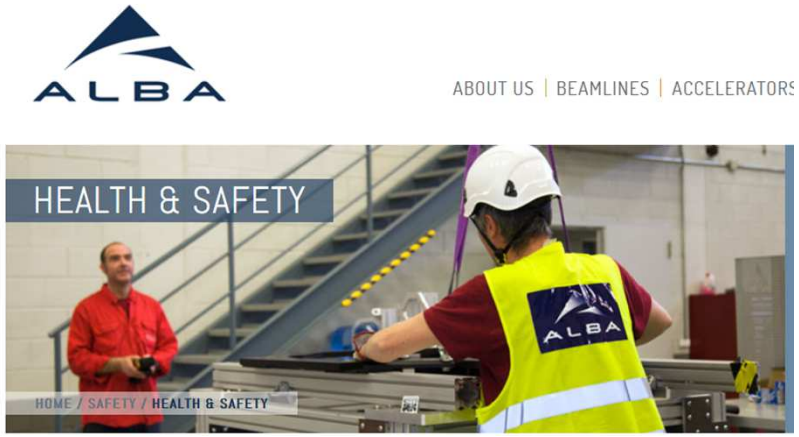
Maintenance aspects of the ALBA Safety systems



Maria-Jose Garcia
Head of the RPS
on behalf of the H&S Office

Safety systems maintenance

Who is the H&S Office?

Risks @ALBA?

Safety & Emergency systems

Maintenance aspects

Conclusions

Maintenance aspects of the ALBA Safety systems

Introduction to Safety@ALBA

"Safety at ALBA is our priority for the entire organization. It guarantees ALBA commitment versus scientific excellence and improvement of the well-being and progress of society. Safety habits in the professional world are seamlessly transmitted to families and children, participating in the education of the whole community."

Caterina Biscari, ALBA Synchrotron Director

ALBA's Health & Safety Office

HEALTH & SAFETY STAFF

Victor Garrido

Safety Officer

RADIATION PROTECTION SERVICE

Mª José García - *E-mail*
Head of the Radiation Protection Service

Arnaud Devienne - *E-mail*

José Antonio Alcobendas – *E-mail*

OCCUPATIONAL HEALTH & SAFETY

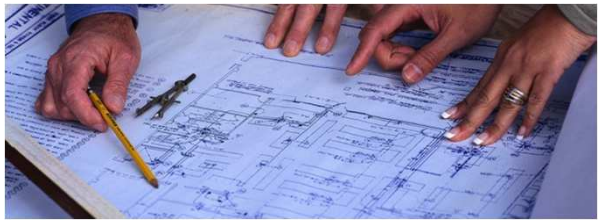
Carme Mármol - *E-mail*

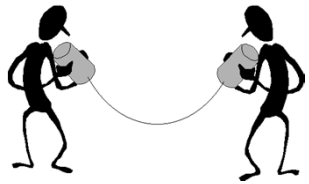
José Aguilar - *E-mail*

Cristina Massa - *E-mail*

H&S OFFICE STAFF

- Occupational H&S
  - Coordinates with the External Prevention Service
  - Checks the reports, procedures and the MSDS (Material Safety Data Sheet)
  - Organizes training sessions about prevention & health
  - Supports all the Staff on prevention and safety aspects
- Radiation Protection Service
  - Checks and to write the reports on the radiation protection
  - Does operational control of radiation levels and interlocking systems
  - Writes the documentation, records and administrative controls on Radiological Protection (RP)
  - Organizes the training sessions on Radiological Protection





