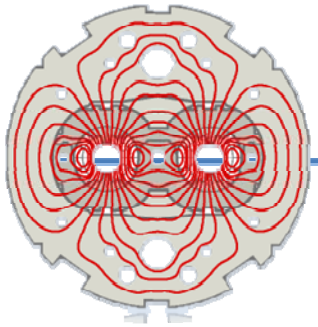


Status Report of Magnet Work Week 13 / 2009

Francesco Bertinelli – TE/MSC

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

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

“Ad-hoc EEWG” 24 March

- Need to handle electrical NC while production increases:
  - gaps: ~10% of cases, small, partial
  - ➢ quantify missing cross-section (20-30% OK)
  - ➢ try measure of electrical resistance

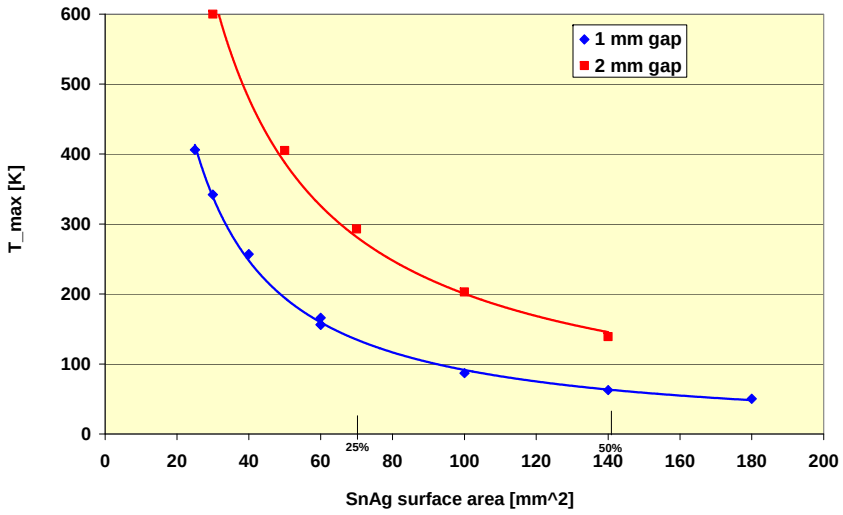
All values in microOhm

T=291 K

	0	1	2	4	8
0%	13.16	23.87	35.11	55.77	91.02
20%	12.69	13.63	13.75	13.82	13.86
40%	12.47	12.82	12.85	12.87	12.88
60%	12.35	12.52	12.54	12.54	12.55
80%	12.26	12.37	12.38	12.38	12.38
100%	12.21	12.27	12.28	12.28	12.28

T=293 K

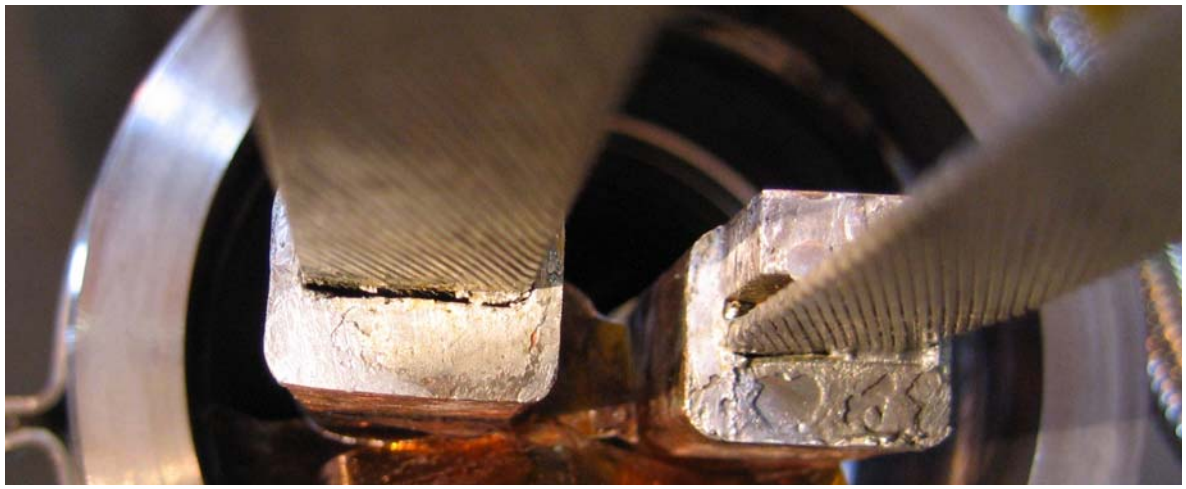
	0	1	2	4	8
0%	13.26	24.05	35.37	56.17	91.61
20%	12.79	13.72	13.85	13.91	13.95
40%	12.57	12.91	12.95	12.96	12.97
60%	12.44	12.61	12.63	12.64	12.64
80%	12.36	12.46	12.47	12.47	12.47
100%	12.30	12.37	12.37	12.37	12.37

