

# Engineering Department Access and Alarms Group

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EN-AA Deputy Group Leader

# Access and Alarms group mandate

The Access and Alarms group (AA) is in charge of the design, engineering, installation, maintenance, operation and renewal of the systems that ensures the Safety of the CERN Personnel, Users and Visitors, on all the CERN sites, Accelerators and Experiment Facilities.

The safety functions covered are:

- Fire Detection, Fire Extinguishing, Emergency Evacuation and Gas/ODH Detection systems, Red Telephones, Safety Alarm transmission systems;
- Access Safety Systems and Interlocks to protect people from the Accelerator Hazards linked to Radioactivity, X-rays, Lasers, Electricity and Cryogenics;
- Access Control systems to all CERN sites, building, Accelerators and underground conventional or radiation facilities;
- Video surveillance, video protection and intrusion detection systems;
- Access data management applications.

# Access Activities (1/2)

CERN site is composed of industrial-like installations mixed with a *tertiary, campus-like environment*.

The main mission of the Access Safety (Personnel Protection Systems) is to protect people from the hazards that can be caused by accelerator or facilities that is covers, mostly ionizing radiation.

To achieve this, it deploys industrial safety-grade control systems that interlock the accelerator facilities when people are present: if BEAM is present then NO ACCESS is allowed, and vice-versa. It also deploys more conventional systems such as biometrics, to authenticate the users against their credentials and verify their safety training status.

These systems are supervised by the CERN Control Centre (CCC) operators from the BE Department.

# Access Activities (2/2)

CERN site is composed of *industrial-like installations* mixed with a *tertiary, campus-like environment*.

The main mission of the Access control systems is to verify that people entering the CERN site are allowed to do so, ensuring a first barrier of protection. It manages access cards and visitor management.

CERN deploys video surveillance and video protection systems to protect the site from degradation and malicious actions.

These systems are supervised by the Guards Control Room operators from the SCE Department.

Finally, CERN develops in-house the databases, web and mobile applications that interpret some of the rules and regulations of CERN and distribute the necessary information to the the access systems.

# Alarms Activities

**CERN deploys in both industrial-like *machine* areas, and *tertiary* areas:**

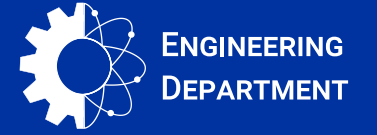
- **Fire Detection & Evacuation**
  - **Fire Extinguishing**
  - **Oxygen Deficiency Hazard (ODH) and Flammable gas detection systems**
  - **Alarm Transmission Systems**
- 
- **These systems are supervised by the Fire Brigade Control Room operators from the HSE Unit.**

# Fields of expertise

Then EN-AA group is a vertically integrated group (from the sensor, to actuator, to Control room applications)

EN-AA leverages partnerships with industry that can provide expertise, flexibility and capacity to intervene locally for deployment of the systems under our responsibility:

- **Engineering expertise in *Functional Safety***
- ***Risk analysis & safety studies* expertise in the nuclear and process industry domain**
- ***Industrial automation and industrial computing competences* :**
  - PLCs (Siemens/Schneider), Supervision Systems (SCADA, WinCC, PcVue, etc), Monitoring and diagnostics systems (zabbix, Grafana)
- **Low-voltage *electrical studies*, design and installations**
- ***Database competencies***
  - ORACLE / APEX, MSSQL
- ***Mobile Application* design and deployment**



# Thank you for your attention

Questions?



