ISOLDE Activities for LS2

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LS2 DAYS
29-30 SEPTEMBER 2015

http://indico.cern.ch/event/436424/

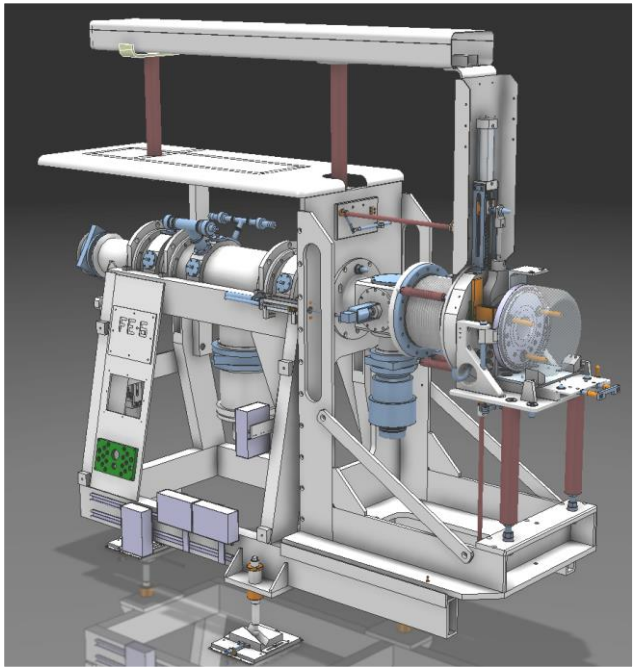
Outline

- LS2
  - Frontend exchange
  - Beam Dumps
  - Beam line alignment in experimental hall
- YETS 2015/2016
- EYETS 2016/2017
- LS1 ALARA Level 3 feedback
- Start-up after LS2

Frontends

- The two existing Frontends (GPS & HRS) will come to the end of their expected lifetime during the LS2 period.
- LS2 will provide a significant cool down period to minimise collective dose rates.
- The opportunity will be taken to improve on design features and upgrades
  - Beam instrumentation
  - Extraction electrode controls
  - Local cable replacement
  - Beam line modification

  - High priority for ISOLDE



Frontends

- Risk analysis
  - If not done then an increase in interventions and/or a 50%-100% loss in physics program.
- Budget
  - Consolidation request submitted. Tba.
  - Estimated cost: 330kCHF/FE
- Support request
  - EN-MME, BE-BI, TE-VSC, DGS-RP, EN-STI
  - Project driven by EN-STI
- Planning
  - Installation in last semester of LS2 to benefit from a maximum of cooling.

ISOLDE Beam Dumps

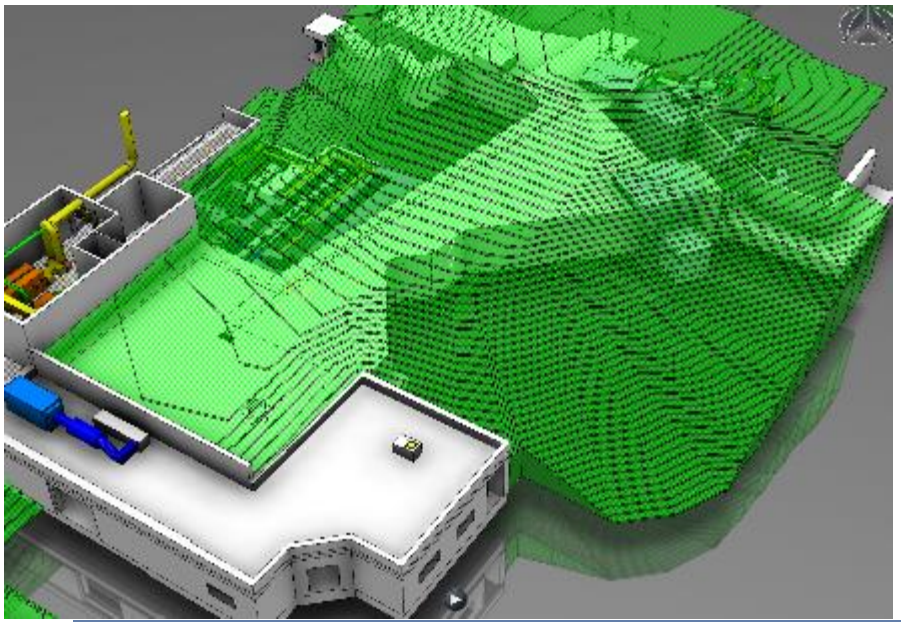
- Calculations have shown that the beam dumps are at the limit of operation in terms of compressive stress and shielding.
- The beam dumps show clear signs of corrosion and condensation
- Little known about their design and specifications
- ISOLDE cannot exploit an increase in p-beam intensity.
  - E.g. with the commissioning of Linac 4

