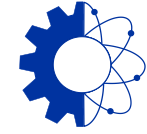


TECHNICAL GALLERIES
CONSOLIDATION

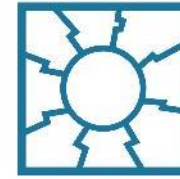


ENGINEERING
DEPARTMENT

Technical Galleries Consolidation Program

Project Safety Challenges

Safety studies



TECHNICAL GALLERIES
CONSOLIDATION

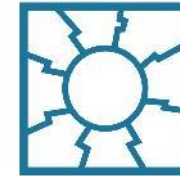
Completed

- Evacuation plan for Meyrin West Area (EDMS [2921024](#))
- Gallery 827: access points and limits
- CO2 and electromagnetic hazard in gallery 180 (EDMS [3072490](#))
- Fire safety and access control in galleries under buildings 864, 865, 866 (ECR EDMS [3017204](#))
- Removal of access point in b.274 (ECR EDMS [3000822](#))

Ongoing

- Gallery 796: access points and fire safety (ECR EDMS [3017542](#))
- Emergency and normal lights
- Emergency Call Points (EDMS [2789563](#))

General evacuation plan for CERN's technical galleries: Meyrin Ouest



TECHNICAL GALLERIES
CONSOLIDATION

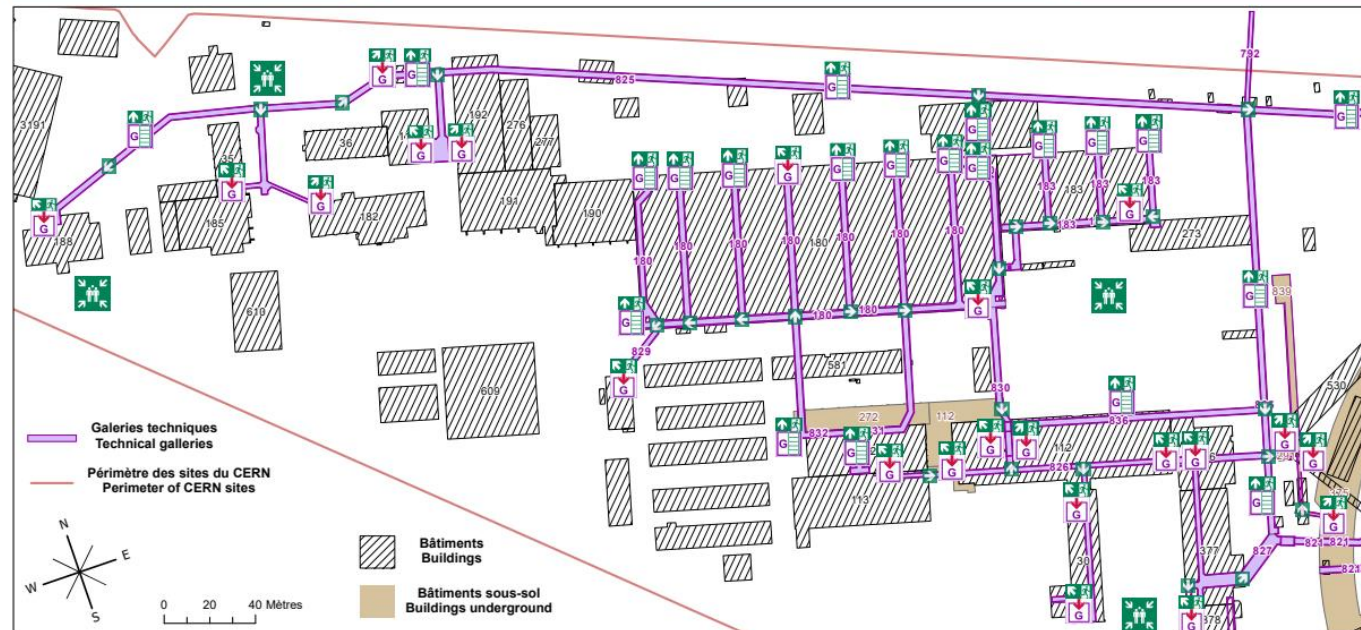


PLAN GÉNÉRAL D'ÉVACUATION DES GALERIES TECHNIQUES DU CERN : MEYRIN OUEST GENERAL EVACUATION PLAN FOR CERN'S TECHNICAL GALLERIES: MEYRIN OUEST

| LEGENDE / LABEL | |
|-----------------|---|
| | Accès aux galeries techniques par des escaliers ou une porte Access to technical galleries via staircases or doors |
| | Accès aux galeries techniques par une échelle Ladder access to technical galleries |

| EVACUATION | | | |
|------------|---|--|-------------------------------------|
| | À l'audition du signal When the alarms rings | | Sortie de secours Emergency exit |
| | Rejoignez le point de rassemblement Report to the assembly point | | Sens d'évacuation Escape route |

| | |
|--|--|
| | 7 44 44 +41 22 76 7444 |
| | Suivez le balisage Follow the signs |



