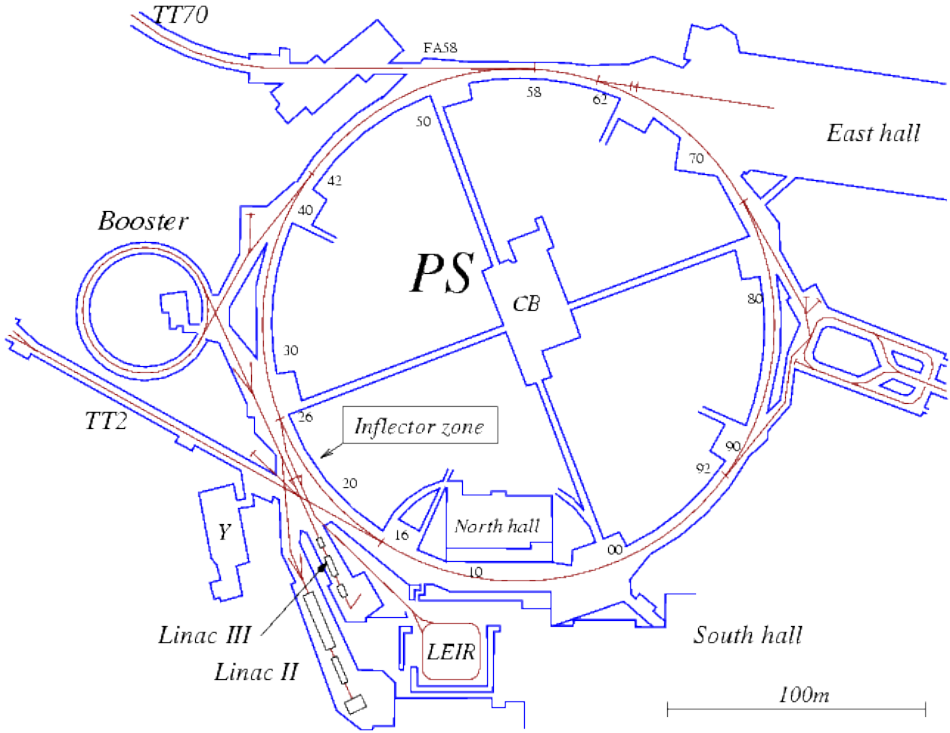


Cables for PS BPM consolidation



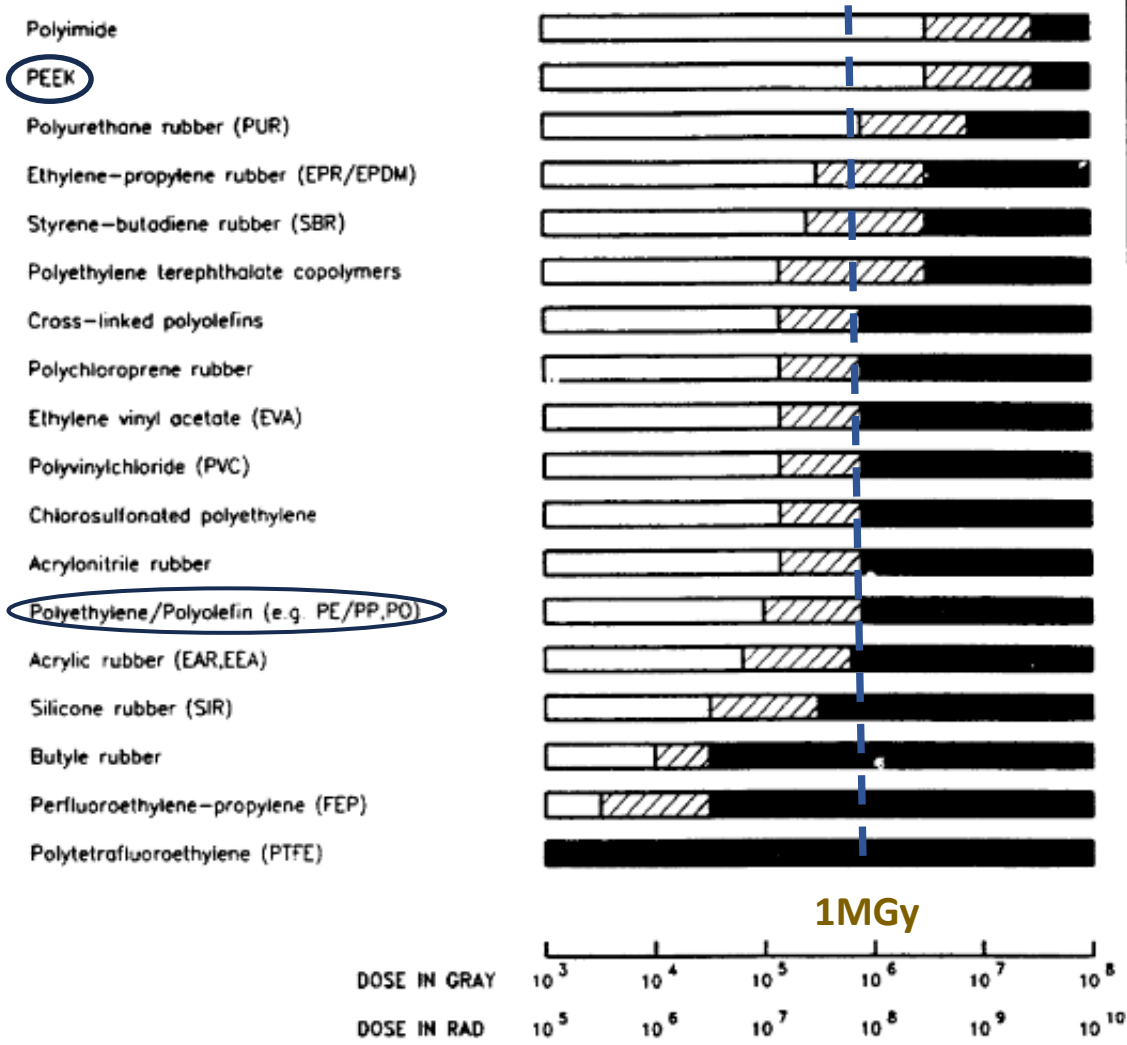
BI technical board
20/06/2024

M. Bozzolan (BI/BP)

Project highlights

- Upgrade of cables and analogue acquisition of PS ring beam position monitor system
- “Main” cables run from the racks located at the center of the ring to 45 beam pick-up locations in the PS tunnel
- They are ~40 years old and use obsolete and fragile connectors
- Short patch cables run from the pickup to the arrival of the long cables
- Consolidation will be carried out during LS3 (2026)

Insulator materials



Appreciation of Damage	Elongation	Utility
Incipient to mild	75-100 % OF IN. VALUE	Nearly always usable
Radiation index area	25-75 % OF IN. VALUE	Often satisfactory
Moderate to severe	< 25 % OF IN. VALUE	Not recommended

