



SMACC Twenty-second report

[20 min]

06/06/2014

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On behalf of the SMACC project

☐ Activities since last LSC (11/04/2014)

- ☐ Arc splices installation
 - By Activities
 - By sectors
- ☐ SIT // DFBA

☐ Dashboards

☐ Specials

- ☐ **DN200 painting**
- ☐ **Overview**

☐ Activities for the next 4 weeks

☐ Conclusions

☐ Sector 56 :

- ✓ Final leak test and reconnection of Q7/DFBAK

DFBAK: All lines reconnected // IC closed
// Last subsector to be leak tested

☐ Sector 67 :

- ✓ Ready for cool-down for Under cool down

☐ Sector 78

- ✓ Work on NC
- ✓ Final leak test

All interconnections reclosed
1 vacuum subsector (Including DFBAO) to be finally leak tested

☐ Sector 81

- ✓ Purge, EIQA, flushing,...

Interventions after pressure test & before cooldown on-going

☐ Sector 12

- ✓ Complete insulation
- ✓ Pressure test for 13.05.2014

All ICs are reclosed

Successful pressure test, to be flushed

☐ Sector 23

- ✓ Complete reclosure of Ics
- ✓ Insulation vacuum leak test

Completed

Completed

Just pressure tested

☐ Sector 34

- ✓ Repair (hopefully) last splice
- ✓ Complete M lines rewelding (except NC)
- ✓ M lines leak test
- ✓ Start ICs reclosure

☺ All repaired

Completed

Completed

Completed

≈ 1/2 vac subsectors finally leak tested

☐ Sector 45

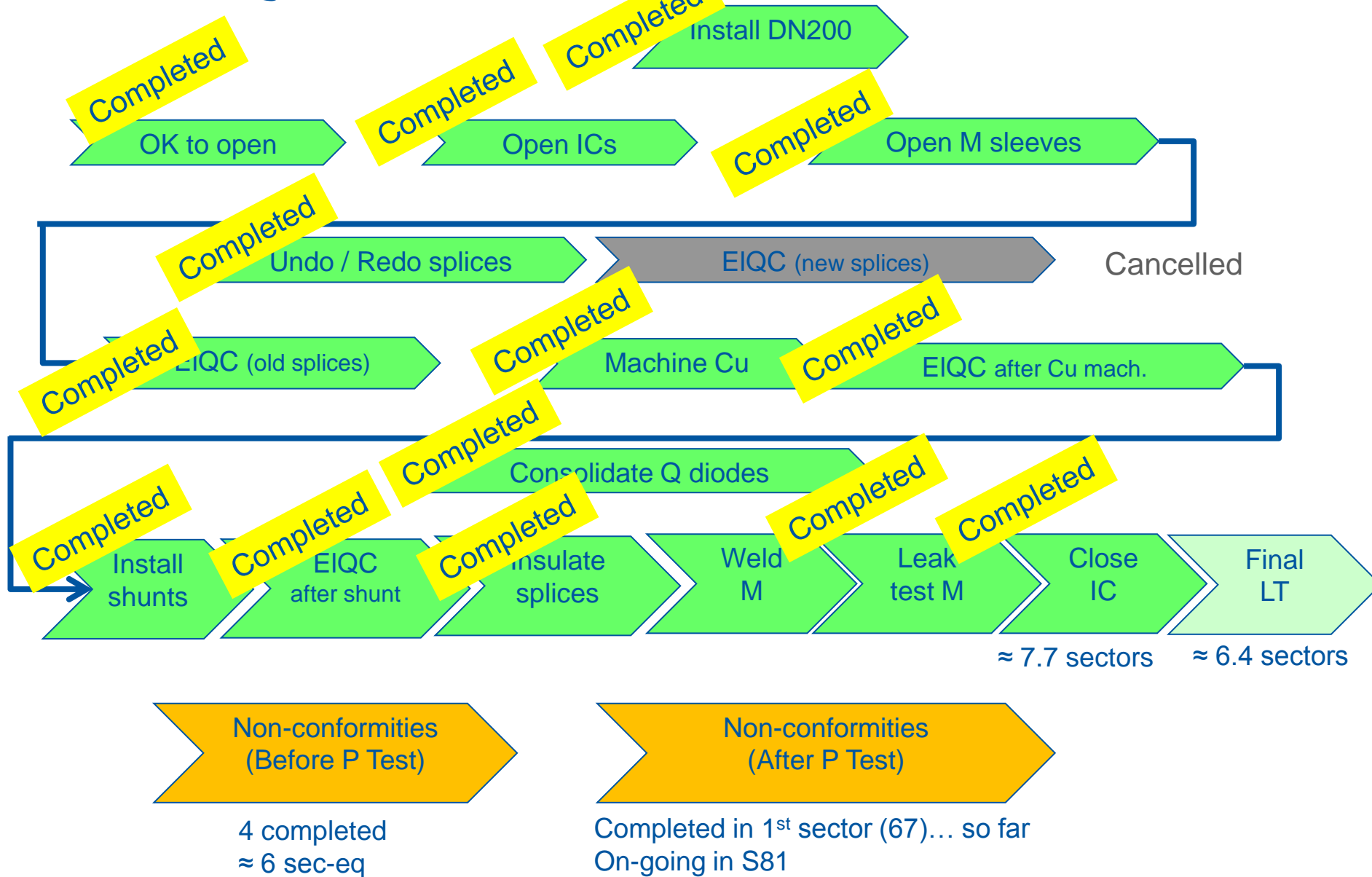
- ✓ Complete repair of overheated splices
- ✓ Start rewelding of M lines

Completed

Completed

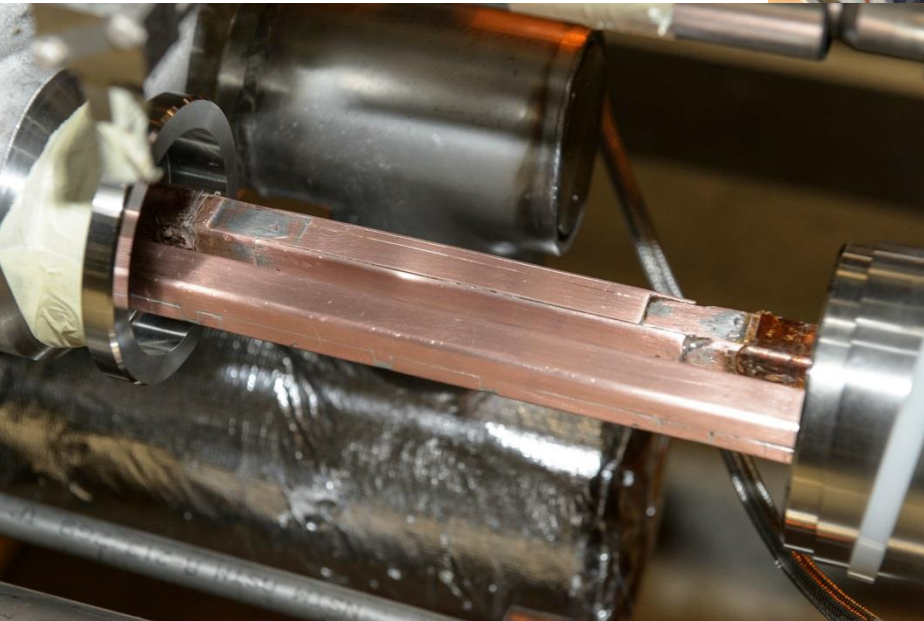
< 60/212 ICs to close

SEQUENCE AND STATUS

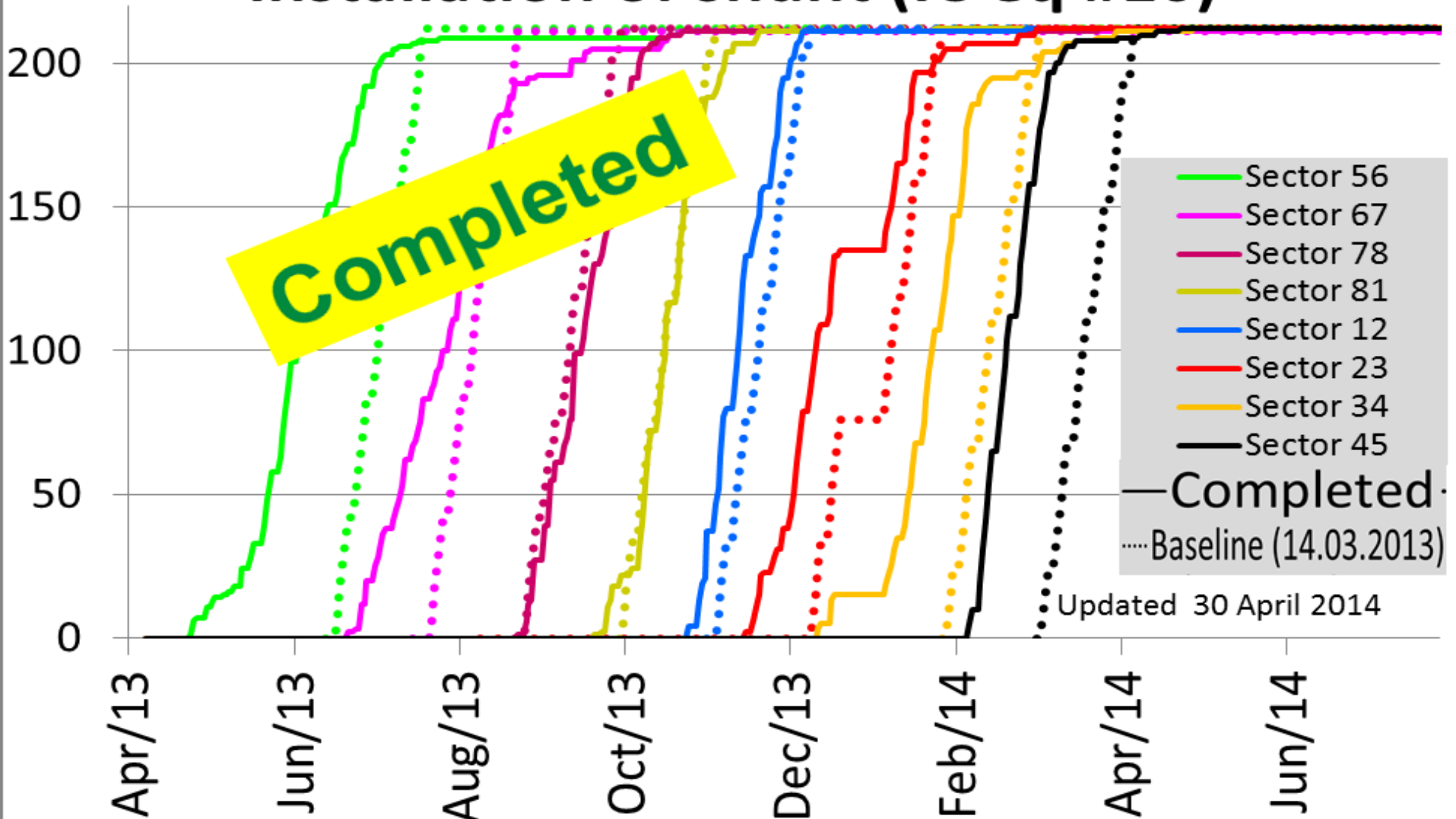


Last overheated splices consolidated

16 were repaired



Installation of shunt (IC eq #16)





