



# RPC Technical Trigger



RPC Cosmic trigger

**Phase I:** Sector Trigger for testing RPC (and DT) during Commissioning

RBC (RPC Balcony Collector)

**Phase II:** Technical trigger to be used during off-beam periods for RPC (and other detectors) calibration

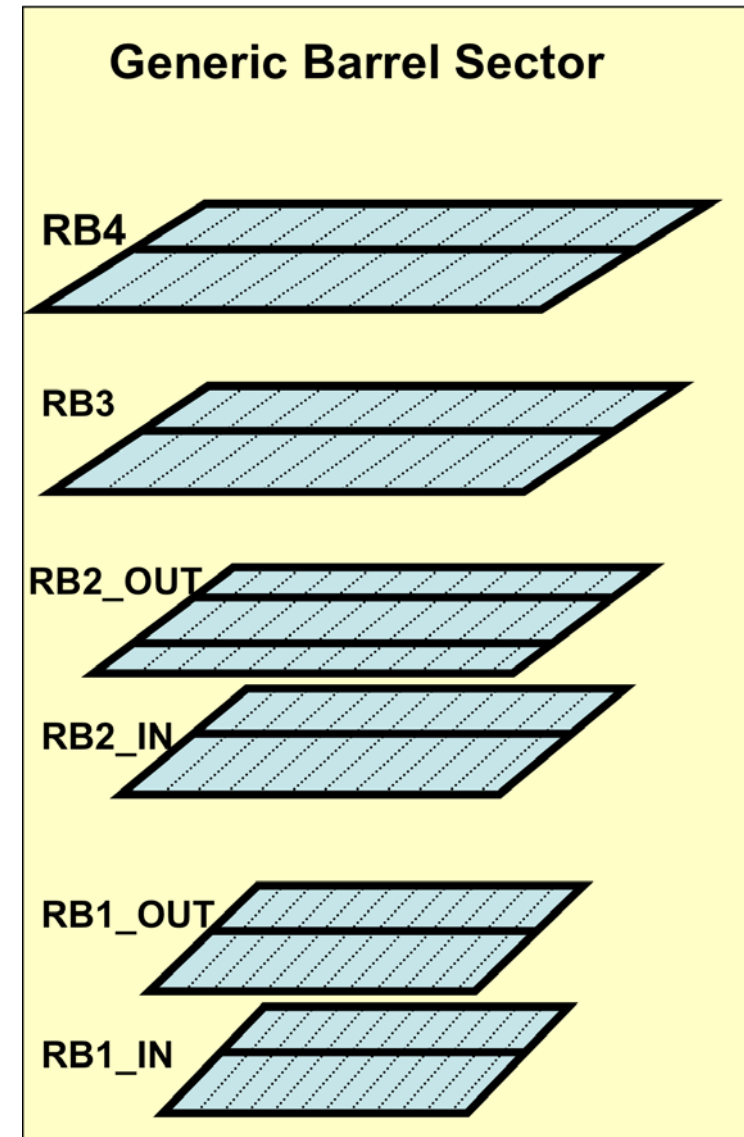
RBC + TTU (Technical Trigger Unit)



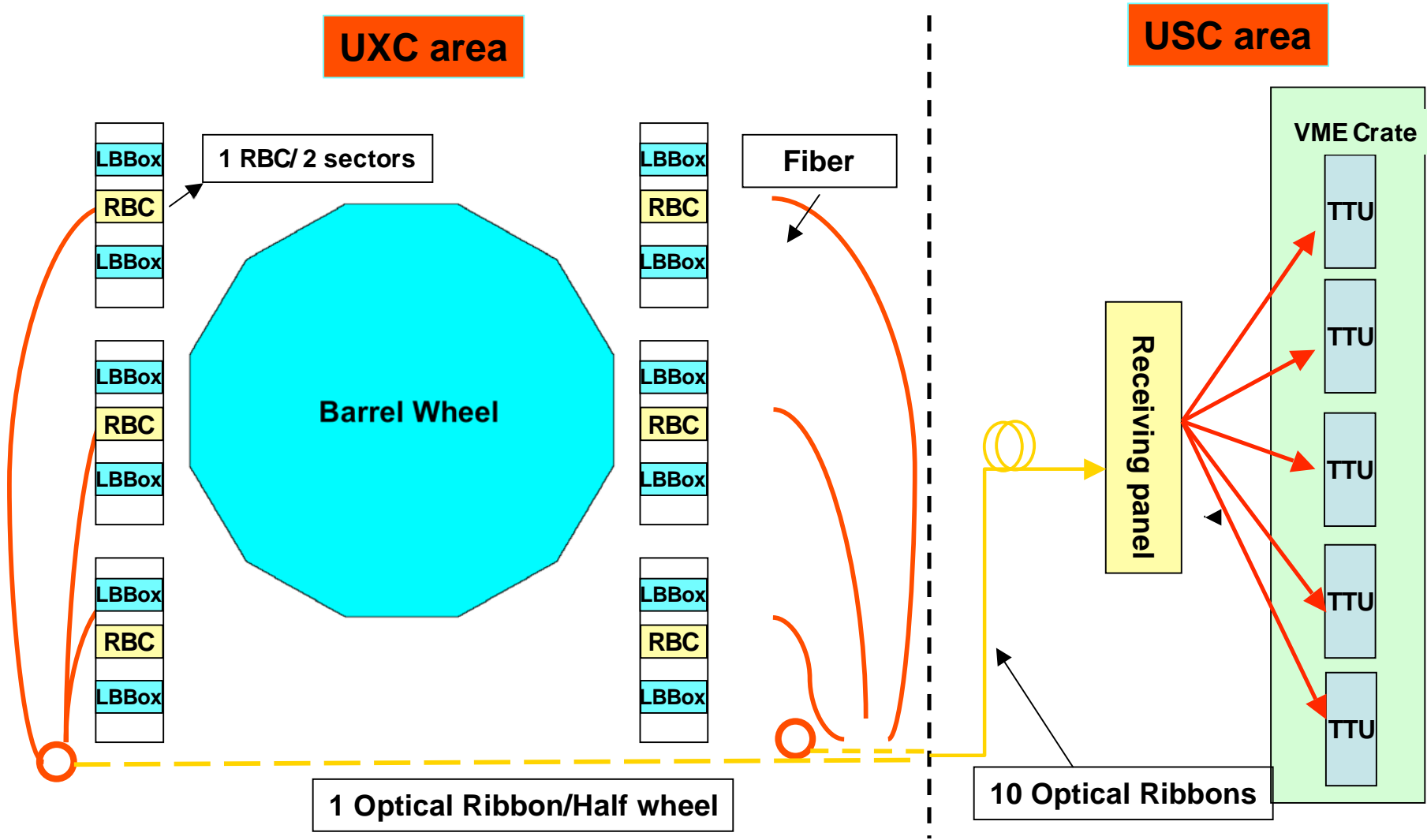
## Phase I: RBC (RPC Balcony Collector) Main Features



- Receive 2x13 (or 15) ORs from LB (LVDS)  
(OR of 96 strips (1 bi-gap = half RPC))
- Produce *Sector Trigger*
- Mask noisy/dead Ors
- Force selected ORs to be in the coincidence to increase trigger selectivity
- Majority level selectable between 1 and 6
- I<sup>2</sup>C Interface
- Re-Transmit input OR electrically (LVDS) to TDC
  
- Transmit input OR optically to Counting Room (GOL)



