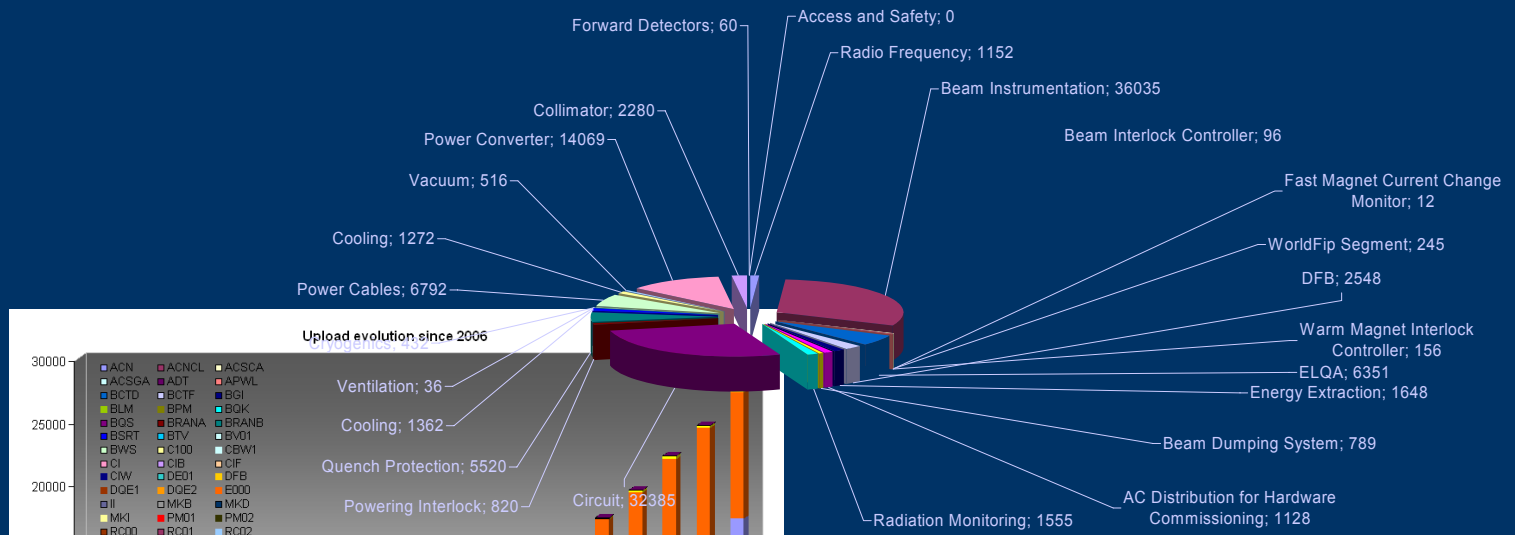
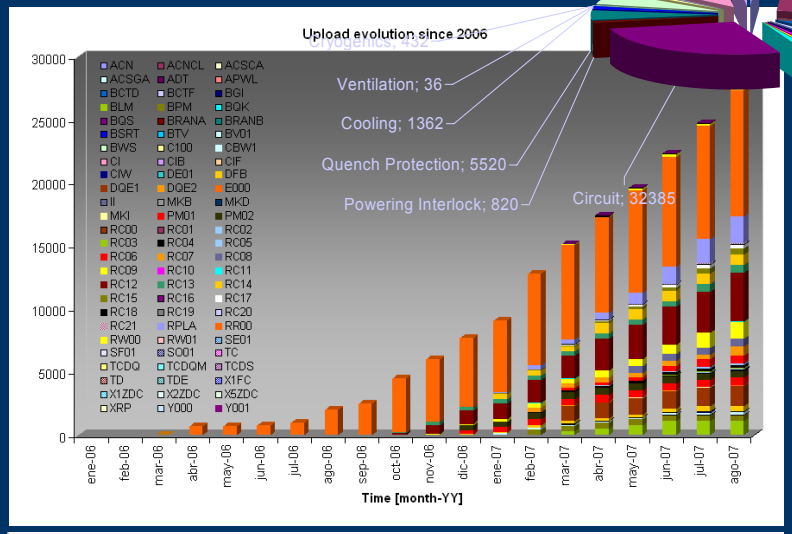
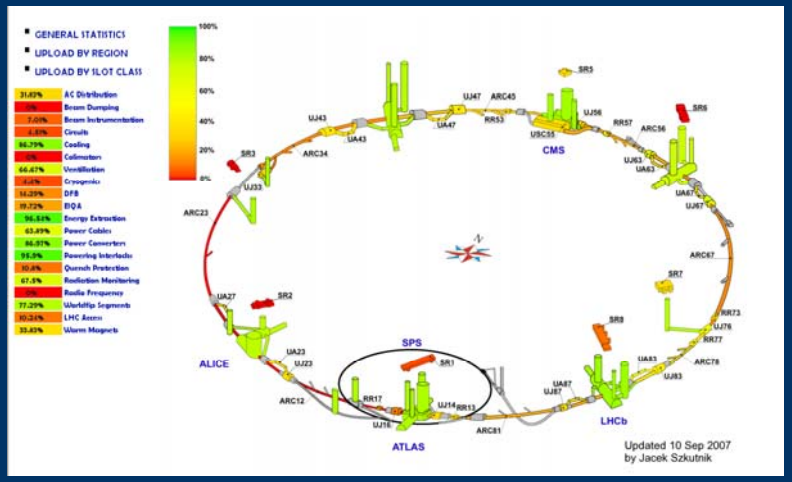




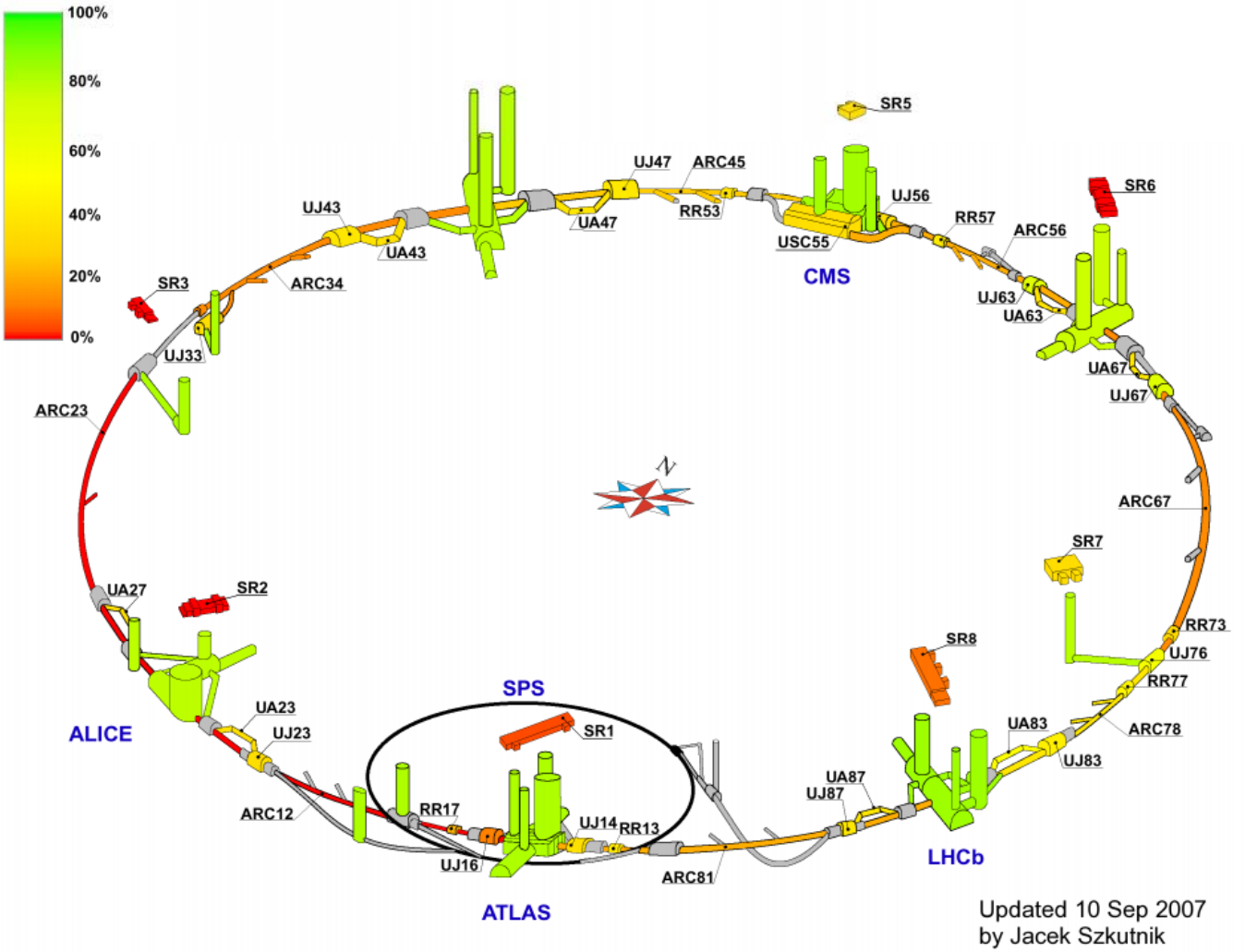


What is the HC MTF ? Organization of the HC MTF. What is traced in the HC MTF ? How is the data organized ? Orders of Magnitude Upload rate 2006-2007. Expected upload rate for 2007-2008. Quality of the Data: Documentation, NCRs, Repeated Steps. Manual & Automatic Upload. Integrating the upload within the test process. Link to the LHC Layout Database. Further requests by users.

What is the HC MTF ?

- GENERAL STATISTICS
- UPLOAD BY REGION
- UPLOAD BY SLOT CLASS

31.83%	AC Distribution
0%	Beam Dumping
7.01%	Beam Instrumentation
4.51%	Circuits
86.79%	Cooling
0%	Collimators
66.67%	Ventillation
4.4%	Cryogenics
14.29%	DFB
19.72%	EIQA
96.54%	Energy Extraction
63.89%	Power Cables
86.97%	Power Converters
95.9%	Powering Interlocks
10.8%	Quench Protection
67.5%	Radiation Monitoring
0%	Radio Frequency
77.29%	Worldfip Segments
10.24%	LHC Access
33.83%	Warm Magnets



Database that tracks the Hardware Commissioning of the LHC Systems

Organization of the HC MTF

- Radio Frequency
- Beam Instrumentation
- WorldFip Segment
- Machine Protection System
- Control
- ELQA
- DFB
- Energy Extraction System
- AC Distribution
- Beam Dumping System
- Beam Injection System
- Radiation Monitoring
- Warm Circuit
- Superconducting Circuit
- Control
- Quench Protection System
- Cooling
- Ventilation
- Cryogenics
- Power Cables
- Cooling
- Vacuum
- Power Converter
- Access & Safety
- Collimator

