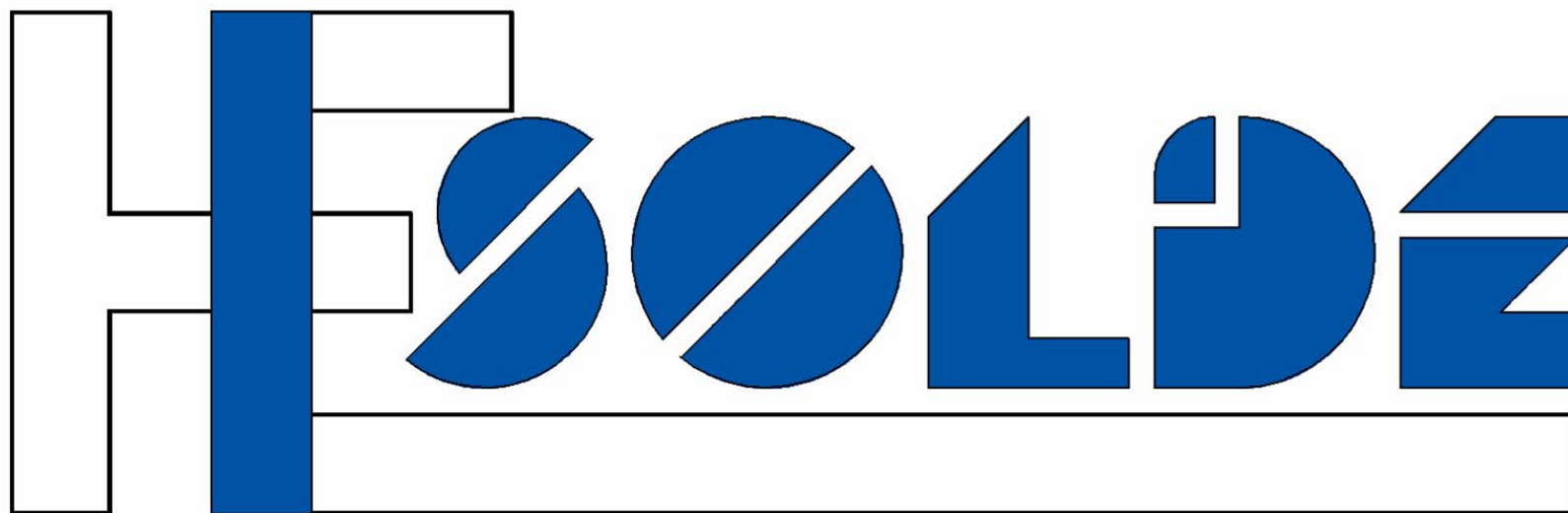
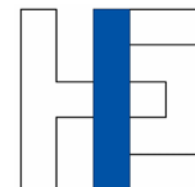
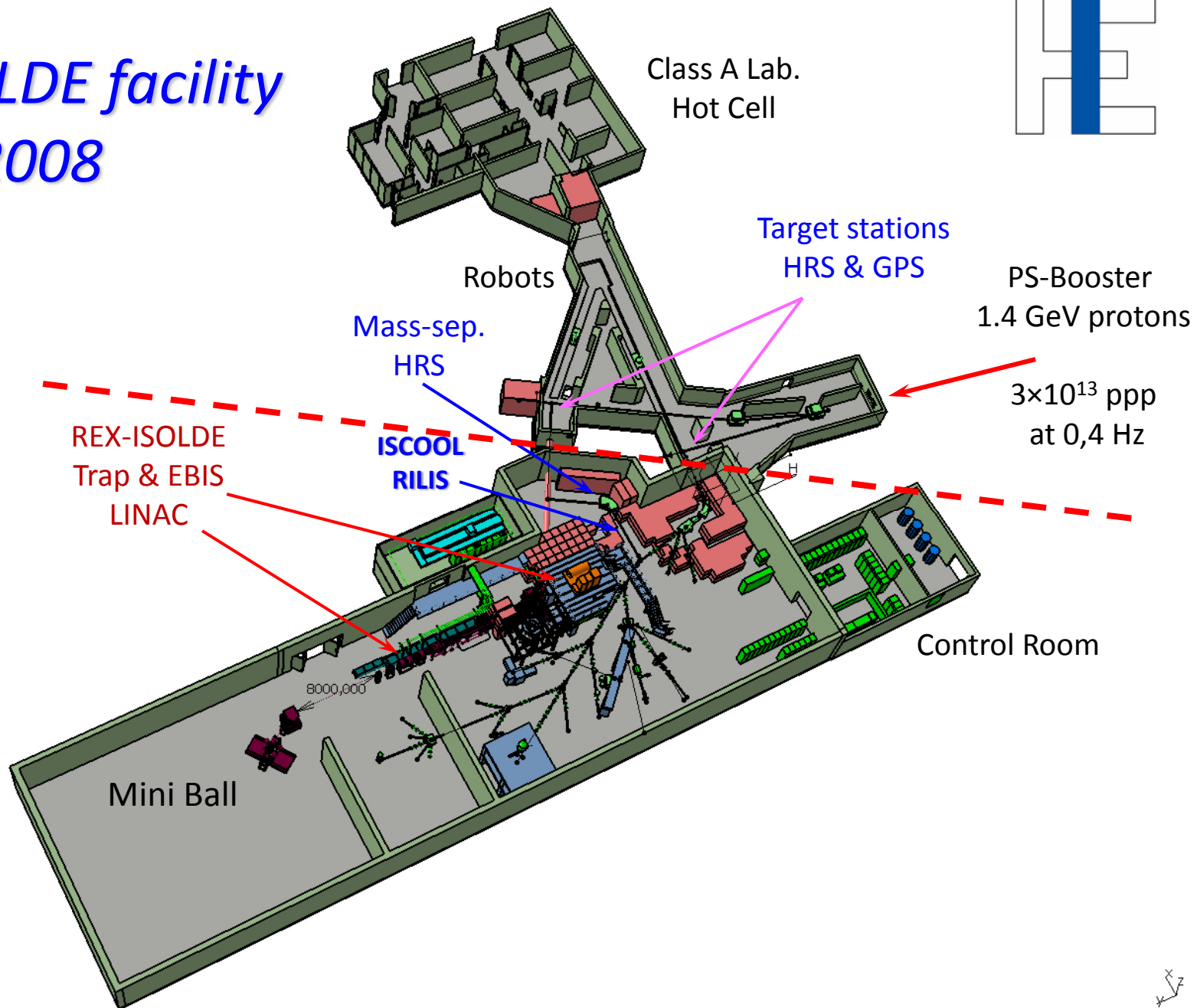
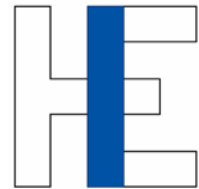


