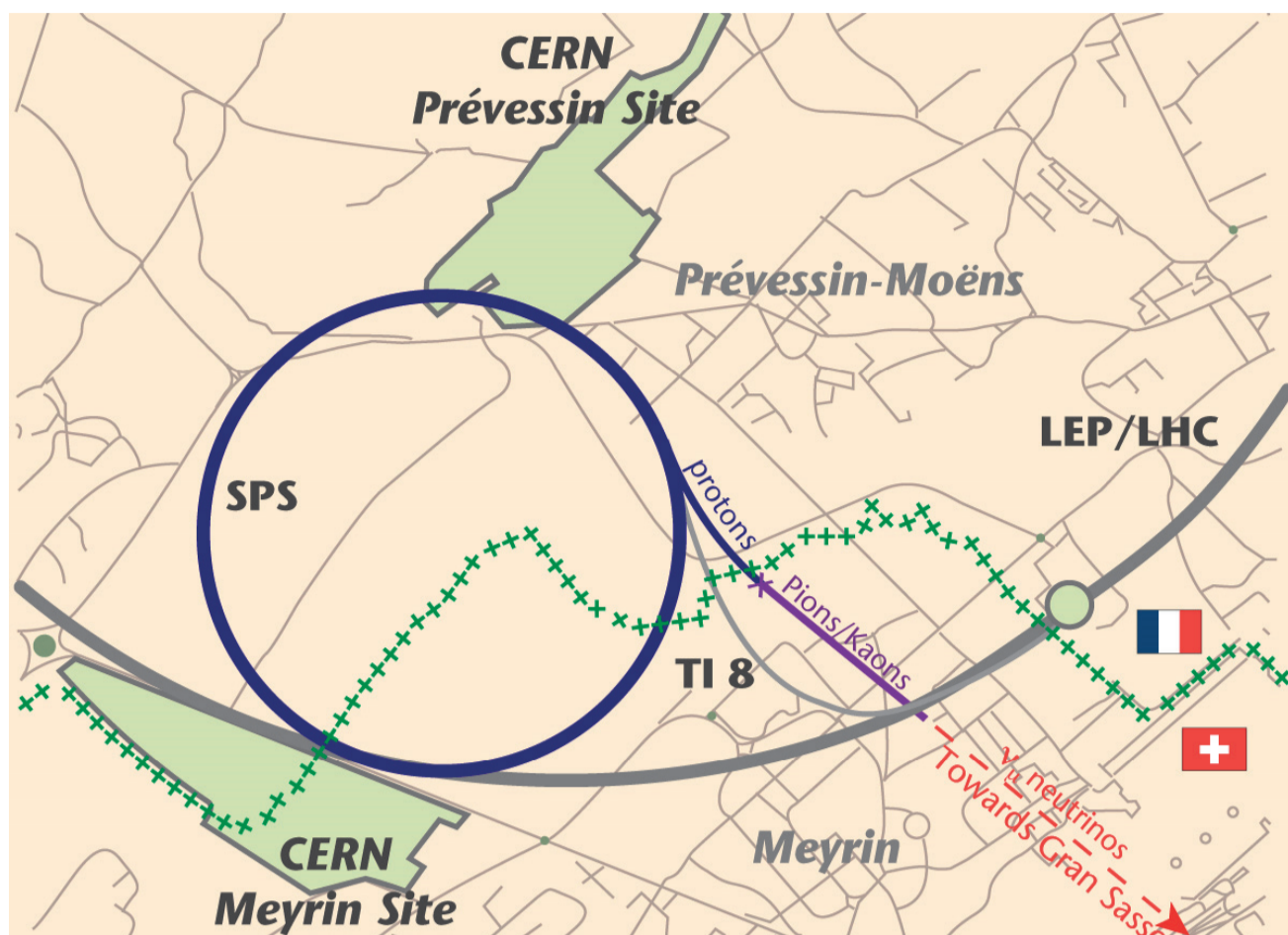




# Radiation Protection for Industrial Radiography activities at CERN

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Two main sites, 13 small sites to access the underground facilities (many different kind of buildings: offices, services, laboratories)