RISKS @ALBA


Entrapment


Overexertion


Cuts


Particle Projection


Falling objects


Falls at different level


Falls at same level


Run Over


Electric


Noise


Chemicals


Thermic contact


Cryogenics

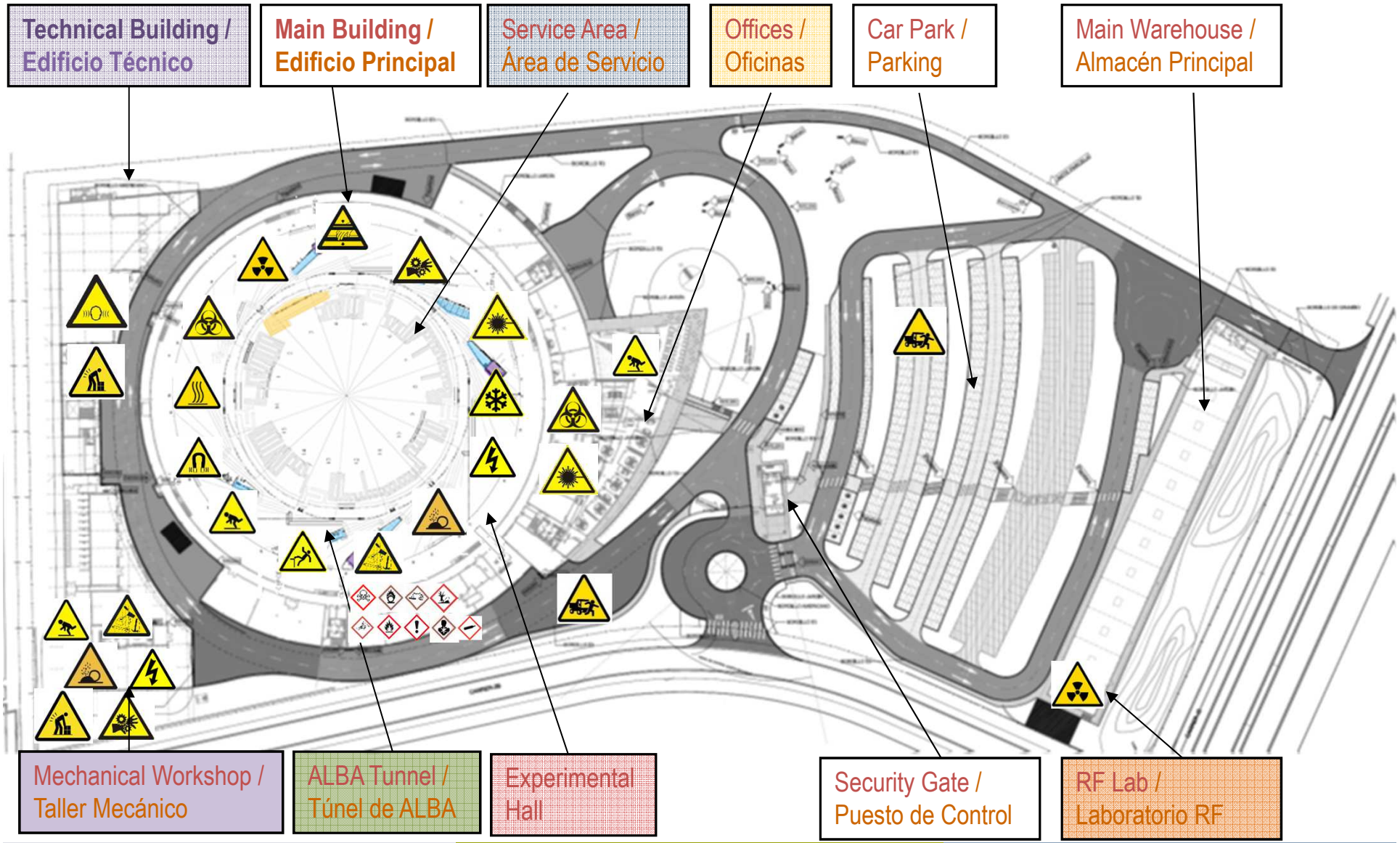

Magnetic Field


Biological


Laser


Radiological

RISKS @ALBA

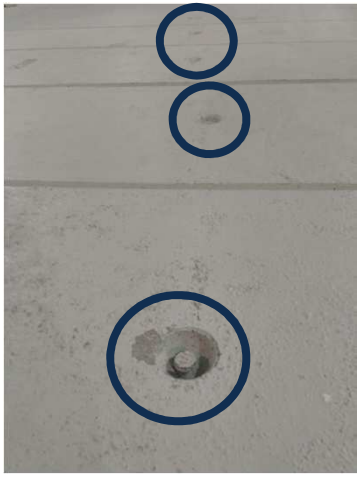

Technical Building / Edificio Técnico
Main Building / Edificio Principal
Service Area / Área de Servicio
Offices / Oficinas
Car Park / Parking
Main Warehouse / Almacén Principal
Mechanical Workshop / Taller Mecánico
ALBA Tunnel / Túnel de ALBA
Experimental Hall
Security Gate / Puesto de Control
RF Lab / Laboratorio RF

