

Safety summary – MEDICIS Project

Medicis Seminar, 2nd and 3rd March 2016

AP.Bernardes on behalf on EN/STI/RBS section



ENGINEERING
DEPARTMENT

Outline

- Introduction
- Shielding/Radioprotection
- Access & Interlocks
- Safety file

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Introduction

WP 4: RP Monitoring see presentation D.Perrin – HSE/RP

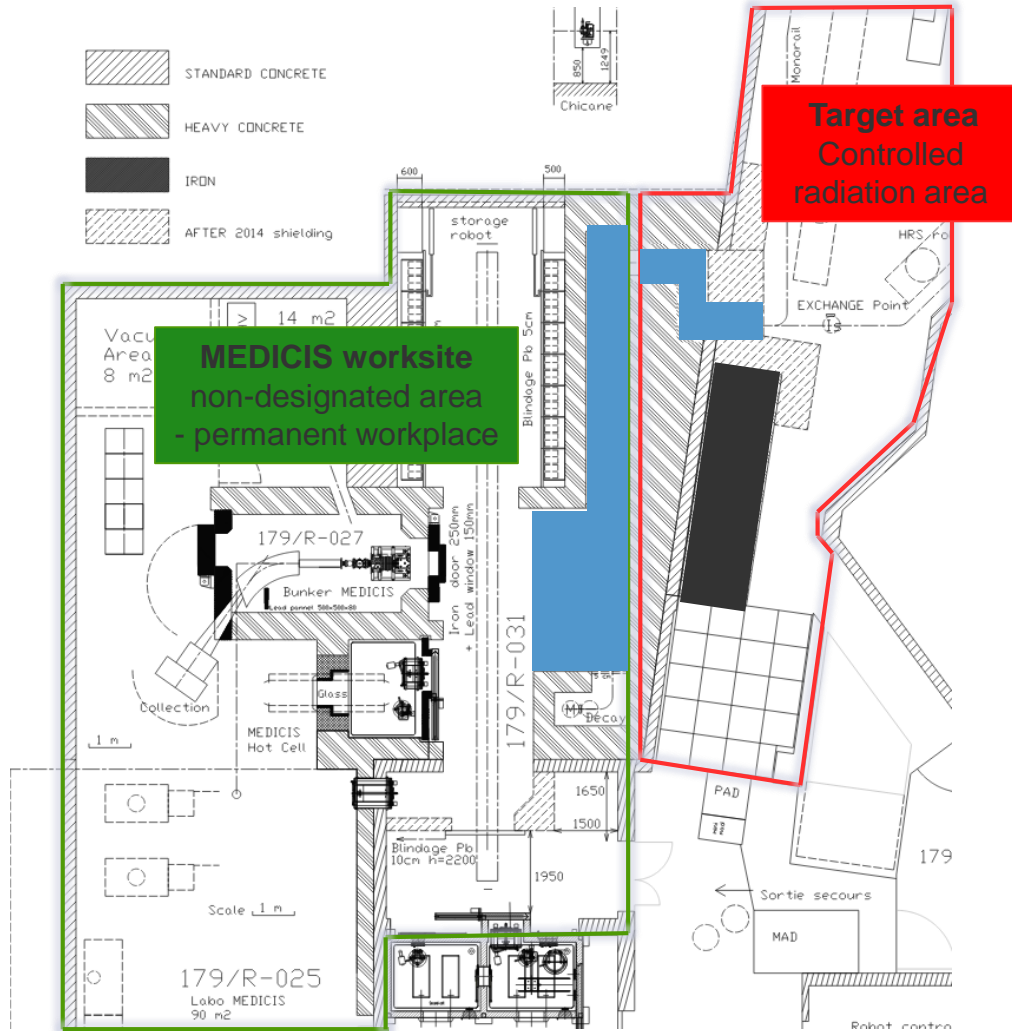
WP 14: Ventilation see presentation M.Battistin – EN/CV

WP 15: Safety Systems see presentation S.Grau – BE-ICS

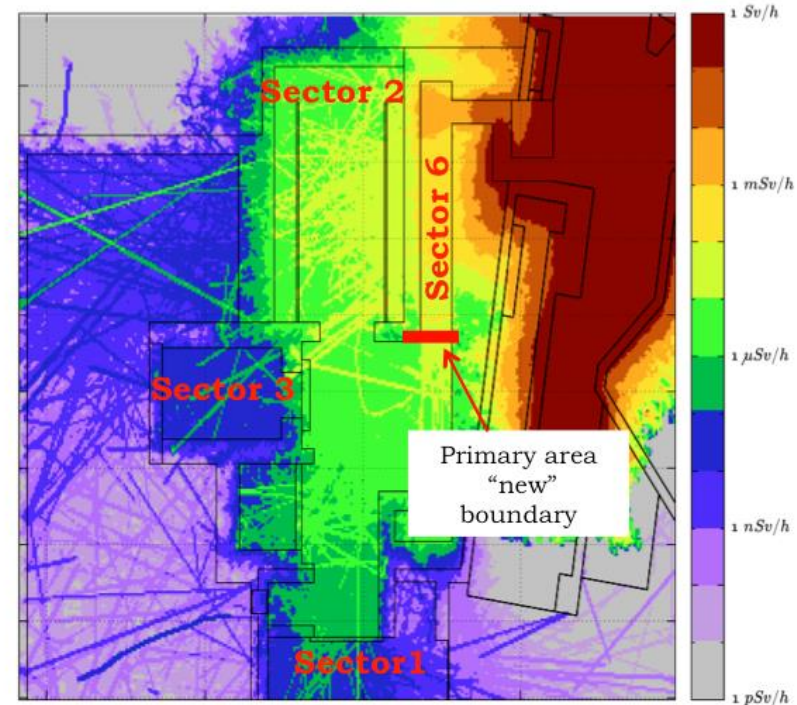
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- **Shielding/Radioprotection**
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Shielding/Radioprotection