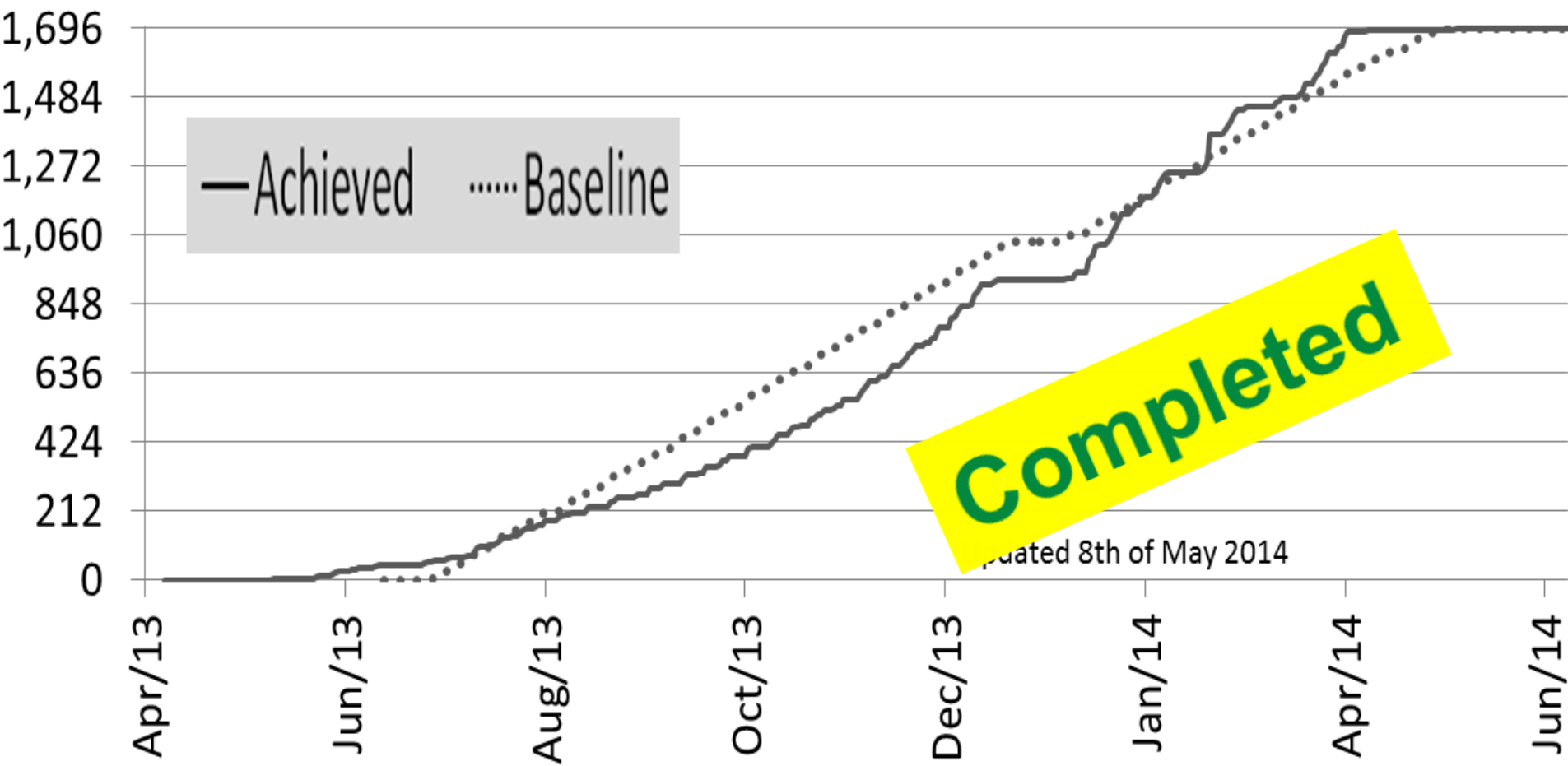
Note the small size of the team ...

A lot of work was necessary to give access to splices and reclose

JPh Tock
8/33



Installation of consolidated insulation





LE 27.05.2014



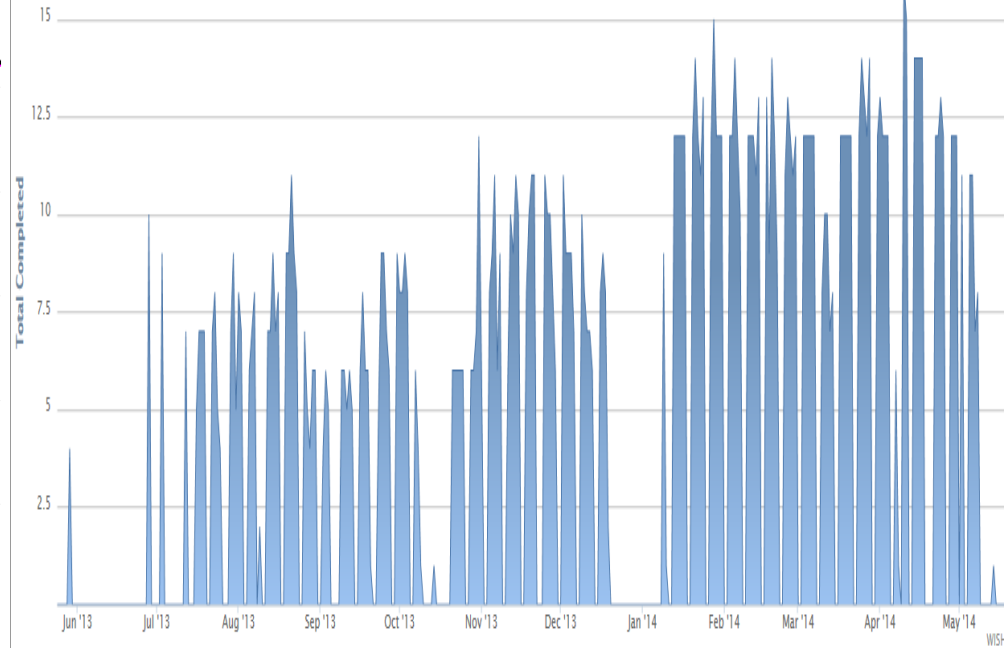
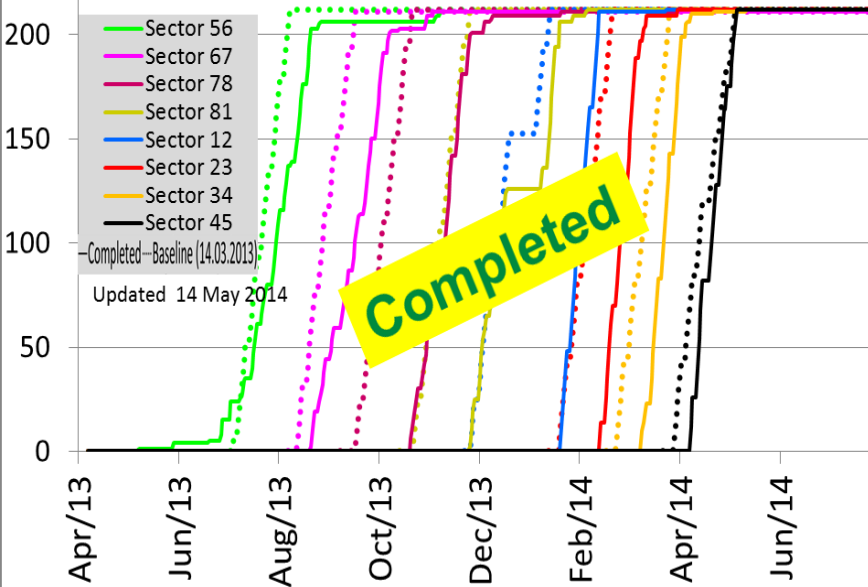
LE TRAIN LMF
ENTRE EN GARE TERMINUS

Courtesy F Savary



SMACC Progress report by activity

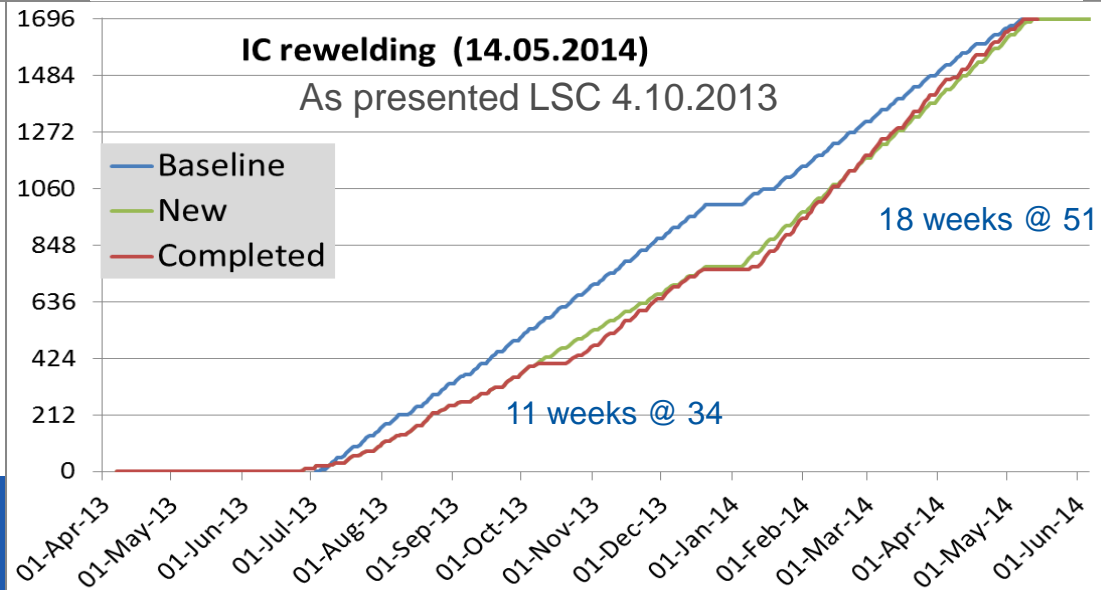
(Re)Welding of M sleeves (ICeq \approx 6 welds)