# Phase II: RPC Technical Trigger Implementation



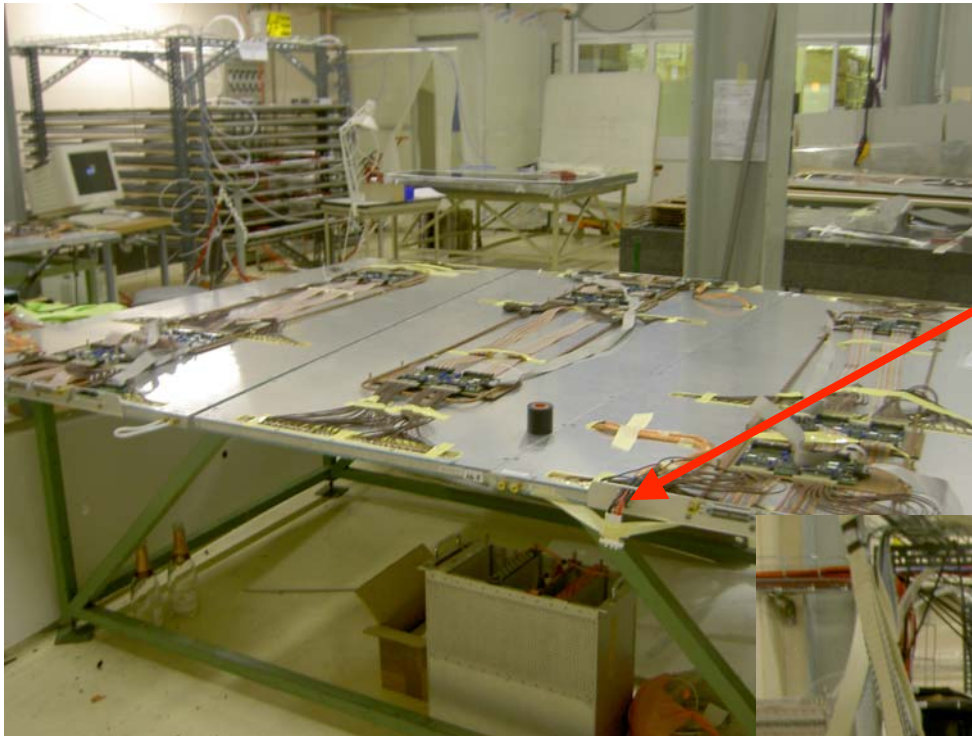
# RE

- Mass production gas gaps Korea full steam
- Assembly RE 1 ramped up @ ISR lab and has reached 5 chambers per week
- The final RE 1/2 RPC has been mated to ME 1/2
- RE1/3 installation exercise performed
- 10 RE2/2 expected from Pakistan in May