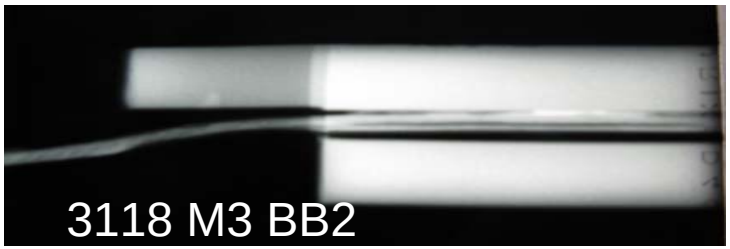


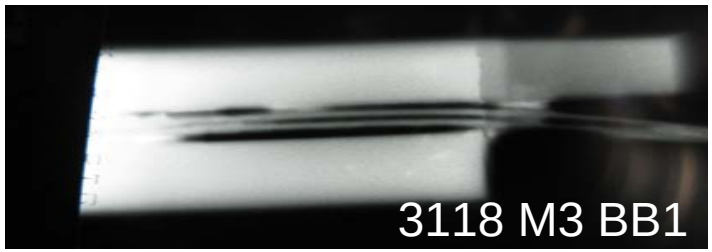
Courtesy A. Verweij, C. Scheuerlein

"Ad-hoc EEWG" 24 March

- Need to handle electrical NC while production increases:
  - missing solder near ends
  - ➢ if detected from visual inspection, then gamma rays
  - ➢ additional solder during IC, but end contact enough