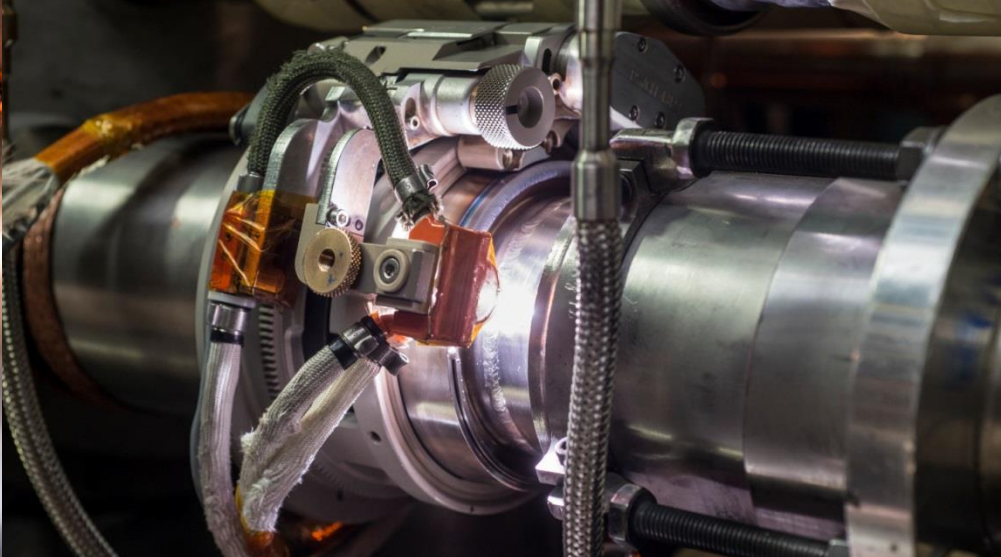


Completed on schedule
Regular rate, not because it was
easy but because it was well
prepared

IC rewelding (14.05.2014)

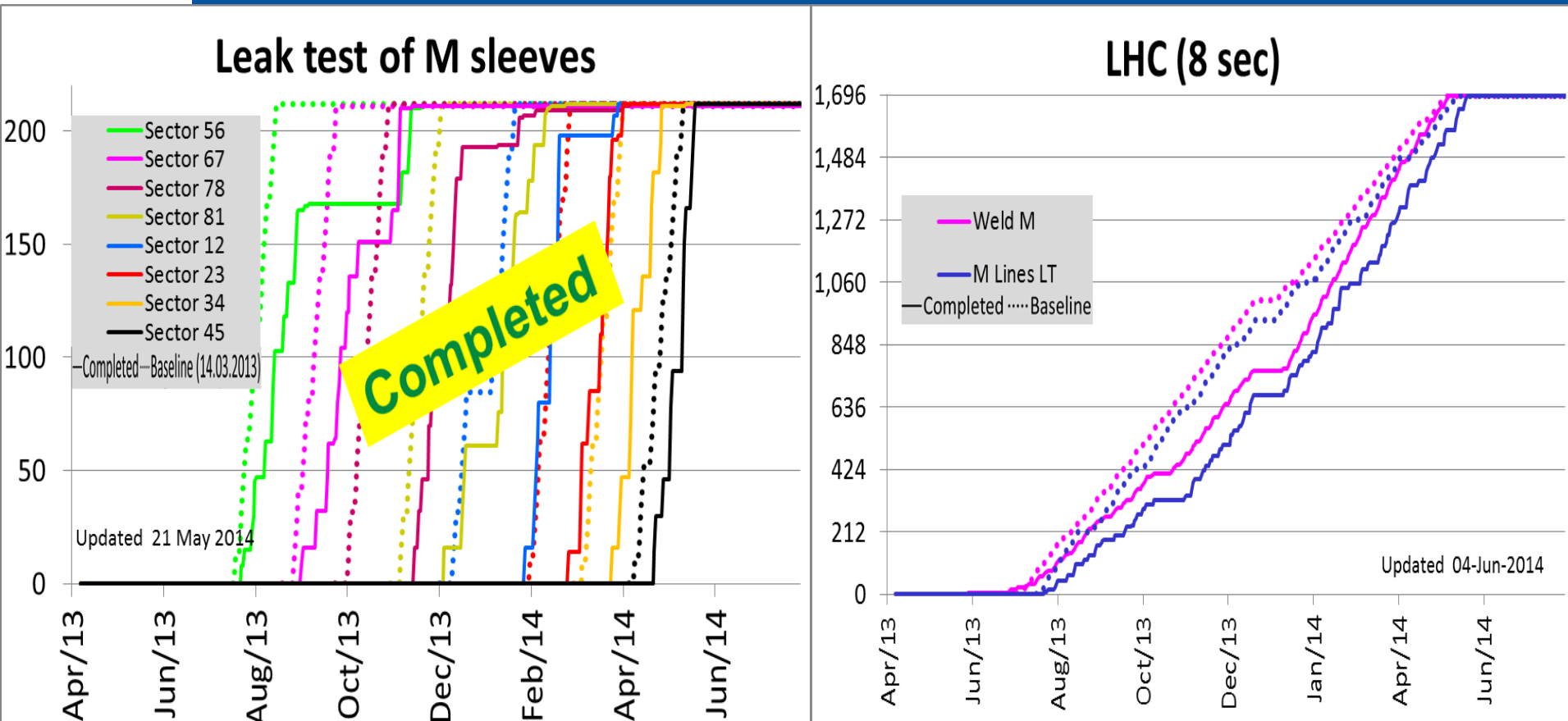
As presented LSC 4.10.2013







SMACC Progress report by activity



Last M sleeve leak tested one week after the last weld
Followed the rewelding rate

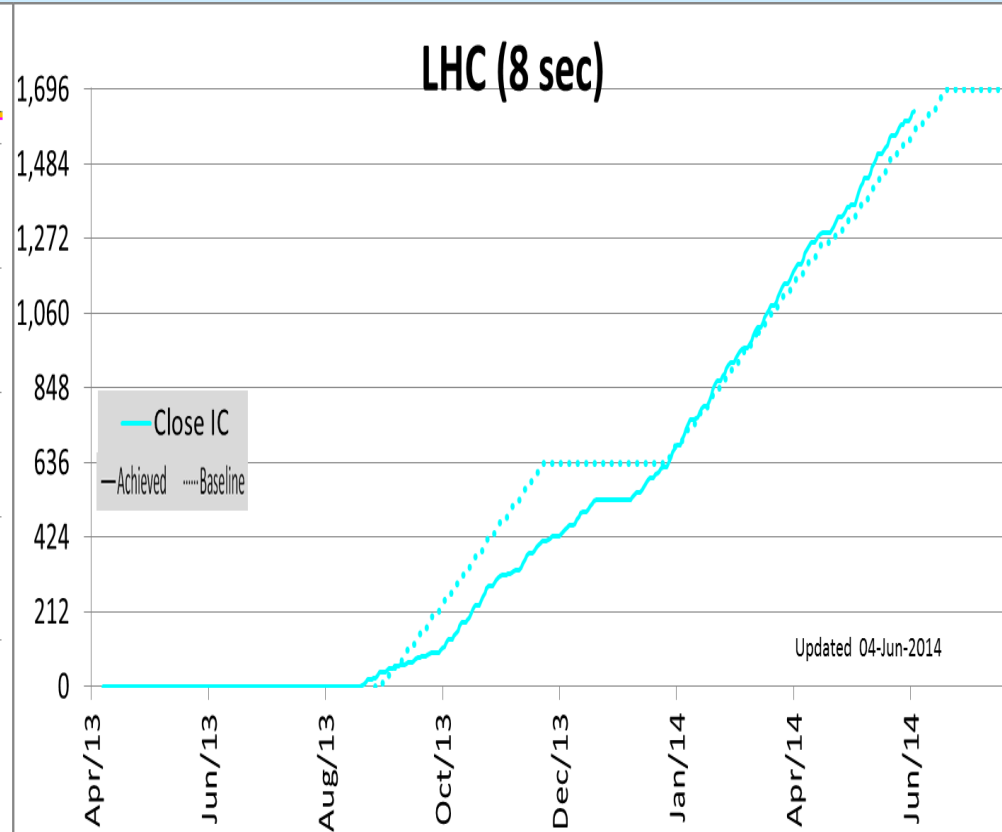
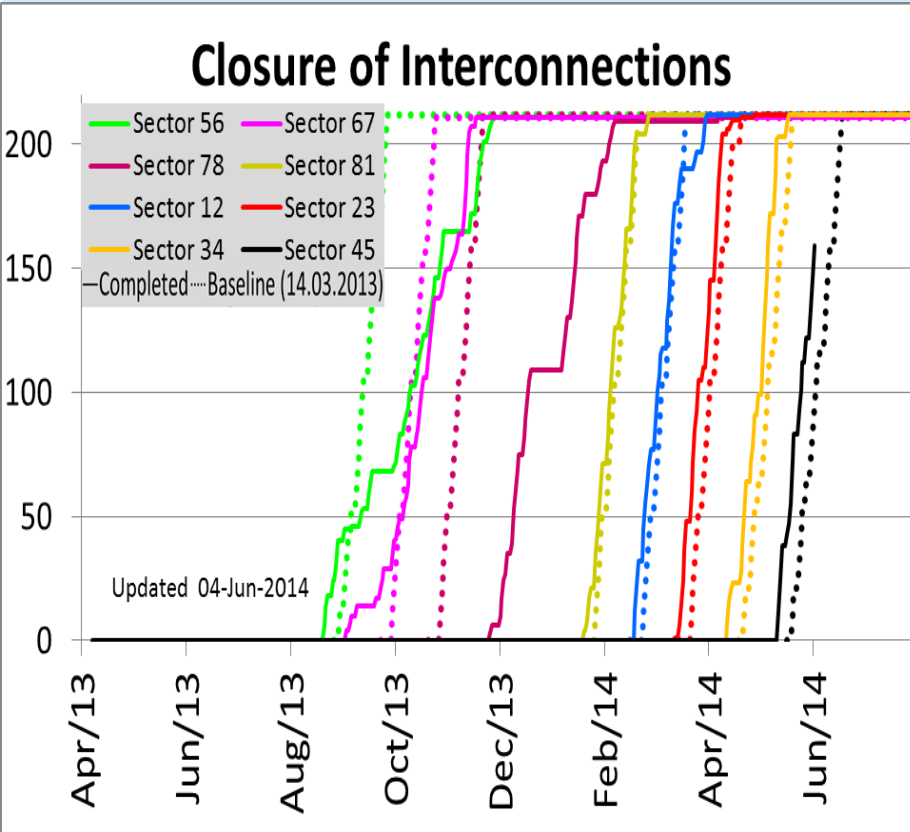


