

RPC Construction Database

Structure, Ideas and Plans II

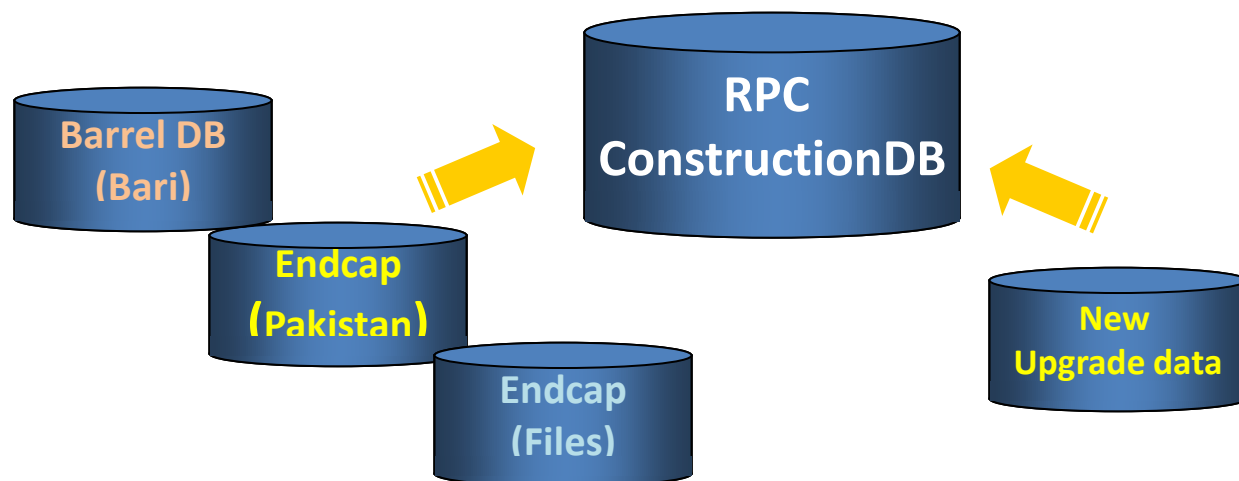
Anton Dimitrov

Daniela Uzunova

RPC General Meeting, 28 June 2011

The RPC database stores all data about chambers on Barrel, Endcap & Upgrade:

- Design drawings;
- Components;
- Construction;
- Tests
- Operation



Interface to ConstructionDB

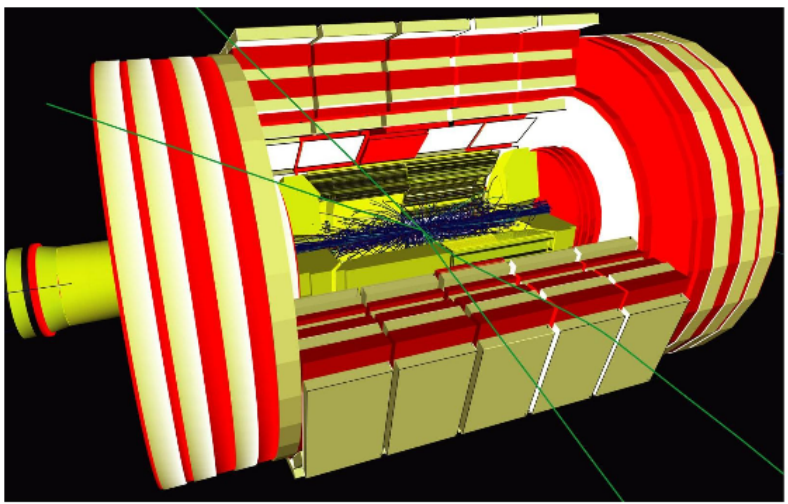
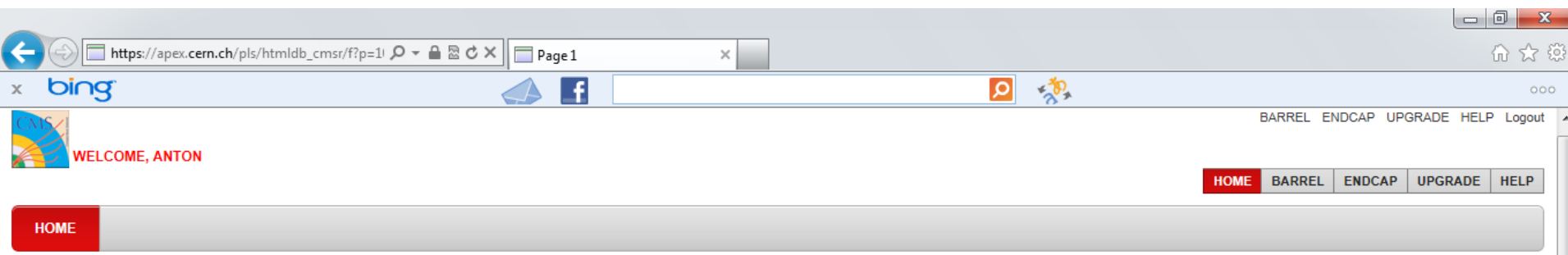
- ❖ Oracle DB with APEX Oracle web interface
- ❖ **2D model of the CMS detector with sensitive areas for mouse click on every station (5 wheels + 8 disks) and then on each chamber.**
- ❖ **Full history of each chamber:**
 - ❖ **Construction period:** chamber components, resistivity, conditioning
 - ❖ **Cosmic test period:** efficiency, cluster size, noise, occupancy
 - ❖ Commissioning period: current monitoring in time, noise
 - ❖ **CMS operation period:** efficiency, cluster size, noise, dark current and a lot more – muonography, resistivity test, gas leak tests...