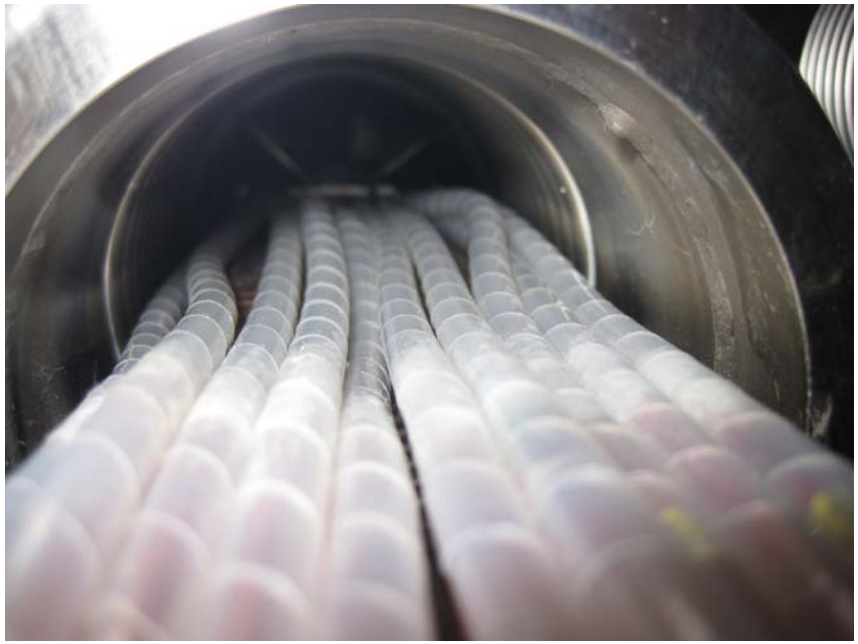




Courtesy C. Scheuerlein

“Ad-hoc EEWG” 24 March

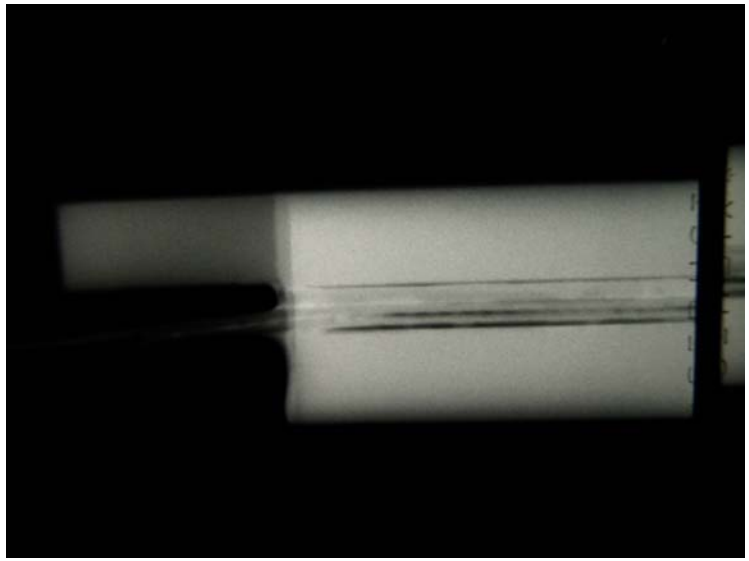
- Need to handle electrical NC while production increases:
  - spools “loose”, contact with stainless steel
  - ➢ pliozip, then glue
  - ➢ seek improvement, but not cut to re-weld



Courtesy C. Scheuerlein

“Ad-hoc EEWG” 24 March

- Recommendation on SSS006:
  - intervention on both ends (with copper shim)