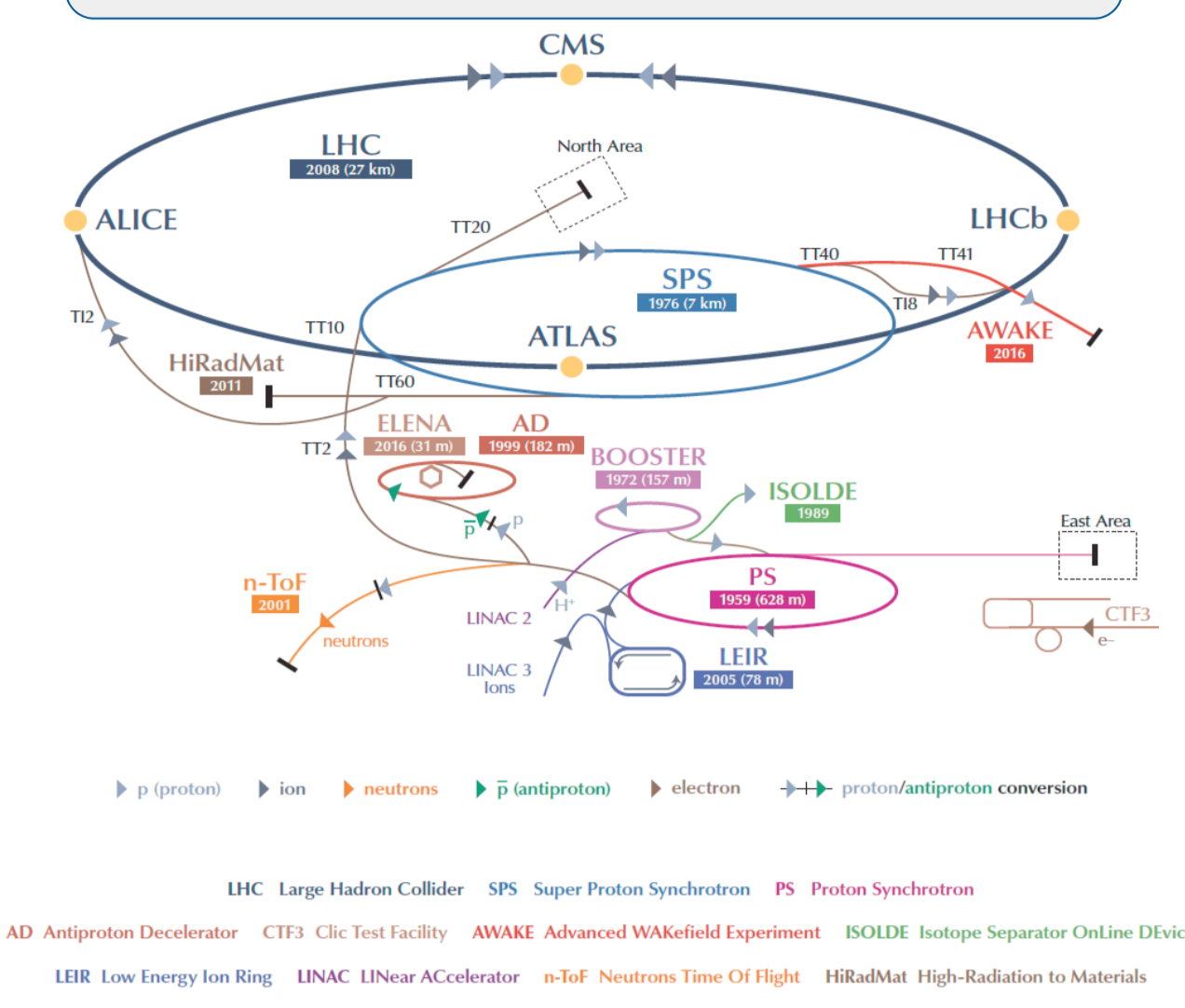
## Introduction

At CERN, the European Organization for Nuclear Research, physicists and engineers are probing the fundamental structure of the universe. They use the world's largest and most complex scientific instruments to study the basic constituents of matter – the fundamental particles.

Founded in 1954, the CERN laboratory sits astride the Franco-Swiss border near Geneva. It was one of Europe's first joint ventures and now has 21 member states.

