

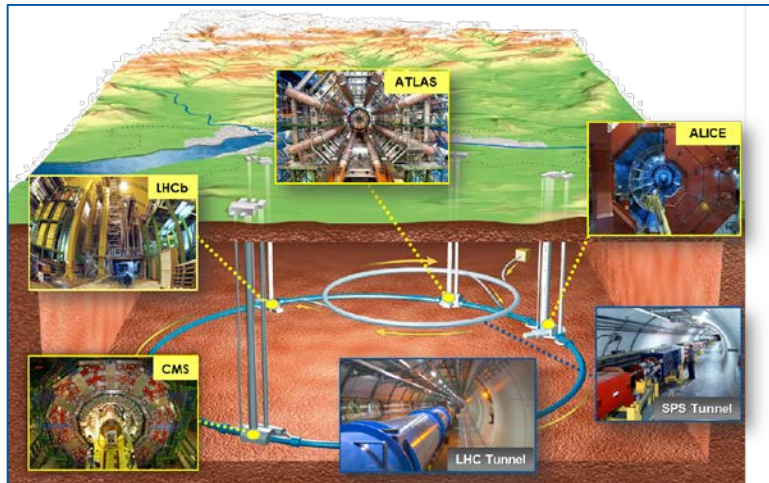
DosiServ integration with CERN's work permit system (IMPACT)

G. Dumont, Radiation Protection Group, CERN

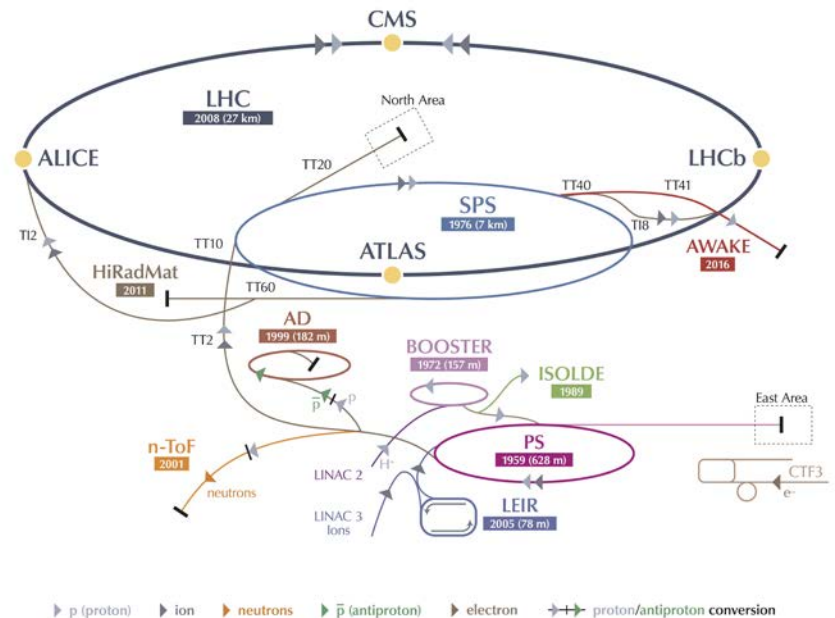


CERN

- ~ **45** km of accelerator tunnel
- ~ **160** experiments
- ~ **60** access points
- ~ **250** zones classified as Controlled Limited-Stay or High Radiation Areas
- ~ **9000** radiation workers in 2015

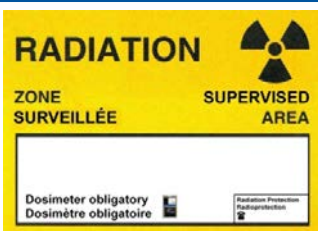
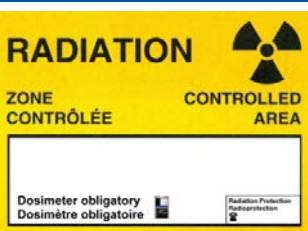
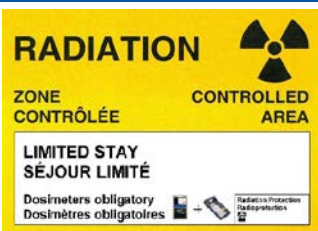
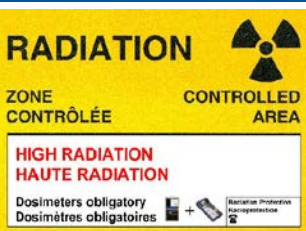


CERN's Accelerator Complex



LHC Large Hadron Collider SPS Super Proton Synchrotron PS Proton Synchrotron
 AD Antiproton Decelerator CTF3 Clic Test Facility AWAKE Advanced WAKEfield Experiment ISOLDE Isotope Separator OnLine Device
 LEIR Low Energy Ion Ring LINAC Linear ACcelerator n-ToF Neutrons Time Of Flight HiRadMat High-Radiation to Materials

CERN's Radiation Areas

					
		Supervised	Controlled		
			Simple	Limited-stay	High Radiation
Max. annual dose		600 mRem 6 mSv	2 Rem 20 mSv		
Max. ambient dose rate	Permanent	0.3 mRem/h 3 µSv/h	1 mRem/h 10 µSv/h		
	Low-occupancy	1.5 mRem/y 15 µSv/h	5 mRem/h 50 µSv/h	200 mRem/h 2 mSv/h	10 Rem/h 100 mSv/h

CERN's ALARA policy

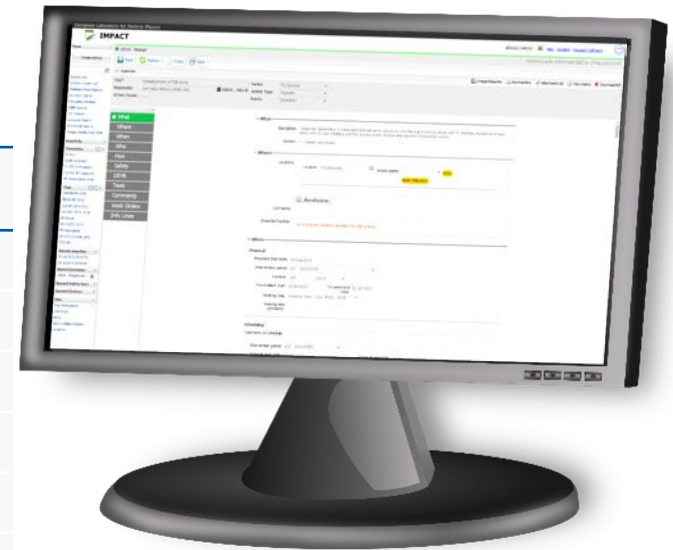
- Interventions or a group of interventions can be classified on three ALARA levels
- Level definition mainly depends on planned collective or individual doses (the application of other criteria depends on the risk analysis)
- Graduate approval workflow depending on the level
- DIMR folder ("Dossier d'Intervention en Milieu Radioactif") regrouping the ALARA documents such as the Work and Dose Planning (WDP), the optimization measures as well as the feedback after the intervention

	Level 1	Level 2	Level 3
Collective dose	50 man.mRem		500 man.mRem
Individual dose	10 mRem		100 mRem
Dose rate	5 mRem/h		200 mRem/h
Atmospheric contamination	5 CA		200 CA
Surface contamination	10 CS		100 CS

Work permits: IMPACT application

- Intervention Management Planning and Coordination Tool
- Central database for interventions
- Web form composed of meaningful blocks
- Dedicated workflow
- Includes ALARA documentation

Blocks	Content
Header	Title, Priority, Facility, Responsible, Type
What	Description, System
Where	Locations, Access Points
When	Duration, Dates, Working hours
Who	Participants, Contact Phone, Number of Participants
How	Modus Operandi
Safety	Location & activity hazards, safety procedures
DIMR	Radiation risk assessments, Recommendations, Feedback



IMPACT: DIMR part

- What
- Where
- When
- Who
- How
- Safety
- DIMR**
- Tests
- Comments
- Work Orders
- Info Lines

← DIMR
✎

DIMR: 6069656 - Echange septum SMH16 + stripline

Estimated total working time: 3.9 [h]

Estimated collective dose: 1938 [uSv]

Max. estimated individual dose: 207 [uSv]

Max. estimated surface contamination: 0.5 [CS]

Operational dosimetry mandatory?: ☒

Radiological conditions:

Effective average dose rate: 492 [uSv/h]

Individual dose alarm per intervention: 100 [uSv]

Max. estimated dose rate: 2000 [uSv/h]

