

LHC Machine Committee - 1 April, 2009

Sector 3-4 Repair Status

[a.k.a. Status Report of Magnet Work]

Francesco Bertinelli - TE/MSC

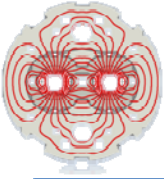
(10 minutes)

On behalf of - and with several contributions from - surface and IC teams

A very general overview:

More details in MMM 8h30, TEMB

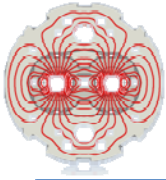
For IC work: Coordination meeting Wednesdays 14h



Surface News Week 13/2009

	End activity week 11 - 2009		End activity week 12 - 2009	
	Magnets	Quantity	Magnets	Quantity
Cryostating	SSS219 -(2445=spare)	2	2524=spare	1
Cold testing	1092-1099-2108-2192-2433-SSS208	6	1071-2035-(2437-2438-2442=spares)	5
Stripping	2103-2428-2441-2443-2446-2690-3118	7	1071-1092-1099-2108-2192-SSS225-SSS227-SSS364	8
Fiducialization	1085-2428-2441-2446-2690-3118	6	1092-2103-2443-SSS225-SSS227-SSS364	6
Beam screen integration	1085-2427-2444-3118-SSS203-SSS221	6	2103-2428-2441-2446-2690-SSS195	6
Tunnel preparation	2252-2429-2418-2435-SSS221-SSS369	6	1085-2427-2428-2444-2690-3118	6
Installation (=pose)	2252-2418-2429-2435-2440-SSS221-SSS369	7	1085-2427-2428-2444-2690-3118	6
	End activity week 13 - 2009		Planned week 14 - 2009	
	Magnets	Quantity	Magnets	Quantity
Cryostating		0		
Cold testing	SSS219-(2445=spares)	2		
Stripping	2035-2433-2437-2438-SSS208-SSS218	6		
Fiducialization	1092-2108-2433-2438-SSS208	5		
Beam screen integration	1092-2108-2192-SSS225-SSS364	5		
Tunnel preparation	2441-2103-SSS195-SSS203-SSS225-SSS364	6		
Installation (=pose)	2103-SSS195-SSS203-SSS225-SSS364	5		7 MB

Courtesy A. Russo, M. Modena, R. Bihery

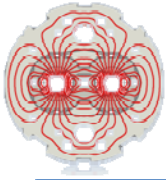


Surface: what is left to do?

Status	Quantity	SSS & MB Identity
MB spare still available	4	Type A= 2445- 2524 Type B= 2431-2442
MB sick	2	2446-2868
SSS sick	1	SSS006
MB at cryostating or preparation for cold test	0	
SSS at cryostating or preparation for cold test	2	SSS279-SSS344
MB at cold test	0	
SSS at cold test	0	
MB at Stripping and Fiducialization	3	1071-2437-3383
SSS at Stripping and Fiducialization	0	
MB at SMI2 (beam screen & BPM)	4	1099-2035-2433-2438
SSS at SMI2 (beam screen & BPM)	2	SSS208-SSS219
MB at preparation for tunnel	3	1092-2108-2192
SSS at preparation for tunnel	1	SSS227
MB ready for installation	0	
SSS ready for installation	0	
MB Ins		2429-3118-
SSS Ins		
MB spares (total)	41	/41
SSS spares (total)	14	/14

- No slack in work
- Last magnets (x2 SSS) installed W17 (18) cf initial planning W15
- ... but there were (are) plenty of (expected) surprises along the way
- ...