Date: 02/08/2023

EDMS:2921024

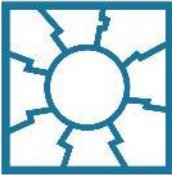
EDMS 2921024



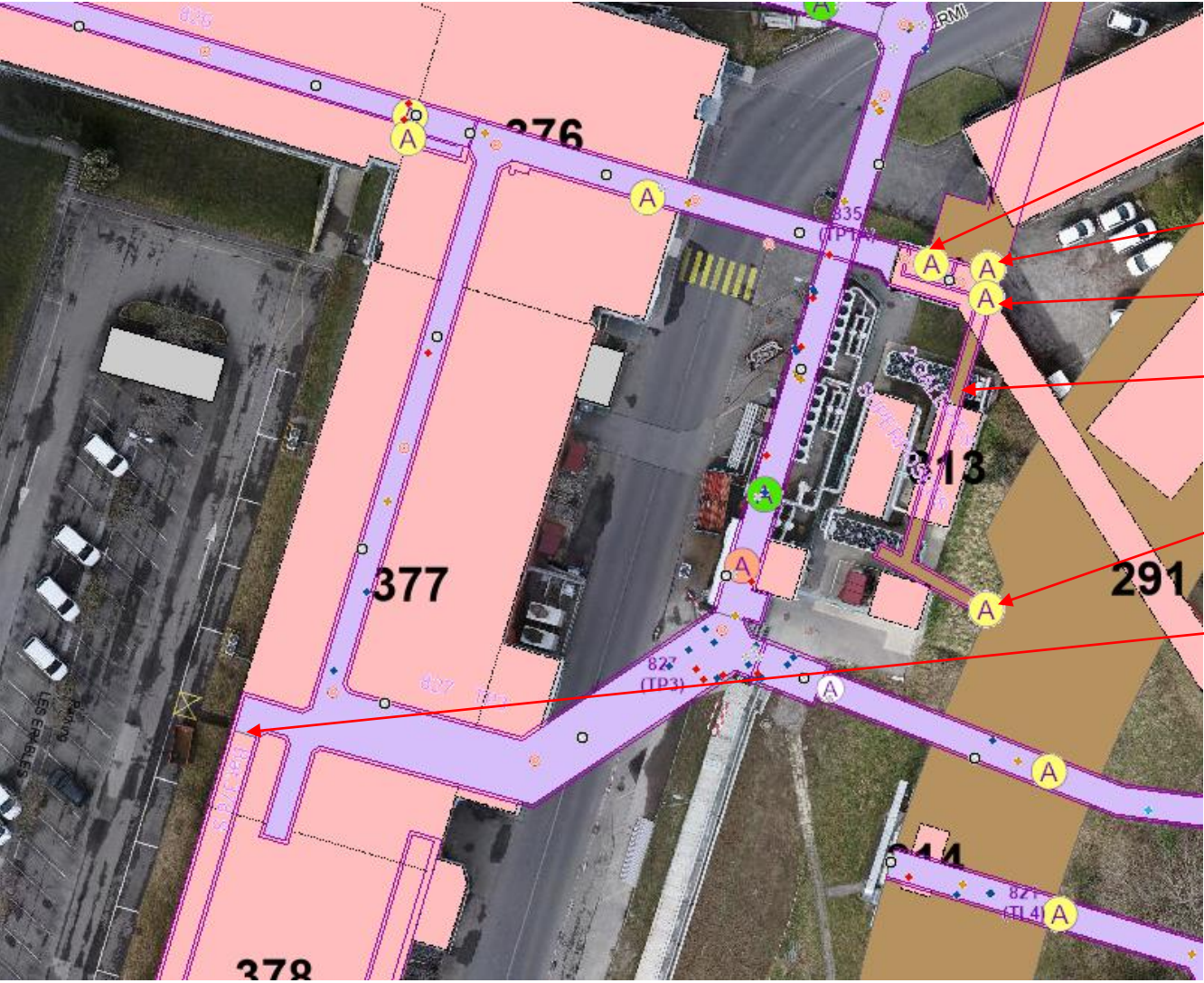
Location plates currently present in technical galleries



Gallery 827: access points and limits



TECHNICAL GALLERIES
CONSOLIDATION



Access point to be locked from outside, openable from inside (electronic key)

Fire partition to be installed, emergency exit both directions

Old doors to be removed

To be separated from 839 and marked as gallery in GIS

Doors to be equipped with alarm system (to register entrance to ISR storage in case of emergency escape from the gallery)