Maintenance aspects of the ALBA Safety systems

Safety and Emergency Systems

Fallings above 2m level and falling objects risks

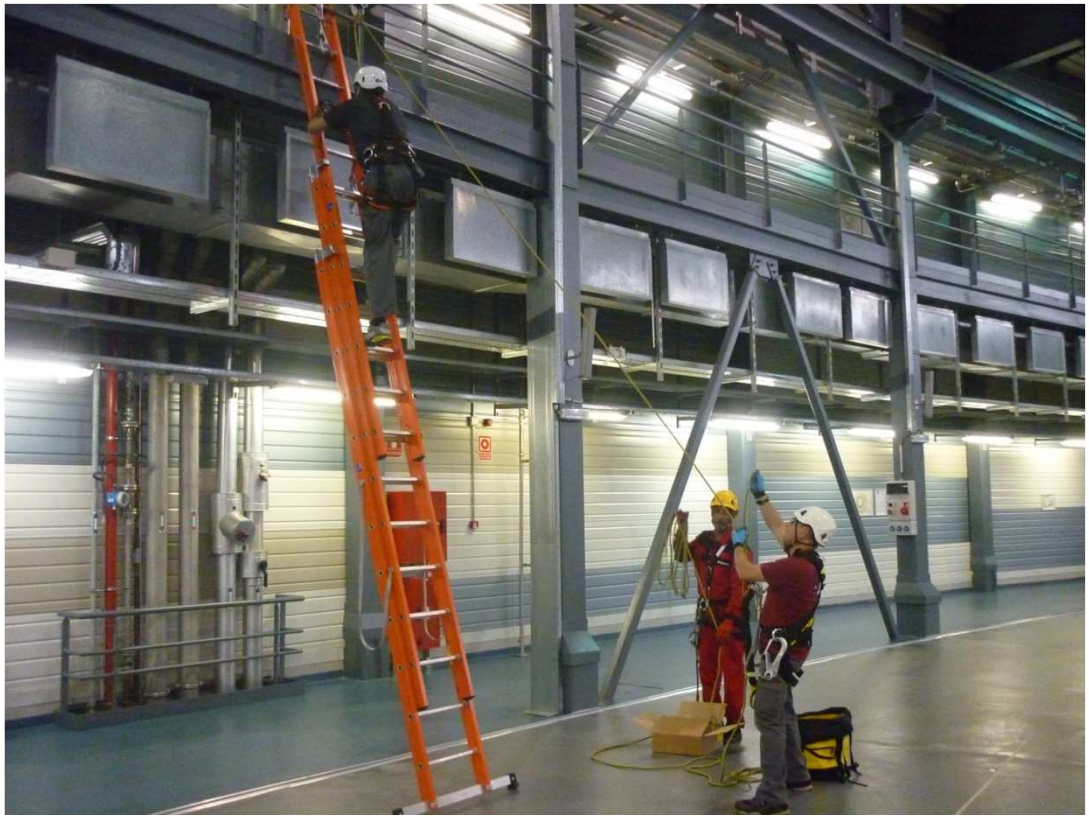
