

CERN Safety Policy



CERN, an intergovernmental organization for fundamental research in particle physics, defines and implements a Safety Policy. Safety covers occupational health and safety, including radiation protection, the protection of the environment and the safe operation of CERN's Installations, including radiation safety.

Safety is a priority of CERN's general policy.

OBJECTIVES

The objectives of the Organization's Safety Policy are:

- to ensure the best possible protection in health and safety matters of all persons, independently of their status, participating in the Organization's activities or present on its site, as well as of the population living in the vicinity of its installations;
- to limit the impact of the Organization's activities on the environment, and
- to guarantee the use of best practice in matters of Safety.

MEANS

The Organization makes the necessary means available to achieve its objectives in matters of Safety. In particular, the Organization:

- takes steps to implement continuous improvement of Safety;
- establishes and updates Safety Rules and ensures compliance therewith;
- implements measures for dealing with emergency situations;
- communicates proactively in Safety matters with persons participating in the Organization's activities or present on its site, with the Host States and the general public, and
- collaborates with its Host States.

Steps to implement continuous improvement of Safety

The Organization is committed to ensure a continuous improvement of Safety based on:

- the definition, follow-up and updating of prevention objectives based on risk assessment and experience gained;
- a Safety management system;
- continuous training in Safety matters of the persons concerned;
- a watching brief on emerging trends and the evolution of laws, regulations and best practices relevant to the activities of the Organization.

Safety Rules

CERN establishes and updates Safety Rules applicable to the Organization's activities on the whole of its site. To this end, it takes into account the laws and regulations of the Host States, EU regulations and directives as well as international regulations, standards and directives.

The Safety Rules established by the Organization are deemed to fully cover the matter concerned. Where the Organization does not establish Safety Rules, the relevant laws and the regulations of the Host States apply on a territorial basis.

The Organization takes the necessary measures to ensure compliance with its Safety rules.

Dealing with emergency situations

In order to limit the impact of incidents with Safety implications, the Organization implements and deploys on a permanent basis a set of technical and organizational measures and means aimed at handling emergency situations.

Proactive communication

CERN communicates proactively in matters of Safety with all persons participating in the Organization's activities or present on its site, with its Host States and with the general public. For persons participating in the Organization's activities, it also conducts information and awareness campaigns.

Collaboration with the Host States

CERN collaborates with its Host States in a transparent and constructive manner in matters of Safety, in particular in matters of radiation protection, radiation safety and environmental protection.

IMPLEMENTATION PRINCIPLES

Measures decided by the Director-General

As the executive of the Organization, ultimately responsible for Safety at CERN, the Director-General:

- assigns to the organic units concerned the responsibility for the implementation of the CERN Safety Policy at all levels of the Organization;
- assigns to the Health and Safety and Environmental Protection Unit, which reports directly to him, the role of providing assistance for the implementation of Safety Policy and a monitoring role related to the implementation of continuous improvement of Safety, compliance with the Safety Rules and the handling of emergency situations;
- assigns specific tasks to specialized units, as necessary;
- decides on the setting-up of a safety management system to ensure follow-up and updating of the prevention objectives, the program for the handling of emergency situations and any other action in Safety matters as well as on the establishment of the related documentation.

Individual responsibility

Each person participating in the activities of the Organization or present on its site shall actively contribute to the implementation of the CERN Safety Policy through exemplary conduct and, in particular, compliance with the CERN Safety Rules, the CERN Safety Objectives and best practices, actively seeking information to minimize risks, avoiding dangerous situations for herself/himself and others and exercising the responsibilities assigned to her/him safety.

We encourage you to familiarize yourself with the CERN Safety Policy and the CERN Safety Rules, which can be found at <https://cern.ch/SafetyPolicy>

Extract from CERN Safety Policy

- ***Safety is a priority of CERN's general policy.***
- **The objectives of the Organization's Safety Policy are:**
 - to ensure the best possible protection in health and safety matters of all persons, independently of their status, participating in the Organization's activities or present on its site, as well as of the population living in the vicinity of its installations;
 - to limit the impact of the Organization's activities on the environment, and
 - to guarantee the use of best practice in matters of Safety.
- The Organization makes the necessary means available to achieve its objectives in matters of Safety.
- CERN collaborates with its Host States in a transparent and constructive manner in matters of Safety, in particular in matters of radiation protection, radiation safety and environmental protection.

Safety responsibilities @ CERN



CERN, an intergovernmental organization for fundamental research in particle physics, defines and implements a Safety Policy. Safety covers occupational health and safety, including radiation protection, the protection of the environment and the safe operation of CERN's Installations, including radiation safety.

Safety is a priority of CERN's general policy.

OBJECTIVES
The objectives of the Organization's Safety Policy are:

- to ensure the best possible protection in health and safety matters of all persons, independently of their status, participating in the Organization's activities or present on its site, as well as of the population living in the vicinity of its installations;
- to limit the impact of the Organization's activities on the environment, and
- to guarantee the use of best practice in matters of Safety.

MEANS
The Organization makes the necessary means available to achieve its objectives in matters of Safety. In particular, the Organization:

- takes steps to implement continuous improvement of Safety;
- establishes and updates Safety Rules and ensures compliance therewith;
- implements measures for dealing with emergency situations;
- communicates proactively in Safety matters with persons participating in the Organization's activities or present on its site, with the Host States and the general public, and
- collaborates with its Host States.

Steps to implement continuous improvement of Safety
The Organization is committed to ensure a continuous improvement of Safety based on:

- the definition, follow-up and updating of prevention objectives based on risk assessment and experience gained;
- a Safety management system;
- continuous training in Safety matters of the persons concerned;
- a watching brief on emerging trends and the evolution of laws, regulations and best practices relevant to the activities of the Organization.

Safety Rules
CERN establishes and updates Safety Rules applicable to the Organization's activities on the whole of its site. To this end, it takes into account the laws and regulations of the Host States, EU regulations and directives as well as international regulations, standards and directives.

The Safety Rules established by the Organization are deemed to fully cover the matter concerned. Where the Organization does not establish Safety Rules, the relevant laws and the regulations of the Host States apply on a territorial basis.

The Organization takes the necessary measures to ensure compliance with its Safety rules.

Dealing with emergency situations
In order to limit the impact of incidents with Safety implications, the Organization implements and deploys on a permanent basis a set of technical and organizational measures and means aimed at handling emergency situations.

Proactive communication
CERN communicates proactively in matters of Safety with all persons participating in the Organization's activities or present on its site, with its Host States and with the general public. For persons participating in the Organization's activities, it also conducts information and awareness campaigns.

