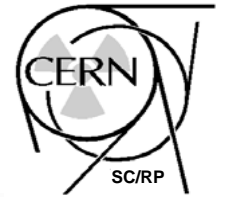




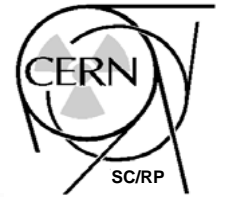
Safety Issues for Hg irradiation



T. Otto (SC/RP), 28 May 2004

- Experiment siting -
Activation of air and components
- Activity of Hg –
unsealed radioactive source
- Radioactive waste

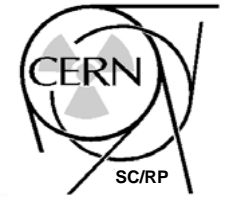
Experiment in TT2a tunnel



- TT2a is an old transfer tunnel. As such, it does not dispose of
 - ventilation
 - waste water retention
- Activation of air by 40 pulses of $2E13$ p corresponds to approx. 1 yr of operation in EHN1.
- Lack of beam dump leads to unnecessary activation of components and aggravates air activation

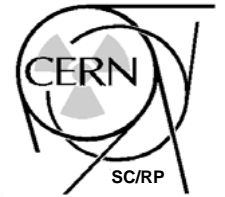


Hg activation



- “worst case scenario”: Hg spill
 - activity of Hg after 1 month $> 22 L_A$ (50% most active isotopes)
 - TT2a drains go directly in Nant’d’Avril
 - Radioactive pollution of environment
- Handling of unsealed sources
 - Work sector
 - “Sealed” design of experimental apparatus

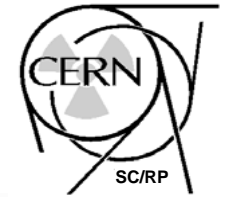
ISO 2919



- International standard, describing design requirements for sealed radioactive sources
- Graded requirements to respond to environmental conditions
- We require the nearly lowest resistance classes:

Temperature	180 deg for 1 hour
ext./int. Pressure	25 kPa
Impact	50 g from 1 m or equivalent energy
Vibration	no test
Puncture	1 g from 1 m or equivalent energy

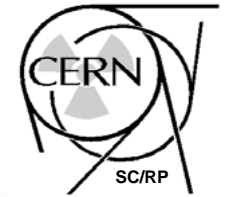
“Certification”?



- No certification required, but:
- traceable demonstration, that the (weakest parts of the) apparatus fulfil the mentioned requirements
- Measurements, FE calculations, use of certain materials ...
- SC/GS shall give its consent to the demonstration.
- “Weakest parts” (my guess):
 - beam windows
 - joints in Hg piping



Radioactive waste



- The magnet will be reused in the US or Japan ✓
- The irradiated Hg shall be transported to the new destination “for re-use” ✓
- As much as the magnets in TT2a, the N₂ system will be slightly activated – any re-use envisaged ?