Radiation protection at EPFL

Emanuele Ripiccini

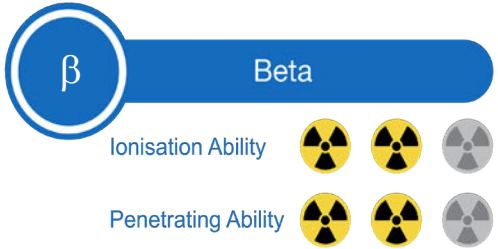
Emanuele Ripiccini

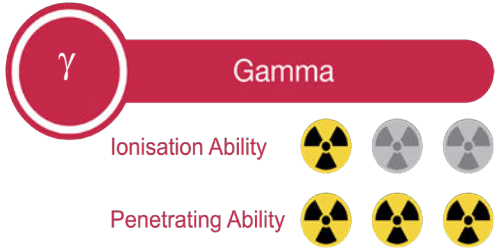
What is radiation protection?

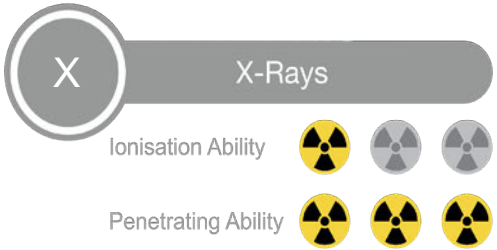
Radiation protection is the set of measures taken to ensure the protection of human being and its environment from the harmful effects of ionising radiations.

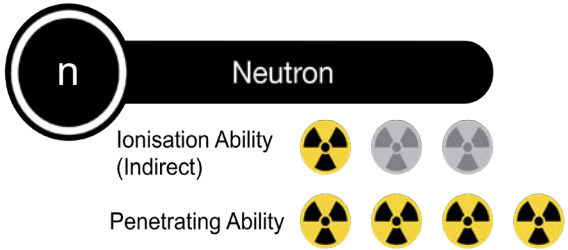
Ionising radiations

Emanuele Ripiccini



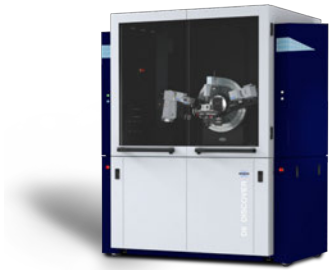


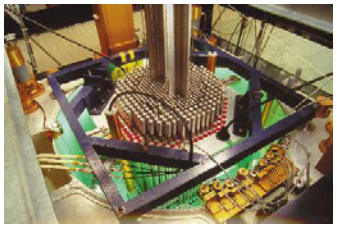




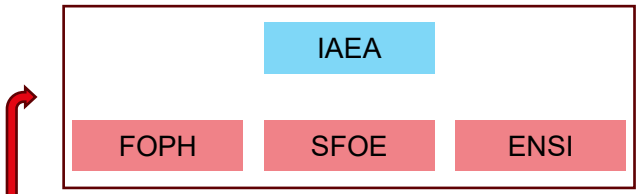
Activities

- Protein labeling (S-35, P-32)
- Isotope labeling (H-3, C-14)
- Uranium staining grids for Electron Microscopy
- Uranium and Thorium Chemistry
- CIBM: PET Scan (F-18, Ge-68)
- Development of detectors (Sr-90, Cs-137, Na-22, etc.)
- PIXE Platform: Materials Analysis
- X-ray diffractometry
- COCRUS reactor: experimental nuclear fission reactor (Independent Radiation Protection)
- TCV tokamak (Swiss Plasma Center)





Organization of radiation protection at EPFL



Surveillance

OHS
Occupational Medicine
SRPO: School Radiation Protection Officer

- Database management (users, purchases, wastes)
- In-house training
- Authorization Management
- Relations with the authorities
- Medical check-ups
- Dosimetry Management
- Validation of activities
- Waste Release
- Accident/Incident Analysis
- Internal Guidelines

Faculty
FRPO: Faculty Radiation Protection Officer

- Faculty Waste Management
- Programmed contamination checks in laboratories (wipe test campaigns)
- Control of measuring instruments

Research Groups
RPO : Radiation protection officer
RPR: Radiation protection referent