Collaboration with the Host States
CERN collaborates with its Host States in a transparent and constructive manner in matters of Safety, in particular in matters of radiation protection, radiation safety and environmental protection.

IMPLEMENTATION PRINCIPLES
Measures decided by the Director-General

As the executive of the Organization, ultimately responsible for Safety at CERN, the Director-General:

- assigns to the organic units concerned the responsibility for the implementation of the CERN Safety Policy at all levels of the Organization;
- assigns to the Health and Safety and Environmental Protection Unit, which reports directly to him, the role of providing assistance for the implementation of Safety Policy and a monitoring role related to the implementation of continuous improvement of Safety, compliance with the Safety Rules and the handling of emergency situations;
- assigns specific tasks to specialized units, as necessary;
- decides on the setting-up of a safety management system to ensure follow-up and updating of the prevention objectives, the program for the handling of emergency situations and any other action in Safety matters as well as on the establishment of the related documentation.

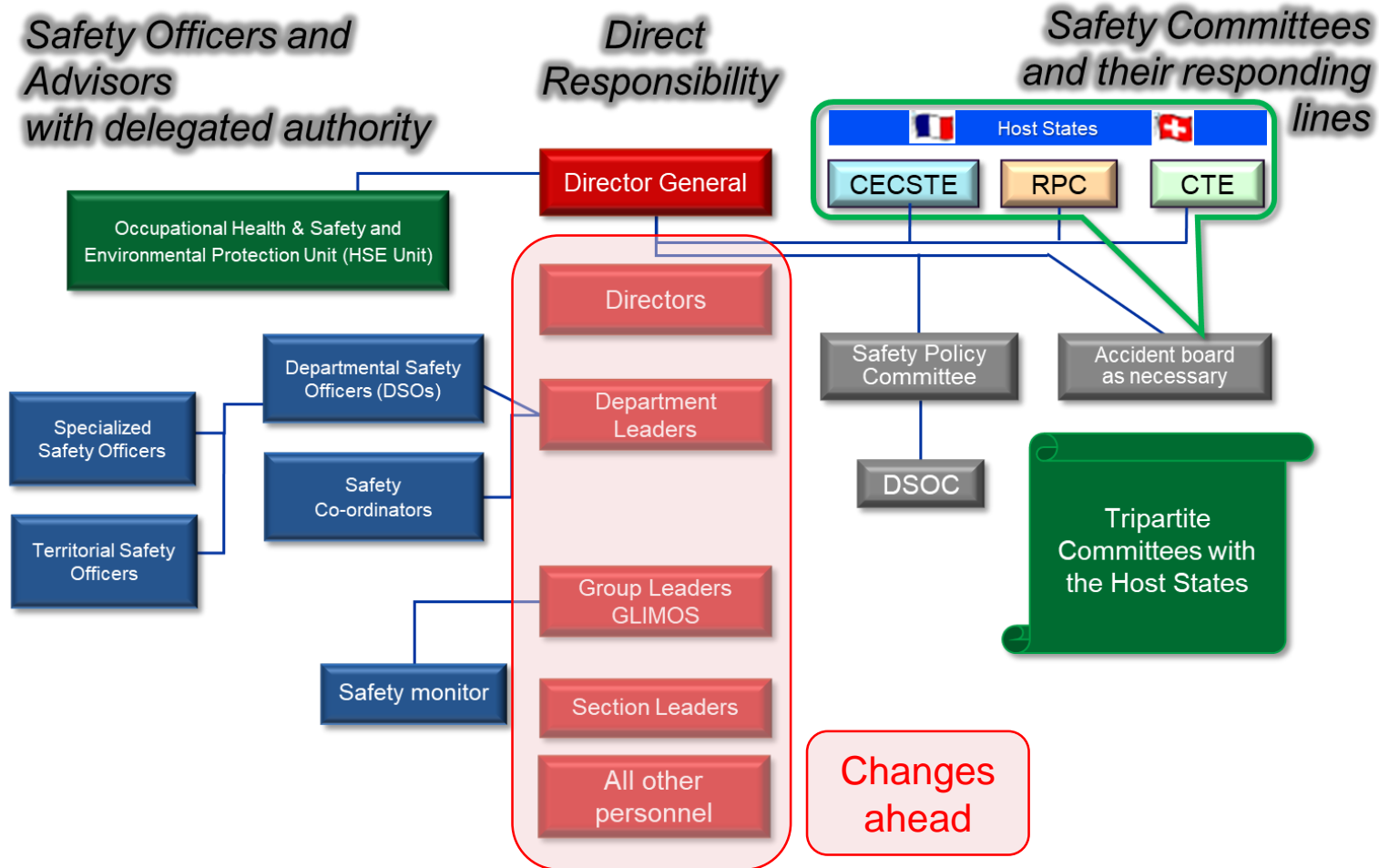
Individual responsibility
Each person participating in the activities of the Organization or present on its site shall actively contribute to the implementation of the CERN Safety Policy through exemplary conduct and, in particular, compliance with the CERN Safety Objectives and best practices, actively seeking information to minimize risks, avoiding dangerous situations for herself/himself and others and exercising the responsibilities assigned to her/him safety.

We encourage you to familiarize yourself with the CERN Safety Policy and the CERN Safety Rules, which can be found at <https://cern.ch/SafetyRules>

Extract from CERN Safety Policy

- As the executive of the Organization, ultimately responsible for Safety at CERN, the Director-General:
 - assigns to the organic units concerned the responsibility for the implementation of the CERN Safety Policy at all levels of the Organization;
 - assigns to the Health and Safety and Environmental Protection Unit, which reports directly to him, the role of providing assistance for the implementation of Safety Policy and a monitoring role related to the implementation of continuous improvement of Safety, Safety Policy compliance with the Safety Rules and the handling of emergency situations;
 - assigns specific tasks to specialized units, as necessary;
 - decides on the setting-up of a safety management system to ensure follow-up and updating of the prevention objectives, the program for the handling of emergency situations and any other action in Safety matters as well as on the establishment of the related documentation.
- Individual responsibility
 - Each person participating in the activities of the Organization or present on its site shall actively contribute to the implementation of the CERN Safety Policy through exemplary conduct and, in particular, compliance with the CERN Safety Rules,