News from the Other Side



Richard Catherall
ISOLDE Workshop, CERN,
17th to 19th November 2008

The ISOLDE facility 2008





Outline

- Project Plan
 - Project Breakdown Structure (PBS)
 - Layout and drawing codes
 - Work Breakdown Structure (WBS)
- LTG – Target Area Laser Scan and Drawings
- LTS – Target Shielding
- LTU – Target Area Ventilation
- LTH – Target Area Handling
- Summary

Project Breakdown Structure



- EDMS document number 927496
- Complex Codes
 - Layout = L
 - Experimental Hall = X
 - Target Area = T
 - Class A lab = J
- Target Codes
 - Target = T
 - Base = B
 - Extraction optics = E
 - Front End = F ...

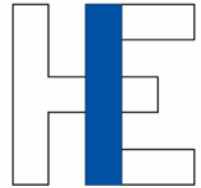
Project Breakdown Structure



- Three tier structure used for PBS and drawings
- L – Layout
 - T- target area
 - X - experimental area
 - J - Class A lab
 - S - Shielding
 - G - Geodesy and Survey
 - B - Beam Instrumentation
 - E - Electrical Power
 - C - Control
 - F - Fluids
 - I - Injection and transfer lines
 - K - Civil engineering
 - H - Handling, mechanics, supports
 - M - Magnetic elements
 - P - Personnel safety and radiation protection
 - U - Ventilation and air conditioning
 - V - Vacuum equipments
 - A - Access system
 - Z - Electrostatic systems
 - D - Management
 - W - Waste disposal
- Examples of PBS
- LTS
 - Layout, target area, shielding
- LTG
 - Layout, target area, survey...etc, etc.
- Examples of drawing codes
- I S L _ _ _ _ _ 0 0 0 1
- I S L L T
 - I S L ISOLDE
 - L Layout
 - T target area
 - V Vacuum systems
 - X Exhaust
 - T Tanks
 - 0001 number 1
- Target Code example
- I S L T F V _ _ 0 0 0 1

HIE-ISOLDE Target Area Upgrade WBS									
LTV Responsible:									
Exhaust Gas									
Filter tanks					Ballons				
tanks	connections	Pumping	Control	tanks	connections	Pumping	Control	Release mechanisms	