Graphical User Interface

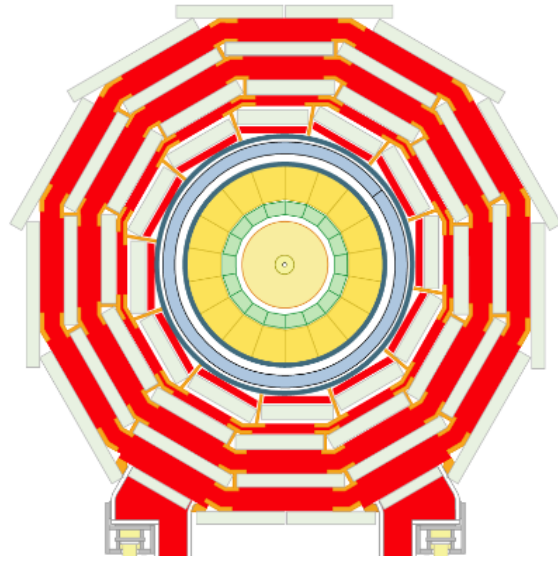
- NICE Login
- 2 Hierarchical Navigation Levels

Home Page- https://apex.cern.ch/pls/htmldb_cmsr/f?p=106:1

Graphical Navigation



CMS RPC BARREL CONSTRUCTION DATABASE



Graphical User Interface

Tree Navigation

Welcome: ANTON BARREL ENDCAP UPGRADE HELP Logout

HOME **BARREL** ENDCAP UPGRADE HELP

SELECT WHEEL/SECTOR/CHAMBER

RPC BARREL

- YB0
 - Sector 01
 - Sector 02
 - Sector 03
 - Sector 04
 - Sector 05
 - Sector 06
 - Sector 07**
 - W 0/RB1 in/7
 - W 0/RB1 out/7
 - W 0/RB2 in/7
 - W 0/RB2 out/7
 - W 0/RB3/7-
 - W 0/RB3/7+
 - W 0/RB4/7-
 - W 0/RB4/7+
 - Sector 08
 - Sector 09
 - Sector 10
 - Sector 11
 - Sector 12
- YB+1
- YB-1
- YB+2
- YB-2

