

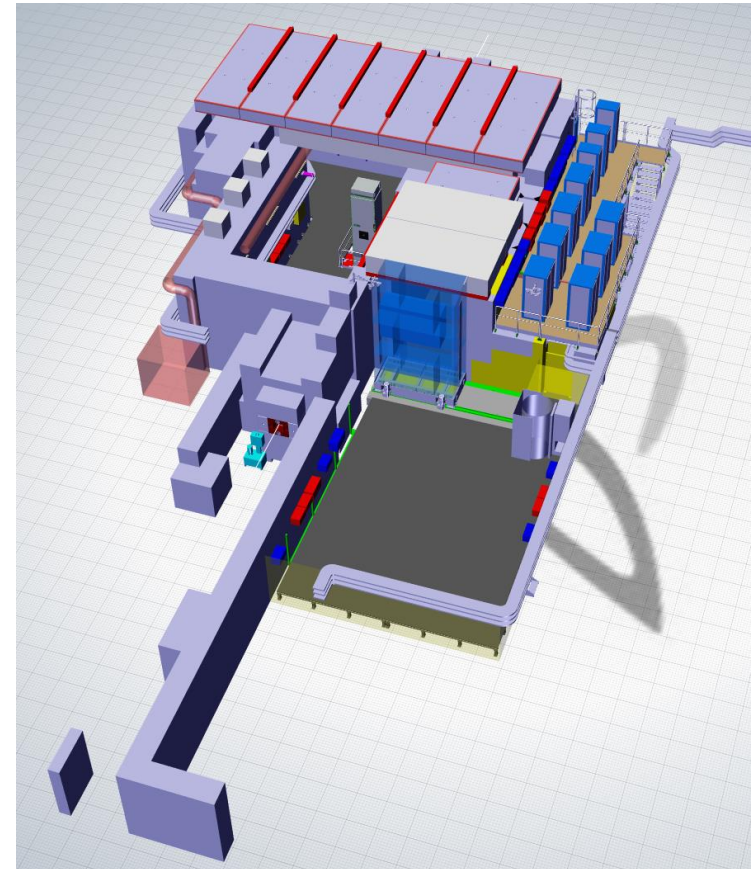
# GIF in EHN1- layout, construction and schedule

Adrian Fabich, EN-MEF-LE

GIF users meeting, 12<sup>th</sup> February 2014

## Project: GIF in EHNI

- ▶ Layout
- ▶ Technical infrastructure
- ▶ Status



<https://edms.cern.ch/nav/SMTII37:ST0428786>  
version a.15

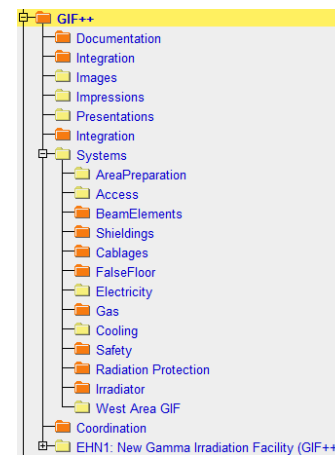


# Document repositories

<http://cern.ch/sba>

- ▶ **Glossary:** <https://espace.cern.ch/sba-workspace/gifpp/SitePages/Glossary.aspx>
- ▶ **Indico**
  - ▶ <http://indico.cern.ch/categoryDisplay.py?categId=5229>
- ▶ **EDMS (all drawings)**
  - ▶ <https://edms.cern.ch/nav/P:CERN-0000077502:V0/P:CERN-0000088840:V0/TAB3>

- ▶ In case of access troubles,  
send an e-mail to me.



# PH responsibilities

- ▶ Defining users' requirements
- ▶ Irradiator procurement



## On-going:

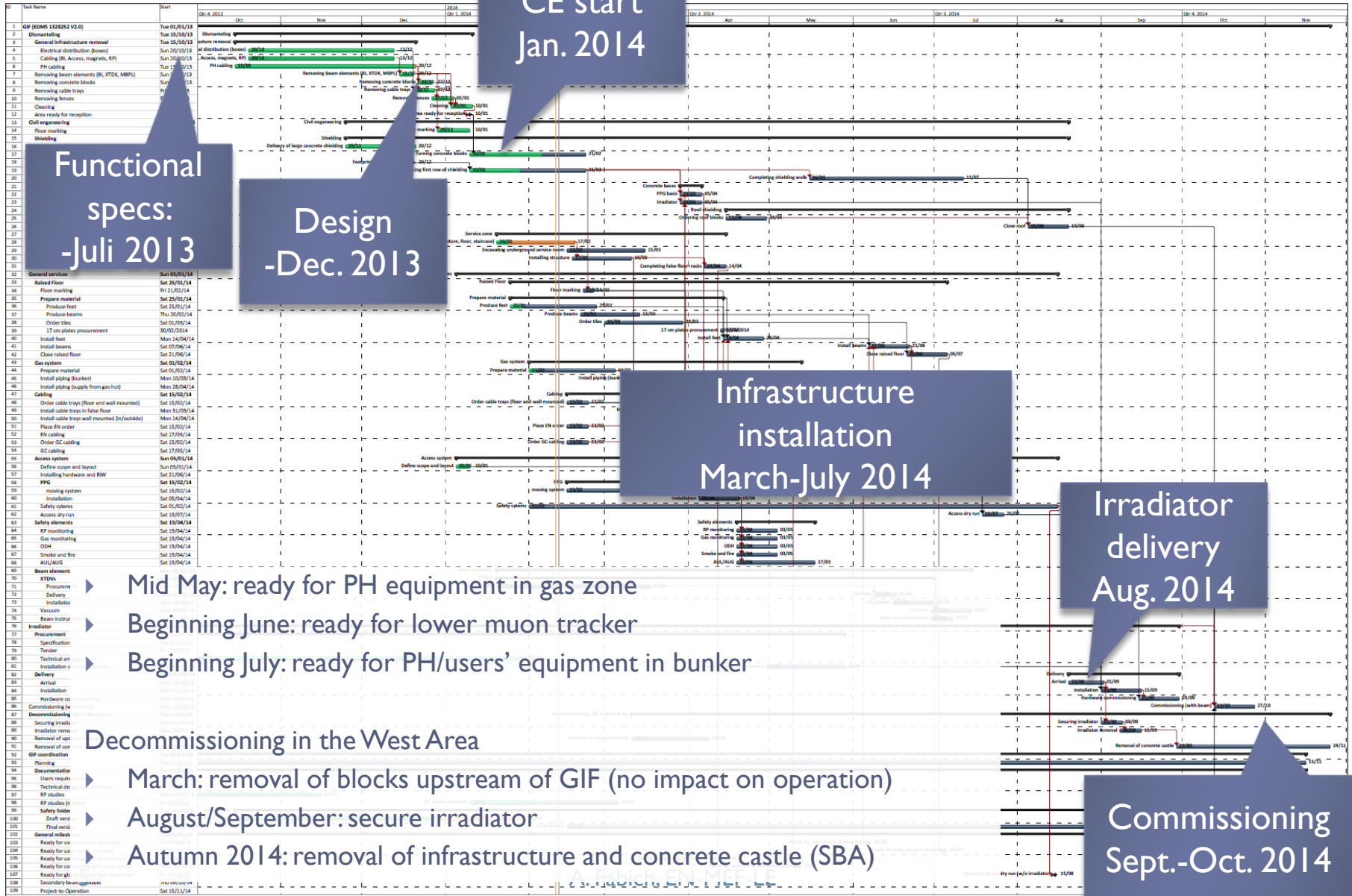
- ▶ Equipment in the gas (mixing) zone
  - ▶ analysers, mixers ... + ATEX conformity
- ▶ Construction of permanent  $\mu$ -detectors, environmental sensors
- ▶ Slow control of irradiator, gas equipment, logging
- ▶ DAQ system