Safety responsibilities @ CERN

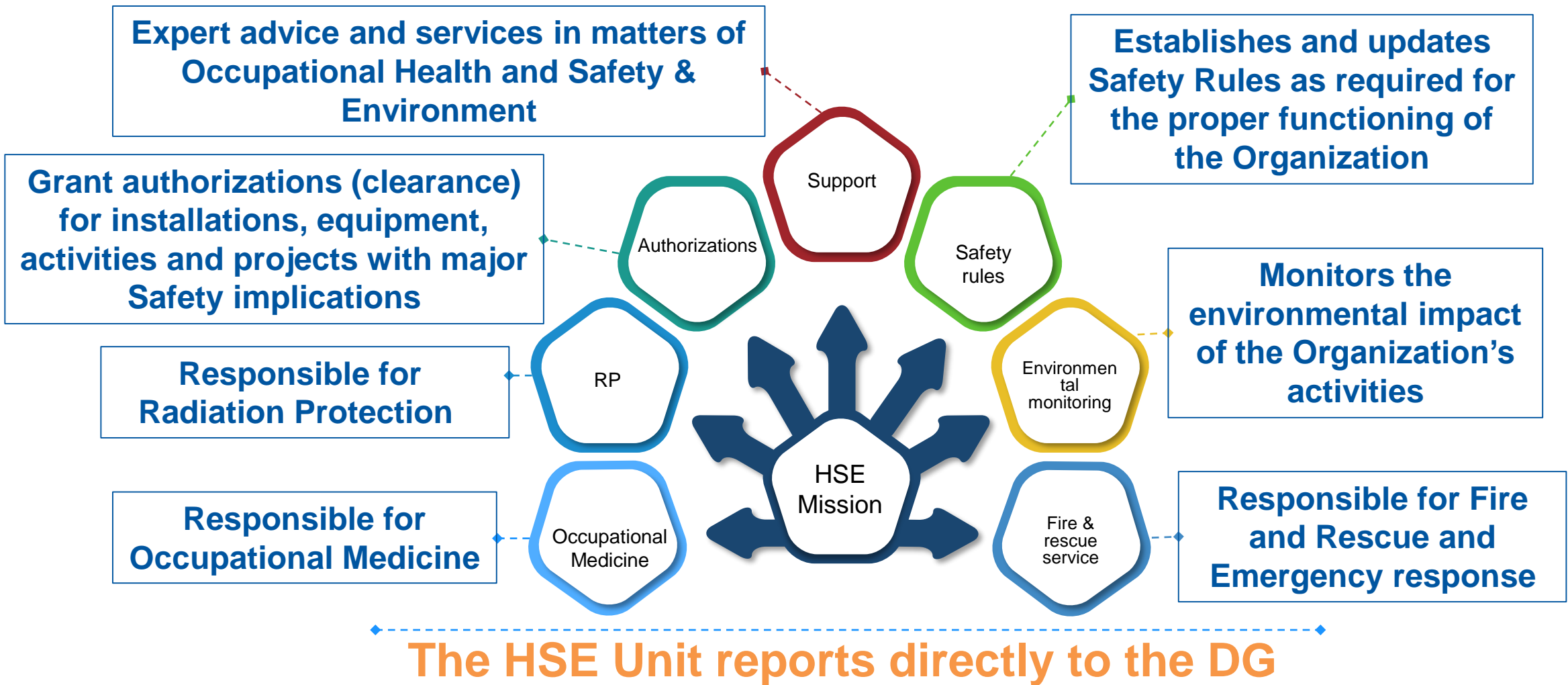




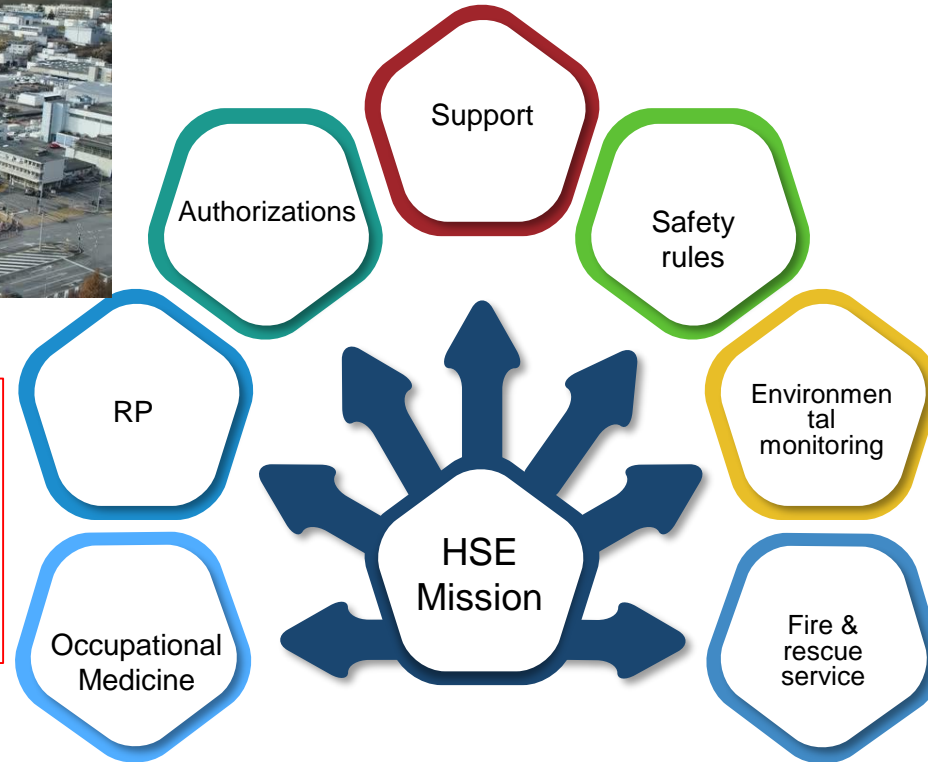
HSE
Occupational Health & Safety
and Environmental Protection unit