Project Plan ISO9001



➤ Steering Committee

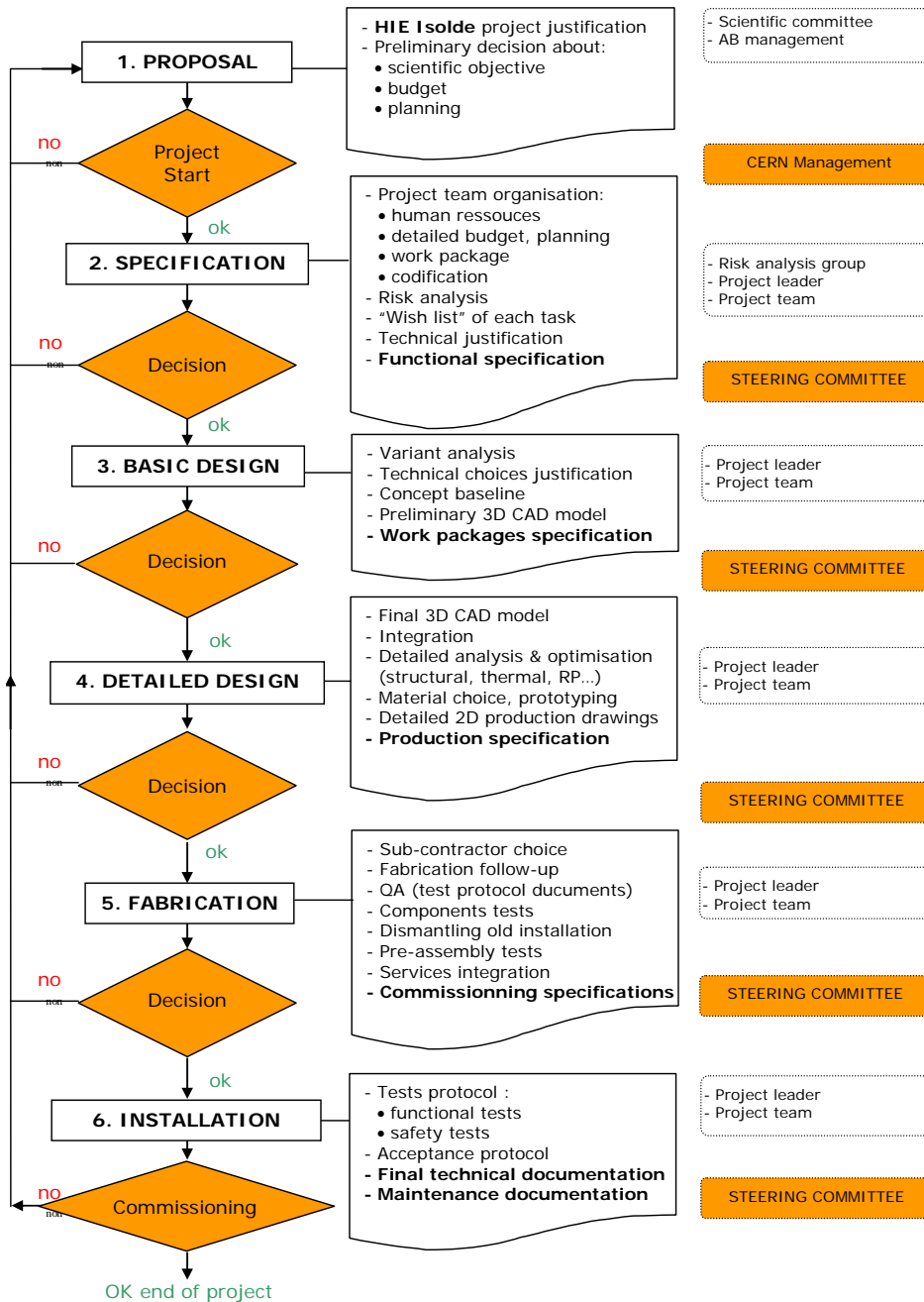
- Each critical phase to be assessed by Steering Committee

➤ Project Team

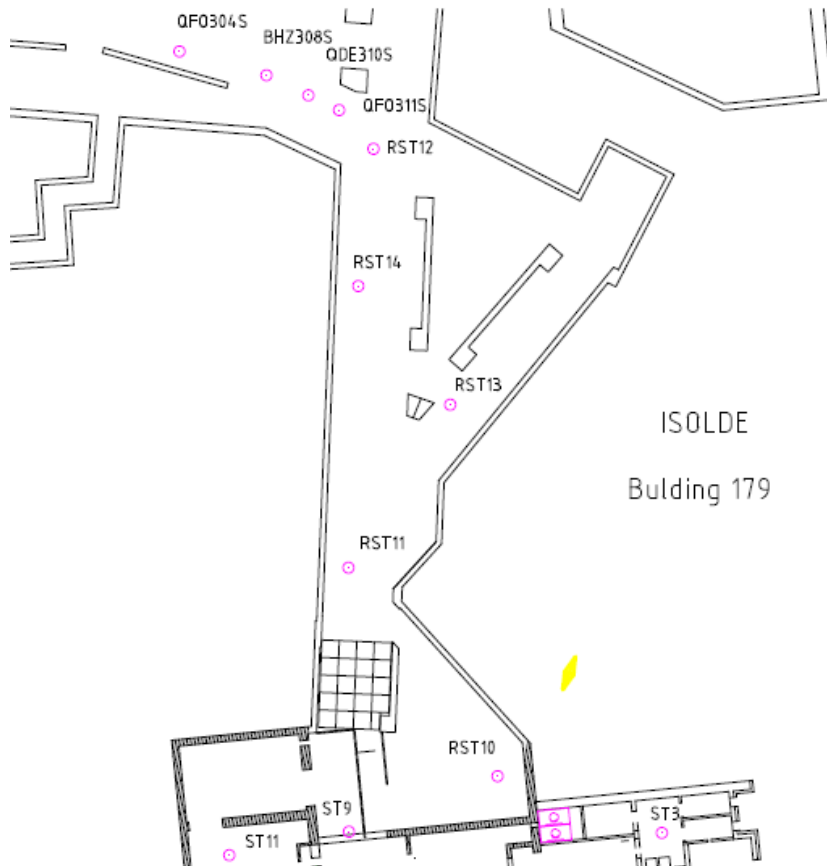
- Made up from those responsible for the various PBS's