Chamber in Wheel 0, Sector 07

CHAMBER_ID	RPC CHAMBER NAME	EMDB CHAMBER NAME	BARCODE	LOCATION
439	W 0/RB1 in/7	0 7 RB1 in Left? Exit 1 439	3061007111011439000	MB_0/1/07
200	W 0/RB1 out/7	0 7 RB1 out Right? Exit 1 200	3061007122011200000	MB_0/1/07
54	W 0/RB2 out/7	0 7 RB2/2 out Right? Exit 1 54	3061007222011054000	MB_0/2/07
479	W 0/RB2 in/7	0 7 RB2/3 in Left? Exit 1 479	3061007311011479000	MB_0/2/07
15	W 0/RB3/7+	0 7 RB3? Left + No exit 1 15	3061007401221015000	MB_0/3/07
285	W 0/RB3/7-	0 7 RB3? Left - Exit 1 285	3061007401311285000	MB_0/3/07
474	W 0/RB4/7+	0 7 RB4/2000? Left + No exit 1 474	3061007601221474000	MB_0/4/07
468	W 0/RB4/7-	0 7 RB4/2000? Left - Exit 1 468	3061007601311468000	MB_0/4/07

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CMS OPERATION PERIOD – MAIN IDEAS

- ❖ HV scan (once per year)
 - efficiency, mean cluster size, cluster size distribution, WP, eff(WP), CLS(WP)
- ❖ Noise Scan without beam
 - Noise rate
- ❖ Gas Leak Test (once per year)
 - Leak Rate (follow the evolution of the leak)
- ❖ Resistivity Test
 - Follow the evolution of Resistivity

CHAMBER PASSPORT

- ✓ Main IDEA – to combine data from different historical periods for the most important chamber parameters and present them in a single plot in order to follow their evolution
- ✓ Main RPC parameters: efficiency, cluster size, noise rate, leak rate, resistivity
- ✓ Online PT correction mandatory in order to be compared data taken in different conditions
- ✓ Selection of 2 P0 PT correction values – 965 and 1010 mbar.

CHAMBER PASSPORT

Chamber_Construction - Windows Internet Explorer
 https://apex.cern.ch/pls/htmldb_cmsr/f?p=106:20:3129631994273703::NO::P20_CH_ID,P12_CH_ID:462,462
 Welcome: UZUNOVA BARREL ENDCAP UPGRADE HELP Logout

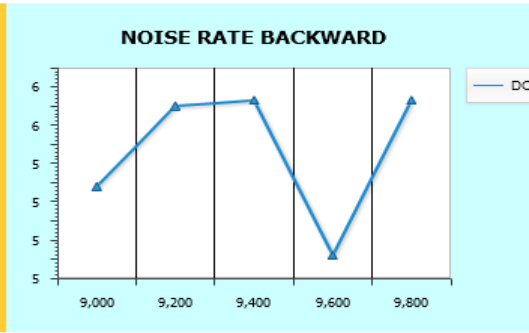
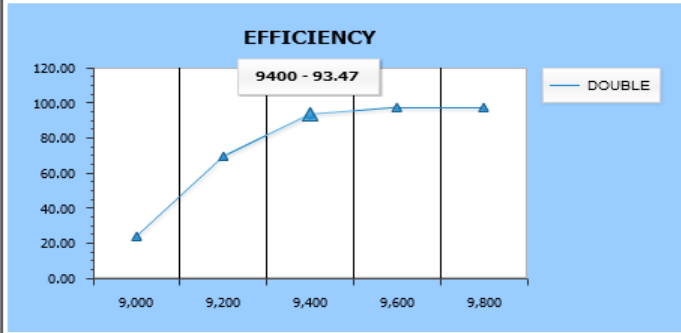
CHAMBER NAME: [W-2/RB2 in/1](#), CHAMBER TYPE: [RB2-2in-Right](#), CHAMBER LOCATION: [RPC BARREL, WHEEL-2, SECTOR 1](#)

[HOME](#) [BARREL](#) [ENDCAP](#) [UPGRADE](#) [HELP](#)