## USING THE FACILITY



EDMS I328252 V0.3

# Schedule



CE start Jan. 2014

Functional specs: -Juli 2013

Design -Dec. 2013

Infrastructure installation March-July 2014

Irradiator delivery Aug. 2014

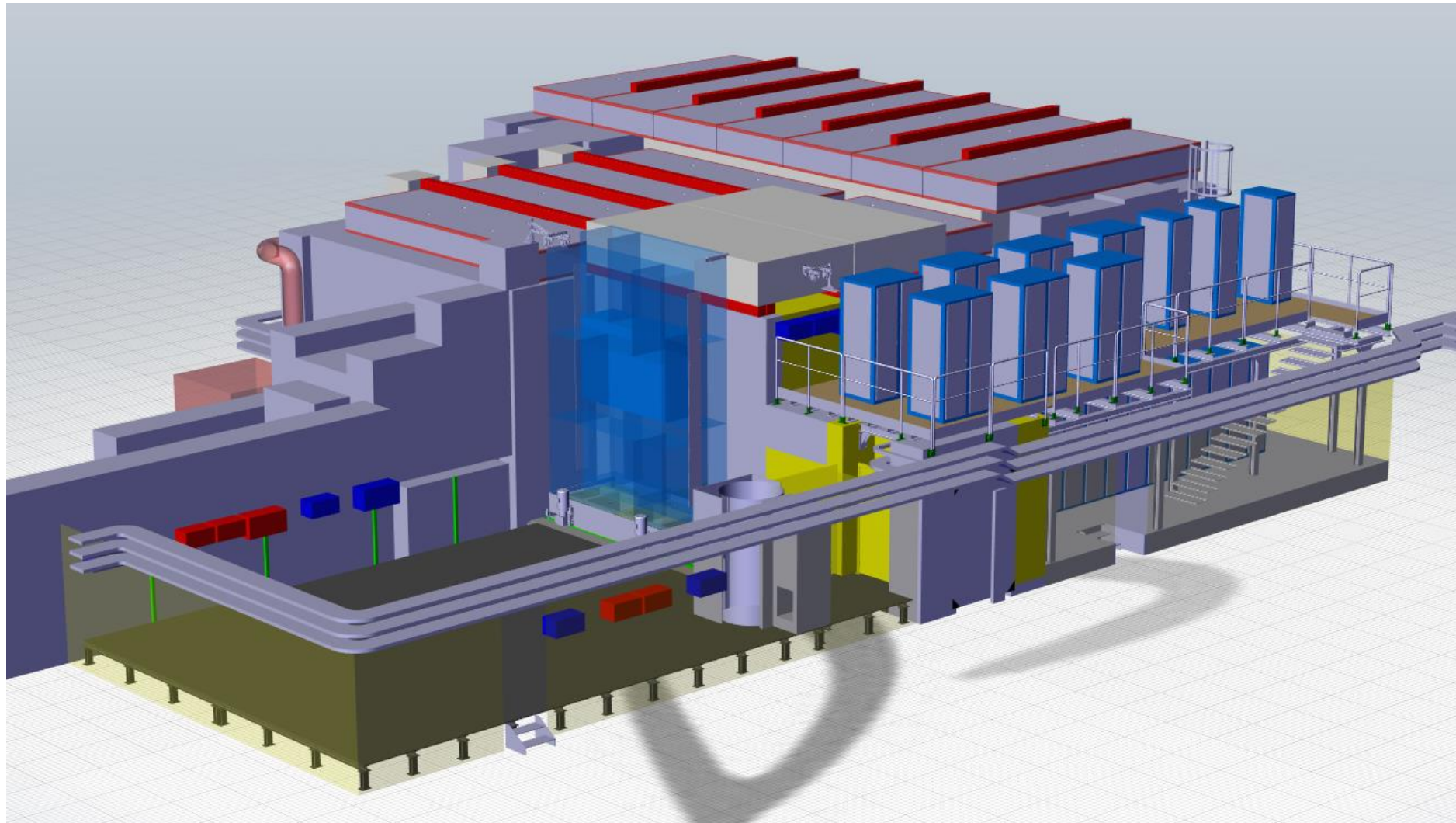
Commissioning Sept.-Oct. 2014

- ▶ Mid May: ready for PH equipment in gas zone
- ▶ Beginning June: ready for lower muon tracker
- ▶ Beginning July: ready for PH/users' equipment in bunker

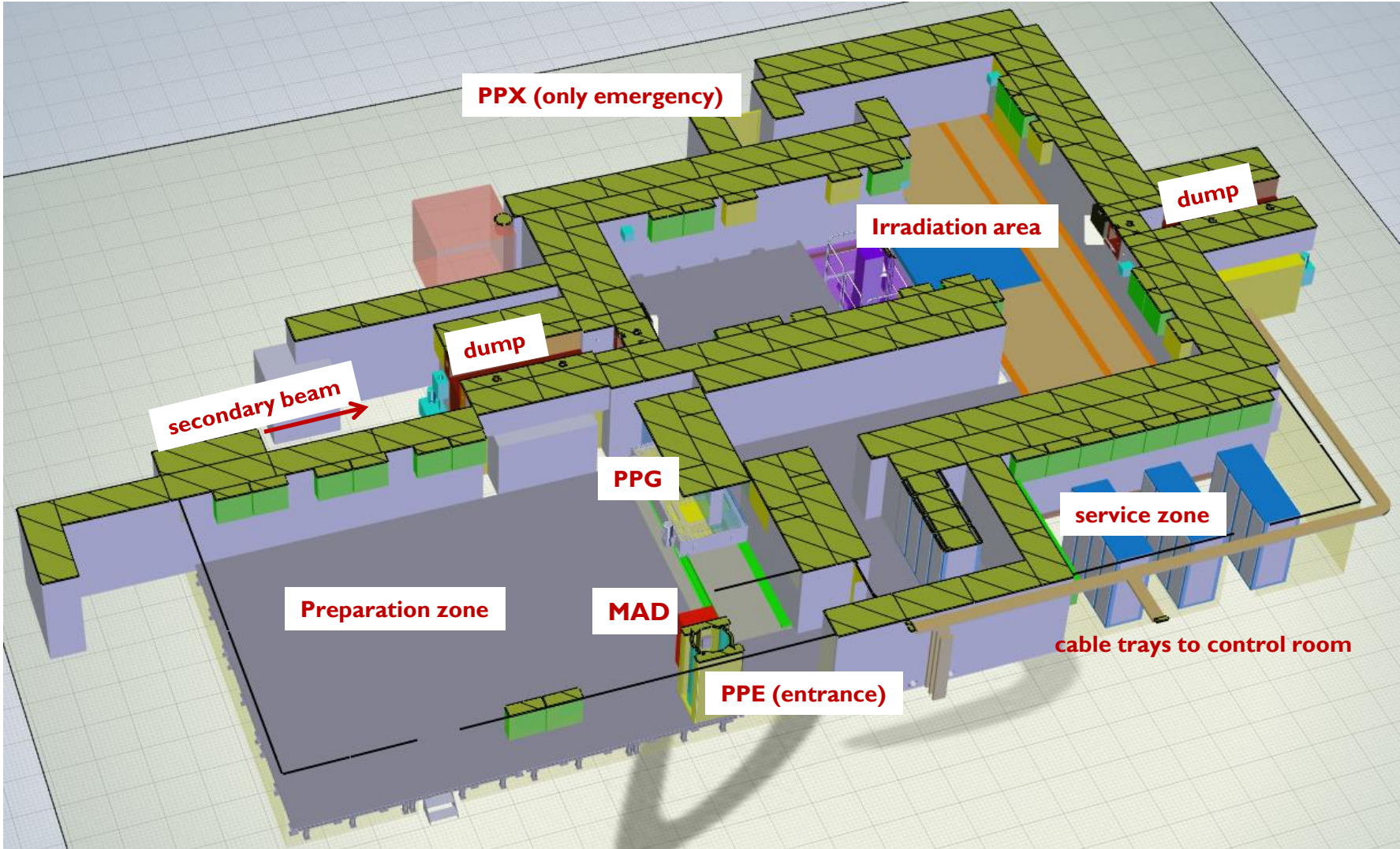
### Decommissioning in the West Area

- ▶ March: removal of blocks upstream of GIF (no impact on operation)
- ▶ August/September: secure irradiator
- ▶ Autumn 2014: removal of infrastructure and concrete castle (SBA)

