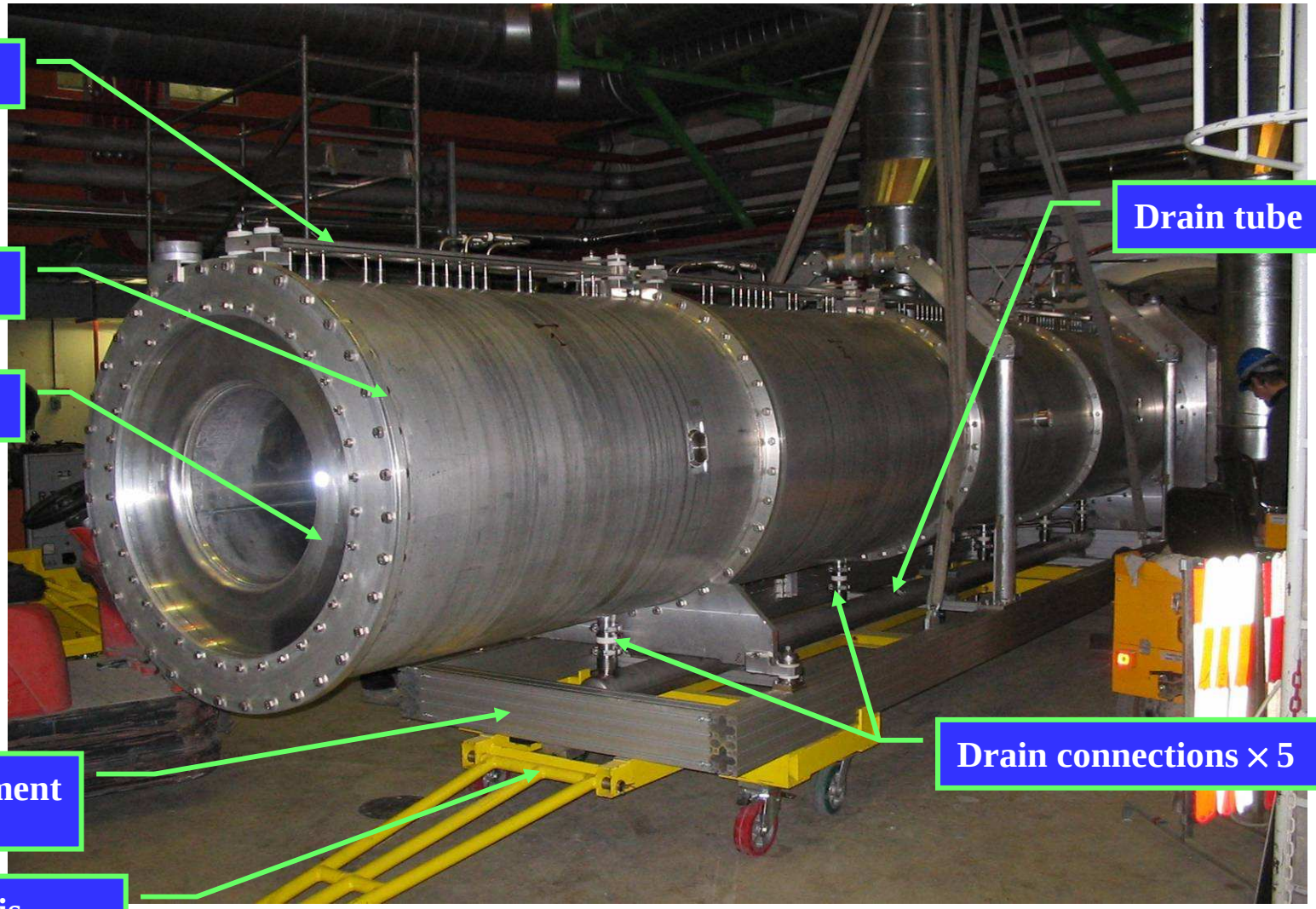
Issues Requiring more Studies

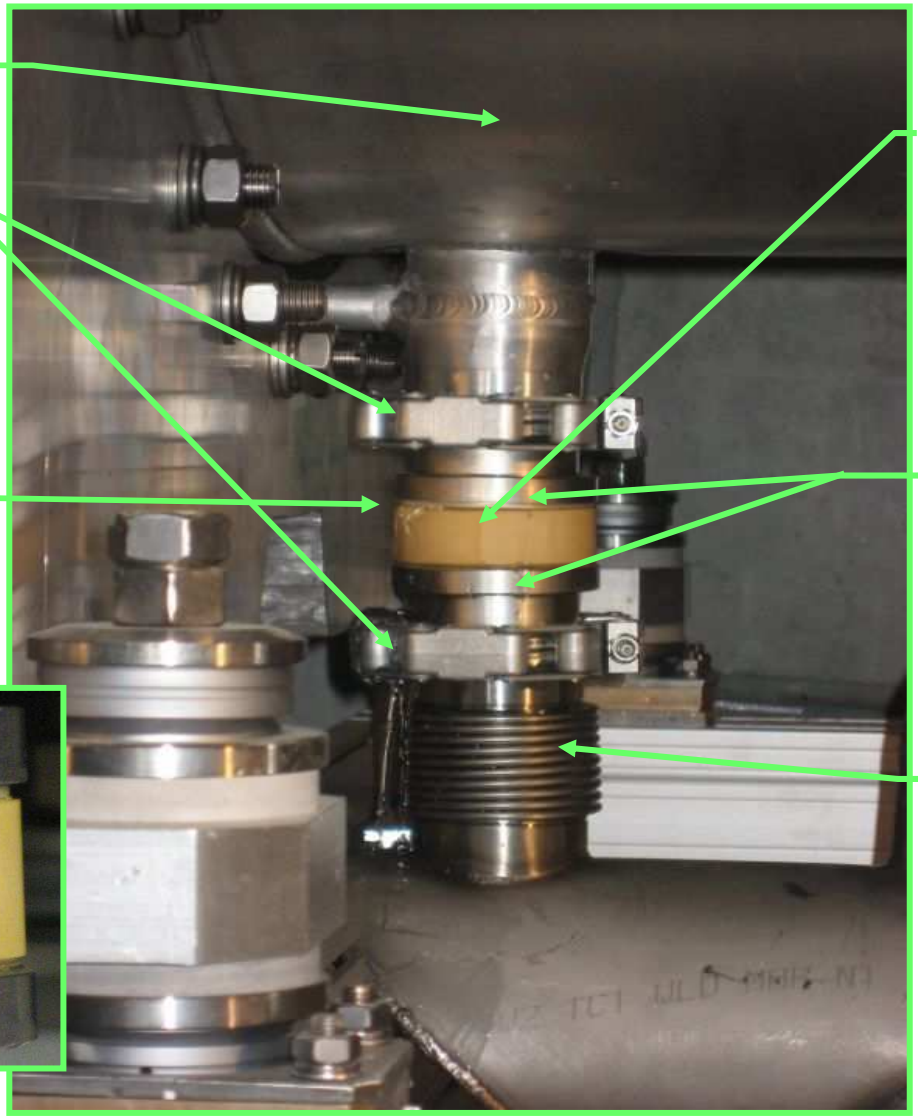
- **TBID calibration:**
  - ➔ **Move target out**
- **Polarity change:**
  - ➔ **Understand different muon signals**
- **Muon detectors:**
  - ➔ **linearity effects with high intensity**

- **Alignment of beam with respect to target and horn**
  - ➔ **Might need to be done regularly (every month)**

The CNGS Reflector



Leaking Drain Connection



Outer conductor (Al)

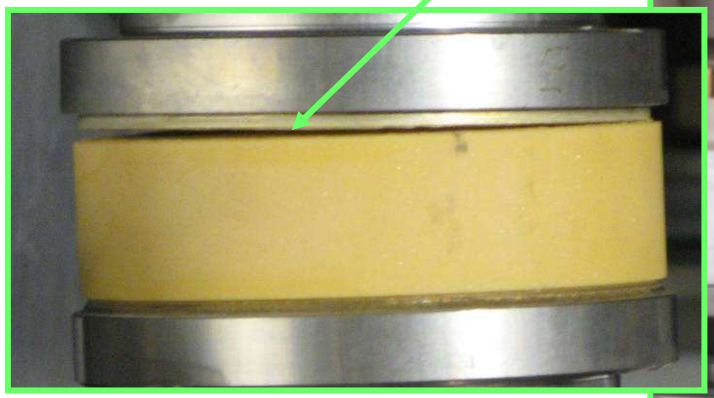
Clamps for vapor tightness

Rupture point – leak!!