After LS1 : Shielding should allow free access to MEDICIS worksite

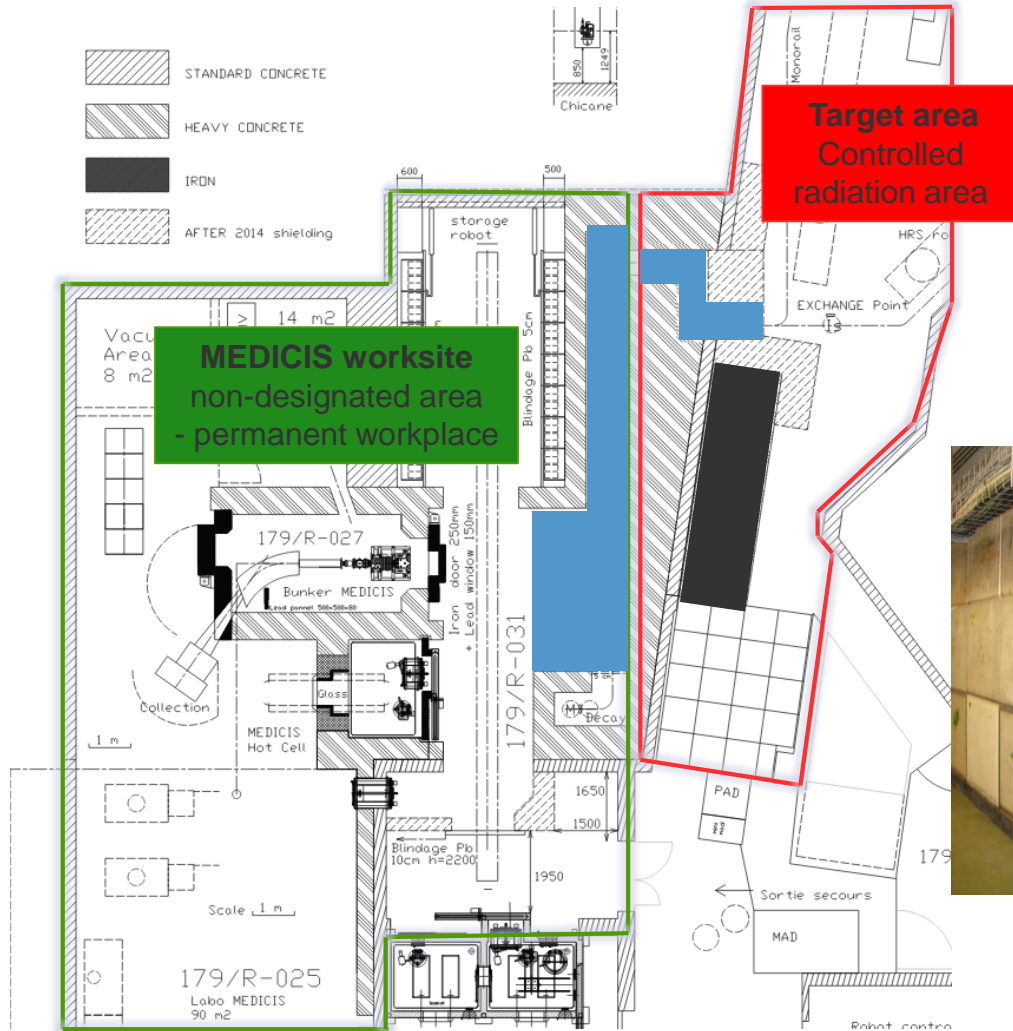


Ambient dose equivalent rate during ISOLDE operation target

HIE ISOLDE parameters EDMS 1371498 (R. S. Augusto)

Acknowledgements: R.S.Augusto, S.Marzari, M.Vagnoni EN/STI
 Fluka study by R.S.Augusto in [EDMS 1371498](#)

