

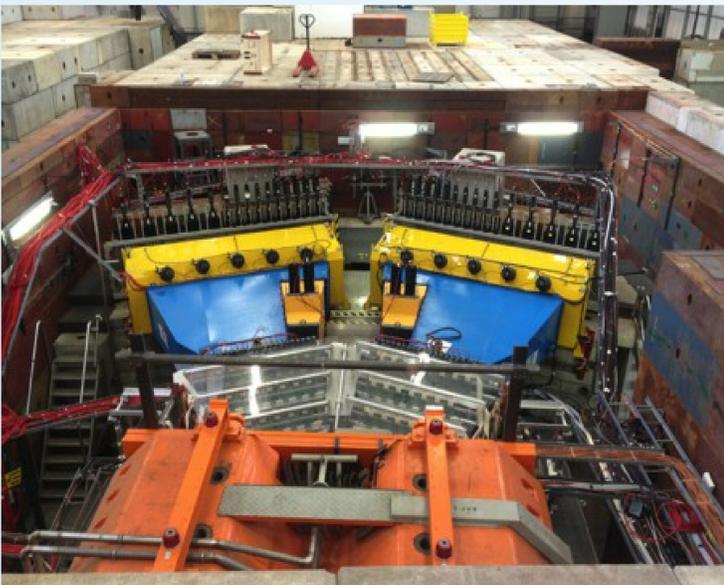
THE EAST AREA UPGRADE PROJECT IN LS1

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on behalf of the project team.

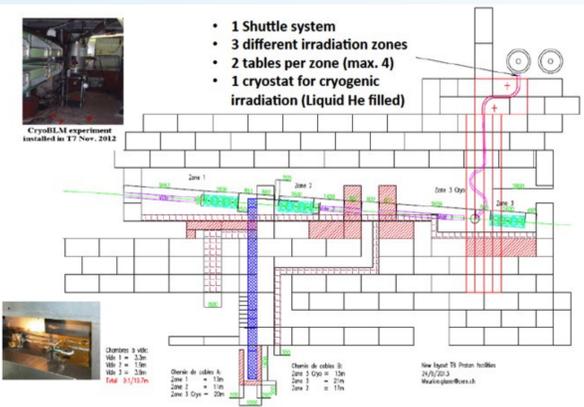


The East Area has been operating for many years with aging equipment, increased failure rates and high dose levels. A consolidation program for the whole of the East Area has been proposed in two phases. The first phase will take place in 2013-2014 during Long Shutdown 1. The DIRAC experiment is being dismantled and a new irradiation facility, combining a proton irradiation facility (IRRAD) and a mixed field facility (CHARM), will be installed in the old DIRAC location. Such an irradiation facility at CERN is necessary to test and validate detectors for the experiments (LHC and others, in IRRAD) and complete electronics systems as well as individual electronics components for accelerators (R2E, in CHARM).