Limit of the gallery, fire partition to be installed

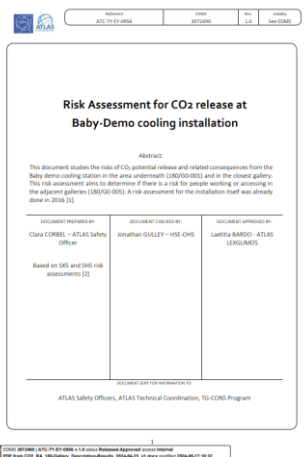
CO² and electromagnetic hazard in gallery 180

CO² - Risk Assessment - B180 Galleries under Baby demo

- **Result: no additional action needed – the existing safety measures were recognized as sufficient**
- **EDMS [3072490](#)**

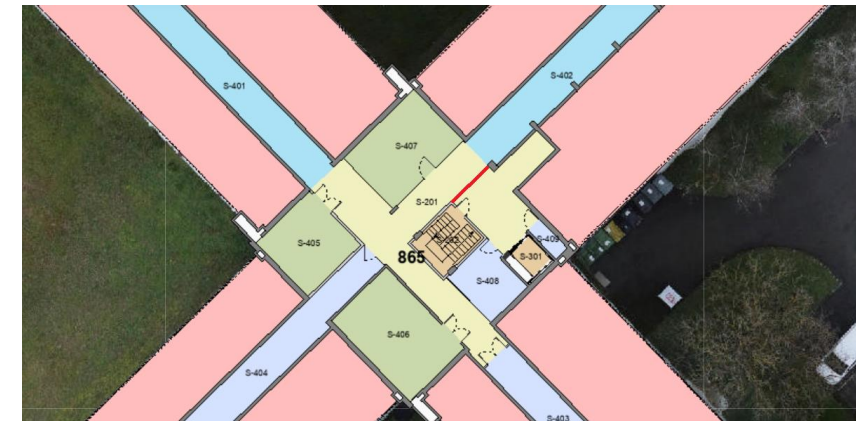
Electromagnetic hazard?

- **No hazard present in gallery 180 – confirmed by Herve Prin, Magnet Production Responsible**
- **Obsolete warning signs were removed**



Fire safety and access control in galleries under buildings 864, 865, 866

- **Goal: improving fire safety and access control to technical galleries below buildings 864, 865, 866**
- **Meetings among TG-CONS Team, EN-AA , EN-HE, HSE-OHS**
 - Buildings 864, 865, 866: new fire doors to be installed between building staircase and basement (864, 866 equipped with access control, marked with red triangles)
 - Building 865 additionally: access control gate to be installed (marked with red line)



ECR: EDMS [3017204](#)

Ongoing studies



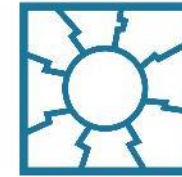
Emergency Call System

- **Goal: To allow personnel to raise an alarm level-3 (IS37) in the event of an emergency and request assistance from the CERN emergency services by means of two-way voice communication**
- **New! SRF on circuit integrity of Emergency Call Systems in Technical Galleries: EDMS [3021609](#)**
 - New requirements on fire resistancy of cables
 - Solution to be reviewed
- **URD (In Work): EDMS 2780563**