Ceramic insulator (500V)
(brazed to the Ti joints)

Titanium joints

Bellows to give (some) flexibility

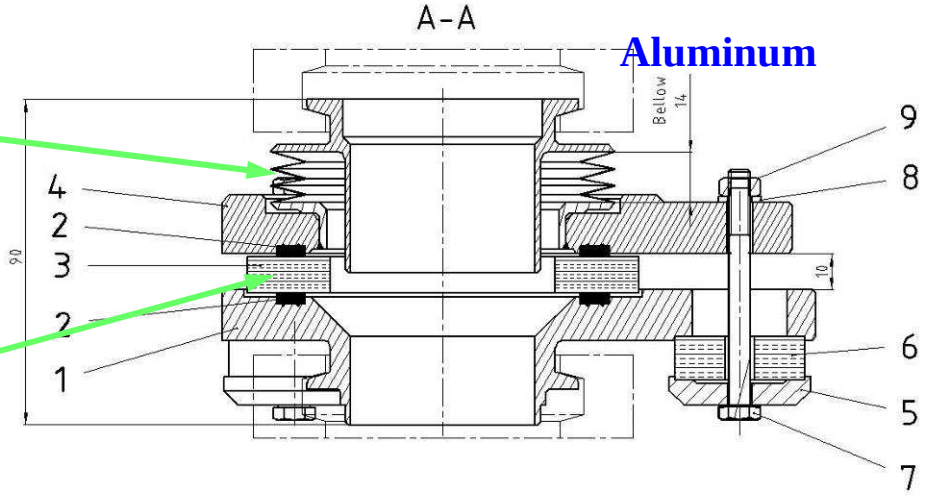


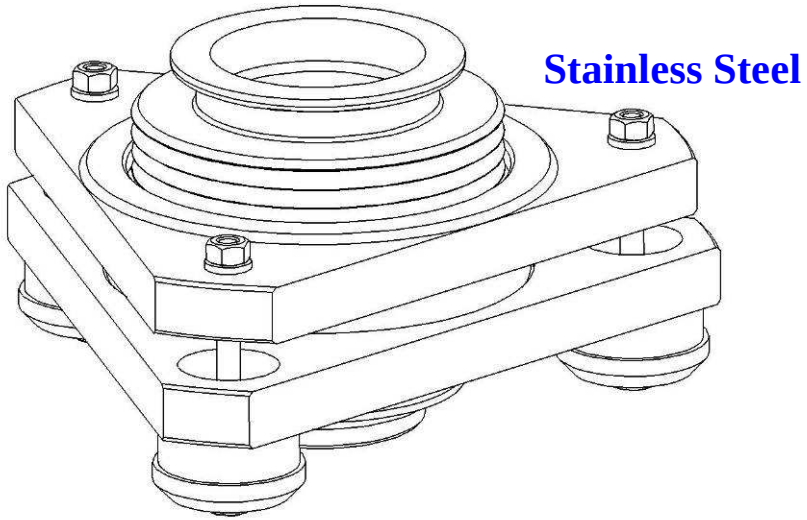
New Design for Drain Connection

CNGS Reflector Leak Review Meeting with AB, TS and RP experts, held on 29 Nov 06

Improvements of new design:

- **Second welded bellows**
  - ➔ **Absorb better any misalignment errors**
- **Water and vapour tightness maintained**
  - ➔ **tightening the ceramic between flanges with bolts**
- **Brazing is avoided**
- **Rigorous QA during assembly**
  - ➔ **Tracing of equipment and record history**





Next Steps

Tests

- First Prototype of drain connection delivered end this week
- Mounting prototype on spare horn
- Transport to BA7
- Perform tests with spare horn, starting Week 6:
  - ➔ **Electrical tests: double pulse, 150kA**
  - ➔ **Vibration measurements on old drain connection**
    - **Understand stress/displacement**
    - **Free/fix connector**
  - ➔ **Vibration measurements on new drain connection**
    - **Validation of new design**