HC Procedures

HC Team

Blanca Perea

Jacek Szkutnik

Gosia Macuda

Alvaro Marqueta

Needs of the user to profile definition in terms of steps and properties I Data Upload tracking I Data Upload tools (XML File Creator, XLS to XML) I Progress views

monthly reports

MTF Team

Sophie Chalard

Sonia Mallon

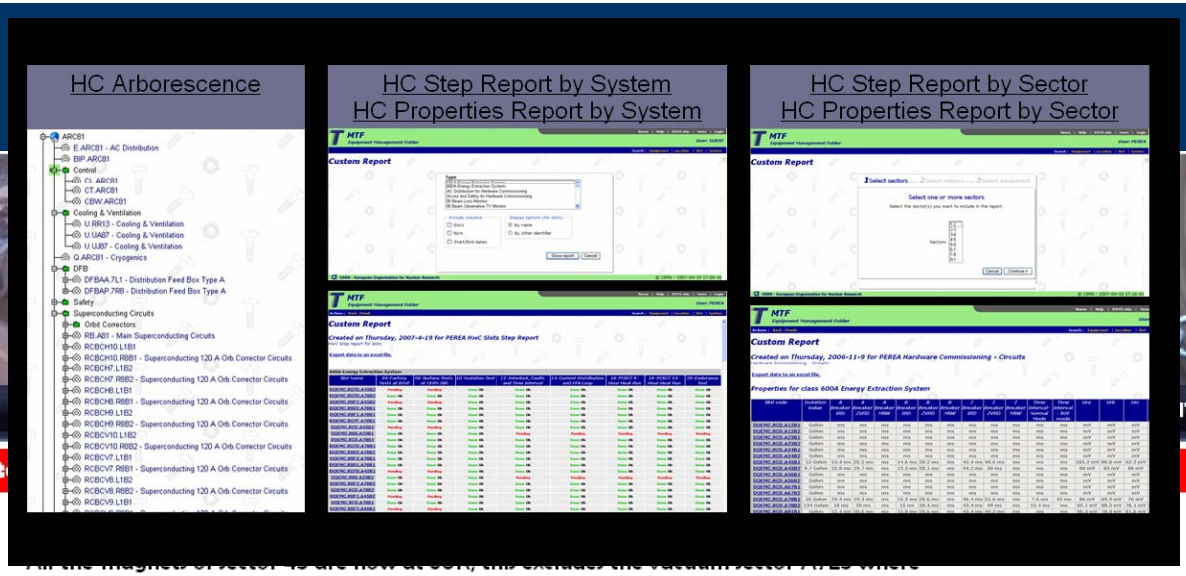
Marcin Sobieszek

Rafal Lyzwa

Catherine Laverriere

Profile Implementation I Automatic upload inbox I Modification of uploaded data I Step and Property Reports (by system and geographical) I MTF Access rights management

EDMS.Support @ cern.ch ++

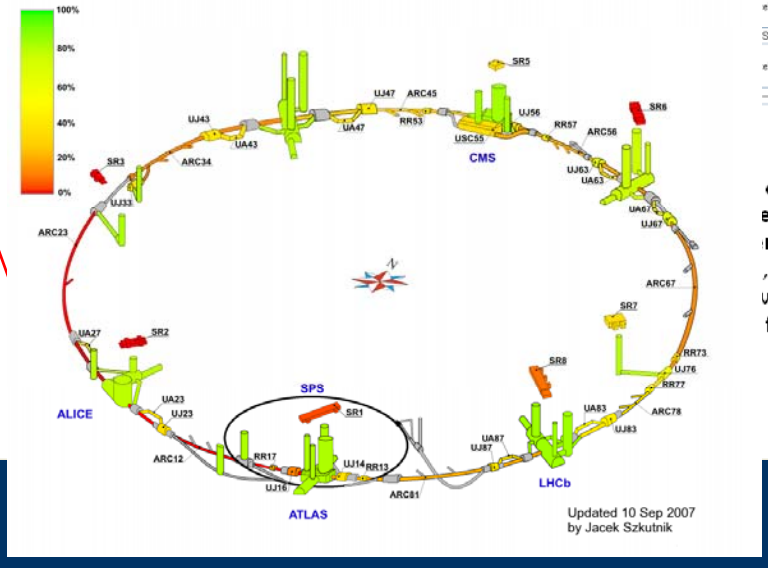


- MAIN PAGE
- MEETINGS
- TWIKI
- MTF
  - MTF LINKS
  - MTF XML REPORTS CREATOR
  - MTF UPLOAD PROGRESS
- DOCUMENTS
- ELOGBOOK
- HC WORKING GROUP
- POWERING PROCEDURES
- LHC
- TIMBER
- METER
- EDMS
- CDD
- LAYOUT DATABASE
- ELECTRICAL CIRCUITS
- INSTALLATION

there is a leak. This leak will be repaired after the ElQA campai
Monday September 3rd.

Sector 78

The consolidation work with the sector at room temperature is a
faulty dipole (1055) has been already replaced and it is currently be
the different leaks found during the pressure tests are being localized
in the region between Q9 and Q11 was repaired this week; the inne
(Q1L8), which had to be brought to the surface to fix a spider that
during the pressure tests, is already repaired and installed; in order t



HARDWARE COMMISSIONING TEST REPORT WIZARD

Select unit type:

- Power Converter for Cold Circuits
- Power Converter for Warm Circuits Type1 (surface buildings)
- Power Converter for Warm Circuits Type2 (underground areas)
- Power Cables Water Cooled
- Power Cables Non Water Cooled
- Powering Interlock Controller
- Cooling
- Cooling Water Cooled Cables
- Quench Protection
- ELQA
- 600A Energy Extraction System
- 13kA Energy Extraction System
- Beam Instrumentation - VME crates

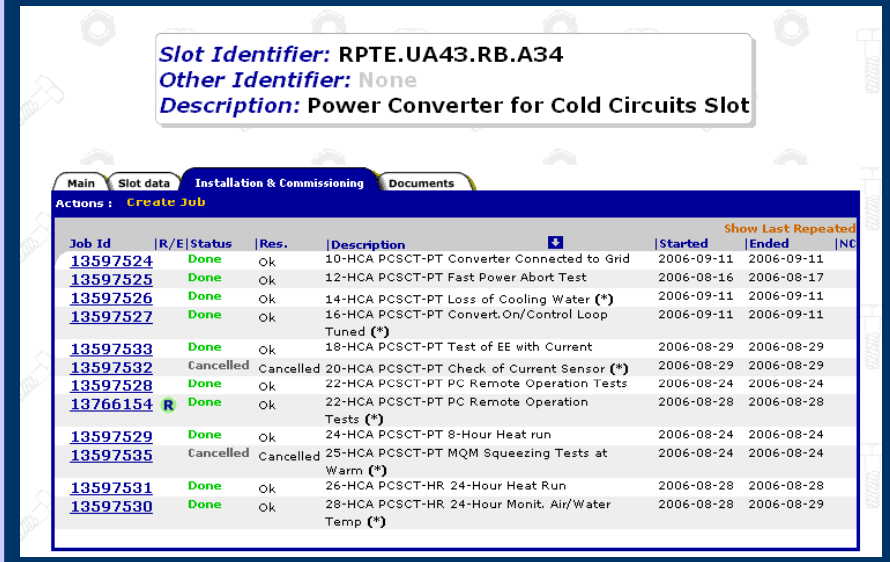
elect Sector

Sector 34

elect Underground Area (using Control and Shift keys you can select multiple)

completed. Some
epaired this week.
mber 3rd; this will
, the new SSS that
varm magnet tests
fixed, the last tests
still by the end of

What is traced in the HC MTF ?



Slot Identifier: RPTE.UA43.RB.A34
Other Identifier: None
Description: Power Converter for Cold Circuits Slot

Main | Slot data | Installation & Commissioning | Documents

Actions : Create Job

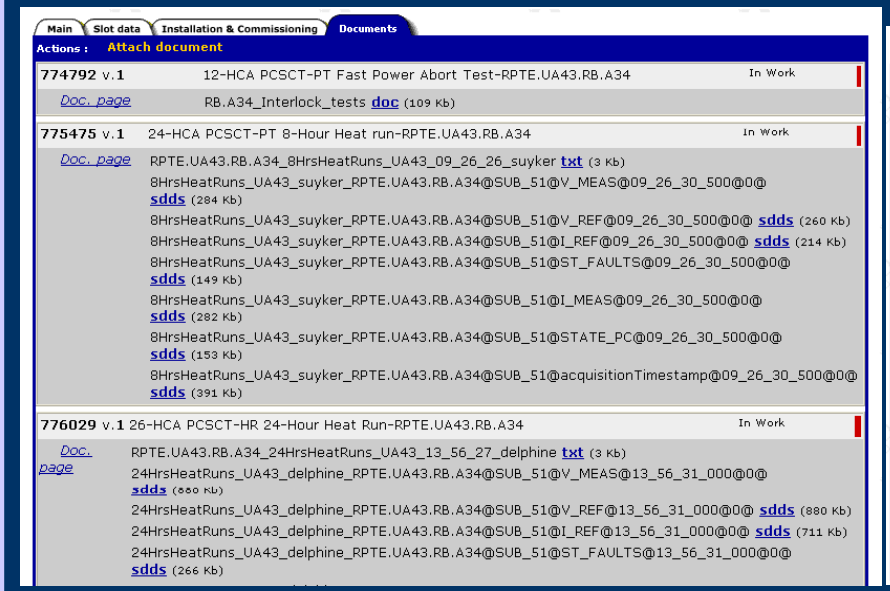
Show Last Repeated

Job Id	R/E	Status	Res.	Description	Started	Ended	NC
13597524		Done	Ok	10-HCA PCSCT-PT Converter Connected to Grid	2006-09-11	2006-09-11	
13597525		Done	Ok	12-HCA PCSCT-PT Fast Power Abort Test	2006-08-16	2006-08-17	
13597526		Done	Ok	14-HCA PCSCT-PT Loss of Cooling Water (*)	2006-09-11	2006-09-11	
13597527		Done	Ok	16-HCA PCSCT-PT Convert.On/Control Loop Tuned (*)	2006-09-11	2006-09-11	
13597533		Done	Ok	18-HCA PCSCT-PT Test of EE with Current	2006-08-29	2006-08-29	
13597532		Cancelled	Cancelled	20-HCA PCSCT-PT Check of Current Sensor (*)	2006-08-29	2006-08-29	
13597528		Done	Ok	22-HCA PCSCT-PT PC Remote Operation Tests	2006-08-24	2006-08-24	
13766154	R	Done	Ok	22-HCA PCSCT-PT PC Remote Operation Tests (*)	2006-08-28	2006-08-28	
13597529		Done	Ok	24-HCA PCSCT-PT 8-Hour Heat run	2006-08-24	2006-08-24	
13597535		Cancelled	Cancelled	25-HCA PCSCT-PT MQM Squeezing Tests at Warm (*)	2006-08-24	2006-08-24	
13597531		Done	Ok	26-HCA PCSCT-HR 24-Hour Heat Run	2006-08-28	2006-08-28	
13597530		Done	Ok	28-HCA PCSCT-HR 24-Hour Monit. Air/Water Temp (*)	2006-08-28	2006-08-29	