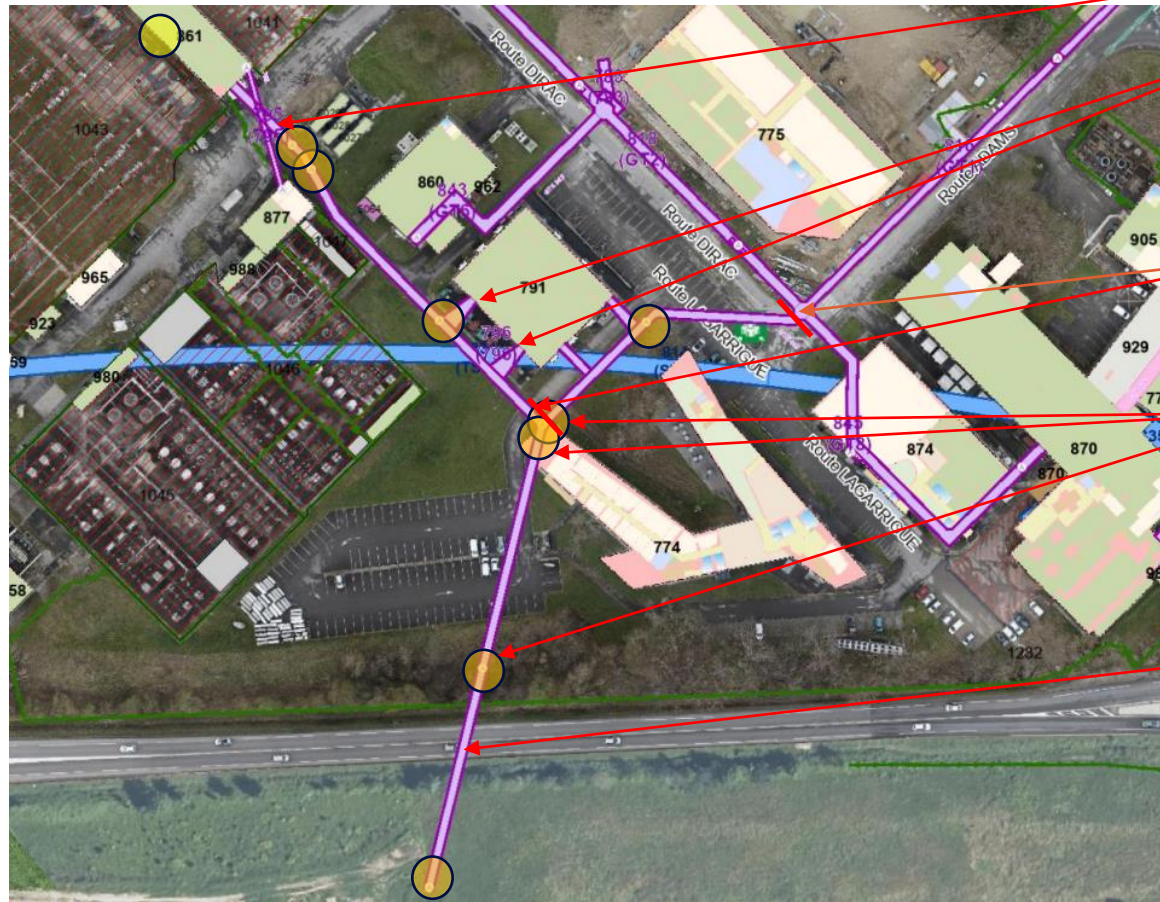
Emergency and normal lighting

- **Technical solution defined for emergency lighting by EN-EL (EDMS [3077752](#))**
- **Normal lighting concept proposed by SCE-SAM**

Gallery 796: access points and fire safety - ongoing



TECHNICAL GALLERIES
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New fire partition to be installed and access to be controlled

Openings between gallery 796 and basement of b.791 (BE91) to be closed

Passage blocked because of cable trays

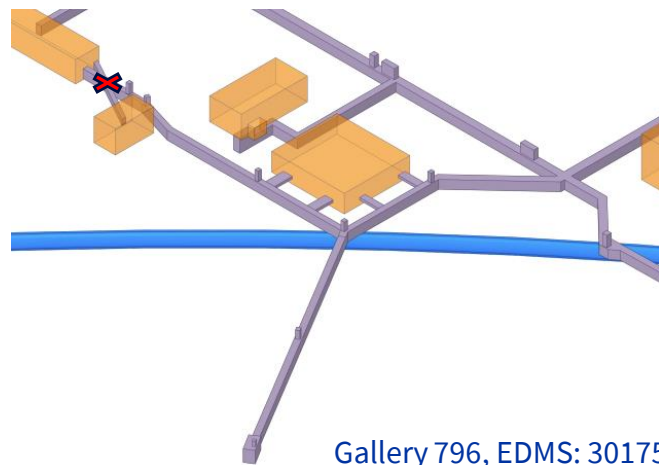
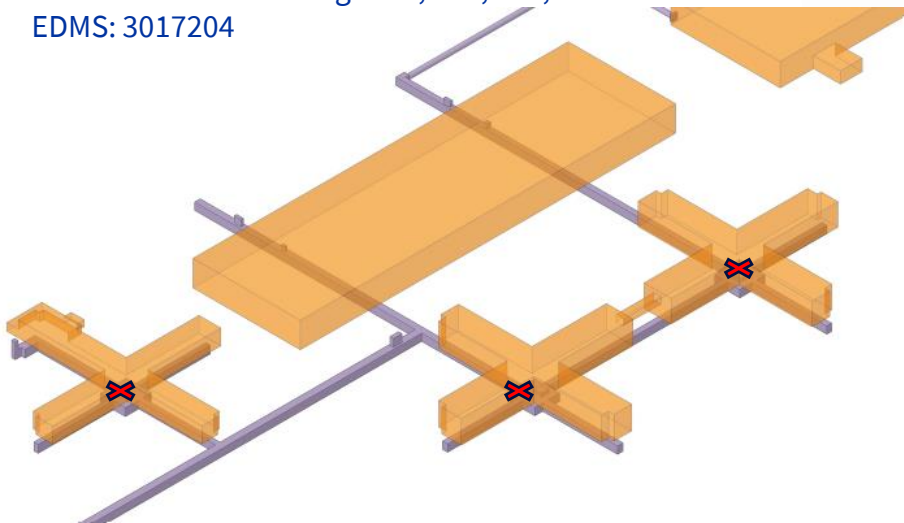
Consolidate access points