Courtesy A. Russo, M. Modena

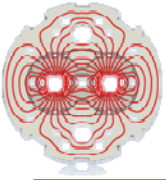


3-4 workload: some examples

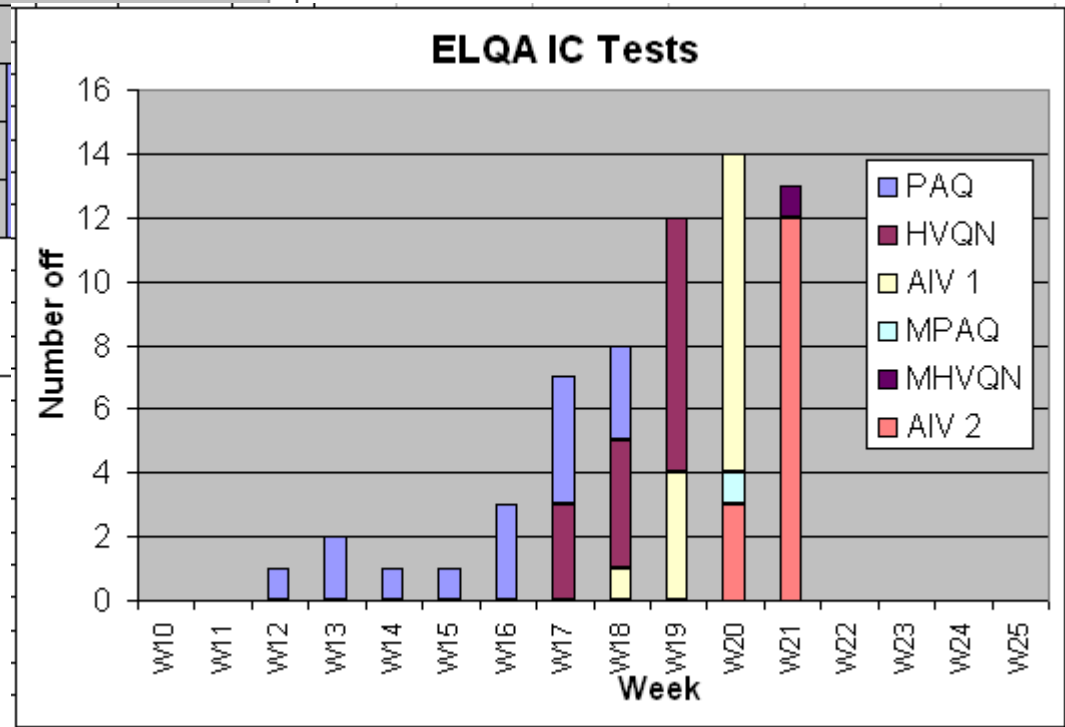
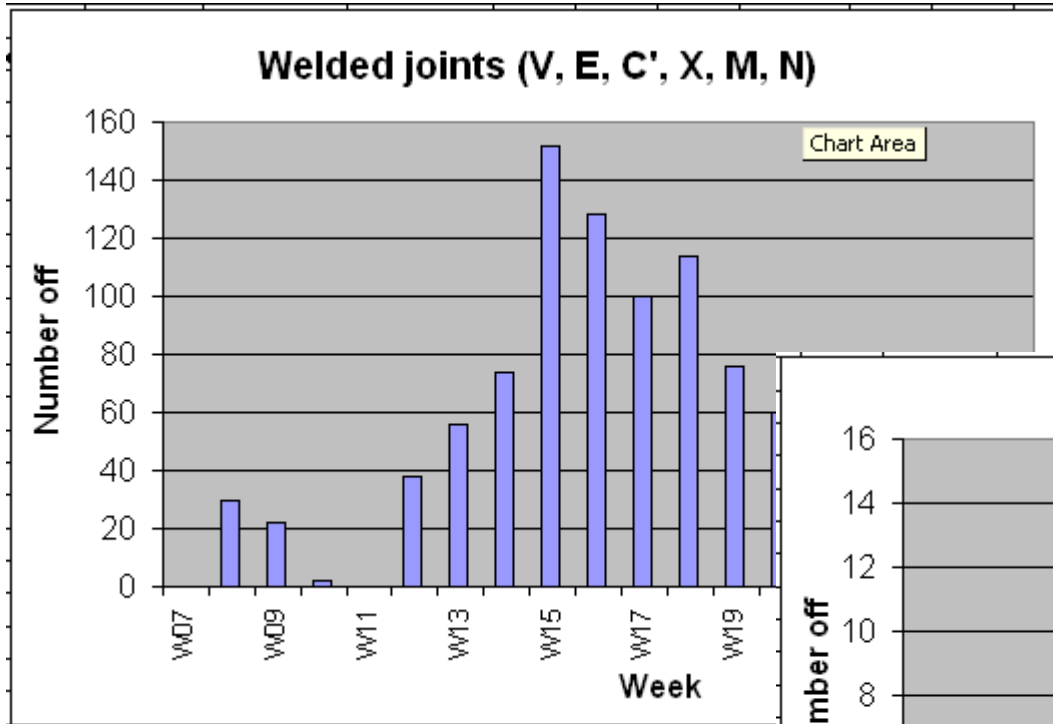
IC work to be done in 3-4: status 31 March (Week 14-2009)