# SUSI – Site Surveillance

Site Entry Gates : 38

Turnstiles : 26 (incl bikes)

Badge Readers : 1'421

Video Cameras : 839

Key cabinets : 96

Access Cards : ~32'000

Licence plates : ~20'000

Transactions per day : ~30'000



# ZORA PS

PADs : 39 (incl. Exp. Areas)

MADs : 17

Video Cameras : 84

Sector/zone doors : 179

Injectors :

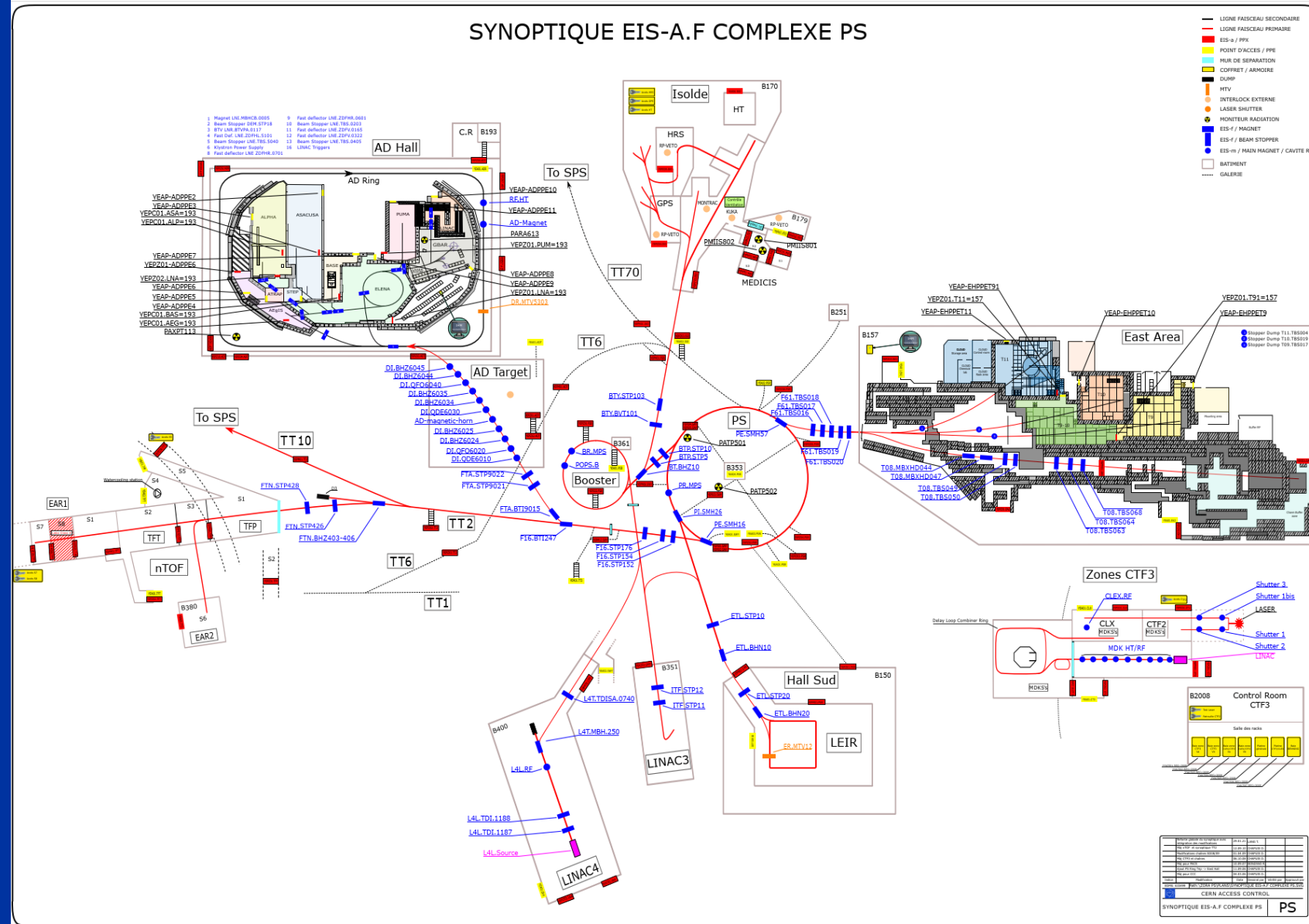
LN4, Booster, SWY, PS Ring, TT2

Non injectors :