➤ Approval List

- Members of Project Team
- External members



LTG - Alignment and drawings

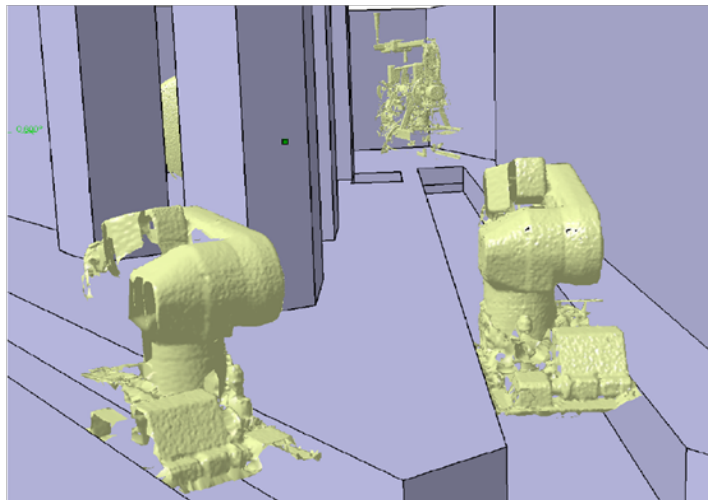
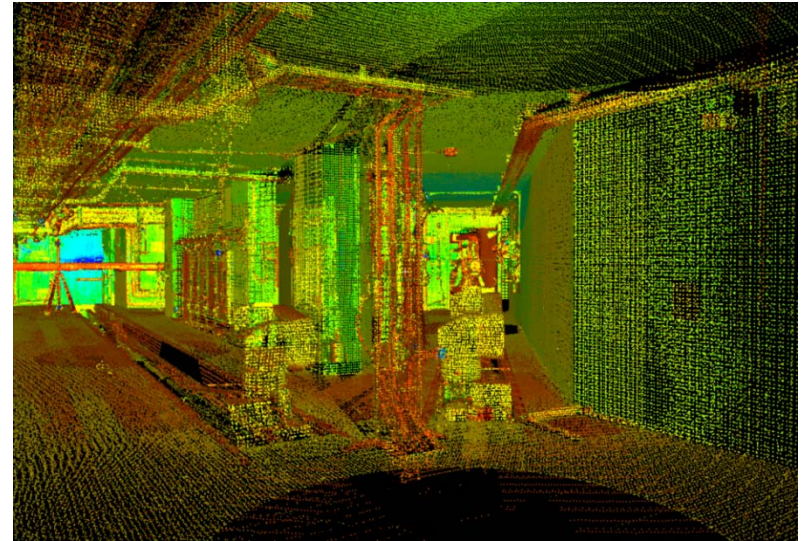


- Access to target area extremely difficult during both running and shutdown periods
- Need of updated and detailed plans of target area
- April 2008, in collaboration with TS-SU, a laser scan of the target area was carried out.