Max. estimated airborne: 0.05

RP presence: Required at start and during inte

RP/RSO recommendation:

- Port des EPI (gants, tyvek ou blouse)
- Supervision Rp pendant toute la durée de l'échange
- Utilisation de deux chariots pour le transport des septums
- Prévoir un tuyau plus long pour le remplissage d'azote
- Vérifier l'absence d'obstacles sur le chemin d'évacuation du septum
- Eviter de travailler à la position D et G du WDP

Work Start: 16-Dec-2015 Work End: 12-Feb-2016

General Job Code: CHANGE Equipment Job Code: SEPTUM


Dosimetry feedback:

Closure feedback:

- Etuvage (coupures de courant intempêtes (rallonge la durée de 1 semaine)
- Problème avec utilisation du pont roulant : ne pouvait pas aller en bout de course. Besoin de plus de temps et d'intervenants pour l'étape 3.06 et 3.07 (15min au lieu de 2min).
- Hauteur support du septum trop haut lors de manutention sur chariot mobile : demande de la manutention supplémentaire.
- Plusieurs fuites de vide lors de l'étape 4.01. Nécessité de changer le joint et de resserrer le collier.
- Débit de dose plus faible qu'estimé après installation du septum pour la position D2 (facteur 7).
- Nombre d'intervenants présents plus important pour les étapes : 1.07, 1.11, 2.04, 2.05, 3.07, 3.08, 3.1.
- Nombre d'intervenants présents plus faible pour les étapes : 1.04, 1.07

Radiation Dose Report:

Work and Dose Planning (WDP)



HSE
Occupational Health & Safety
and Environmental Protection Unit

26th MIRION Annual Training and Benchmarking Seminar

9

WDP: example of PSB dump



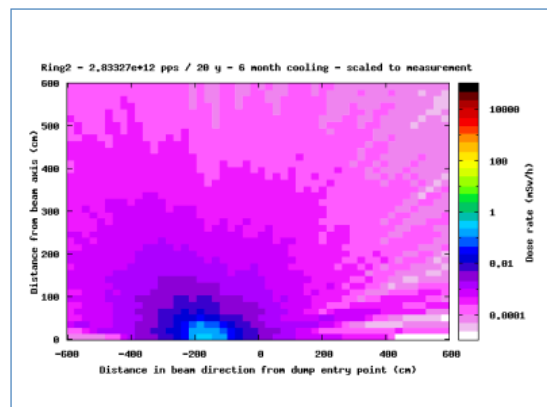
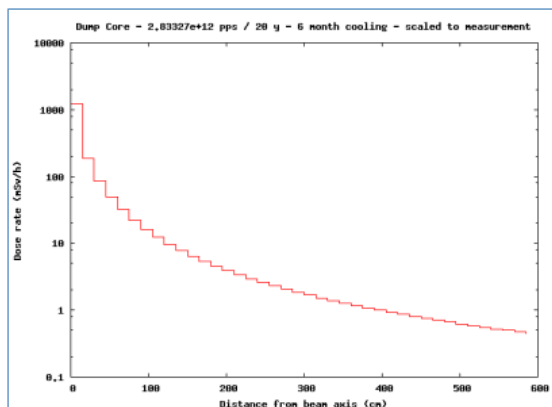
WDP: work positions

Positions during dump removal

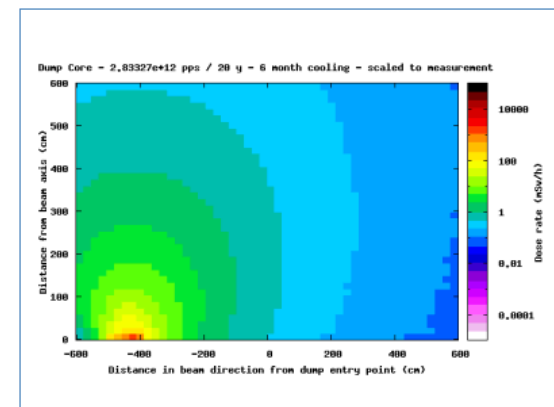


WDP: dose rate estimates

Prior intervention To be completed and checked by work coordinator(s) and experts		Prior intervention To be checked and completed by RP	Calculations	
Working positions (refer to drawing on tab 'DoseMap')		Dose rate [$\mu\text{Sv/h}$]	Reduction factor	New dose rate [$\mu\text{Sv/h}$]
Position	Description			
A - Pump BT-VPI23A	Pump BT-VPI23A (dump 'plugged' in cavity)	20		0
B - Platform-Stairs	Platform-Stairs (dump 'plugged' in cavity)	2		0
C - Cavity	(dump 'plugged' in cavity)	15		0
D - Vacuum Window	(dump 'plugged' in cavity)	7		0
E - Beam line	(dump 'plugged' in cavity)	5		0
F0 - Transport corridor	(dump 'plugged' in cavity)	15		0
F1 - Transport Container RW (in B360)	at 1.5 m from container + exposed to PSB ambient DR	115		0
F2 - Transport Container RW (in B361)	at 1.5 m from container	100		0
F22 - Transport Container RW (on the way)	at 3 m from container	25		0
F3 - Transport of Concrete Blocks (in B360)	at 1.5 m from container	60		0
F33 - Transport of Concrete Blocks (in B361)	at 1.5 m from container	45		0
F4 - Transport of Concrete Blocks (outside)	at 3 m from container	11		0
G0 - Winch - Dump exposed	at ~6 m from unshielded dump	400		0
G1 - Winch - Pipe exposed (no dump)	at ~6 m from shielded dump	51		0
G2 - Winch - Shielding inside cavity	at ~7 m from cavity	5		0
G3 - Winch - Concrete block exposed	at ~6 m from unshielded block	206		0
H1 - Close Dump Container	at ~2m from shielded dump - ~2m from unshielded pipe remaining	213		0
H2 - Close Pipe Container	at ~2m from shielded dump and ~1.5 m from container	100		0
J0 - Saw breaks (dump exposed) - 1m - Accident	Accident case - blade needs to be replaced - 100cm	15000		0
J00 - Saw breaks (dump exposed) - 1m - Accident	Accident case - blade needs to be replaced - 200cm	4000		0
J1 - Saw breaks (pipe exposed) - 1m - Accident	Accident case - blade needs to be replaced - 100cm from pipe - 200m from shielded dump	1563		0



Taken as reference for Ring 1



Taken as reference for Ring 2

WDP: collective dose estimates

$$\text{Total collective dose} = \sum_{Seq=1}^{\infty} (\text{No.} \cdot \text{Recurrence} \cdot \text{Time} \cdot H \cdot 10)$$