The huge dimension of the laboratory sets the needs for the Industrial Radiography, an activity which is carried out almost daily.

~ 45 km of accelerator tunnel



## Industrial Radiography activities

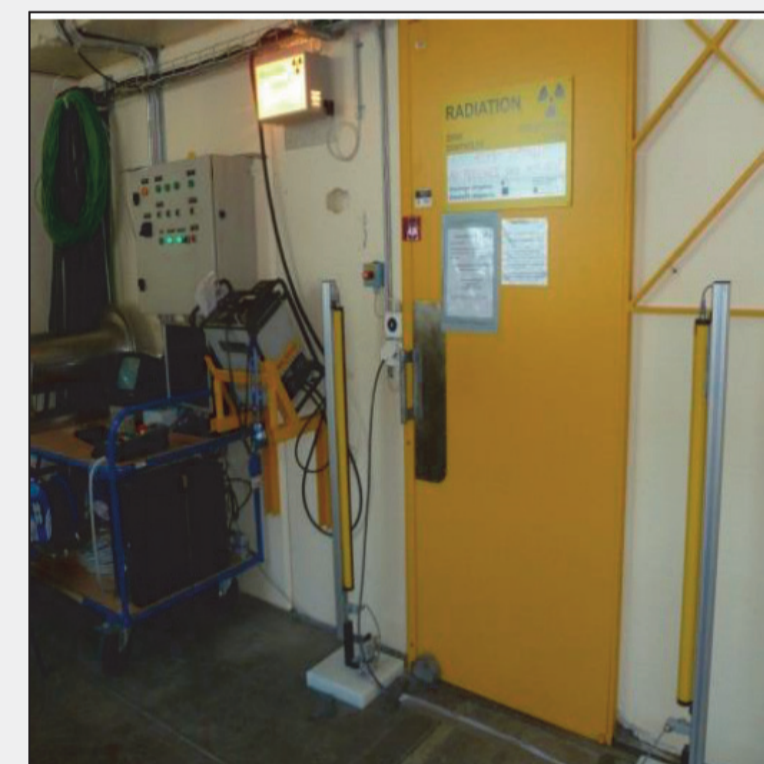
**Executer:** EN-MME group (Engineering Department) or subcontractor (DEKRA, since July 2015)

**γ sources used:** recorded in CERN source DB (GESO), managed by HSE-RP

**X-ray generators:** recorded in CERN DB, managed by HSE-RP

TREC

Record of all the equipment (sources and X-ray generators) used for the Industrial Radiography with the aim of knowing real time the location and retrieving easily all the concerned data in case of incident/accident.



**Where:** Industrial Radiography activity can be performed **everywhere** on the CERN site or in the Industrial Radiography bunker.

**Storage:** Safe storage on CERN site also for the firm equipment.

## Radiation Protection for Industrial Radiography

**Safety documents:**

- Safety Code F Rev. 2006
- PRP30 - Règles applicables aux activités de radiographie industrielle
- Procédure de sécurité pour les activités de radiographie industrielle



Any Industrial Radiography activity requires approval by all the concerned bodies (Facility Coordinators, Territorial Safety Officers...) and by Radiation Protection at least 48h in advance.

Activities are usually planned **outside working hours**, and cannot be performed outside the declared and approved time window. Automatic email notification sent to building occupants/facility users.

**Dosimetry:**



Personal and operational dosimetry is mandatory (plus their own for the external personnel)



**Procedure:**

- Activity notice put on all entrances 24h in advance
- One acoustic signal (foghorn) is given before fencing the exclusion zone
- Careful patrol of the exclusion zone
- Not accessing the exclusion zone « by mistake » is enforced using a flashing beacons with presence detection (an audible alarm in case of breach)
- Double acoustic signal is given at the end of the patrol and 5 minute before the start of the activity

