

- **Sector by sector**
- **Technical issues : SSS-500 & PIM**
- **DFBs interconnections**
- **Inner triplets**
- **DS zones (dedicated presentation by C Vollinger)**
- **Conclusion**

Work done by the whole MCS-IC section in collaboration with MCS-ET, MCS-SC, AT-MEL, AT-VAC, TS-IC, TS-SU, ... and IEG (F523 Contract) and especially :

LSSs

C Garion / I Slits

DS

T Colombet / C Vollinger / P Galbraith

DFBA / DFBM

F Laurent

DFBL / Cryo ext / WRL

I Slits

Arcs

P Fessia, A Musso, M Struik, C Vollinger (1...7)

A Poncet (7-8)

F Bertinelli (8-1)

MARIC

Progress status of the LHC interconnections

Sector 1-2

- IC works should start Mid of April 2007: Delay of a few weeks
BUT : 20 weeks allocated in the schedule ; never achieved so far and looks not possible with the present resources (same for 6-7)
- Work foreseen on Fridays to consolidate the schedule and avoid any additional delay in the start of sector 1-2

Sector 2-3

- About 200 ICs are available for IEG
- 120 IC with beam lines connected (Installation has been resumed for 2 weeks)
- 120 IC with busbars connected.
- Line N interconnection is going on.
- Delay of 4 to 5 weeks : Work on Fridays ; see 1-2

Sector 3-4

- Interconnection of inner lines at more than 95 %
- Line N inserted everywhere ; closure of line N is on-going
- 75/212 ICs are closed

Progress status of the LHC interconnections

Sector 4-5

- Interconnection of inner lines completed except 2 (DS zones)
- Line N inserted in the whole sector including DS4R and 5L ; and closed everywhere except in DS zones
- IC closure is on-going :
 - 175/212 done (83%) everywhere except DS zones
 - 10/14 vac sectors closed all but DS zones
- Should be on time for pressure test on 21-22/4 (except if impact of SSS-500)

Sector 5-6

- Interconnection of inner line is well advanced (90 %)
- Line N insertion is completed ; interconnection is going on
- DS6R IFS : Problem solved ; impact on DS interconnections

Progress status of the LHC interconnections

Sector 6-7

- Interconnection of inner lines is progressing with 2 teams in production
 - PIMs are NOT installed in this sector
- BUT : 20 weeks allocated in the schedule ; never achieved so far and looks very difficult (same for 1-2)

Sector 7-8

- See further presentations
- Interventions after warm-up are under study for next summer

Sector 8-1

- IC closure is progressing (> 50%)
- Work is also going on in the DS regions

Progress status of the

SSS 500 Series [Work done by R Lopez]

Origin :

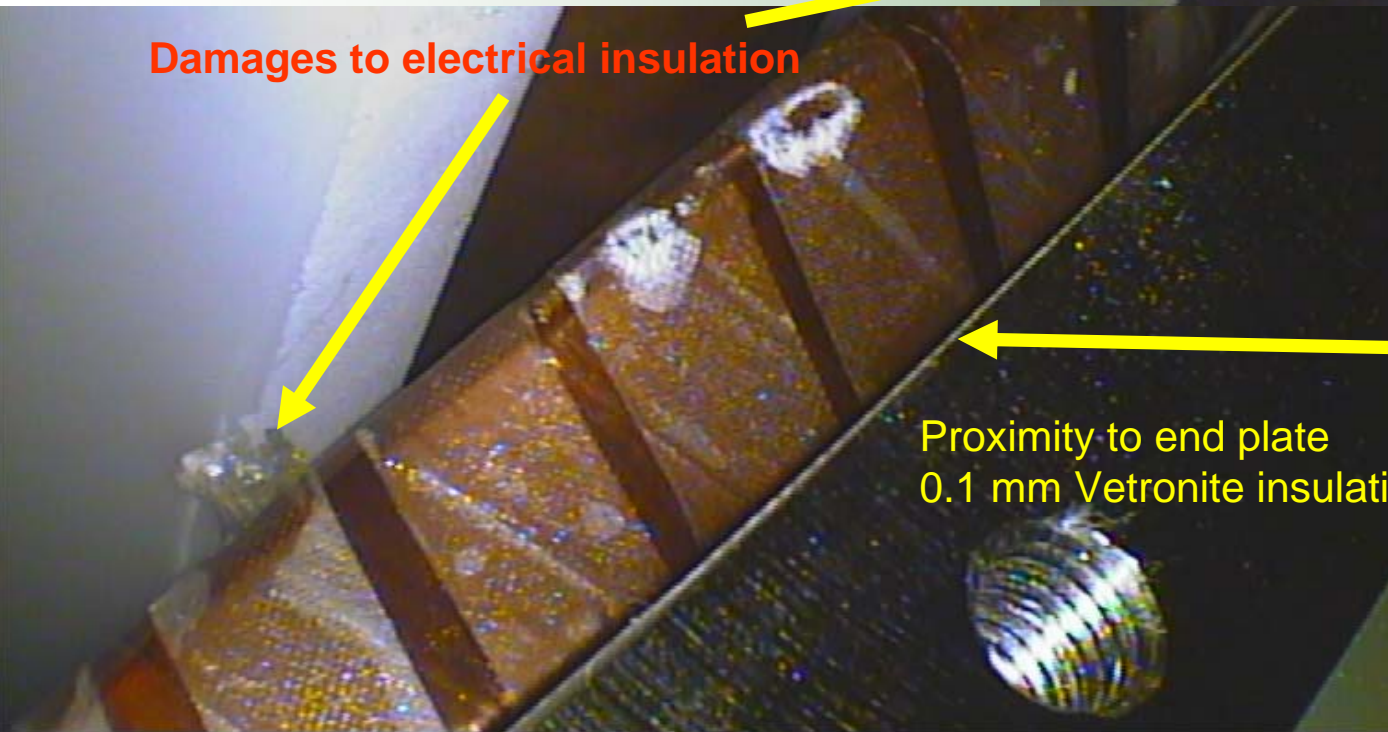
SSS514 Q9R3 :