Works concerning the dismantling and disposal of the current PS Booster dump and the assembly and placement of a new dump. Works foreseen for 2013, during the LS1.									Working time [man.hours] 316.3	Effective avg. dose rate [µSv/h] 11	Collective dose [man.µSv] 3447	Collective dose [man.µSv] 3447	Collective dose [man.µSv] 3447
Prior intervention To be completed and checked by work coordinator(s) and experts									Prior intervention To be checked and completed by RP				
1	2	3	4	5	6	7	8	9	10				
No.	Work description (Task)	Responsible person	Workteam	Dep/Grp (executing)	Location (check table 'DoseRates')	Persons [No.]	Recurrence	Time [min]	Dose rate [µSv/h]	Estimated dose [µSv]	Estimated dose [µSv]	Estimated total dose [µSv]	
3.44	Disconnect cables Semfil Tank (BTM-SGHV2)	Gerrit Jan FOCKER	BI-PM	BE-BI	E - Beam line	2	1	30	5	5			
3.45	Transport of dismantled Semfil Tank to storage area	Caterina BERTONE	HH1	EN-HE	F0 - Transport corridor	2	1	30	15	15			
3.46	Dismantle Vacuum Tube (see drawing PSBIHENS0342)	Jan HANSEN	VSC1	TE-VSC	E - Beam line	2	1	30	5	5			
3.47	Dismantle Semfil Tank (see drawing PSBIHENS0353: 'BTM-SGHV2')	Delphine GERARD	BI-ML	BE-BI	E - Beam line	2	1	15	5	3			
3.48	Disconnect cables Semfil Tank (BTM-SGHV2)	Gerrit Jan FOCKER	BI-PM	BE-BI	E - Beam line	2	1	30	5	5			
3.49	Transport of dismantled Semfil Tank to storage area	Caterina BERTONE	HH1	EN-HE	F0 - Transport corridor	2	1	30	15	15			
3.50	Dismantle Vacuum Chamber (see drawing PSBIHENS0348)	Jan HANSEN	VSC1	TE-VSC	E - Beam line	2	1	30	5	5			
3.51	Dismantle Upper Chamber support (see drawing PSBIHENS0350)	Jan HANSEN	VSC1	TE-VSC	E - Beam line	2	1	30	5	5			
3.52	Dismantle Lower Chamber support (see drawing PSBIHENS0351)	Jan HANSEN	VSC1	TE-VSC	E - Beam line	2	1	30	5	5			
3.53	Dismantle Varian Ion Pump (see drawing PSBIHENS0139)	Jan HANSEN	VSC1	TE-VSC	E - Beam line	2	1	45	5	8			
3.54	Transport of dismantled equipment (Vacuum Chamber, Chamber supports and Varian Ion Pump) to storage space	Caterina BERTONE	HH1	EN-HE	F0 - Transport corridor	2	1	60	15	30			
3.55	Dismantle girder	Delphine GERARD	BI-ML	BE-BI	E - Beam line	2	1	90	5	15			
3.56	Move dismantled girder against the wall	Caterina BERTONE	HH1	EN-HE	F0 - Transport corridor	2	1	60	15	30			
										0			
										0			
4 Dismantling and disposal operations (including transport to ISR)												1669	
Disposal of beam pipe-dump core assembly												450	
4.01	Block first concrete block	Caterina BERTONE	HH1	EN-HE	C - Cavity	2	1	30	15	15			
4.02	Insertion and fitting of the clamping tool inside the beam pipe	Frederic LOPRETE	ST11	EN-ST1	C - Cavity	1	1	5	15	1			
4.03	Mark the positions of the equipment to be installed on the ground	Frederic LOPRETE	ST11	EN-ST1	D - Vacuum Window	2	1	60	7	14			
4.04	Positioning of container for old dump + beam pipe	Frederic LOPRETE	ST11	EN-ST1	B - Platform-Stairs	2	1	15	2	1			
4.05	Place saw and its workbench	Frederic LOPRETE	ST11	EN-ST1	E - Beam line	2	1	15	5	3			
4.06	Positioning of frame, with adjustable support for winch	Frederic LOPRETE	ST11	EN-ST1	E - Beam line	2	1	10	5	2			
4.07	Pull beam pipe-dump core assembly (about 6m) - dump in cavity	Frederic LOPRETE	ST11	EN-ST1	E - Beam line	1	1	7	5	1			
	Pull beam pipe-dump core assembly (about 6m) - dump out of cavity	Frederic LOPRETE	ST11	EN-ST1	G0 - Winch - Dump exposed	1	1	8	400	53			
4.08	Press pipe with a vice, placed on the saw's workbench	Frederic LOPRETE	ST11	EN-ST1	S0 - Saw commands - Dump exposed	1	1	2	2000	67			
4.09	Cut the last section of dump-pipe assembly (900 mm)	Frederic LOPRETE	ST11	EN-ST1	G0 - Winch - Dump exposed	1	1	10	400	67			
4.10	Free pipe from vice. Cut part falls into container	Frederic LOPRETE	ST11	EN-ST1	S0 - Saw commands - Dump exposed	1	1	2	2000	67			
4.11	Close lid of container (dump side)	Frederic LOPRETE	ST11	EN-ST1	H1 - Close Dump Container	1	1	2	213	7			

Steps - Sequences

Team

Positions

No.

Time

H*10

Estimated Dose

WDP: individual dose estimates

LIST OF PERSONS					Radiation Protection Information	
					Real collective dose [man.µSv]:	0
					Number of persons:	19
					Real average individual dose [µSv]:	0
					Estimated max individual dose [µSv]:	239
					Estimated average individual dose [µSv]:	166
CERN ID	Last Name	First name	Dep/Grp	WorkTeam	DOSE Last 12 months [µSv]	Estimated dose [µSv]
				RP	331	43
				RP	341	43
				Septa	245	225
				Septa	288	225
				Septa	27	225
				Septa	3	225
				Septa	52	225
				Septa	64	225
				Transport	848	239
				Transport	126	239
				vacuum	736	128
				vacuum	112	128
				vacuum	96	128
				vacuum	662	128
				vacuum	497	128
				vacuum	1079	128
				BI	179	158
				BI	63	158
				BI	8	158

Participants

Team

Individual dose = $\frac{\text{Team collective dose}}{\text{No. of team participant}}$

IMPACT: DIMR part

What

Where

When

Who

How

Safety

DIMR

Tests

Comments

Work Orders

Info Lines

- DIMR

DIMR: 6069656 - Echange septum SMH16 + stripline

Estimated total working time: 3.9 [h] **Effective average dose rate:** 492 [uSv/h]

Estimated collective dose: 1938 [uSv] Individual dose alarm per intervention: 100 [uSv]

Max. estimated individual dose: 207 [uSv] **Max. estimated dose rate:** 2000 [uSv/h]

Max. estimated surface contamination: 0.5 [CS] Max. estimated airborne: 0.05

Operational dosimetry mandatory?: ☒

Radiological conditions:

RP presence: Required at start and during inte

RP/RSO recommendation: Port des EPI (gants, tyvek ou blouse)
 - Supervision Rp pendant toute la durée de l'échange
 - Utilisation de deux chariots pour le transport des septums
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 - Vérifier l'absence d'obstacles sur le chemin d'évacuation du septum
 - Eviter de travailler à la position D et G du WDP

Work Start: 16-Dec-2015 Work End: 12-Feb-2016

General Job Code: CHANGE Equipment Job Code: SEPTUM

Dosimetry feedback:

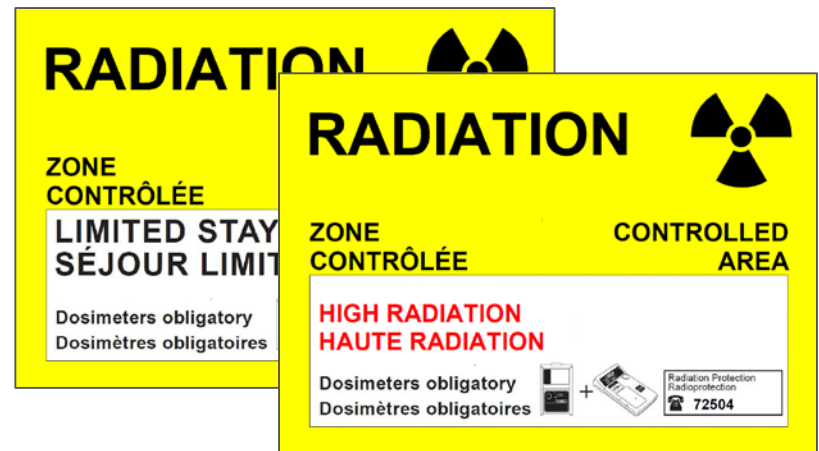
Closure feedback: - Etuvage (coupures de courant intempêtes (rallonge la durée de 1 semaine)
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 - Nombre d'intervenants présents plus faible pour les étapes : 1.04, 1.07

Radiation Dose Report:

Work and Dose Planning (WDP)

Dosimetry at CERN

Electronic Operational Dosimeter is mandatory in Controlled Limited Stay and High Radiation Areas, in addition to the Personal Dosimeter which is required in all CERN's Radiation Areas.