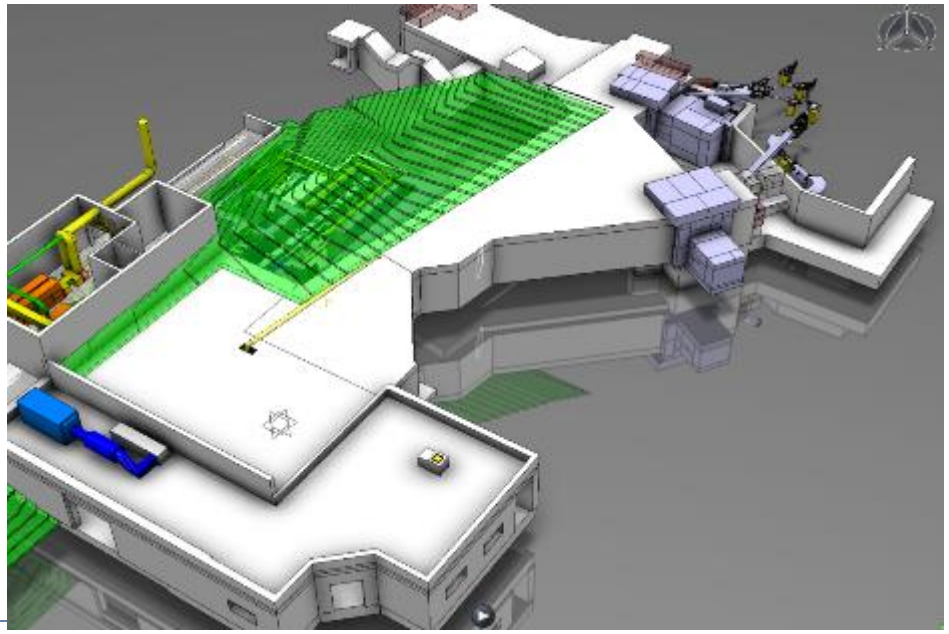
GPS beam dump

HRS beam dump

ISOLDE Beam Dumps

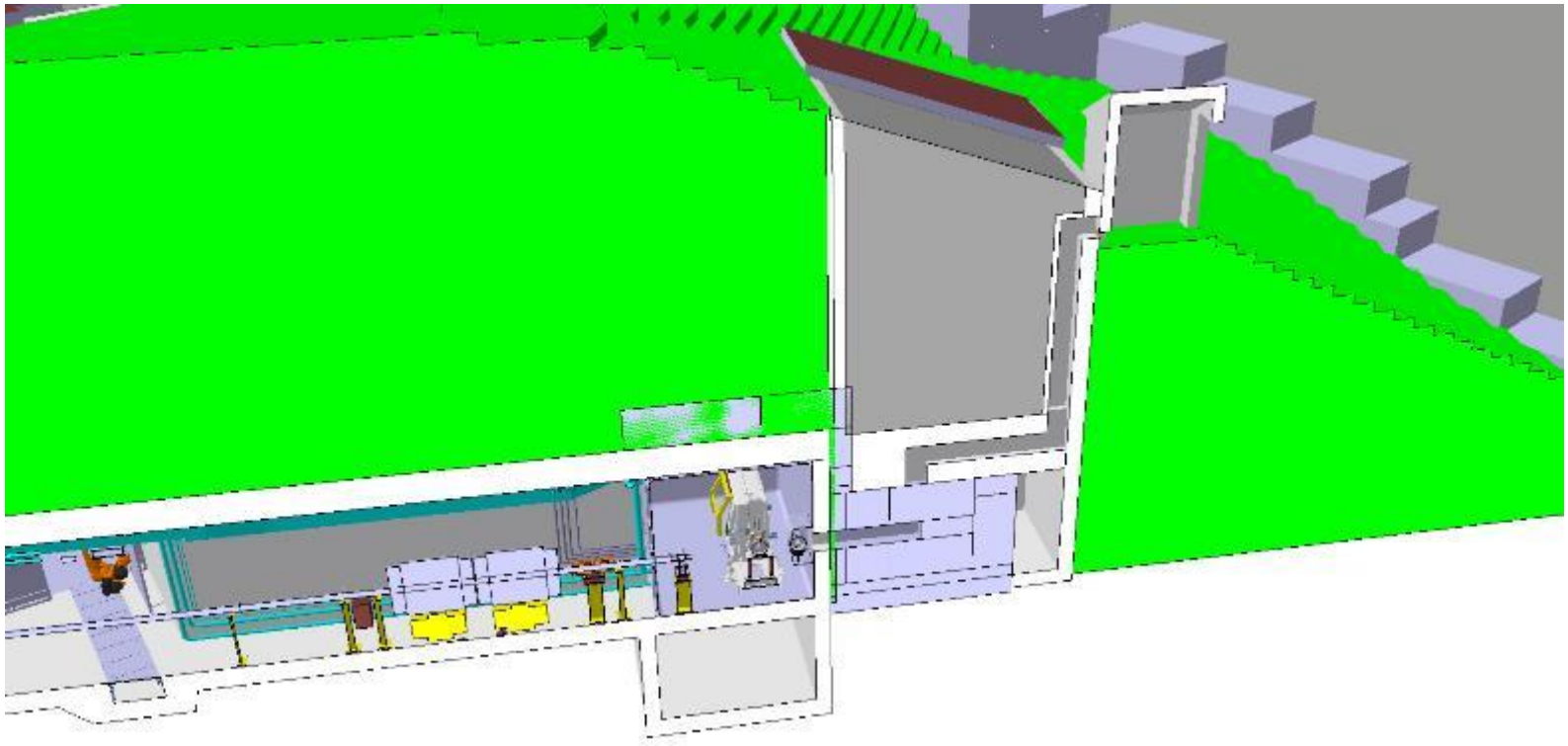
- Major issues
  - Removal and storage of partially activated earth for access