# View from Saleve



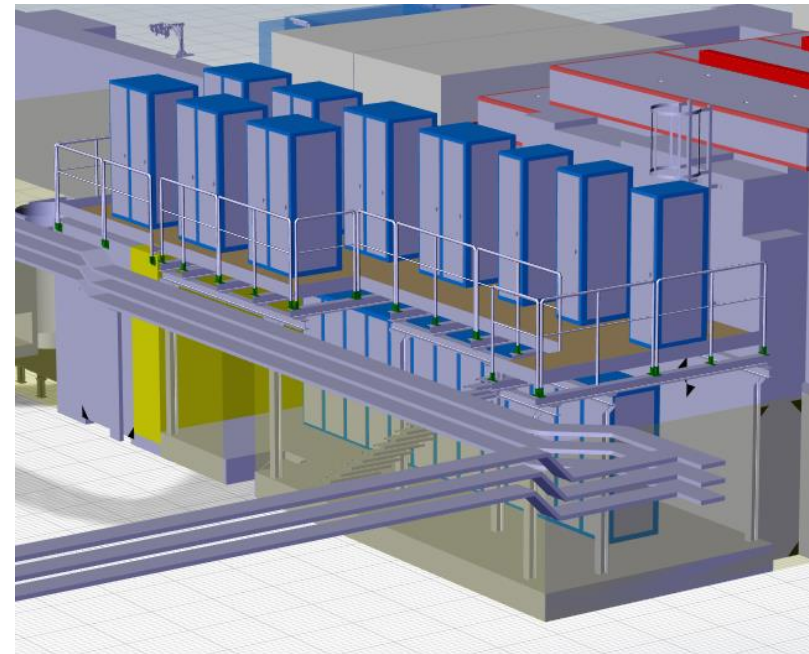
# GIF++ layout (1)



# Service zone

Two floor area hosting

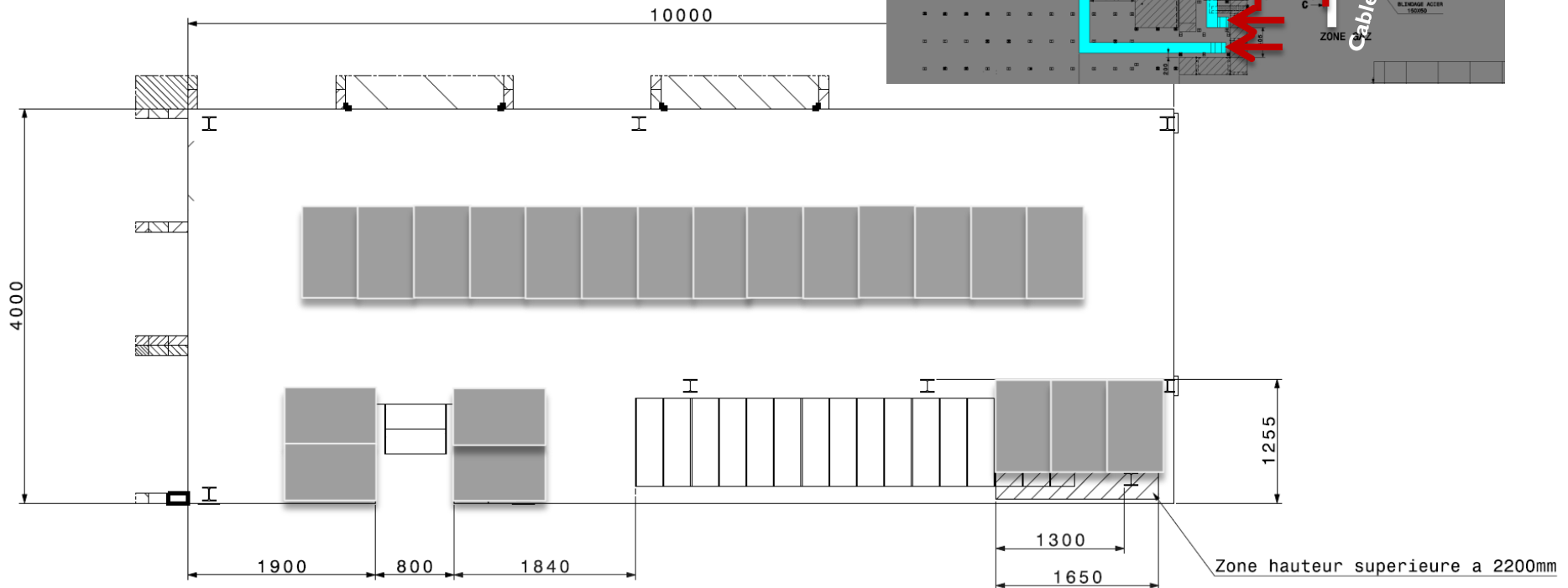
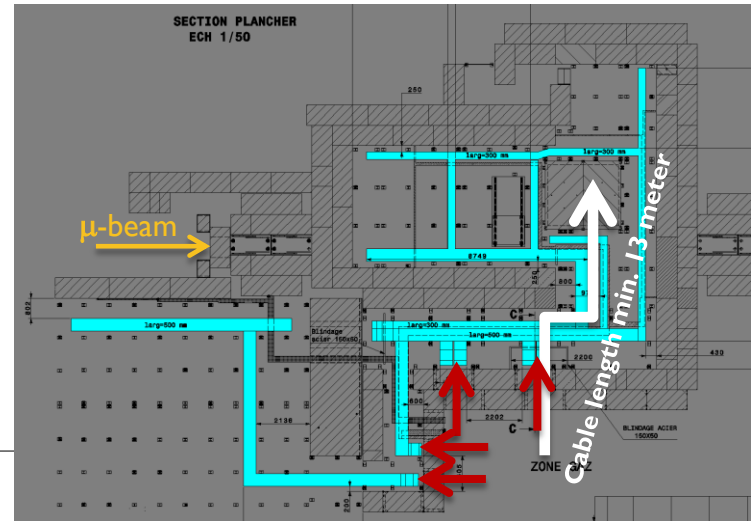
- ▶ Electronic racks (ground floor)
- ▶ Gas mixing zone (first floor)
  - ▶ In agreement with HSE
- ▶ Fenced area
- ▶ Both are equipped with raised floor.
- ▶ More than 35 racks in total