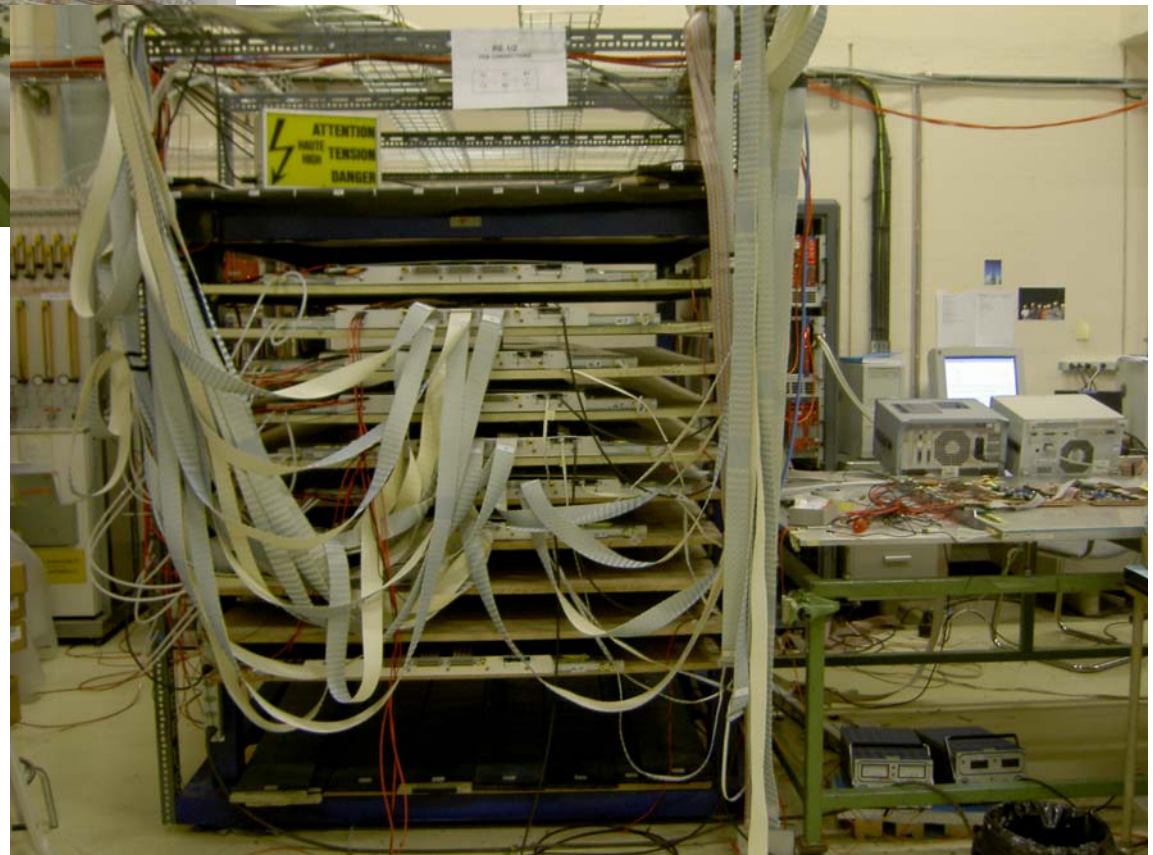
Dec. 2004

HV connector  
Last step

Cosmic stand and DAQ

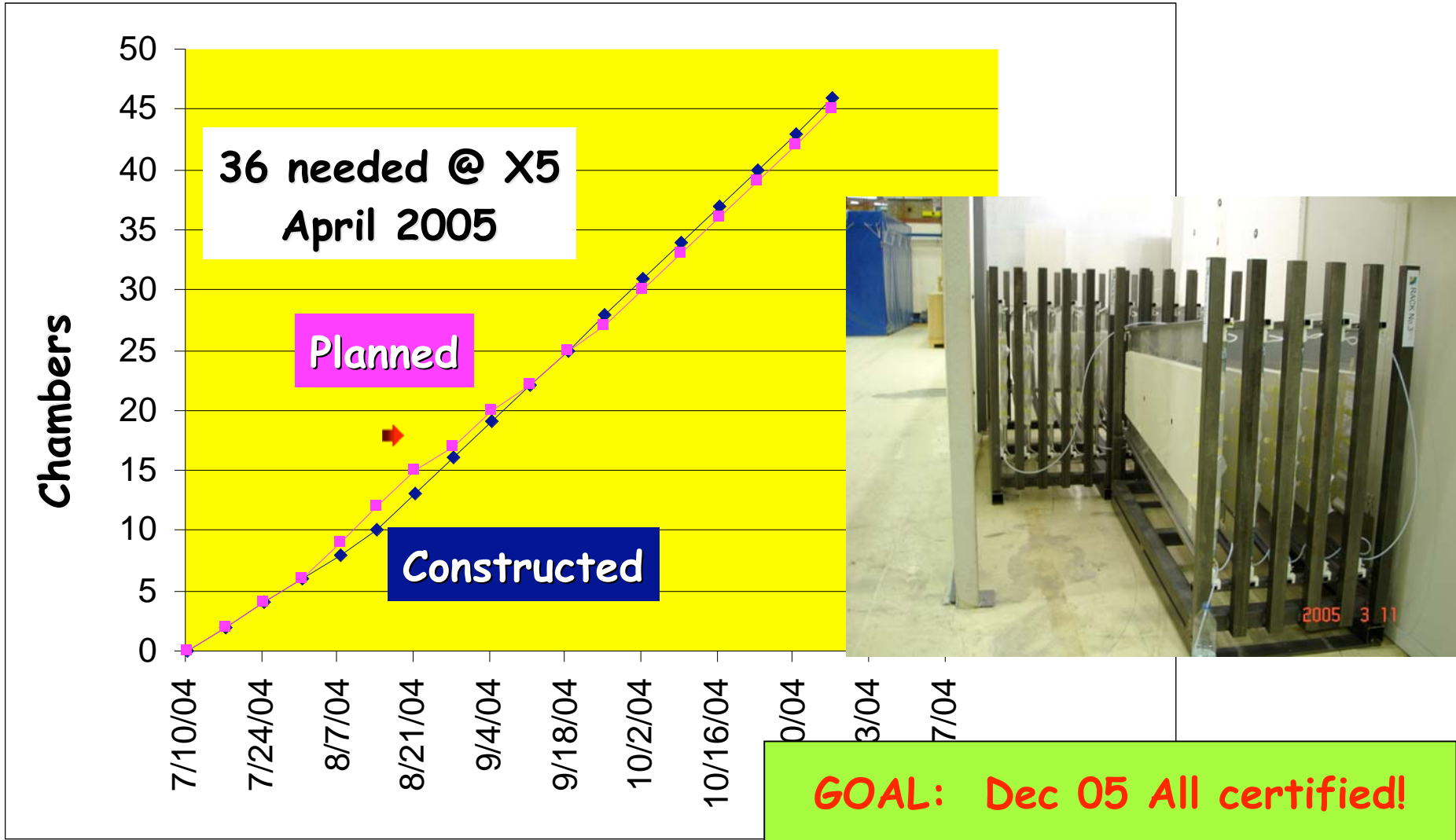


RE1/2 Completed chambers  
ready for quality control  
tests in the cosmic stand



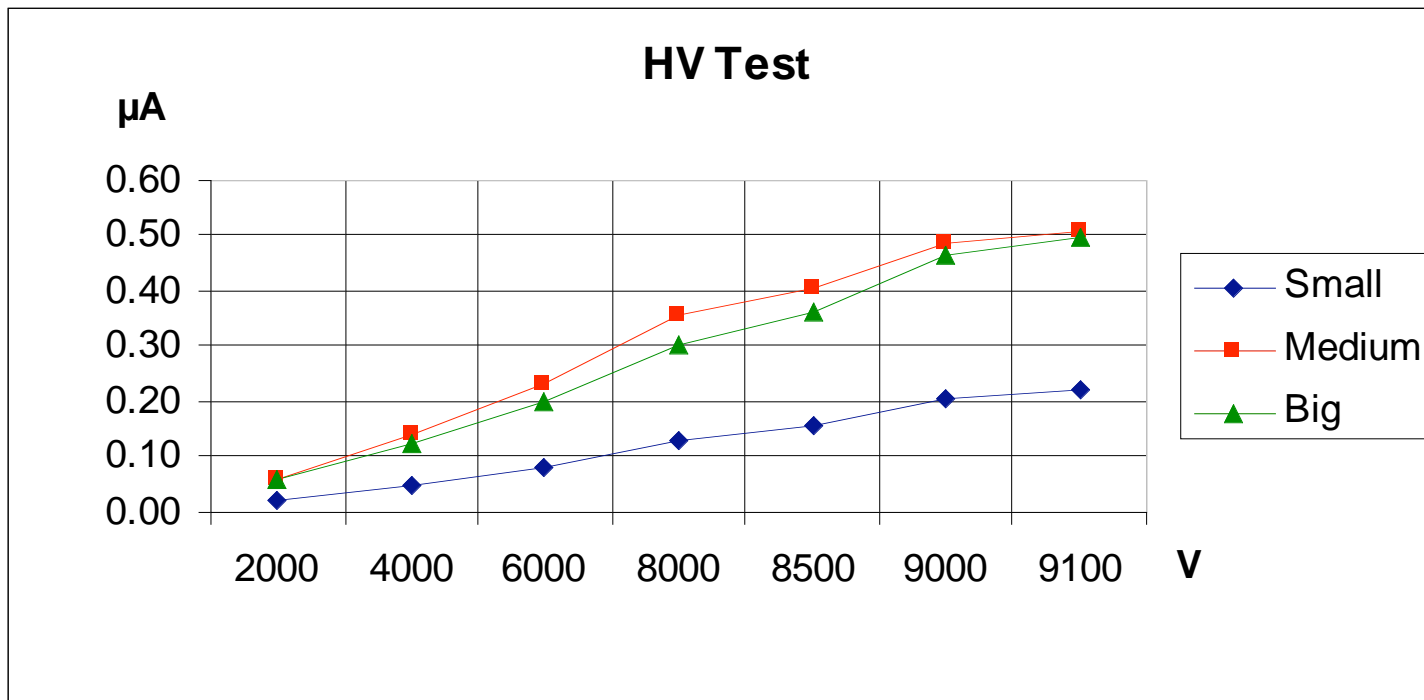


**Production Status: 20 RE1/2 + 30 RE1/3 Assembled**



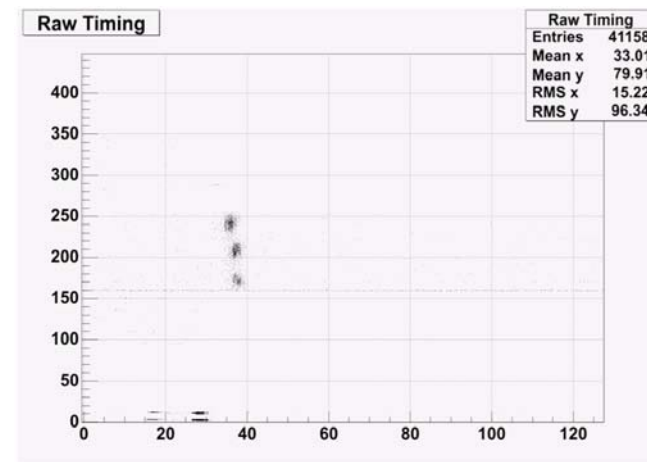
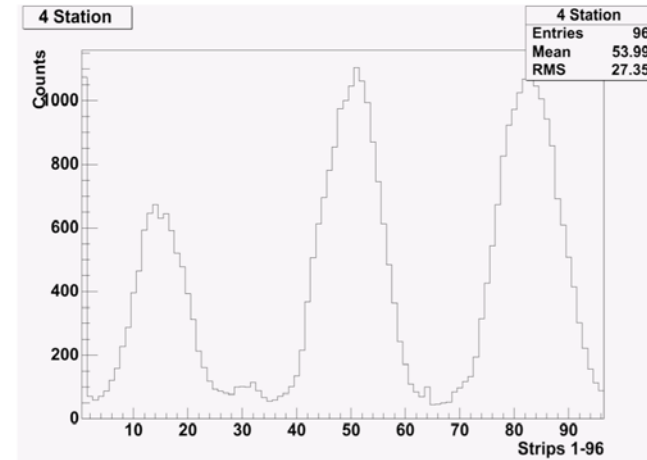
# RE1/3 QC – HV Test