  - Removal and handling of highly activated beam dumps and their shielding.





ISOLDE Beam dumps

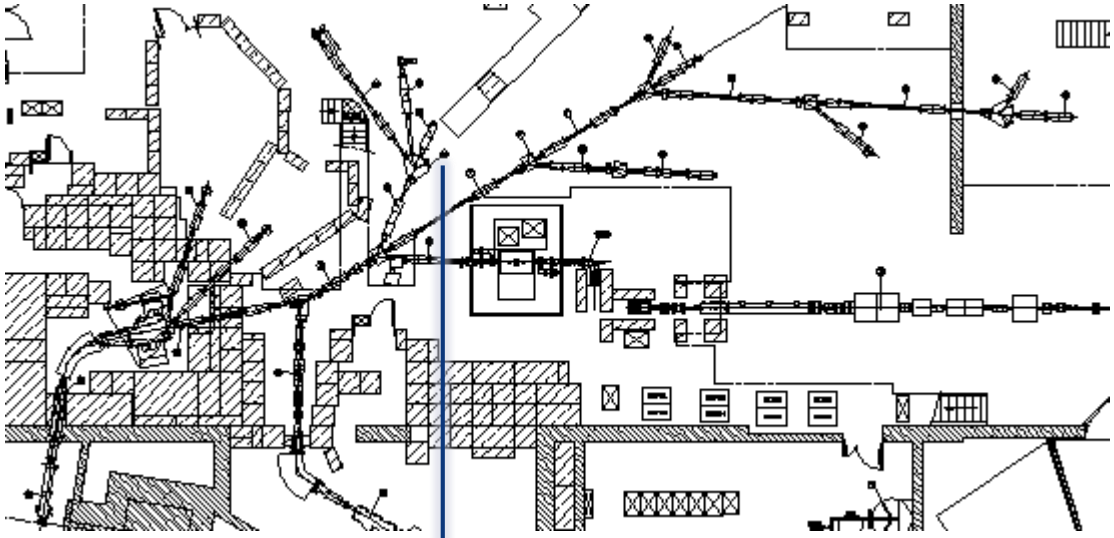
- Bore pile shafts could be used to limit the amount of earth excavated