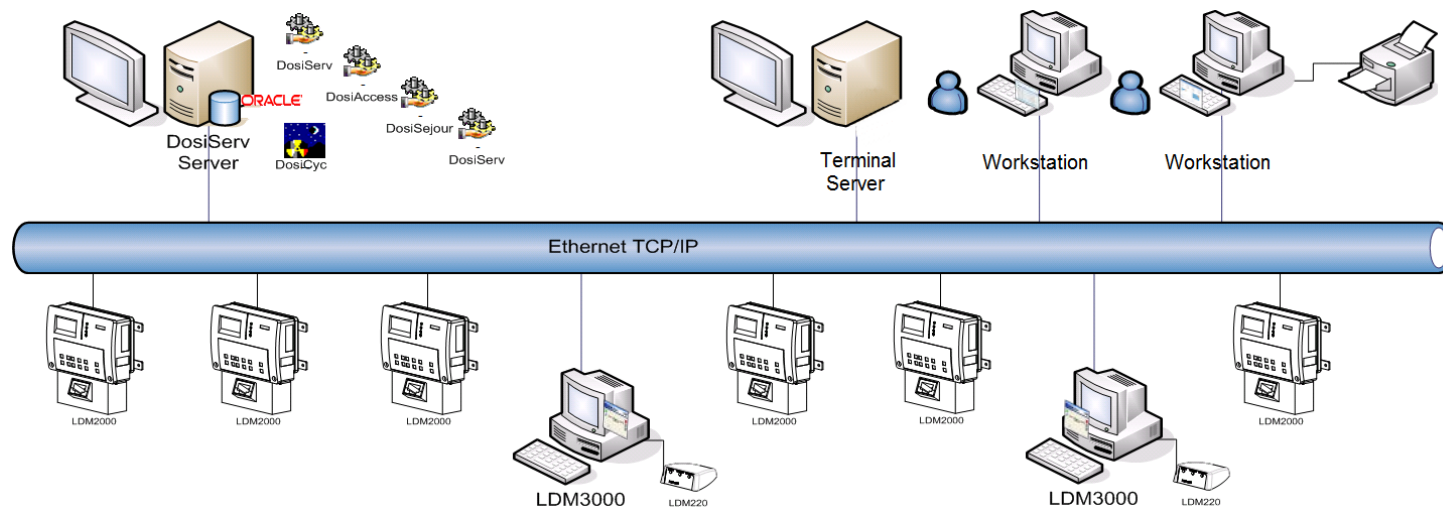
A new operational dosimetry system

- 26th March 2013: a new computerized operational dosimetry system is deployed at CERN
- 50 readers in 2013 and a total of 66 readers today!
- One of the biggest *DOSISERV* installations in the world
- 2013-2014: 1st Long Shutdown (LS1) at CERN: ~1500 DMC used by >2000 distinct DMC users/year resulting in nearly 130,000 “visits” in two years

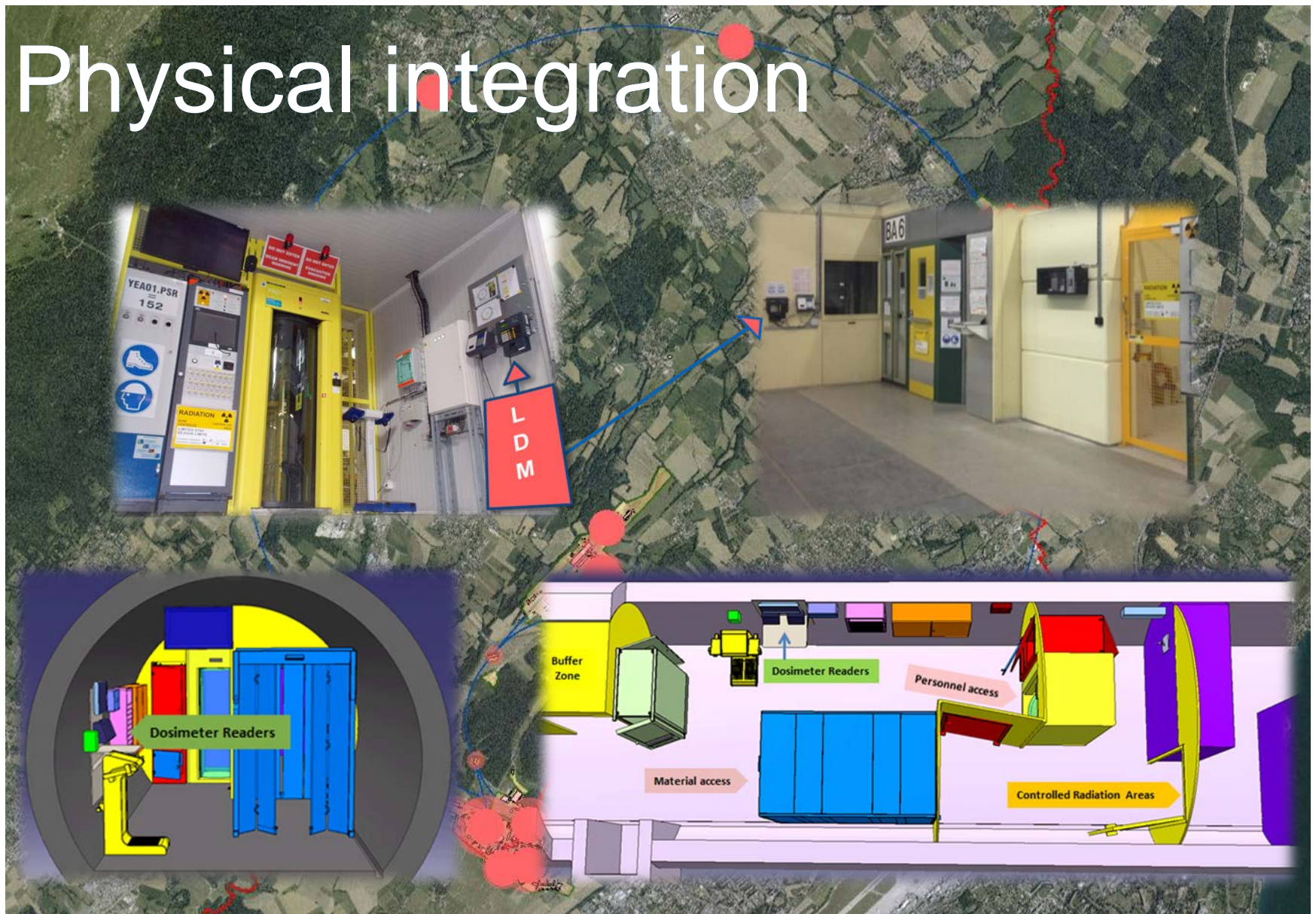


Outline

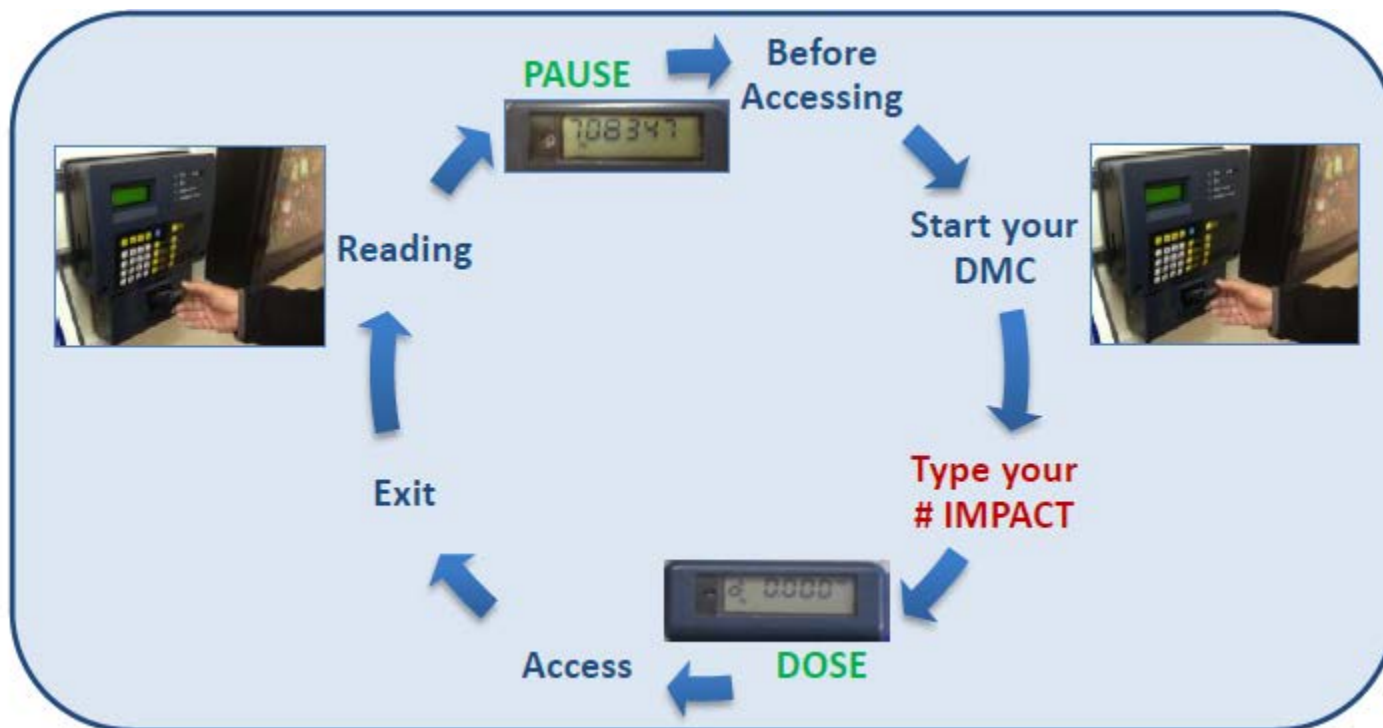
- Mirion DOSISERV solution with:
 - 66 readers (LDM 2000 and LDM 3000)
 - One computing server running DOSISERV services
 - Records stored in Oracle database
- RP user interfaces:
 - One terminal server running DOSIGUI for configuration, edition, etc.
 - A CERN web application (OPEDOSI) for Data processing and statistics