The HSE Unit

Mandate of the HSE Unit



Stakeholders

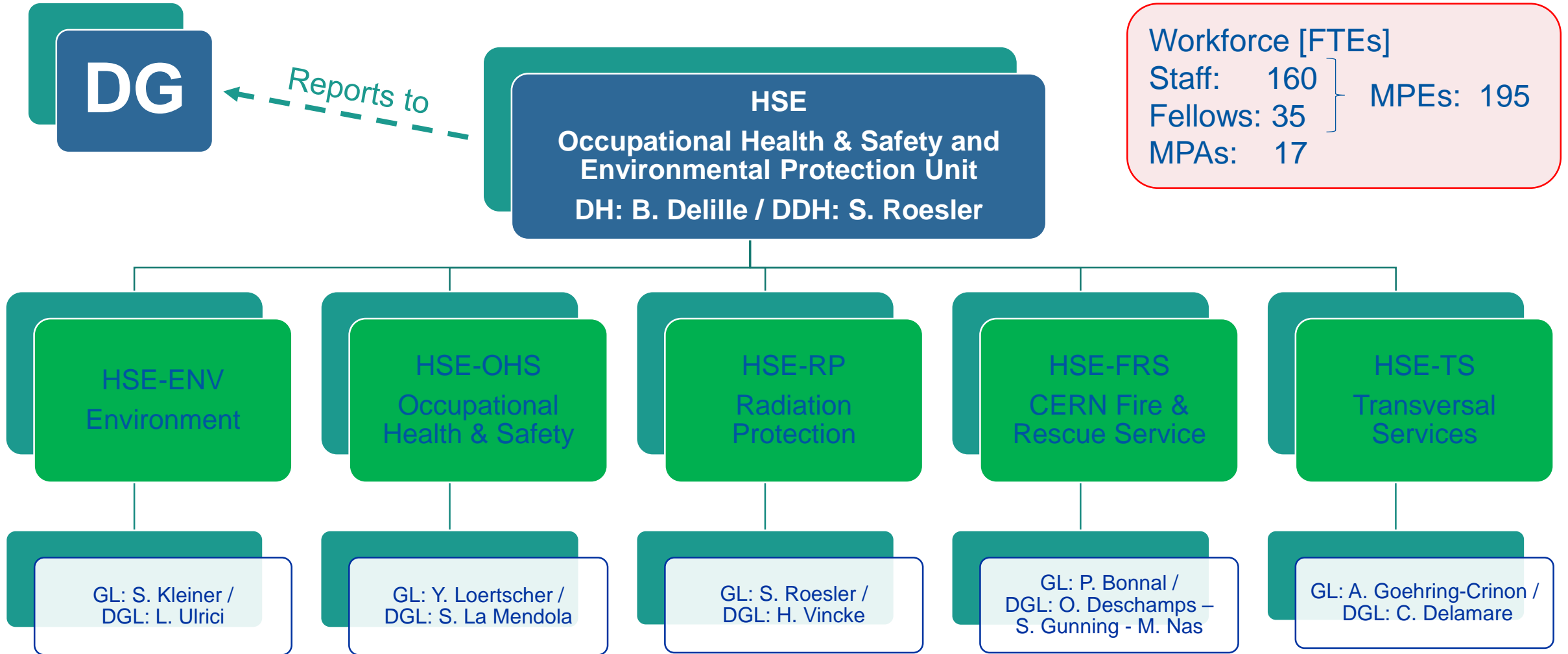


ALL CERN Units and Departments, including their partners (institutes etc)

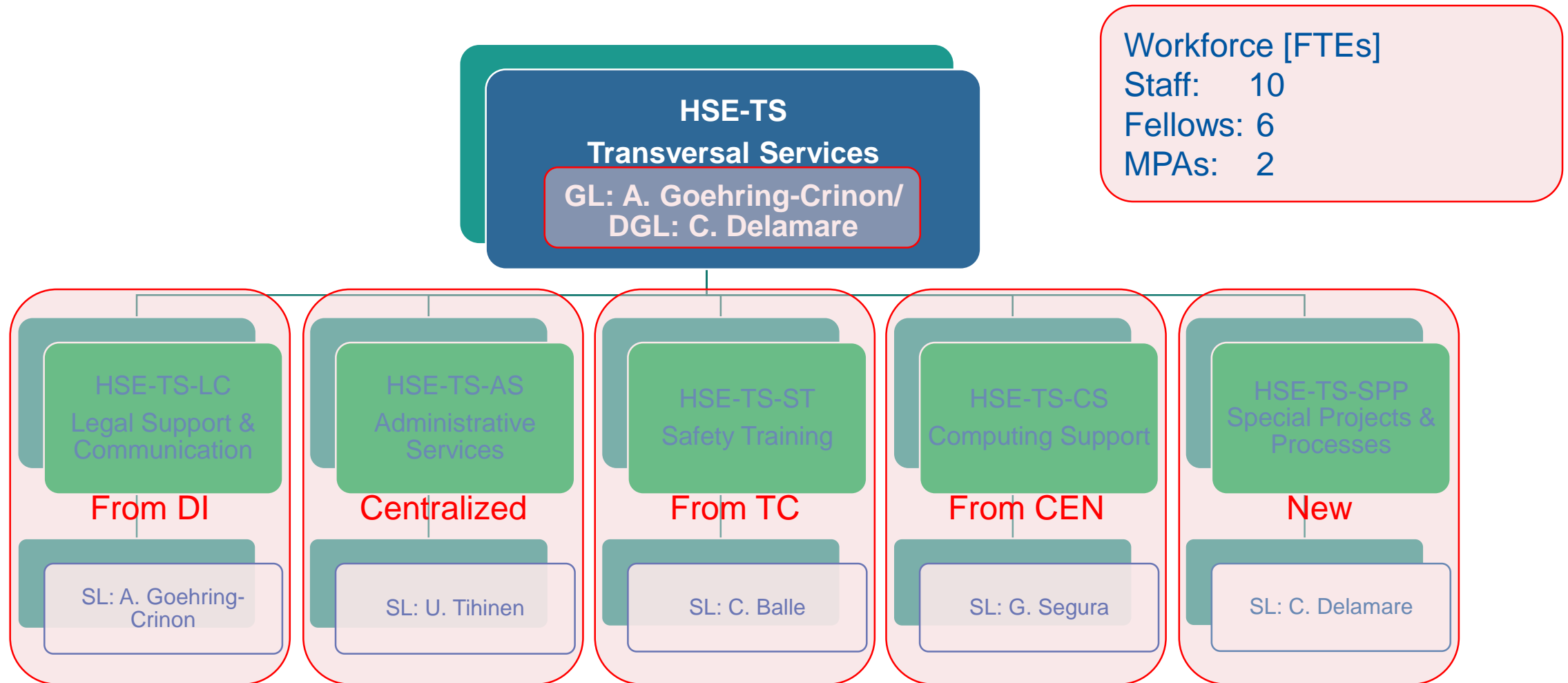
For the safe operation of CERN's accelerators, experiments and premises

- Host States Authorities in Matters of Radiation Protection and Radiation Safety
- Local Authorities in matters of Environmental Protection
- Fire and Rescue Services in France and Switzerland

HSE Unit - 2021 Structure



HSE 2021 – Transversal Services Group



HSE 2021 – Transversal Services Group



The image shows a composite graphic. On the left is a screenshot of a web application interface with a sidebar menu containing items like SIM, Cables, NIR (Laser), Fire Safety, Inspection, Electricity, Confined Spaces, Chemical, Safety Signs, RP, and Noise. The main content area has sections for 'Classroom Online', 'Projects', and 'Partners'. On the right is a photograph of a modern, multi-story building with large windows and a concrete facade. Overlaid on the photograph is the text 'Joint Learning Centre' and 'An interdepartmental project'. Below this, it says 'Project presentation 26.08.2020'. A blue ribbon at the bottom of the screenshot contains the text 'Jan'.

