

Introduction to Asset Management at CERN and Enforcing QA through the Naming Service

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- *Responsibility for the Asset Management at CERN*
- *Information Systems used throughout the Assets lifecycle*
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Enterprise Asset Management

- *The optimal management of the physical assets in order to:*

- *reduce costs*
- *reduce risks*
- *improve decision making (KPIs)*
- *improve availability of equipment*
- *improve operational performance*
- *compliance with required regulations*
- *etc., etc....*

➔ B. Todd – Thursday

➔ M. Tavlet – Thursday

➔ L. Bruno – Thursday



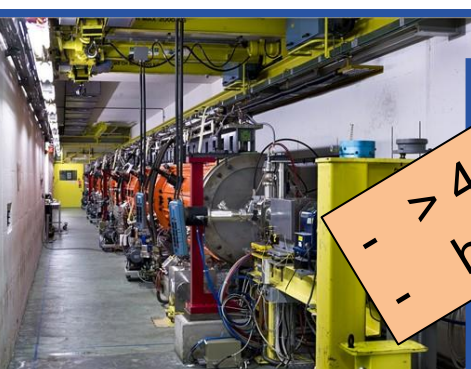
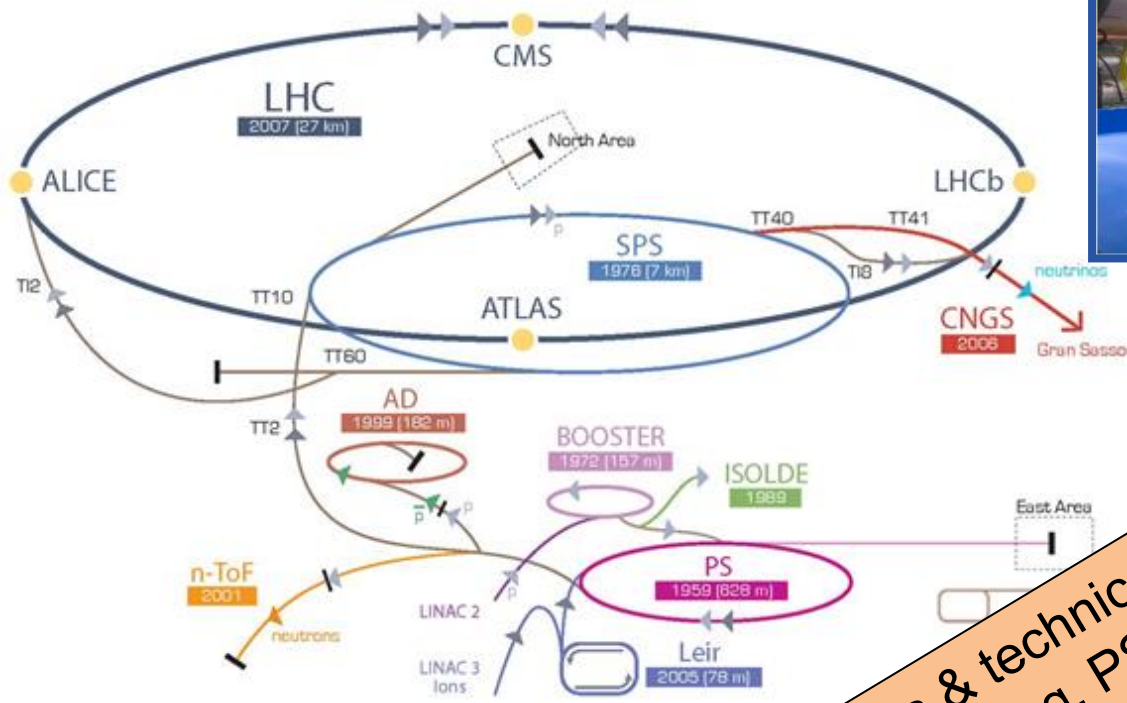
- *Need a strategy across the complete organization*
- *Covers the complete lifecycle of an asset*