LTG - Alignment



Photographic documentation

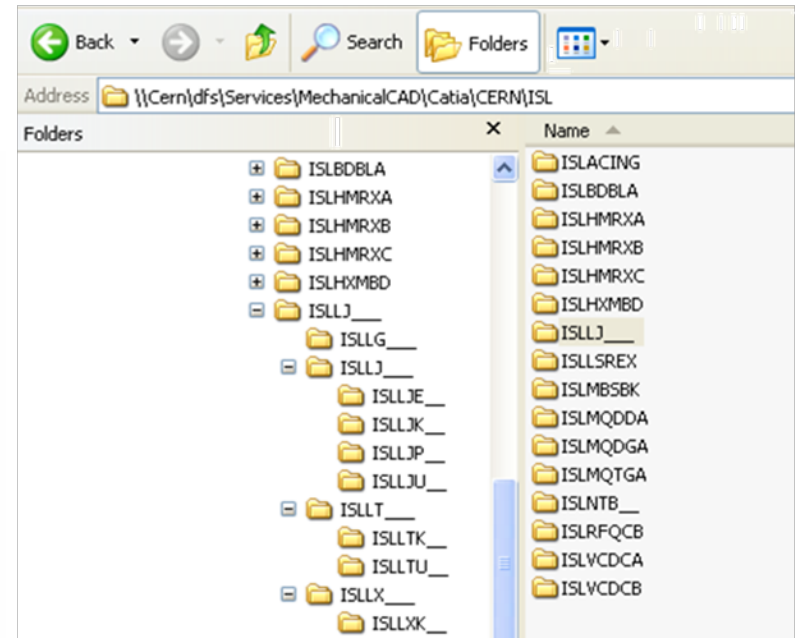
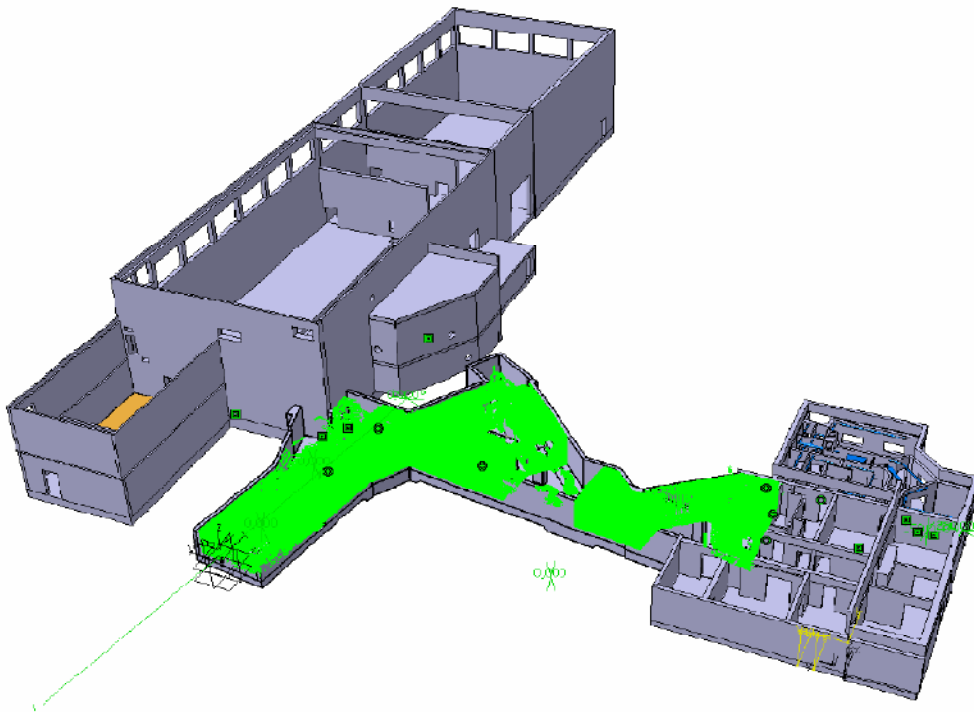


Incorporation of the 3D scan in the 3D model

- Laser scan generates a cloud of points representing the internal geometry
- Points can be migrated into Catia model of the target area.
- Complemented with a photography survey

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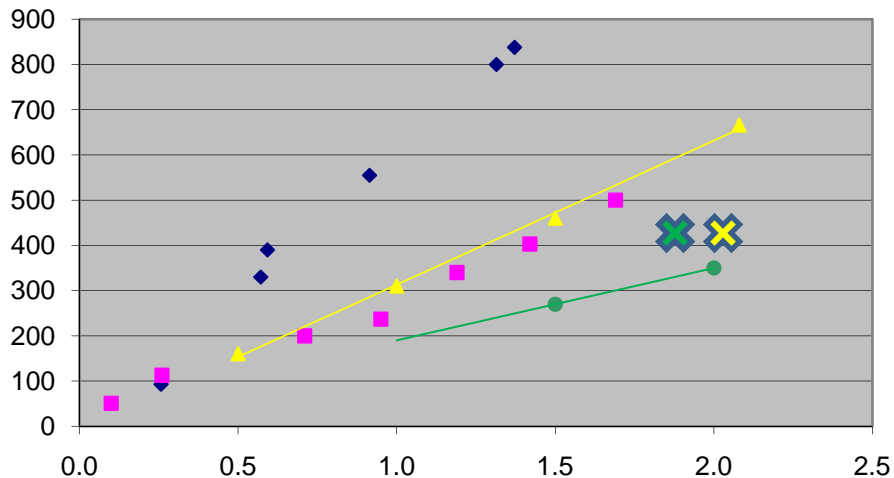
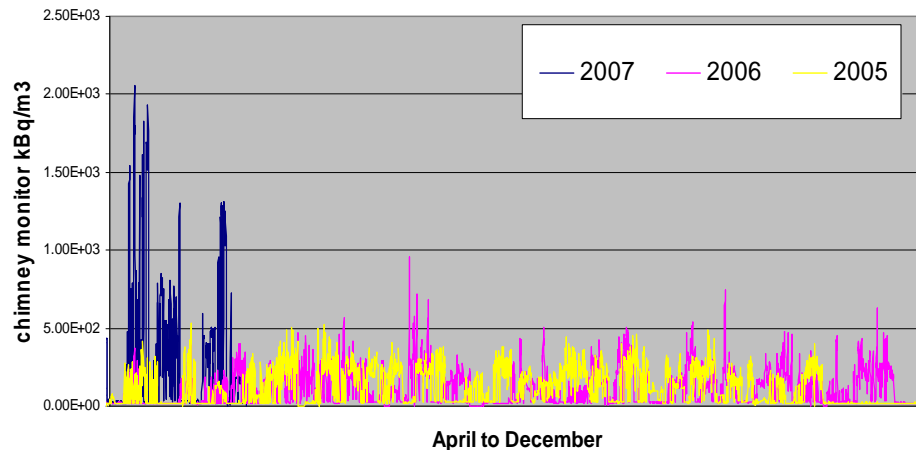
graph LR
    ISLL__0001.CATProduct --- ISLLG__0001.CATProduct
    ISLL__0001.CATProduct --- ISLLJ__0001.CATProduct
    ISLL__0001.CATProduct --- ISLLT__0001.CATProduct
    ISLL__0001.CATProduct --- ISLLX__0001.CATProduct
    ISLLG__0001.CATProduct --- ISLLG__0002.CATPart
    ISLLG__0001.CATProduct --- ISLLG__0003.CATPart
    ISLLG__0001.CATProduct --- ISLLG__0005.CATPart
    ISLLJ__0001.CATProduct --- ISLLJK__0001.CATProduct
    ISLLJ__0001.CATProduct --- ISLLJE__0002.CATPart
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    ISLLJ__0001.CATProduct --- ISLLJE__0004.CATPart
    ISLLJ__0001.CATProduct --- ISLLJU__0001.CATProduct
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Catia 3D model referenced in the CERN coordinate system
And in the process of being implemented in Smarteam