1. Validation of the tests performed to the equipment

2. Report documents, journals, EDMS, etc.

3. External Properties (LDB) + Property Values (test variables) + Parameters (historical tracking)



Main | Slot data | Installation & Commissioning | Documents

Actions : Attach document

774792 v.1 — 12-HCA PCSCT-PT Fast Power Abort Test-RPTE.UA43.RB.A34 — In Work

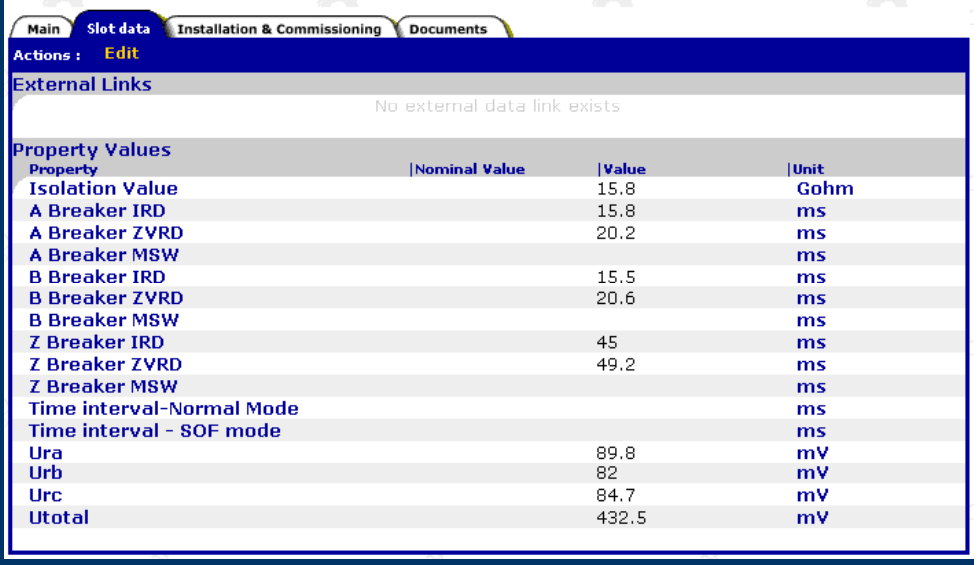
Doc. page — RB.A34_Interlock_tests doc (109 Kb)

775475 v.1 — 24-HCA PCSCT-PT 8-Hour Heat run-RPTE.UA43.RB.A34 — In Work

Doc. page — RPTE.UA43.RB.A34_8HrsHeatRuns_UA43_09_26_26_suyker txt (3 Kb)
8HrsHeatRuns_UA43_suyker_RPTE.UA43.RB.A34@SUB_51@V_MEAS@09_26_30_500@0@ sdds (284 Kb)
8HrsHeatRuns_UA43_suyker_RPTE.UA43.RB.A34@SUB_51@V_REF@09_26_30_500@0@ sdds (260 Kb)
8HrsHeatRuns_UA43_suyker_RPTE.UA43.RB.A34@SUB_51@I_REF@09_26_30_500@0@ sdds (214 Kb)
8HrsHeatRuns_UA43_suyker_RPTE.UA43.RB.A34@SUB_51@ST_FAULTS@09_26_30_500@0@ sdds (149 Kb)
8HrsHeatRuns_UA43_suyker_RPTE.UA43.RB.A34@SUB_51@I_MEAS@09_26_30_500@0@ sdds (282 Kb)
8HrsHeatRuns_UA43_suyker_RPTE.UA43.RB.A34@SUB_51@STATE_PC@09_26_30_500@0@ sdds (153 Kb)
8HrsHeatRuns_UA43_suyker_RPTE.UA43.RB.A34@SUB_51@acquisitionTimestamp@09_26_30_500@0@ sdds (391 Kb)

776029 v.1 — 26-HCA PCSCT-HR 24-Hour Heat Run-RPTE.UA43.RB.A34 — In Work

Doc. page — RPTE.UA43.RB.A34_24HrsHeatRuns_UA43_13_56_27_delphine txt (3 Kb)
24HrsHeatRuns_UA43_delphine_RPTE.UA43.RB.A34@SUB_51@V_MEAS@13_56_31_000@0@ sdds (880 Kb)
24HrsHeatRuns_UA43_delphine_RPTE.UA43.RB.A34@SUB_51@V_REF@13_56_31_000@0@ sdds (880 Kb)
24HrsHeatRuns_UA43_delphine_RPTE.UA43.RB.A34@SUB_51@I_REF@13_56_31_000@0@ sdds (711 Kb)
24HrsHeatRuns_UA43_delphine_RPTE.UA43.RB.A34@SUB_51@ST_FAULTS@13_56_31_000@0@ sdds (266 Kb)



Main | Slot data | Installation & Commissioning | Documents

Actions : Edit

External Links

No external data link exists

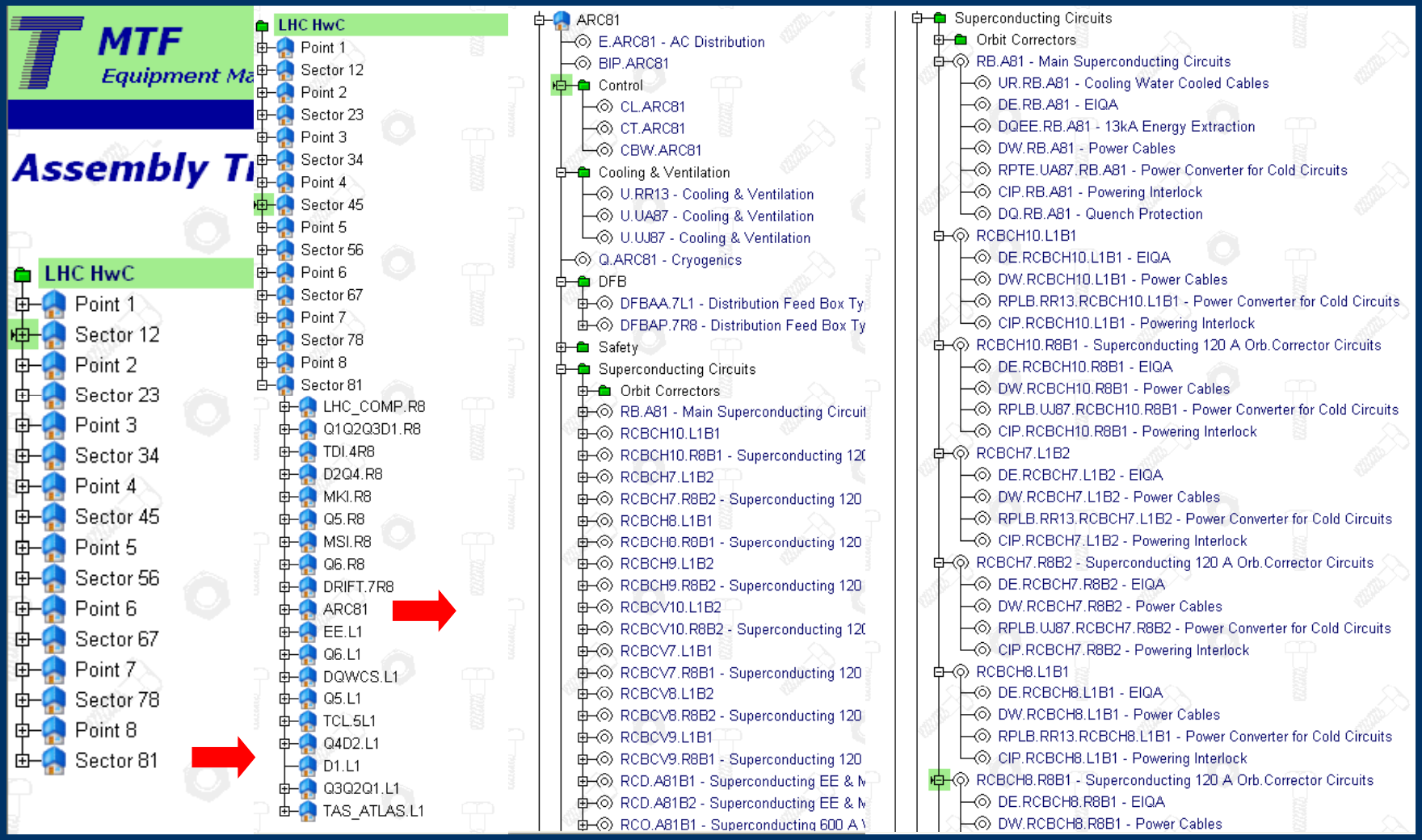
Property Values

Property	Nominal Value	Value	Unit
Isolation Value		15.8	Gohm
A Breaker IRD		15.8	ms
A Breaker ZVRD		20.2	ms
A Breaker MSW			ms
B Breaker IRD		15.5	ms
B Breaker ZVRD		20.6	ms
B Breaker MSW			ms
Z Breaker IRD		45	ms
Z Breaker ZVRD		49.2	ms
Z Breaker MSW			ms
Time interval-Normal Mode			ms
Time interval - SOF mode			ms
Ura		89.8	mV
Urb		82	mV
Urc		84.7	mV
Utotal		432.5	mV

How is the data organized ?

Systems (*slots*) are organized in groups (classes) sharing the same testing procedures (*profile*): they are commissioned through the same test sequence (*steps*). If parameters are measured they are stored as *properties.*

The data is linked to the systems (slots), which are geographically and functionally distributed within the LHC Ring, organized in Sectors and Regions



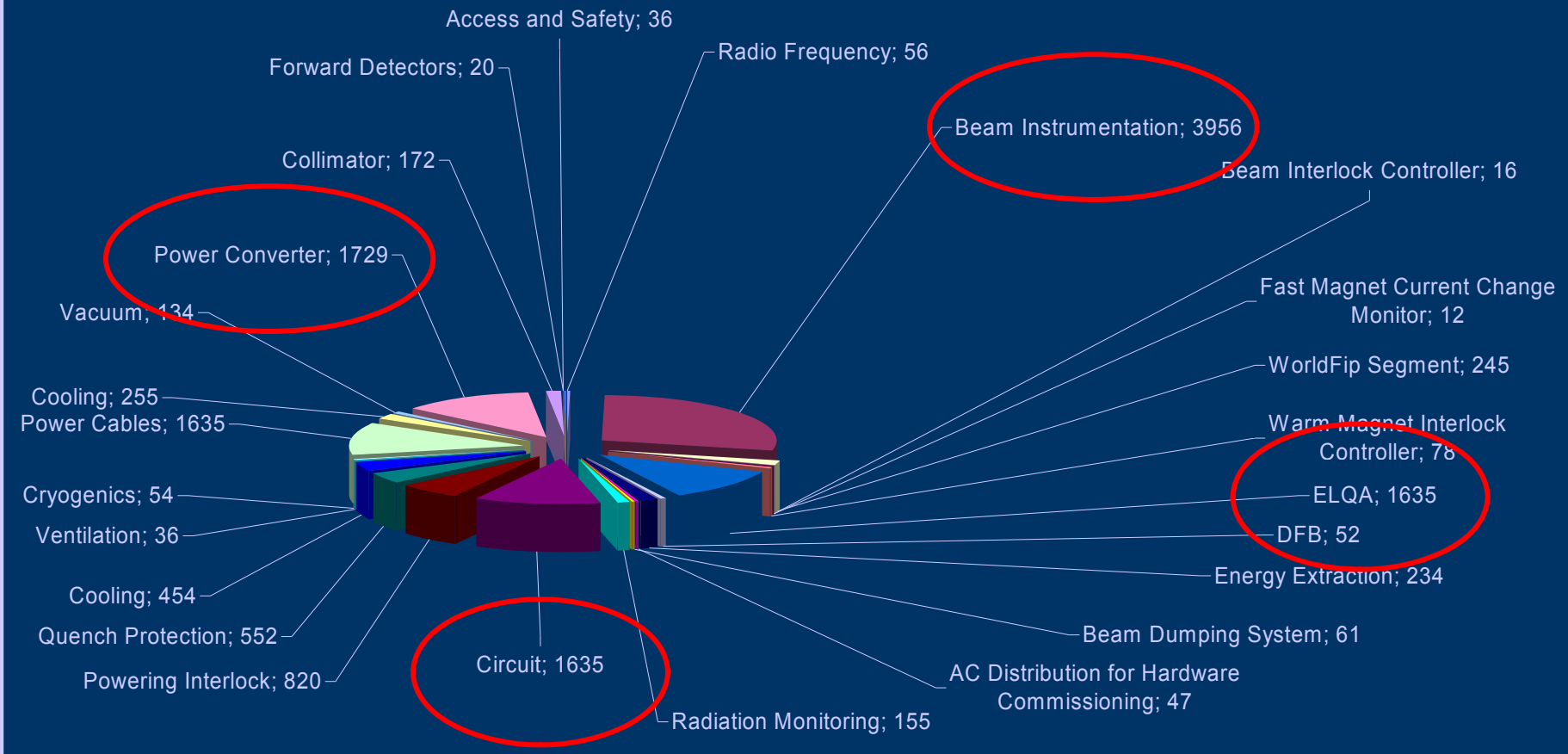
SECTOR HC REGION EQUIPMENT & EQUIPMENT GROUPS