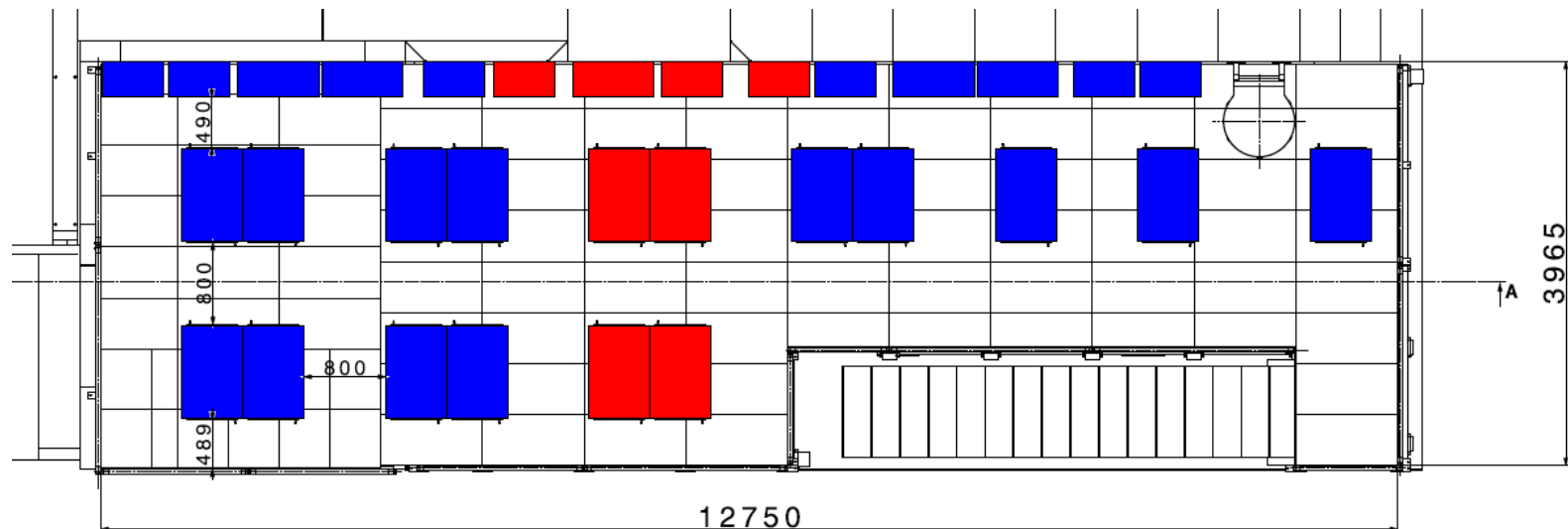
# Service zone: electronic racks

- ▶ 33 m<sup>2</sup> net space
- ▶ 20 electronic racks
- ▶ Patch panels to be defined
- ▶ Minimum cable length 13 m
  - ▶ From rack to downstream irradiation field



# Service zone: gas (mixing) zone

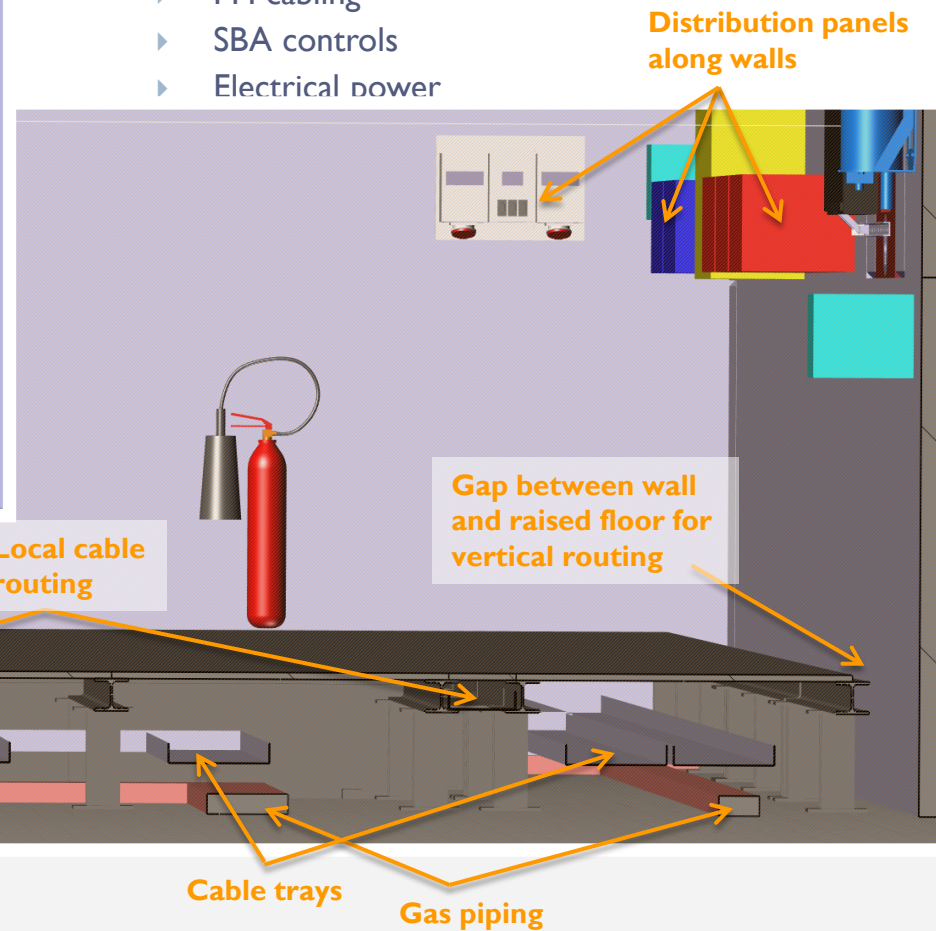
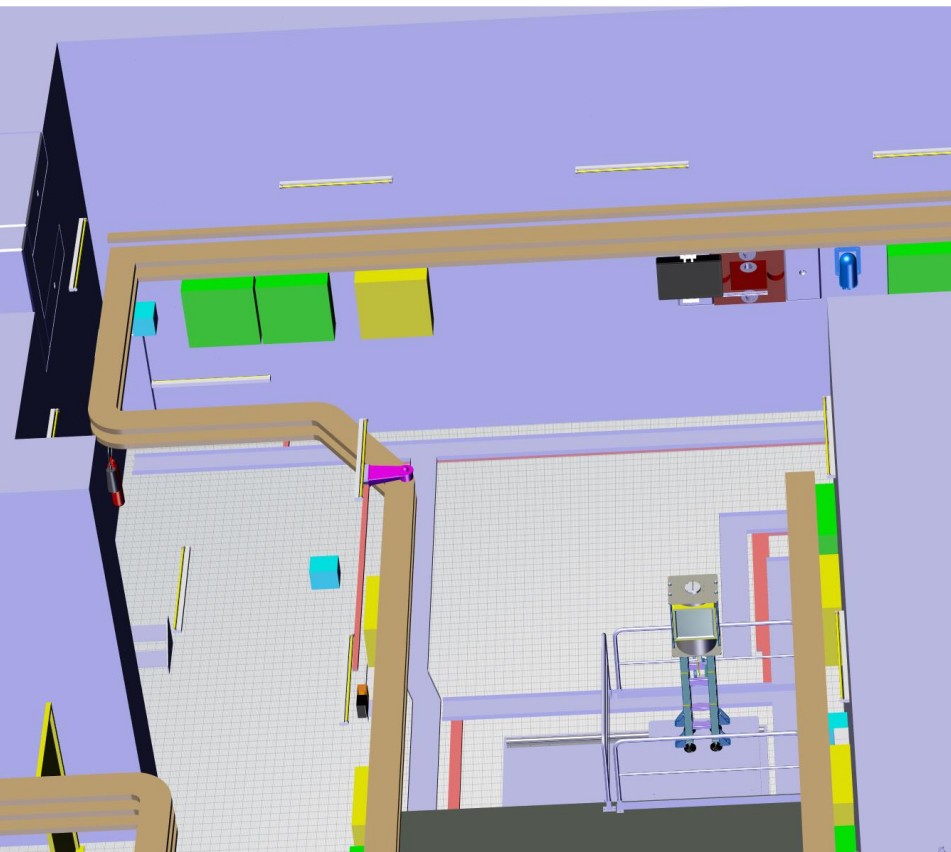
- ▶ Supply lines for 15 gases simultaneously
- ▶ 40 m<sup>2</sup> net area
- ▶ 8 distribution panels with each 6 return lines
- ▶ 17 racks for gas equipment
- ▶ 6 km of piping (304L / 316L)



