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PSI

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Refurbishment of PSI-Hotlaboratory

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Content

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Duties of PSI Hotlaboratory (HL)

- Handling of highly radioactive samples/components (incl. wastes)
- PIE of lead (and defected) fuel pins / targets
- Preparation of actinide ceramics samples
- USER LAB for universities
- Support for power station urgencies
- Recruitment of next generation staff

History and status at beginning of reconstruction

- HL constructed in1962 as two wing building
- Hotcell- and radiochemistry- wing
- Radiochemistry wing enlarged in1975
- Mechanical test labs and office section added in 1982 and 1995
- Small scale safety improvements realized every few years (fire protection, elevators, heat regaining system, fissile material security...)

Safety related short comings

- Rescue corridors containing air conduct channels
- Fire delimiter areas greater than individual labs
- Full size fire could have lead to lab. window rupture due to caloric load
- Inflexible instrumentation and control system
- Weakness for earth quake resistance
- Missing storage area for radioactive tools to be reused
- New requests for additional security gadgets

Concept of refurbishment

- the winner project consist(s,ed) in adding a media conduct channel along the radiochemistry wing,from which the labs. on two floors are supplied with the media through vertical ducts.
- Lab windows and doors are replaced to withstand a full size fire during 60 minutes.

Concept of refurbishment, continued

- Caloric load reduced by replacing most wooden construction material
- Lab. Instrumentation and control organized with bus system (fire alarm system with separate bus)
- Installation of pillers and concrete walls for improved earth quake resistance.
- Addition of storage area for active material along the hotcell wing.

Logistics for reconstruction

- Addition of external buildings without opening of controlled, operating zones
- Installation of media ducts and I+C system in installation corridor and control room
- Definition and separation of lab. sections which are refurbished together
- Withdrawal of radioactive samples from glove boxes and lead caves.

Logistics for reconstruction, continued

- Withdrawal and storage of some equipment outside the labs (section wise)
- Encapsulation of contaminated glove boxes and lead caves into strong casings after separation of glove boxes from exhaust systems (section wise)
- Extraction of hoods, ducts, contaminated wall paint, cables from individual labs (section wise)

Logistics for reconstruction, continued

- Meticulous decontamination and control of background contamination levels at accessible areas
- Installation of corridor wall separating active areas from inactive construction area
- Installation of intervention containers for lab access of construction workers through windows

Status of reconstruction at visit time

- Additional peripheral buildings added
- Media ducts in installation corridor added
- Labs of construction phase 2 refurbished from outside
- Labs of construction phase 3 under decontamination and background measurem.
- Material in labs of construction phase 4 under encapsulation

Costs and time schedule

Budget endorsed by Federal Government	8'800'000 CHF
Additional costs budgeted by general architect	1'500'000 CHF
Person years of LWV invested	8-12 PY
Estimated total construction time	1.5 Y