- ***Maintenance Management is part of Asset Management***

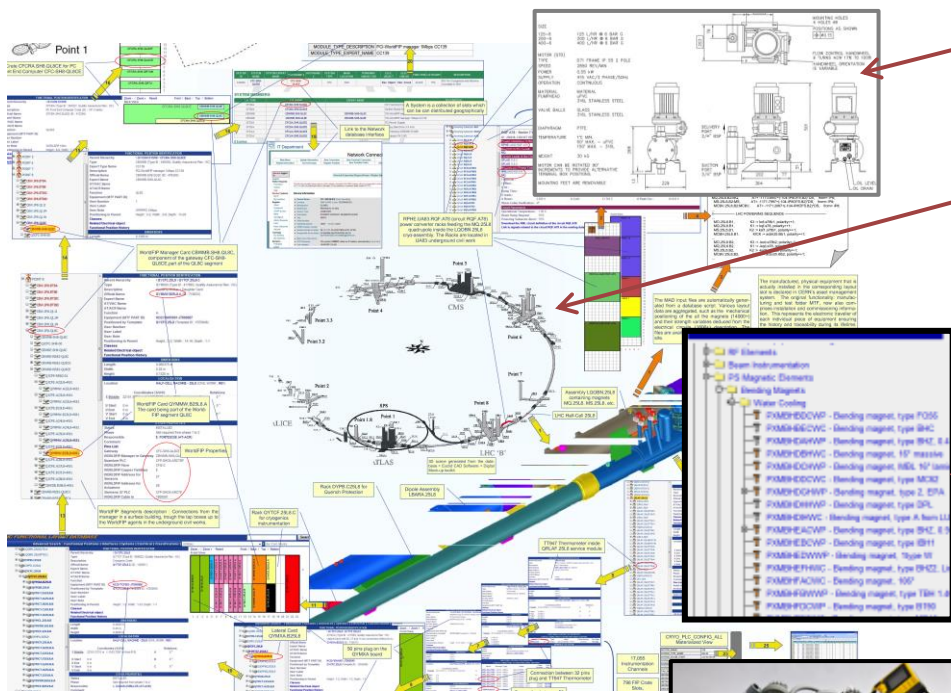
Which are the assets managed at CERN?

CERN Accelerator Complex



- > 40 km of beam facilities & technical infrastructure
- history of the accelerators, e.g. PS - 55 years old

Assets Management – What needs to be managed?



Drawings / reference documentation

Layout functional positions

Which is the place where an asset will be installed in order to perform a specific function?

Items (equipment types)

What equipment type is required to deliver a requested function?

Assets

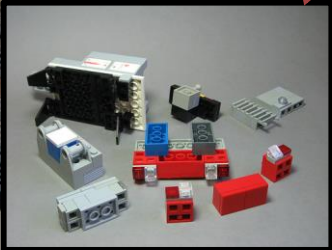
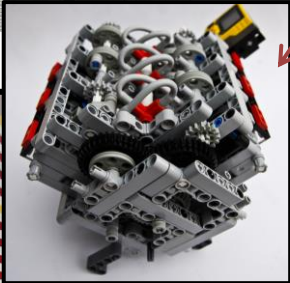
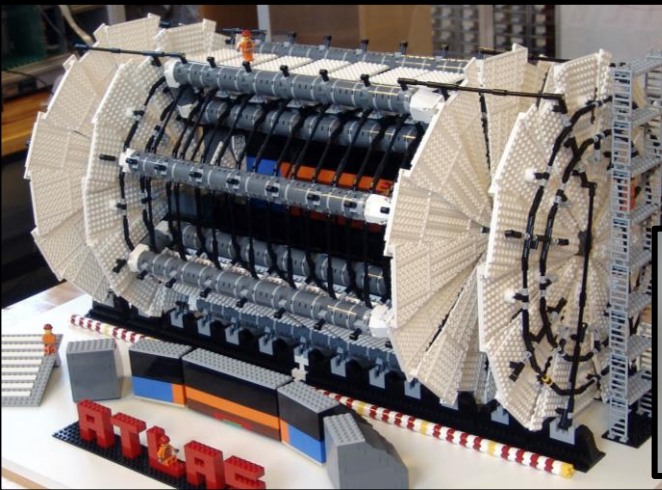
What shall be managed once bought/manufactured?

Spare parts

What is kept in stores?

An incredible amount of relations:
dependencies, breakdown structures, etc.