Repair

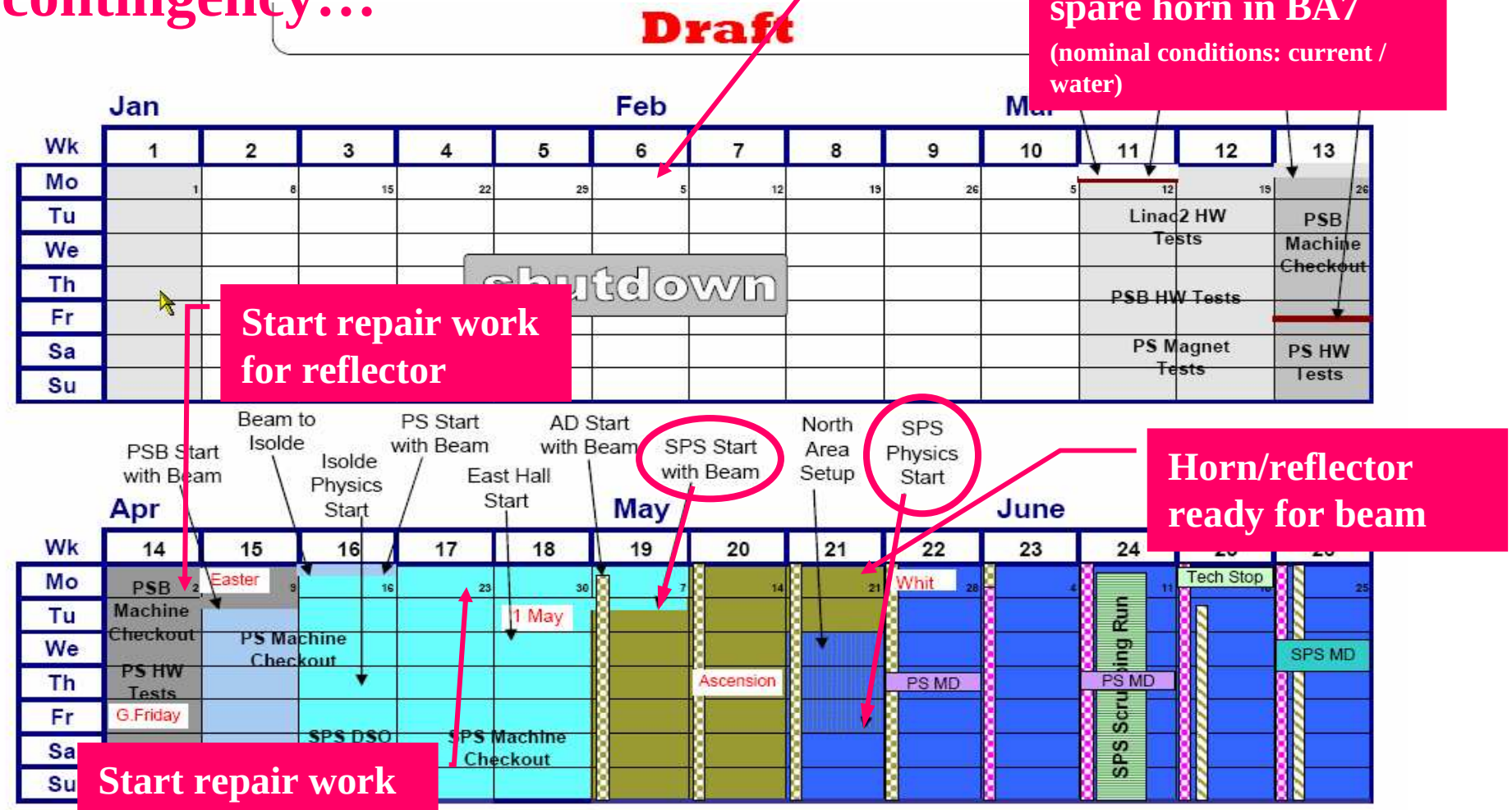
- Radiation Issues
  - ➔ **Careful dose planning needed**
- Repair is not trivial

All drain connections: (3 x 5 + spares)