The population of the systems within the arborescence is now 100% automatic once established the criteria to locate the system, which may be geographical or functional

Class	Nr. of slots in MTF	Nr. of slots in the Tree	Nr. of slots not in the Tree	Nr. of slots not in MTF
CIB	16	16	0	0
CIF	12	12	0	0
CIW	78	63	15	0
Radio Frequency	56	56	0	0
Cryogenics	54	54	0	0
Power Cables	1635	1635	0	0
Cooling	583	579	4	0
Powering Interlock Controller	820	820	0	0
Quench Protection	552	552	0	0
DFB	52	52	0	0
Radiation Monitoring - Standard RP	80	76	4	0
Radiation Monitoring Air, Water, Standalone	75	63	12	0
WorldFip	245	243	2	0
Energy Extraction 600A	202	202	0	0
Energy Extraction 13kA	32	32	0	0
Ventilation	35	35	0	0
Power Converter	1729	1729	0	0
Circuit	1635	1635	0	0
Beam Interlock Controller	16	16	0	0
Fast Magnet Current change Monitor	12	12	0	0
MKI Injection Kickers	8	8	0	0
Collimator	160	160	0	0
BV01	133	88	133	88
BLM	2624	2624	0	0
BPM	1175	1175	0	0
BTV	37	37	0	0
BCTF	10	10	0	0
BCTD	4	4	0	0
BGI	4	4	0	0

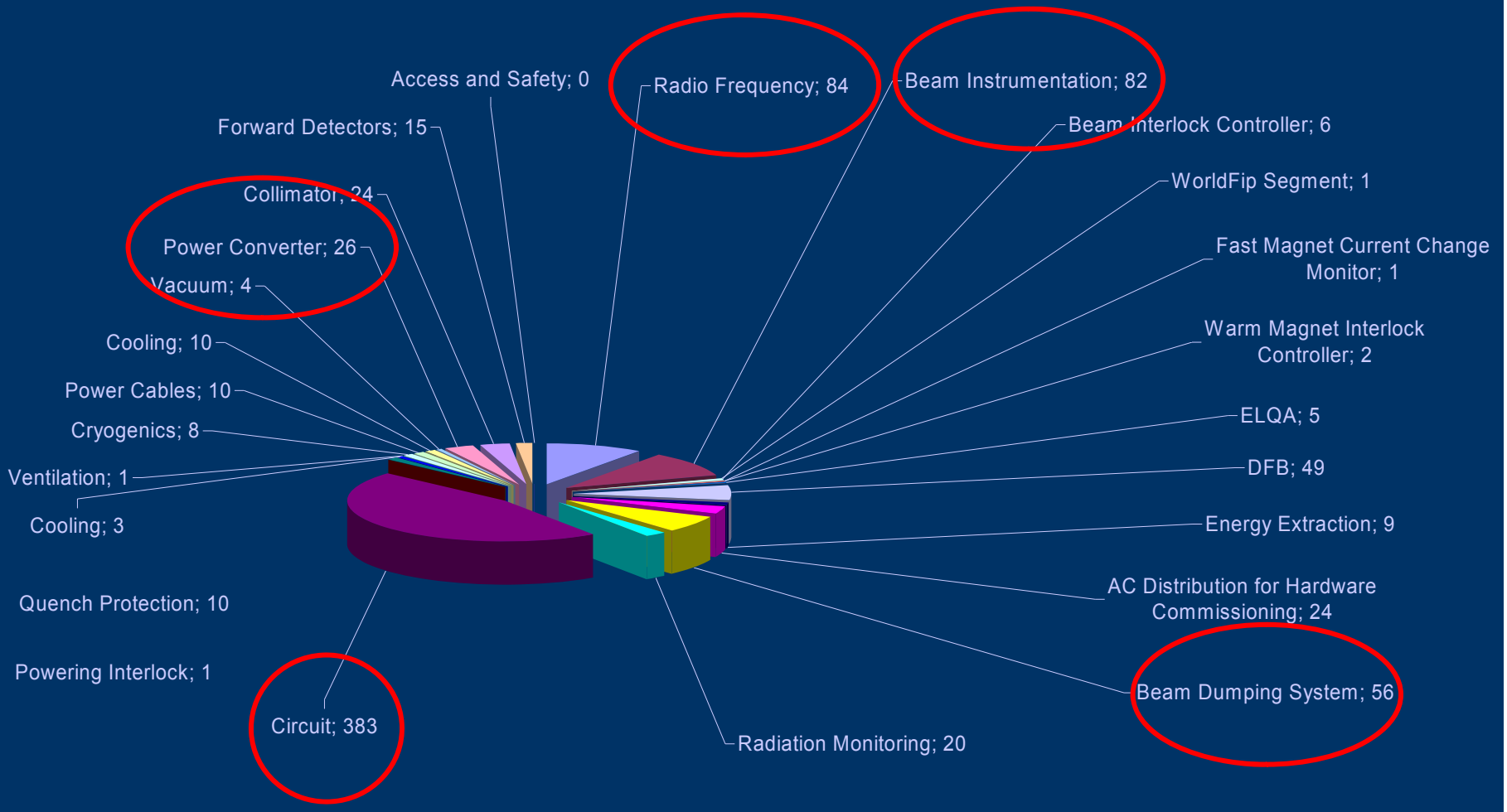
Orders of Magnitude

Number of Systems (*slots*)



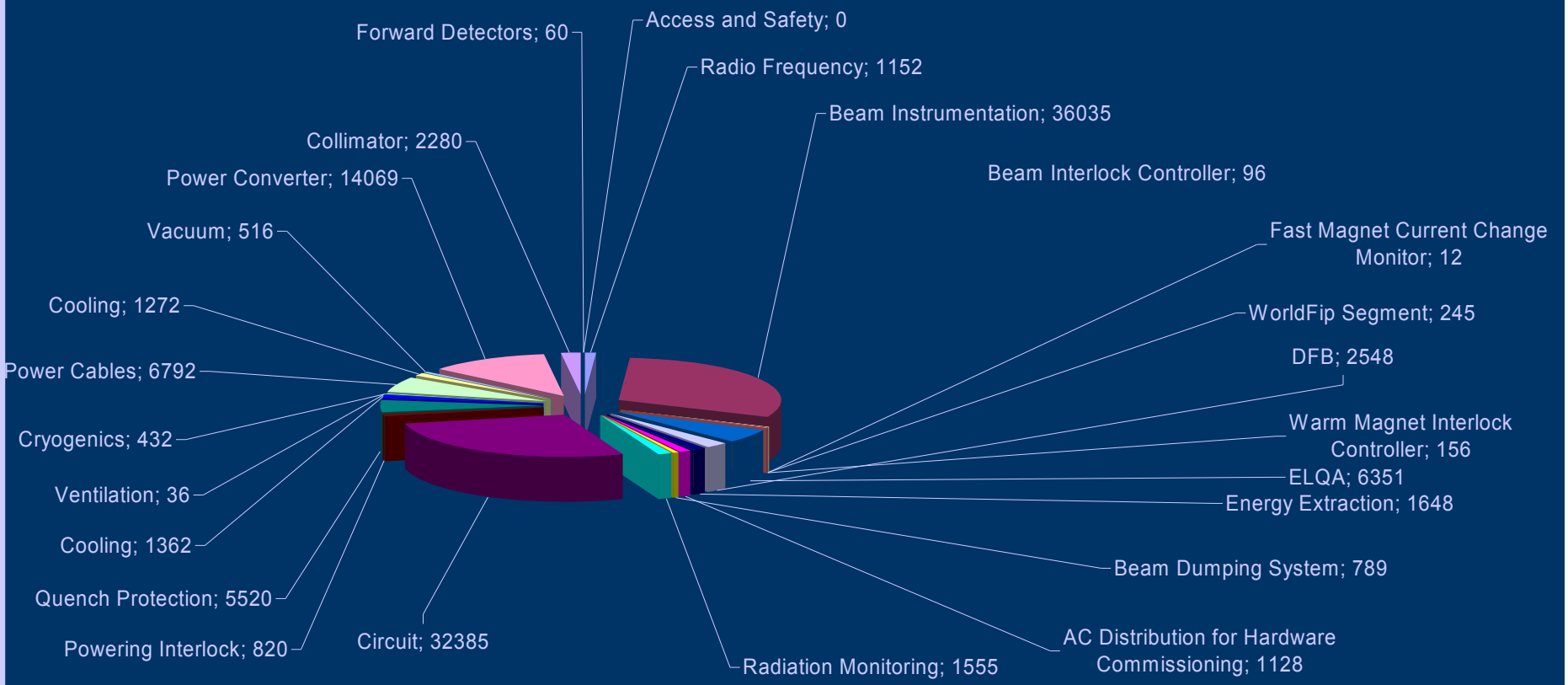
- ~ 14 000 Systems organized within ~ 70 classes
- Major Systems in terms of slots are (classes): Beam Instrumentation / Power Converters / Circuits / ElQA & Systems directly linked to the circuits

Number of tests per system (*steps*)