SELECT WHEEL/SECTOR/CHAMBER **CHAMBER PASSPORT** CHAMBERS' ELEMENTS CHAMBERS' TESTS

CHAMBER ID	CHAMBER NAME	CHAMBER TYPE	SERVICE EXIT
462	W-2/RB2 in/1	RB2-2in-Right	

ETA PARTITION: BACKWARD

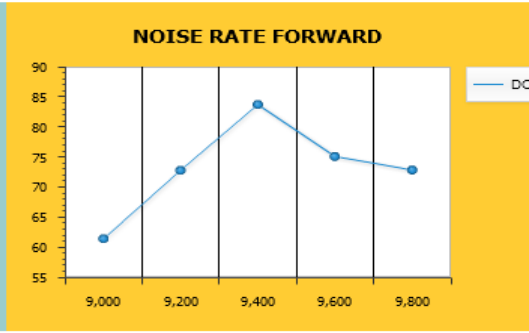
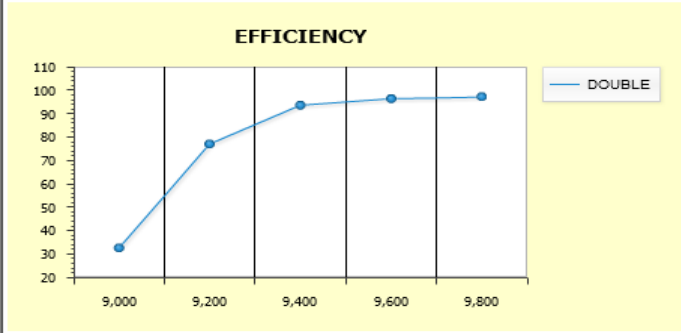


TEST LOCATION: [BARI](#)
 DATE of TESTS: [28-AUG-06](#)

TEST LOCATION: [BARI](#)
 DATE of TESTS: [28-AUG-06](#)

TEST LOCATION: [BARI](#)
 DATE of TESTS: [28-AUG-06](#)

ETA PARTITION: FORWARD



TEST LOCATION: [BARI](#)
 DATE of TESTS: [24-AUG-06](#)

TEST LOCATION: [BARI](#)
 DATE of TESTS: [24-AUG-06](#)

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 DATE of TESTS: [24-AUG-06](#)

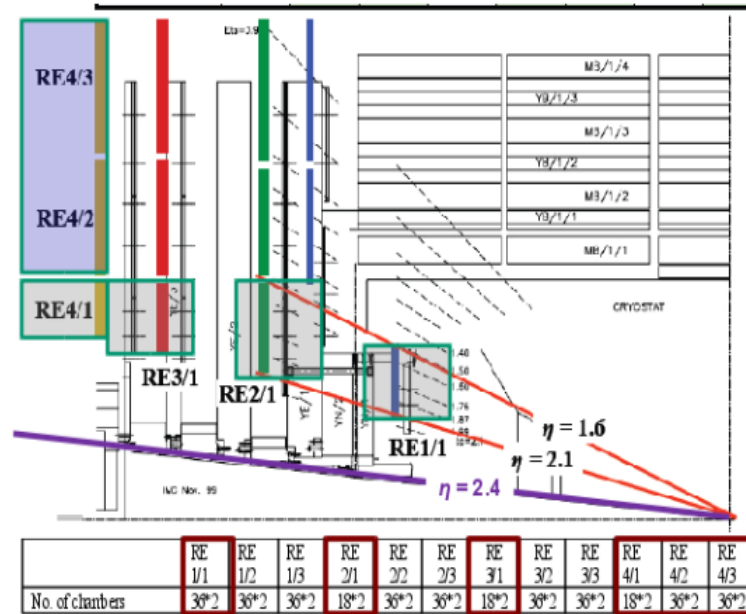
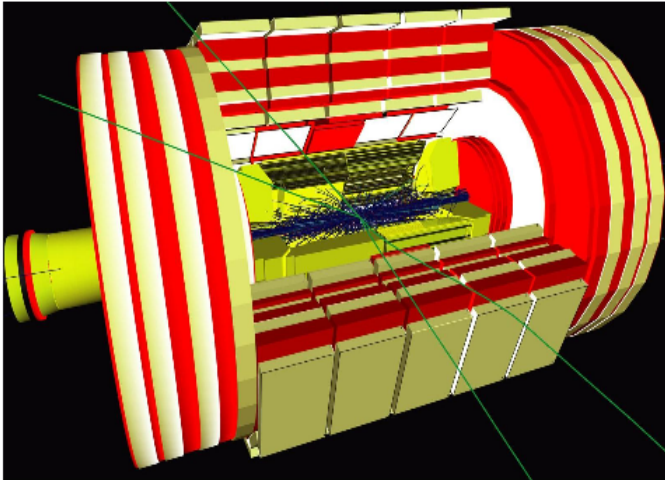
Development of Upgrade Construction Database

Browser window showing the URL: https://apex.cern.ch/pls/htmldb_cmsr/f?p=1. The page title is "UPGRADE".