Unblock drain pipes

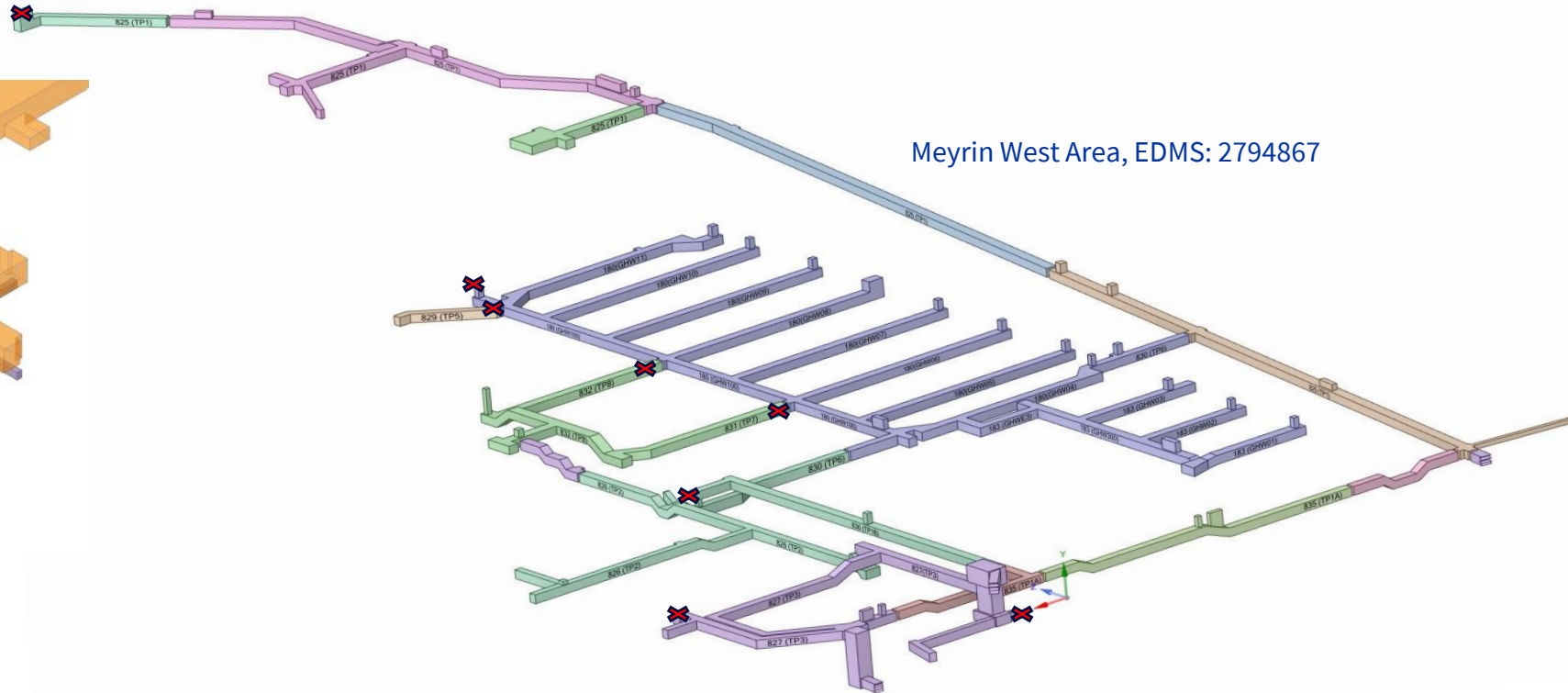
ECR: [EDMS 3017542](#) (In Work)