Air Activation

Air activation levels over 3 years as measured in chimney

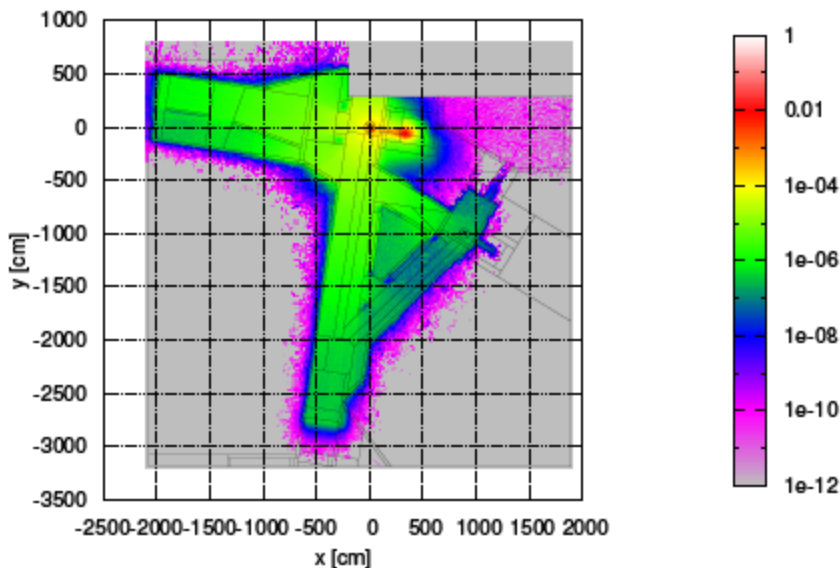
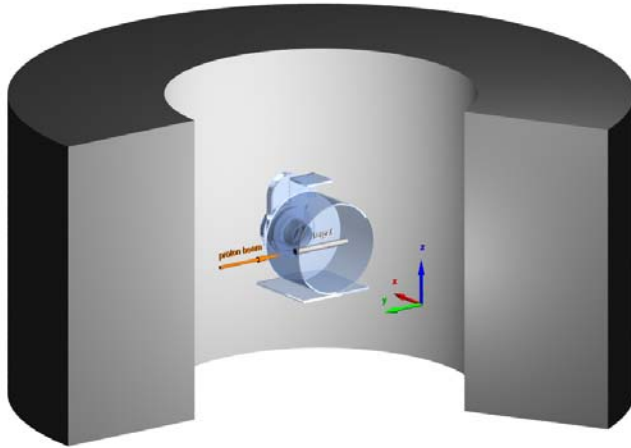


➤ Two approaches to minimize the activated air released to the atmosphere during operation.

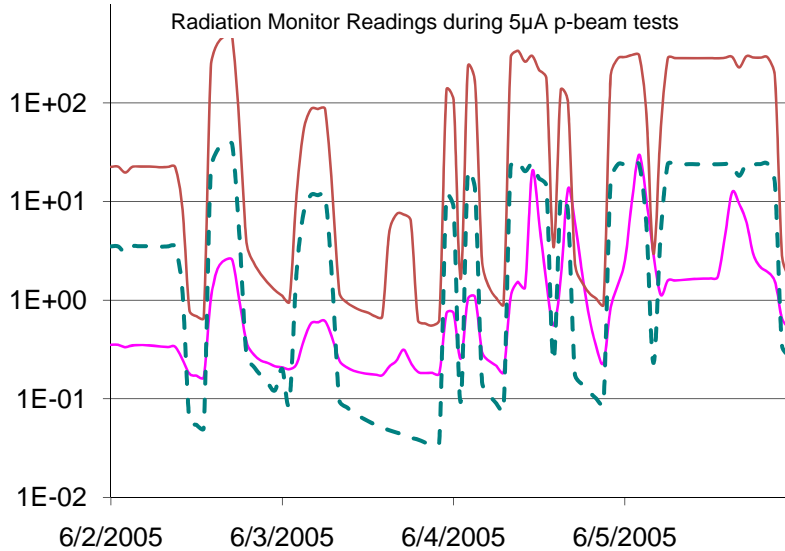
➤ Reduce the amount of air activation through shielding - LTS