Specific functionalities for the Controls and Operation of the accelerators



Asset Management Responsibility Strategy

- *Every equipment group is responsible for the management of their own asset (responsibility split by functional systems – e.g. Vacuum, RF, Power Converters, etc.)*
- *The equipment groups need to comply to the CERN-wide standards and QA best practices established for the different areas of asset management*
 - *The MMP project is working on improving certain aspects within the Maintenance Management*
- *The equipment groups should use the CERN standard tools in each area and put their data in the central databases*

⇒ *F. Antoniotti (Vacuum) – Thursday; ⇒ C. Dehavay (Controls) – Thursday*



“The needs of the many outweigh the needs of the few or the one”

Asset Management Information Systems Strategy

- *Dedicated, integrated information systems for each one of the different areas of asset management*
- *Clear scope separation between the services, based on the functionality they provide*
 - **CDD & SmarTeam** – CERN Drawings Directory
 - **EDMS** – Documentation Management
 - **Infor EAM (MTF)** – Maintenance Management ➔ D. Widegren - Friday
 - **Layout Service** – Management of the Accelerators Topology ➔ E Fortescue-Beck – Thursday
 - **Controls Configuration Service** - Configuration Management of the Accelerators Controls System
 - *Configuration and generation of controls computers (~4000) Start-up Sequences, Drivers, etc., Controls Devices (90 000) & properties (8 000 000); configuration of alarms, diagnostics and monitoring definitions, etc.*
 - **Alarms** – CERN Alarms System, 300 000 pre-defined alarm states
 - **DIAMON** – Diagnostics and Monitoring of the Controls Equipment
 - **Logging** - Accelerators Feedback – logging of signals – 170TB of data
 - **etc. ...**

Specific to the Accelerators Controls and Operation

Distributed Information Systems supporting the Asset Management

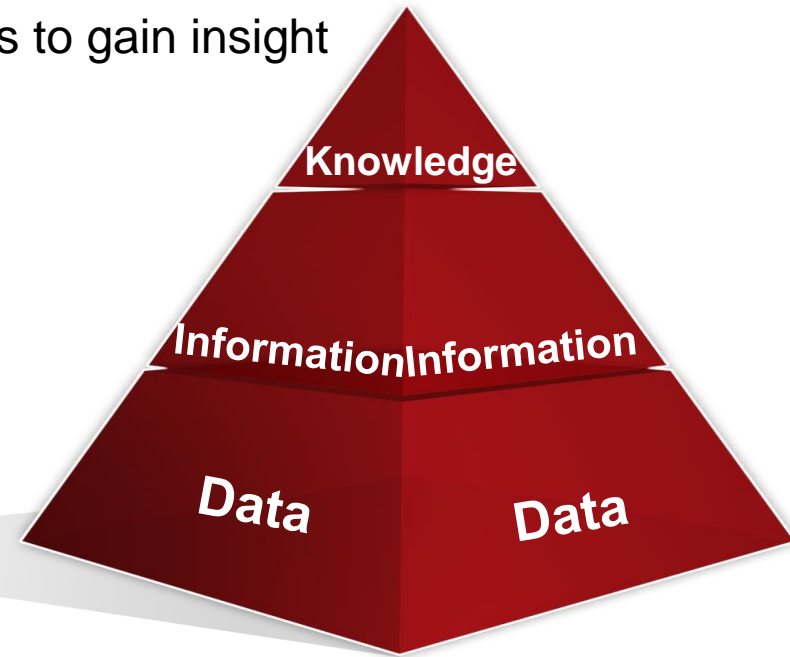
Objective:
Integrated data management across
different Information Systems