Physical integration

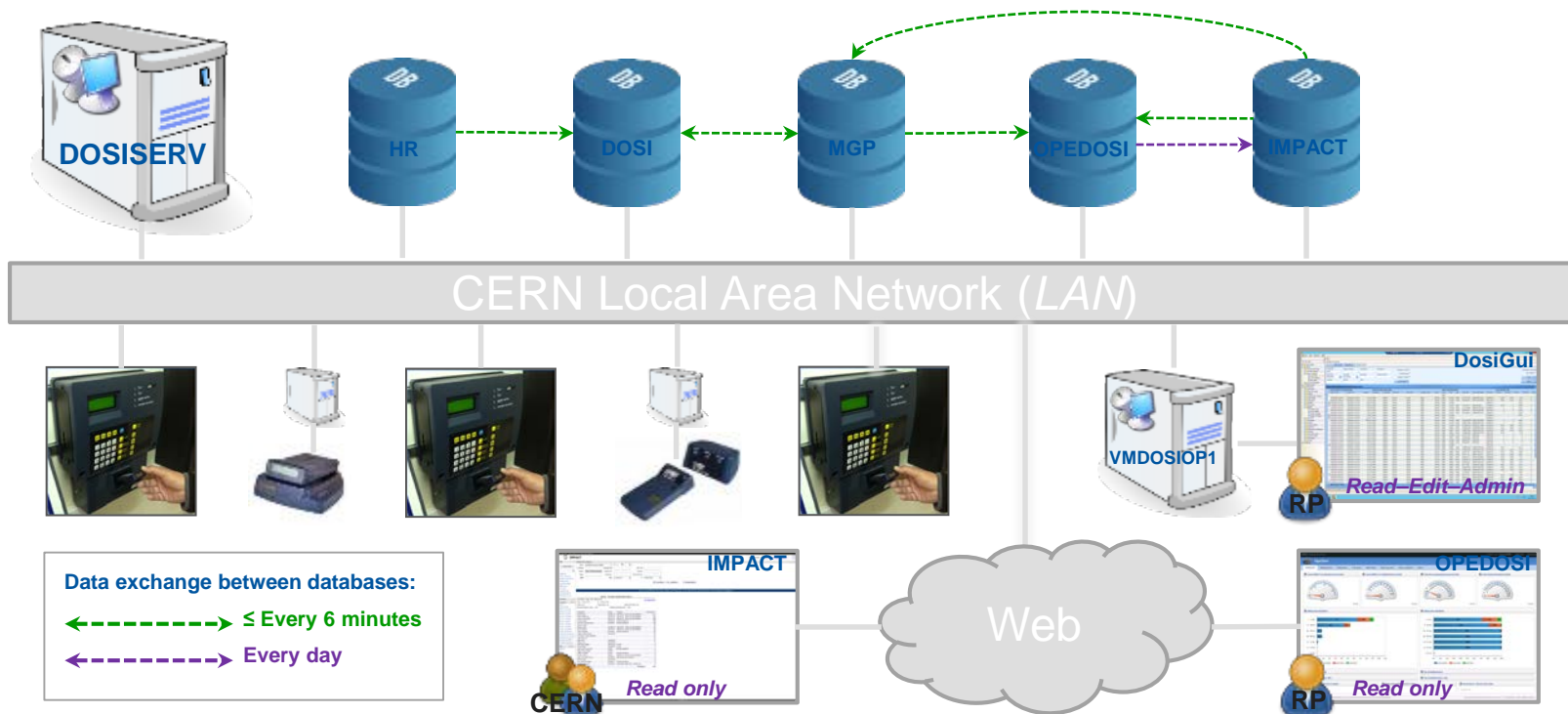


Integration & connection



IMPACT and DOSISERV were connected to attain the maximum benefit from both systems

Integration & connection



Non-standard DOSISERV installed at CERN with several database connections

Interface with IMPACT

DIMR

DIMR: 6069656 - Echange septum SMH16 + stripline

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General Job Code: CHANGE Equipment Job Code: SEPTU

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 - Hauteur support du septum trop haut lors de manutention
 - Plusieurs suites de vide lors de l'étape 4.01. Nécessité d'attendre
 - Débit de dose plus faible qu'estimé après installation du septum
 - Nombre d'intervenants présents plus important pour les étapes 3.06 et 3.07
 - Nombre d'intervenants présents plus faible pour les étapes 4.01 et 4.02

Radiation Dose Report:



Still perfectible:

- management of individual dose needed in DosiServ
- Additional IMPACT field needed to distinguish Max. dose rate and dose rate alarm level

Collective Activity Dose Summary

Activity	Tech. Responsible Group	Status	Title	Schedule Start	Schedule End	Est. Collective Dose (μSv)	Total Dose (μSv)	Total Dose / Est. Collective Dose (%)
62602	TV-NET	Late	Testing Dose Reports with Harry Potter	02-Sep-2013	19-Sep-2013	500	506	101 %
62601	TV-NET	In progress	Testing Dose Reports with The Big Bang Theory	05-Nov-2013	17-Jan-2014	200	161	81 %

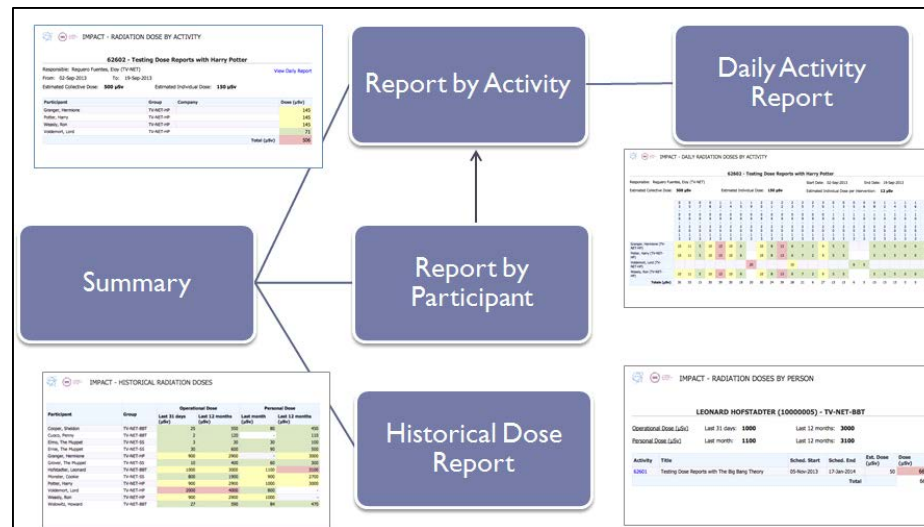
Individual Dose Summary

Participant (Group)	Activity (Tech. Responsible Group)	Title	Last badge date	Est. Dose (μSv)	Dose Taken (μSv)	Dose Taken / Est. Dose (%)
Hofstadter, Leonard (TV-NET-BBT)	62601 (TV-NET)	Testing Dose Reports with The Big Bang Theory	07-Dec-2013	50	66	132 %
Monster, Cookie (TV-NET-SS)	62600 (TV-NET)	Testing Dose Reports with Sesame Street	28-Nov-2013	100	113	113 %
Wolowitz, Howard (TV-NET-BBT)	62601 (TV-NET)	Testing Dose Reports with The Big Bang Theory	20-Nov-2013	50	53	106 %
Potter, Harry (TV-NET-HP)	62602 (TV-NET)	Testing Dose Reports with Harry Potter	19-Oct-2013	150	145	97 %
Weasley, Ron (TV-NET-HP)	62602 (TV-NET)	Testing Dose Reports with Harry Potter	19-Oct-2013	150	145	97 %
Granger, Hermione (TV-NET-HP)	62602 (TV-NET)	Testing Dose Reports with Harry Potter	19-Oct-2013	150	145	97 %
Cooper, Sheldon (TV-NET-BBT)	62601 (TV-NET)	Testing Dose Reports with The Big Bang Theory	23-Nov-2013	50	39	78 %

