Layout

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BE-CO-DS

Layout Service

- Initially developed in 2003, the Layout Database centralises the management of integrated, controlled functional positions and layout data across CERN

- CERN infrastructures are documented by modelling their architectures as layouts of related Functional Positions

- Layout Data is used for many diverse purposes and is fundamental for the operation of the accelerator complex (configuration of BLMs, Cryogenics, Optics...)

- The Layout database is not a high-availability online system

Hierarchy with functional position names – logically ordered

Identification: names, equipment type, description from Naming service

MTF link

Localisation

Positions

GIS Control portal integration More details in Rack Inventory Presentation

Rack data-driven generated schematic

Version: STUDY

IDENTIFICATION

ID	383841
Machine	LHC Ring
Type	CYFRE001 (Type ID : 380607, naming convention : HC)
Description	Rack Front End (Rack standard CERN 45U)
Layout Name	CYFRE03=SR1
Expert Name	CYFRE.03SR1
Label	CYFRE03
Links t	CYFRE03=SR1 in MTF
Classifi	
Log	

DIMENSIONS

Length	Width	Height
0.6 m	0.9 m	2.189 m

LOCALISATION

Positions (S/U/V)   Rotations

Location	From	S Start	S Middle	S End	U Start	U End	V Start	V End	B	A	C	Magnetic Length
SR1/R-E28	SR1/R-E28	141.2 m	141.50 m	141.8 m	15 m	15.9 m	0 m	0 m	0°	0°	0°	

CYFRE03=SR1 in CERN Geographic Information System (Patrimony)
Location: **SR1/R-E28** (Coordinates: Q-143 on EN/EL reference plan)

OTHER PROPERTIES

Status	DESIGN
Responsible	MAGNUS BJORK (BE-CO)
Comment	
Pins & Pinouts	

Layout Service

- The Layout Service in BE-CO develop, manage and maintain a CERN-wide Oracle database and its associated set of tools:

  - A public .NET browsing web-interface with navigation and search capabilities:
    - 3.5 million .NET pages accesses since 2007
    - This year: ~500 individual users
    - Generally ~60 frequent users in 20 groups

  - Limited applications for data entry
    - ~80 legacy Oracle Forms in 3 applications
    - 30 APEX pages in 4 applications

GROUP	PEOPLE
EN-ACE	16
TE-VSC	12
EN-STI	5
BE-CO	5
BE-BI	4
TE-ABT	4
EN-EL	3
SMB-SE	2
TE-CRG	2
ATS-DO	2
TE-MSC	2
BE-RF	1
HSE-RP	1
EN-EA	1
EN-MME	1
BE-ABP	1
BE-OP	1
EN-HE	1
BE-ASR	1

Layout Service Consolidation

- The Layout Web Interface is a hub, facilitating navigation to other CERN web interfaces:

  - MTF (Asset Maintenance Management)
  - EDMS (Documentation Management)
  - Power Converters Database (Alim DB)
  - GIS Portals (CERN Geographical Information Systems)
  - Normal Conducting Magnets Database (Norma DB)
  - IT Network Service (NetOps)
  - Control Configuration Service (CCS)
  - and more to come like AFT...

RPMBC.UL16.RTQX1.R1 : PC:[600A 10V 4Q] Use:Inner Triplet Model:B without DC contactor

ID : 2348088, Layout version : STUDY

IDENTIFICATION	

ID	2348088
Type	RPMBC
Description	PC:[600A 10V 4Q] Use:Inner Triplet Model:B without DC contactor
Layout Name (Electrical)	RPMBC.UL16.RTQX1.R1
Location	UL16 (Galerie de liaison)
Powering sector	XR1
Circuits	RQX.R1
Links to other databases	RPMBC.UL16.RTQX1.R1 in MTF *T*
	HCRPMBC___-CI000167 equipment in MTF *T*
	RPMBC.UL16.RTQX1.R1 in TE-EPC DB
	More P.C. Data in Layout DB...
Log	