Report by acti



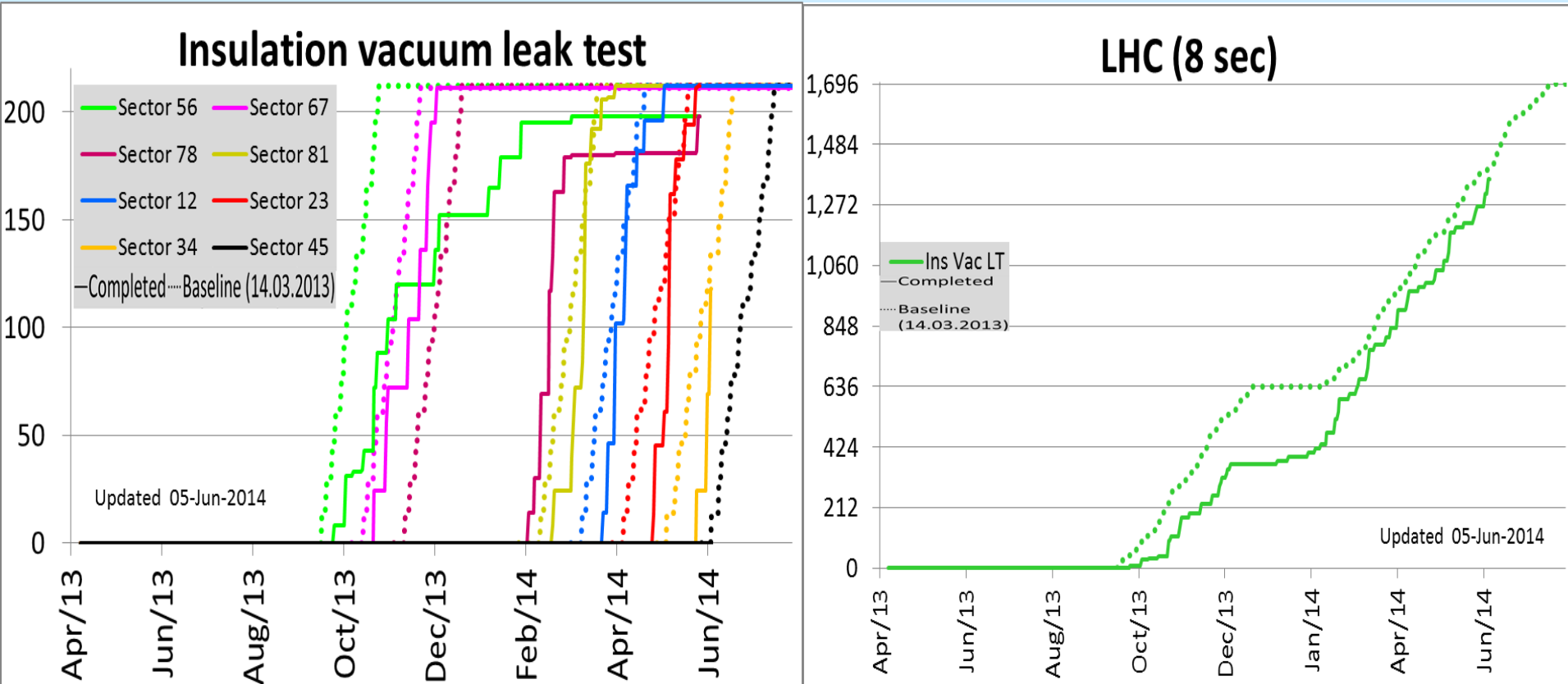
Excellent collaboration between the teams
and a very good team spirit
Positive atmosphere
Celebrated in a BBQ co-organised with CSI

☐ Reclosure of interconnections :



- ❖ Baseline rate achieved despite openings for special interventions
- ❖ < 60 ICs to reclose
- ❖ \approx 1 week ahead of schedule
- ❖ Last «first» reclosure before the end of June ...
 other ones will follow after local interventions

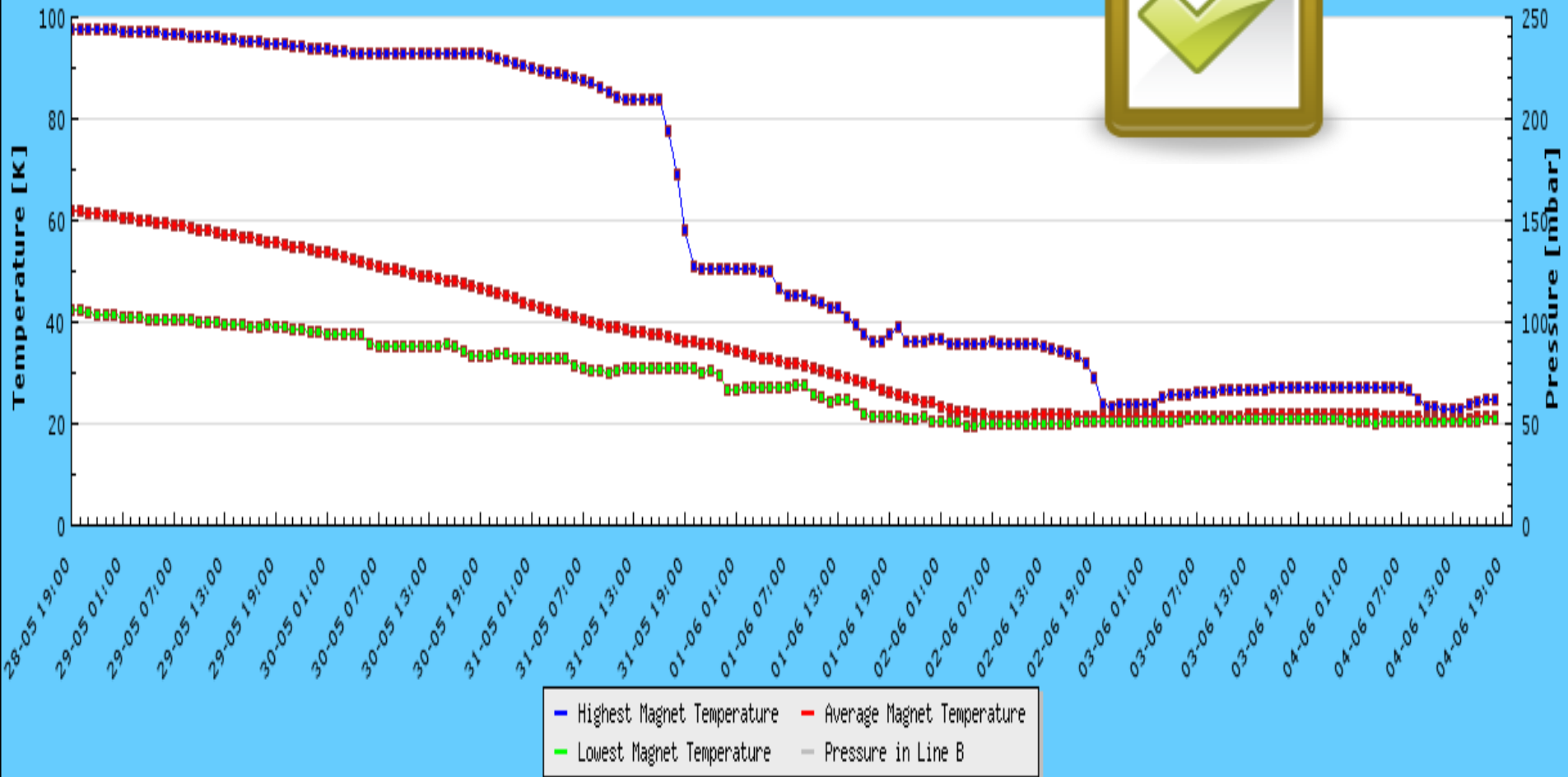
Final leak test: ≈ 6.4 sec equivalent



- ❖ About 1 week behind schedule, reducing
- ❖ Subsectors under pumping in last sector (S45)
- ❖ Recovering the baseline