Safet **Saf** Web Ap

Deploy Stable

Classroom Online

Projects

Partners

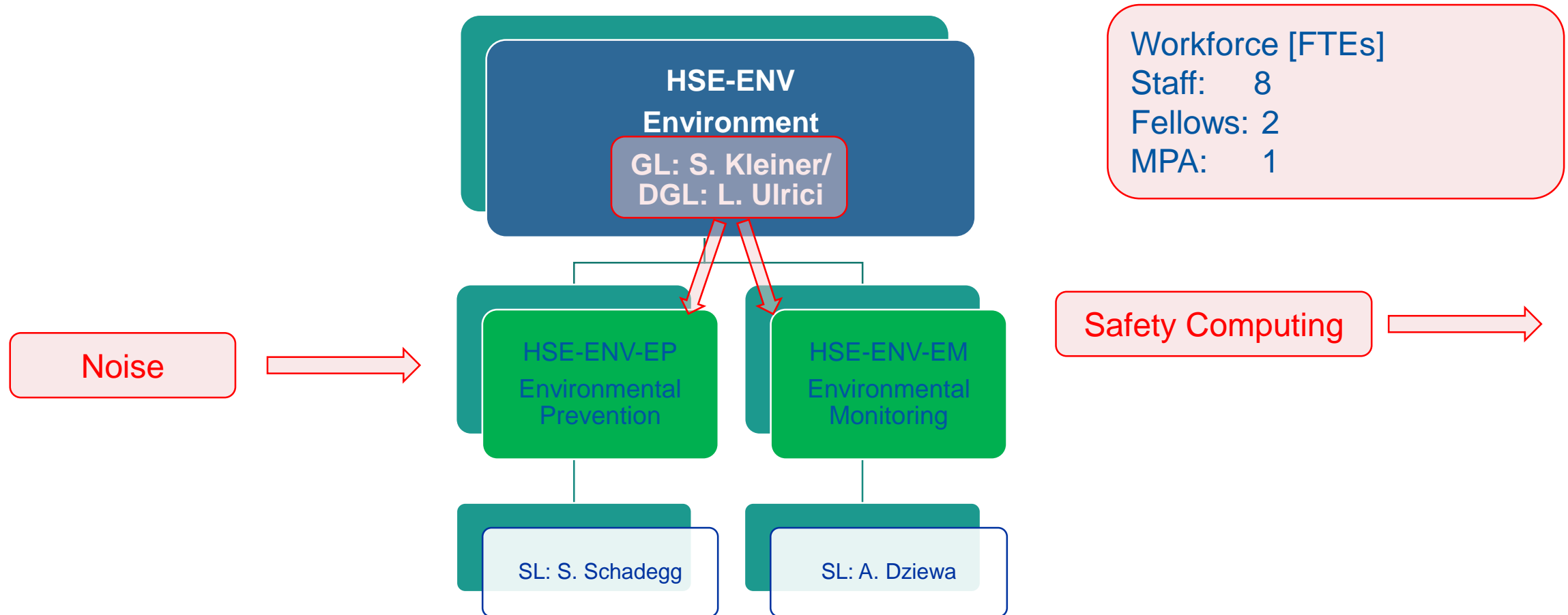
Jan

Joint Learning Centre

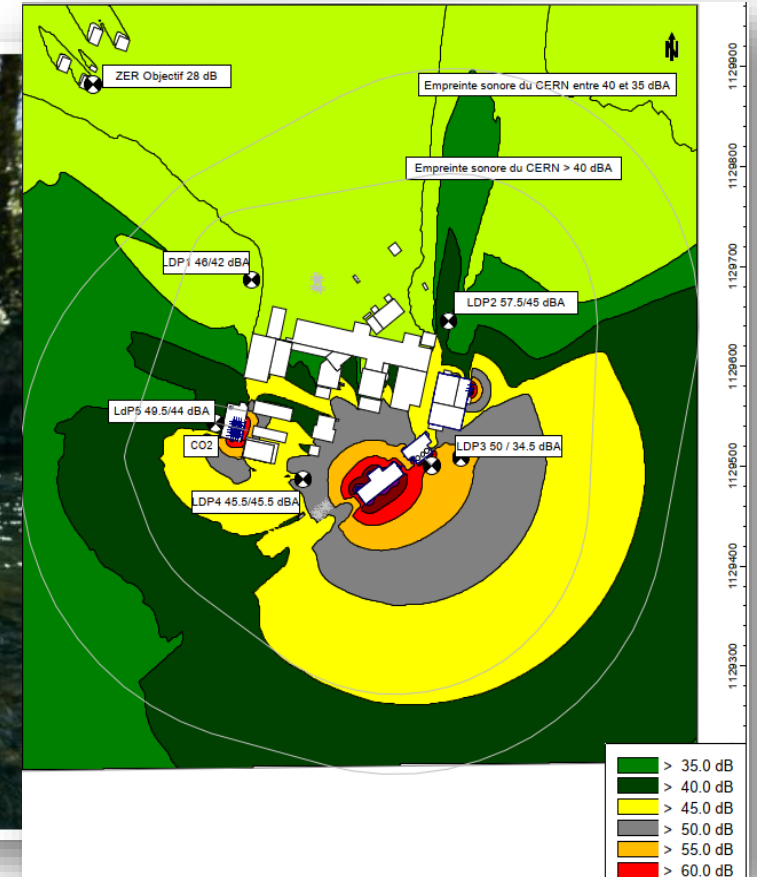
"An interdepartmental project"