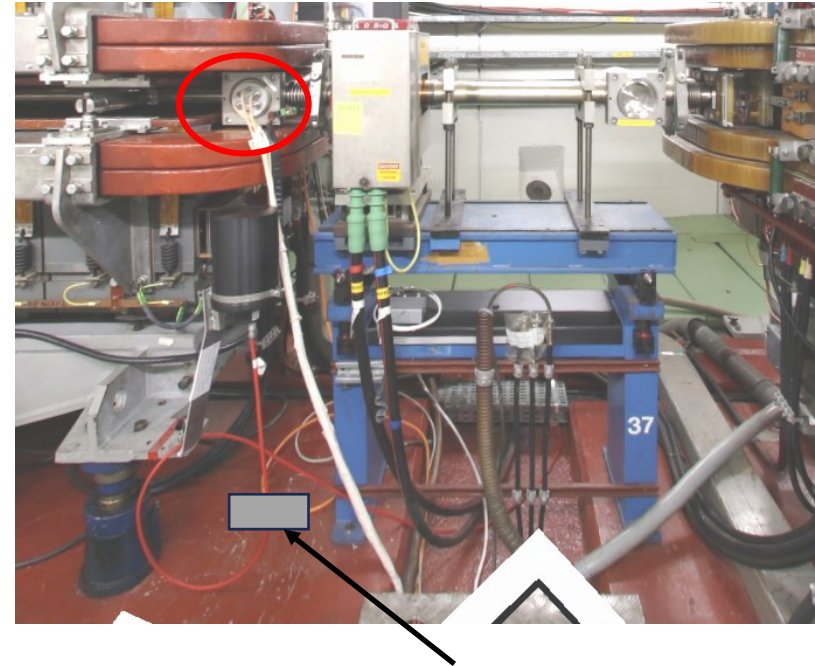
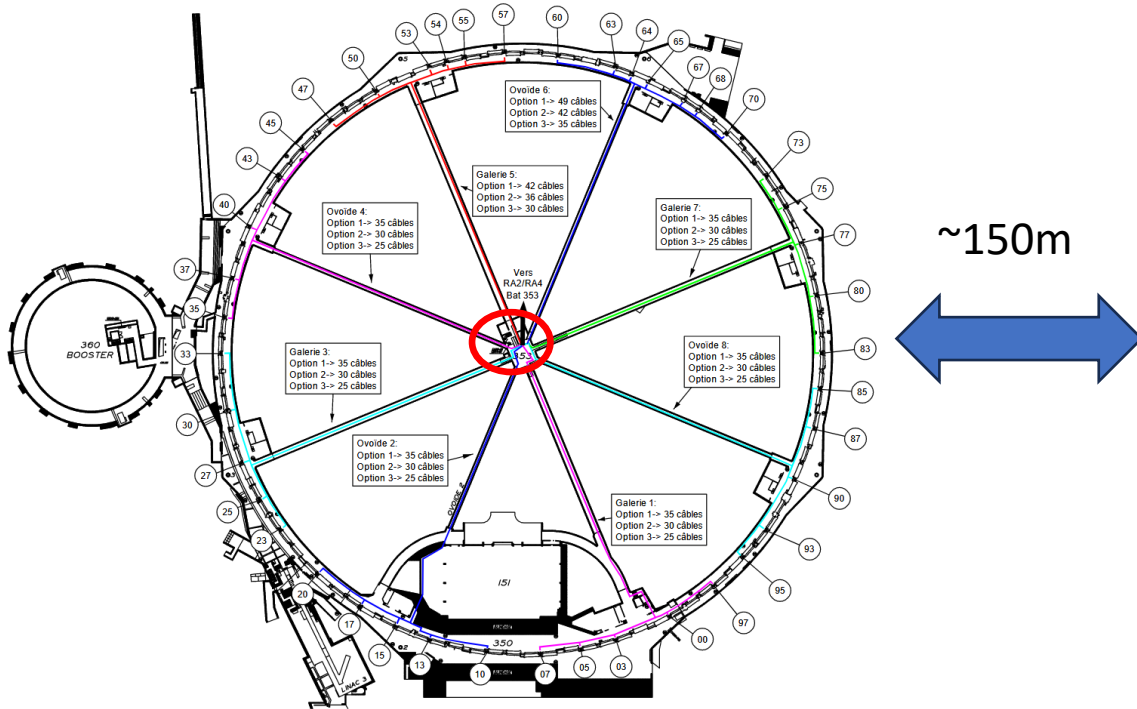
- PTFE(Teflon) not suitable
- PEEK is best, but with bad electrical characteristics (good for connectors)
- PE is ok also for cables

Source: <https://cds.cern.ch/record/220670/files/p743.pdf>

“Main” cables (surface to the tunnel)

PS racks located in B353 (PS central building)

One of the ~45 pickups in the ring tunnel



@ chamber
~40kGy/year
(estimated)

@ floor
~1kGy/year
(estimated)

Possible cables patch location (~20cm above floor)

Requested cables:

- 4x CKC50 signals
- 1x CC50 calibration
- 1x NE18 power & controls

PE dielectric and FRNC sheath

- RPL (passive radiation monitor) installed this year TS1 at all pickup locations

Status

- “Main” cables with PE dielectric selected
- Custom N connectors for CKC50 coaxial signal cable are no longer produced
- Producing a new connector for the PS consolidation (~300 pieces) is not worth
- Checking manufacturer availability to modify dielectric of standard connectors