ToF, AD Prim, EA Prim, ISOLDE, LEIR, CTF-CLEAR

Others :

East Area Exp, AD Exp Area, SM18 RF Test Bench, MEDICIS



# ZORA SPS

PADs : 54 (incl. Exp. Areas)

MADs : 17

Video Cameras : 123

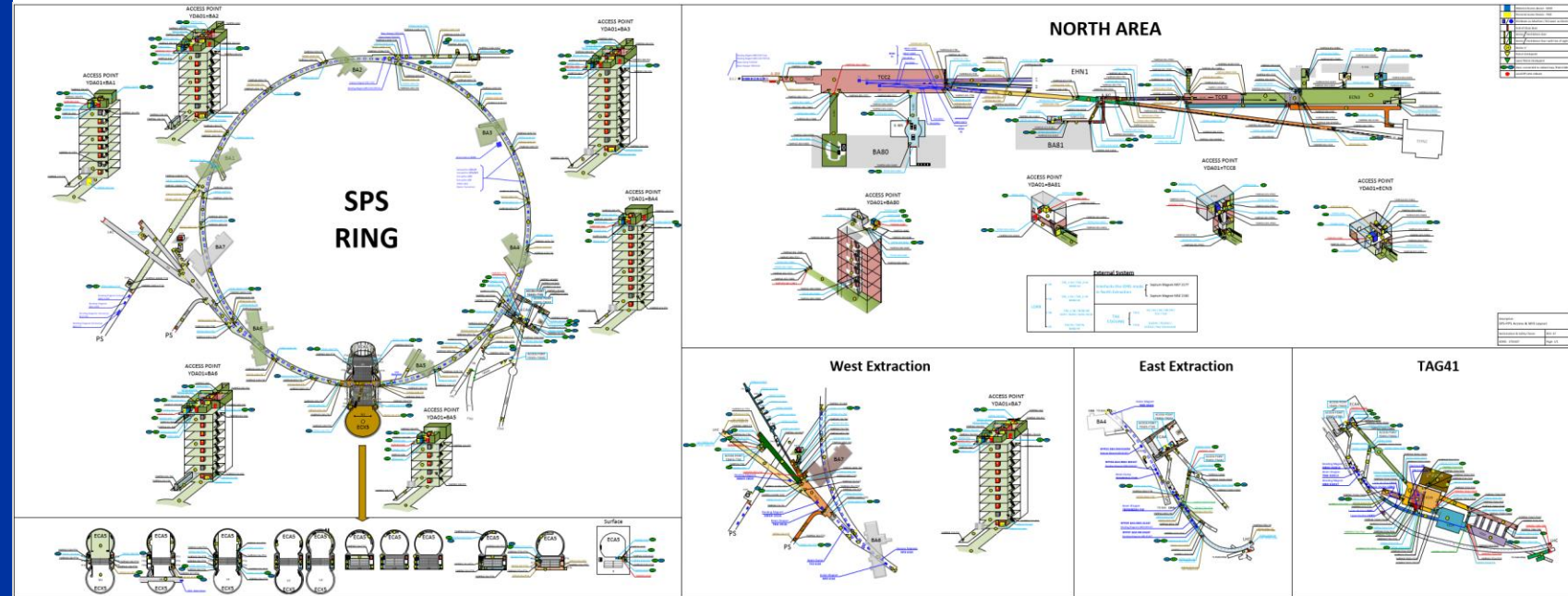
Sector/zone doors : 382

SPS PPS:

Ring, AWAKE and North Area  
Primary (TCC2, TCC8, NA62),

Exp Areas:

North Area (EHN1, EHN2) y.c GIF++  
and Neutrino Platform



# ZORA LHC

PADs : 46

MADs : 30

Video Cameras : 201

Sector/zone doors : 400

## LHC PPS (LACS,LASS)

LASS , LACS

Exp Areas:

SSA – Safety System ATLAS



Avant



Après



Avant



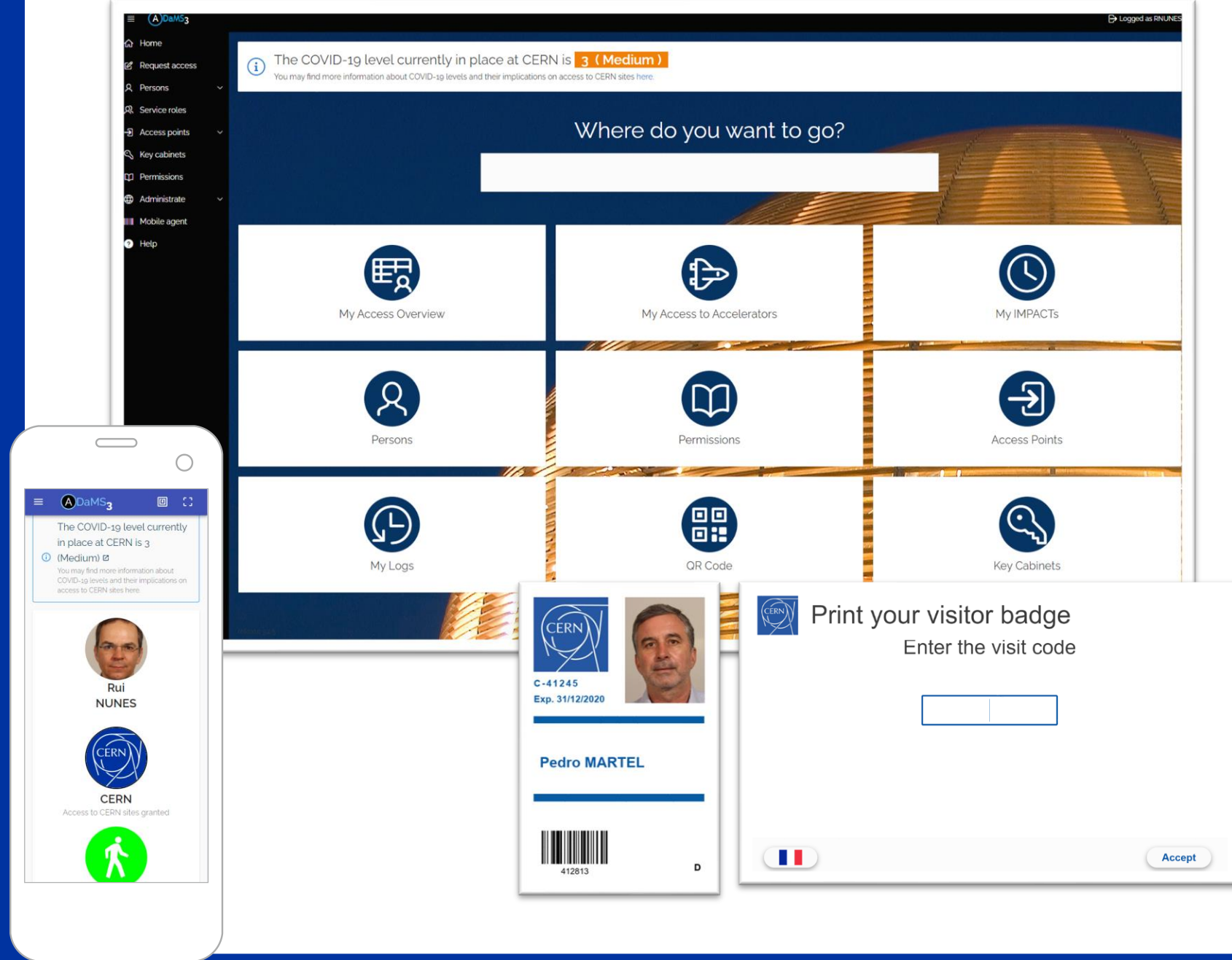
Après