- Group Waste Management (Only if RPO)
- User training on the operation of the lab(s)
- Regular monitoring of workstation contamination

The RPR is not an expert according to the Radiation protection ordinance (Orap)

Emanuele Ripiccini

Organization of radiation protection at EPFL

RPO SV

Geneviève Dayer

Office SV 1822

genevieve.dayer@epfl.ch

+41 21 693 16 49

RPO STI

Ilias Charles Gemperli

Office MXE 012

ilias.gemperli@epfl.ch

+41 21 693 71 50

RPO SB

Maurizio Maio

Office BCH 1218

maurizio.maio@epfl.ch

+41 21 693 98 46

Emanuele Ripiccini

Working with ionizing radiation sources at EPFL

- All persons working with ionizing radiation sources must register in the database maintained by the OHS.
- If a user is found to be "professional exposed personnel" according to the ORap, a medical examination is mandatory before starting their activity and a dosimeter is provided.
- Take the basic online training (moodle) "Ionising radiation safety training»
- To work in a C lab, additional online training is required "Working with unsealed ionising radiation sources"
- Access to C labs can only be granted once all prerequisites have been met. (Workflow AxS: coming soon)

Emanuele Ripiccini

Base de données

EPFL

Login

Authorization request for pe… …ations

According to the Radiological Protection Ordinan… …dergo a medical examination before beginning work with radioact… …diations must undertake a basic radioprotection safety course … …ted to personal protection, management of waste, and individual…

Procedure

1. Fill out the exposure the following Ra…
2. Follow the safety training
   a. All users working with any ki…
   b. For those working with unse…
3. You will receive via email an appoint…
   a. a medical exam (30 min);
   b. the next radioprotection safe…
4. Before the appointment, print and fill…

Sign Up

Basic traning

Advanced training

Selon l'Ordonnance sur la radioprotection (ORaP… …doivent passer un contrôle médical avant de commencer à travaille… …au laboratoire, elles doivent suivre une formation en radioprotection e… …e qui touche à la protection personnelle, la gestion des déchets et…