  - special attention to make IC splice with zero gap
  - installation possible (W15)
- Lucio’s preference not to install: use SSS 344 instead (W18)



Courtesy H. Prin

Other Surface News

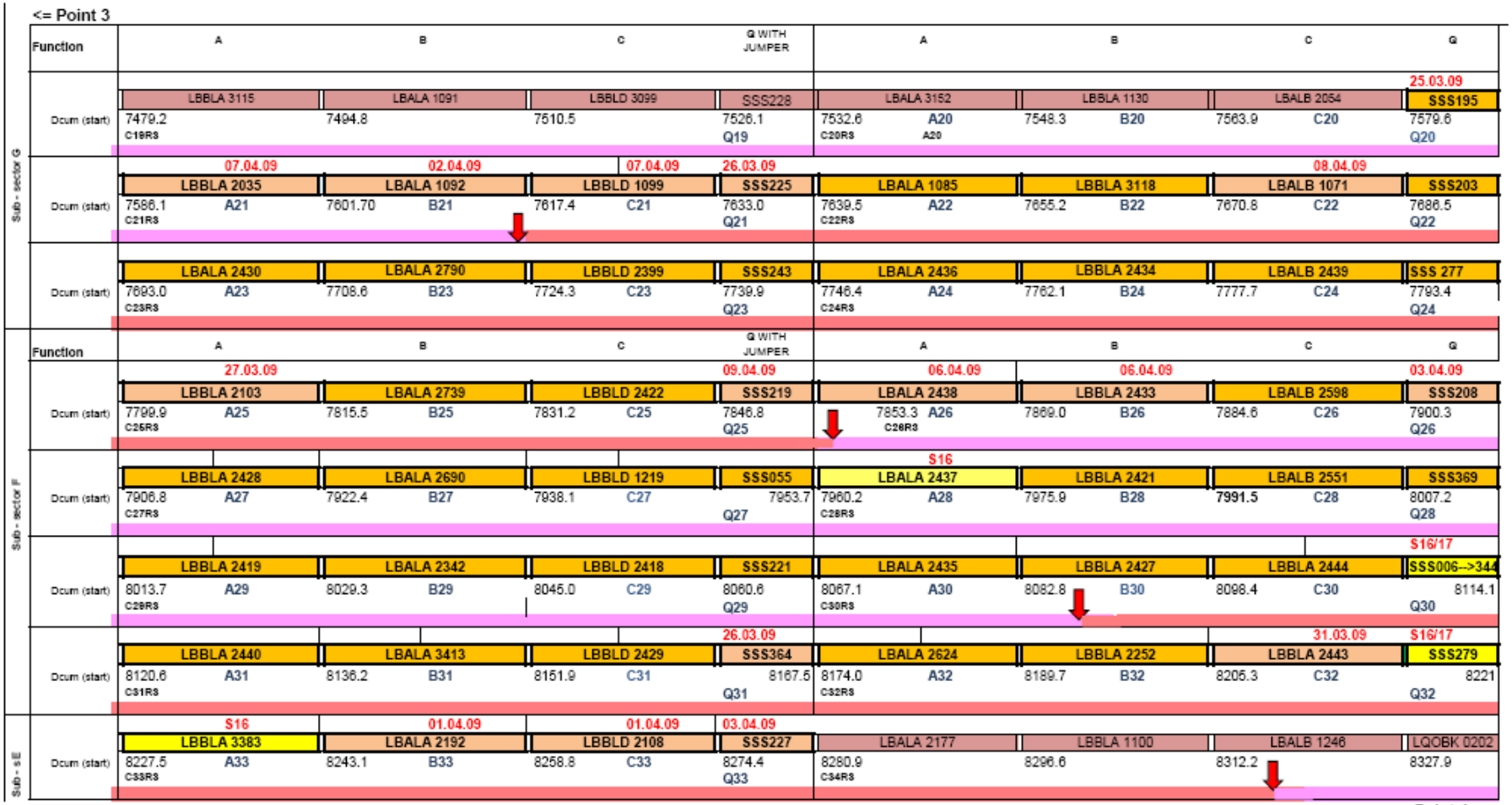
- MB3383: splice resistance measurements OK
- SSS279 has 1 week delay, now planned end W17-start W18
  - but with cold testing in series with SSS344 (a few days to a week) could become W19
  - ➢ direct impact on 3-4 schedule