Consistent Processes

Consistent Vocabulary

Coherent Naming

- Correlate data across domains to gain insight



CDD /
SmarTeam

EDMS

Infor EAM /
MTF

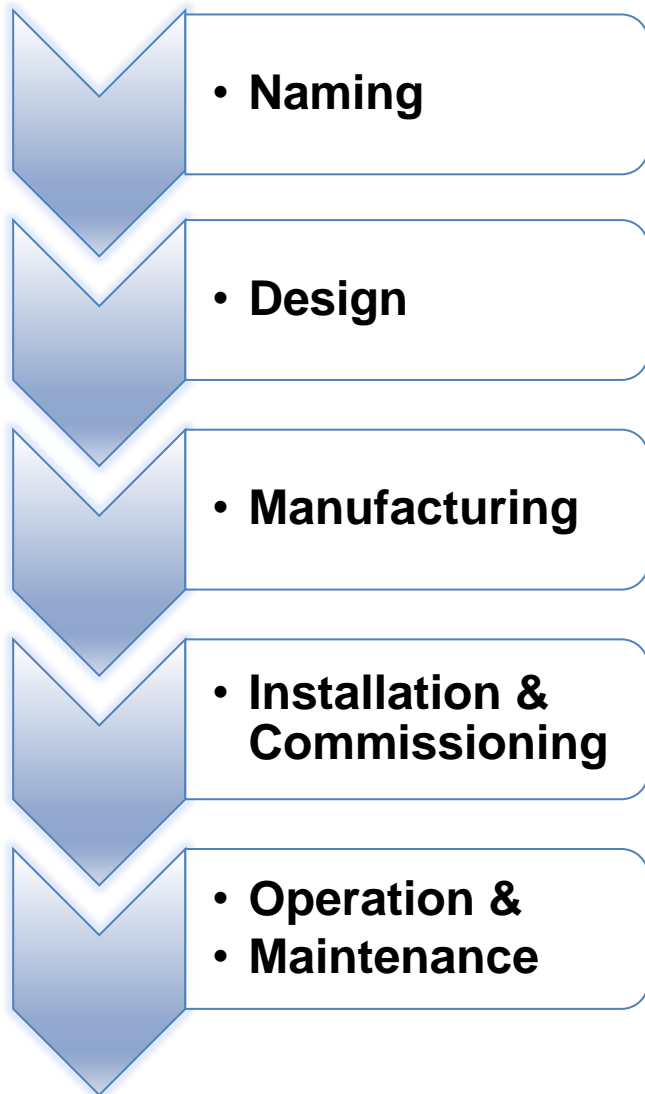
Layout

Controls
Configuration

...

Naming Service

Example integrating the Information Systems across some of the Asset Management domains



Naming Portal

CDD and EDMS

Accelerators Layout

MTF

MTF

Infor EAM



Naming throughout the different Information Systems



**Operation (Alarms, Logging
Diagnostics and Monitoring)**

**EDMS
(equipment types &
documentation)**

Layouts (functional positions)

**Controls Configuration
(Controls Devices)**

**Infor / MTF
(assets labeling)**

→ T. Birtwistle – Thursday

Drawings (CDD)



Unique Identification



Coding – Naming Service

Coherent naming coding references

- Part of the **Quality Assurance Plans (QAP)** of:
 - LHC
 - SPS
 - PS Complex

The image displays three overlapping document covers from CERN, illustrating naming conventions for equipment and LHC entities. The documents are:

- Left Document:** "EQUIPMENT IDENTIFIERS OF EQUIPMENT BELONGING TO THE PS-COMPLEX". It features the CERN logo and the text "CERN CH-1211 Geneva 23 Switzerland".
- Middle Document:** "CONVENTIONS IDENTIFIERS OF EQUIPMENT BELONGING TO THE PS-COMPLEX". It features the "AB" logo (Accelerator & Beams department) and the text "CERN CH-1211 Geneva 23 Switzerland".
- Right Document:** "NAMING OF LHC ENTITIES AND THEIR PARAMETERS FOR THE CERN CONTROL CENTRE". It features the CERN logo and the text "CERN CH-1211 Geneva 23 Switzerland".

Each document cover includes a header with the CERN logo and the text "CERN CH-1211 Geneva 23 Switzerland". The right document also includes a header with the LHC Project Document No. "LHC-C-QA-0002 rev 1.0", the CERN Div./Group or Supplier/Contractor Document No. "AB - CO", and the EDMS Document No. "473091". The date "2004-07-26" is visible at the bottom right of the right document.

Coding – Naming Service

- Accelerators Entities Naming Service – responsible for the attribution of codes, their publication on a central portal and QA questions related to Coding
 - Naming Portal: <https://cern.ch/service-acc-naming>
 - > 10 000 distinct equipment types identified and equipment codes assigned (not counting the variants of the equipment types)
- Hide the complexity of the Coding from the users and serve as a unique point of reference (dictionary for the codes used throughout other systems)
- Common naming reference - prerequisite for a **harmonized** Asset Management
 - A lot of considerations behind the assignment of an equipment codes