	W bellows		PIMs cut		PIMs welded		BB disconnected	BB soldered
	fully opened	partial opening	V1	V2	V1	V2	M1, M2, M3	M1, M2, M3
Within Zone-D (Q19R3 to Q33R3 include d)	57		55	57	17	17	57	21
Outside D-zone (replace all QQBI PIMs, cleaning soot and MLI)								
Towards Point 3	35		15	30	0	0	1	0
Towards Point 4	31		28	28	8	8	0	0
Outside D-zone (for DN200 work only)								
Towards Point 3		7						
Towards Point 4		51						
Total done/ongoing		181	98	115	25	25	58	21
		85%	46%	54%			27%	
Total present		212	212	212			212	

	M cut	M welded	N-lines removed	jumpers	week	Busbar soldering (BB)
	M1, M2, M3					
Within Zone-D (Q19R3 to Q33R3 include d)	57					5
Outside D-zone (replace all QQBI PIMs, cleaning soot and MLI)					12	5
Towards Point 3	1				13	8
Towards Point 4	2				14	10
Outside D-zone (for DN200 work only)					15	10
Towards Point 3					16	10
Towards Point 4					17	5
Total done/ongoing	60				18	5
	28%		28%	25%		58
Total present	212		46	28		

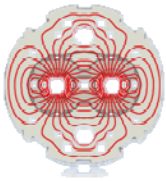


3-4 resources



4 TIG orbital teams (x2 MSC and x2 MME)

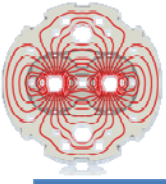
➤ ~120 welded joints per week



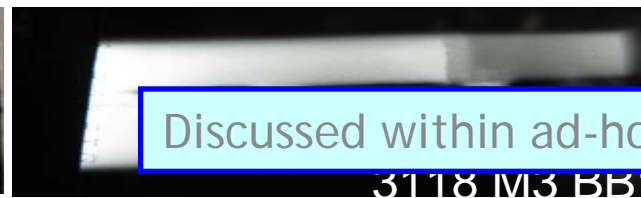
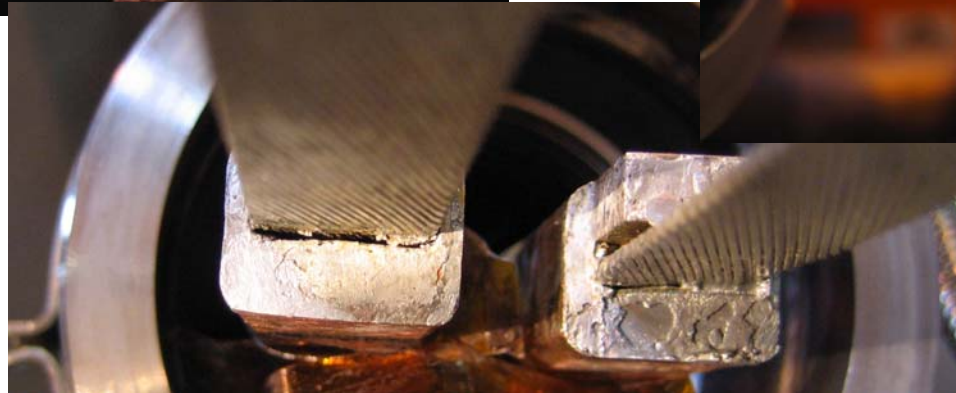
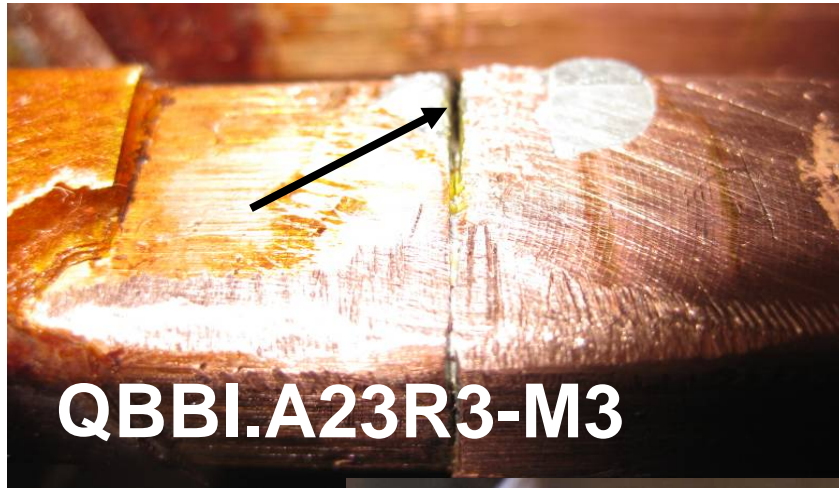
3-4: can we reduce the "8 weeks"?