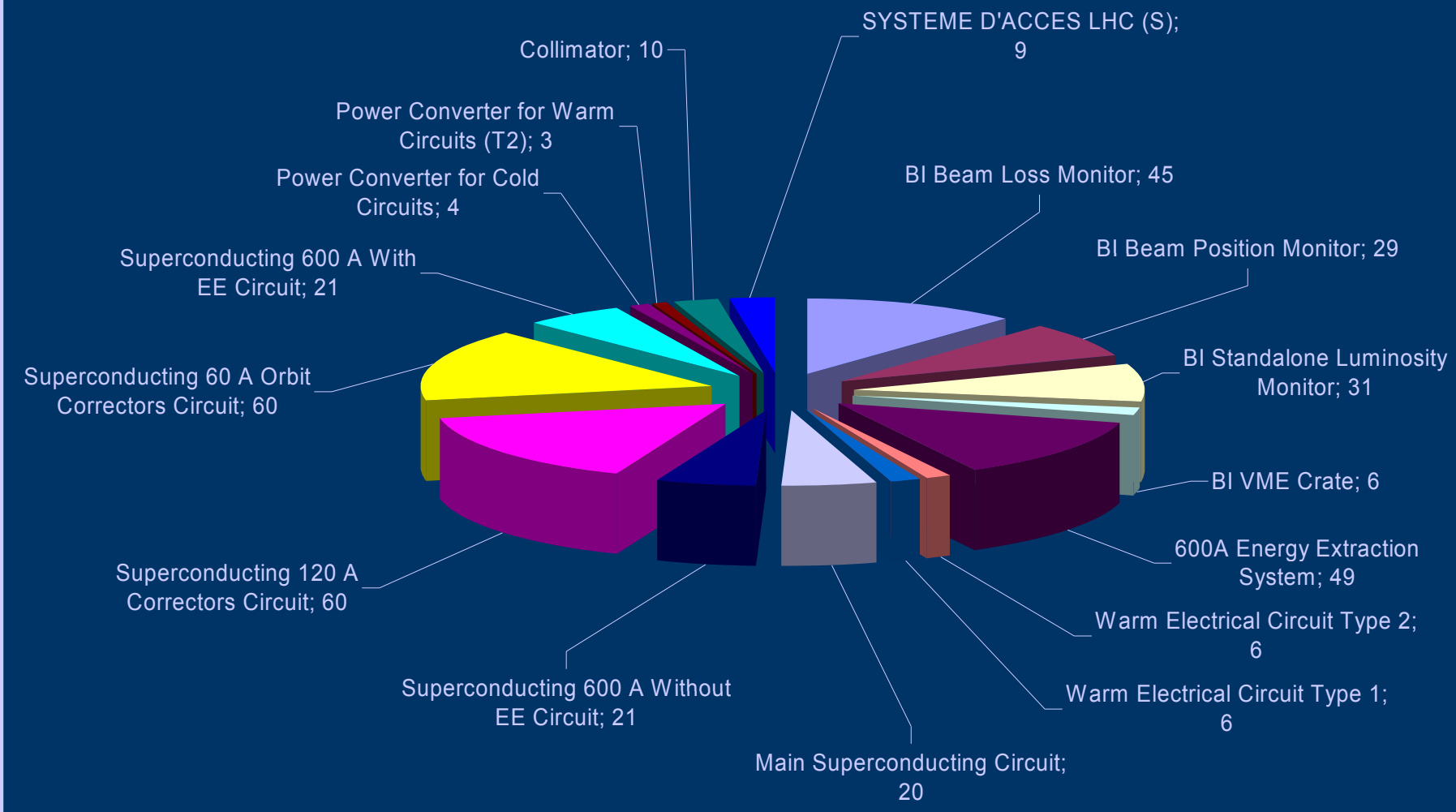
- Individual profiles can range from 1 to 100 steps
- The systems that trace in more detail are Circuits, RF, Beam Dumping System, BI and PC

Number of *entries* (*steps* x *slots*)



116 000 entries expected

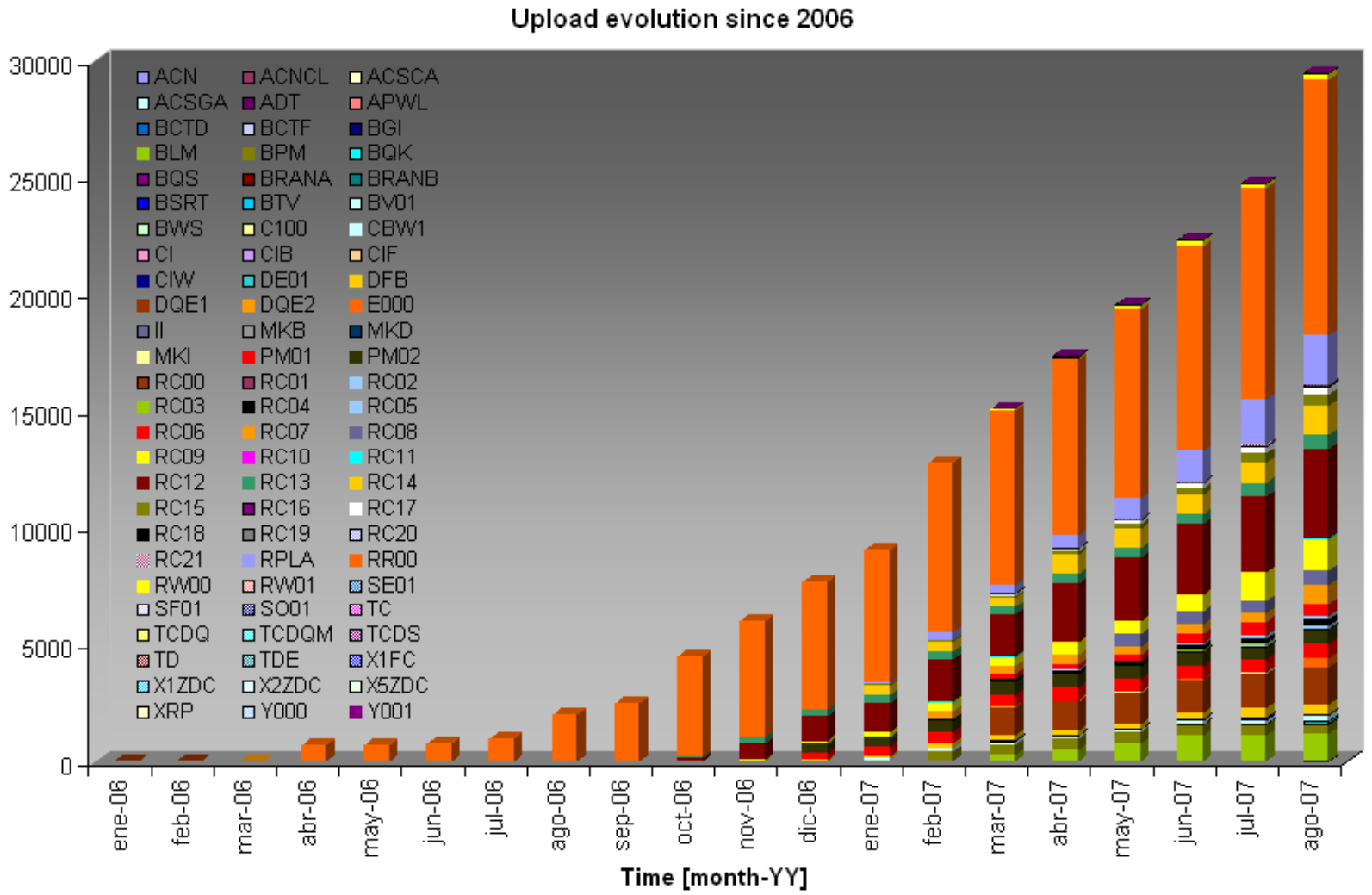
Number of parameters (*properties*)

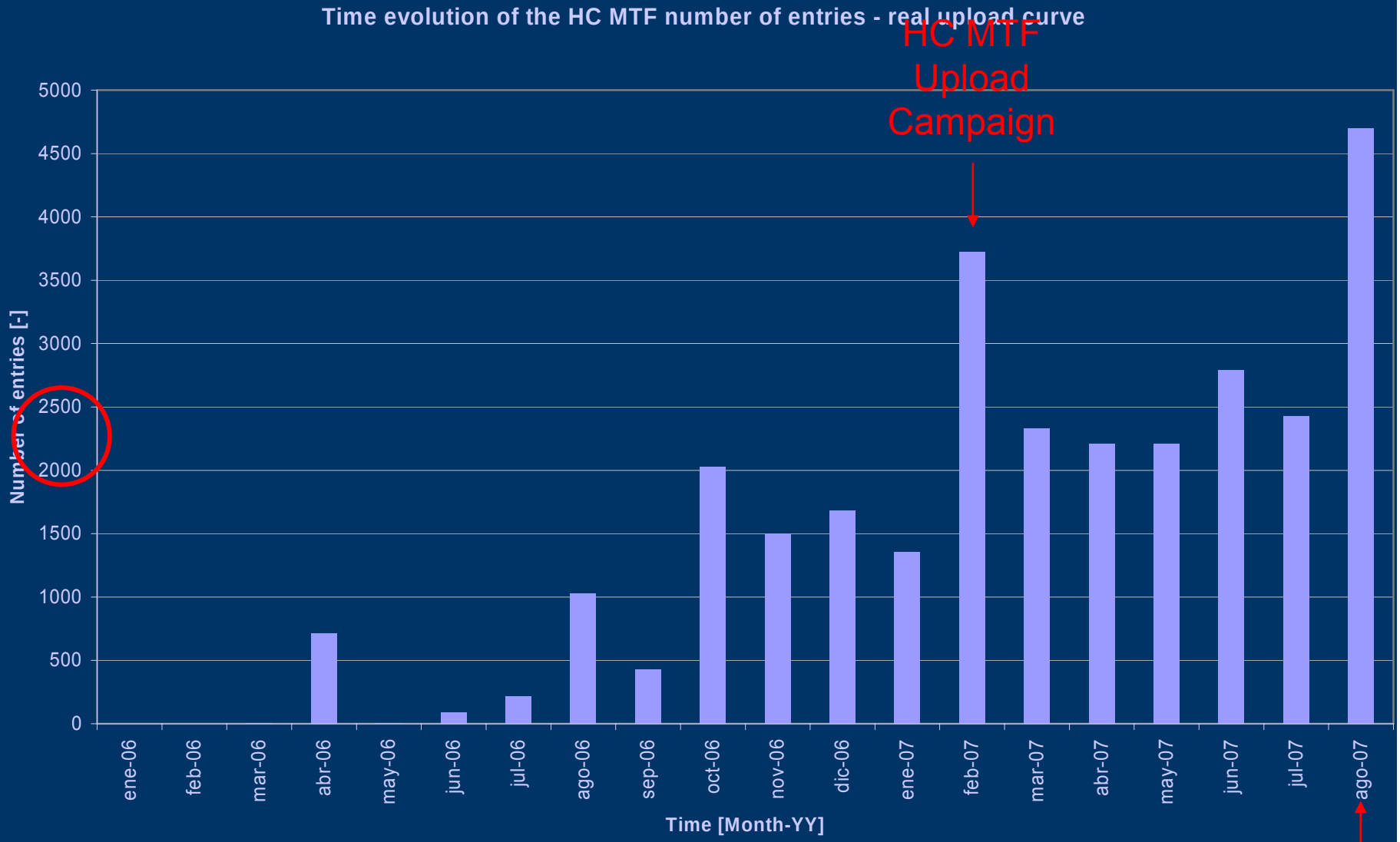


- Individual profiles store between 1 (EDMS Procedure) and 60 parameters
- Classes tracking more parameters are: Circuits, Energy Extraction and BI