The screenshot shows the 'Accelerators Entities and Signals NAMING PORTAL' website. The page has a navigation bar with links like 'Home', 'Signal Simple Extraction', 'Signal Experts Interface', 'LHC Equipment Codes', 'SPS Equipment Codes', and 'PS Equipment Codes'. The main content area is divided into several sections: 'ENTITIES & SIGNALS', 'EQUIPMENT CODES CATALOGUES', 'DOCUMENTATION', 'Excel Templates for DATA IMPORT', and 'NEWS'. A 'Codes Search' sidebar is visible on the right, with a search input field containing 'MBE%' and a 'Search' button. Below the search bar, there are sections for 'Naming DB' and 'Layout DB'. The 'Naming DB' section shows search results for 'Eqp. codes LHC - 1 entries found', 'Eqp & entity codes SPS - 1 entries found', 'Eqp & entity codes PS - no entries found', 'Entities - no entries found', and 'Signals - no entries found'. The 'Layout DB' section shows 'Functional positions - 5 entries found'. A table is displayed at the bottom of the 'Layout DB' section, showing search results for 'MBE%'.

Name	Description	Expert Name1	Expert Name2	Expert Name3	QAP	Responsible Person	Responsible Group
MBE 610422	Bending magnet, modified MBB for vertical deflection	MBE 610422	-	-	SP	DAVID SMEKENS	TE-MSC
MBE 610430	Bending magnet,	MBE 610430	-	-	SP	DAVID	TE-MSC



Group Coding Officer (GCO)

- Work in **close collaboration** with the Naming Service
- Serve as a link between the Equipment Groups (responsible for the equipment) and the Naming Service
- Helpful functionalities on the **Naming Portal**
 - **Common codes search** across information systems - covering Naming, Layout, CDD, EDMS, MTF/Infor EAM, Controls Configuration, Alarms (Laser)

Accelerators Entities and Signals
NAMING PORTAL

Home Signal Simple Extraction Signal Experts Interface LHC Equipment Codes SPS Equipment Codes PS Equipment Codes Print Help

- ENTITIES & SIGNALS
 - Signals (Parameters) - Simple Data Extraction Interface
 - Entities and Signals (Parameters) - Experts Interface
- DOCUMENTATION
 - CERN Equipment Identification
 - LHC
 - LHC Quality Assurance Plan
 - Equipment Naming Conventions
 - LHC Part Identification
 - General rules for naming of equipment and signals
 - Detailed rules for naming of equipment and signals
 - Naming of Hardware Equipment in the Controls Topology (draft version)
 - Practical Guidelines for Equipment Codes in the CD group
 - SPS
 - Conventions for naming of equipment
 - Naming of Electrical Circuits and Power Converters for LHC Injection Lines, CNGS
 - PS-Complex
 - Conventions for naming of equipment
 - Linac4 - Naming conventions for the Layout of Linac4
- EQUIPMENT CODES CATALOGUES
 - LHC Equipment Codes catalogue
 - SPS Equipment Codes catalogue
 - PS-Complex Equipment Codes catalogue
- Excel Templates for DATA IMPORT
 - Equipment Codes (Entity Codes)
 - Entities
 - Quantity Codes
 - Quantities
 - Signals
 - Signals, Quantity Codes and Quantities
- NEWS
 - 29-01-2013
 - No news available
- SERVICE INTERRUPTIONS
 - There are no scheduled interventions

Codes Search

MBE%

Search Clear results

Naming DB

- Eq. codes LHC - 1 entries found
- Eq & entity codes SPS - 1 entries found
- Eq & entity codes PS - no entries found
- Entities - no entries found
- Signals - no entries found

Layout DB

Functional positions - 5 entries found

1 - 5

Name	Description	Expert Name1	Expert Name2	Expert Name3	QAP	Responsible Person	Responsible Group
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MBE 610430	Bending magnet,	MBE 610430	-	-	SP	DAVID	TE-MSC

QA & Naming Service



Jam today

vs



Jam tomorrow

Conclusion

- *Due to the number of equipment to be followed and their complexity, each equipment group is managing their own assets*
 - *QA rules and best practises exist, however they are not yet fully adopted by all groups*
- *The approach is to use dedicated & integrated Information Systems throughout the Asset Management domains*
 - *Efforts are put to further integrate the Information Systems in order to facilitate the users*
- *The Naming Service is an integral part of the Asset Management*
 - *It is used as a dictionary for providing data coherency checks for other systems.*

Thank you for your attention!