Tunnel Roof Bannister

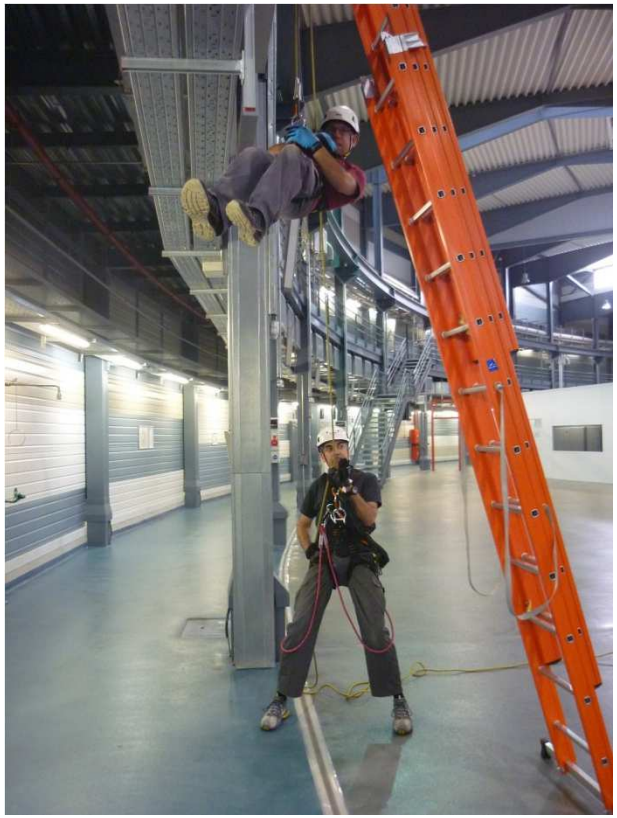


Mechanical Bolts

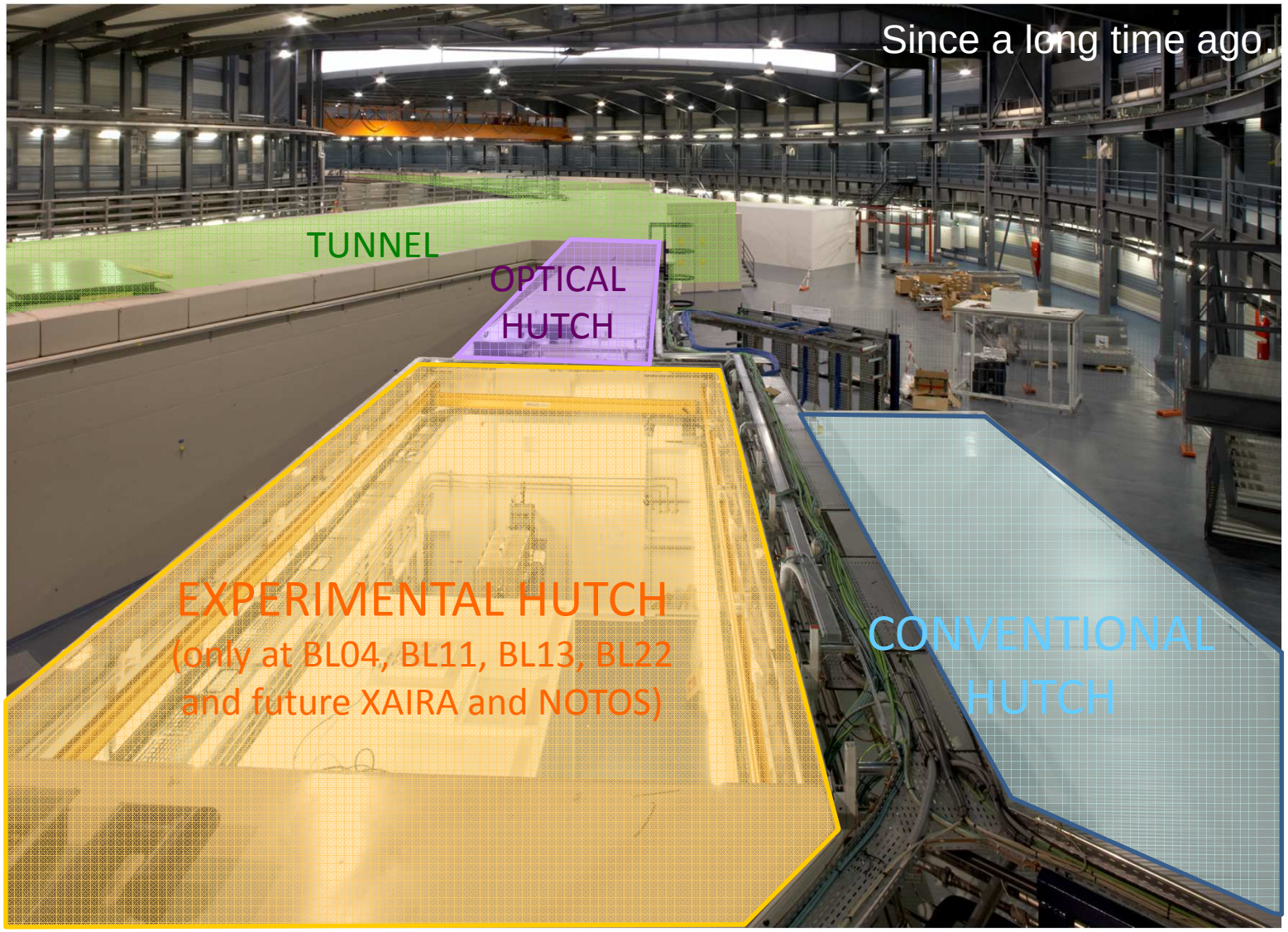
Tunnel Roof Lifting with Mechanical bolts