Procédure

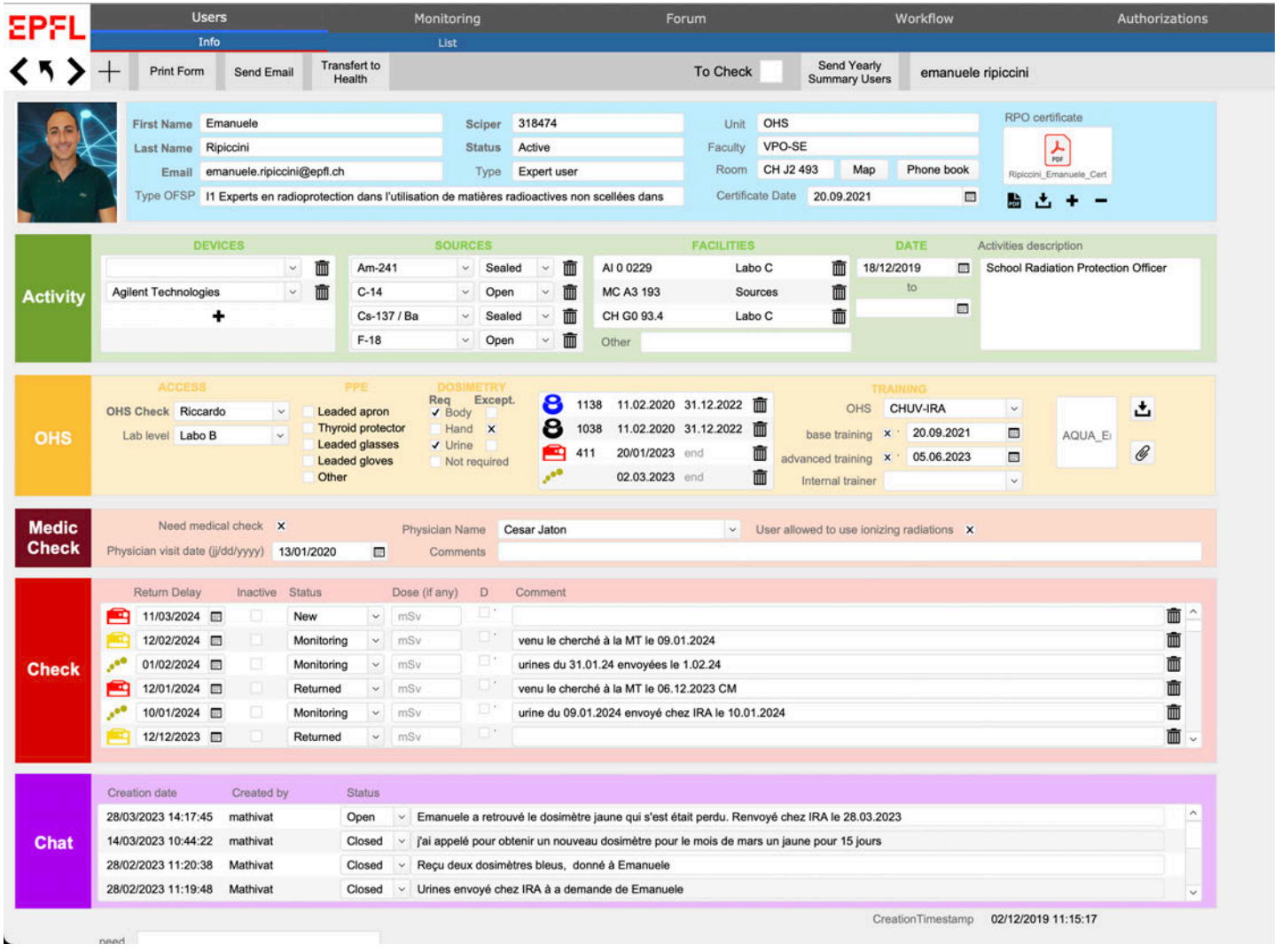
1. Remplir le Questionnaire radioprotec…
2. Suivez la formation de sécurité
   a. Tous les utilisateurs travaillant avec des sources de rayonnement ionisant à l'EPFL doivent suivre la formation de base
   b. Pour ceux qui travaillent avec des sources non scellées, la formation avancée est également obligatoire
3. Une convocation vous sera adressée par email pour :
   a. un contrôle médical d'entrée (30 min);
   b. la prochaine session de cours d'introduction à la radioprotection (1h);
4. Avant de se rendre à une convocation, imprimez et complétez le Certificat de visite médicale radioprotection.

Enregistrement

Basic traning

Advanced training

Only EPFL WiFi or EPFL VPN


EPFL
Users
Monitoring
Forum
Workflow
Authorizations
Info
List
Print Form
Send Email
Transfert to Health
To Check
Send Yearly Summary Users
emanuele ripiccini
First Name Emanuele
Last Name Ripiccini
Email emanuele.ripiccini@epfl.ch
Type OFSP I1 Experts en radioprotection dans l'utilisation de matières radioactives non scellées dans
Sciper 318474
Status Active
Type Expert user
Unit OHS
Faculty VPO-SE
Room CH J2 493
Map
Phone book
Certificate Date 20.09.2021
RPO certificate
Ripiccini_Emanuele_Cert
Activity
DEVICES
Agilent Technologies
SOURCES
Am-241 Sealed
C-14 Open
Cs-137 / Ba Sealed
F-18 Open
FACILITIES
AI 0 0229 Labo C
MC A3 193 Sources
CH G0 93.4 Labo C
Other
DATE
18/12/2019
to
Activities description
School Radiation Protection Officer
OHS
ACCESS
OHS Check Riccardo
Lab level Labo B
PPE
Leaded apron
Thyroid protector
Leaded glasses
Leaded gloves
Other
DOSIMETRY
Req Except.
Body
Hand
Urine
Not required
1138 11.02.2020 31.12.2022
1038 11.02.2020 31.12.2022
411 20/01/2023 end
02.03.2023 end
TRAINING
OHS CHUV-IRA
base training 20.09.2021
advanced training 05.06.2023
Internal trainer
AQUA_E
Medic Check
Need medical check
Physician visit date (jj/dd/yyyy) 13/01/2020
Physician Name Cesar Jaton
Comments
User allowed to use ionizing radiations
Check
Return Delay Inactive Status Dose (if any) D Comment
11/03/2024 New mSv
12/02/2024 Monitoring mSv venu le cherché à la MT le 09.01.2024
01/02/2024 Monitoring mSv urines du 31.01.24 envoyées le 1.02.24
12/01/2024 Returned mSv venu le cherché à la MT le 06.12.2023 CM
10/01/2024 Monitoring mSv urine du 09.01.2024 envoyé chez IRA le 10.01.2024
12/12/2023 Returned mSv
Chat
Creation date Created by Status
28/03/2023 14:17:45 mathivat Open Emanuele a retrouvé le dosimètre jaune qui s'est était perdu. Renvoyé chez IRA le 28.03.2023
14/03/2023 10:44:22 mathivat Closed j'ai appelé pour obtenir un nouveau dosimètre pour le mois de mars un jaune pour 15 jours
28/02/2023 11:20:38 Mathivat Closed Reçu deux dosimètres bleus, donné à Emanuele
28/02/2023 11:19:48 Mathivat Closed Urines envoyé chez IRA à a demande de Emanuele
CreationTimestamp 02/12/2019 11:15:17