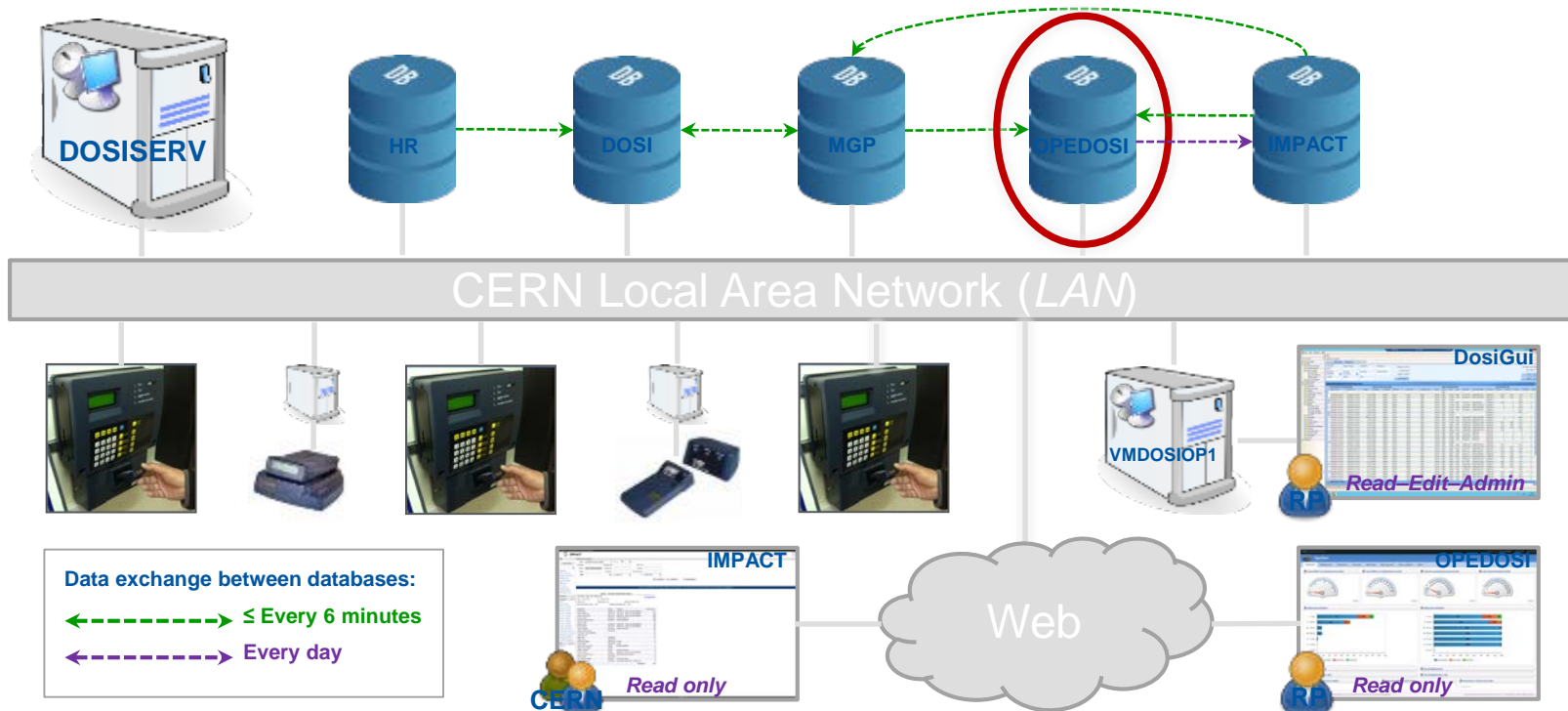
Below 50% Between 50% and 75% Between 75% and 100% > 100% of the dose estimate

Interface with IMPACT

- Link the operational doses with the activities and the DIMR
- Set alarm thresholds in the DMC according to the estimates
- Detect and react if the estimated collective or individual doses are exceeded
- Allow users, the person responsible and safety officers to visualize the doses in IMPACT with a Radiation Dose Reports feature



Integration & connection



OPEDOSI: intermediate database -> Backup of 'VISITS' after 3 years and history of modifications performed in DosiGui.

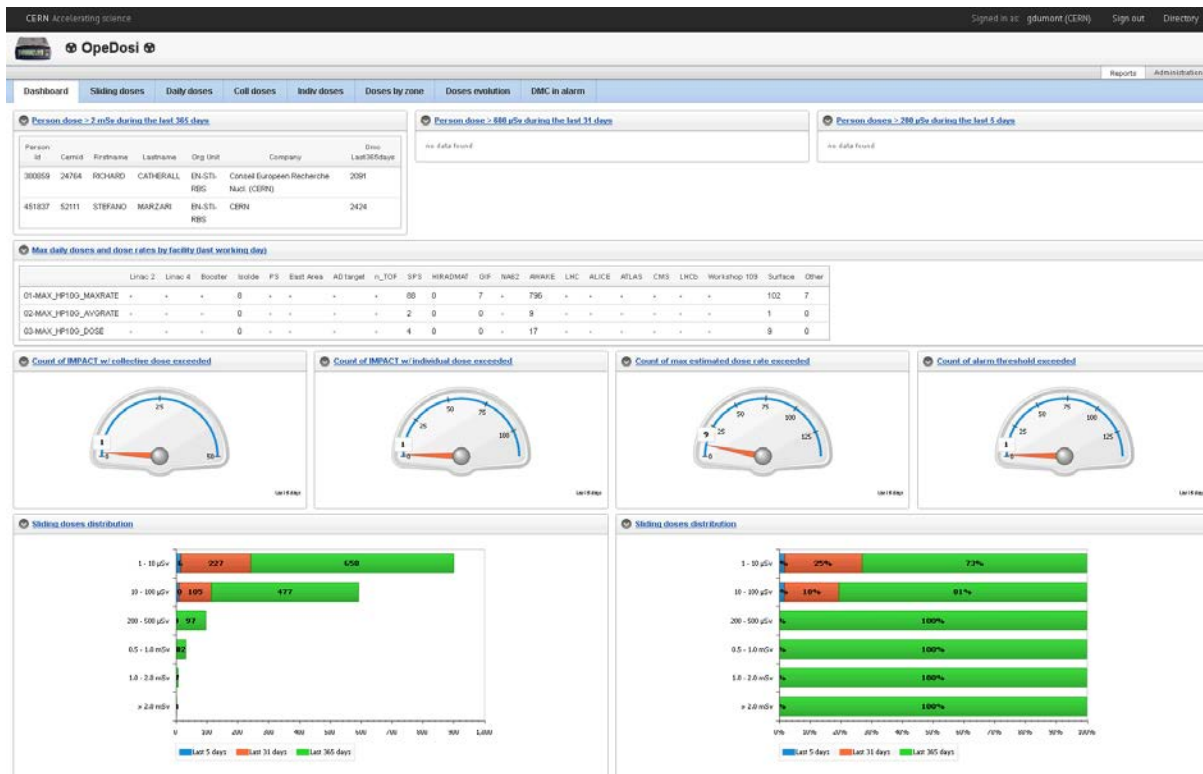
OPEDOSI database

- Automated checks with email alerts in case of:
 - Data synchronisation, DosiCyc or Backup issue
 - DMC activated for more than 48h
 - Daily ALARA email report to RP group
- Web application for CERN RP group only

	PS complex	SPS complex	LHC complex	Buildings - Other facilities	Links
More than 2 mSv during the last 365 days	1				Sliding doses
More than 600 µSv during the last 31 days	3				
More than 200 µSv during the last 5 days	1				
DMC in alarm (last 5 days)	1	4	1	1	DMC in alarm
Estimated individual dose exceeded (last 5 days)	4	1	1	1	Indiv doses
Estimated collective dose exceeded (last 5 days)	1	0	1	1	Coll doses
Maximum doses and dose rates (last w-day)	404 µSv 6280 µSv/h	100 µSv 2900 µSv/h	2 µSv 29 µSv/h	41 µSv 1690 µSv/h	Dashboard
Impact activities without alarm	0	1	2	1	Impact w/o alarm
Impact with missing job and equipment codes	0	1	1	1	Impact w/o workdesc

Automatic message please do not answer.

OPEDOSI web application




RP application for detailed data analysis & on-line solution for gaps in DosiGui: graphs, user-defined email alerts, data export, etc.