The evolution of arc magnet temperatures in Sector 67



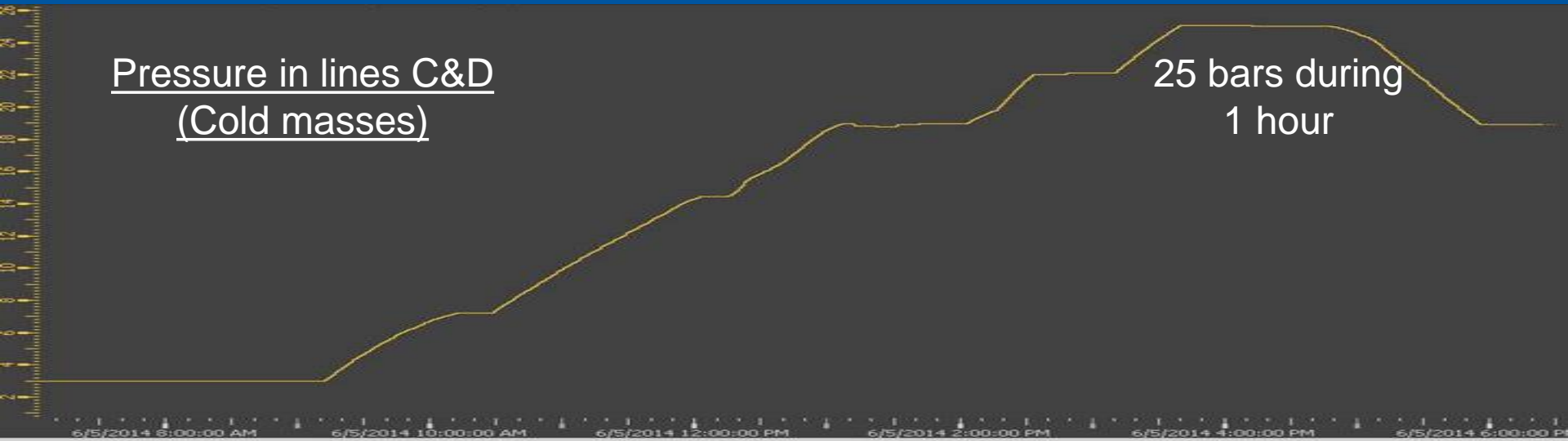
Magnet T \approx 20 K, EIQA at cold to be done

- ☐ ElQA after flushing completed, no fault on the cold side
- ☐ Thermometer issue solved
- ☐ External leaks repaired and under pumping for validation
- ☐ Internal leaks solved or accepted «as is» except
 - C'K leak in A23R8 : Required IC opening and cutting of cryogenics circuit
On-going with SIT

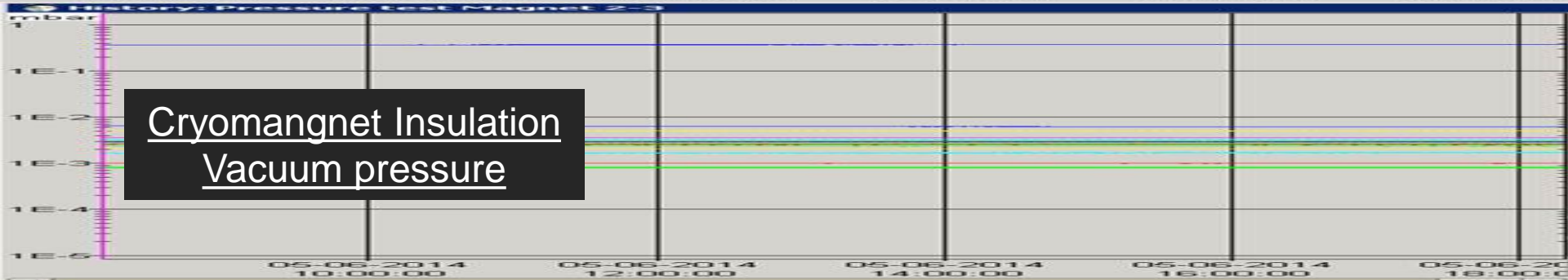
COOLDOWN planned for W26

Pressure in lines C&D
(Cold masses)

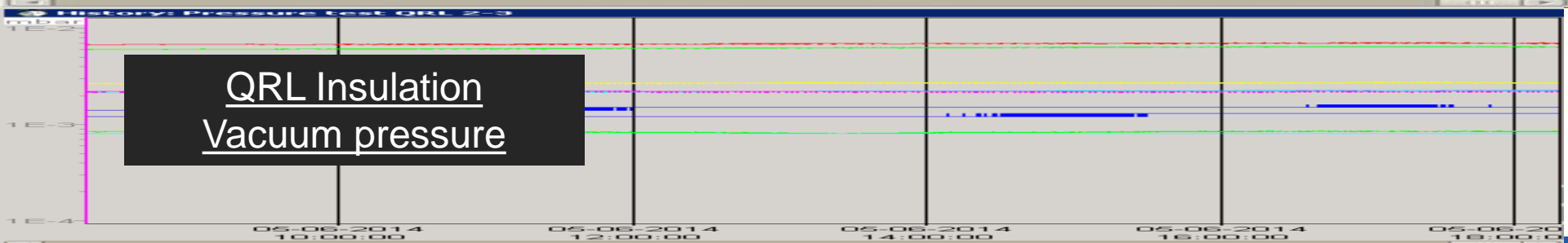
25 bars during
1 hour



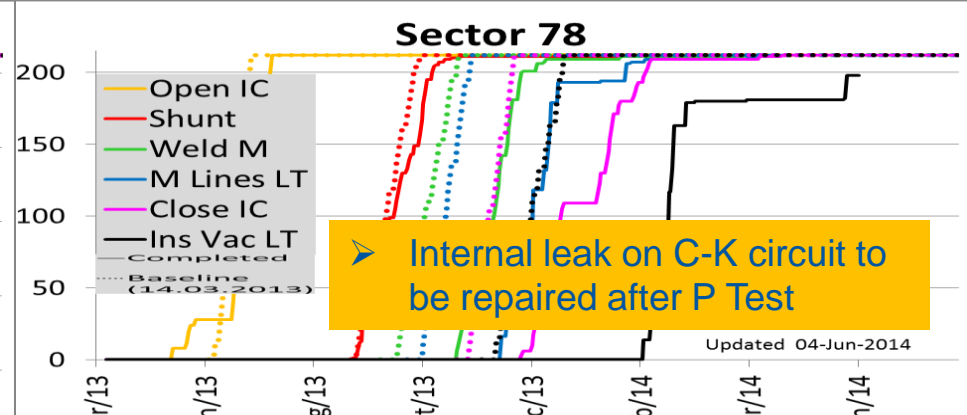
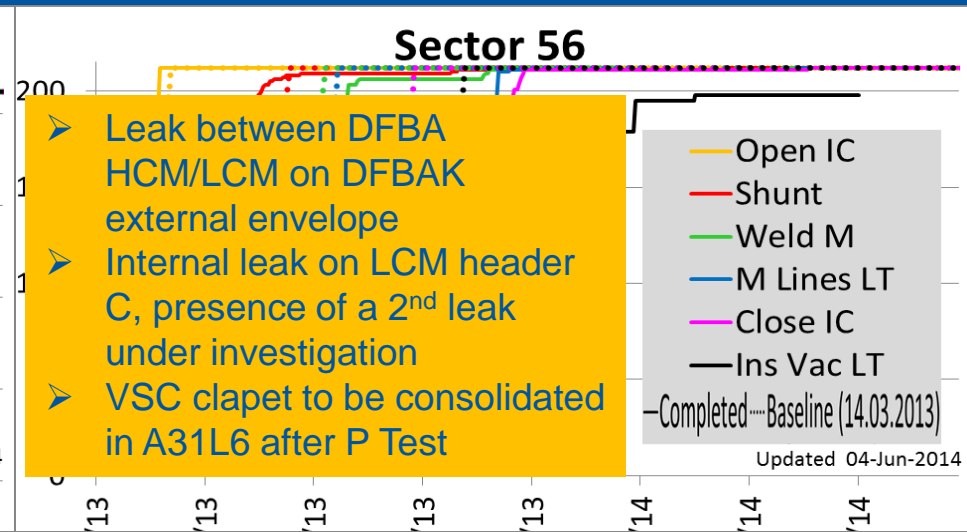
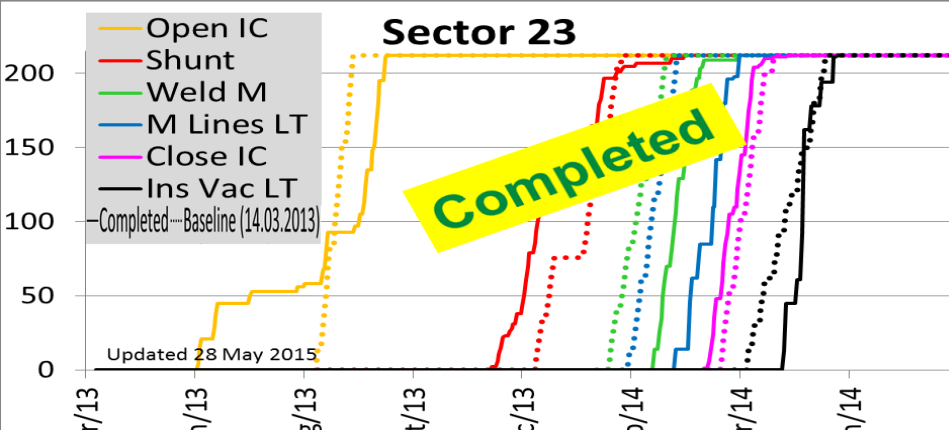
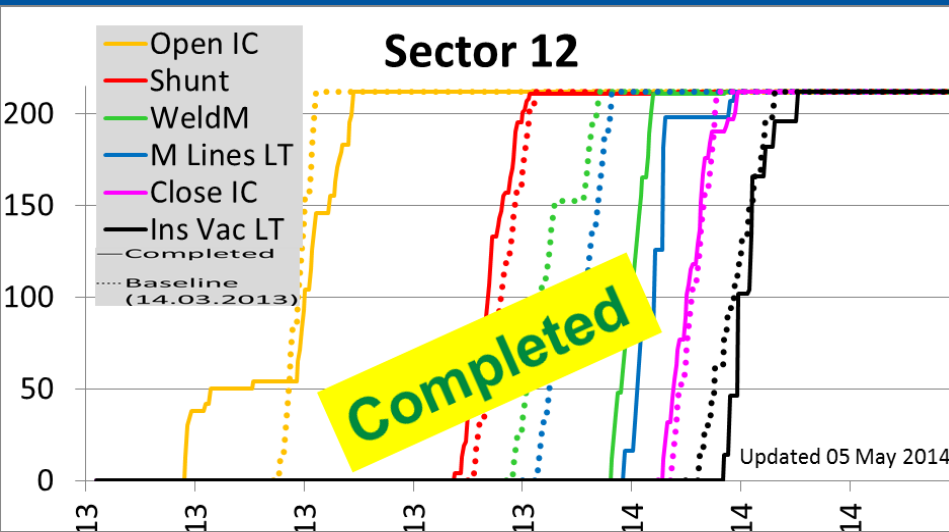
Cryomagnet Insulation
Vacuum pressure



