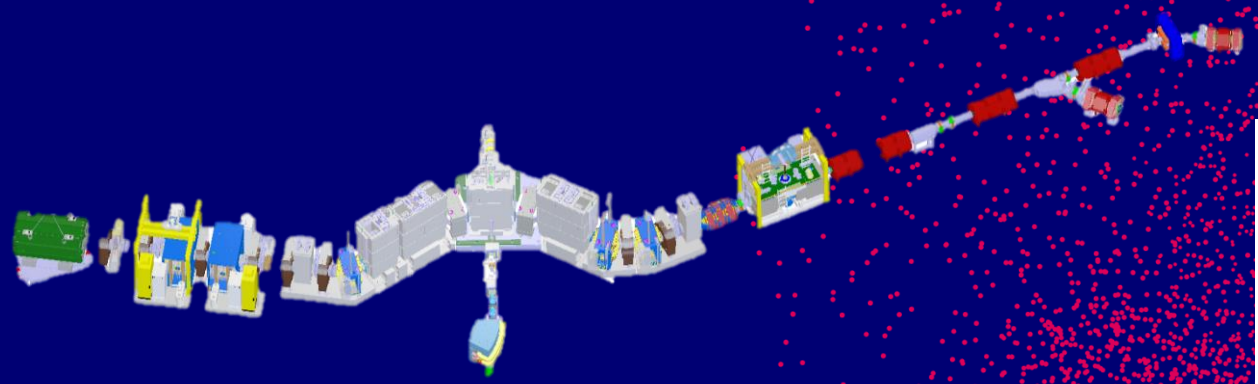
5th Workshop on Particle Accelerator Upgrade - Removal and Installation



Johan Wickström

4- 7.May 2026, Bad Zurzach

RSI AN ASRC INDUSTRIAL COMPANY
REITZ PRÄZISIONSGRANIT | MOTION SYSTEMS | MONTAGE
Transmutex
SwissFactory Group
HILTI

Summary 5th PAU R&I 2026 at PSI

Take aways from the Workshop

- **Time schedules:**

  Highlighted in many talks. Proper scheduling is considered a key to success – especial when unexpected obstacle occur - keeps you flexible.

  Time schedules, finest **granularity commonly ½ day.**

  Some **favor P6, other MS-Project,** excel for small and draft plans

- **Estimation of storage** often to **small**, often leads to additional handlings efforts and channeling delivery. It seems trivial but reality differs.

Summary 5th PAU R&I 2026 at PSI

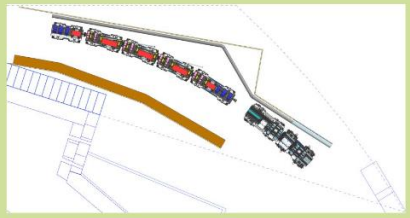
Take aways from the Workshop

- **Mockups** and tests – recommendation to be a **milestone** in the planning.

www.cells.es

Testing and Assembly areas

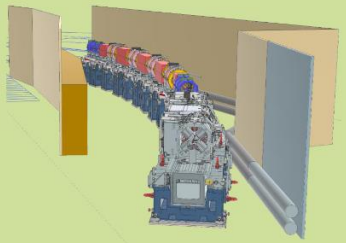
Mock up



Mockup objectives

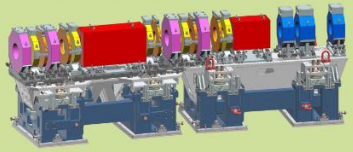
To assemble a complete arc for:

- Integration validation
- MA alignment
- MA opening repeatability
- VC alignment strategies



Prototypes from ALBA01 *Enable technologies for ALBA II* already in the mockup area for testing:

- Stability
- Magnets alignment strategies



ALBA

PG05 Implementation

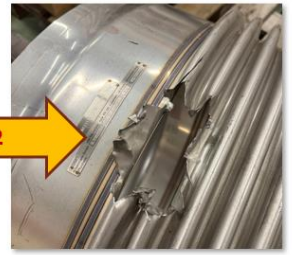
03 Testing Areas

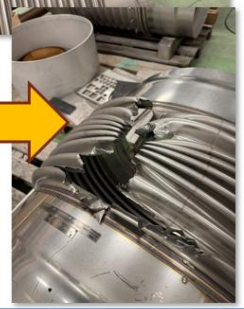
External vacuum sleeves

2) Heavy duty electrical cutting shears

Compensator (55 kg) will be held from above while cutting

RP compliant





No chips!