OPEDOSI web application

CERN Accelerating science

Signed in as: gdumont (CERN) | Sign out | Directory

 OpeDosi

Reports Administration

Dashboard Sliding doses Daily doses Coll doses Indiv doses Doses by zone Doses evolution DMC in alarm

Daily individual doses by IMPACT and by reader

Q- Go Reports 3. LHC Complex Rows 15 Actions

☒ Hp10g Dose > 0
☒ Complex = 'LHC'
☒ Date Dose is in the last 5 days
☒ Dose rate > 100% x Estim maxrate
☒ Hp10g dose > 100% x Alarm
☒ Hp10g dose > 100% x Estim Indiv

1 - 15 of 33

Personid	Firstname	Lastname	Unit	Impact	Title	Facility	Reader Label	Date Dose	Hp10g Dose	Hp10g Maxrate	Estim Indiv [%]	Alarm [%]	Maxrate [%]
783844	ARNAUD	RIBES	EN-MME	81620	Contrôle Radiographique GT 829, 180 S205 T11 et 180 S206	Buildings And Other Facilities	LDM3000 #081 RadioGraph - B112	2016-07-04	9	608	120	120	203
781016	SYLVAIN LOUIS	DREVON	EN-MME	81620	Contrôle Radiographique GT 829, 180 S205 T11 et 180 S206	Buildings And Other Facilities	LDM3000 #081 RadioGraph - B112	2016-07-04	7	531	93	93	177
781015	BERNOT	GROND	EN-MME	81548	Contrôle Radiographique Prevision, Bat.905	SPS	LDM2000 #003 SPS - BA3	2016-07-02	12	303	80	80	101
781408	CHRISTOPHE	JUSTO	EN-MME	81548	Contrôle Radiographique Prevision, Bat.905	SPS	LDM2000 #003 SPS - BA3	2016-07-02	12	241	80	80	80
781016	SYLVAIN LOUIS	DREVON	EN-MME	81646	Contrôle Radiographique Prevision, Bat.905	SPS	LDM2000 #003 SPS - BA3	2016-07-05	4	88	50	50	29
783844	ARNAUD	RIBES	EN-MME	81646	Contrôle Radiographique Prevision, Bat.905	SPS	LDM2000 #003 SPS - BA3	2016-07-05	3	34	38	38	11
780724	BERNARD	PELLEGRINELLI	EN-EA-CT	81204	Installation passerelle collimateur TCC4	AWAKE	LDM2000 #008 SPS - AWAKE TT40	2016-07-05	17	560	17	17	37
802581	JOS	DE VIT	EN-HE-HM	81297	Remplacement jonction rails roulement pont roulant PR582	Buildings And Other Facilities	LDM2000 #068 SPS - BA80	2016-07-05	9	17	15	45	85
685274	ABOUBAKR	EBN RAHMOUN	EN-EA-CT	81204	Installation passerelle collimateur TCC4	AWAKE	LDM2000 #008 SPS - AWAKE TT40	2016-07-05	15	424	15	15	28
802580	MARTIN HENDRIK	SMIT	EN-HE-HM	81297	Remplacement jonction rails roulement pont roulant PR582	Buildings And Other Facilities	LDM2000 #068 SPS - BA80	2016-07-05	8	95	13	40	475
781016	SYLVAIN LOUIS	DREVON	EN-MME	81622	Contrôle Radiographique Bat 180	Buildings And Other Facilities	LDM3000 #081 RadioGraph - B112	2016-07-05	1	102	13	13	34
685283	MIKHAIL	MARTYANOV	EN-ST-LP	80261	AWAKE laser and beam line test and commissioning	AWAKE	LDM2000 #008 SPS - AWAKE TT40	2016-07-05	1	6	10	10	40
483412	SYLVAIN	GROND	EN-EA-EC	81204	Installation passerelle collimateur TCC4	AWAKE	LDM2000 #008 SPS - AWAKE TT40	2016-07-05	10	350	10	10	23
687482	CHRISTIAN	DOCHE	EN-EA-CT	81204	Installation passerelle collimateur TCC4	AWAKE	LDM2000 #008 SPS - AWAKE TT40	2016-07-05	10	314	10	10	21
802580	MARTIN HENDRIK	SMIT	EN-HE-HM	81297	Remplacement jonction rails roulement pont roulant PR582	Buildings And Other Facilities	LDM2000 #068 SPS - BA80	2016-07-04	3	13	5	15	65

Dashboard

Sliding doses

Daily doses

Coll doses

Indiv doses


Doses by zone

Doses evolution

DMC in alarm



OPEDOSI web application

 OpeDosi

Reports Administration

Dashboard Wrong facility Reader facility Ghost DMC too long IMPACT w/o workdesc IMPACT w/o alarm DMC usage

DMC activated since > 48h

Person Id	Cernid	Firstname	Lastname	Email	Org Unit	Company	Sup Id	Sup Email	Impact	Start Date
721230	121145	DANIEL ALEXANDER	BERKOWITZ ZAMORA	daniel.berkowitz@cern.ch	TE-CRG-ML	CERN	394538	Philippe.Gayet@cern.ch	70778	2016-06-27 11:11:03
726430	132677	STAVROULA	PALLADA	stavroula.pallada@cern.ch	EP-SME-IS	Hellenic Republic Democritus University of Thrace	394105	Maria.Garcia.Boroni@cern.ch	80391	2016-07-02 13:43:53

Persons with annual threshold > 2 mSv and a lower annual dose

no data found

Dashboard Wrong facility Reader facility Ghost DMC too long IMPACT w/o workdesc IMPACT w/o alarm DMC usage

Count of DMC use (all users) and indication of the last user

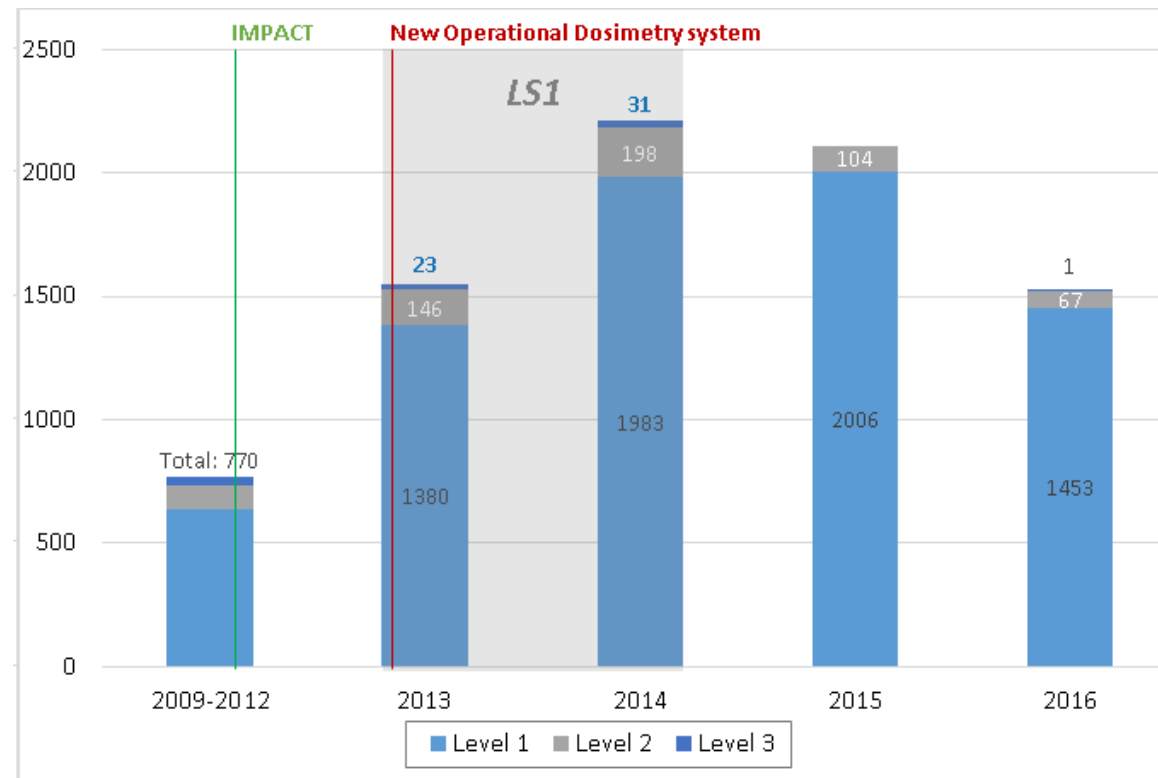
Q- Go Rows 20 Actions

☒ Count 0-30d < 2 ☒ ☒
☒ Count 31-90d < 3 ☒ ☒
☒ Count 91-365d < 10 ☒ ☒
☒ Users (365d) < 2 ☒ ☒
☒ Org Unit not like 'HSE-FB' ☒ ☒
☒ Pool? ☒ ☒