# Cable paths in the bunker

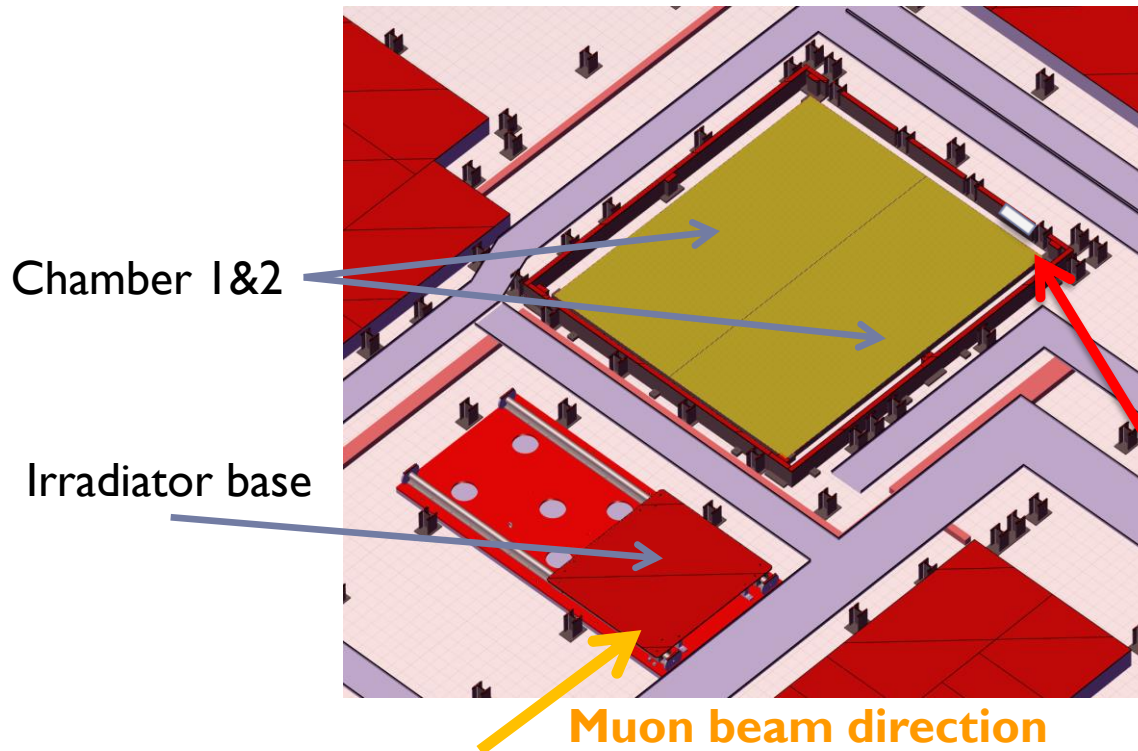
Two routing possibilities

- ▶ In the false floor  
for permanent installations (SBA and PH)
- ▶ Along the walls
- ▶ Three cable trays
  - ▶ PH cabling
  - ▶ SBA controls
  - ▶ Electrical power



# $\mu$ -detector in the raised floor

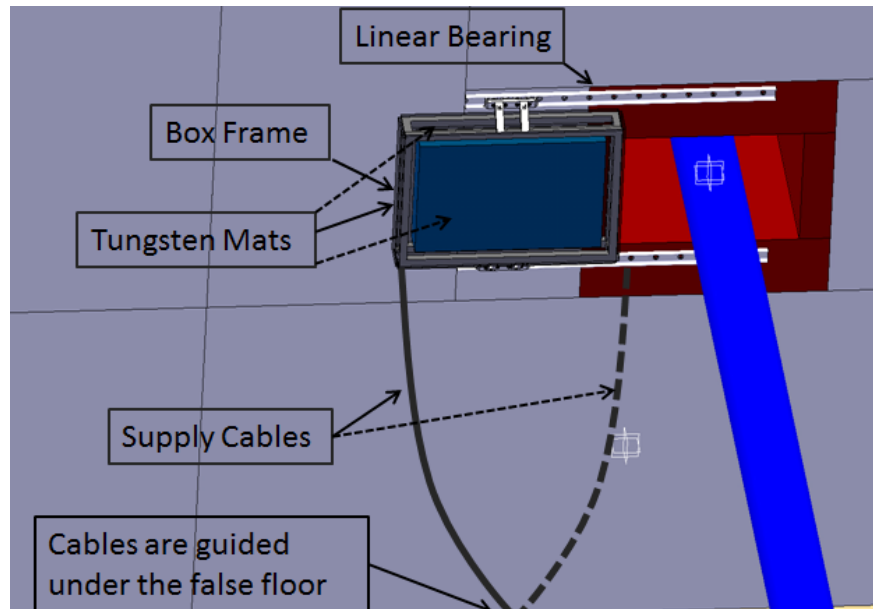
- ▶ Integrated based on Davide's input (technical drawing)