QRL Insulation
Vacuum pressure



SMACC Progress report by sector



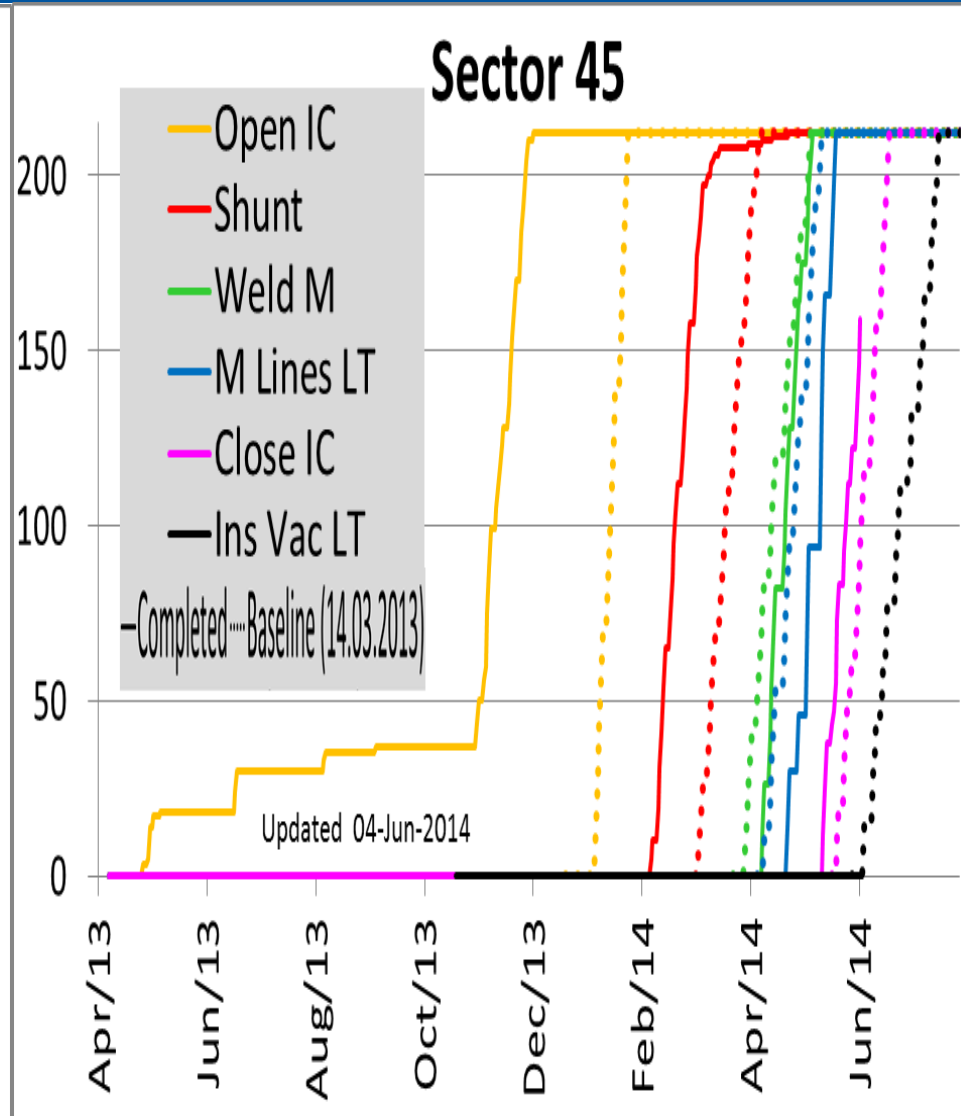
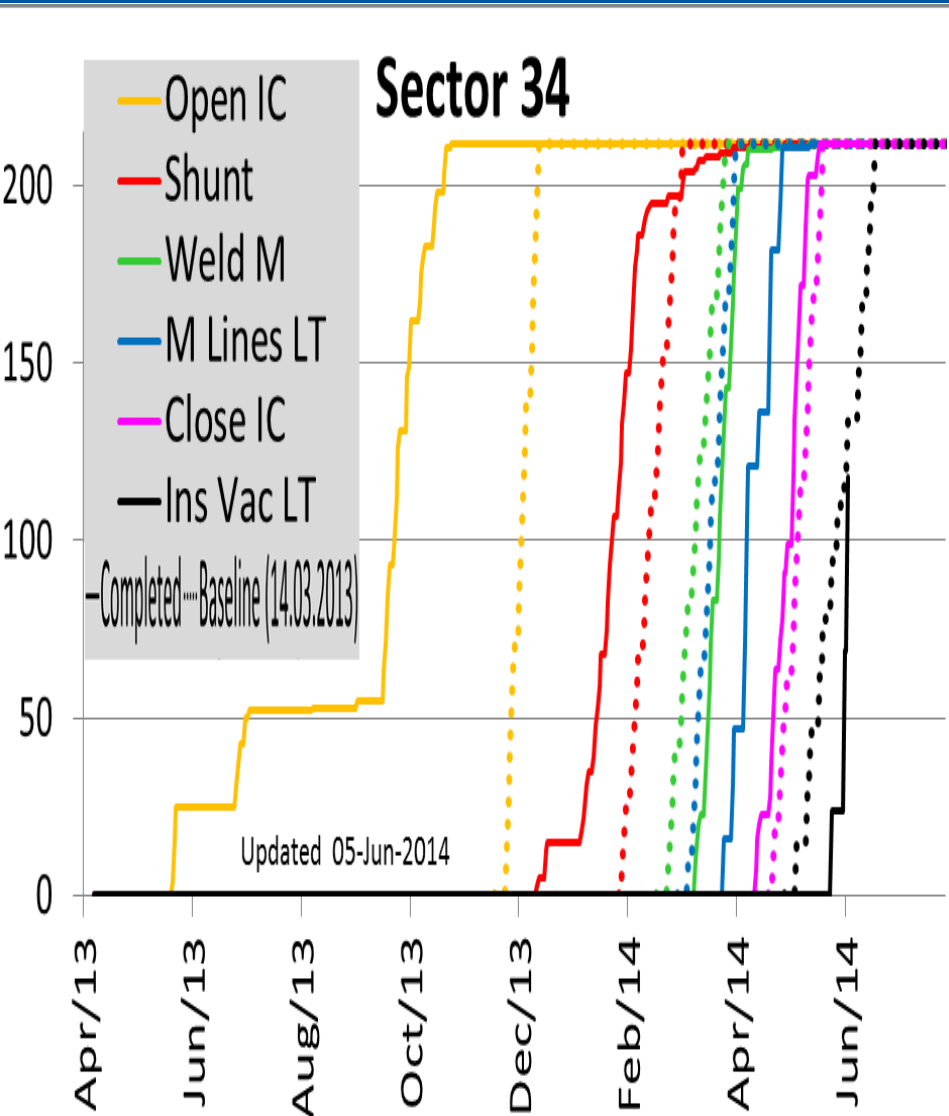
Sectors 12 & 23:

- ❑ Pressure tested successfully
- ❑ Interventions to be planned before cooldown: (Leaks [internal in A27R1 E line «clapet type»] , [Ext in 25R2 and internal A23R2])

Sectors 56 & 78:

- ❑ Only last vac subsector to be leak tested
- ❑ Pressure tests before end of June
- ❑ Interventions to be done before cooldown

SMACC Progress report by sector



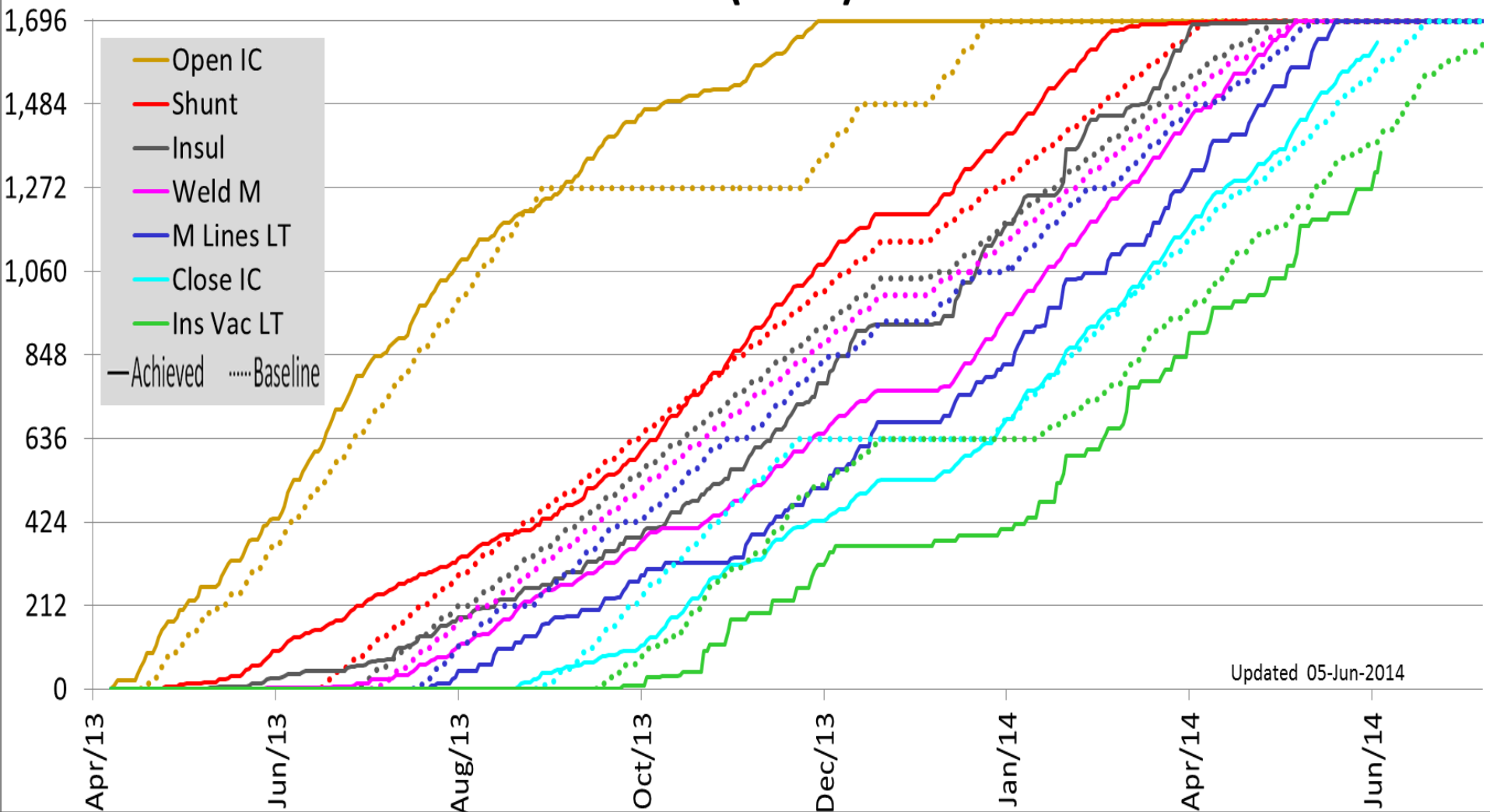
Final leak test on-going
8/14 vac sec tested
3 leaks under investigation