➤ Reduce the amount of air released to the atmosphere - LTU

LTS - Shielding

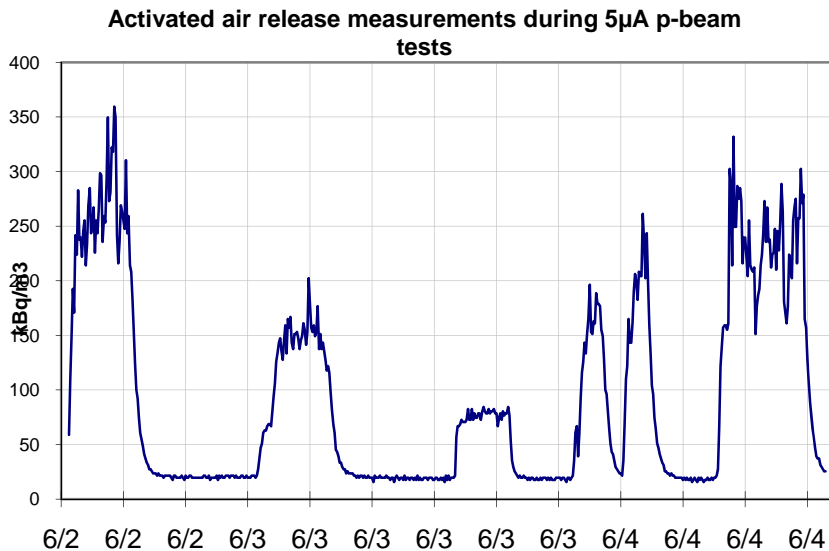


- Initial Fluka simulations made on shielding and air activation by D. Hovarth in 2007.
 - Recommended 2 meters of shielding around target ...but to obtain $\sim 1\mu\text{Sv/h}$ background at 2 m
 - Air activation model in accordance with present situation
- More refined simulations required taking into account geometry and more realistic boundary conditions
- Need to consider shielding requirements for adjacent experimental hall



Shielding

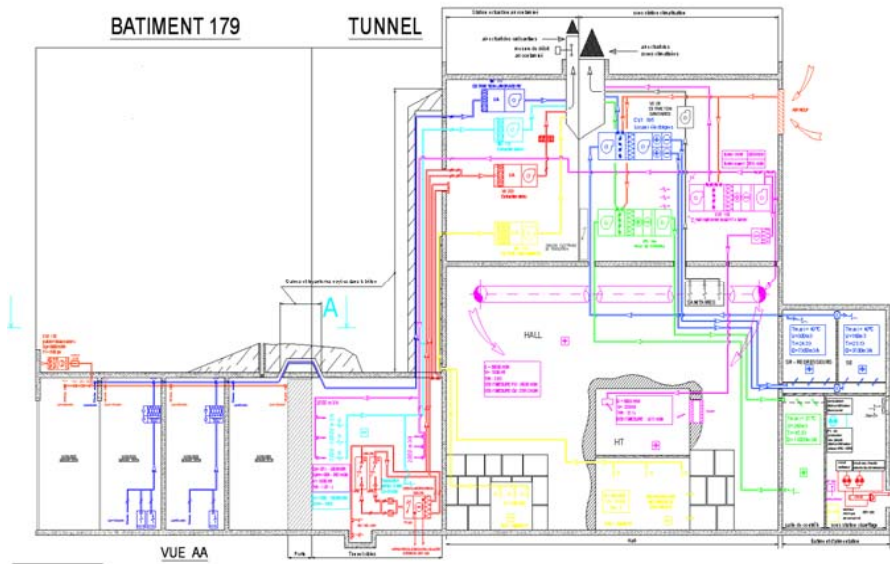
- Experimental Hall Measurements at 5 μ A of p-beam in 2005
 - HT room $\sim 445 \mu\text{Sv/h}$
 - At door $n \sim 10 \mu\text{Sv/h}$, gamma $\sim 3 \mu\text{Sv/h}$
 - Merging switchyard $\sim 20 \mu\text{Sv/h}$
 - Water cooling tubes $300 \mu\text{Sv/h}$ at contact
 - $5 \mu\text{Sv/h}$ at control room doors