Average currents of HV tested gaps



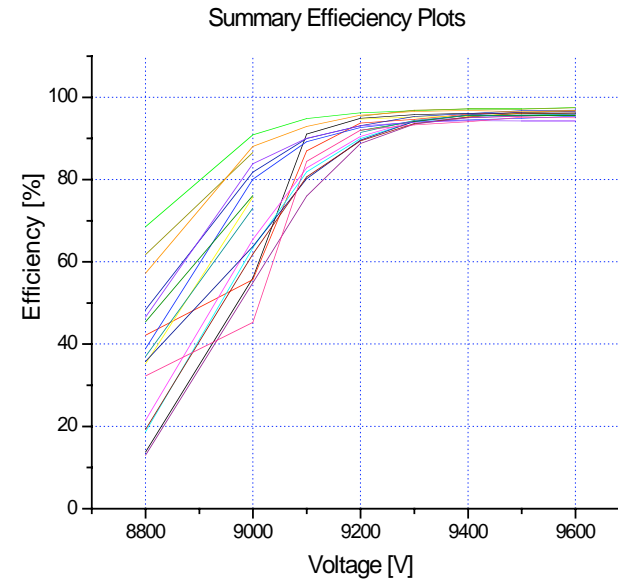
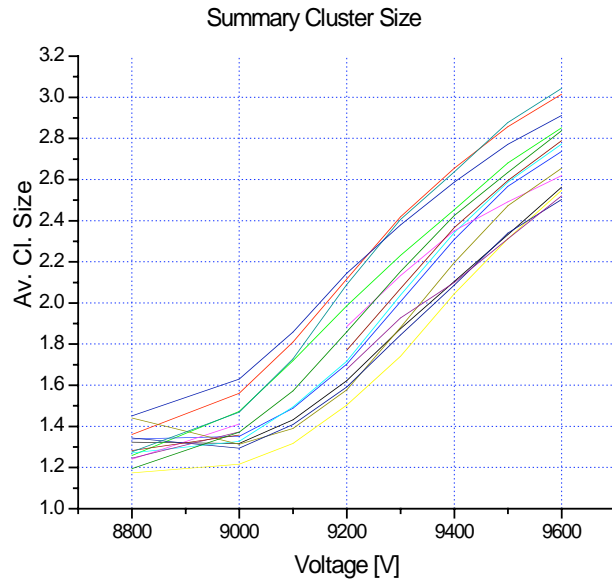
# Data From Cosmic Test

- Strips profile of the chamber
- Time distribution from each RPC station and trigger counters.
- Efficiency and Cluster Size scanning.
- HV current history for each chamber