Shielding/Radioprotection

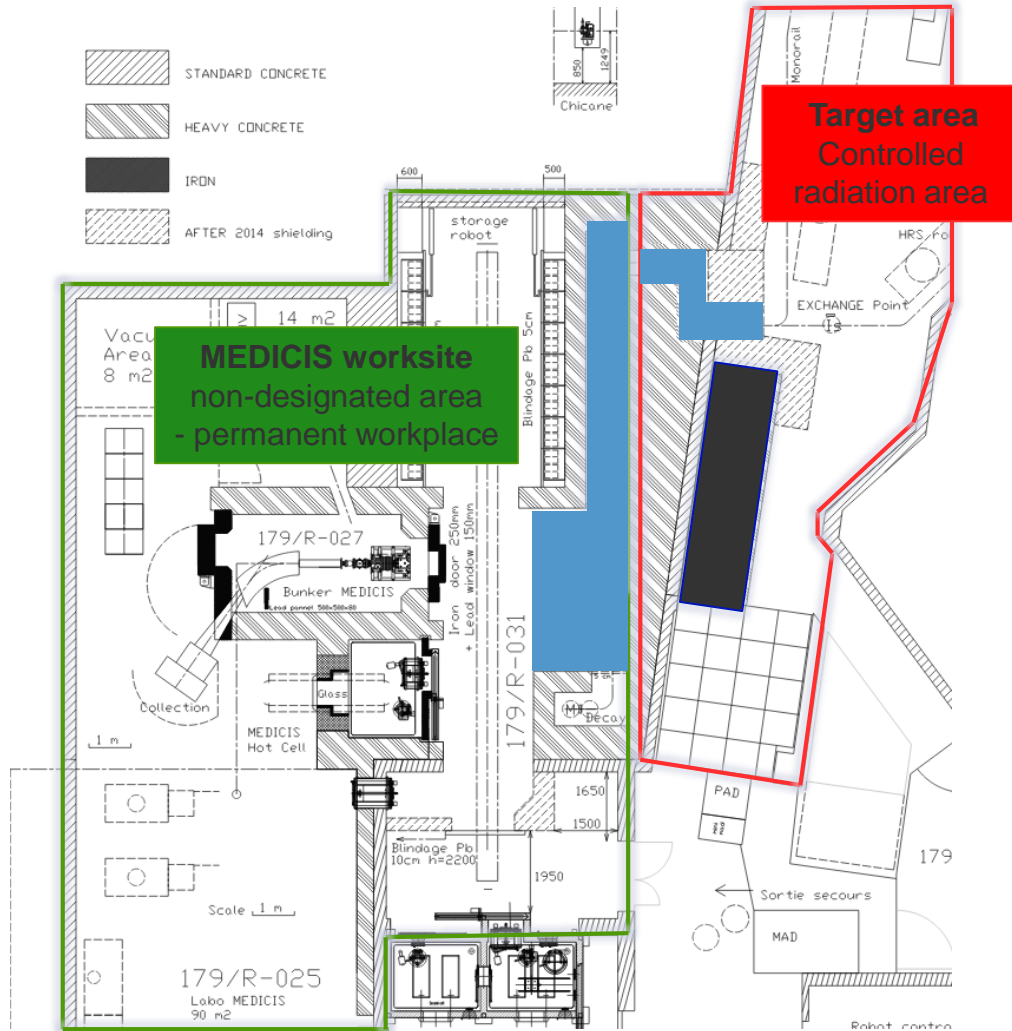


- After LS1** : Shielding should allow free access to MEDICIS worksite
- Part of final shielding installed at the end of LS1 (ALARA principle)
 - Temporary shielding installed (magnetite powder + magnetite bricks inside chicane)



Acknowledgements: R.S.Augusto, S.Marzari, M.Vagnoni EN/STI
Fluka study by R.S.Augusto in [EDMS 1371498](#)

Shielding/Radioprotection



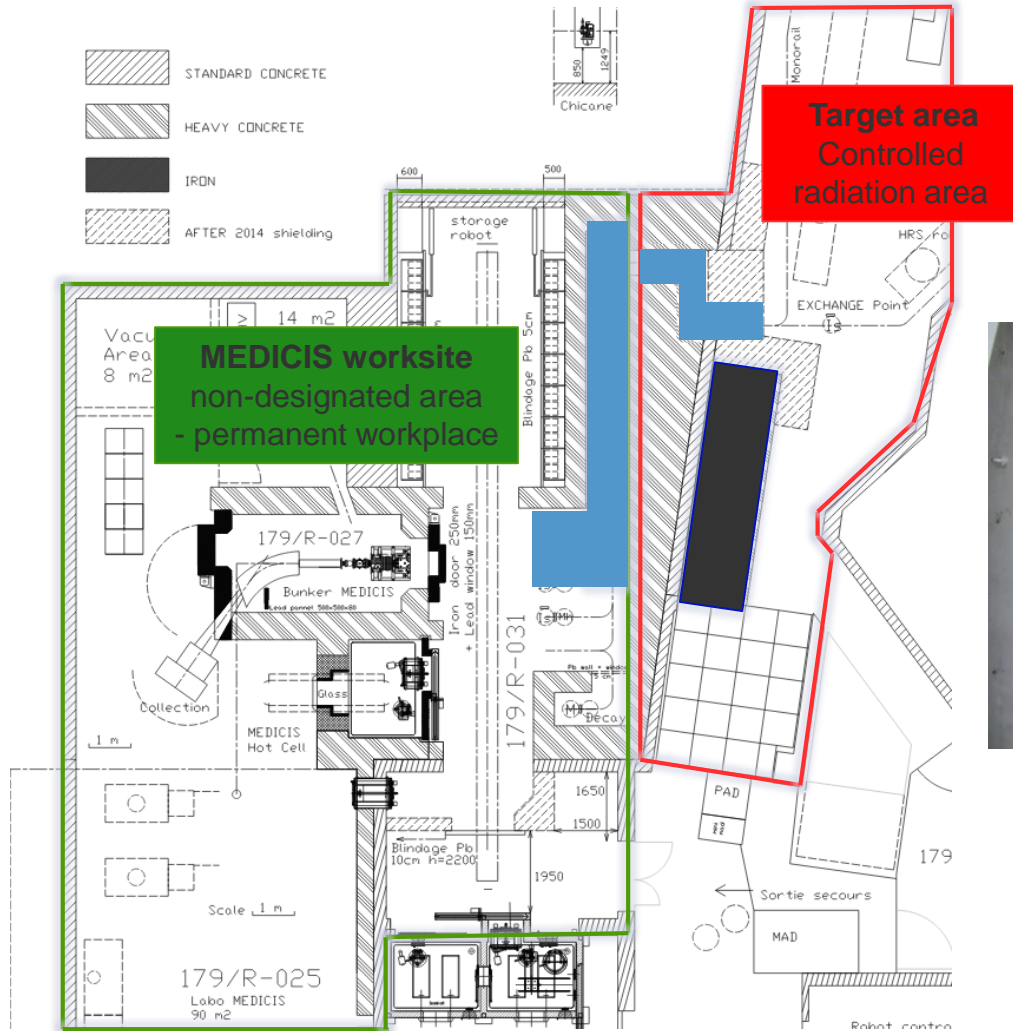
December 2014:

- Partial removal of magnetite powder



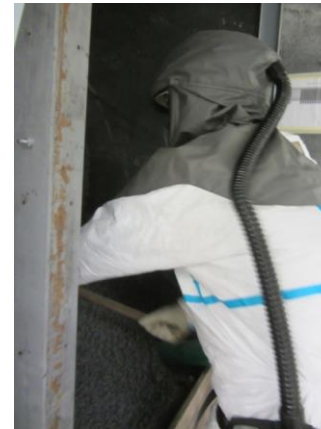
Acknowledgements: R.S.Augusto, S.Marzari, M.Vagnoni EN/STI
Fluka study by S. Damjanovic & J.Vollaire HSE/RP in [EDMS 1483657](#)

Shielding/Radioprotection



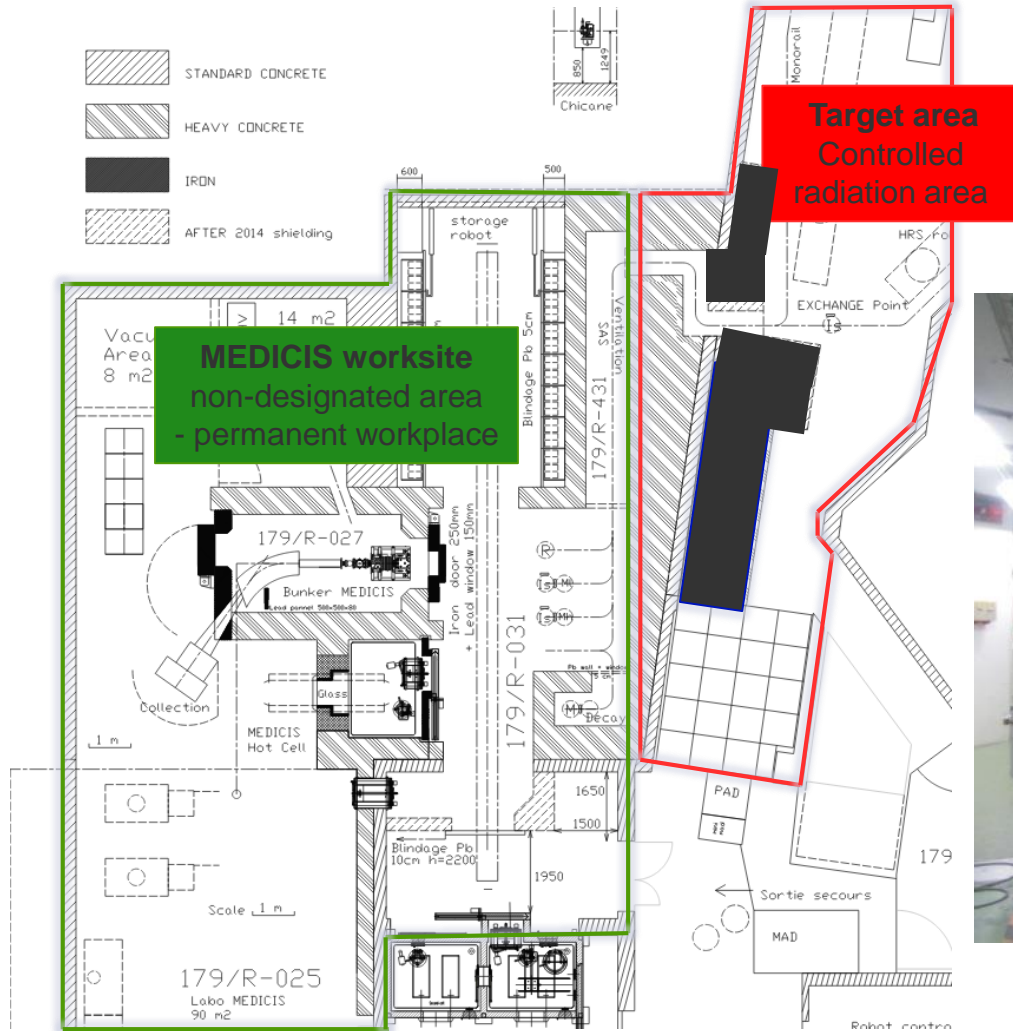
December 2015:

- Final removal of magnetite powder
- Final removal of magnetite bricks



Acknowledgements: R.S.Augusto, S.Marzari, M.Vagnoni EN/STI
Fluka study by R.S.Augusto in [EDMS 1371498](#)