Main activities are :

- ☐ Reclosure of lcs
- ☐ Final leak test

SMACC Dashboards

LHC (8 sec)



➤ Everything is completed but:

- Reclosure: Ahead of schedule, < 60 ICs to reclose; priority given to repair interventions
- Insulation vacuum leak test : Recovering, < 2 sectors to test

SMACC summary status

Updated

04-Jun-14

ICs Opening

Shunts Installation

Sleeves Welding

M lines Leak Test

ICs closure

Ins Vac Leak test

S56

19-Apr-13	212	13-May-13
-11	212	-6
08-Apr-13	100%	07-May-13

17-Jun-13	212	19-Jul-13
-54	212	245
24-Apr-13	100%	21-Mar-14

05-Jul-13	212	08-Aug-13
-58	212	257
08-May-13	100%	22-Apr-14

19-Jul-13	212	15-Aug-13
4	212	258
23-Jul-13	100%	30-Apr-14

30-Aug-13	212	27-Sep-13
-10	212	222
20-Aug-13	100.0%	07-May-14

17-Sep-13	198	25-Oct-13
8	212	
25-Sep-13	93%	

S67

16-May
-20
26-Apr

Two activities are on-going :

- * Reclosure in S45
- * Ins Vac LT in S56, S78, S34

One activity to start:

- * Ins Vac LT in S45

Sep-13
1
Nov-13

30-Sep-13	211	27-Oct-13
-27	211	22
03-Sep-13	100%	18-Nov-13

15-Oct-13	211	22-Nov-13
7	211	11
22-Oct-13	100%	03-Dec-13

S78

07-Jun
-24
14-May

Oct-13
61
Apr-14

28-Oct-13	212	22-Nov-13
29	212	151
26-Nov-13	100.0%	22-Apr-14

12-Nov-13	198	20-Dec-13
83	212	
03-Feb-14	93%	

S81

28-Jun
-38
21-May

Dec-13
3
Feb-14

27-Jan-14	212	21-Feb-14
-7	212	6
20-Jan-14	100%	27-Feb-14

11-Feb-14	212	21-Mar-14
8	212	12
19-Feb-14	100%	02-Apr-14

S12

19-Jul
-53
27-May

Jan-14
9
Mar-14

24-Feb-14	212	21-Mar-14
-5	212	12
19-Feb-14	100%	02-Apr-14

11-Mar-14	212	22-Apr-14
14	212	13
25-Mar-14	100%	05-May-14

S23

09-Aug-13	212	29-Aug-13
-67	212	19
03-Jun-13	100%	17-Sep-13

10-Dec-13	212	27-Jan-14
-25	212	35
15-Nov-13	100%	03-Mar-14

20-Jan-14	212	21-Feb-14
24	212	40
13-Feb-14	100%	02-Apr-14

31-Jan-14	212	27-Feb-14
26	212	35
26-Feb-14	100%	03-Apr-14

24-Mar-14	212	22-Apr-14
-10	212	8
14-Mar-14	100.0%	30-Apr-14

08-Apr-14	212	21-May-14
20	212	7
28-Apr-14	100%	28-May-14

S34

25-Nov-13	212	13-Dec-13
-188	212	-49
21-May-13	100%	25-Oct-13

29-Jan-14	212	04-Mar-14
-48	212	57
12-Dec-13	100%	30-Apr-14

24-Feb-14	212	28-Mar-14
15	212	47
11-Mar-14	100.0%	14-May-14

07-Mar-14	212	03-Apr-14
20	212	42
27-Mar-14	100.0%	15-May-14

24-Apr-14	212	22-May-14
-10	212	-2
14-Apr-14	100%	20-May-14

07-May-14	69	20-Jun-14
20	212	
27-May-14	33%	

S45

06-Jan-14	212	24-Jan-14
-255	212	-53
26-Apr-13	100%	02-Dec-13

05-Mar-14	212	08-Apr-14
-27	212	17
06-Feb-14	100%	25-Apr-14

31-Mar-14	212	07-May-14
10	212	1
10-Apr-14	100%	08-May-14

11-Apr-14	212	13-May-14
13	212	8
24-Apr-14	100%	21-May-14

22-May-14	159	20-Jun-14
-8	212	
14-May-14	75%	

06-Jun-14	0	18-Jul-14
	212	
	0%	

LHC

19-Apr-13	1695	24-Jan-14
-11	1695	-53
08-Apr-13	100%	02-Dec-13

17-Jun-13	1695	08-Apr-14
-54	1695	22
24-Apr-13	100%	30-Apr-14

05-Jul-13	1695	07-May-14
-58	1695	7
08-May-13	100%	14-May-14

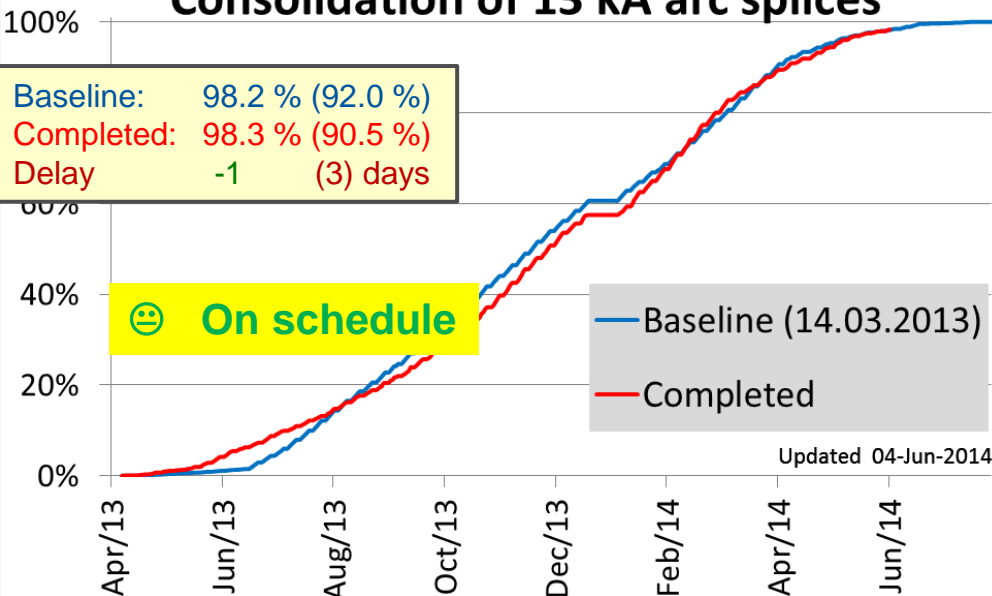
19-Jul-13	1695	13-May-14
4	1695	8
23-Jul-13	100%	21-May-14

30-Aug-13	1642	20-Jun-14
-10	1695	
20-Aug-13	97%	

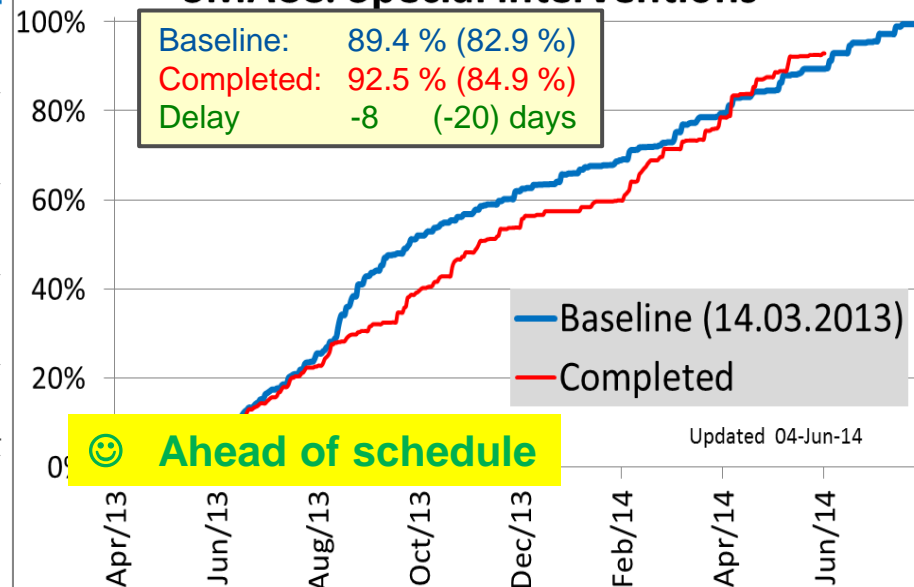
17-Sep-13	1312	18-Jul-14
8	1695	
25-Sep-13	77%	