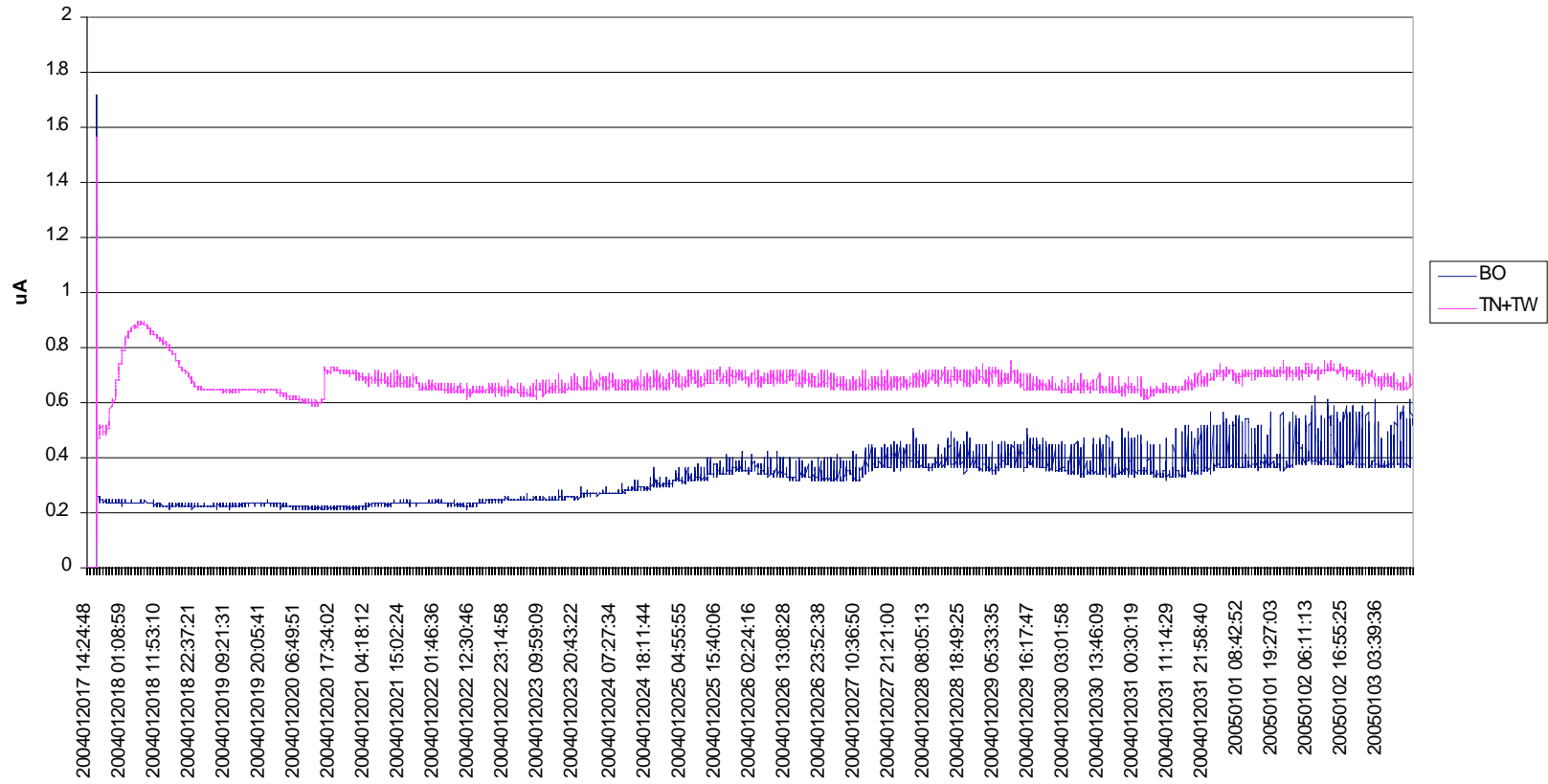


# Efficiency and Cluster Size



# Currents Monitoring

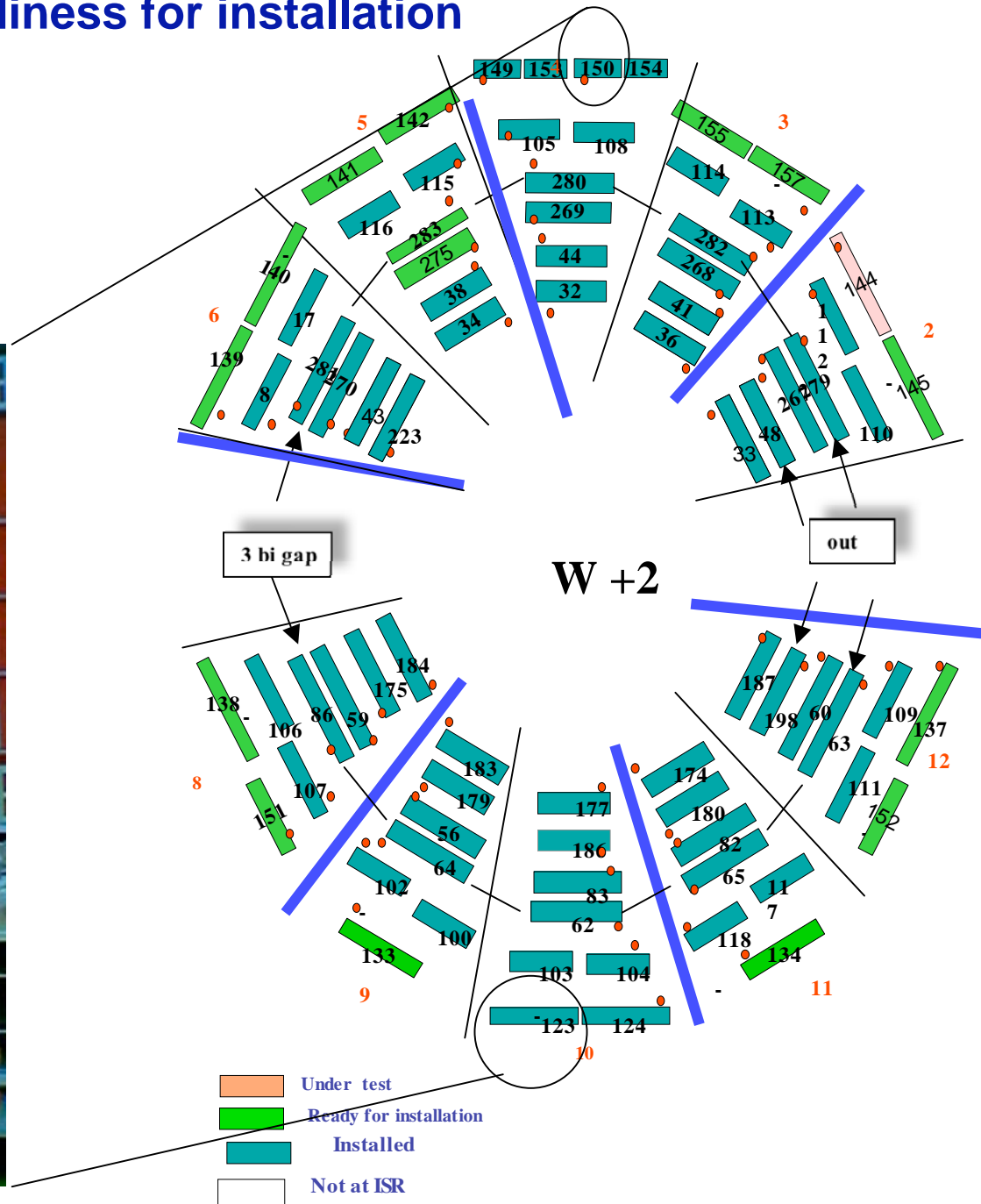
RE1/2-075



# RB RPC Readiness for installation

Integration problem

Sector 4 and 10  
interference between cable  
tray and RPC service block

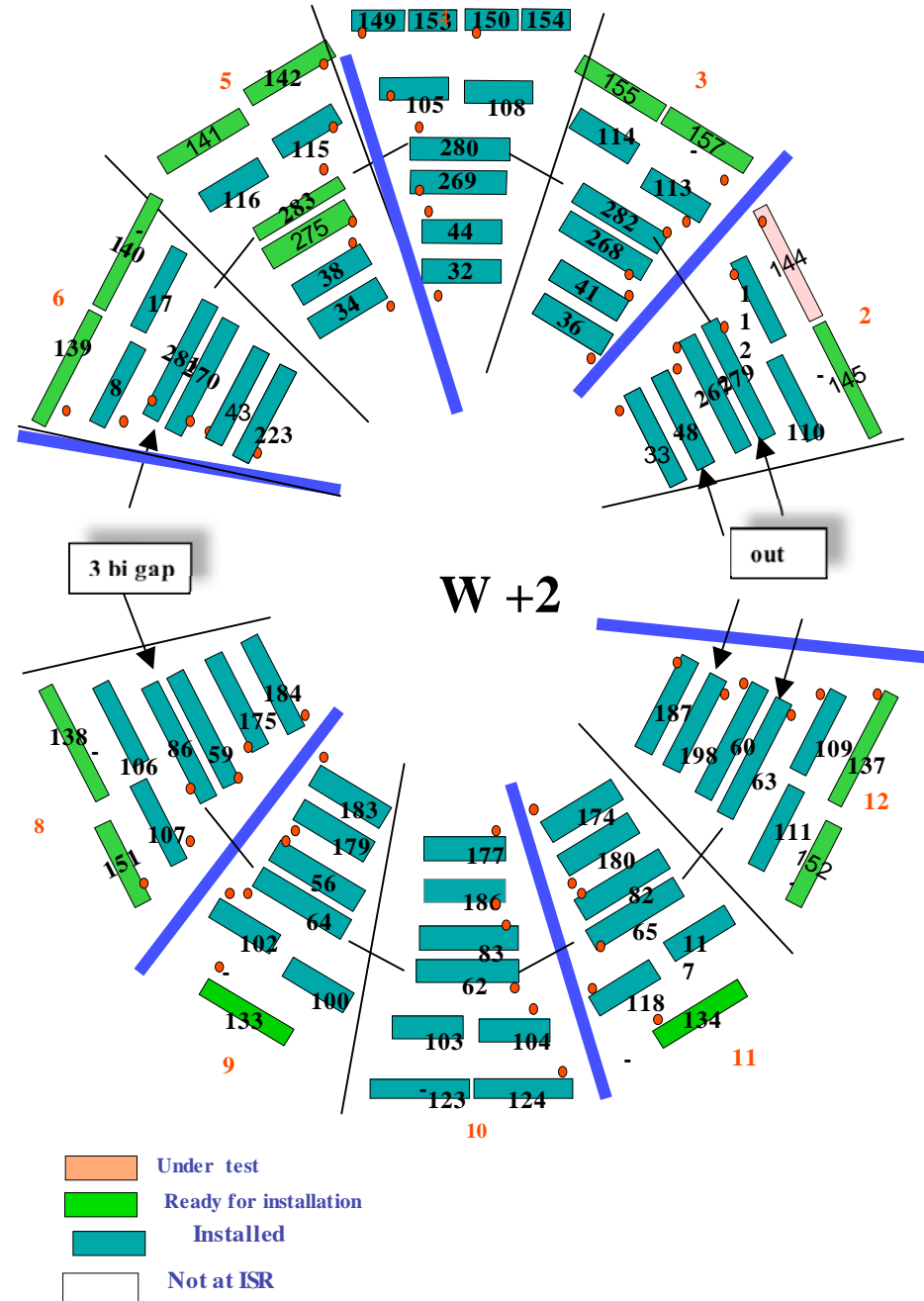


# RB RPC Readiness for installation

New shorter service block has been built.  
 But changing it on the installed chambers was very difficult: in both chambers we broke the gas inlet  
 -Chamber in Sector 10 already replaced (last week).



-Chamber in sector 4 to be replaced in April.



# ISR Status: W+1

- **Sector 4 (chimney).**

RB2-RB3 at ISR: 21 March

RB4-RB1. Assembling in March 05.