		SSS Q30	MB A31	MB B31	MB C31									
IC name		QBQI	QQBI	QBBI.A	QBBI.B									
1 Magnet ready for installation		W15			W15									
2 Magnet transported		W14R			W14R									
	SSS Q26	MB A27 R	MB B27 R	MB C27 R	SSS Q27	MB A28 R	MB B28 R	MB C28 R	SSS Q28	MB A29 R	MB B29 R	MB C29 R		
IC name	QBQI.26R	QBBI.26R	QBBI.A27R	QBBI.B27R	QBQI.27R	with jumper	QBBI.27R	QBBI.A28R	QBBI.B28R	QBQI.28R	QBBI.28R	QBBI.A29R	QBBI.B29R	QBQI.29R
1 Magnet ready for installation														
2 Magnet transported						W16								
3 Survey positioning /check						W16								
4 QC: start IC						W16								
5 Y: Solder Y line						W17	W17	W17	W17	W17	W17	W17	W18	
6 He leaktest Y line						W17	W17	W17	W17	W17	W17	W17	W18	
7 X: TIG weld						W18	W18	W18	W18	W18	W18	W18	W18	
8 He leaktest X line						W19	W19	W19	W19	W19	W19	W19	W19	
9 Jumper lines CY and XB: TIG welding						W20								
10 He leaktest CY and XB						W21								
11 C: TIG welding		W17	W17	W17	W17	W17	W17	W17						
12 ELQA: PAQ		W18				W18								
13 M3: TIG welding		W19	W19	W19	W19	W19	W19	W19						
14 K1, K2, K-C collector: TIG welding		W19	W19	W19	W19	W19	W19	W19						
15 He leaktest KC' line		W20	W20	W20	W20	W20	W20	W20						
16 Jumper lines KD1, KD2, CC: TIG welding						W21								
17 He leaktest KD1, KD2, CC'						W22								
18 Jumper lines LD1, LD2: TIG welding						W21								
19 He leaktest LD1, LD2						W22								
20 Mount MLI						W23								
21 Position Z bellows						W23								
22 Z: TIG welding						W23								

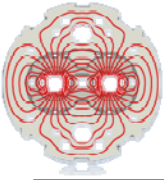
No



Technical difficulties



Discussed within ad-hoc "EEWG"









3-4: IC Week 13/2009

IC	Inst	Align	Pre-insp	Start	BR	SP	V	E	C'	Y+X
QBQI.19R3										
QQBI.19R3										
QBBI.A20R3										
QBBI.B20R3										
QBQI.20R3	25/Mar									
QQBI.20R3	7/Apr									
QBBI.A21R3	7/Apr									
QBBI.B21R3	7/Apr									
QBQI.21R3	7/Apr									
QQBI.21R3	26/Mar	27/Mar	27/Mar							
QBBI.A22R3										
QBBI.B22R3	8/Apr									
QBQI.22R3	8/Apr									
QBQI.22R3										
QBBI.A23R3										
QBBI.B23R3										
QBQI.23R3										
QBBI.A24R3										
QBBI.B24R3										
QBQI.24R3										
QQBI.24R3	27/Mar	30/Mar	30/Mar							
QBBI.A25R3	27/Mar	30/Mar	30/Mar							
QBBI.B25R3										
QBQI.25R3	9/Apr									
QBQI.25R3										
QBBI.A26R3	3/Apr									
QBBI.B26R3	3/Apr									
QBQI.26R3										
IC	Inst	Align	Pre-insp	Start	BR	SP	V	E	C'	Y+X
QBQI.26R3										
QBBI.A27R3										
QBBI.B27R3										

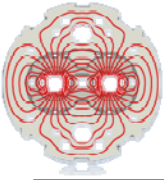
Current week	
Brazing	8
Spool	6
V	7
E	8

Week 13	
Brazing	8
Spool	6
V	7
E	8

	Done current week
	Done
	Started
	Blocked
	Blocked by NCR
	Next activities

- Good progression but need to clear NC issues fast
- find "correct" balance of Quality and productivity, specifically w.r.t. rest of the machine

Courtesy A. Musso



Tunnel News: first W closures

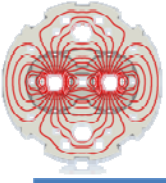
Planning fermeture IC
en remettant le 1-2
avant le 6-7.