Fire partitions study - ongoing

Galleries under buildings 864, 865, 866,
EDMS: 3017204



Gallery 796, EDMS: 3017542

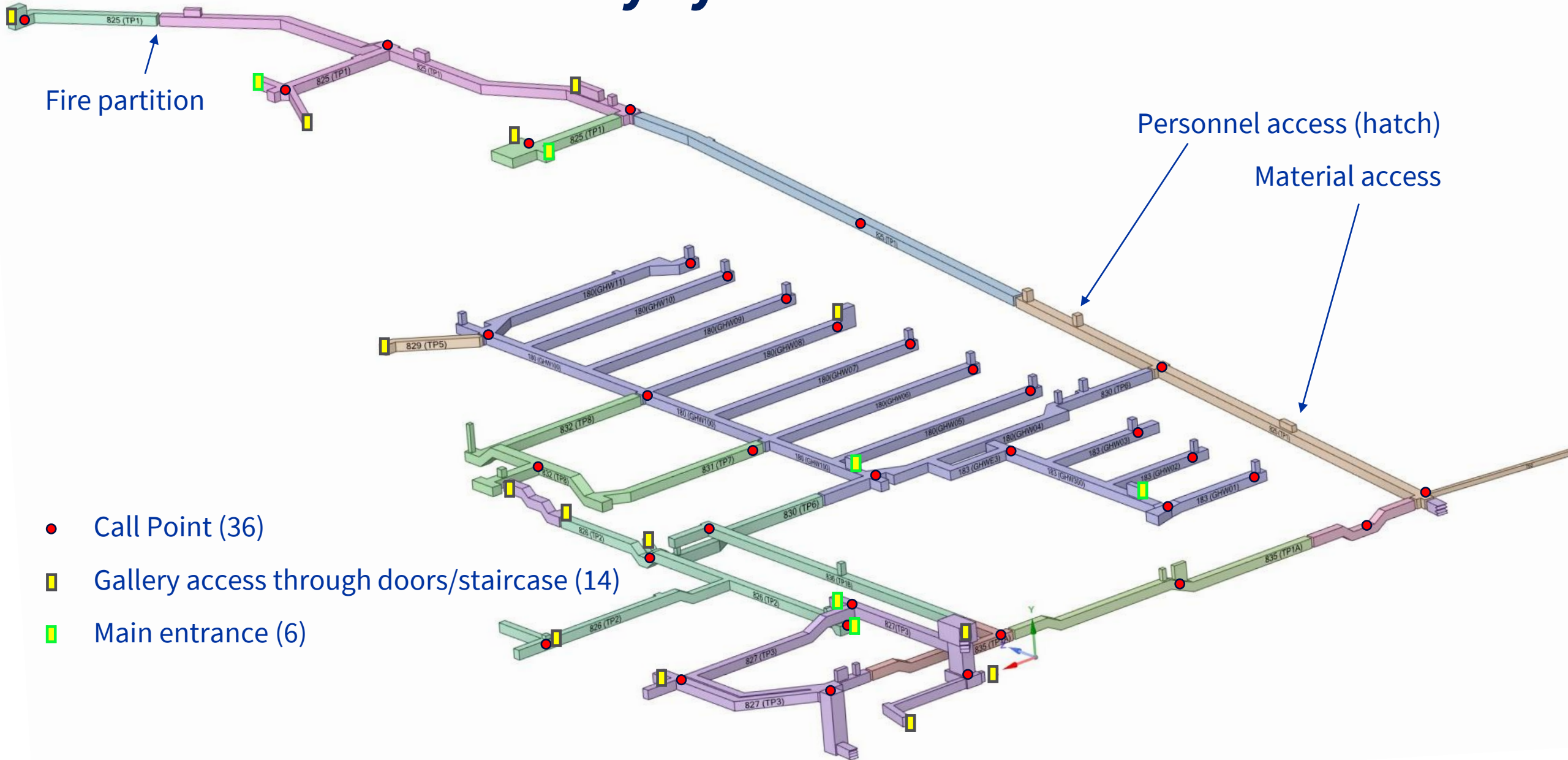


Meyrin West Area, EDMS: 2794867

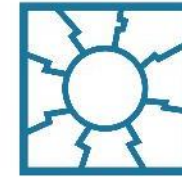
12 new fire partitions/doors to be installed:

- 8 in Meyrin
- 4 in Preveessin

Safety systems combined - future state



TG-CONS Safety aspects at International Technical Safety Forum



TECHNICAL GALLERIES
CONSOLIDATION

- Dates: 10-14 June 2024
- International forum, 2024 edition in Tokyo
- Dedicated talk focused on safety aspects in the Technical Galleries Consolidation Program – remote
- Poster session – on site

Technical Galleries Consolidation Safety aspects



Authors: I. Krautzstrung, S. Evrad, O. Prouteau, M. Lemetayer

Project overview and goals

"The Technical Galleries Consolidation Project shall take care of remedying the existing issues and refurbish the galleries' conditions and their related infrastructure to the extent reasonably possible."

At the core of the Project, along with the renovation of services hosted in technical galleries, is the improvement of safety to ensure the protection of the personnel and the environment, property preservation, and business continuity at CERN. The Project, planned to span a duration exceeding 12 years, also aims at optimizing the networks and the equipment layout envisioning future projects, system upgrades, and development.