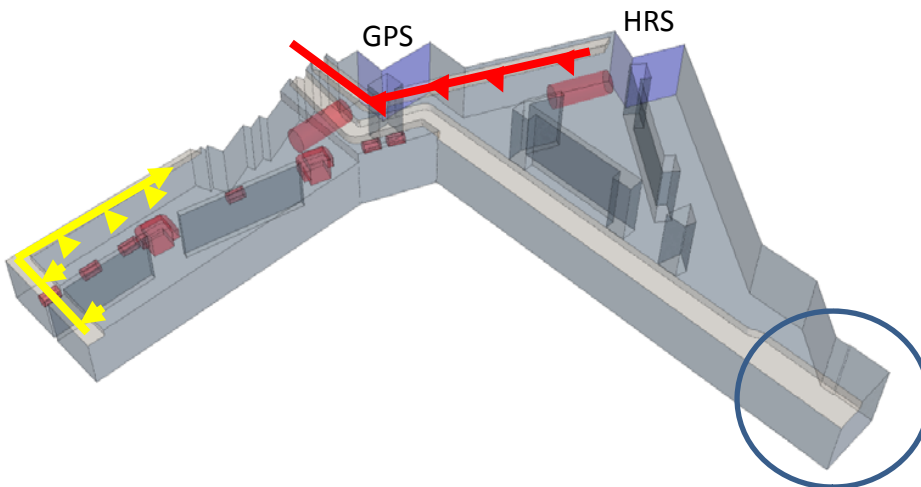
Air Activation

- In 2005, measurements recorded when taking 5 μ A of p-beam at HRS
 - Activated air emissions seem acceptable but measurement conditions unsure.

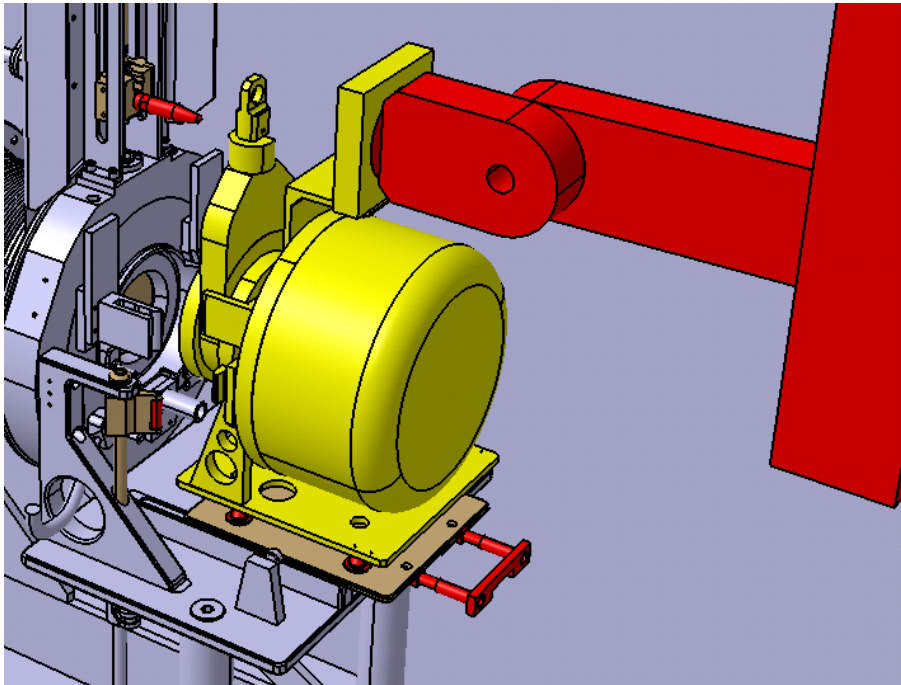
LTU -Ventilation



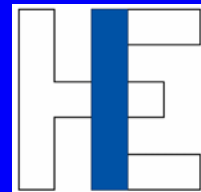
- Dissociate target area and Class A lab ventilation systems
- Eliminates the need for such a low under-pressure in target area thus reducing air flow
- Separate ventilation system for Class A lab
- Requires double door sealing between the 2 areas



LTH -Target Handling



- Initial contact with Tampere University of Technology, Finland
- Participation by TS/HE (remote handling at CERN)
- Initial proposition based on existing facility
- Application of funding to the Finnish Technology Research Foundation
- Joint development leading to shared patent



Target Assembly



Summary

- The HIE Target Area sub-project is growing in importance hence the need for a solid project plan.
 - The question of available resources remains
- The activated air issues witnessed at ISOLDE over the last 2 years have to be seriously considered within the HIE ISOLDE project .
- Radiation protection issues will play a key role in defining the future layout of the target area, experimental hall and equipment – has to be addressed asap.
- Collaboration with Tampere University in Finland is promising.

Acknowledgements

- A. Dorsival SC-RP
- L. Bruno AB-ATB-IF
- J. Helen Sarret AB-ATB-IF
- D. Hovarth AB-ATB
- Tampere University of Technology, Finland
- Tobias Dobers and TS-SU