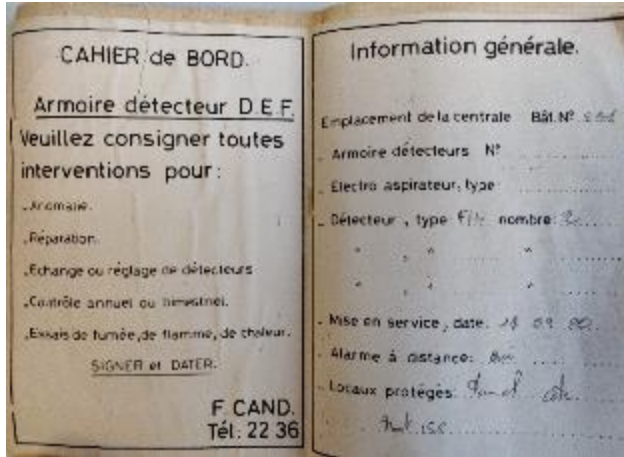


EAM use in EN-AA-AS (and more)

CERN EN-AA-AS SERVICE

- The CERN *Alarm System* service is responsible for the installation, the maintenance, and the renewal of safety alarm systems at CERN. This includes fire and gas detection systems (Flammable Gas, Oxygen Deficiency, Toxic Gas), emergency telephones (Red Telephones).
- Transmission systems to CERN main control rooms (SCR-CERN Fire Brigade, CCC-CERN Control Centre and XCR-Experiment Control Rooms).
- There were in 2019 9,687 automatic smoke detectors, 783 automatic gas detectors, 2115 manual break-the-glass devices and 413 emergency telephones installed all over CERN sites, and covering from office buildings to accelerator complexes and experimental halls.

A bit of history



- Paper records
- Rapier
- MP5
- D7i
- INFOR

50 years of data !!

Data (re)structuring

- Many variations in the quantity and quality of the data entered over the years
- Difficult to extract useful data e.g. PPE (Plant, Property, equipment)
- Main problems related to
 1. The age of the equipment
 2. The type of equipment
- It was decided to do a complete restructuring and define how the data should be structured before changing anything in INFOR

CERN
CH-1211 Geneva 23
Switzerland



EDMS NO.	REV.	VALIDITY
1706394	2.8	RELEASED

REFERENCE

Date: 2020-10-06

NOTE TECHNIQUE

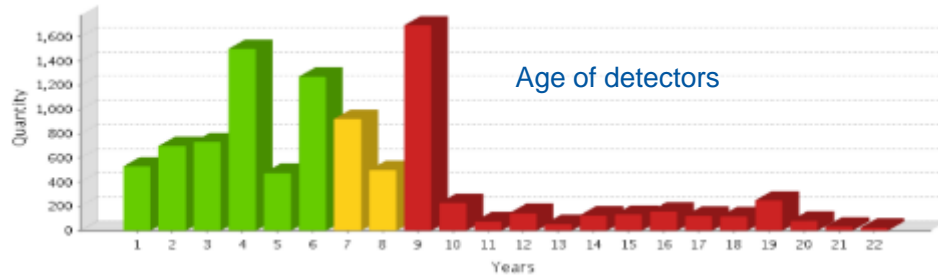
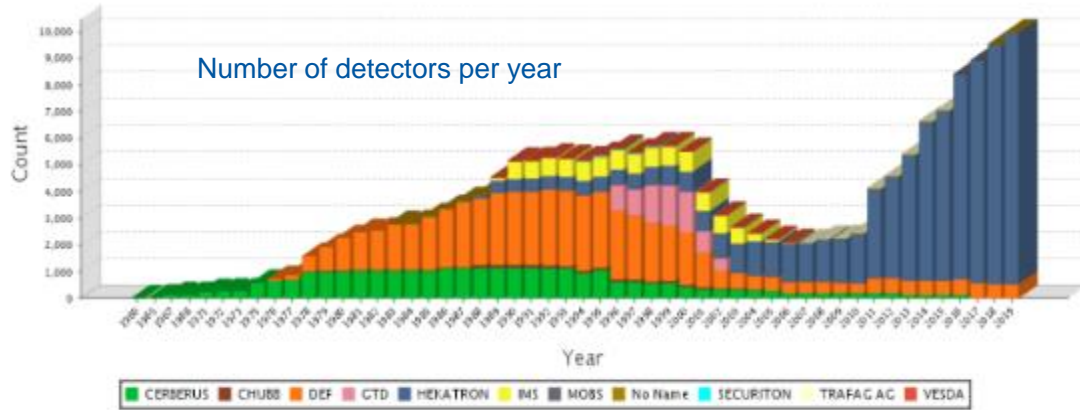
**CODIFICATION GMAO DES MATERIELS POUR
LES SYSTEMES D'ALARMES**

Validation

- Because everything is formalized it is relatively easy to run scripts to verify that the information in INFOR follows the definitions in the document.
- E.g.
 - All equipment's must have a class.
 - An equipment type should all have assigned a class of a certain subset