EPFL

Users | Monitoring | Forum | Workflow | Authorizations | Controls

Management | Purchase | Waste

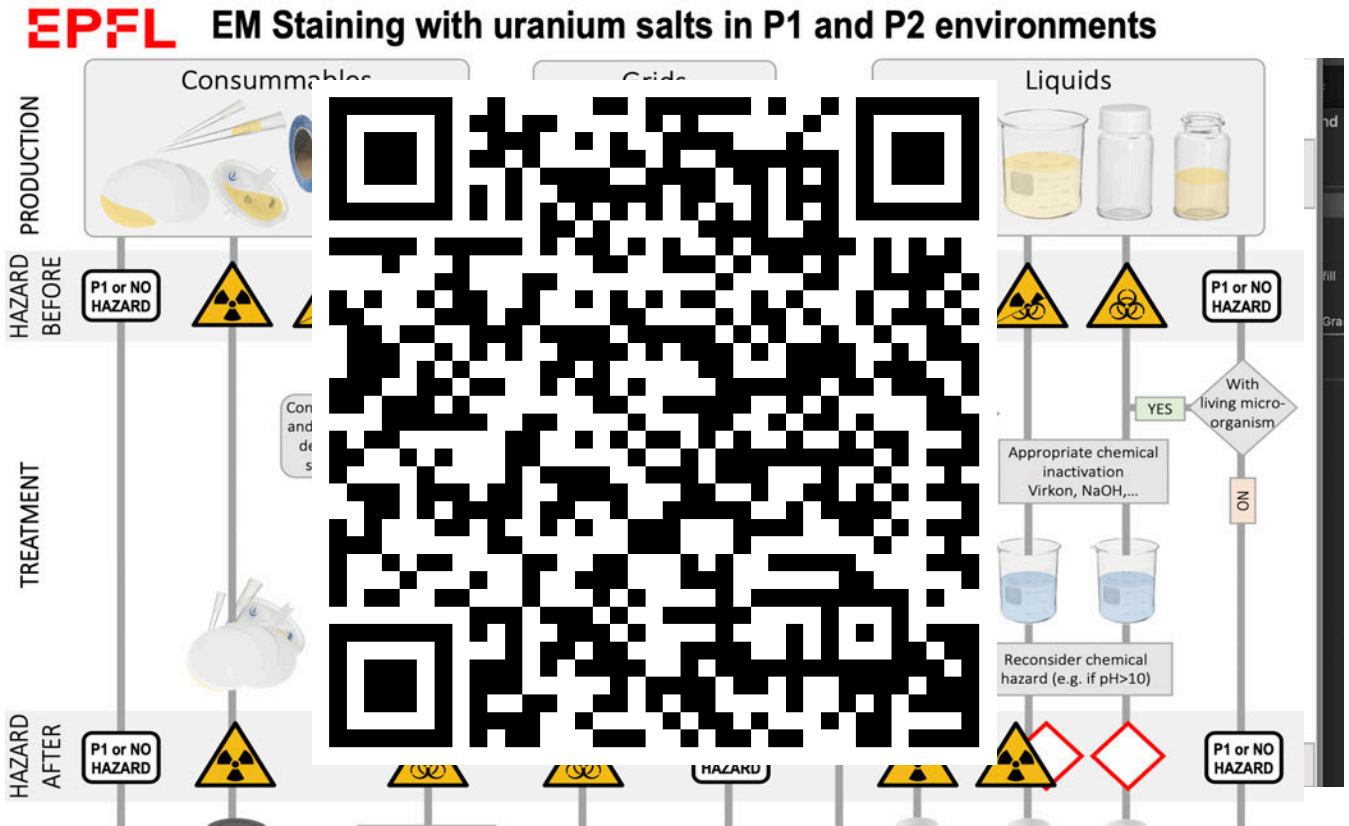
Default View | Show Yearly Summary | Export List | Show Sealed Summary | Show Open Summary | Show Authorisations | Show Facilities | 2023