Shielding/Radioprotection



February 2016:

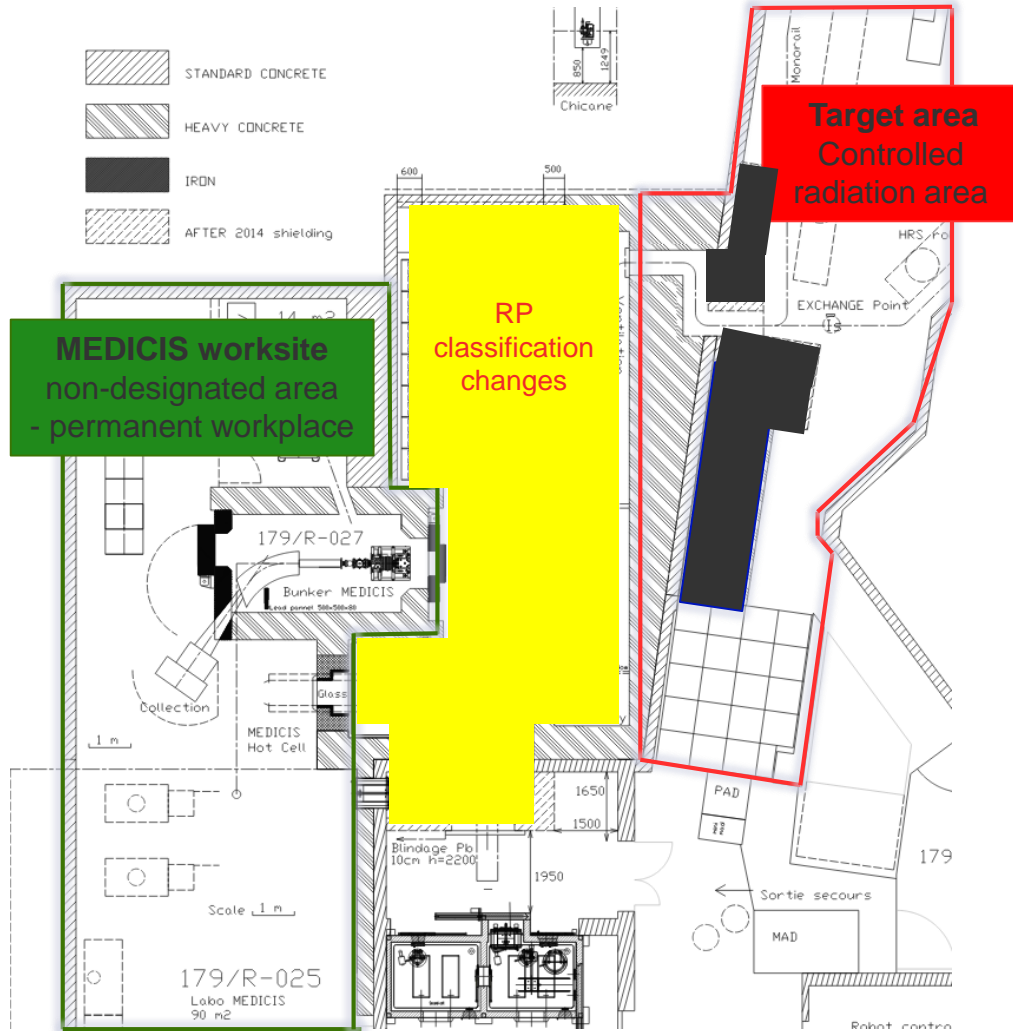
- Final shielding completion inside target area (Supervised by M.Vagnoni & JL.Grenard)



Acknowledgements EN-HE handling work

Acknowledgements: R.S.Augusto, S.Marzari, M.Vagnoni EN/STI
 Fluka simulation studies (shielding as built) by S.Damjanovic and J.Vollaire in [EDMS 1583337](#)

Shielding/Radioprotection - Planning



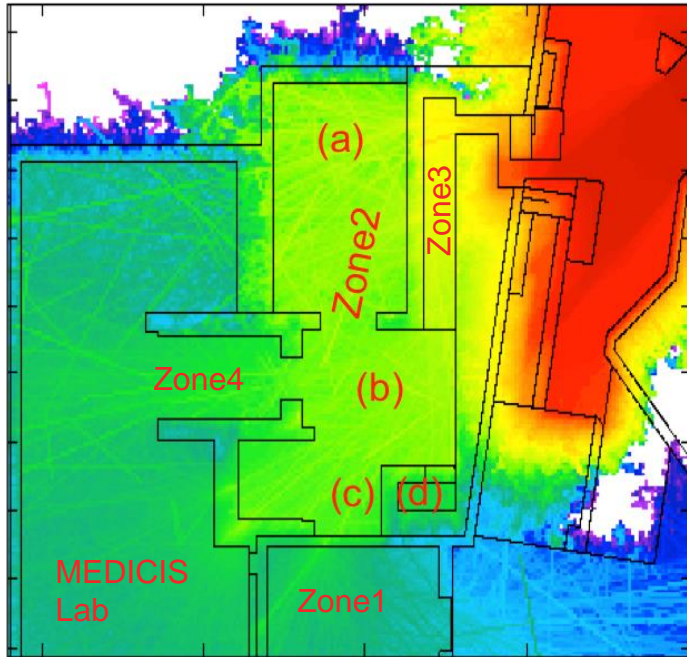
RP classification will change in April 2016 for the MEDICIS worksite