Equipment	Errors
SFDEI	2
SFEAI	73
SFSIR	2
SFVEM	3
SXREP	6
SACSP	9
CA-APIMMD	27
	1 - 7

Reporting



PPE

	Class		
	Class Description		
	SCBG Bris de Glace	SCIA Indicateur d Action	SDGB jeux de Batteries
Year	Equipment Commissioned	Equipment Commissioned	Equipment Commissioned
1995	-	-	-
1996	57	-	1
1997	8	-	-
1998	60	-	1
1999	13	-	-
2000	271	-	-
2001	111	-	-
2002	75	25	-
2003	51	10	-
2004	177	-	-
2005	496	65	-
2006	33	81	-
2007	51	122	-
2008	57	143	-
2009	31	140	2
2010	18	78	5
2011	63	16	1
2012	45	11	5
2013	35	23	4
2014	189	68	11
2015	49	13	37
2016	48	5	134
2017	98	35	64
2018	126	57	92
2019	11	8	74
Grand Total	2,173	900	431

Web services

- Important for us that that the same data is not entered twice in two different places. Time waste and difficult to maintain data consistency. Data synchronized from alarms database to INFOR
- Detector addresses
- What location the detector monitor (can be different from installed location)
- Description
- Safety zone
- (Facility)



Personalized screens

AS Position SFDEI-08054 FEU SALLE CONFERENCE

Record View Comments × Events × Costs × PM Schedules × Structure × EDMS Documents × Meter Readings Graph × Show on Map ×

Position: SFDEI-08054 **FEU SALLE CONFERENCE** Status: **Installe et Maintenu** ▼
Department: **SAS** EIS:
Type: Position fonctionnelle

Equipment Details

Class: SFDPO	Original Install Date: 14-JUL-1998
Category: SF-MMD140	Commission Date: 21-JUN-2012
Model:	Assigned To:
Production: <input checked="" type="checkbox"/>	IMPACT Facility: Buildings And Other Fa
Safety: <input checked="" type="checkbox"/>	Location: 39
	Local Installe: 1-002
	Local Surveille: 39/1-002
	Zone de Sécurité: Z26

GIS Details

Linear Reference Details

Facility Details

Reliability Ranking Details

Custom Fields

Détenteur (ID CERN):

Resp. Technique (ID CERN):

Année de construction:

Adresse Detecteur

Zone:

Group: 30

Detector: 2

Tracking Details

Variables

Call Center Details

Hierarchy

What next

- Currently working on introducing dependencies. First electrical but would like to extend to signal to other systems e.g., evacuation signals
- EAM light. Currently we all use the native interface.
- Investigate if we can extend our use of checklist
- Predictive maintenance !!! Lots of talk but not much result yet. Would like to have automatic ODM based machine learning solution.

Predictive maintenance use case

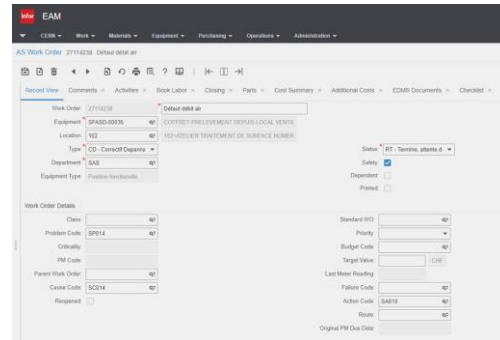
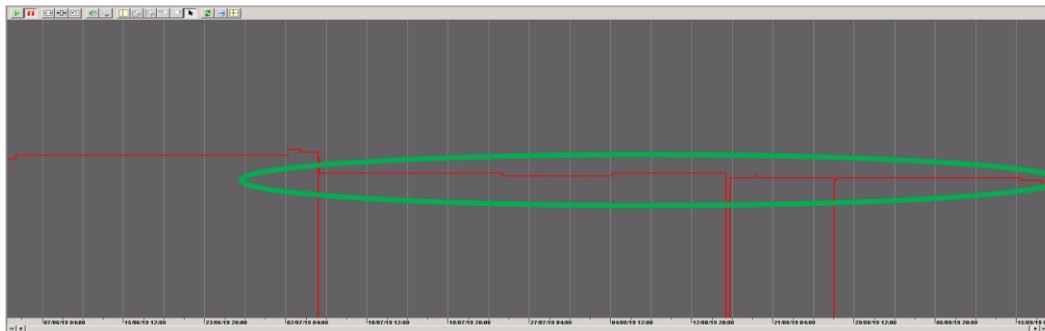
Detector and pump location



The goal of the automatic solution is that the system will learn over time what constitutes a condition that requires the pipes to be cleaned. Sudden peaks in the measurements should be ignored as they can be caused by maintenance or ventilation changes.

Detection location

CERN Safety Alarm Monitoring SCADA System





www.cern.ch