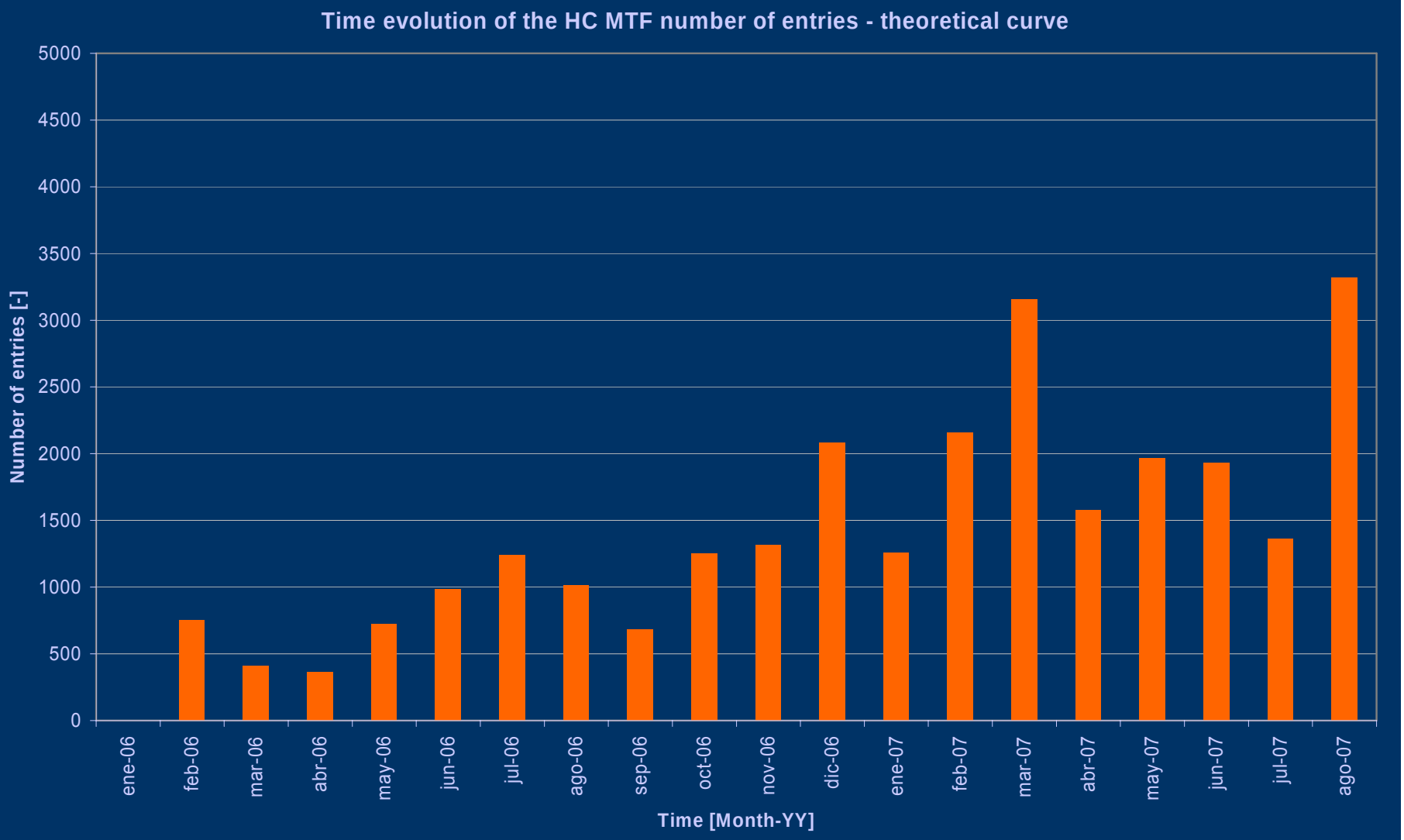
Upload rate 2006-2007

24% of the entries are filled

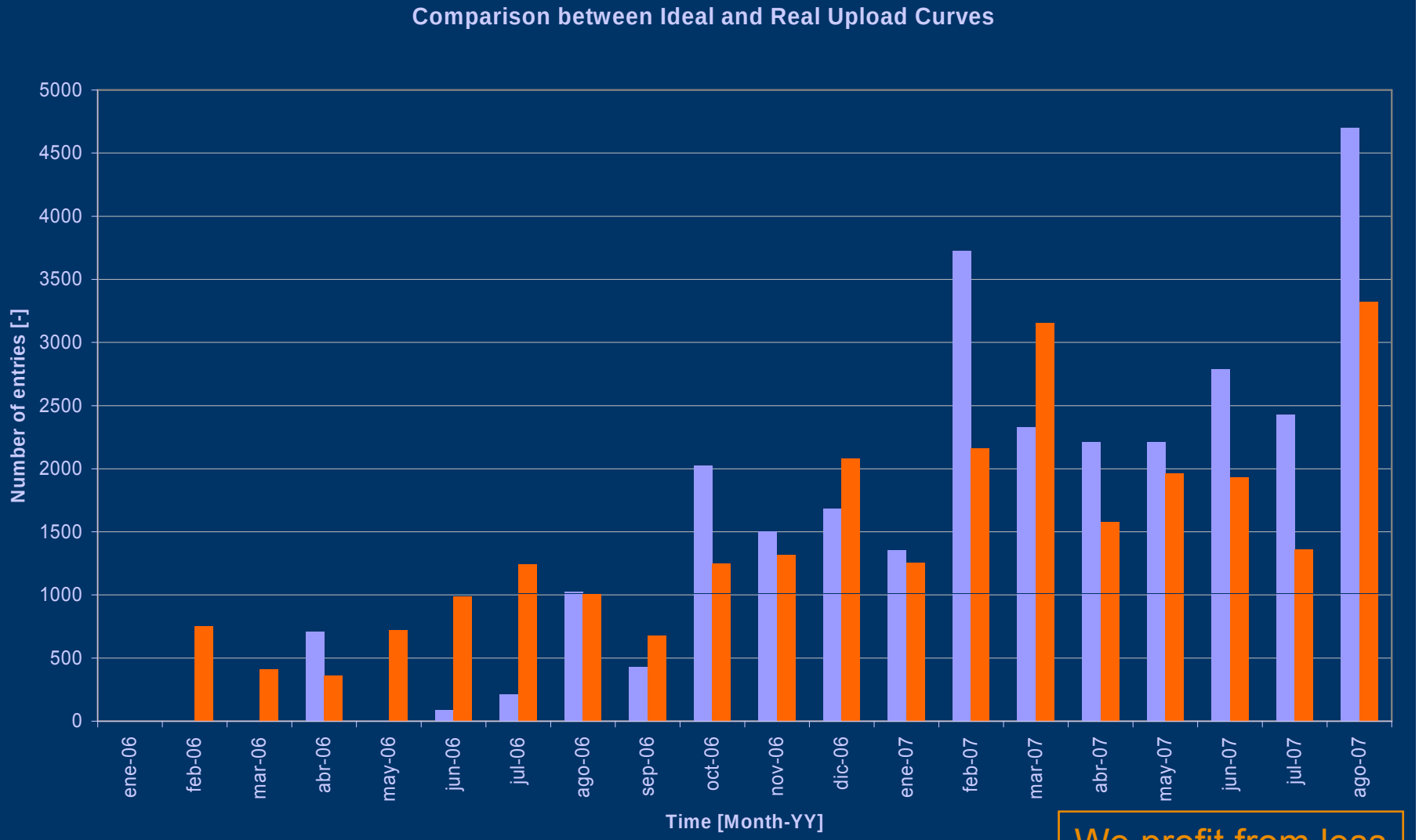




Real Upload Curve



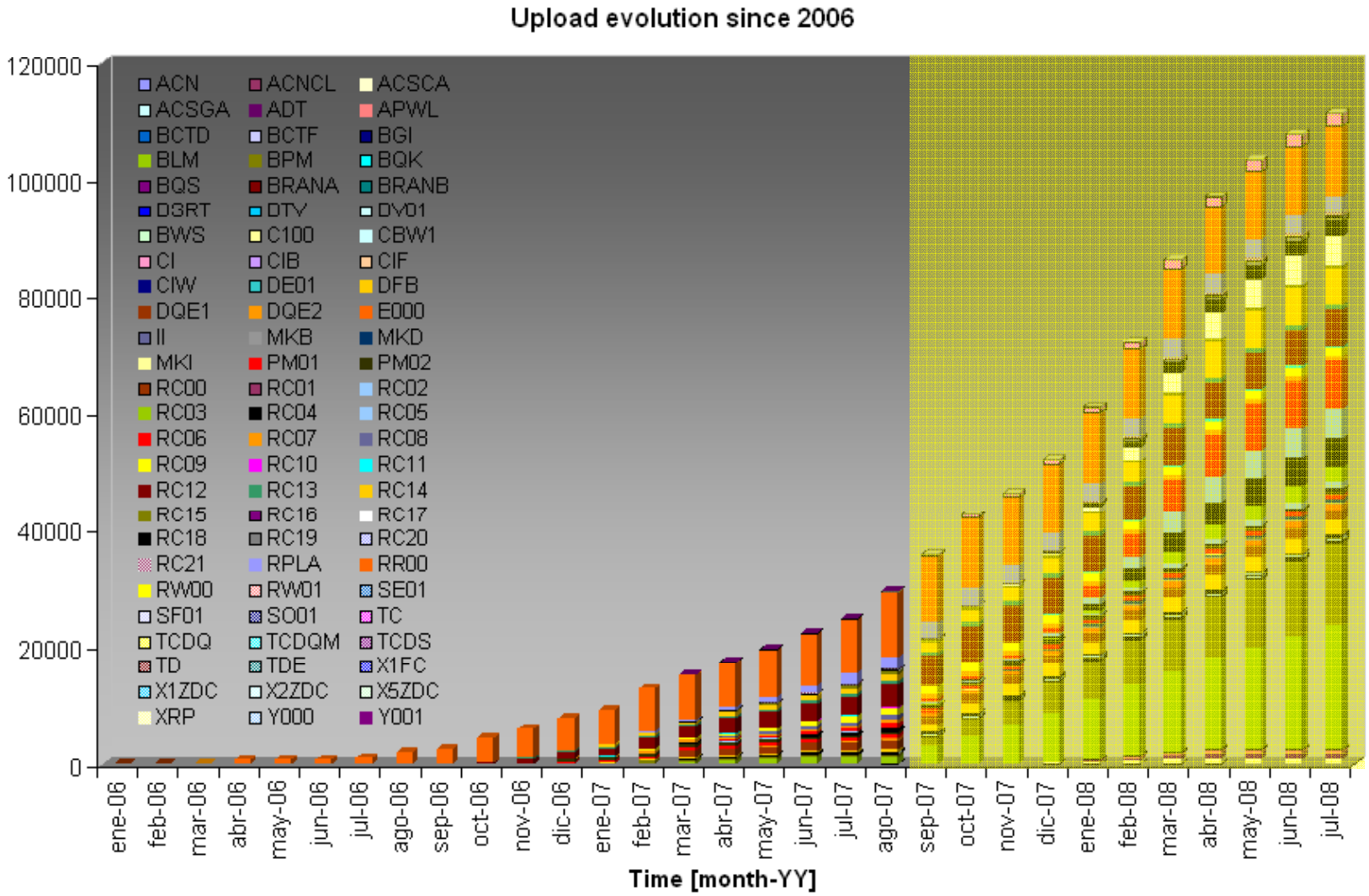
Ideal Upload Curve



Real vs. Ideal Upload Curve

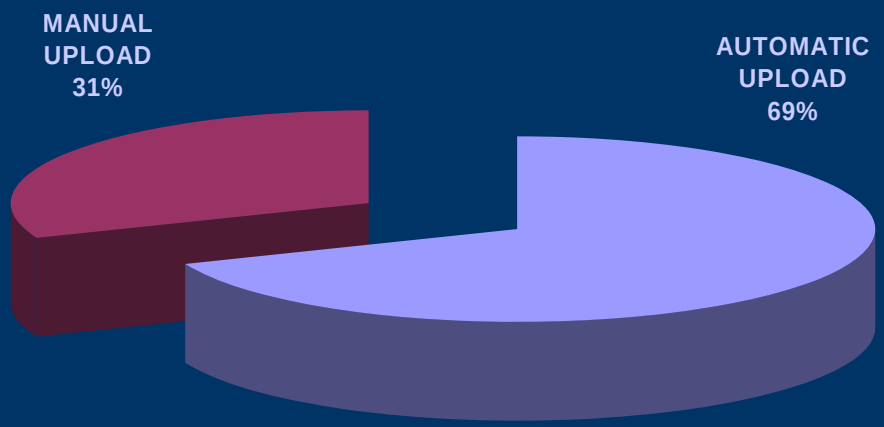
We profit from less intense testing periods to upload data

Expected upload rate 2007-2008



EXTRAPOLATION !!