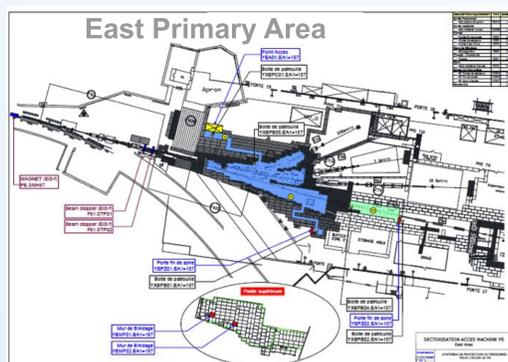
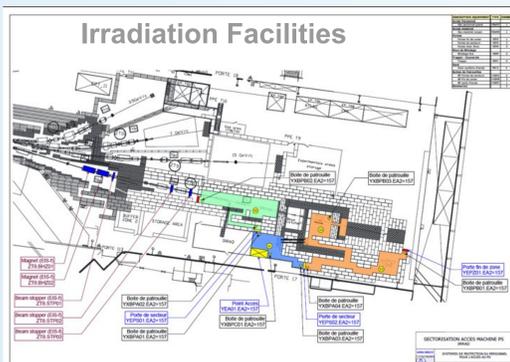
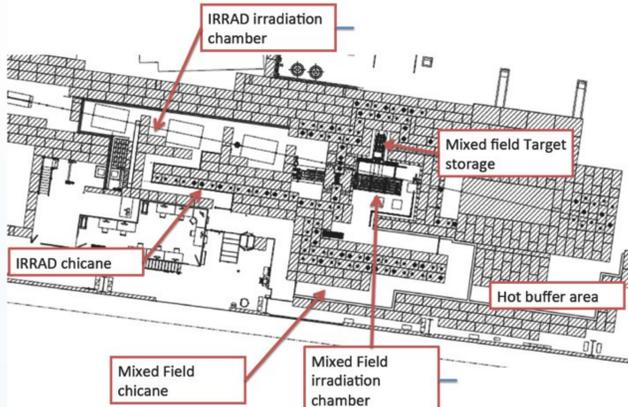
The advantages of such a new facility are numerous. As the facility has no more competition for protons from the DIRAC experiment, more protons can be made available for irradiations. On top of that in many cases the same protons can be shared between the proton and mixed field facilities. More space and shielding will be available and the irradiation areas will be equipped with a state-of-the-art ventilation system. The layout can be optimised to reduce doses to the personnel during the interventions. The increased space also allows irradiating larger objects, even in operation with services (e.g. cooling, ventilation) connected. Access will only stop the facility itself, not the beam to the other East Area users such as the test beams and the CLOUD experiment. The facility is urgently required for the R2E project.



The proton facility layout:

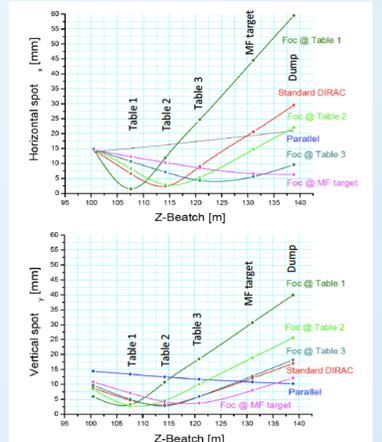


The Mixed Field facility layout:



| Parameter | Value |
|---|---------------------|
| Proton beam momentum [GeV/c] | 24 |
| Maximum flux per PS spill | $5 \cdot 10^{11}$ |
| Maximum # spills per super-cycle | 6 |
| Duration of super-cycle [s] | 45.6 |
| Maximum # protons per second | $6.7 \cdot 10^{10}$ |
| Maximum number of days per year | 200 |
| Assumed efficiency | 90% |
| Maximum number of super-cycles per year | 340,000 |
| Maximum number of protons per year | $1.0 \cdot 10^{18}$ |
| Minimum spot size [mm RMS] | $\sim 5 \times 5$ |

The table shows the maximum beam fluxes achievable in fully dedicated operation mode. This served as basis for the design, but in practice fluxes will usually be much lower.



The DIRAC location by the end of the dismantling

In the shadow of the modifications outlined above, some independent consolidation work and modifications will take place in the East Hall. At the time of writing the two cranes have been renovated and slightly upgraded in capacity from 20 to 25 tons for PR67 and from 40 to 45 tons for PR39. Also the DIRAC experiment, the old irradiation facility and the T7 beam line and experimental area have been dismantled. The foreseen works include the replacement of splitter magnet F61.SMH1 by a MCB-type magnet, the replacement of the marguerite targets, beam stopper consolidation and the implementation of the Cesar beam control system for the secondary beams and replacing the working sets and knobs.

In parallel, the replacement of the primary zone access doors by new PAD/MAD doors will take place. This is managed by PS-PSS project in the GS department, but closely coordinated with the other works in the building which are described here.



The renovation of the cranes in the East Area was a major undertaking!