SMACC Dashboards

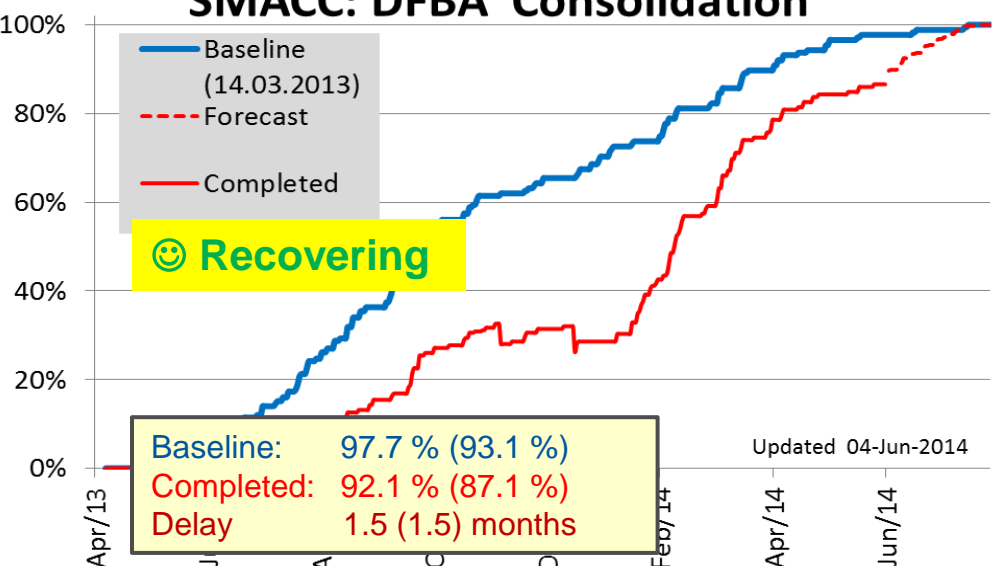
Consolidation of 13 kA arc splices



SMACC: Special interventions

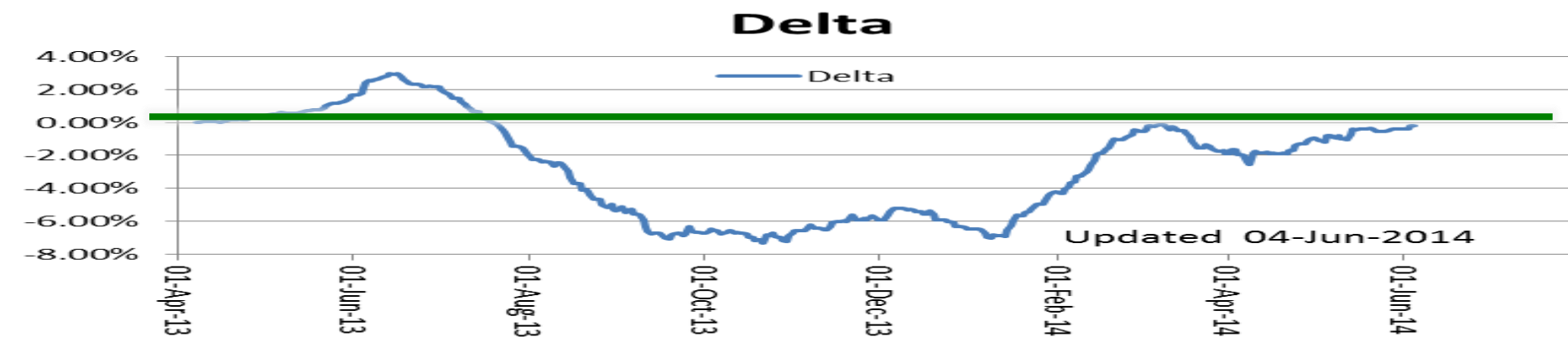
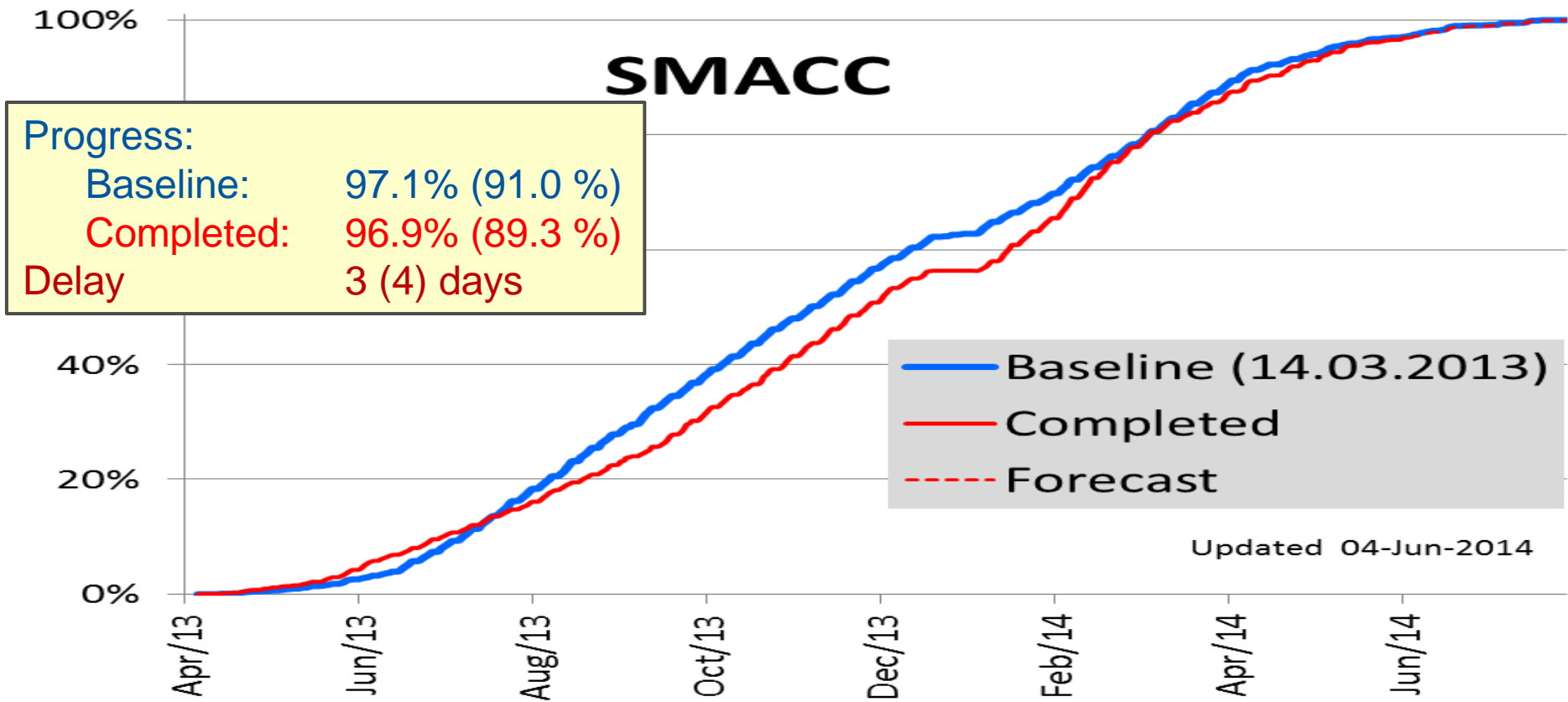


SMACC: DFBA Consolidation



- ❖ Arc splices: On Schedule
- ❖ SIT Reactive Ahead of schedule
- ❖ DFBA: Depending on progress on last leak tests

SMACC Dashboards



DN200 painting



❖ Done after final leak test

❖ Progress:

- S81 : Completed
- S78 : 85% done, waiting OK from LT
- S23 : Just started
- S45 : To start



Collaboration between

- PAEC-NCP (Pakistan) and
- DUBNA (Russia)



Courtesy A Musso / A Chrul

LHC Overview

Sector	IC Closed	Final LT	Pressure Test (*)	NC after P Test	Cool-down
67	18-Nov-13				
81	27-Feb-14				
12	02-Apr-14				
23	30-Apr-14				
56	07-May-14				
78	22-Apr-14				
34	20-May-14				
45	> 2/3				

(*) Some lines with minor repair are not tested to the test pressure, following derogations asked to and granted by HSE

Main 13 kA Splices:

- ☺ On schedule
- ☺ Overheated splices : COMPLETED
- ☐ Activities still in production mode :
Inspection before closure, Closure of ICs, Final leak test
- ☐ Other activities :
Resolution of NCs (leaks,)

Special Interventions & DFBA:

Progress according to final leak test

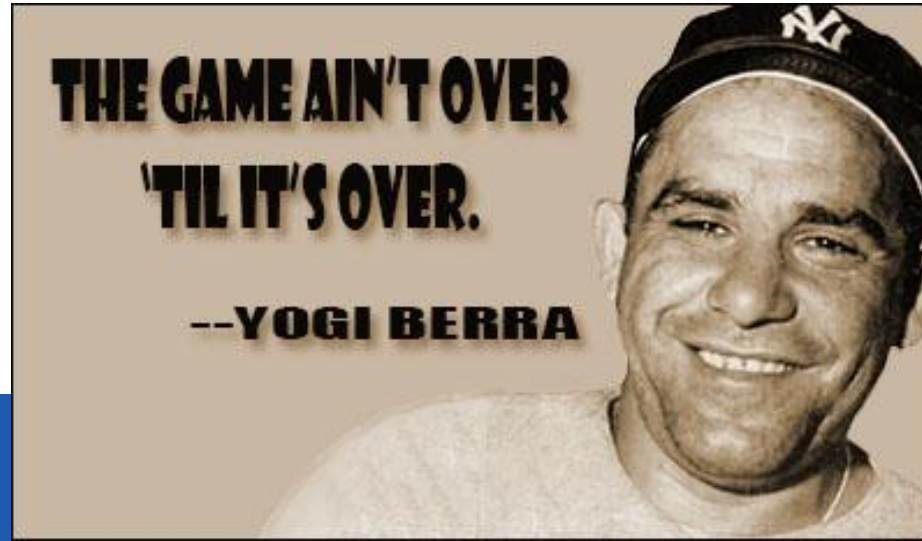
SMACC:

- ☺ **About 3 days of delay (stable)**
wrt schedule defined > one year ago !!

- ❑ Sector 56 :
 - Complete final leak tests
 - Pressure test
- ❑ Sector 67 :
 - EIQA @ cold
- ❑ Sector 78
 - Complete final leak tests
 - Pressure test
- ❑ Sector 81
 - Complete interventions on NC
 - Start cooldown
- ❑ Sector 12
 - Interventions on NCs
- ❑ Sector 23
 - EIQA, flushing,...
- ❑ Sector 34
 - Complete final leak tests
 - Ready for pressure test from SMACC point of view
- ❑ Sector 45
 - Complete reclosure of ICs
 - Progress on final leak tests

CONCLUSIONS

- ❖ All ICs will be reclosed for the first time for Mid of June
- ❖ The good quality and progress (so far) should be attributed to the commitment of the whole team but also to the thorough preparation. Investment pays off.
- ❖ Working mode has evolved for most of the activities from a production mode towards specific interventions requiring a high reactivity and coordination of all teams
- ❖ The baseline for insulation vacuum leak tests (last activity) is under recovery





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