Installation Week 13/2009

Secteur 3-4

Situation semaine 13/09 (au 26.03.09)

Réinstallation des aimants semaines 14 (30.03.09 au 03.04.09) et 15 (06.04.09 au 09.04.09) + 16-17/09



Courtesy H. Gaillard

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

Courtesy A. Musso

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

3-4 Complete detailed Planning

SEC	Inter. number	IC from magnet installation	IC Survey Alignment	IC Pre-inspection	Weld V1 V2	VAC test V1 V2	Sold. Main Bus bars	QC Inspection and US measurements	Ins. Main bus bars	Us weld spool	Insulate spool	PAQ	weld Y line	Y leak test	weld X line	VAC test X line
	QBBI.B24R3				V08	V15iii	V09 T1	V10	V10	V11		V12	V10	V11	V14	V16
	QBQI.24R3				V08	V15iii	V15ii	V15ii	V15ii	V15ii	V15ii		V10	V11	V14	V16

SEC	Inter. number	VAC test K1, K2, C' line	weld M1,M2	weld M3	insert N line	cabling N line	HVQN	AIV 1	MPAQ	MHVQN	Weld N line sleeve	US weld N line	AIV 2	M to N weld	Insul. N line	Weld N sleeve	Wire N line Thermometer	IC certification and inspection before closure	Place MLI	Close V
	QBBI.B24R3	V18	V14	V14	V13i		V17iii	V20i	V20iii	V21iii	V20ii		V21i				V22ii	V23	V23	V23
	QBQI.24R3		V21				V17ii		V20iii	V21iii		V20ii		V22i	V21ii	V22i	V22ii	V23	V23	V23
	QQBI.24R3	V20	V16	V17	V17i		V19iii	V20i	V20iii	V21iii	V20ii		V21i							
	QBBI.A25R3	V20	V16	V17	V17i		V19iii	V20i	V20iii	V21iii	V20ii		V21i							
	QBBI.B25R3	V20	V16	V17	V17i		V19iii	V20i	V20iii	V21iii	V20ii		V21i				V22ii	V23	V24	V24
	QBQI.25R3																			
	QQBI.25R3																			
	QBBI.A26R3																			
	QBBI.B26R3																			
F	QBQI.26R3																			
	QQBI.26R3																			
	QBBI.A27R3																			
	QBBI.B27R3																			
	QBQI.27R3																			
F	QQBI.27R3																			
	QBBI.A28R3																			
	QBBI.B28R3																			
	QBQI.28R3																			
	QQBI.28R3																			
	QBBI.A29R3																			
	QBBI.B29R3																			
	QBQI.29R3																			
	QQBI.29R3																			
	QBBI.A30R3																			
	QBBI.B30R3																			
	QBQI.30R3																			
	QQBI.30R3																			
	QBBI.A31R3																			
	QBBI.B31R3																			
	QBQI.31R3																			
	QQBI.31R3																			
	QBBI.A32R3																			
	QBBI.B32R3																			
	QBQI.32R3																			
	QQBI.32R3																			
	QBBI.A33R3																			
	QBBI.B33R3																			
E	QBQI.33R3																			