MTF

TE/EPC ALIM DB

DOCUMENTS : NON CONFORMITIES, ECR...		
Electrical Object Concerned	Document	Description
RPMBC.UL16.RTQX1.R1	EDMS Id: 1227985 (ECR)	Change of software over current protection thresholds for the Inner Triplet power converters
RPMBC.UL16.RTQX1.R1	EDMS Id: 977059 (ECR)	Change of Power Converter Type to include DC contactor

EDMS Documents

IT Network Service

FUNCTIONAL POSITIONS SYSTEM

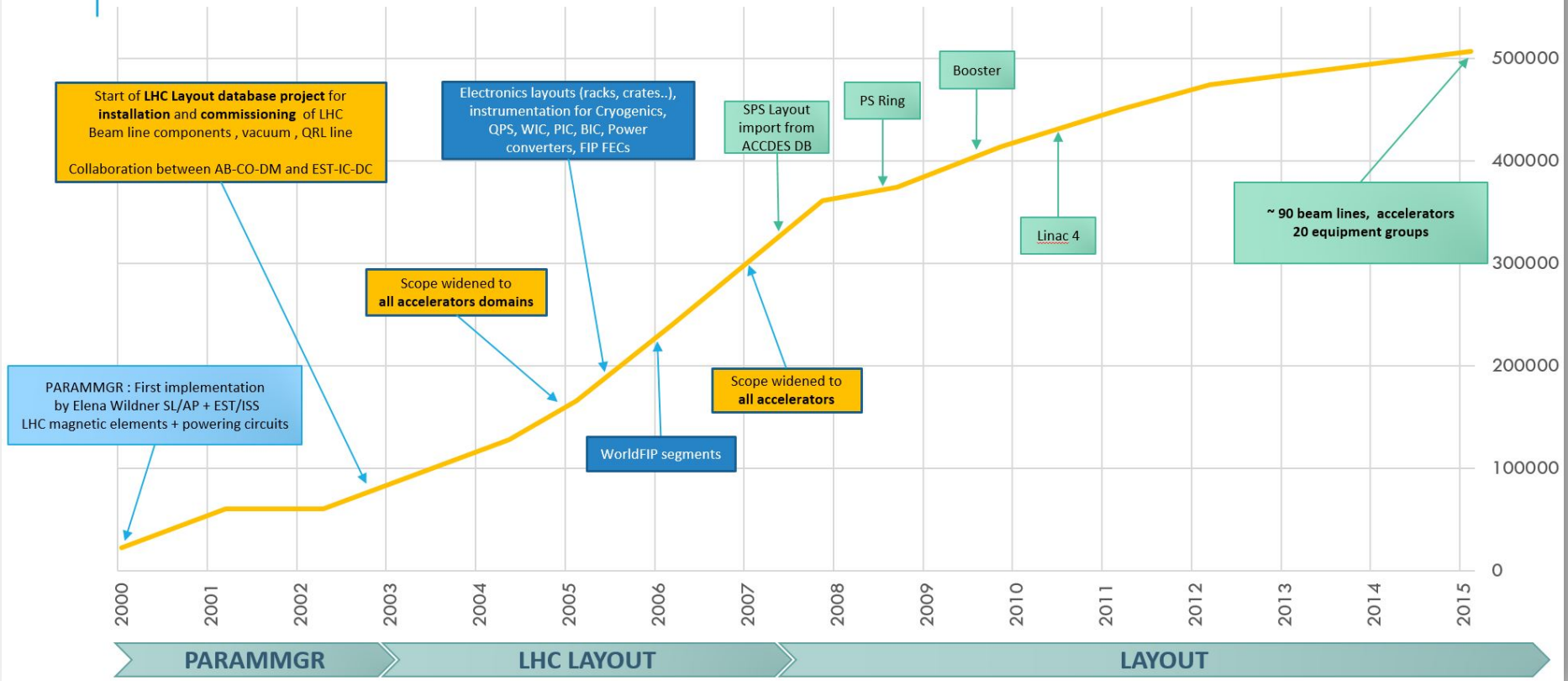| SYSTEM ID	SYSTEM TYPE	SYSTEM NAME	SYSTEM EXPERT NAME	HOSTNAME	MAIN LOCATION	FUNCTION	DESCRIPTION	STATUS	RESPONSIBLE	USER	ELEC.	Links	VERSION
444611	CFC	CFC-SR1-DT1FA	CFC-SR1-DT1FA	cfc-sr1-dt1fa	SR1/R-E28	DT1FA	LHC Quench Protection	INSTALLED	HERVE MILCENT , EN-ICE	HERVE MILCENT EN-ICE	Elec. Object Elec. Circuit	Network DB CCDB MTF	STUDY