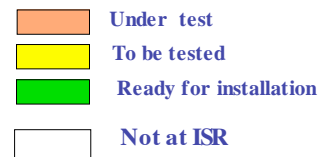
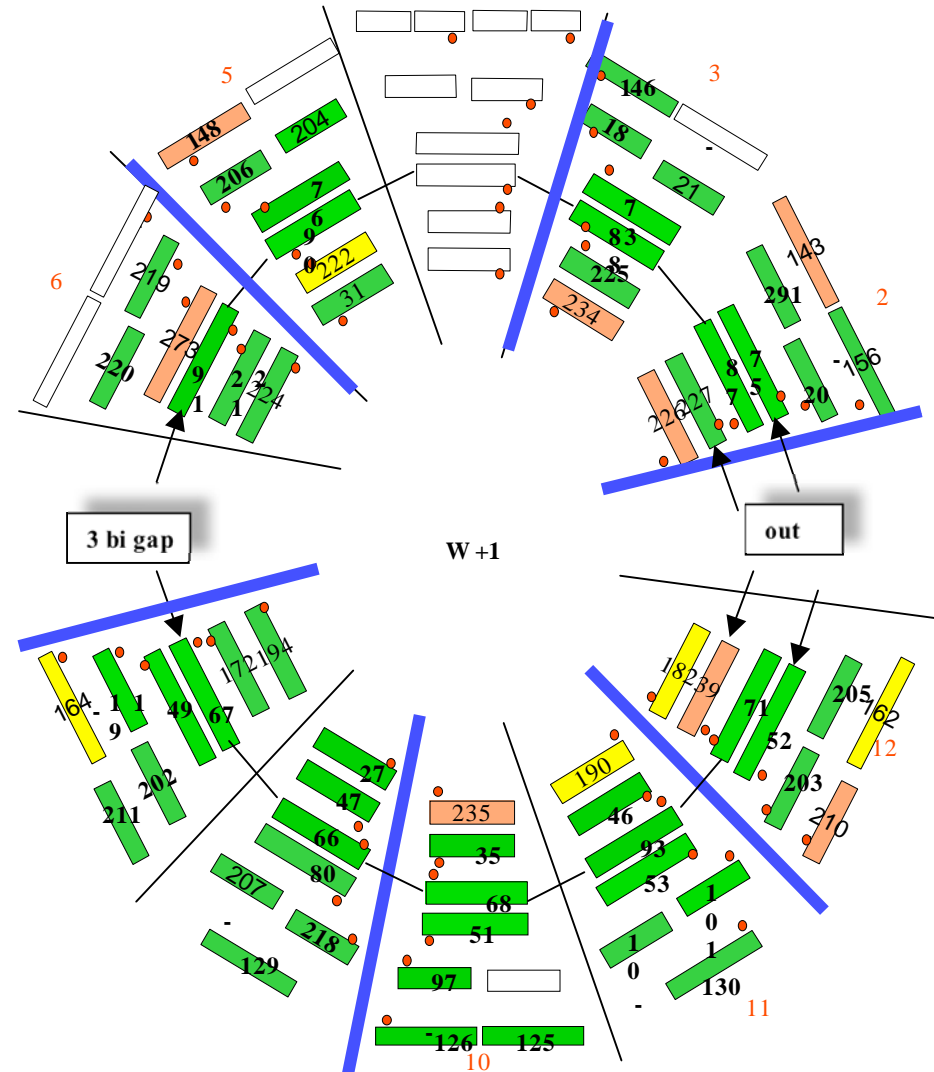
- **RB1**

Missing chambers arrive at CERN on 16 March

- **RB4**

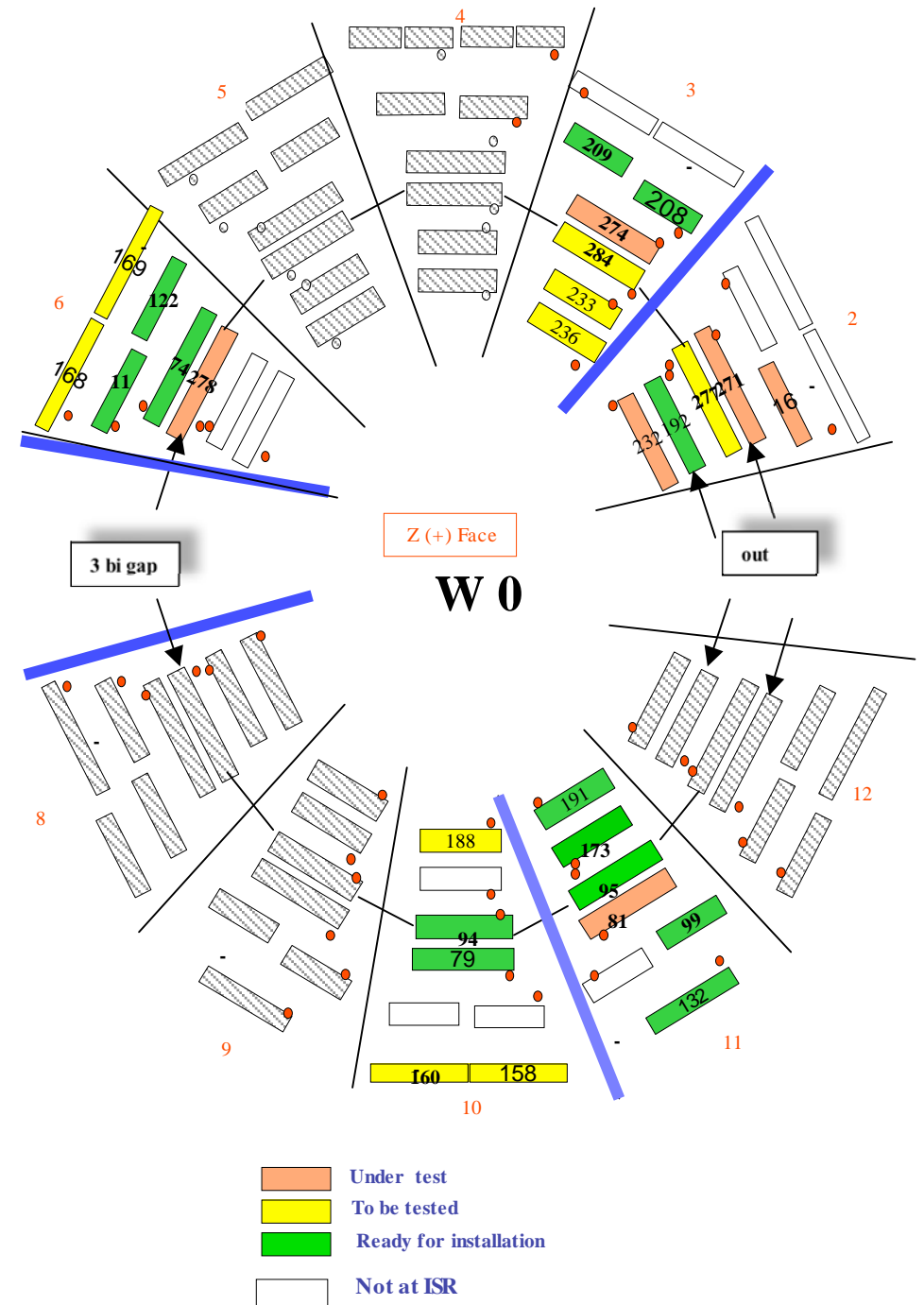
Missing RB4

Under test in Bari.