Project presentation
26.08.2020

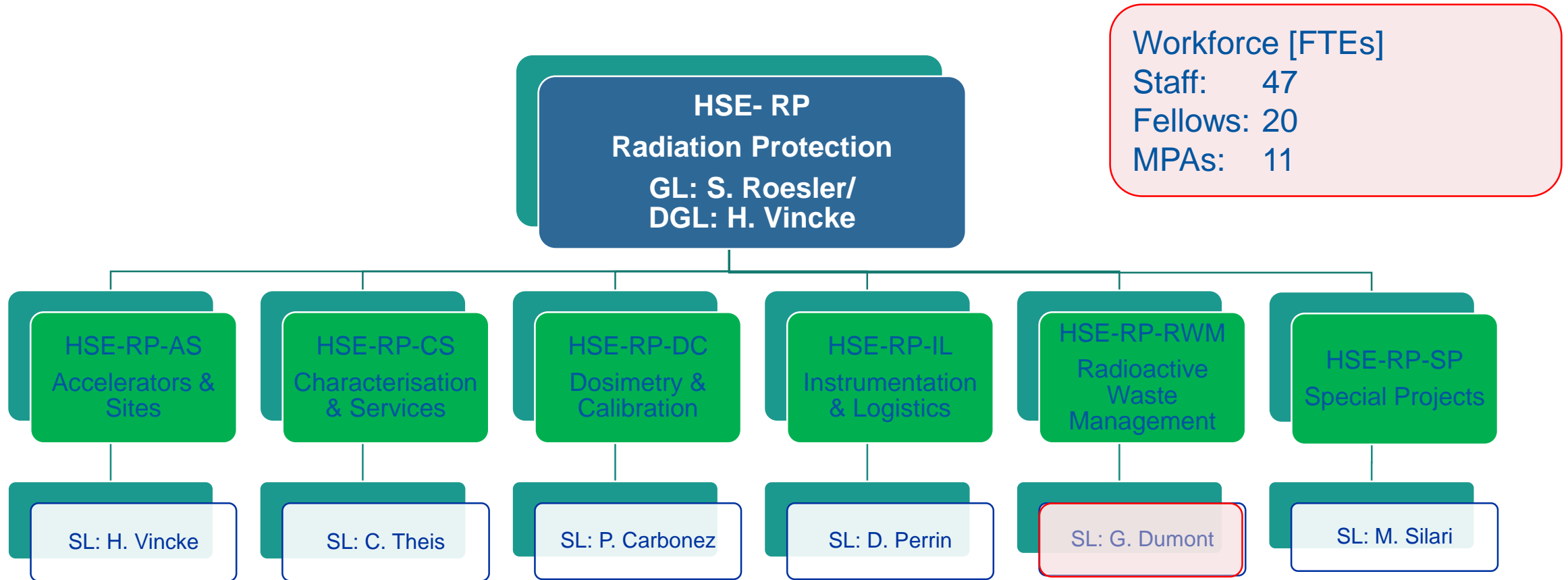
HSE 2021 – Environment Group



HSE 2021 – Environment Group

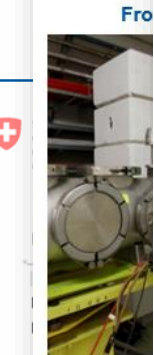


HSE 2021 – Radiation Protection Group

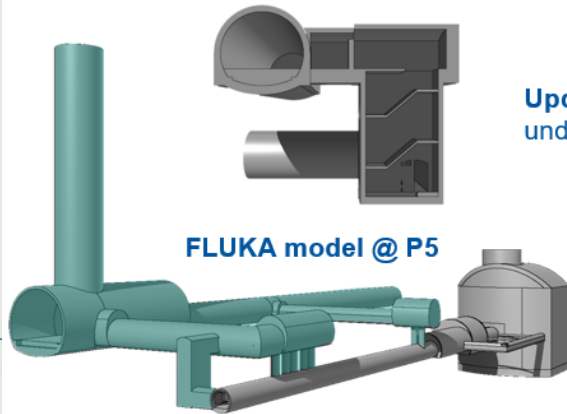


HSE 2021 – Radiation Protection Group

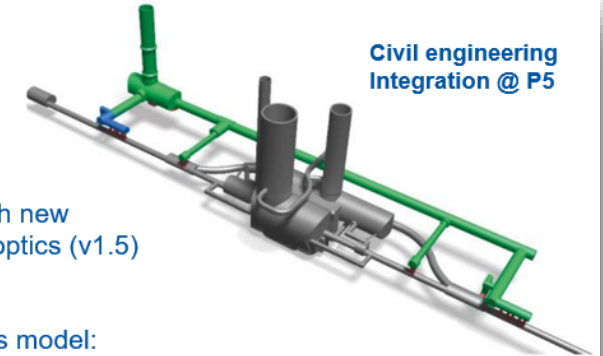
FLUKA Studies – HL-LHC



- In
- 9
- A



Updates of the existing FLUKA models, among others, with new underground infrastructures (Points 1 and 5), new beamline optics (v1.5)



Civil engineering Integration @ P5

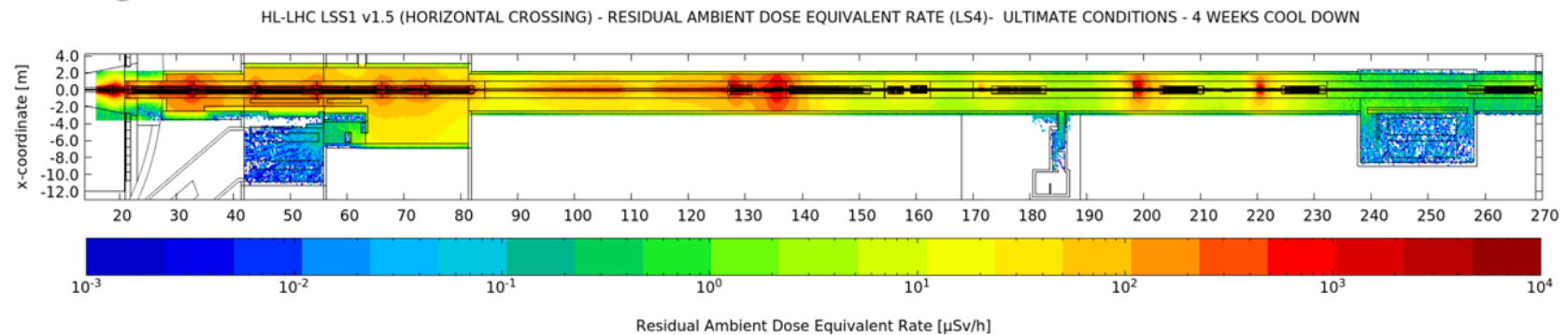
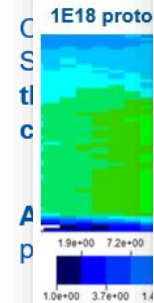
Several studies performed with this model:

- Prompt radiation levels in LSS1 and LSS5
- Residual dose rates during HL-LHC era
- Air activation in new HL-LHC galleries
- TAXN design and ZDC integration