Navigation menu: HOME | BARREL | ENDCAP | **UPGRADE** | HELP

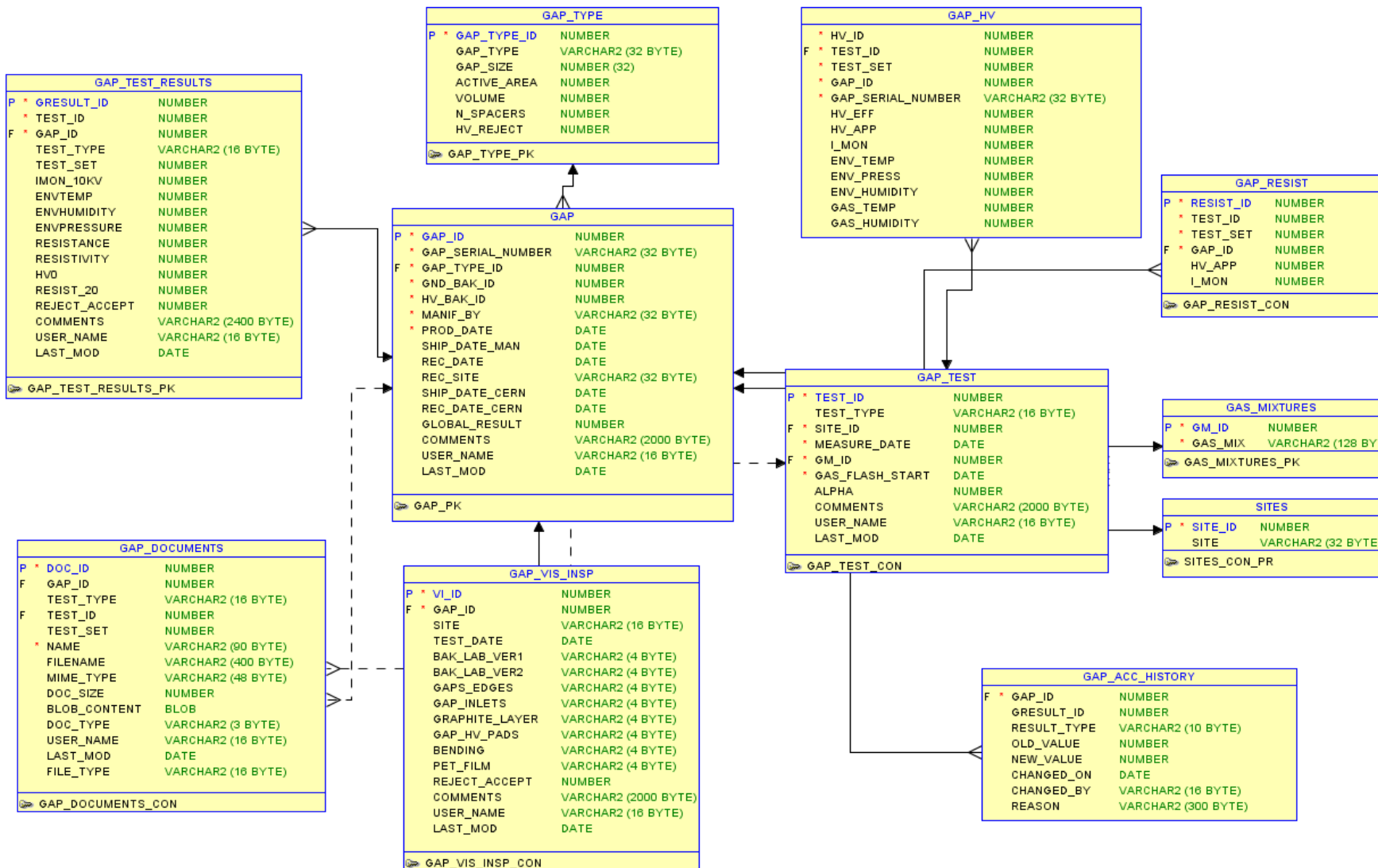
Secondary navigation menu: **UPGRADE** | BAKELITE | GAPS | GAP TESTS | ADMIN

CMS RPC UPGRADE CONSTRUCTION DATABASE



GAP STRUCTURE

ask
for



Register New Gap

Browser window showing the URL: https://apex.cern.ch/pls/htmldb_cmsr/f?p=1. The browser tabs include 'NEW_GAP' and 'Anton Dimitrov - Outlook Web...'. The browser interface includes the Bing search bar and various icons.