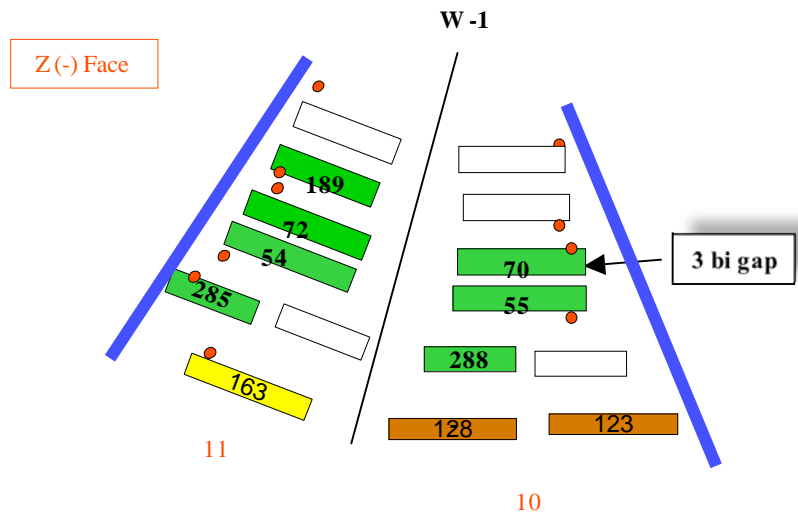
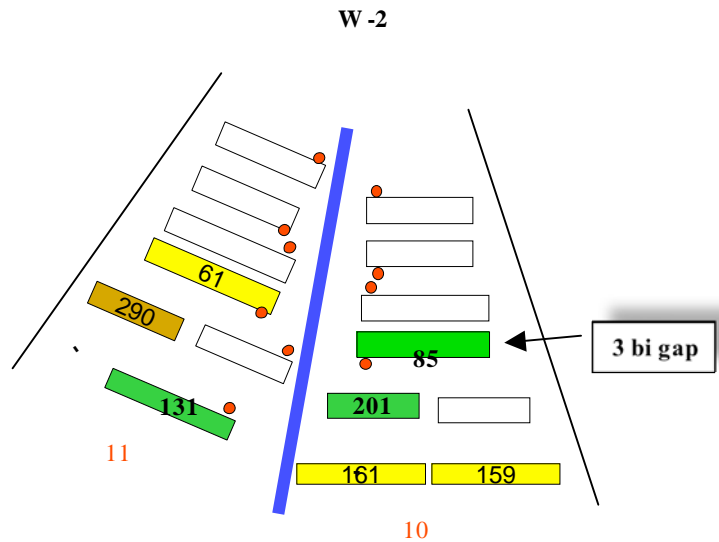


## ISR Status: W0+

- **RB1** 3 missing chambers under test in Pavia
- **RB3** 4 missing chambers at ISR on 21 March
- **RB4** missing RB4 to be tested in Bari



# ISR STATUS: W-1 /W-2 sect 10-11



- RB1** 3 chambers to be built + 4 under test in Pavia
- RB2** 1 chamber to be built
- RB3** 4 chamber under test in Italy
- RB4** 2 chambers to be repaired

- Under test
- To be tested
- Ready for installation
- Not at ISR



## RPC readiness vs DT schedule: W+2/W+1/W0+

DT	RPC	Coupling - Installation
W+1 36 DT All chamber but S1/ S 7 and MB4To	<u>RB1s under test. Ready middle of April.</u> <u>Chimney RB2-RB3 ready middle April</u> <u>Chimney RB1-RB4 ready middle May</u>	11 April – 6 May
W0+ 18 DT All but MB4To  W+2 6 MB4 S 3-5-9-10-11	<u>Middle of May</u>  <u>Ready</u>	30 May – 17 June
9 MB4To W0+ W+1 3 MB4 W0 + 6 MB4To W+1	<u>End of June</u>	4 July – 22 July
18 DT W-1 W-2 S 10/ S11	<b>July</b>	5 Aug- 23 Aug

# Status Production and PLANNING

CH type	RB1	RB2/4	RB3
<b>Built</b>	<b>68</b>	<b>144</b>	<b>80</b>
<b>Rejected</b>	<b>9 (13%)</b>	<b>14 (10%)</b>	<b>6 (8%)</b>
<b>To be built</b>	120 - (68-9) = <b>61</b>	240 - (144-14) = <b>110</b>	120 - (80-6) = <b>46</b>
<b>To be built in total (with % of rej)</b>	<b>61 + .13*61 = 69</b>	<b>110 + .10*110 121</b>	<b>47 + .11*46 = 52</b>