# ADaMS

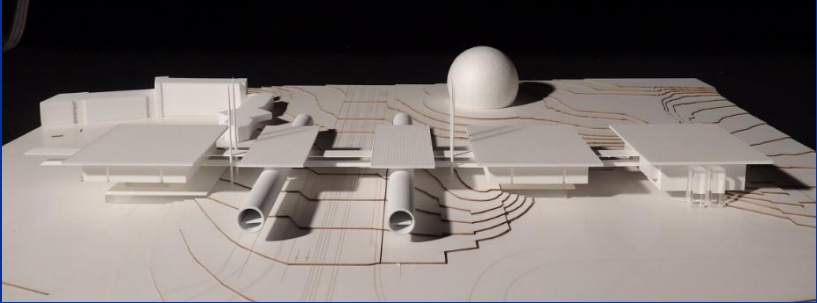
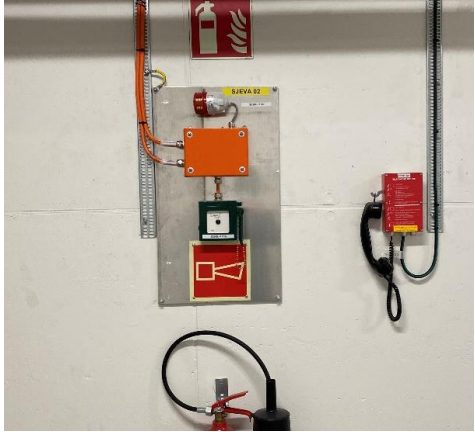
1 ORACLE DB backend  
(business logic)