Name	Type	Brand	OFEN inventory	Room	Delivery	Quant	Activity (new and now)		Leftover Date	Activity kgLL	Usage
C-14 Total activity at present time: 61.79 MBq (6.8LA)											
SV – UPDANGELO		Authorisation: A-59564-80	Purchase	Expiring on: 23.04.2030							
Galactose, L-[1-14C] in Ethanol:water (9:1)											
50 µCi	Open	Anawa Trading SA		AI 0 0229	14.11.2019	.5 l	1.85 MBq	1.85 MBq	22/06/2023	1849.0861	In Use
SV – UPSCHOONJANS		Authorisation: A-59564-80	Purchase	Expiring on: 23.04.2030							
(1-C14)2 Deoxy-D-glucose											
100µCi/ml	Open	Hartmann Analytic		AI 0 0229	23.01.2020	3.4 ml	12.58 MBq	2.26 MBq	09/06/2023	2263.3342	In Use
Cholesterol (4-14C))											
0.1 ml	Open	Hartmann Analytic		AI 0 0229	10.07.2013	100 µl	370 kBq	339.97 kBq	09/06/2023	339.9692	In Use
Choline Chloride methyl-14C											
100µC/ml	Open	Hartmann Analytic		AI 0 0229	23.01.2020	2.5 ml	9.25 MBq	6.29 MBq	09/06/2023	6287.0396	In Use
Glucose D-(14C (U))											
1.25 ml	Open	Perkin Elmer		AI 0 0229	01.01.2020	1.25 ml	9.25 MBq	8.14 MBq	09/06/2023	8136.1092	In Use
Sarcosine (glycine 1-14C)											
0.1mCi/ml	Open	Hartmann Analytic		AI 0 0229	22.11.2019	2.5 ml	9.25 MBq	5.92 MBq	09/06/2023	5917.0915	In Use
SV – VDG		Authorisation: A-210305-71	Owner	Expiring on: 14.10.2032							
Acetic Acid, Sodium Salt, [1-14C]											
1mCi	Open	American Radio labelled Chemicals		AI 3 3248	11/05/2022	10 µl	37 MBq	36.99 MBq	11/05/2022	36992.9249	In Use
H-3, OBT Total activity at present time: 3.63 GBq (36.2LA)											
SB – LEAGO		Authorisation: A-59850-95	Owner	Expiring on: 05/08/2029							
Cytidine 5'-diphosphate, ammonium salt, [5-^{3}H]											
250 µCi	Open	ViTrax		CH A2 424	25/04/2022		9.25 MBq	8.45 MBq	25/04/2022	84.4588	In Use
SV – UPDANGELO		Authorisation: A-59564-80	Purchase	Expiring on: 23.04.2030							
Sphingosine, D-erythro-[3-3H]											
50µCi	Open	American Radio labelled Chemicals		AI 0 0229	16/02/2022	50 µl	1.85 MBq	1.67 MBq	16/02/2022	16.7156	In Use
50µCi	Open	American Radio labelled Chemicals		AI 0 0229	26.05.2020	50 µl	1.85 MBq	.61 MBq	22/06/2023	6.0665	In Use
50µCi	Open	American Radio labelled Chemicals		AI 0 0229	13.02.2019	50 µl	1.85 MBq	282.22 kBq	22/06/2023	2.8221	In Use
SV – UPSCHOONJANS		Authorisation: A-59564-80	Purchase	Expiring on: 23.04.2030							
Carnitine L-(N-methyl-3H) HCl											
1mCi/ml	Open	Hartmann Analytic		AI 0 0229	05.09.2019	250 µl	9.25 MBq	.84 MBq	09/06/2023	8.4457	In Use
Cholesterol (1,2-3H (N))											
0.25 ml	Open	Hartmann Analytic		AI 0 0229	10.07.2013	250 µl	9.25 MBq	3.4 MBq	09/06/2023	33.9808	In Use
0.25 ml	Open	Hartmann Analytic		AI 0 0229	10.07.2013	250 µl	9.25 MBq	1.05 MBq	09/06/2023	10.5031	In Use
1 ml	Open	Hartmann Analytic		AI 0 0229	27.03.2013	1 ml	37 MBq	10.13 MBq	09/06/2023	101.3191	In Use
Glutamic acid L-(3,4-3H)											
1mCi/ml	Open	Hartmann Analytic		AI 0 0229	21.06.2019	250 µl	9.25 MBq	3.45 MBq	09/06/2023	34.5408	In Use
Taurine (2-3H)											
1 mCi/ml	Open	Hartmann Analytic		AI 0 0229	21.06.2019	250 ml	9.25 MBq	143.92 kBq	09/06/2023	1.4392	In Use
SV – VDG		Authorisation: A-210305-71	Owner	Expiring on: 14.10.2032							