Fallings above 2m level and falling objects risks





Radiological risk - Bunkers



Radiological risk - PSS

The Personnel Safety System - **PSS** warranties that:

1. **Radiation cannot get into** the bunker/hutch before it is checked that nobody is left inside it.

2. When the **bunker/hutch is interlocked,** nobody can access inside it.

3. If the level of external radiation in the bunker/hutch is above the limits, **the Accelerator and/or the Beamline are stopped automatically.**

Radiological risk - Detectors

RADIATION MONITORS

- Real-time measures **every 2 sec** including background
- 24 Fixed stations (19 Exp. Hall, 5 Ser. Area)
- 9 Movable stations

PORTABLE MONITORS

- Real-time measures including background

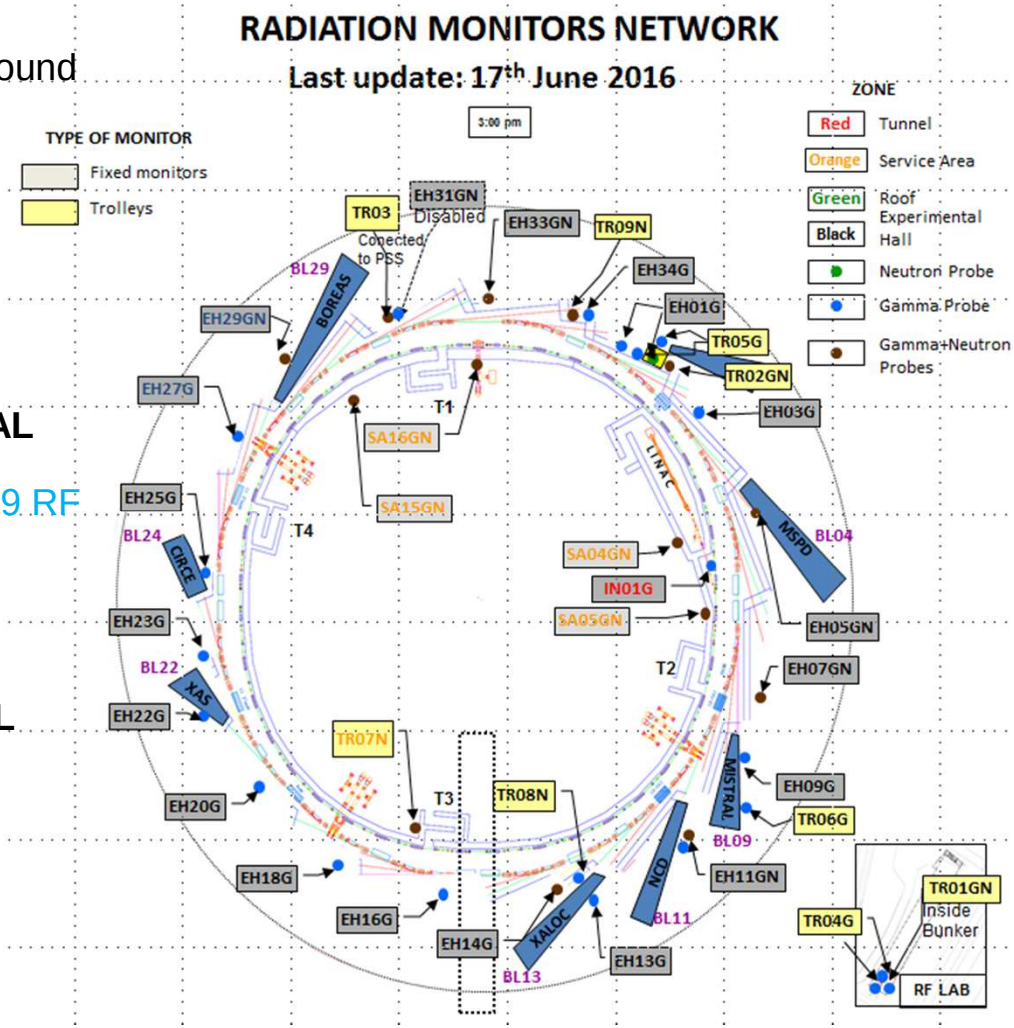
AREA DOSIMETRY

- ThermoLuminiscence Dosimeters (TLD) - **OFFICIAL**
  Monthly accumulated dose readings once background substraction
- 139 distributed TLDs (44 Exp. Hall, 42 Serv. Area, 9 RF Lab, 12 BLs, 5 LINAC Bunker, 27 Tunnel)
- **139 TLDs/month**

PERSONNEL DOSIMETRY

- Thermoluminiscence dosimeters (TLD) - **OFFICIAL**
  Monthly accumulated dose readings once background substraction
- **Around 80 TLDs/month**

- Electronic Personal Dosimeters (EPD)
  Real-time measures including background



EXPOSITION TO HAZARDOUS GASES

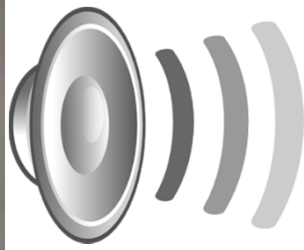
- Safety Cabinets:

- Electrovalves:

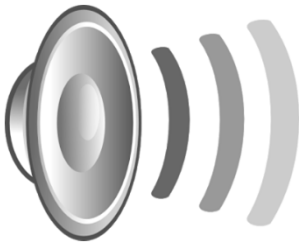
- Fixed & Portable gas detectors:

EXPOSITION TO HAZARDOUS GASES

- Gas system Alarm:



- Exhaust system Alarm:



EXPOSITION TO CHEMICALS AND BIOLOGICAL AGENTS

- Chemicals:

Glovebox

Chemical Fume hoods

Tasks in fume hood

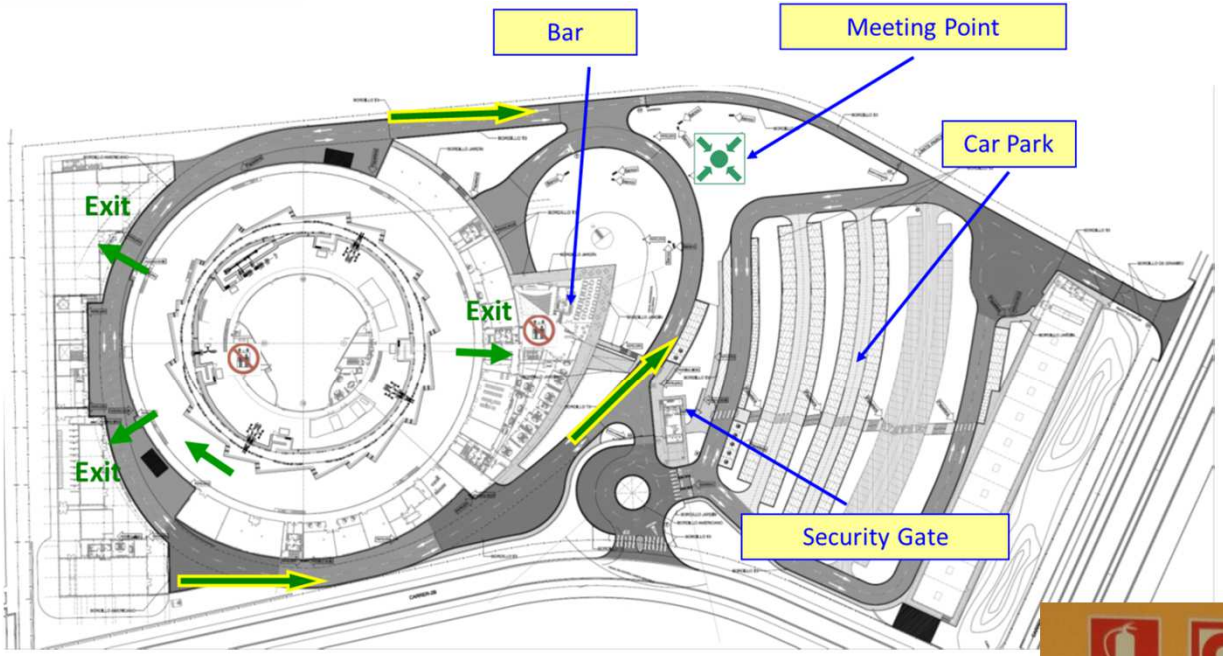
Tasks in fume hood

- Biological Agents:

Biosafety Cabinet

Tasks in biosafety cabinet

Emergency dealing systems

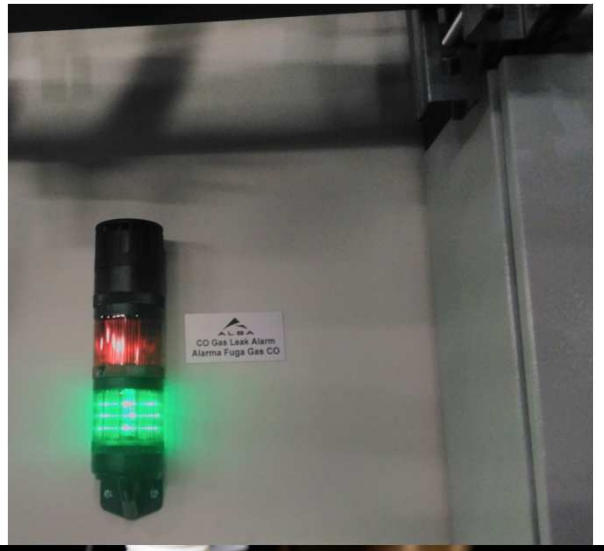


First Aid Kits

Loudspeakers

Maintenance aspects of the ALBA Safety systems

Maintenance aspects



Structures

- New maintenance program for BL hutches
  - Started this year
  - Experience and accident in similar facilities
  - Externalised to an expert
  - To be done yearly

- Banister, harnesses, etc:
  - Standard requirements
  - Maintenances regulated by law
  - Usually linked to useful life or manufacturer instructions

Personnel Safety System

- Yearly verification program
  - By **Controls** Section & SPR, not necessarily in parallel
  - Compulsory as stated by the regulator
  - Initial certification for the system done by an external expert is a must
  - Impact on RPS human resources is high
  - Has impact on the operation calendar
  - New BLs implementation:
    - Need specific testing implying the whole machine
    - Dependant of technology upgrades

Radiation Detectors

- Yearly verification program
  - By SPR and according to procedure approved by regulator
  - Compulsory as stated by the regulator
- Calibration by an authorised facility is compulsory every 6 years
  - Impact on the machine availability if not done properly
  - Needs to be externalised and tendered