- ➔ **Ceramic: ordered (6 weeks delivery)**
- ➔ **Flanges + bellows: delivery end March**

Reflector Repair Schedule

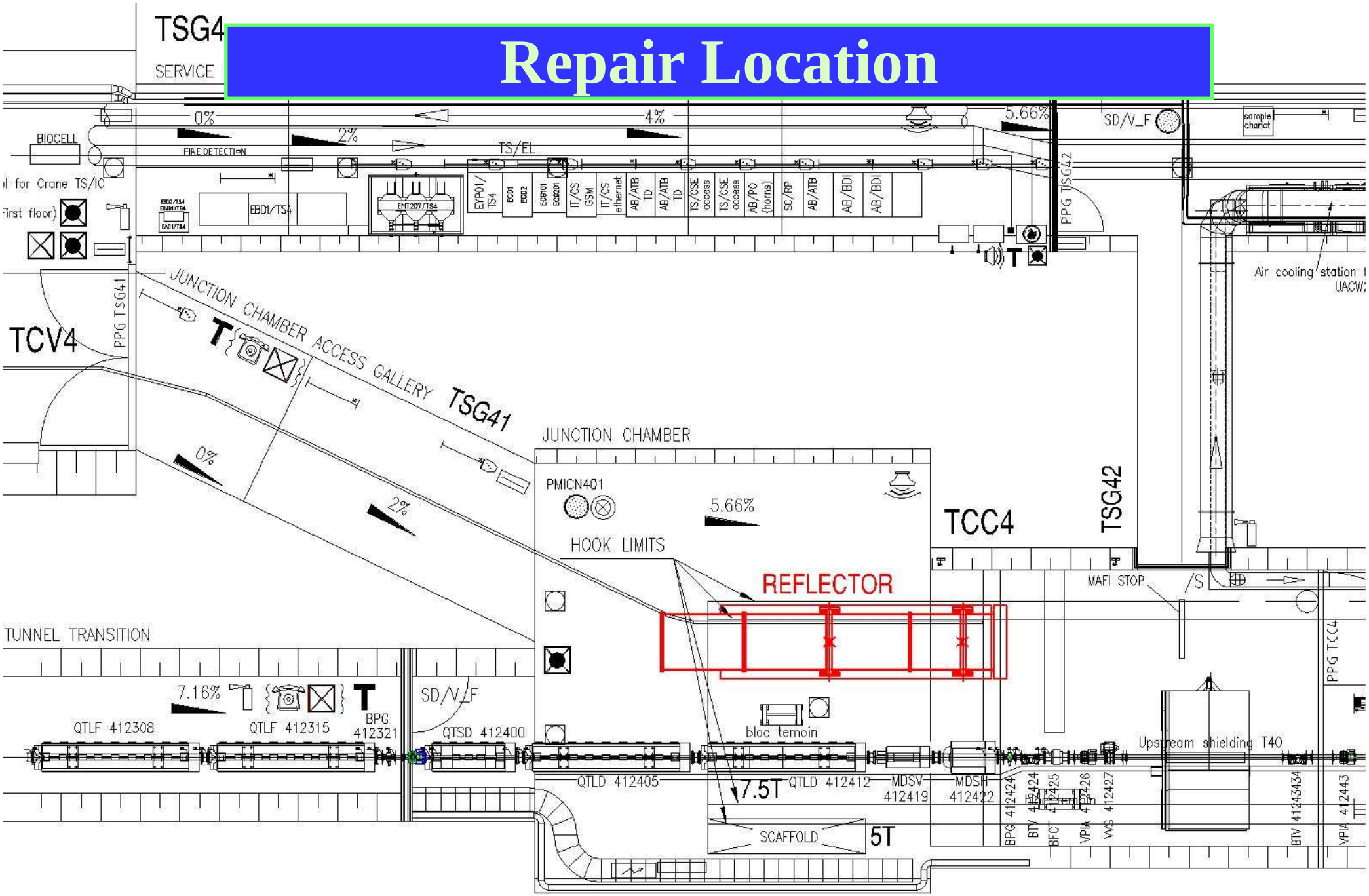
Most optimistic scenario!
No contingency…