Radioactive Waste Management

Emanuele Ripiccini

The disposal of radioactive waste is regulated by the Radiation Protection Ordinance (ORap)
At EPFL, we have 2 decision trees that are complementary to other for other hazardous wastes




EPFL
Users
Monitoring
Forum
Workflow
Authorizations
Management
Purchase
Produits (SIS)
Waste
Déchets (SIS)
View All
New wastes (Nouveaux déchets)
Forecast (Prevus)
Already Released (déjà jetés)
Already Collected (déjà retirés)
Stored (Stockés)
mCi =
Bq =
Waste
Status
Producer
Date
Generation
Room
Activity
Container
Form
Waste manager
Date
Storage
Room
LL date
Waste manager
Elimination Date
Elimination
Pathway
Company
Expected (Prevu)
September 2087
Week (Semaine) 37
1.0494E+51 kgLL
2909
H-3, OBT
Stored
Triana Amen
26/07/2023
AI 0 0229
3.7 MBq
(37 kgLL)
(3.7 10kgLL)
(.04 LA)
Bag
Solid
Geneviève Dayer
08/11/2023
AI 0 0219
Today: 35.91 kgLL
1 kgLL reached on
13.09.2087
Aujourd'hui
3590994.59 Bq
Thrower
Collection
Date
1.0494E+51 kgLL
Elimination
Remark
Expected (Prevu)
June 2075
Week (Semaine) 25
5.2711E+50 kgLL
2806
H-3, OBT
Stored
Triana Amen
25/08/2023
AI 0 0229
1.85 MBq
(18.5 kgLL)
(1.85 10kgLL)
(.02 LA)
Bag
Solid
Geneviève Dayer
08/11/2023
AI 0 0219
Today: 18.04 kgLL
1 kgLL reached on
22.06.2075
Aujourd'hui
1803819.39 Bq
Thrower
Collection
Date
5.2711E+50 kgLL
Elimination
Remark
Week (Semaine) 24
5.2646E+50 kgLL
2805
H-3, OBT
Stored
Triana Amen
17/08/2023
AI 0 0229
1.85 MBq
(18.5 kgLL)
(1.85 10kgLL)
(.02 LA)
Bag
Solid
Geneviève Dayer
08/11/2023
AI 0 0219
Today: 18.02 kgLL
1 kgLL reached on
14.06.2075
Aujourd'hui
1801596.4 Bq
Thrower
Collection
Date
5.2646E+50 kgLL
Elimination
Remark
Expected (Prevu)
October 2028
Week (Semaine) 45
kgLL
3034
Ge-68
Stored
Bernard Lanz
22/03/2023
CH F0 608
1.89 MBq
(189 kgLL)
(18.9 10kgLL)
(3.15 LA)
Emballage
Solid
Maurizio Maio
28.03.2023
CH G0 93.4
Today: 83.36 kgLL
1 kgLL reached on
29.10.2028
Aujourd'hui
833559.17 Bq
Thrower
Collection
Date
? kgLL
Elimination
Remark
Expected (Prevu)
May 2027
Week (Semaine) 21
kgLL
3035
Ge-68
Stored
Bernard Lanz
28/03/2023
CH F0 608
481 kBq
(48.1 kgLL)
(4.81 10kgLL)
(.8 LA)
Emballage
Solid
Maurizio Maio
28.03.2023
CH G0 93.4
Today: 21.54 kgLL
1 kgLL reached on
20.05.2027
Aujourd'hui
215419.89 Bq
Thrower
Collection
Date
? kgLL
Elimination
Remark
Expected (Prevu)
July 2026
Week (Semaine) 30
kgLL
3036
Ge-68
Stored
Bernard Lanz
28/03/2023
CH F0 608
222 kBq
(22.2 kgLL)
(2.22 10kgLL)
Emballage
Solid
Maurizio Maio
28.03.2023
CH G0 93.4
Today: 9.94 kgLL
1 kgLL reached on
21.07.2026
Thrower
Collection
Elimination
Remark