Rooms: 179-R-031,
179R-431

Acknowledgements: R.S.Augusto, S.Marzari, M.Vagnoni EN/STI

Fluka simulation studies (shielding as built) by S.Damjanovic and J.Vollaire in [EDMS 1583337](#)

Shielding/Radioprotection - Planning



May impact MEDICIS planning.
To be checked with RP
measurements during 2016
operation

ISOLDE Operation with HRS target in 2016: Summary of the Ambient Dose equivalent Rates in all MEDICIS sectors

Ambient Dose-eq Rate [$\mu\text{Sv/h}$] during ISOLDE (HRS) operation in 2016

MEDICIS Sectors	Average values [$\mu\text{Sv/h}$]	Peak values [$\mu\text{Sv/h}$]
Zone1 – backside of ISOLDE hot-cell	0.002	0.004
(a) target storage area	1-6	20
(b) exchange area	0.7-5	5
Zone2 (c) between Medicis hot-cell and decay point	0.25-0.6	0.8
(d) decay point	0.05	0.08
Zone3 – access to the primary area	10-600	1000
Zone4 – MEDICIS Bunker	0.04-0.2	0.35
MEDICIS lab	0.004-0.025	0.045

With the present shielding configuration 2016, the whole MEDICIS Lab, Zone1 (back side of the ISOLDE hot-cell) and Zone4 (MEDICIS Bunker) will remain classified as non-designated area – permanent workplace

S. Damjanovic, CERN

controlled radiation area
supervised radiation area - low occupancy
non-designated area - low occupancy
non-designated area - permanent workplace

Acknowledgements: S.Damjanovic and J.Vollaire HSE-RP

Fluka simulation studies (shielding as built) by S.Damjanovic and J.Vollaire in [EDMS 1583337](#)

Shielding/Radioprotection – Summary

	Design	Installation	Fluka simulation
Temporary Shielding	Done by S.Marzari and R.S.Augusto EN/STI	Done by EN/HE	- R.S.Augusto EN/STI Checked by HSE/RP EDMS 1371498 - S.Damjanovic & J.Vollaire HSE/RP EDMS 1483657
Final Shielding	Done by S.Marzari and M.Vagnoni EN/STI	Done by EN/HE	S.Damjanovic & J.Vollaire HSE/RP EDMS 1583337
Shielded doors	Done by K.Kershaw EN/STI	Done by DIB	S.Damjanovic & J.Vollaire HSE/RP EDMS 1517769 , EDMS 1551473
Vacuum room shielding	If needed but no budget	If needed for December 2016	To be discussed
Collection chambers	Marie Curie Network	Marie Curie Network	To be checked by RP

Planning, resources and budget ok, except for extra shielding for the vacuum room

Thanks to the work and involvement of EN/STI, EN/HE, HSE/RP !

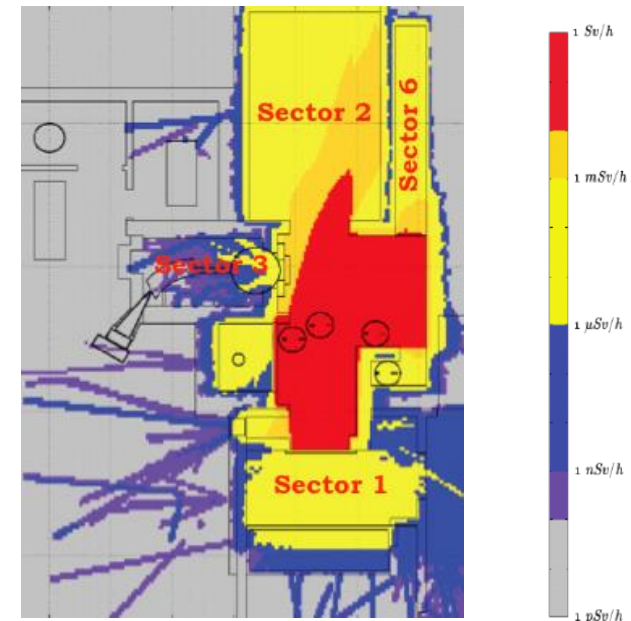
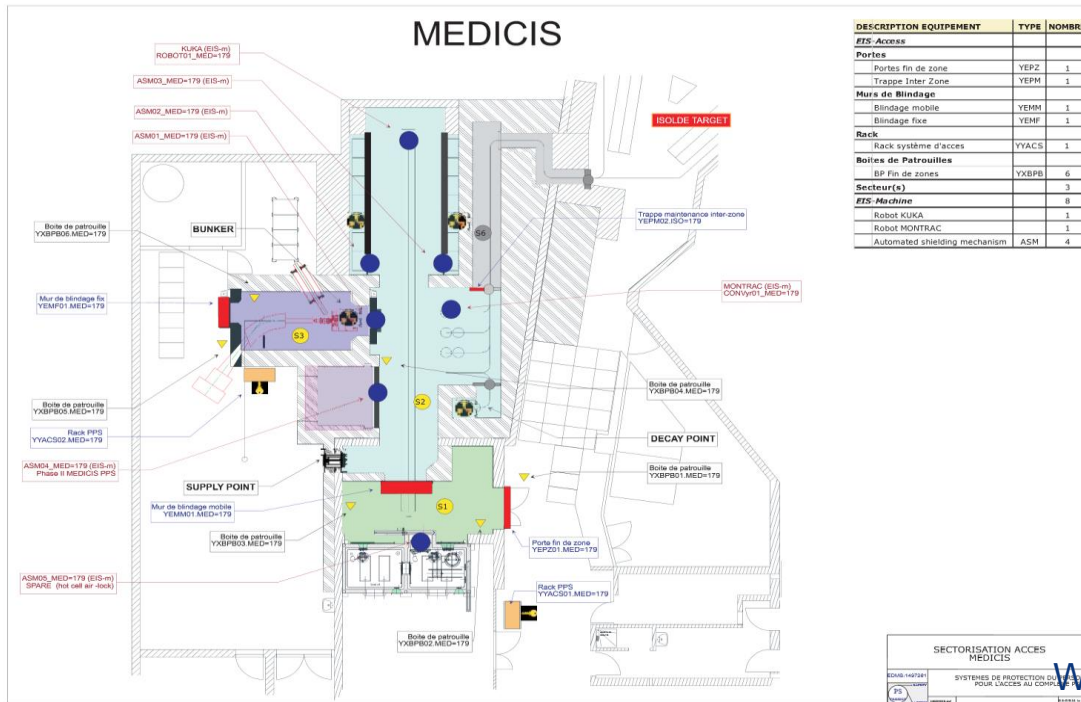
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Access and interlocks