Secteur	1-2	3-4	5-6	6-7	Total	Cumule
W13			2		2	2
W14			3		3	5
W15			3		3	8
W16			3		3	11
W17	2		2		4	15
W18	3		1		4	19
W19	6				6	25
W20	3			3	6	31
W21				6	6	37
W22		1		5	6	43
W23		6			6	49
W24		7			7	56
W25					0	56
W26					0	56
W27					0	56
TOTAL	14	14	14	14		

ELQA
CoolDown

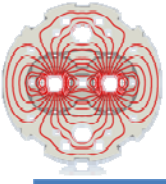
- Planning for closures with VSC
- W13: first 3 VAC subsectors pumping in 5-6 (A19R5, A23R5, A31R5)

Courtesy J.P. Tock



Tunnel News Week 13/2009

- 1-2: MB replacement work finished
- SAM work: all drilling (except 7-8 and 8-1) finished W13, good progress
- 4-5: triplet pressure relief holes in L5 machined
- 5-6: arc SSS He gauges finished
- 6-7: MB2303 disconnected and loaded, reinstallation ongoing
- Connection cryostats: work ongoing
 - more cuts for inspections in 3-4
 - evaluation of alternatives to Nomex
 - qualification tests for Nomex
 - **will have an impact on 5-6 schedule**



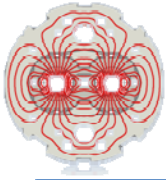
SAM News

Courtesy J. Mazet

MISE A JOUR le 01/04/2009 08h00

N°	Secur	Position	Decoupe soufflet	Decoupe ligne LD	Ouverture fond bombé	Remplacement capillaire	Test Reniflage	Soudure ligne LD	Test radiq/vidé ligne LD	Soudure soufflet	Soudure Bride 160	Ouverture MILI		Detection globale circuits interieur	Test global de l'enveloppe	Mise en place sonde Pw	Test en pression	Et sous vide			
												1	2								
10	S 2-1(A)	06 L1																			
		05 L1																			
		04 L1																			
		02 L1																			
15	S 1-2	02 P1			25/08						31/08	27/08									
		04 P1				5			vide												
		05 P1				15				vide											
		06 P1				4				vide											
		06 L2				2				vide											
		05 L2				3					vide										
		04 L2				26/08						31/08	30/08								
02 L2				26/08						31/08											
11	S 2-3	02 P2																	X		
		04 P2				12			vide										X		
		05 P2*				25				vide									X		
		06 P2*																			
		06 L3*				10														X	
24	S 3-4	06 P3				16															
		04 L4				27/08					01/04	31/08	31/03								
		03 L4				27/08						01/04	31/08	31/03							
		LUL4																			
		06 L4				1				Rev											
18	S 4-5	05 L4				9										08/08					
		LUP4																			
		03 P4																			
		04 P4																			
		05 P4																			
		06 P4				7				vide											
		06 L5*				18				vide											
		05 L5*				24				vide											
12	S 5-6	04 L5				8															
		02 P5																			
		04 P5				25/08						30/08	25/08	25/03							
		05 P5										27/0830	25/08	25/03							
14	S 5-6	06 P5				14															
		06 L6				6															
		05 L6										25/08									

OK



Pressure relief DN200 News

Schedule 19 MARCH						
Week	Total	Sector 1-2	Sector 3-4	Sector 5-6	Sector 6-7	Remarks
6	2		2			Surface
7	11		9			Surface
8	34	9	11	3		Surface &
9	87	20	16	12		Surface &
10	157	34	27	24		Surface &
11	269	41	5	30	26	
12	353			54	30	
13	428			45	39	
14	488				60	
15	565	30			13	
16	625	28	24			
17	672	6	74			
SUM		168	168	168	168	
Contract		DUBNA	All	S-107 DUBNA	S-107 S-108	

- 5-6: finished
- new plan includes holidays

OK

Courtesy JC. Perez