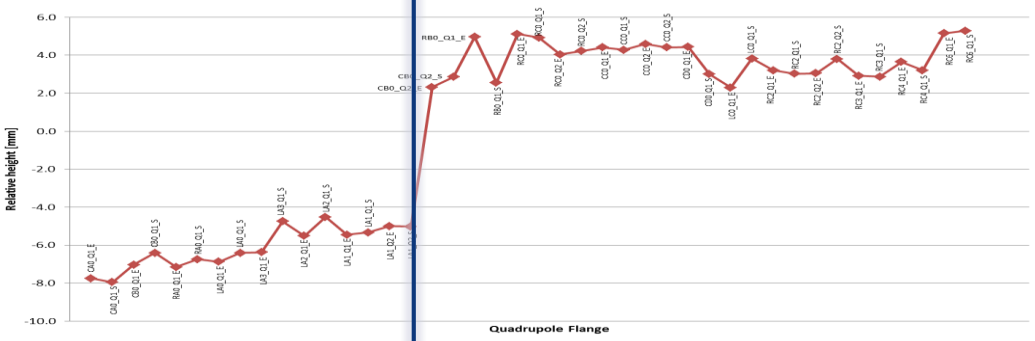


ISOLDE Beam Dumps

- Risk analysis
  - In the case of failure, ISOLDE would not operate for 2 years
- Budget
    - Consolidation request submitted…tba
    - 3-4MCHF
- Support request
  - GS-CE, EN-HE, EN-STI, EN-CV, EN-MME, DGS-RP
- Planning
  - 2017 – Design
  - 2018 – Beam dump fabrication
  - 2019 – Civil engineering and installation
    - 1st semester of 2019

ISOLDE Hall Alignment





10mm step in vertical direction

ISOLDE Hall Alignment

- Misalignment of beam lines can result in:
  - Poor transmission to experiments
  - Hot spots along the beam line
- Re-alignment requires that the experiments at the end of the beam line should also be re-aligned.
- Budget
  - 30-40kCHF
- Support request
  - EN-SU, PH-SME
- Planning
  - First semester LS2?

YETS 2015-2016

- Temporary installation of Fast Tape Station at LA2 beamline.
  - Resources required: TE-VSC, EN-STI, BE-CO/OP
- Installation of Remote Conveyor System (RCS) in ISOLDE target area
  - For future MEDICIS and ISOLDE target manipulation
  - Implies modification of robot programming
  - Resources: EN-STI, EN-HE
- Frontend maintenance and possible modification
  - All-metal pistons, extraction electrode mechanism. Preparation of FE for LIEBE target.
  - Resources: EN-STI
- Upgrade of vacuum controls
- HIE-ISOLDE
  - Installation of cryo-module 2
  - Commissioning of refurbished 9-gap amplifier.

EYETS 2016-2017

- Fixed installation of Fast Tape Station in central beamline
  - TE-VSC, EN-STI, EN-SU
- Installation of cryo-modules 3 & 4 for HIE-ISOLDE
- Completion of 3rd beam line XT03 and extension of XT02

Feedback from ALARA 3 committee after LS1 - 20th May 2015

- Too many interventions were scheduled in the last months of the shut-down to maximise radioactive decay. This led to co-activities and time pressure, which are sources of accidents. It would be advantageous to **schedule activities more equally distributed over the duration of the shut-down**, to relax the stressful accumulation of jobs, **even at the price of an increased collective dose,**
- The weekly coordination meetings are fruitful only when **all stakeholder groups** send representatives with the capability for decisions,
- The presence of an **on-site coordinator for the works is important** for scheduling activities which are progressing in parallel, to avoid hazardous co-activities,
- **Visual inspections** at the beginning of the shut-down will also cost additional dose, but can reveal non-conformities and damages which can be taken into account in the planning,
- The ISOLDE section is in favour of a **database for shielding elements** which allows the exchange of such items between the different facilities at CERN.

ISOLDE Start-up

- Towards the end of LS2, ISOLDE will require at least **3 months** of operation with stable beam prior to taking the proton beam.
  - All machine equipment should be operational
    - Vacuum, power converters, controls, beam diagnostics, water cooling
- Operation with stable beam is the best way to check all systems.
  - Transmission to experiments after beam line re-alignment
- Dedicated testing of new beam dumps with protons
  - Could be done in parallel with ISOLDE on-line operation

- Thank you for your attention