CCS

MTF

Layout Service Consolidation

- Over the last 10 years, the scope of the Layout service has expanded enormously

  - Increase in geographical scope: From LHC main tunnel to any accelerator related locations
    - Surface buildings, SM18, Cryogenic plants…

  - Increase in domain scope: From LHC beam-line components to potentially any domain covered at CERN
    - Magnets, QPS, vacuum, Cryogenics, Shielding's, Electronics, circuits and connections, etc.

EVOLUTION

Functional Position increase over 15 years

Start of **LHC Layout database project** for **installation** and **commissioning** of LHC Beam line components , vacuum , QRL line

Collaboration between AB-CO-DM and EST-IC-DC

Electronics layouts (racks, crates..), instrumentation for Cryogenics, QPS, WIC, PIC, BIC, Power converters, FIP FECs

SPS Layout import from ACCDES DB

PS Ring

Booster

Linac 4

~ 90 beam lines, accelerators 20 equipment groups

Scope widened to **all accelerators domains**

PARAMMGR : First implementation by Elena Wildner SL/AP + EST/ISS LHC magnetic elements + powering circuits

Scope widened to **all accelerators**

WorldFIP segments

PARAMMGR   LHC LAYOUT   LAYOUT

Layout Service Consolidation

- To cope with the ever-increasing demand for the service, the team is currently implementing

  - A completely new Oracle Layout Database

  - New web interfaces for browsing and editing layout data fully based on ACW architecture

New Layout Browser

- The new browsing interface will cover and extend the functionality of the current read-only web interface

- So far, the current test version integrates:
  - A data-driven advanced search with time-oriented results
  - Time-oriented Functional Position tree navigators: by civil works, by machine
  - Functional Position Entity Page
    - With tabs for Identification & naming, positioning, links to MTF, GIS integration, Documents, 360 panoramas

- Browser demo:
  - Search: https://layout-test.cern.ch:14001/search/36277322
  - QYCCC.34L2: https://layout-test.cern.ch:14001/elements?id=952090&tab=0&version=LS1&navigator=MACHINE
  - BLMAI.A4L1: https://layout-test.cern.ch:14001/elements?id=39754674&tab=0&version=TS3%202016&navigator=MACHINE
  - QYTBA.UA87: https://layout-test.cern.ch:14001/elements?id=1117422&tab=0&version=LS1
  - 360 pano: https://layout-test.cern.ch:14001/elements?id=100410&tab=2&version=LS1&navigator=MACHINE

Next Steps…

- Version 1.0 of the Layout Browser will also contain:
  - Class and types navigator with associated data, grouped by domain in tabs
  - Additional domain-specific tabs in Entity Page for Cryogenics, Vacuum, Magnets, Power Converters , WorldFIP, etc
  - Graphical visualisation of circuits/connections using TVC component

- Additional features planned for future versions include:
  - Simplified 2D (or 3D with Three.js) schematics of assembly structures
  - Custom dashboards
  - User defined reports (fixed or configurable) using ACW Reporting Grid component

- Before the end of the year, start developing editing functionality

Questions?

https://wikis.cern.ch/display/layout