- ▶ Single passage of piping/cabling at the downstream side

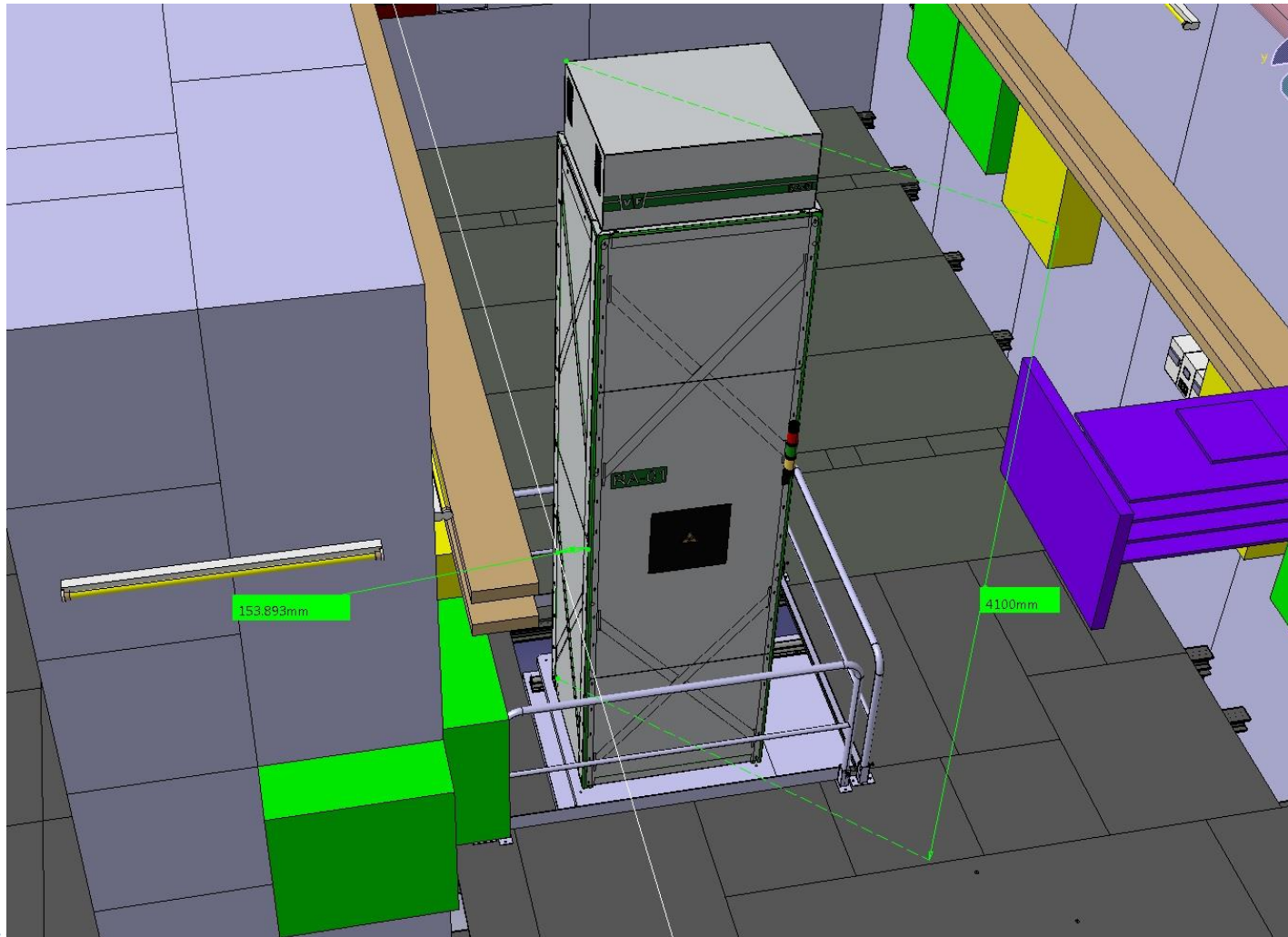
# Beam muon trigger

- ▶ We would appreciate integration drawings.



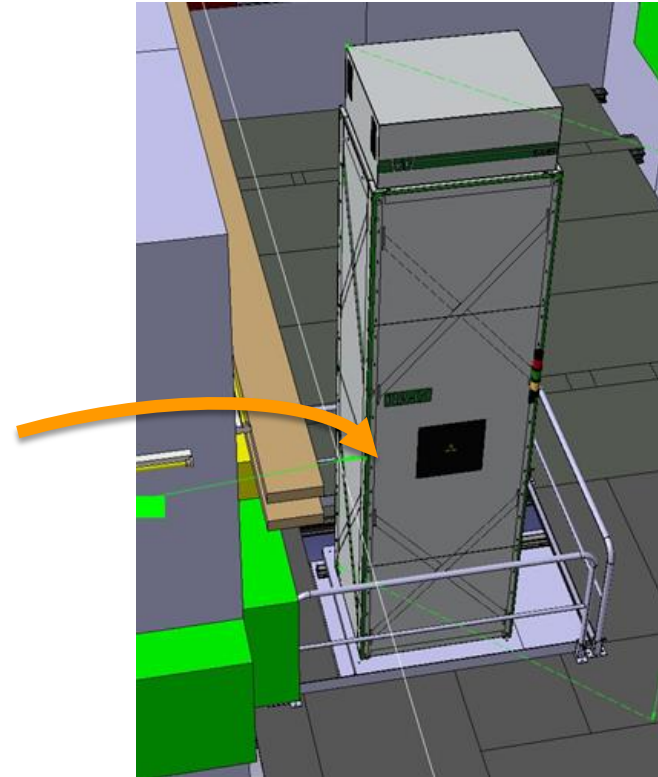
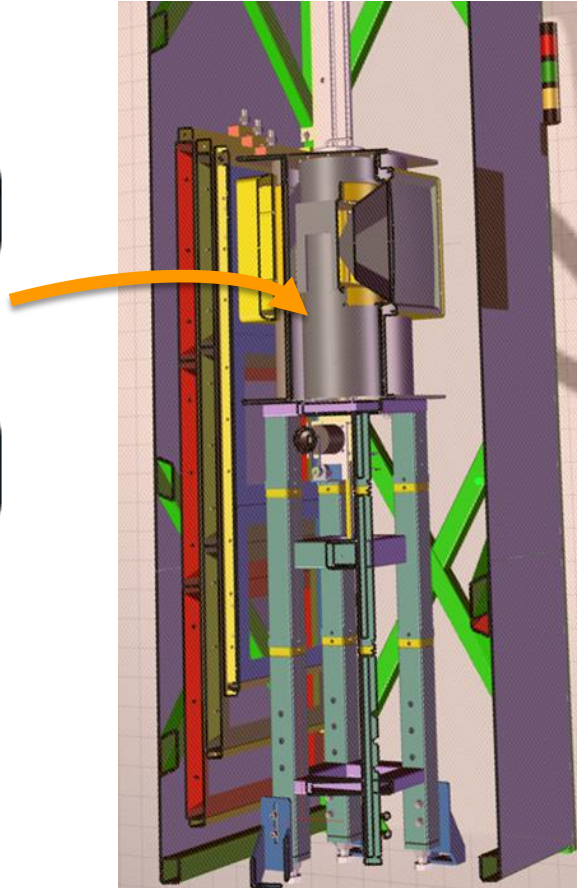
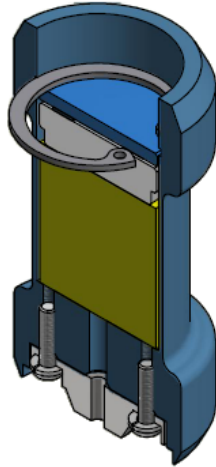
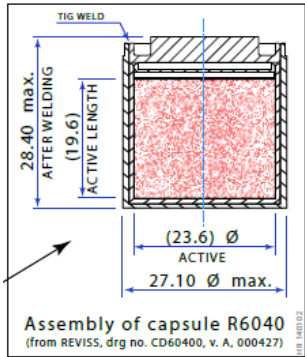
- ▶ Currently we assume, that the triggers will be provided with the supporting frame (sliding mechanism).