Done:

Customized solution for MEDICIS Personnel Protection System (PPS) developed by BE-ICS ([EDMS 1524042](#))



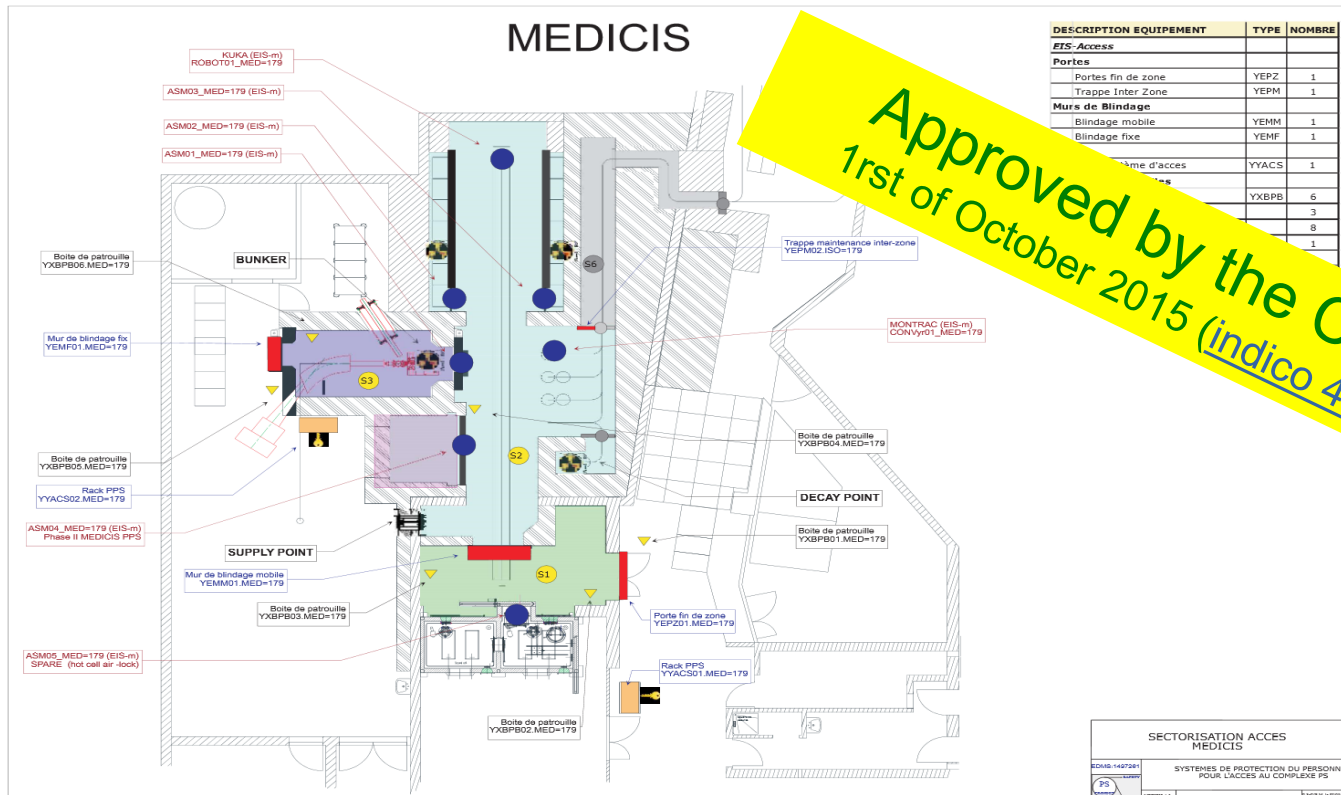
When moving the target (shielding closed)
Sector 1,3,6 ≈ 1 mSv/h – Interlocked area

Acknowledgements PPS WG: JL Duran Lopez, JL.Grenard, L.Hammouti, S.Marzari, E.Sanchez-Corral, F.Valentini, M.Vagnoni, J.Vollaire