Welcome: ANTON BARREL ENDCAP UPGRADE HELP Logout

HOME BARREL ENDCAP **UPGRADE** HELP

UPGRADE BAKELITE **GAPS** GAP TESTS ADMIN

GAPS OVERVIEW **REGISTER NEW GAP** DEFINE GAP TYPE

REGISTER NEW GAP

CANCEL **SAVE**

* GAP SERIAL NUMBER

* GAP TYPE **ADD TYPE**

* GROUND BAKELITE

* HV BAKELITE

MANUFACTURED BY

* PRODUCTION DATE

Shipment Date (Assembly)

Reception Date (Assembly)

Assembly Site

Shipment Date to CERN

Reception Date at CERN

Windows taskbar showing icons for Internet Explorer, File Explorer, and other applications. The system tray shows the time as 16:38 on 27.6.2011.

GAP OVERVIEW

Browser window showing the URL: https://apex.cern.ch/pls/htmldb_cmsr/f?p=1. The page title is "GAPS OVERVIEW". The user is identified as "Anton Dimitrov - Outlook Web...". The browser is Bing.

Welcome: ANTON BARREL ENDCAP UPGRADE HELP Logout

HOME BARREL ENDCAP **UPGRADE** HELP

UPGRADE BAKELITE **GAPS** GAP TESTS ADMIN

GAPS OVERVIEW REGISTER NEW GAP DEFINE GAP TYPE

GAPS OVERVIEW

Q- Go Actions ▾

<u>Click to edit</u>	<u>Serial Number</u>	<u>Gap Type</u>	<u>Gnd Bak</u>	<u>Hv Bak</u>	<u>Manufactured By</u>	<u>Production Date</u>	<u>Shipment Date</u>	<u>Reception Date</u>	<u>Assembly Site</u>	<u>Shipment Date (Cern)</u>
Edit	Kodel-CMS-RE4-2-B123	TW	1C07a110411010162	3A07a110411010154	KODEL	02-JUN-11	11-JUN-11	-	CERN	-
Edit	Kodel-CMS-RE4-2-B124	B	5A07a110411010156	2C08b110412010188	KODEL	03-APR-11	18-JUN-11	30-JUN-11	Ghent	04-JUL-11
Edit	Kodel-CMS-RE4-2-B126	B	1A07a110411010152	2A08b110412010178	KODEL	05-JUN-11	-	-	CERN	-
Edit	Kodel-CMS-RE4-2-B127	B	4B07a110411010160	4C08b110412010190	KODEL	01-APR-11	-	-	CERN	-
Edit	Kodel-CMS-RE4-2-B129	TW	2A07a110411010153	5B07a110411010161	KODEL	01-MAY-11	-	-	Ghent	-
Edit	Kodel-CMS-RE4-2-B130	B	5C08b110412010191	2C07a110411010163	GT	03-JUN-11	-	-	CERN	-

Windows taskbar showing the Start button, several application icons (Internet Explorer, etc.), and the system tray with the time 16:38 and date 27.6.2011.

GAP TESTS: VISUAL INSPECTION

Browser: https://apex.cern.ch/pls/htmlldb_cmsr/f?p=1 | Report on GAP_VIS_INSP | Anton Dimitrov - Outlook Web...