# Irradiator- Integration



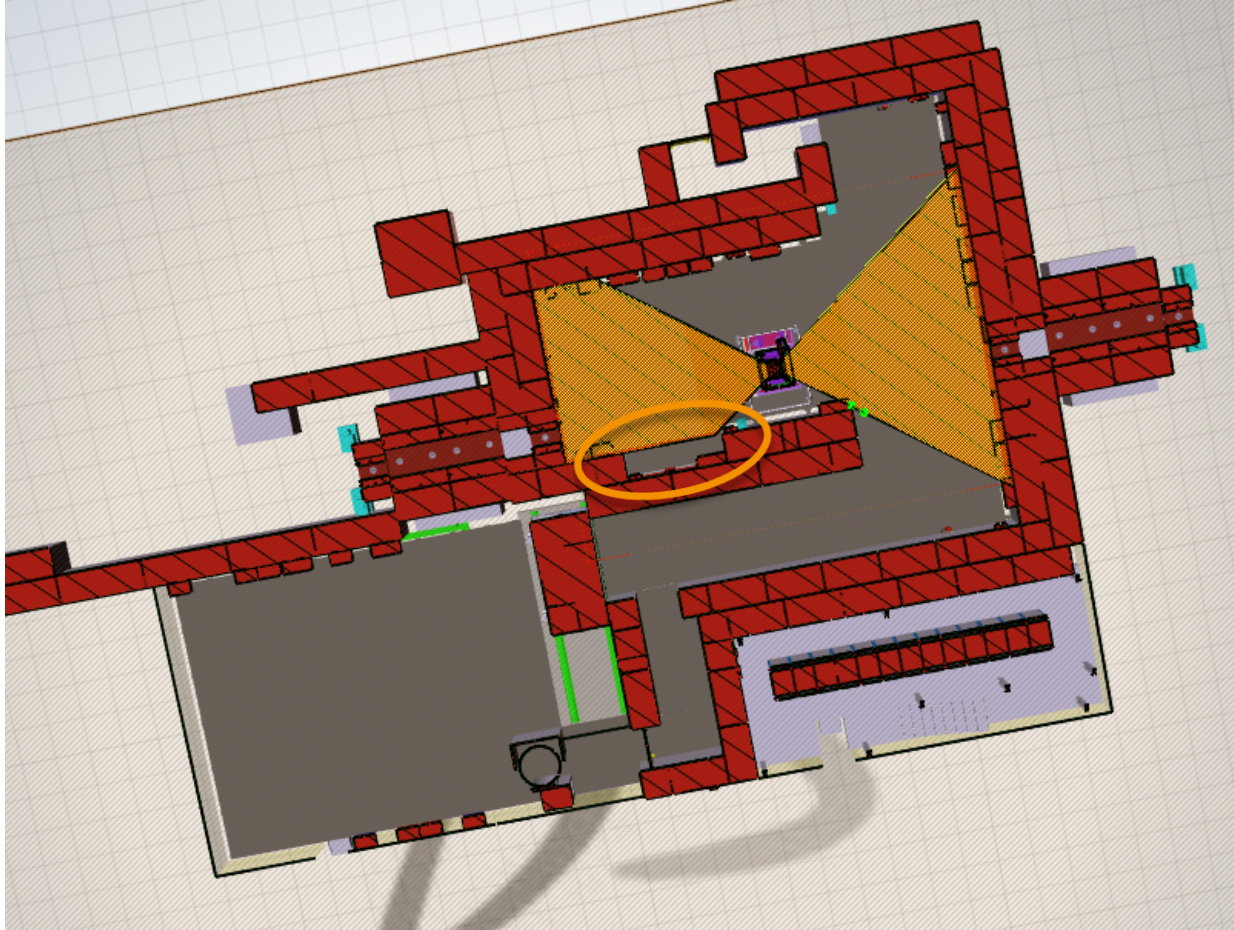
# Irradiator

hosting a  $^{137}\text{Cs}$  source: 14 TBq



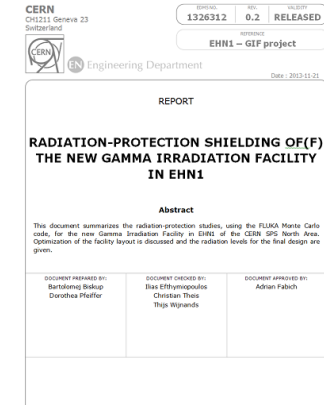
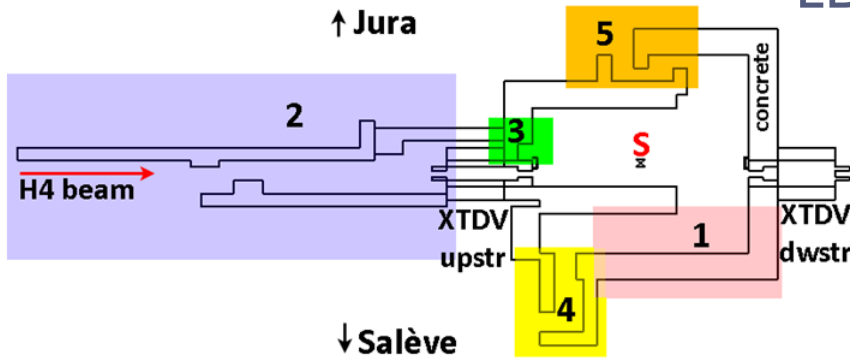
Irradiator will be equipped with a identical **filter system on both sides** (up- and down-stream)

# Extension of upstream irradiation area



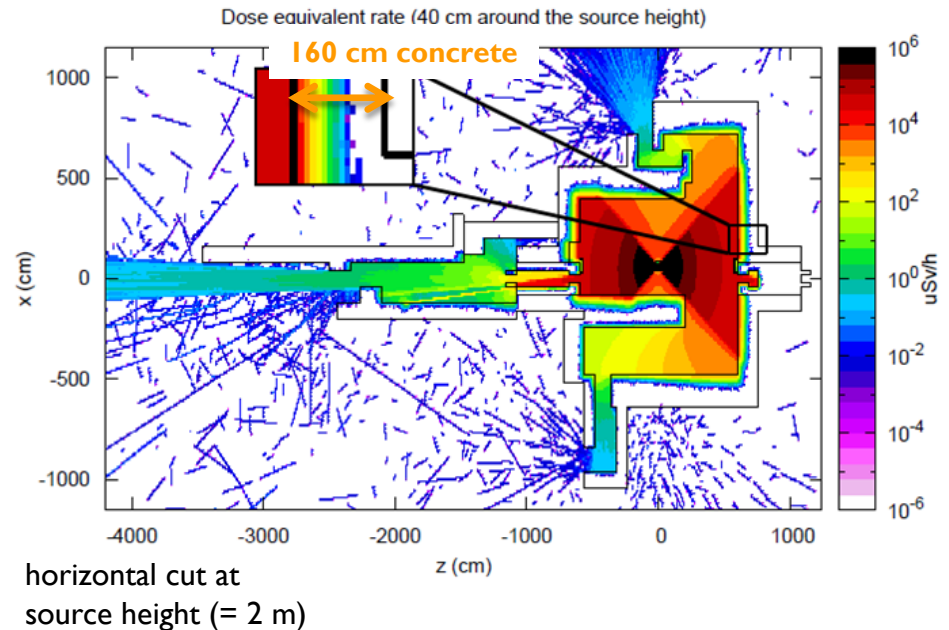


EDMS 1326312



## Case studies

- ▶ Shielding walls
- ▶ Chicanes
- ▶ Feed-throughs
- ▶ Roof area
- ▶ Neighbouring zones



# Safety conditions for active irradiator/beam

Exclude direct exposure to  $\gamma$ -source

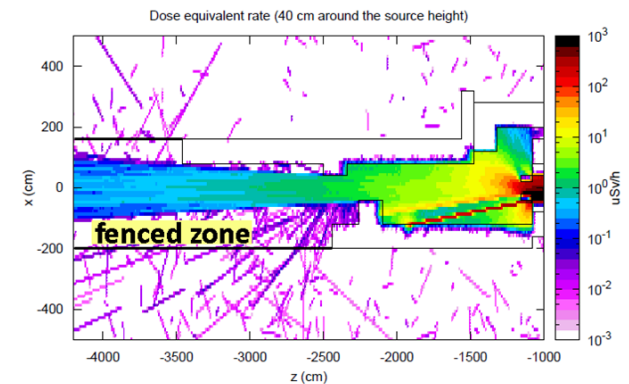
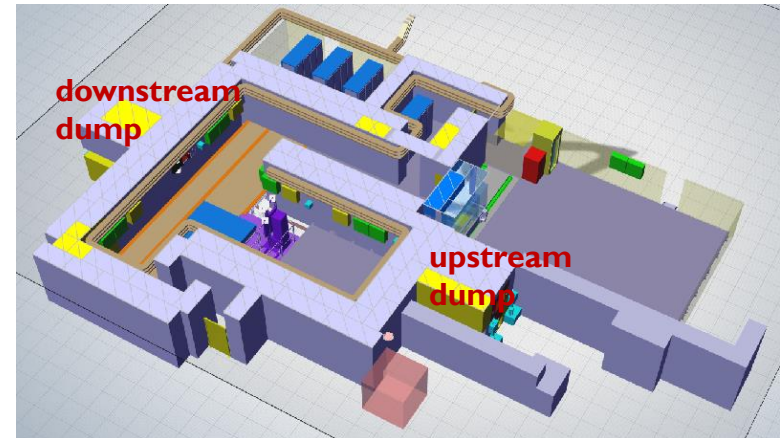
Source out of parking position only possible if