Access and interlocks

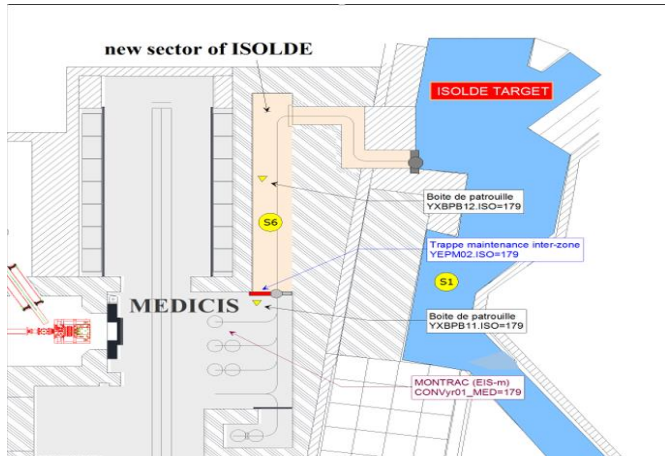
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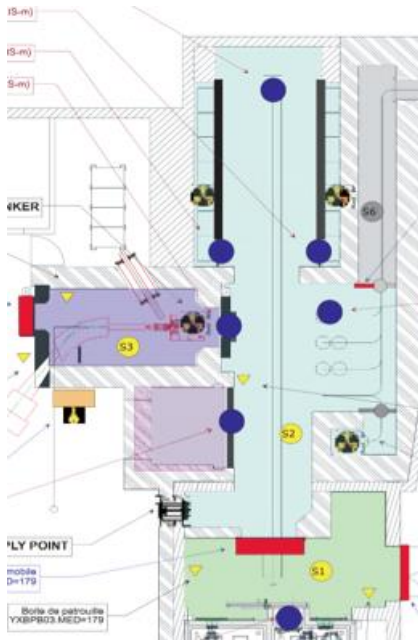
Access and interlocks



S6: Transfer tunnel new blind sector of the ISOLDE primary zone
→ Interlock with MONTRAC

See ECR – ISOLDE target area Modification by M. Vagnoni [EDMS 1538303](#)

To be operational end of Mars 2016



S1, S2, S3: MEDICIS Sectors

→ Interlock with Kuka robot, MONTRAC, automated shielding doors
→ External interfaces: RAMSES, Targets

See APR and Specification of safety elements interlocked for the personnel protection of the MEDICIS Area by PPS WG [EDMS 1524042](#)

To be operational June 2016

Access and interlocks - Summary

	Design	Installation
Isolde target area PPS modification	Done by BE-ICS and EN-STI	- On going - ISOLDE PPS functional tests on 17/03/2016
PPS for MEDICIS	Done by BE-ICS and WG PPS	- Tests interfaces PPS with EIS : May 2016 BE-ICS with EN-STI - PPS Commissioning to be done for June 2016 by BE-ICS

Planning, resources and budget ok, thanks to BE-ICS budget contribution

Thanks to the work, involvement and contribution of BE-ICS !
Thanks to the the work and involvement from the PPS WG !

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Safety file

HSE/SEE contact person for MEDICIS : A. Henriques HSE/SEE

- MEDICIS project included in « Launch Safety Agreement for the ISOLDE Target Area » [EDMS 1257254](#)
- MEDICIS project included in « Safety clearance for the operation of the ISOLDE Target Area » [EDMS 1257531](#)

Regular contact and high collaboration between EN/STI and HSE/SEE

Safety file

CERN CH-1211 Geneva 23 Switzerland



EDMS NO. 1541088	REV. 0.1	VALIDITY DRAFT
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REFERENCE
XXX-EQCOD-ES-XXXX

Date: 2015-09-07

SAFETY FILE – DESCRIPTIVE PART

Safety File for CERN-MEDICIS

ABSTRACT:

The aim of this document is to provide a description of the CERN-MEDICIS facility, dedicated to the production of radioisotopes for biomedical researches. The description of the facility is given in terms of safety, lifecycle and future evolutions, dismantling and disposal of its components.

This document is intended to evolve throughout the life of the facility.

DOCUMENT PREPARED BY:
Y. [Amaador](#) EN/STI
B. [Conde Fernandez](#) EN/STI
[Contributors](#)

DOCUMENT CHECKED BY:
R. [Catherall](#) EN/STI
A-P [Bernardes](#) EN/STI
C. [Lemesre](#) EN/STI
S. [Mazzari](#) EN/STI

DOCUMENT APPROVED BY:
F. [Bordry](#) DG/DI
T. [Stora](#) EN/STI
R. [Losito](#) EN/STI

Safety file started in 2015 with a trainee student

→ Since February 2016, an editor has been nominated « [B. Conde Fernandez](#) » for this task

Safety file - Summary

	Descriptive part	Demonstrative part	Operational part	REM part
Draft	Done by EN-STI (EDMS 1541088)	To be started in April	To be started in September 2016	To be started in 2017
Circulation to contributors in EDMS	Planned Mars 2016	Planned July 2016		
Circulation to checkers in EDMS	Planned April 2016	Planned August 2016		
Circulation to CSAP	Planned June 2016	Planned September 2016		
Circulation to approvers	Planned July 2016	Planned October 2016		

Resources ok, Planning is dependant to feed-back and signatures delays!



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Questions?