For longitudinal cut when nibbling machine cannot access all around the interconnection because of wall proximity

Summary 5th PAU R&I 2026 at PSI

Take aways from the Workshop

- Not very often noted:
  - The **lack of manpower** did not seem to be a very common problem.
  - Multiple **parallel projects** at the laboratories seldom a problem, except concerning storage space

- However:

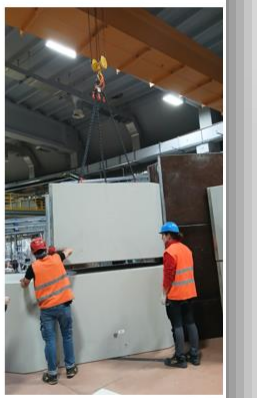
  Coffee breaks, **lunch**, dinner and **walks** are a **key elements** for a **successful workshop**.

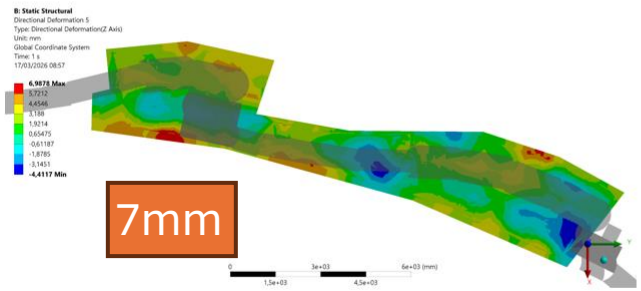
Summary 5th PAU R&I 2026 at PSI

Take aways from the Workshop

- Found an **interesting correlation** between tunnel **Elettra floor** and **ALS walls.**
  > finding shows the exact same **deviation of 7mm.**

Elettra Sincrotrone Trieste | SR Shielding Wall reconfiguration – steps



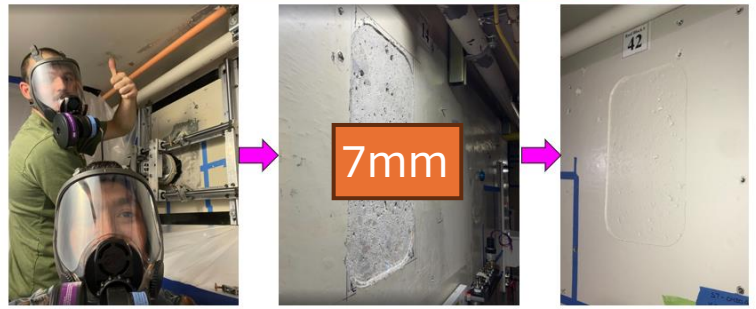


- Remove the blocks.
- Survey and floor analysis.
- Definition of "zero".
- Levelling of peaks.
- Paint and marking new configuration.
- Reconstruct the wall.

Courtesy: Pietro Vinoni

AR tunnel wall shaving to resolve interference

- Inner tunnel wall has irregularities/bowing.
- Potential interferences with ion pumps were discovered.
- Wall shaving at four different locations.
  - Shield wall is highly process controlled.
  - 7 mm deep.
  - Custom tooling, tested outside of tunnel beforehand.
  - Full dust control.
- Support stand shimming as a related challenge.