2 APEX web  
applications (Interface)

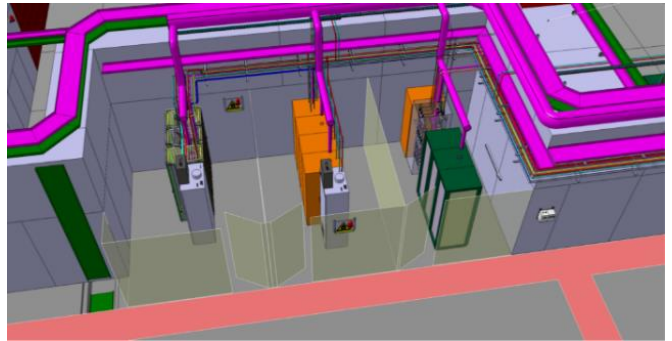
1 Mobile (beta)  
application



# Fire Detection & Protection



# Gas Detection & Protection



# CERN Safety Alarm Transmission

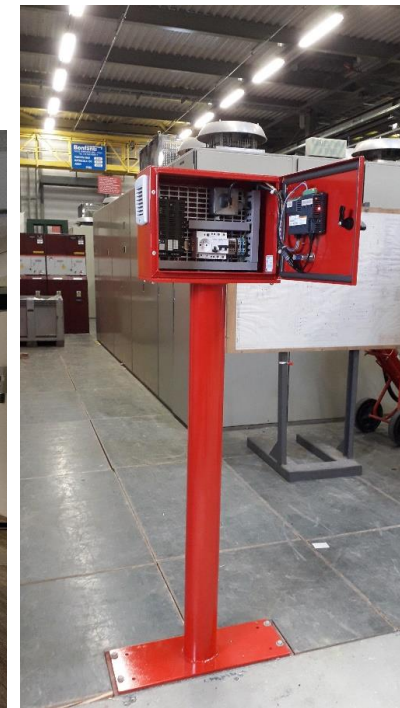
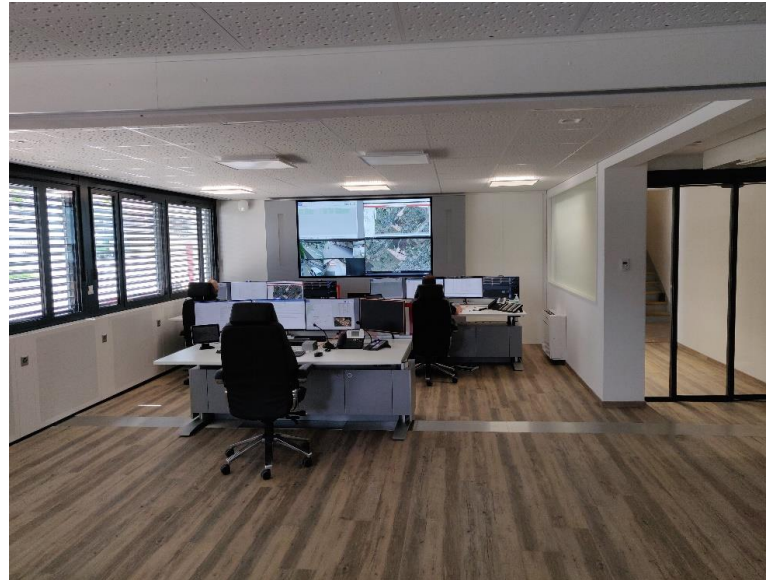
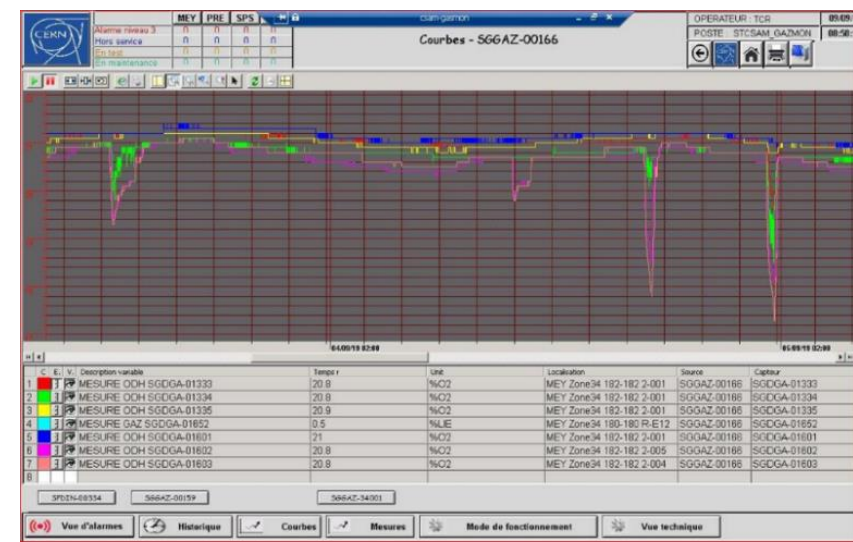
Alarmer niveau 3