Technical galleries at CERN

- Located underground
- Host technical networks: gas pipes, heating, water, optical fibers, cables
- Supply offices & technical facilities
- 80 tunnels, a total of 14 km

Technical galleries in Meyrin and Prévessin (in red)

Current achievements: 275.9 t of old equipment removed, 3.5 km of new piping installed, 4.7 km of old piping dismantled, 343 km of old cables removed

Safety improvements

| Completed studies | Emergency infrastructure | Individual safety | Synergies | Environmental protection |
|---|--|--|---|---|
| <p>Personal access point, pilot installation assessment</p> <p>Conducted safety studies:</p> <ul style="list-style-type: none"> Fire safety and emergency preparedness Oxygen Deficiency Hazard Environmental pollutants Ventilation Access points Access control <p>Means of risk management:</p> <ul style="list-style-type: none"> Survey reports Preliminary Risk Register <p>Transversal studies can be applied in other CERN facilities</p> | <p>General evacuation plan for West Area in CERN Meyrin site</p> <p>On-site safety and emergency preparedness measures:</p> <ul style="list-style-type: none"> General evacuation plan Emergency signs Consolidation of personnel and material access points <p>Coordinated application of safety measures ensures the most effective cooperation between the systems and provides maximum safety for CERN personnel visiting the premises.</p> | <p>Personal Protective Equipments is obligatory during inspections</p> <p>In the technical galleries:</p> <ul style="list-style-type: none"> Wear Personal Protective Equipment (safety shoes, helmet with headlamp, work clothes if possible) Use portable ODH detector (oxygen deficit risk) Avoid solitary visits (limited mobile signal and low occupancy of galleries) Follow local signs Keep fire doors closed Avoid touching unknown equipment | <p>Exemplary 3D integration model used for network optimization</p> <p>The TG-CONS Project aims for global collaboration and progress at CERN. Key partnerships include:</p> <ul style="list-style-type: none"> North Area Consolidation EN-EL General Decabling <p>The project's goal is to create added value for the entirety of CERN by optimizing gallery equipment layout with 3D integration models, ensuring reliable and up-to-date information.</p> | <p>Old material dismantled for recycling purposes</p> <p>Consolidation is characterized by notable waste production:</p> <ul style="list-style-type: none"> Unpolluted or cleaned material used for recycling Waste limited to the unavoidable minimum <p>The main challenge is diagnosis, removal, and disposal of polluting and hazardous materials, e.g.:</p> <ul style="list-style-type: none"> Asbestos Lead HAP PCB |

Conclusions

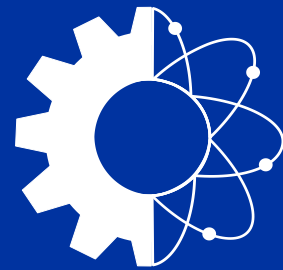
Main safety improvements

- Conducting safety studies
- Establishing safety rules
- Installation of safety systems
- Disposal of polluting materials

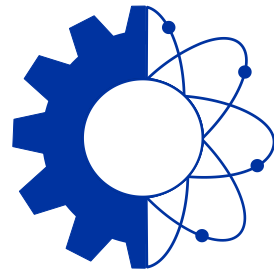
The Technical Galleries Consolidation Project addresses the deterioration of the equipment hosted in the galleries while improving numerous safety aspects to protect the personnel, the environment, and property.

It is imperative to make every required effort to ensure the necessary refurbishment of the galleries to the extent that guarantees the services' safety, reliability, and optimal expansion in line with CERN's future facility development.

Fully refurbished gallery 825 in CERN Meyrin site



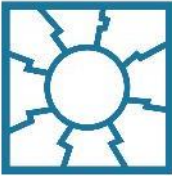
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BACKUP slides

Consolidation of cable tray consoles in gallery 818



TECHNICAL GALLERIES
CONSOLIDATION

Cable tray supports found in bad condition in gallery 818
(issue might be also present in other galleries).