1 - 20 of 282

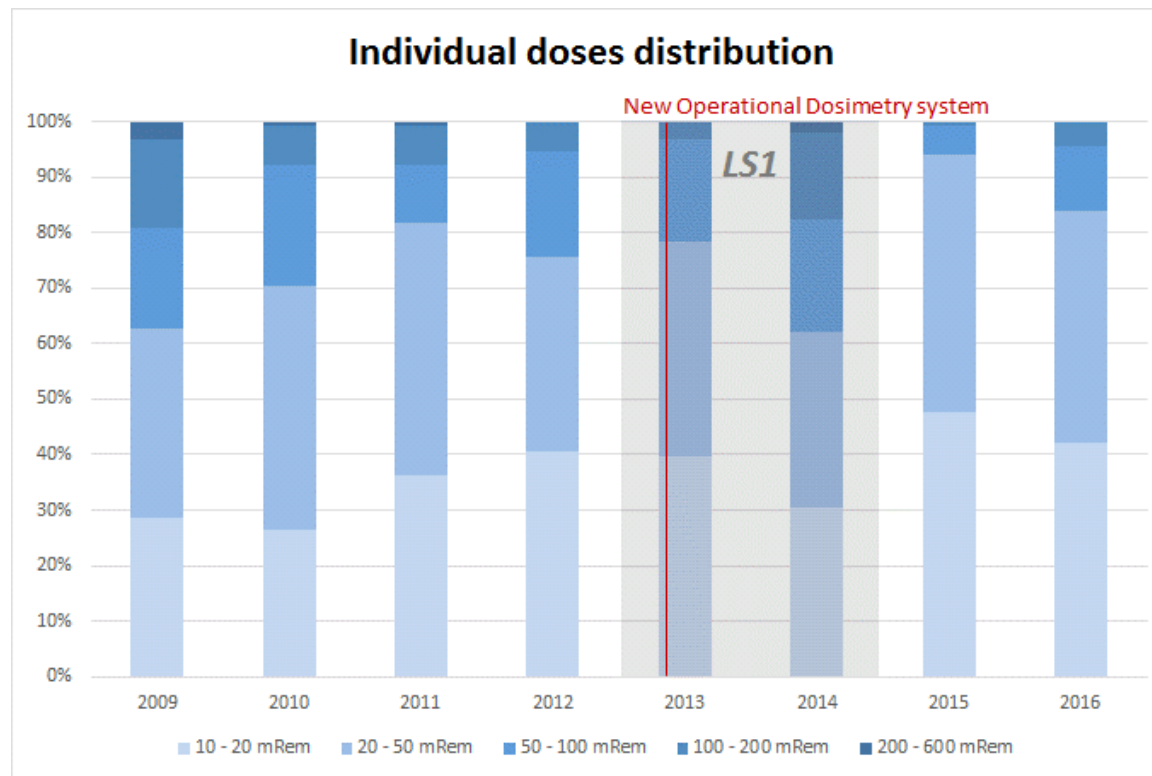
DMC s/n	Users (365d)	Personid	Cernid	Last user (email)	Org Unit	Company	Supid	Sup Email	Last Date	Count 0-30d	Count 31-90d	Count 91-365d
922307	1	482949	48007	Henric.Wilkens@cern.ch	EP-ADE-CA	Conseil European Recherche Nucl. (CERN)	380243	Tancredi.Cerli@cern.ch	21-10-2015	0	0	1
911102	1	754362	132379	gael.berger@cern.ch	HSE-FB-TEC	CERN	601812	rui.samoos@cern.ch	09-02-2016	0	0	1
927053	1	756843	132691	edoardo.tarditi@cern.ch	SMB-SE-DOP	DIMENSIONE - FAMY	475996	Eliseo.Perez-Duenas@cern.ch	05-11-2015	0	0	1
926380	1	572163	58555	bayram.dinger@cern.ch	EP-DT-FS	SOTEB NAT. ELEKTRO	608882	frederic.merlet@cern.ch	09-02-2016	0	0	1
089593	1	668628	111543	nikolaos.charitonidis@cern.ch	EN-EA-LE	CERN	394445	Lau.Gatignon@cern.ch	07-07-2015	0	0	1

Statistics



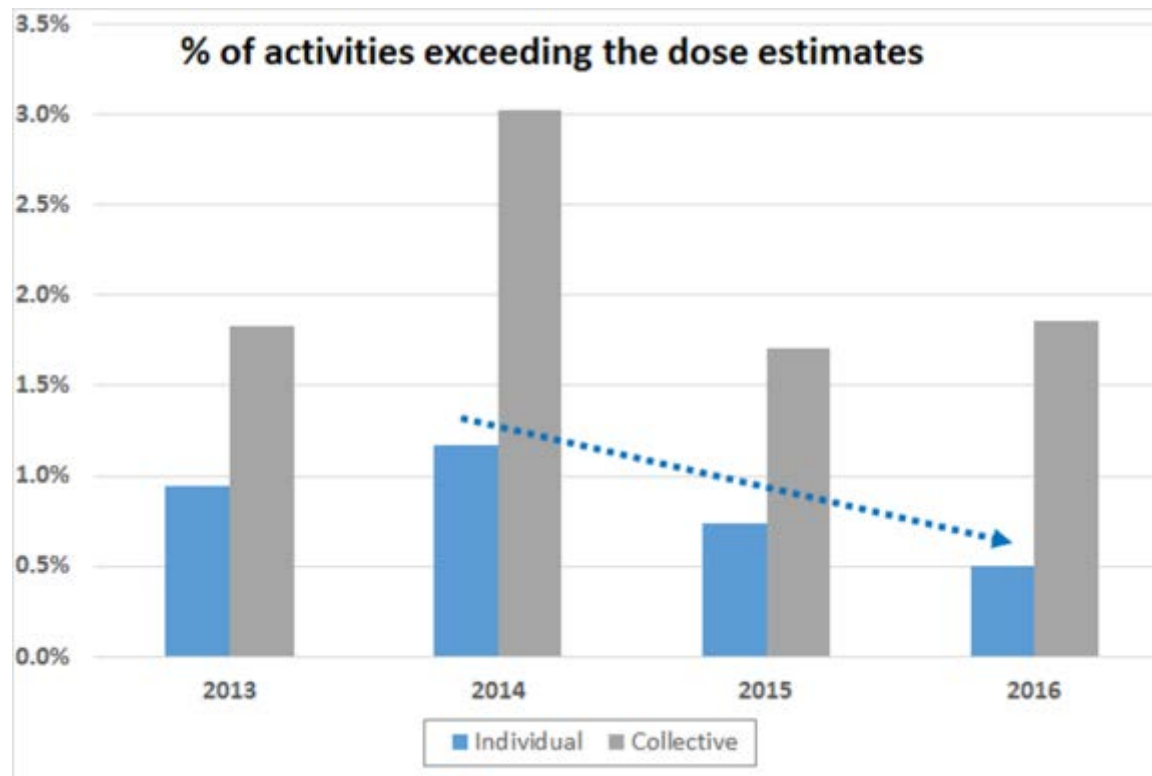
The number of documented ALARA analysis increased significantly since 2013 and most probably not only due to LS1

Statistics



Except during LS1, a decreasing proportion of individual doses above 100 mRem and an increasing proportion below 50 mRem

Statistics



Very few realized doses exceed the estimates: exceeding of collective doses <3%, exceeding of individual doses <1.2% with a decreasing proportion since 2014 (~0.5% for the moment in 2016)

What's next?

- Facilitate the choice of the IMPACT code
- Reduce the duration of the access sequence
- Implement a solution for a dosimeter distribution system near to the access points



Conclusion

- CERN developed a central application to declare interventions and to record the ALARA analysis
- CERN acquired one of the biggest computerized operational dosimetry systems of its type in the world
- But it is the connection of these two systems which allowed a unique ALARA tool to be built: it covers the full optimization process, from the dose estimates to the feedback, including the live transmission of the parameters to the dosimeters
- This is a very important asset for CERN as it improved the control of interventions in Radiation Areas and made operational dosimetry and the ALARA application state-of-the-art at CERN in matters of Radiation Safety and Radiation Protection



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