Manual & Automatic Upload



Automatic Upload is used by:

- BLM & BPM
- WorldFip Segments
- Warm Magnet Interlock Control
- ELQA for Warm/Cold Circuits
- Energy Extraction Systems
- AC Distribution (*)
- RAMSES
- Warm Electrical Circuits
- SC Circuits
- Powering Interlock
- Quench Protection
- Cooling
- Power Cables
- Power Converters

Manual Upload is used by:

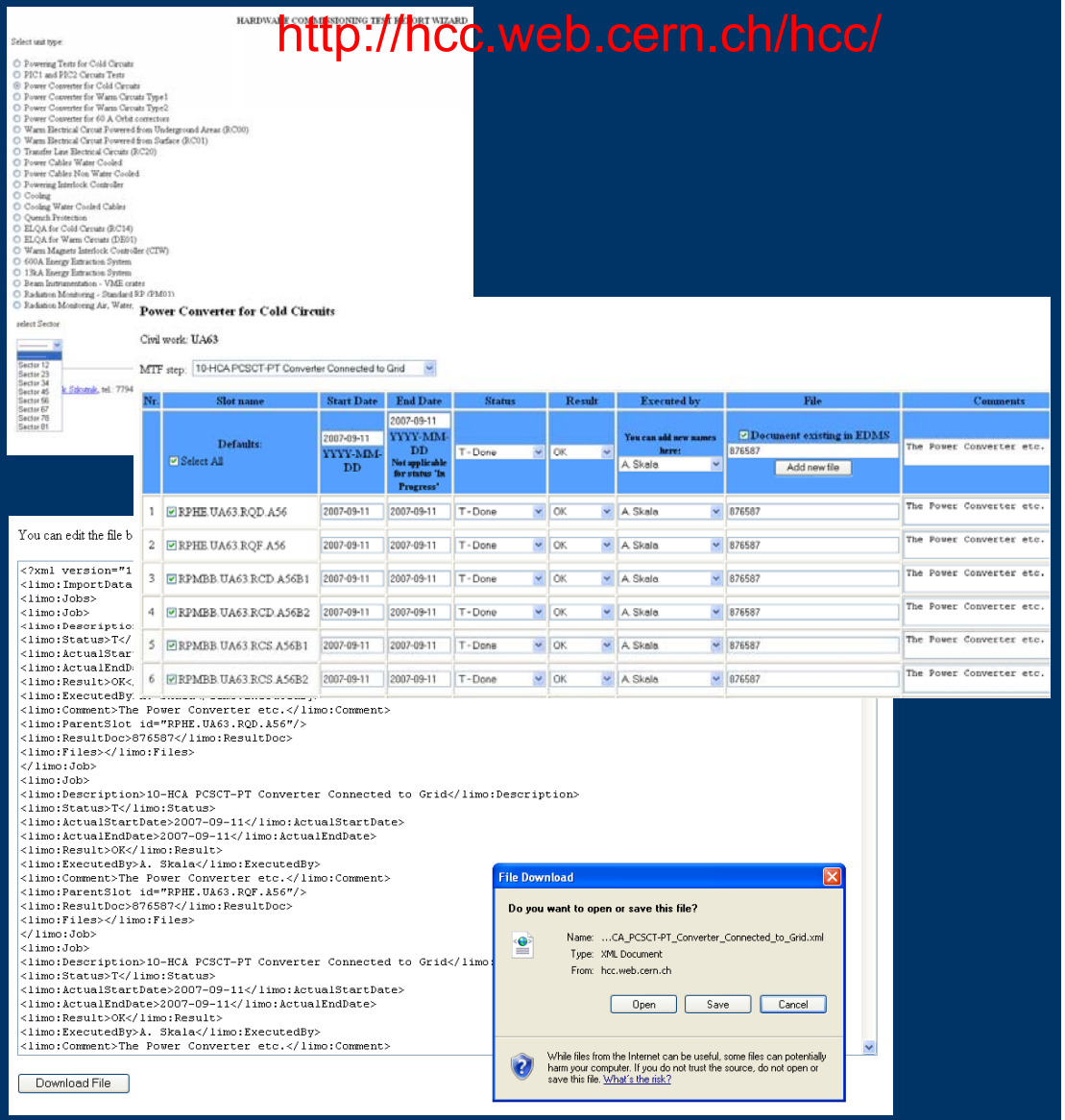
- DFBs
- BSRT & BTV & BCTD & BCTF
- Injection Kicker
- RAMSES
- Ventilation

- Automatic Upload is made through XML files copied into \\cern.ch\dfs\Users\h\hardcom\MTF folder and notified to Malgorzata Macuda or copied to the MTF Sequencer folder (only the Sequencer for the Superconducting Circuit tests)

- There are still a number of incidences while uploading data due to inexact syntax of the XML files. See Gosia's talk

- HC Team (Jacek) has prepared a number of tools to facilitate the upload, either through XML file creator or by automatically converting XLS files to XML files (in particular for properties). See Jacek's demo

XML file creator accessible from http://hcc.web.cern.ch/hcc/



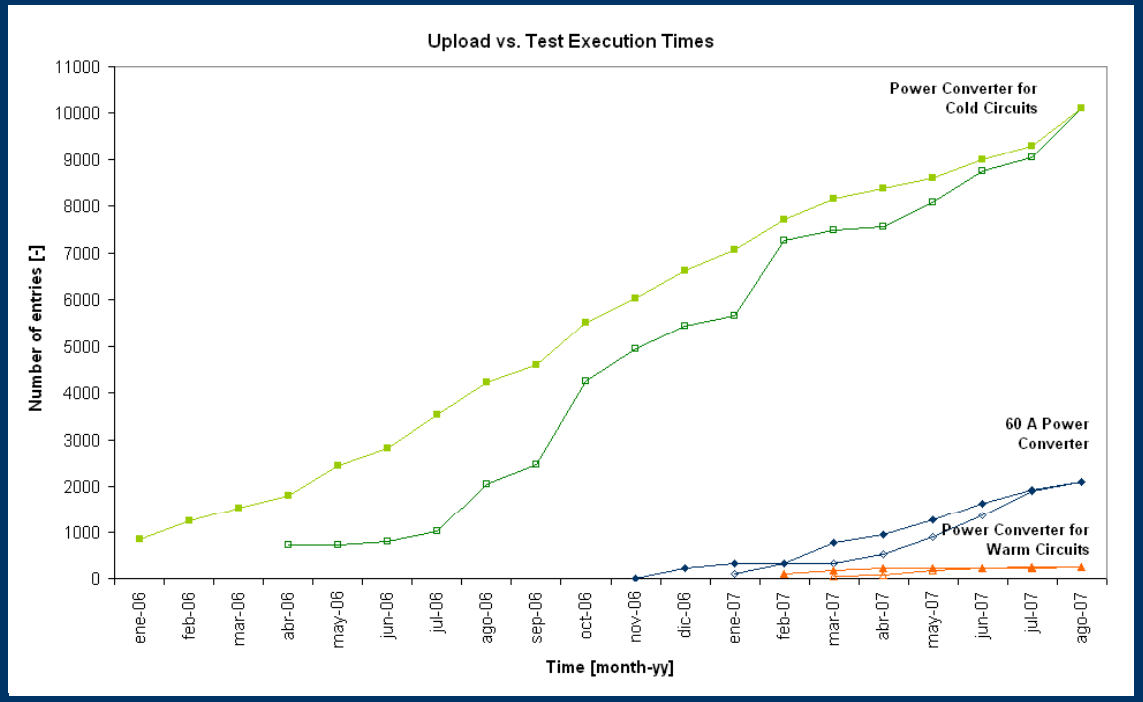
Integrating data upload within the system tests

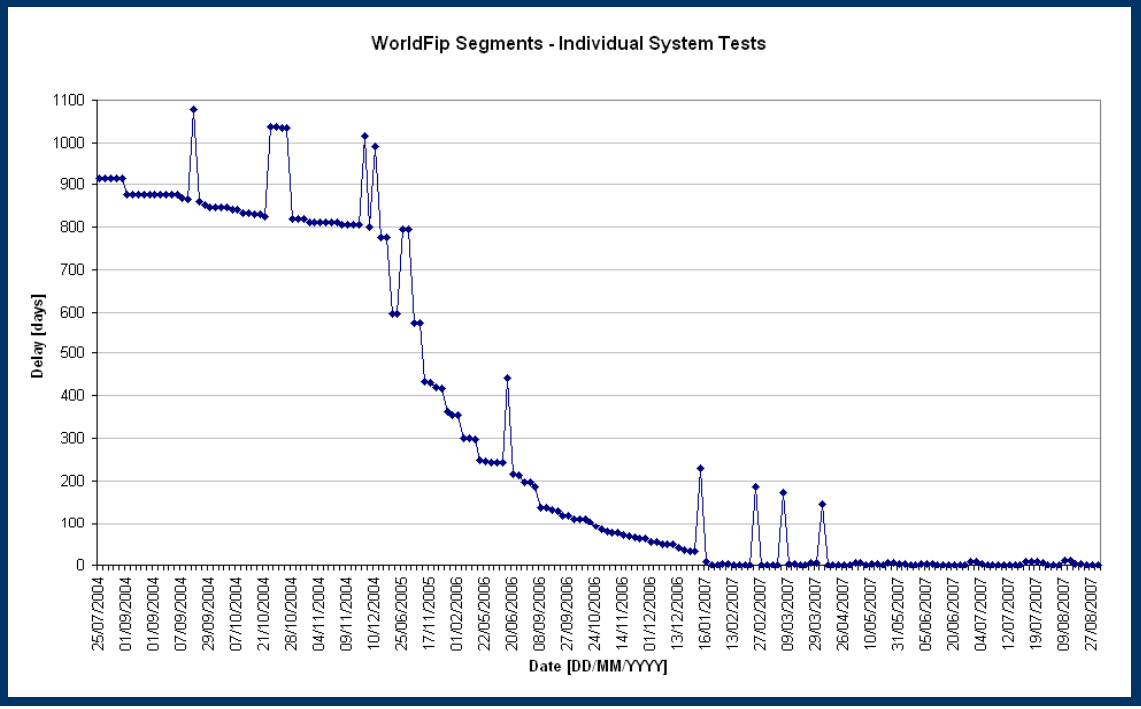
Upload times have dramatically decreased for most of the systems, from a few months to a few weeks in most of the cases !