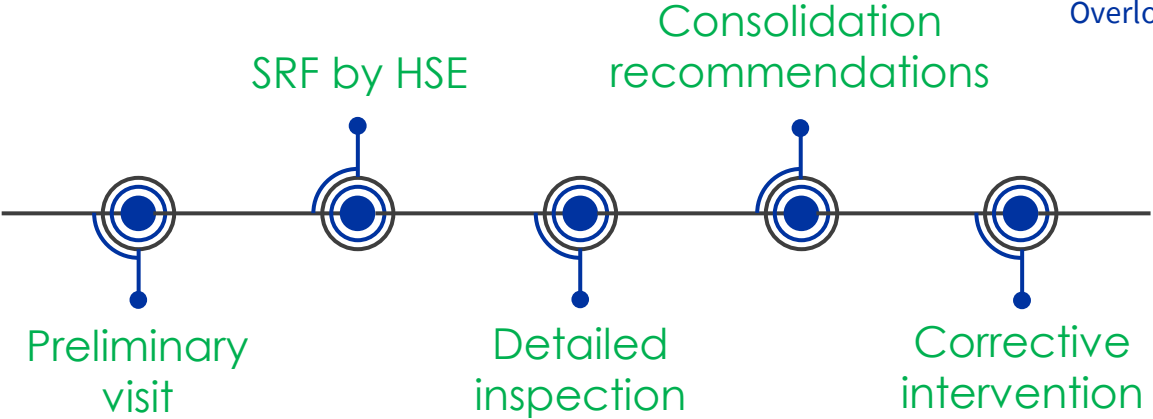
Cross-functional Working Group: TG-CONS, HSE-OHS, EN-EL

- **Goal: Find a proper response to the issue (solution, modus operandi)**

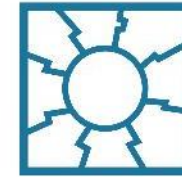
Intervention done in YETS 23/24 ✓



Overloaded cable tray, EDMS: 2900780



Removal of cable trays containing asbestos

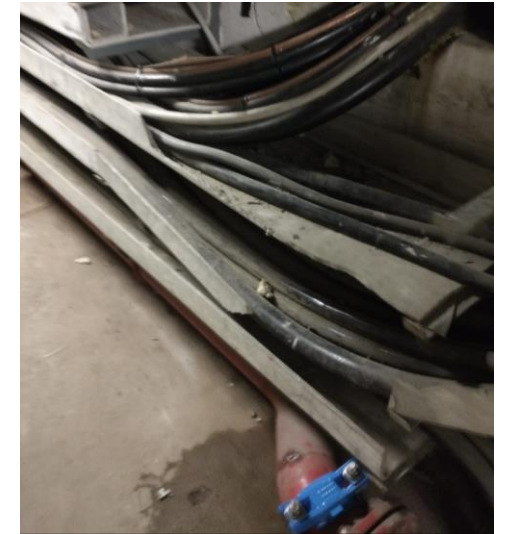


TECHNICAL GALLERIES
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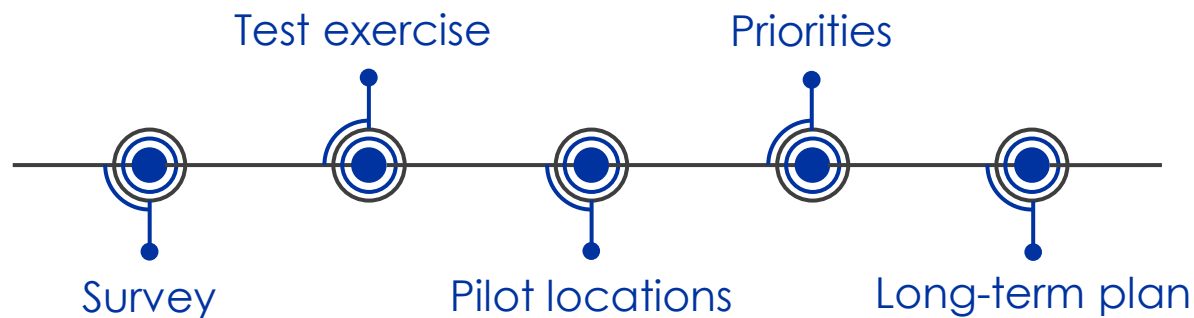
- **Recurring and omnipresent issue**
- **Special focus on the Swiss part of Meyrin**
- **2 main hazards: asbestos, live cables – dual competencies needed**

Cross-functional Working Group: TG-CONS, HSE-OHS, EN-EL, SCE-SAM

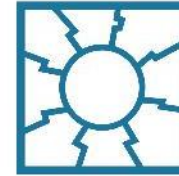
- **Pilot location chosen: gallery 815, under b.55**
- **Contractor: TIA Suisse**
- **Pilot intervention: postponed to YETS 24/25**



Broken asbestos tray, EDMS: 2871752



Support received from HSE



TECHNICAL GALLERIES
CONSOLIDATION

- ✓ Reply to SRF relating to the program
- ✓ HSE Representatives attending monthly Project meetings and Core Team meetings
- ✓ Diagnostics needed before activities start
- ✓ Superheated pipes (mechanical engineering) – validation of calculation for superheated pipes supports
- ✓ Pressure tests after pipes installation
- ✓ Safety and electrical inspections
(Level 3 Alarm testing and electrical inspections e.g., for Emergency Call System)
- ✓ Safety support in matters of worksite safety