OPERATEUR : Admin 07/10/11  
POSTE : STCSAM\_GAZM01 08:24:41

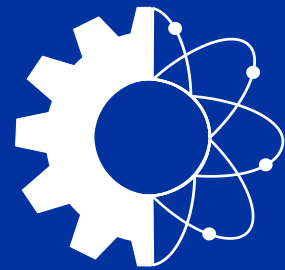
Acquitter la selection

Date heure	Localisation	Type	Source	Libellé	Identifiant
06/10/2011 09:00:29	0005 ASC 5	TR	10040	APPEL TELEPHONE D'URGENCE SCR DROIT	2
06/10/2011 09:00:35	0005 ASC 5	TR	10040	APPEL TELEPHONE D'URGENCE SCR GAUCHE	1
06/10/2011 09:04:52	MEY Zone24 157-157 R-001	G	SGGAZ-00144	GAZ	15912
06/10/2011 09:04:52	MEY Zone24 *	GEN	CSAC	ALARME GENERALE ZONE 24	22593
06/10/2011 09:05:11	MEY Zone24 157-157 R1	F	SGGAZ-00144	ALARME CAPTEUR GAZ MDK ATLAS	17560
06/10/2011 09:54:03	PRE Zone10 866-066	F	SFDIN-00271	FEU BAT 366	26344
06/10/2011 09:54:03	PRE Zone10 *	GEN	CSAC	ALARME GENERALE ZONE 10	26344
06/10/2011 09:54:10	PRE Zone10 866-066 R-A01	F	SFDIN-00271	FEU FRIEUSE RESTAURANT	26344
06/10/2011 10:04:30	0005 ASC 5	TR	10040	APPEL TELEPHONE D'URGENCE SCR DROIT	2
06/10/2011 10:04:30	0005 ASC 5	TR	10040	APPEL TELEPHONE D'URGENCE SCR GAUCHE	1
06/10/2011 10:25:27	MEY Zone24 157-157 R1	G	SGGAZ-00144	ALARME CAPTEUR GAZ MDK ATLAS	22593
06/10/2011 10:29:14	0157 R-000	TR	78262	APPEL TELEPHONE D'URGENCE SCR DROIT	2
06/10/2011 10:29:15	0157 R-000	TR	78262	APPEL TELEPHONE D'URGENCE SCR GAUCHE	2
06/10/2011 14:23:49	MEY Zone29 367-367	F	SFDIN-00266	FEU BAT 367	17043
06/10/2011 14:23:48	MEY Zone29 367-367 5-0	F	SFDIN-00266	FEU GALERIE TECHNIQUE	25149
06/10/2011 14:23:49	MEY Zone29 *	GEN	CSAC	ALARME GENERALE ZONE 29	25150
06/10/2011 14:24:21	MEY Zone29 367-367 5-0	F	SFDIN-00266	FEU GALERIE TECHNIQUE	25150
06/10/2011 14:43:41	SPS Zone17 076-BA7	F	SFDIN-00261	FEU VENTILATION BA7	15595
06/10/2011 14:43:42	SPS Zone17 *	GEN	CSAC	ALARME GENERALE ZONE 17	15597
06/10/2011 14:53:10	SPS Zone17 046-TNC	F	SFDIN-00261	FEU HIRADMAT	15587
06/10/2011 15:13:44		TR	Sonnes	APPEL TELEPHONE D'URGENCE SCR DROIT	2
06/10/2011 15:13:44		TR	Sonnes	APPEL TELEPHONE D'URGENCE SCR GAUCHE	1
06/10/2011 15:23:17	SPS Zone17 *	GEN	SFDIN-00261	FEU HIRADMAT	15587
06/10/2011 15:26:43	SPS Zone17 046-TNC	F	SFDIN-00261	ALARME GENERALE ZONE 17	686
06/10/2011 15:26:43	SPS Zone17 046-TNC	F	SFDIN-00261	FEU T17 HIRADMAT ANTENNE N.3	687
06/10/2011 15:26:47	SPS Zone17 076-BA7 R	F	SFDIN-00261	FEU T17 HIRADMAT ANTENNE N.3	687
06/10/2011 15:31:47	SPS Zone17 046-TNC	F	SFDIN-00261	FEU BA7	926
06/10/2011 15:31:47	SPS Zone17 *	GEN	CSAC	ALARME GENERALE ZONE 17	15587
06/10/2011 15:31:50	SPS Zone17 076-BA7 R	F	SFDIN-00261	FEU BA7	926
06/10/2011 15:32:03	SPS Zone17 046-TNC	F	SFDIN-00261	ALARME GENERALE ZONE 17	688
06/10/2011 15:32:03	SPS Zone17 046-TNC	F	SFDIN-00261	FEU T17 HIRADMAT ANTENNE N.4	689
06/10/2011 15:39:35	Servicek.	TR	Michael	APPEL TELEPHONE D'URGENCE SCR DROIT	2
06/10/2011 15:39:35	Servicek.	TR	Michael	APPEL TELEPHONE D'URGENCE SCR GAUCHE	1

Vue d'alarmes Historique Courbes Actions Mode de fonctionnement Vue technique 17







**ENGINEERING  
DEPARTMENT**