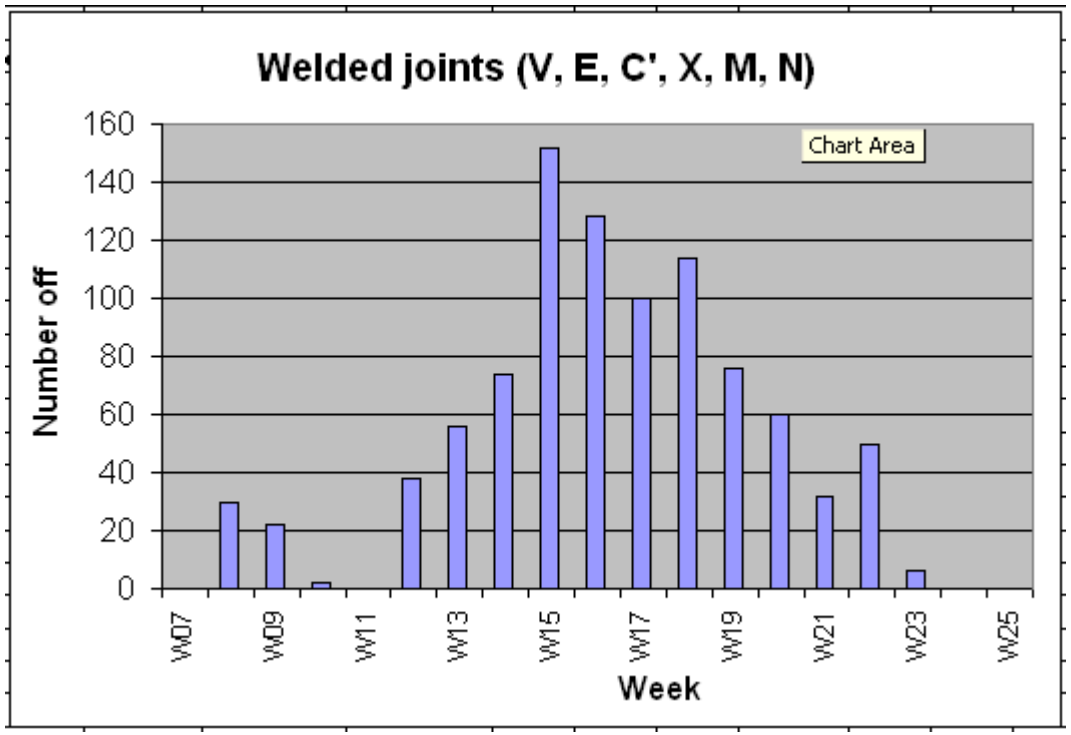
Inter. number	QUAD	weld LD1	weld Ld2	test LD1-LD2 line	test X line	inject He	Weld CY	Weld XB	Vac test CY-XB	test K C'	Inj. He2	Weld KD1	Weld KD2	Weld CC'	Vac test KD1-KD2-CC'	Place MLI	Close Jumper
QBQI.7R3	Q7R3	19/06/2007	[illegible]	25/06/2007	0	########	########	########	[illegible]	39288	########	########	########	########	########	########	########
QBQI.9R3	Q9R3	19/06/2007	[illegible]	25/06/2007	0	########	########	########	25/06/2007	39288	########	########	########	########	########	########	########
QEQI.11R3	Q11R3	19/06/2007	19/06/2007	25/06/2007	0	########	########	########	25/06/2007	39288	########	########	########	########	########	########	########
QBQI.13R3	Q13R3	26/03/2007	[illegible]	29/03/2007	0	########	########	########	29/03/2007	39147	########	########	########	########	########	########	########
QBQI.15R3	Q15R3	22/03/2007	22/03/2007	28/03/2007	0	########	########	########	28/03/2007	39147	########	########	########	########	########	########	########
QBQI.17R3	Q17R3	21/03/2007	[illegible]	28/03/2007	0	########	########	########	28/03/2007	39147	########	########	########	########	########	########	########
QBQI.19R3	Q19R3	21/03/2007	21/03/2007	27/03/2007	0	########	########	########	27/03/2007		########	########	########	########	########	########	########
QBQI.21R3	Q21R3	V20		V21	V18		V19	V19	V20	V19		V20	V20	V20	V21	V22	V22
QBQI.23R3	Q23R3	V19	V19	V20	V16		V17	V17	V18	V18		V19	V19	V19	V20	V21	V21
QBQI.25R3	Q25R3	V21		V22	V19		V20	V20	V21	V20		V21	V21	V21	V22	V23	V23
QBQI.27R3	Q27R3	V21	V21	V22	V19		V20	V20	V21	V20		V21	V21	V21	V22	V23	V23
QBQI.29R3	Q29R3	V20		V21	V19		V20	V20	V21	V17		V18	V18	V18	V19	V22	V22
QBQI.31R3	Q31R3	V20	V20	V21	V19		V20	V20	V21	V19		V20	V20	V20	V21	V22	V22
QBQI.33R3	Q33R3	V21		V22	V18		V19	V19	V20	V20		V21	V21	V21	V22	V23	V23
QBQI.34L4	Q33L4	07/03/2007	[illegible]	13/03/2007	0	########	########	########	13/03/2007	39120	########	########	########	########	########	########	########
QBQI.32L4	Q31L4	01/03/2007	01/03/2007	03/03/2007	0	########	########	########	03/03/2007	39120	########	########	########	########	########	########	########
QBQI.30L4	Q29L4	07/03/2007	[illegible]	13/03/2007	0	########	########	########	13/03/2007	39120	########	########	########	########	########	########	########
QBQI.28L4	Q27L4	06/03/2007	01/03/2007	08/03/2007	0	########	########	########	08/03/2007	39120	########	########	########	########	########	########	########
QBQI.26L4	Q25L4	01/03/2007	[illegible]	08/03/2007	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	39115	########	########	########	########	########	########	########
QBQI.24L4	Q23L4	06/03/2007	06/03/2007	13/03/2007	0	########	########	########	13/03/2007	39094	########	########	########	########	########	########	########
QBQI.22L4	Q21L4	05/03/2007	[illegible]	08/03/2007	0	########	########	########	08/03/2007	39094	########	########	########	########	########	########	########
QBQI.20L4	Q19L4	01/03/2007	01/03/2007	06/03/2007	0	########	########	########	06/03/2007	39094	########	########	########	########	########	########	########
QBQI.18L4	Q17L4	05/03/2007	[illegible]	09/03/2007	0	########	########	########	09/03/2007	39094	########	########	########	########	########	########	########
QBQI.16L4	Q15L4	01/03/2007	01/03/2007	06/03/2007	0	########	########	########	06/03/2007	39094	########	########	########	########	########	########	########
QBQI.14L4	Q13L4	26/03/2007	[illegible]	30/03/2007	0	########	########	########	30/03/2007	39094	########	########	########	########	########	########	########
QBQI.12L4	Q11L4	27/03/2007	27/03/2007	02/04/2007	0	########	########	########	02/04/2007	0	########	########	########	########	########	########	########
QQBI.9L4	Q9L4	28/03/2007	[illegible]	02/04/2007	39224	########	########	########	02/04/2007	39218	########	########	########	########	########	########	########
QBQI.8L4	Q7L4	26/04/2007	26/04/2007	27/04/2007	0	########	########	########	27/04/2007	39218	########	########	########	########	########	########	########