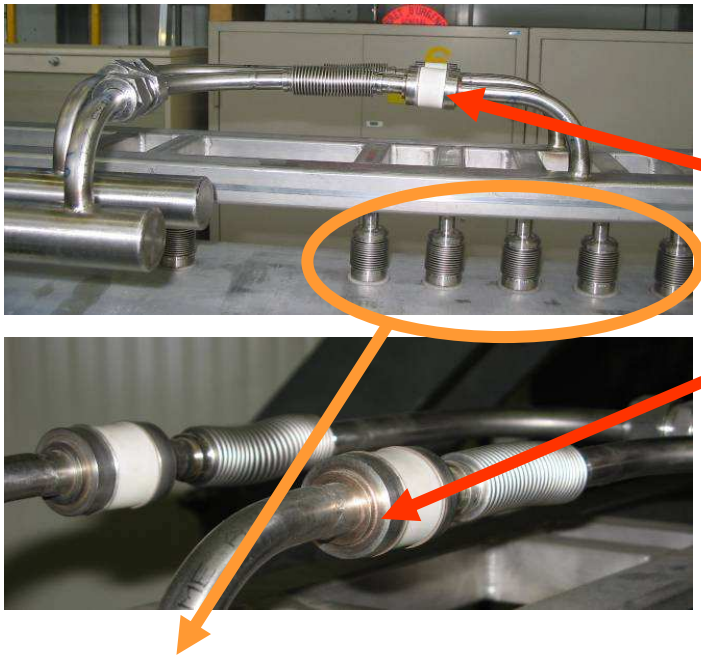
Repair Procedure

- The top and side shielding blocks are removed with crane
  - ➔ for the horn everything can be done remotely
  - ➔ for the reflector the side shielding requires manual intervention
- Repair cannot be done in the beam position of the reflector (horn)
  - ➔ access is limited
  - ➔ radiation levels higher inside the shielding
- The reflector and horn moved to upstream area of the target chamber
  - ➔ sufficient space available
- Chariot foreseen for the horn transport can be used as pedestal during the works
- Outer conductor part of reflector/horn has to be disconnected from the bottom chassis
  - ➔ bellows flexibility not sufficient to remove ceramic pieces.

Repair Location

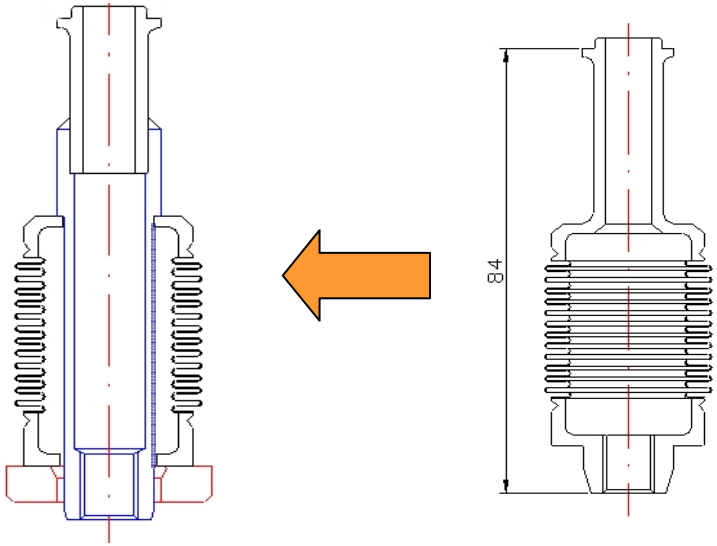


CNGS Horns: Other Possible Weak Points



- **Water inlet bellows**
  - ➔ **Thin stainless steel foil brazed on ceramic sleeve**
  - ➔ **Thin foil brazed to water tube**

- **Water sprayers**
  - ➔ **Double-walled → no leak when bellows failure**
  - ➔ **50% already replaced**



CNGS Perspectives for 2007

- **Repair of Reflector and Horn ongoing**
  - ➔ **Finished by week 21 for SPS Physics Start-Up**

    …if everything goes well!!

- **2 weeks needed to complete the setting up schedule of October 2006 of the CNGS primary & secondary beam.**
  - ➔ **Understand polarity change, muon detector linearity, etc…**

- **MD slots during the run needed for the Secondary Beam Line**