- ▶ GIF++ access chain is SAFE
- AND (protecting in upstream zone)
  - ▶ Upstream beam dump is IN-BEAM
  - OR
  - ▶ PPE144 is CLOSED (no access)
- AND (protecting in downstream zone)
  - ▶ Downstream beam dump is IN-BEAM
  - OR
  - ▶ PPE164 is CLOSED (no access)
- AND (no alarms)
  - ▶ No RP veto
  - ▶ No fire
  - ▶ No power failure
  - ▶ No emergency stop button (AUL/AUG)

Irradiator controls included in industrial delivery.

**Veto/alarm or electricity cut from CERN safety chain will force source into parking position.**

- ▶ EHNI standard conditions for secondary beam operation





# Beam time examples

18-Apr-2011

## 2011 SPS Fixed Target Programme

Version 1.0

Colour code: blue (dark shading) = not yet allocated ; yellow (light shading) = not allocatable or Machine Development

2011

	P1	P2	P3	P4	P5	P6
	35 26 Apr 31 May	35 31 May 5 Jul	35 5 Jul 9 Aug	35 9 Aug 13 Sep	35 13 Sep 18 Oct	34 18 Oct 21 Nov
T2 -H2	NA 22	NA61 TR, CMS MPGD, CALICE SDHCAL	CMS PLT, CMS CALO	NA61 Protons, NA61-Protons	NA61 Protons, CMS SiBT, CREAM	CMS CALO, CMS CALO, NA61 Ions+2.5weeks
T2 -H4	NA 22	CMS ECAL, H4IRRAD	RD51, PHOTAG	CMS ECAL LHCb, RD51	NA63 Electrons, SOIPIX, FAIR, CALET, PEBS	CMS ECAL, LH
T4 -H6	NA SiLC, PIX	NA62 STR, ALICE SPD	CERF, RD42	DEPFET RD42, APPS, AIBCM, RD42	AIDA TK, SILC, A, A, BELLE SuperB, ATLAS IBL, BELLE II SVD	NA62 PIX

2-May-2012

## 2012 SPS Fixed Target Programme

Version 1.0

Colour code: blue (dark shading) = not yet allocated ; yellow (light shading) = not allocatable or Machine Development

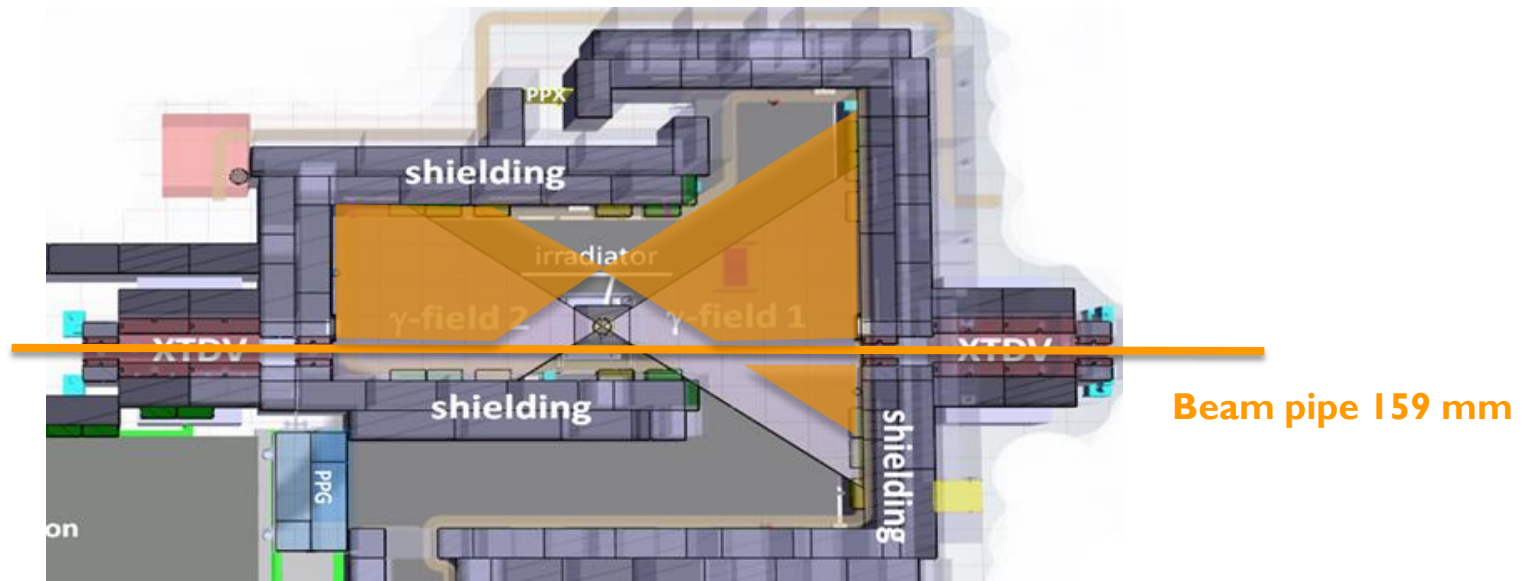
2012

	P1	P2	P3	P4	P5	P6
	39 15 Apr 24 May	39 24 May 2 Jul	39 2 Jul 10 Aug	39 10 Aug 18 Sep	39 18 Sep 27 Oct	37 27 Oct 3 Dec
T2 -H2	NA Setup, CALICE SDHCAL	CMS MPGD, A CREAM, NA61 TR, NA61 pPb	NA61-pPb	NA61 pPb, NA61 Ions	NA61 Ions, NA61 Ions, CMS CALSiBT	TWICE SCE, SDHCAL, MMEGAS
T2 -H4	NA Setup, CMS ECAL, H4IRRAD	H4IRRAD, RD51, CMS ECAL	PHOTAG, RD51, SOIPIX, H4IRRAD, LHCf	NA63, PANDA, DAMPE	CMS ECAL, RD51, H4IRRAD	
T4 -H6	NA XSECT, IBL	A IBL, CERF	RD42, A MMEGAS, A BCM, AIDA	MONOPIX	CBM, BELLE, BELLE II SVD, A BELLE II SVD	NA62, AIBCM, BELLE II SVD, PIX



# Impact of downstream zones on GIF operation

- ▶ PPE 164 downstream of GIF
  - ▶ Primarily electron beam
  - ▶ Requires installation of vacuum pipe through GIF
  - ▶ Access needs to be coordinated with main user



- ▶ Neutrino Detector facility in EHNI extensions
  - ▶ Construction of extension possibly starts end 2014
  - ▶ In operation from 2016/2017 (educated guess)
  - ▶ Similar effect on GIF operation as PPE164 as main user
    - ▶ E.g. doubling the duration of GIF vacuum installation and reduced access flexibility to GIF

# Status PPE154



- ▶ Gas piping to be installed from March 2014 onwards
- ▶ Followed by cabling
  - ▶ Requirements input needed “today” for cable ordering
- ▶ On track for receiving the irradiator by end August 2014