  - Whole procedure might expand for more than 1 year

Hazardous gases systems

- Yearly gas detectors and respiratory equipment calibration program
  - Scheduled by Occupational H&S Office and according to provider instructions
  - Calibration by an authorised facility
  - Performed during shutdowns periods (no experiments at ALBA) to reduce impact

Chem/Bio systems

- Yearly verification program
  - Scheduled by Occupational H&S Office and according to provider instructions
  - According to Standard CEN-WA 15793, 2008 about Laboratory Biorisk Management.

Emergency systems

- Emergency doors:
  - High number & important use as normal doors → Correction actions are often needed
  - Preventive program by **Eng Div**.
- Fire fighting systems:
  - Checked according to law with a quarterly verification program managed by **Eng Div**.
  - Externalised
- Messaging system:
  - Large network tested yearly by **Eng Div**.
  - Externalised
- DEA defibrillators:
  - Yearly maintenance
  - Externalised

Maintenance aspects of the ALBA Safety systems

Conclusions

- Maintenance of the different systems is the key to keep ALBA safe
- A large number of assets depend on these maintenance programs
- Impact on the operation calendar can be produced if the different verification programs are not coordinated
- Many of the verification can be externalised
- Those who cannot may need an important number of human resources from several divisions

THANKS ALL FOR YOUR ATTENTION!