EPFL Users Monitoring Forum Workflow Authorizations

Default View

<Table Missing>

AI 0 0229

Fume hood uranyl acetate

Resp Geneviève Dayer
Status Active
Date 01/01/2021 end
Fumehood for preparing the uranyl acetate stock solution

Sources: U nat — Open — Need monitoring

Device

Controls			
23/06/2023	Done	Geneviève Dayer	0.0 CS
23/06/2023	Done	Geneviève Dayer	0.0 CS
10/08/2022	Done	Geneviève Dayer	0.0 CS
10/08/2022	Done	Geneviève Dayer	0.0 CS

Need control × Control Type Control points 2

Fume hood other

Resp Geneviève Dayer
Status Active
Date 01.01.2021 end
Fumehood for other experiment related to chemicals that require a fumehood

Sources: P-32 — Open; S-35 (org.) — Open; I-125 — Open — Need monitoring

Device

Controls			
23/06/2023	Done	Geneviève Dayer	0.0 CS
23/06/2023	Done	Geneviève Dayer	0.0 CS
10/08/2022	Done	Geneviève Dayer	0.0 CS
10/08/2022	Done	Geneviève Dayer	0.0 CS

Need control × Control Type Control points 2

Workbench window

Resp Geneviève Dayer
Status Active
Date 01.01.2021 end
This is the central working bench window side. The setup use a centrifuge

Sources: H-3, OBT — Open — Need monitoring

Device

Controls			
23/06/2023	Done	Geneviève Dayer	0.0 CS
23/06/2023	Done	Geneviève Dayer	0.0 CS
11/11/2022	Done	Geneviève Dayer	0.0 CS
10/08/2022	Done	Geneviève Dayer	0.0 CS

Need control × Control Type Wipe Control points 2

Rita star workbench

Resp Geneviève Dayer
Status Active
Date 01.01.2021 end
Description

Sources: H-3, OBT — Open — Need monitoring

Device

Controls			
23/06/2023	Done	Geneviève Dayer	0.0 CS
10/08/2022	Done	Geneviève Dayer	0.0 CS
11/04/2022	Done	Geneviève Dayer	0.0 CS
13/10/2021	Done	Marianne	0.0 CS

Need control × Control Type Control points 1

Ultra centrifuge workbench

Resp Geneviève Dayer
Status Active
Date 01.01.2021 end
Description

Sources: P-32 — Open; S-35 (org.) — Open; H-3, OBT — Open — Need monitoring

Device

Controls			
23/06/2023	Done	Geneviève Dayer	0.0 CS
23/06/2023	Done	Geneviève Dayer	0.0 CS
10/08/2022	Done	Geneviève Dayer	0.0 CS
10/08/2022	Done	Geneviève Dayer	0.0 CS