Lessons Learned

Analyze as-built conditions early and thoroughly to avoid future interferences

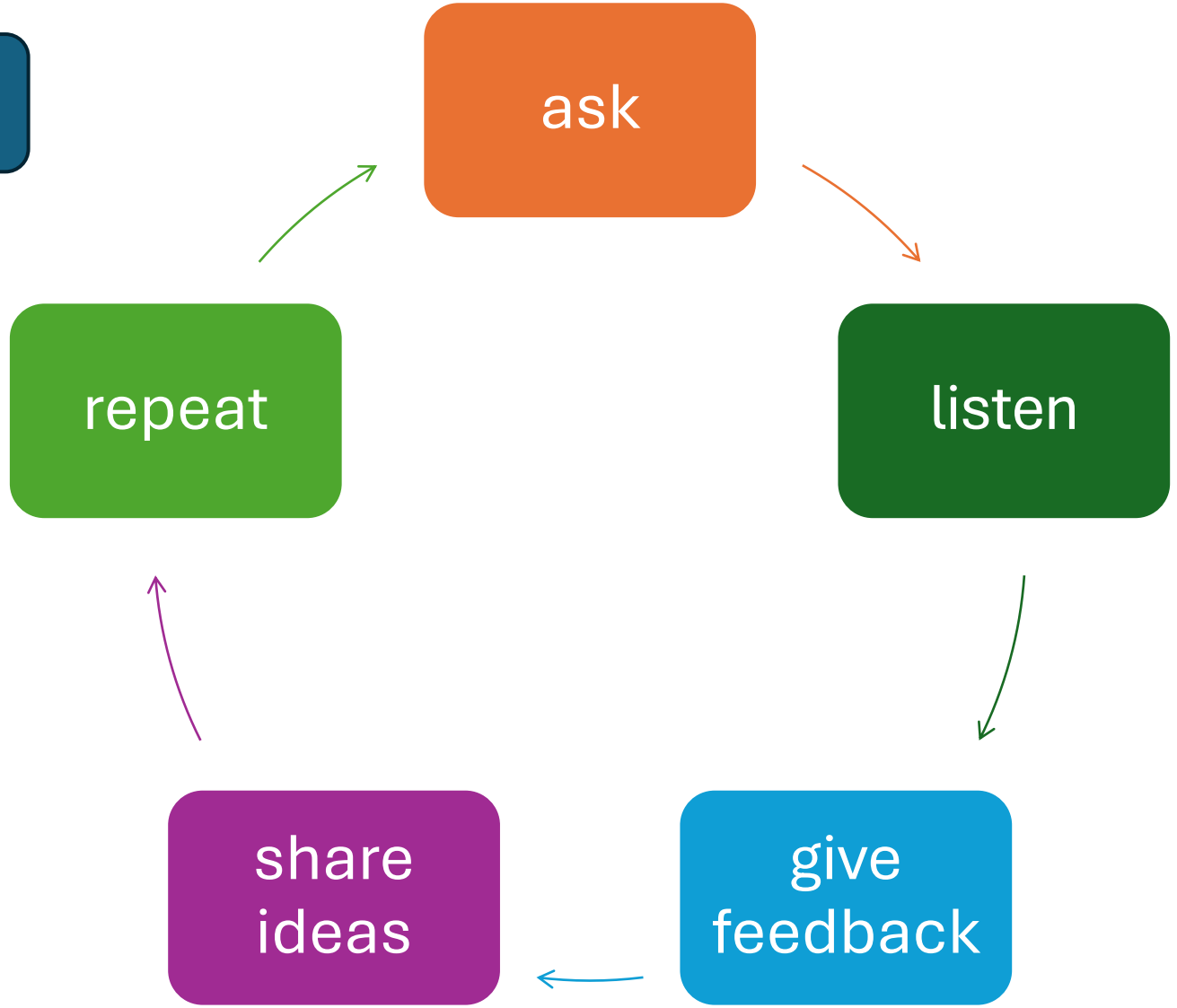
Summary 5th PAU R&I 2026 at PSI

Take aways from the Workshop

Balance between **holding back eager horses and waiting for everyone** to be at the starting line.

Summary 5th PAU R&I 2026 at PSI

PAU R&I formula



That was the 5th Particle Accelerator Upgrade Workshop in May at PSI

Many thanks for your participation!

5th Workshop on Particle Accelerator Upgrade Removal and Installation

4–7 May 2026 | PSI, Switzerland