LS2

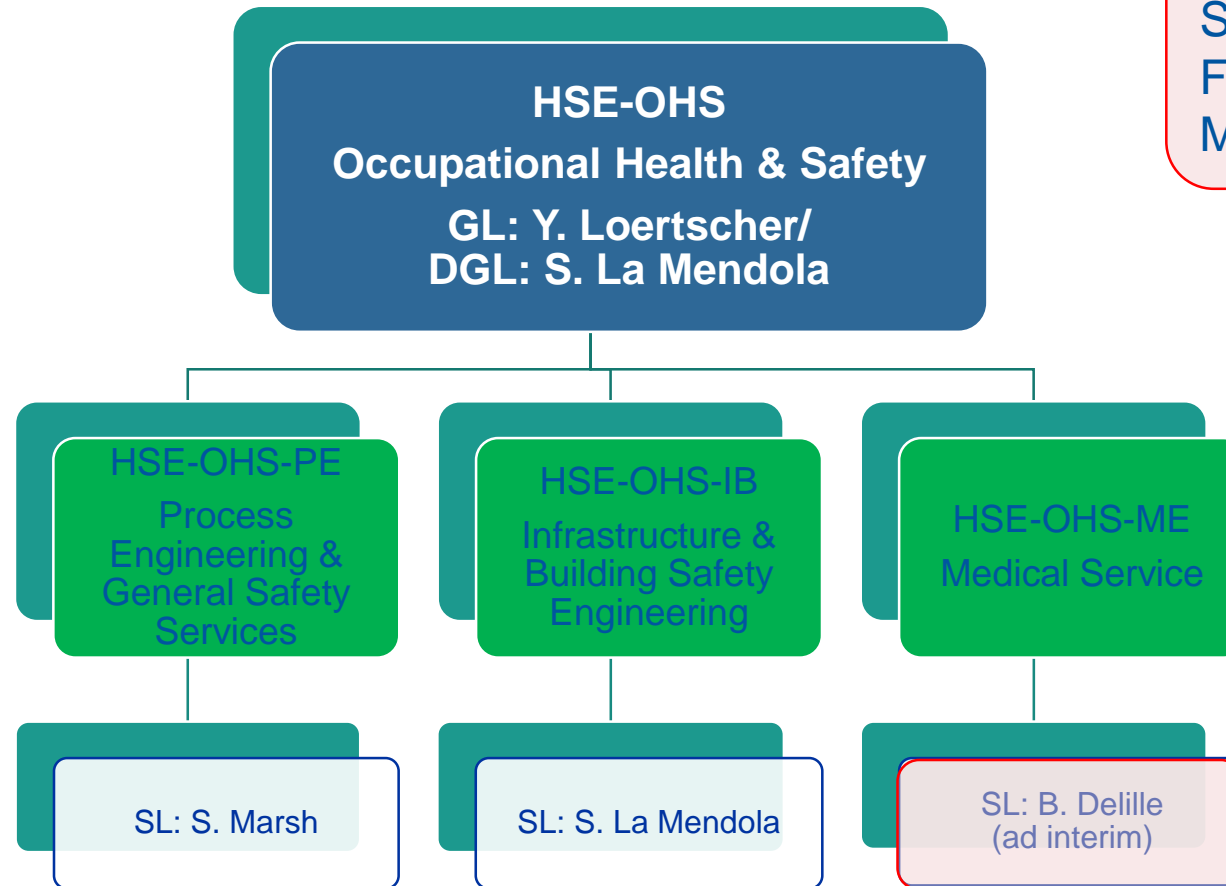
- A
- d

- Ma
- co
- ins
- La
- pr
- Ins
- an
- go



HSE 2021 – Occupational Health & Safety Group

Workforce [FTEs]
Staff: 31
Fellows: 6
MPAs: 3



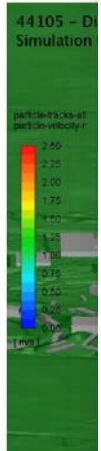
Noise →

HSE 2021 – Occupational Health & Safety Group

Pro FIR

- Over
- sup
- full
- act
- Imp
- mu
- imp
- ins
- hal
- Ro
- pro
- the

• FIR



Courte

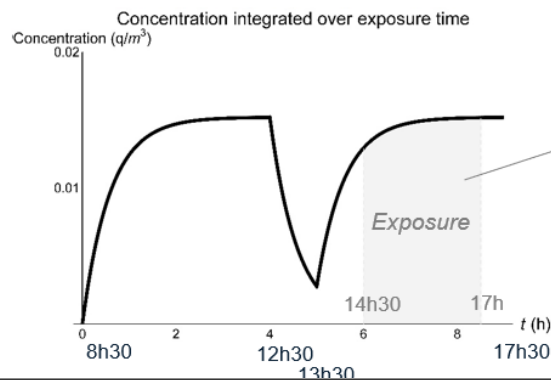
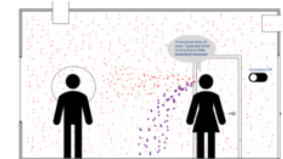
ESWG (e group), a for EXEC OF ELEC across al CERN.



CARA
COVID Airborne
Risk Assessment

<https://cern.ch/cara>

1. Estimate the emission rate of viruses (ER)
2. Estimate the concentration of infectious quanta in a room ($c(t)$)
Effect of: *ACH + Bio decay + deposition + HEPA*
3. Estimate the infection probability of an exposed individual (P_i) and the estimated number of possible new cases (R_0)

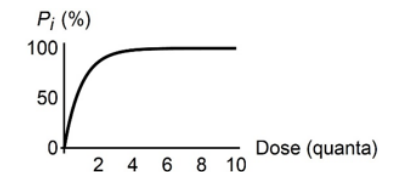


$$D = \int_{t_i}^{t_f} c(t) dt * \text{Inhalation flow rate}$$

= **Dose** (# of infectious quanta in the system)