Need control × Control Type Control points 2

Workbench close to fumehoods

Resp Geneviève Dayer
Status Active

Sources: P-32 — Open; S-35 (org.) — Open — Need monitoring

Controls			
23/06/2023	Done	Geneviève Dayer	0.0 CS
23/06/2023	Done	Geneviève Dayer	0.0 CS

Surveillance: federal authorities

Emanuele Ripiccini

Swiss Federal Office of Energy (SFOE):

- Twice a year, the SFOE (safeguard) requests an inventory of all products containing thorium, uranium and plutonium.

Federal Office of Public Health (FOPH):

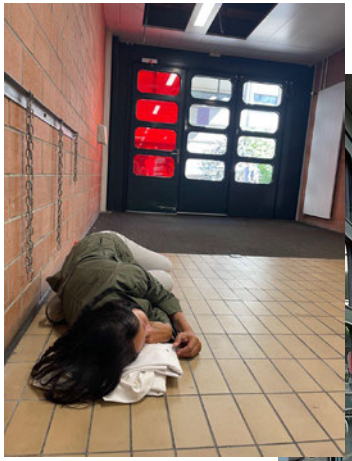
- Once a year, the FOPH asks us to:
- An inventory of all products containing radioisotopes (unsealed sources).
- The number of people for whom sorting measurements are performed (urine test).
- The number of people being monitored by dosimetry.
- The amount of waste released if more than 10 kg of LL has been exceeded in a week.

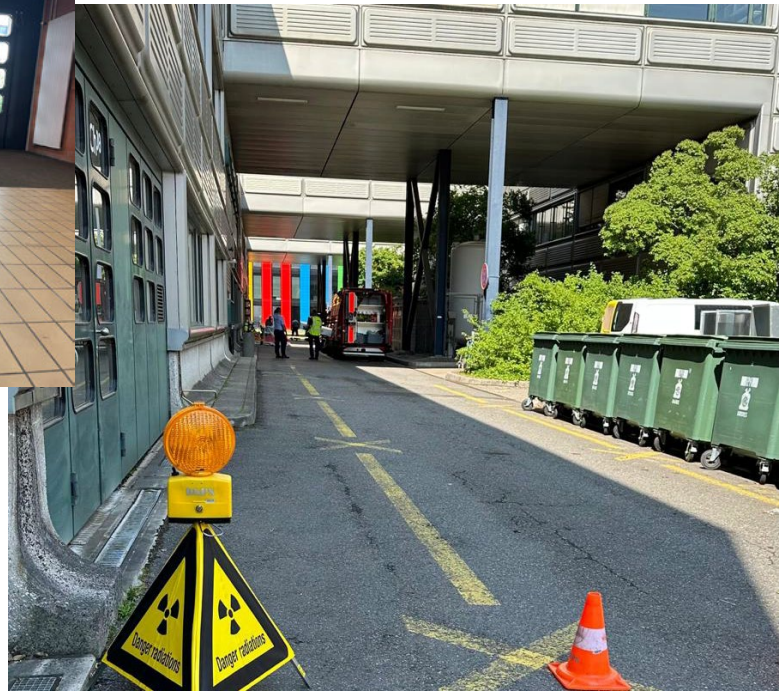
Emanuele Ripiccini

Highlights 2023

- 4 new authorisations issued
- 19 modified authorisations
- 2 Waste collections
- New TCV Shielding
- Elimination of dosimetry for irradiator users in the SV pet facility
- Relocation of 2 "problematic" sources
- Improved shielding of the PIXE irradiation room at GC G0
- Standardisation of inventories for the SFOE
- Exercise RAD with Firebrigade, June 2023
- Basic training for the firebrigade
- Update to the Decision Tree for Radioactive Waste
- Decision tree for the reception of packages containing radioactive materials
- Two safety training courses are now available online

Highlights 2023





Emanuele Ripiccini

Emanuele Ripiccini

2024

- Publication of the Radiation Protection Technical Guideline Complementary to LEX 1.5.1
- Automated access to C Labs upon completions of the mandatory safety trainings

Thank you for your attention

Emanuele Ri