## Production planning:

HT → 6 ch/month

Bari-Sofia → 4 ch/month

GT → 10 ch/month

DG → 40 DG/month

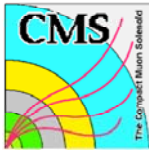
SG → 100 gaps/month

## Test planning:

Bari → 10 ch/month

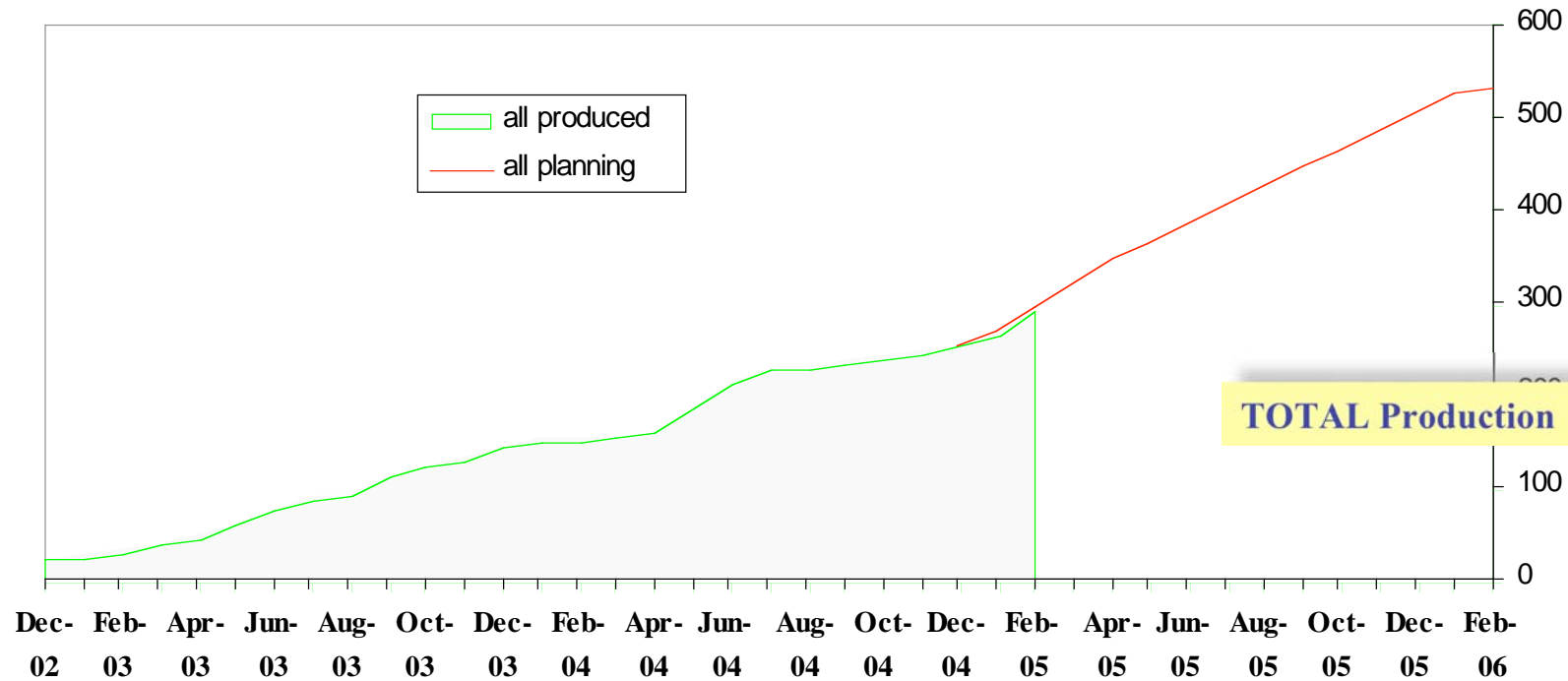
Sofia → 5 ch/month

Pavia → 5 ch/month



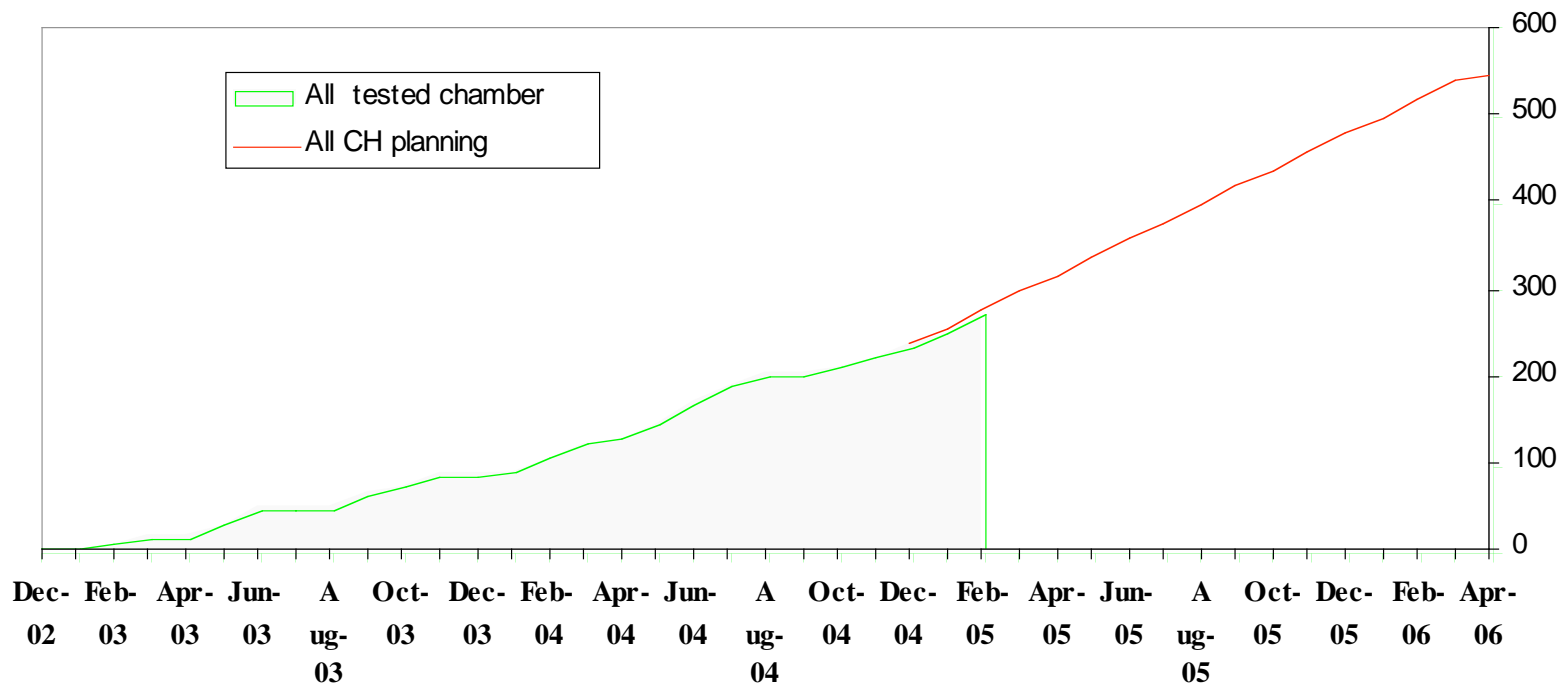
# Chamber production

CMS RPC  
group





# Chamber test, integral

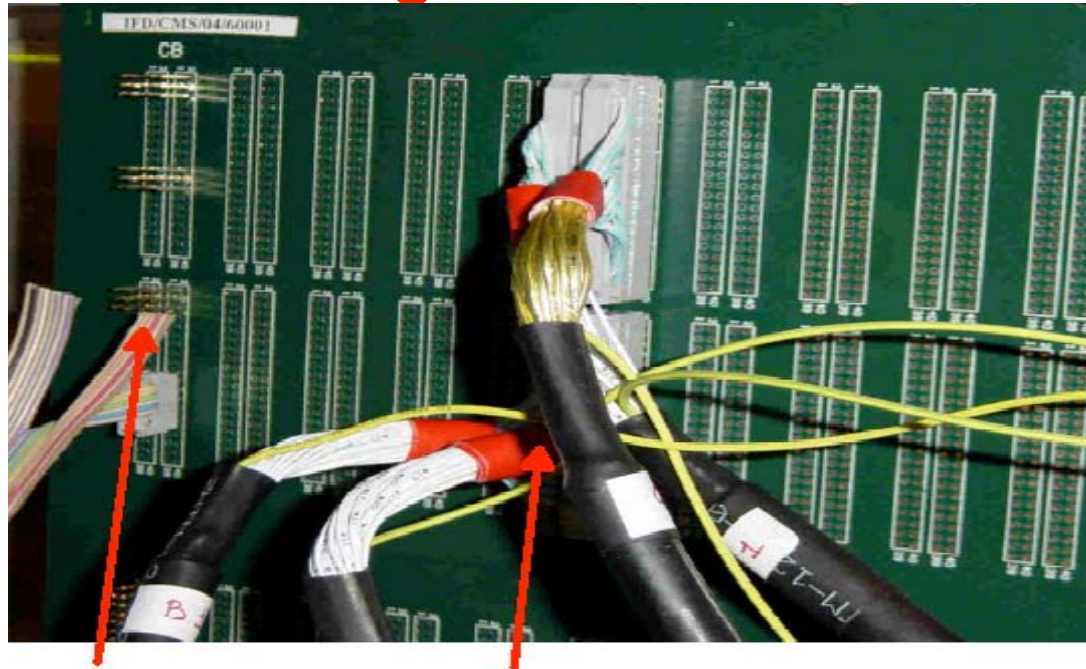


Conclusion:	end production	rate
DG	December	40/month
CH-prod.	January-February	20/month
CH-test	March - April	20/month
Ch ready at ISR + 1 month...		

# RPC signal cable procurement status

- Cern started a tender last December fixing the specification of cable (mechanical dimension, timing performance, safety rules compliance, etc.)
- Three competitors are running (NOVACAVI, TECHNIKABEL, PLASTICAVI)
- 5 Km from NOVACAVI + 2 Km from Technikabel are already at Cern, while from Plasticavi other 2 Km are waited for next week
- When finally evaluated by us Cern could make the final order
- We expect a production rate of 20 Km/month + 2 months for connectorizing cable necessary for one wheel
- For sector tests we don't see any major problems except for:
  - Definition of final cutting length: some details on periphery should be fixed yet
  - Definition of connector from the Link Board side

# Signal cable connector issue



RPC I2c cable

RPC data cables

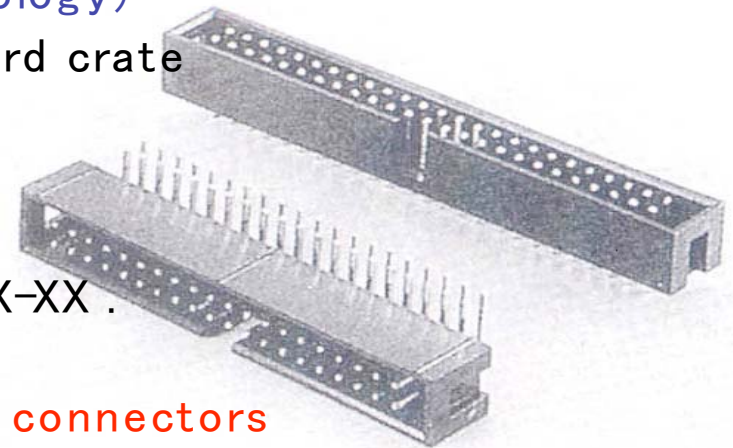
A common review on these items (more generally about interface between detector and Link system) is required to take shared decision

Matti Iskanius (Lappeenranta University of Technology)

is studying the possibility to modify the Link Board crate backplane in such a way to use male connectors with receptacle (this seems possible).

The problem is the strength relief

Suggested connector: Weitronic 138-40-X-20-XX-XX .



- The backplane should be modified to fit the 96 connectors
- Next week they should give us the final answer
- Enlarge the space among connectors have a big impact on the LB project