Example could be the comparison between upload and test execution dates for the three profiles of Power Converters

or WorldFip Segments who have reduced to zero their delay to upload the data

YES !!! It looks like the data upload becomes a last step after data analysis!!





Quality of the Data

NCRs
[249]

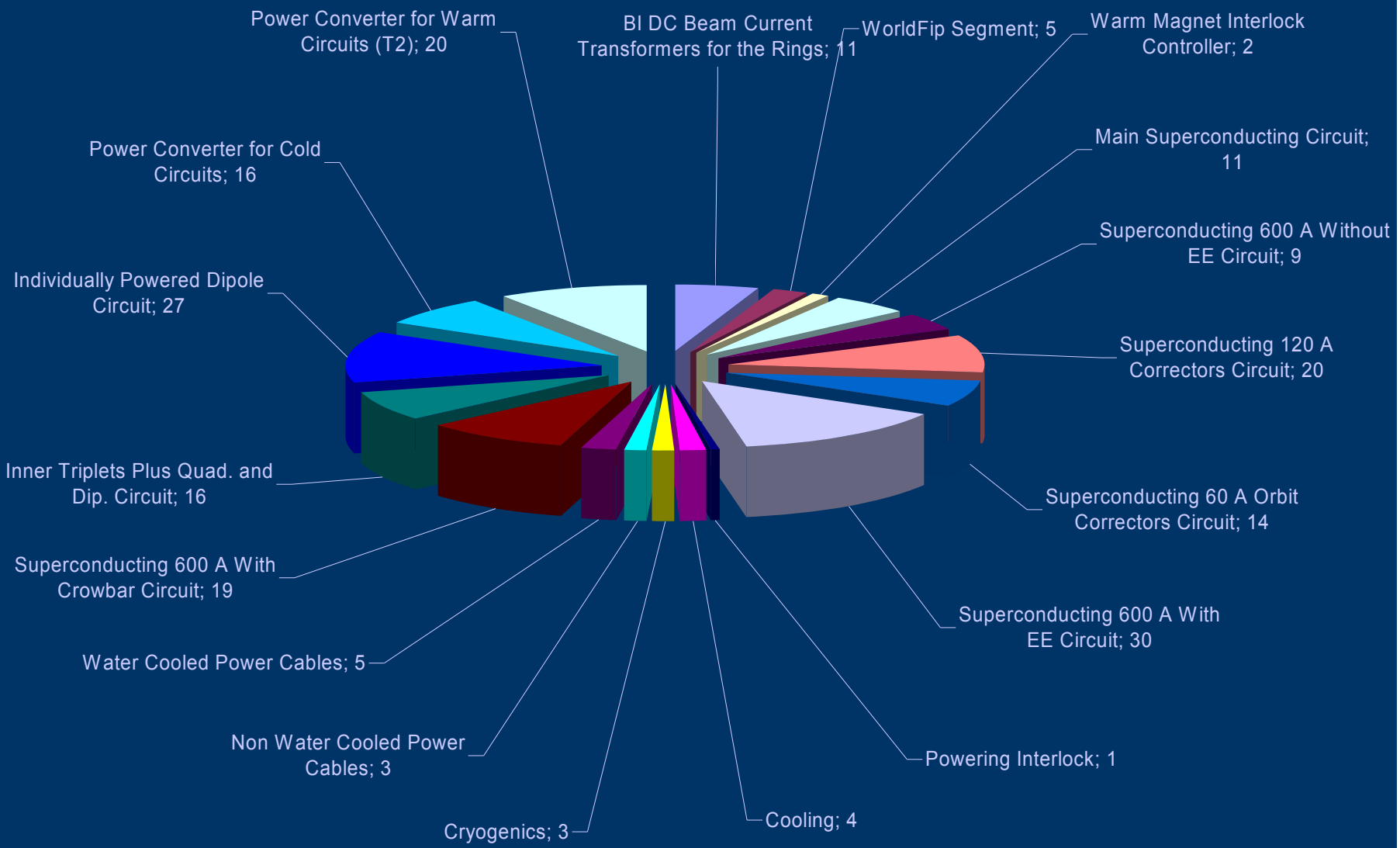
Comments
[1.5%]

Repeated Steps
[8%]

Documentation
[26%]

10%-30% repeated entries SC Circuits
16-20 % repeated entries for PC
5% repeated entries WorldFip, Cooling
< 5% other classes

The repeated steps may be an indicator of the quality of tracking



The associated documentation is also an indicator of the data quality

Circuits, Energy Extraction Systems, Worldfip and ELQA for Warm Circuits are those linking more documentation to their entries

System	% entries with documents
Quench Protection	3
Cryogenics	3
SYSTEME D'ACCES LHC (S)	5
Powering Interlock	7
BI Synchrotron Radiation Telescope	13
Radiation Monitoring - Standard RP	19
Radiation Monitoring Air, Water, Standalone	25
Power Converter for 60A Orbit Correctors	32
Power Converter for Warm Circuits (T2)	35
Power Converter for Cold Circuits	41
Warm Electrical Circuit Type 2	46
600A Energy Extraction System	48
Warm Electrical Circuit Type 1	50
Inner Triplets Plus Quad. and Dip. Circuit	69
Individually Powered Dipole Circuit	73
Superconducting 600 A Without EE Circuit	74
Superconducting 600 A With Crowbar Circuit	76
Superconducting 120 A Correctors Circuit	79
Superconducting 600 A With EE Circuit	86
13kA Energy Extraction System	86
Main Superconducting Circuit	97
WorldFip Segment	99
ELQA for Warm Circuits	100
Superconducting 60 A Orbit Correctors Circuit	100

Layout & MTF direct link

Address http://layout.web.cern.ch/layout/default.aspx?ID=1374039 Go Links

LHC FUNCTIONAL LAYOUT DATABASE

Search Mechanical & Optic (MAD) | Search Systems | Search Electrical | Interfaces | Classifications | Utilities | Navigators

FUNCTIONAL POSITIONS LAYOUT HOME - BACK

ID	ELEC. OBJ.	F. P. | INTERFACES HIERARCHY	POSITION OF	DCUM RING START	DCUM RING END	TYPE	OFFICIAL LHC F.P. NAME	MTF EQUIPMENT	EXPERT NAME	OPTIC NAME	AT/ACR NAME	CIVIL WORK	U	V	A	B	C	BEAM	FAMILY	PHASE	STATUS	More	VERSION
1374039	Elec.Obj.	↑ ↓ | ↑ ↓	MIDDLE	486.0507	486.0507	BLMQI	BLMQI.A12R1		BLMQI.12R1.B2I3_MQ			RI18	0.4990	0	0	0	0			1st LSS Installation	DESIGN	Details	STUDY

1 Entry HOME - BACK

LAYOUT DB
jueves, 09 de noviembre de 2006 12:42:26

Address https://edms.cern.ch/asbuilt/plsql/mtf_slot.slot_main_top?cookie=5797328&p_rec_type=P&p_rec_id=BLMQI.A12R1 Go Links

MTF *Equipment Management Folder*

Home | Help | EDMS site | News | Login

User: PEREA

Search : Equipment | Location | Slot | System

Assembly Tree

- LQATH.12R1 - Arc SSS
  - **BLMQI.A12R1 - BI Beam Loss Monitor**
  - BLMQI.B12R1 - BI Beam Loss Monitor
  - BLMQI.C12R1 - BI Beam Loss Monitor
  - BLMQI.D12R1 - BI Beam Loss Monitor
  - BLMQI.E12R1 - BI Beam Loss Monitor
  - BLMQI.A13R1 - BI Beam Loss Monitor

Slot Folder: Installation Jobs

Slot Identifier: **BLMQI.A12R1**
Other Identifier: None
Description: **BI Beam Loss Monitor**

Main | Slot data | Installation & Commissioning | Documents

Actions : Create Job

Show Last Repeated

Job Id	R/E	Status	Res.	Description	Started	Ended	NC
13832114		Pending		10-BLM Insulation Test			
13832115		Pending		20-BLM High Tension Test			
13832116		Pending		30-BLM Acquisition Chain Test			
13832117		Pending		40-BLM Acquisition Chain Test via RA Source			

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Coherence between Layout and MTF systems is continuously checked through an interface prepared by Jacek

Class	Description	Nr. of slots in MTF	Nr. of slots in Layout	Nr. of missing slots	Nr. of false slots
ACN	RF Normal Conducting Cavity	16	16	0	0
ACNCL	RF Coaxial Line for Normal Conducting Cavity Module	0	0	0	0
ACSCA	RF Superconducting Bare Cavity	16	16	0	0
ADT	RF Transverse Damper	8	8	0	0
APWL	RF Instrumentation	12	12	0	0
BCTD	BI DC Beam Current Transformers for the Rings	4	4	0	0
BCTF	BI Fast Beam Current Transformer	10	10	0	0
BGI	BI Ion Profile Monitor	4	4	0	0
BLM	BI Beam Loss Monitor	2624	2624	0	0
BPM	BI Beam Position Monitor	1175	1175	0	0
BQK	BI Stripline Kicker for PLL Measurement	4	4	0	0
BQS	BI Schottky Monitor	4	4	0	0
BRANA	BI TAN Type Luminosity Monitor	4	4	0	0
BRANB	BI Standalone Luminosity Monitor	4	4	0	0
BSRT	BI Synchrotron Radiation Telescope	2	2	0	0
BTV	BI Beam Observation TV Monitor	37	37	0	0
BV01	BI VME Crate	133	133	0	0
BWS	BI Wire Scanner Profile Monitor	2	2	0	0
CI	Machine Protection System	0	0	0	0
CIB	Beam Interlock System	16	16	0	0
CIF	Fast Magnet Current Change Monitor	12	12	0	0
CIW	Warm Magnet Interlock Controller	78	78	0	0
DE01	ELQA for Warm Circuits	63	63	0	0
DQE1	600A Energy Extraction System	202	202	0	0
DQE2	13kA Energy Extraction System	32	32	0	0
E000	AC Distribution	47	47	0	0
MKB	Diluter Dump Kicker	20	20	0	0
MKD	Ejection Dump Kicker	30	30	0	0
MKI	Injection Kicker	8	8	0	0
PM01	Radiation Monitoring - Standard RP	80	80	0	0
PM02	Radiation Monitoring Air, Water, Standalone	75	75	0	0
RC00	Warm Electrical Circuit Type 2	24	24	0	0
RC01	Warm Electrical Circuit Type 1	20	20	0	0
RC02	Main Superconducting Circuit	24	24	0	0
RC03	Superconducting 600 A Without EE Circuit	72	72	0	0
RC04	Superconducting 120 A Correctors Circuit	284	284	0	0
RC05	Superconducting 60 A Orbit Correctors Circuit	752	752	0	0

NCRs
[249]

116 000 entries
[24% filled]

70 classes

Comments
[1.5%]

The system is becoming a passive structure to receive data. Flexibility to obtain maximum profit from the MTF in profile definition, upload and follow up.

7800 documents

442 properties

Repeated Steps
[8%]

14 000 slots

Documentation
[26%]

Upload Tools

THANKS !!!

Questions from the users to MTF

How is it going to be followed once HC Phase is over ?

Maintenance periods

Automatic upload of Properties (historic)

Dependencies between steps

N/A status

Automatic flag when a new run is going to be performed

Filtering when viewing the profiles