3-4: Activities after last magnet in place

	"IC half-cell"				SSS Q30		MB A31			MB B31			MB C31			
	IC name			QBQI		QBQI		BBI.A			BBI.B			QBQI		

	IC name	QBQI.26R	SSS Q26	QQBI.26R	MB A27 R	QBBI.A27R	MB B27 R	QBBI.B27R	MB C27 R	QBQI.27R	SSS Q27 with jumper	QQBI.27R	MB A28 R	QBBI.A28R	MB B28 R	QBBI.B28R	MB C28 R	QBQI.28R	SSS Q28	QQBI.28R	MB A29 R	QBBI.A29R	MB B29 R	QBBI.B29R	MB C29 R	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		W18		
6	He leak test Y line											W17		W17		W17		W17		W17		W17				
7	X: TIG weld											W18		W18		W18		W18		W18		W18		W18		
8	He leak test X line											W19		W19		W19		W19		W19		W19		W19		
9	Jumper lines CY and XB: TIG welding									W20																
10	He leak test 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 leak test KC' line			W20		W20		W20		W20		W20		W20		W20										
16	Jumper lines KD1, KD2, CC': TIG welding									W21																
17	He leak test KD1, KD2, CC'									W22																
18	Jumper lines LD1, LD2: TIG welding									W21																
19	He leak test LD1, LD2									W22																
20	Mount MLI									W23																
21	Position Z bellows									W23																
22	Z: TIG welding									W23																

3-4: Resource usage



Plus other orbital welds:

- K welds
- jumper welds (W19, 20, 21)
- PIMs outside D area (~ 180 welds)
- 6-7

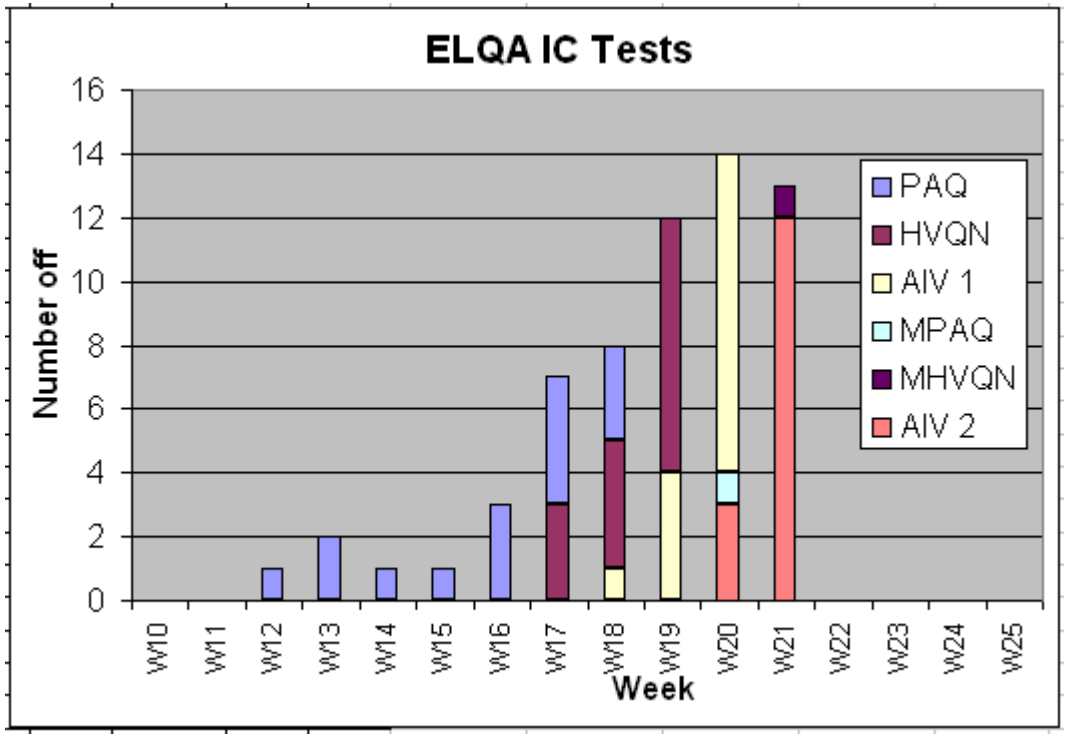
4 TIG orbital teams (x2 MSC and x2 MME)

- ~120 welded joints per week

Proposal (QA impact): manual welding instead of orbital welding

Institut de Soudure for visual control

3-4: Resource usage



- W20 – W21: may need to prepare for "horaire decale" (6h to 14h, 14h to 22h) to minimise coactivity between AIV1 and welding teams

Or: weld outside D area.

- starting W14, 9h work days to reduce impact of lost holidays

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: V 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

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

Courtesy JC. Perez