Welcome: ANTON BARREL ENDCAP UPGRADE HELP Logout

HOME BARREL ENDCAP **UPGRADE** HELP

UPGRADE BAKELITE GAPS **GAP TESTS** ADMIN

VISUAL TEST RESISTIVITY TEST GAP HV TEST

ALL GAP passed by VISUAL INSPECTION

Yes

Q- Go Rows 15 Actions **NEW VISUAL TEST**

	GAP SN	Test Date	Site	GND BAK. LABEL	HV BAK. LABEL	Gaps Edges	Gap Inlets	Graphite Layer	Gap Hv Pads	Bending	Pet Film	Reject Accept
Edit	Kodel-CMS-RE4-2-B123	08-JUN-11	Ghent	GOOD	GOOD	GOOD	GOOD	-	GOOD	GOOD	-	0
Edit	Kodel-CMS-RE4-2-B124	13-JUN-11	1	GOOD	GOOD	GOOD	GOOD	-	GOOD	GOOD	GOOD	1
Edit	Kodel-CMS-RE4-2-B129	23-JUN-11	CERN	-	-	-	-	-	-	-	-	-
Edit	Kodel-CMS-RE4-2-B130	07-JUN-11	CERN	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	1

11

EN 16:25 27.6.2011

VISUAL INSPECTION PROTOCOL

Browser: https://apex.cern.ch/pls/htmldb_cmsr/f?p=1 | Form on GAP_VIS_INSP | Anton Dimitrov - Outlook Web...

Welcome: ANTON BARREL ENDCAP UPGRADE HELP Logout
HOME BARREL ENDCAP UPGRADE HELP

UPGRADE BAKELITE GAPS **GAP TESTS** ADMIN

VISUAL TEST RESISTIVITY TEST GAP HV TEST

REGIDTER NEW GAP

- [Kodel-CMS-RE4-2-B126](#)
- [Kodel-CMS-RE4-2-B127](#)

VISUAL INSPECTION OF GAP

Cancel SAVE

* GAP SERIAL NUMBER:

Site:

Test Date:

GND BAK. LABEL: GROUND BAKELITE LABEL: 4B07a110411010160

HV BAK. LABEL: HV BAKELITE LABEL: 4C08b110412010190

Gaps Edges:

Gap Inlets:

Graphite Layer:

Gap Hv Pads:

Bending:

Pet Film:

Reject Accept:

Comments:

12

EN 16:28 27.6.2011

GAP TESTS: RESISTIVITY TEST

The screenshot shows a web browser window with the URL `https://apex.cern.ch/pls/htmldb_cmsr/f?p=1`. The browser tabs include 'UPLOAD RESISTIVITY' and 'Anton Dimitrov - Outlook Web...'. The page header features a navigation menu with buttons for 'HOME', 'BARREL', 'ENDCAP', 'UPGRADE', and 'HELP'. A secondary menu below it includes 'UPGRADE', 'BAKELITE', 'GAPS', 'GAP TESTS' (highlighted), and 'ADMIN'. A third menu shows 'VISUAL TEST', 'RESISTIVITY TEST' (highlighted), and 'GAP HV TEST'. The main content area is titled 'RESISTIVITY TEST' and contains a form with the following fields:

- SITE**: A dropdown menu with 'Select from list'.
- COMMENTS**: A large text area for notes.
- Date of Measure**: A date input field with a calendar icon.
- Gas mixture**: A dropdown menu with 'Select from list'.
- Gas Flash Start**: A date input field with a calendar icon.
- Alpha**: A text input field.
- Resistance (ohm)**: A text input field containing the value `5.724E+06`.
- Resitivity (ohm x cm)**: A text input field containing the value `2.813E+11`.

A red 'SAVE' button is located in the top right corner of the form area. The Windows taskbar at the bottom shows the system tray with the time `16:30` and date `27.6.2011`.

GAP TESTS: HV TEST

Browser window showing URL: https://apex.cern.ch/pls/htmldb_cmsr/f?p=1...
 Tabs: HC_TEST_ONLY, Anton Dimitrov - Outlook Web...
 Search: bing

Welcome: ANTON BARREL ENDCAP UPGRADE HELP Logout

HOME BARREL ENDCAP **UPGRADE** HELP

UPGRADE BAKELITE GAPS **GAP TESTS** ADMIN

VISUAL TEST RESISTIVITY TEST **GAP HV TEST**

HV TEST - GENERAL INFORMATION

SAVE

* SITE

* Date of Measure

* Gas mixture

* Gas Flash Start

COMMENTS

[Enter New Test General information or Select from existing TESTS](#)