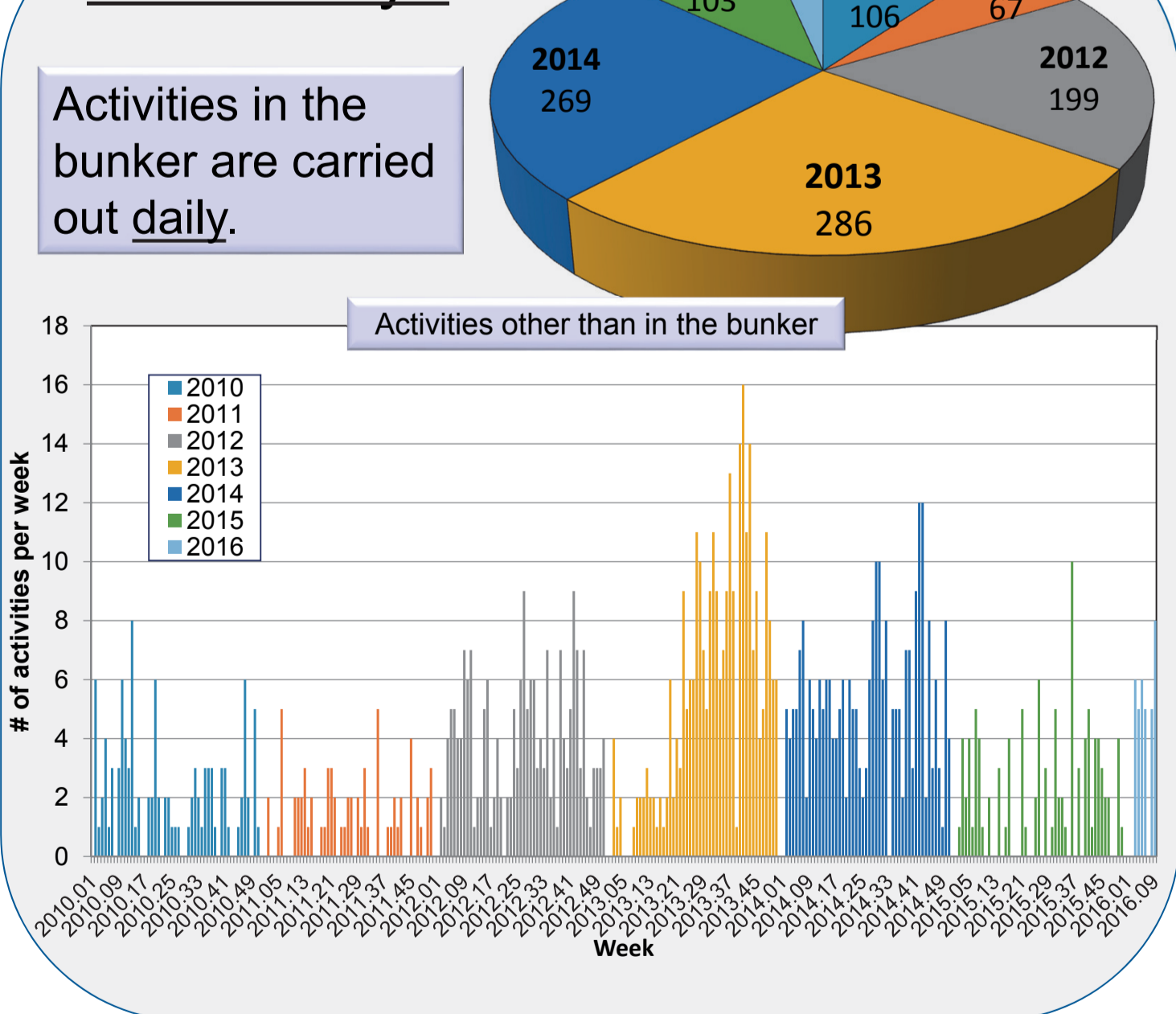


**Dose rate limits outside the exclusion zone:**

- Non-Designated Area**
- Inside CERN boundary < 2.5 μSv/h
- At CERN boundary < 0.5 μSv/h
- Radiation Area defined for each specific case by RP

Regular control are performed during the activities to verify all the safety aspects.

**How many?**



## Conclusion

CERN is an heterogeneous place, presenting a lot of specificities: offices, restaurants, public areas, laboratory, underground facilities. The Industrial Radiography activities are performed everywhere and each activity has to be treated accordingly to the potential risk.