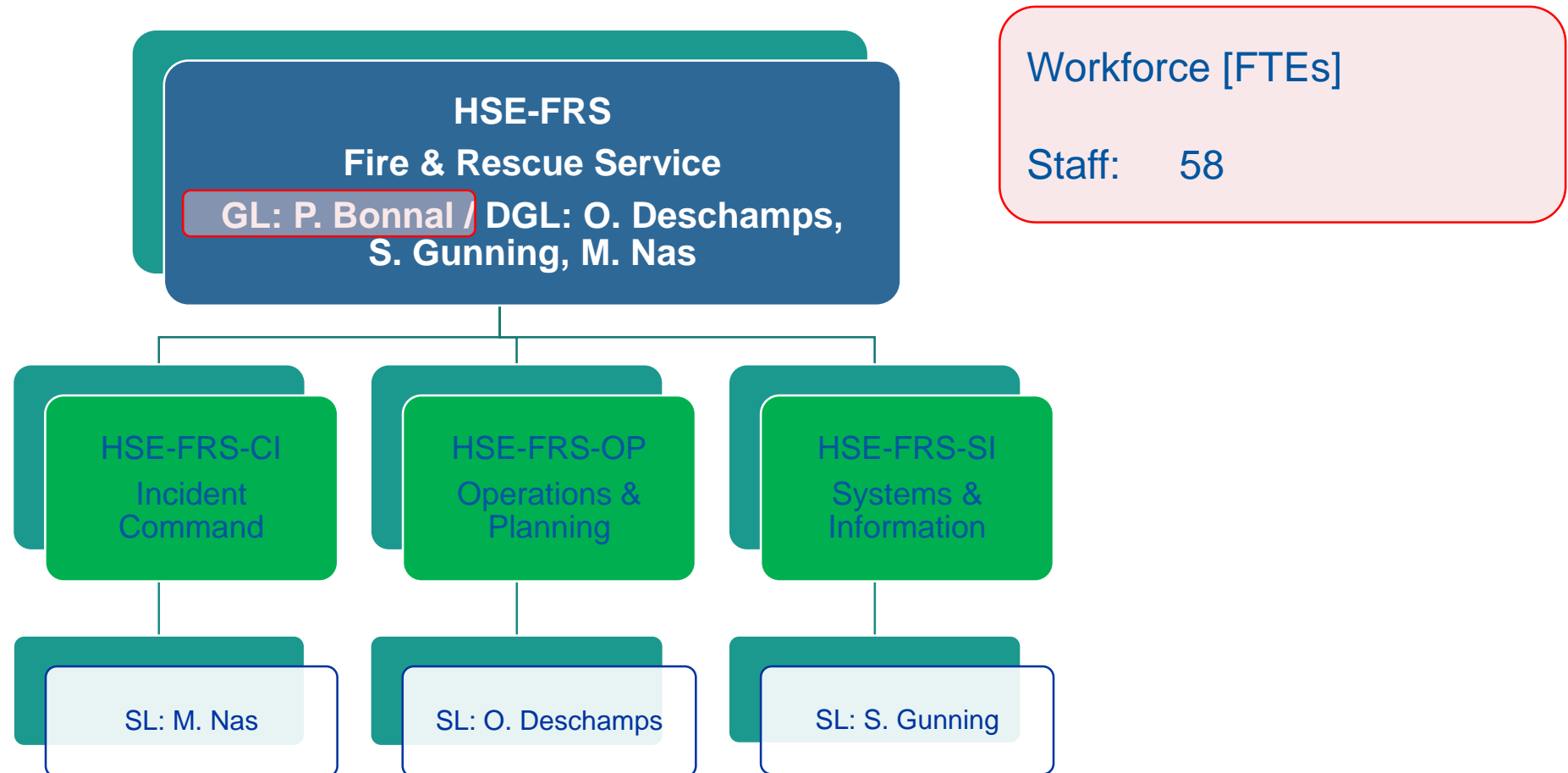
$$P_i = 1 - e^{-D}$$

$$1 - e^{-1} = 63\%$$



$$R_0 = P_i * \text{number of exposed subjects}$$

HSE 2021 – Fire & Rescue Service Group



HSE 2021 – Fire & Rescue Service Group

CFRS Challenges 2021



S
Covid-
Particip



CFRS
Presence
at LHC Pt.5



CFRS responsibility
w.r.t. **Medical
Emergency
Process**



CFRS Emergency
Preparedness
Project



Contribution to
**Fire
Prevention**



**B.65 Refurb.
Completion**

HSE 2021/2025 – A 5-Yr Vision



An integrated HSE Unit that

- is recognized as the advisory, inspection and authoritative body in matters of Safety at CERN.
- provides a well-defined level of operational and emergency response.

Ready to face challenges of Run3/LS3 and future major accelerator project(s).

The Management and Technical Management Boards (MB & TMB) will ensure the sharing of managerial and technical information to allow the appropriate decisions to be taken. These are the managerial & operational bodies of the Unit.

HSE 2021/2025 – Priorities (1/4)



- Environment

- Deliver and monitor objectives defined in CERN Environmental reports, for both conventional and radiological environmental aspects. Assess and document the long-term radiological environmental impact for homologation with the Host States Authorities.
 - Develop, with CEPS, the strategy and implementation plan for 2021-2025. *(Proposal to Directorate members that DHs participate in CEPS, the original participation -2016- was DHs of BE, EN, TE, EP, SMB, HSE, IR + SY– to be discussed ofc).*
 - Strengthen relations with both inside partners (FCC) & outside partners (*external stakeholders, EC*).
- ***The strategy and implementation plan shall cover three main aspects: Raise awareness of our impact on the environment, propose the implementation of projects for CERN in the HiLumi Era, study with partners like FCC the environmental impact of PP activities***

HSE 2021/2025 – Priorities (2/4)



- **HSE operational and emergency response: the definition and implementation of**

- Emergency Preparedness Plan
- Occupational Health Management Plan
- Safety Reviews Plan, i.e. revised Inspection plan (name to be agreed)

- ***The development of these plans will require the identification of the HSE operational & emergency response level - according to risks and retour d'expérience, a gap analysis to compare with the currently developed response level, an implementation plan and the identification of situations needing the intervention of outside partners.***

Note: The Occupational Health Management Plan will include the required evolution towards a risk based health surveillance at CERN. Before launching a project on the evolution of the Medical Service, the priority for 2021 will still be to manage the COVID-19 situation.

HSE 2021/2025 – Priorities (3/4)



- **HSE as advisory body and support to departmental activities**
 - Implement support to Projects, Studies, Experiments and Departments' activities transversally across HSE, delivering a proactive and pragmatic approach in providing guidance and training in all Safety domains within the scope of the HSE Unit.
- ***This project concerns all HSE groups and technical safety domains. The goal is that HSE provides advice as a Unit, and not as a combination of groups working in silo.***

HSE 2021/2025 – Priorities (4/4)



- **Lessons learnt from LS2 and readiness for Run3/LS3**

- For all Safety aspects, team up with Departments and Experiments to understand the safety issues raised during LS2 and how these could develop during LS3. This priority is wide and includes many aspects such as: the definition of clear guidelines for interventions of non-electrical nature in the vicinity of electrical equipment, works and services supervisor, safety coordination depending on the category of works, closure of all LS2 ALARA Level 3 works, document lessons-learnt and agree on actions to be taken for LS3. Review together with LHC Experiments the RP follow-up during LS2 upgrade works and integrate into LS3 preparation

- **Safety rules**

- Delivering well-coordinated efforts towards a consistent framework of rules in support of operational activities.