HV EXISTING TESTS

SELECT	TEST TYPE	SITE	MEASURE DATE	GAS TYPE	GAS FLASH START	COMMENTS	Number of GAPS
SELECT TEST	HV	904	10-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	22-JUN-2011 12:10		
SELECT TEST	HV	CMS	04-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	17-JUN-2011 17:23		
SELECT TEST	HV	CMS	02-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	23-JUN-2011 16:46		
SELECT TEST	HV	904	02-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	14-JUN-2011 12:19		
SELECT TEST	HV	ISR	02-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	25-JUN-2011 11:58		
SELECT TEST	HV	Ghent	01-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	18-JUN-2011 11:54		

GAP with HV Test:

- Kodel-CMS-RE4-2-B123
- Kodel-CMS-RE4-2-B124

Windows taskbar showing icons for Start, Internet Explorer, and other applications. System tray shows time: 16:31, 27.6.2011.

Data Import Verification

HC_TEST_ONLY - Windows Internet Explorer
https://apex.cern.ch/pls/htmldb_cmsr/f?p=106:112:3129631994273703::NO
Google

Welcome: UZUNOVA BARREL ENDCAP UPGRADE HELP Logout

HOME BARREL ENDCAP UPGRADE HELP

UPGRADE BAKELITE GAPS **GAP TESTS** ADMIN

VISUAL TEST RESISTIVITY TEST **GAP HV TEST**

HV TEST - GENERAL INFORMATION

SAVE

* SITE: CMS
* Date of Measure: 02-Jun-2011
* Gas mixture: Freon 95.2%, Isobutan 3.5%
* Gas Flash Start: 23-Jun-2011 16:45

COMMENTS

[Enter New Test General information](#)

TEST ALREADY EXISTS

This TEST ALREADY exists in the database.

TEST TYPE: HV

SITE: CMS

Date of Measure: 02-Jun-2011

Gas mixture: Freon 95.2%, Isobutan 3.5%, SF6 0.3%

Gas Flash Start: 23-Jun-2011 16:45

**To import data for this test, please click on KEEP EXISTING TEST.
To SAVE as NEW TEST, click on SAVE AS NEW TEST.**

KEEP EXISTING TEST

SAVE AS NEW TEST

HV EXISTING TESTS

SELECT	TEST TYPE	SITE	MEASURE D		
SELECT TEST	HV	904	10-JUN-11		
SELECT TEST	HV	CMS	04-JUN-11		
SELECT TEST	HV	CMS	02-JUN-11		
SELECT TEST	HV	904	02-JUN-11		
SELECT TEST	HV	ISR	02-JUN-11		
SELECT TEST	HV	Ghent	01-JUN-11		
SELECT TEST	HV	GIF	01-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	23-JUN-2011 11:49
SELECT TEST	HV	904	01-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	01-JUN-2011 14:58
SELECT TEST	HV	GIF	01-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	23-JUN-2011 10:32
SELECT TEST	HV	904	01-JUN-11	Freon 95.2%, Isobutan 3.5%, SF6 0.3%	21-JUN-2011 15:22

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release 1.0

Conclusions

- Chamber Passport under development
- Upgrade Bakelite Structure and GUI in RPC construction database completed – separate tables for production (Puricelli), certification (Pavia) and multiple measurements
- Upgrade Gap Structure and GUI in RPC construction database are being developed
- Complicated data verification algorithms applied for data import of all Gap Quality Certification Tests.
- Structure and GUI for registering new gap, Visual Inspection, Resistivity and HV Tests are ready.
- Results for 2011 HV scan are obtained. To be imported soon.

Future Plans

- Create the Structure and Navigation Tree for the Endcap – RE1, RE2, RE3, RE4
- Import Pakistani Data for RE2 and RE3
- Develop Structure for **HV Scan Results** and import 2011 data
- Develop Structure for **Gas Leak Test** and import 2011 data
- Develop Structure for the Conditioning (TestCaenBari, I vs. HV)
- Import the Design and Construction Drawings
- **Finalize the Structure for GAPS – Gas Leak Test is missing**
- **Develop Structure for Chambers (long term plan)**
- **Develop Structure for Cosmic Tests (long term plan)**
- Develop Interface for all structures to be used in the assembly and test sites – India, Ghent, CERN
- Communication with responsible people for the different items mentioned above is extremely important in order to perform fast end efficient database development.