PAQ revealed a short to
ground

- * Defocusing
- * Without corrector



Damages to electrical insulation



Proximity to end plate
0.1 mm Vetronite insulation

Progress status of the LHC interconnections

SSS 500 Series [Work done by R Lopez]

	Without Corrector	With Corrector
Focusing	Case 1	Case 2
Defocusing	Case 4	Case 3

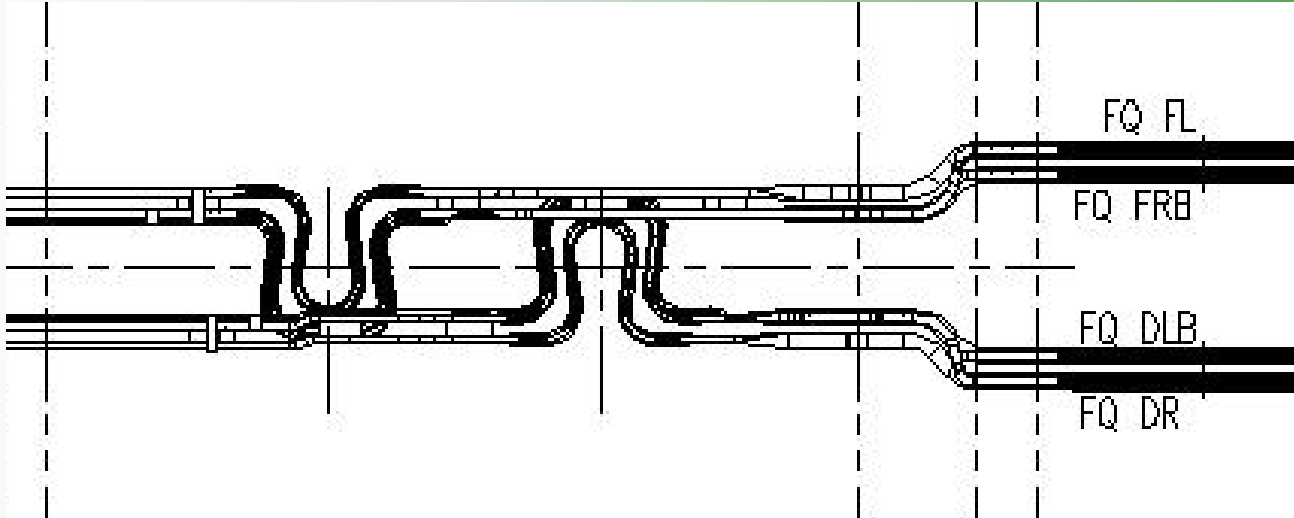
More pictures :

<G:\Departments\AT\Groups\CRI\SSA\PhotoTunnelRoberto\busbarsinvest>

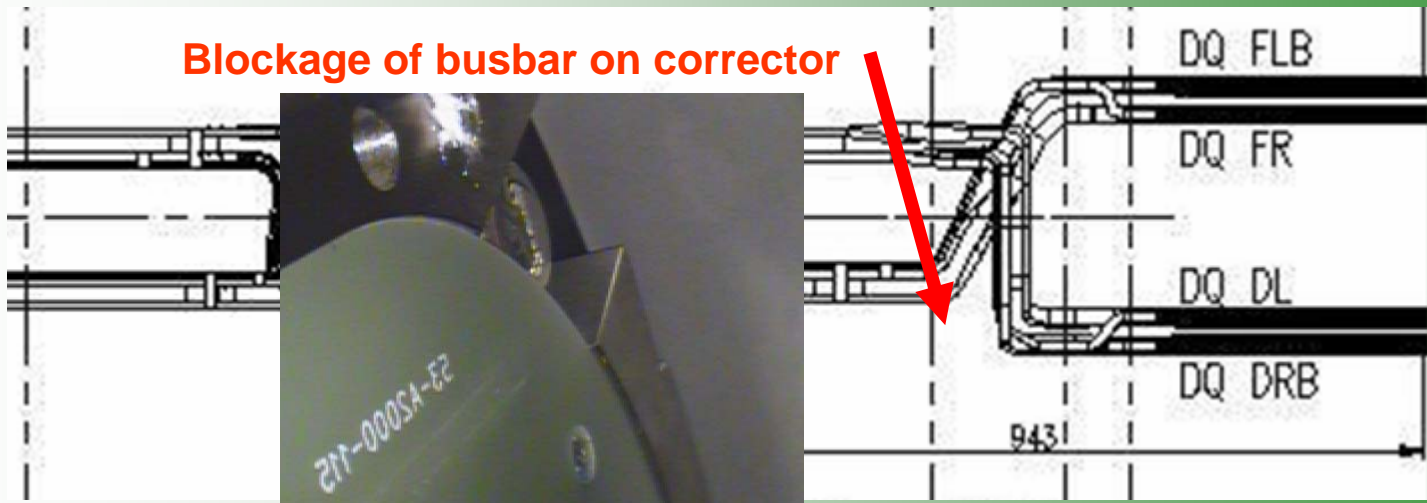
Progress status of the LHC interconnections

SSS 500 Series

Focusing / Defocusing



Blockage of busbar on corrector

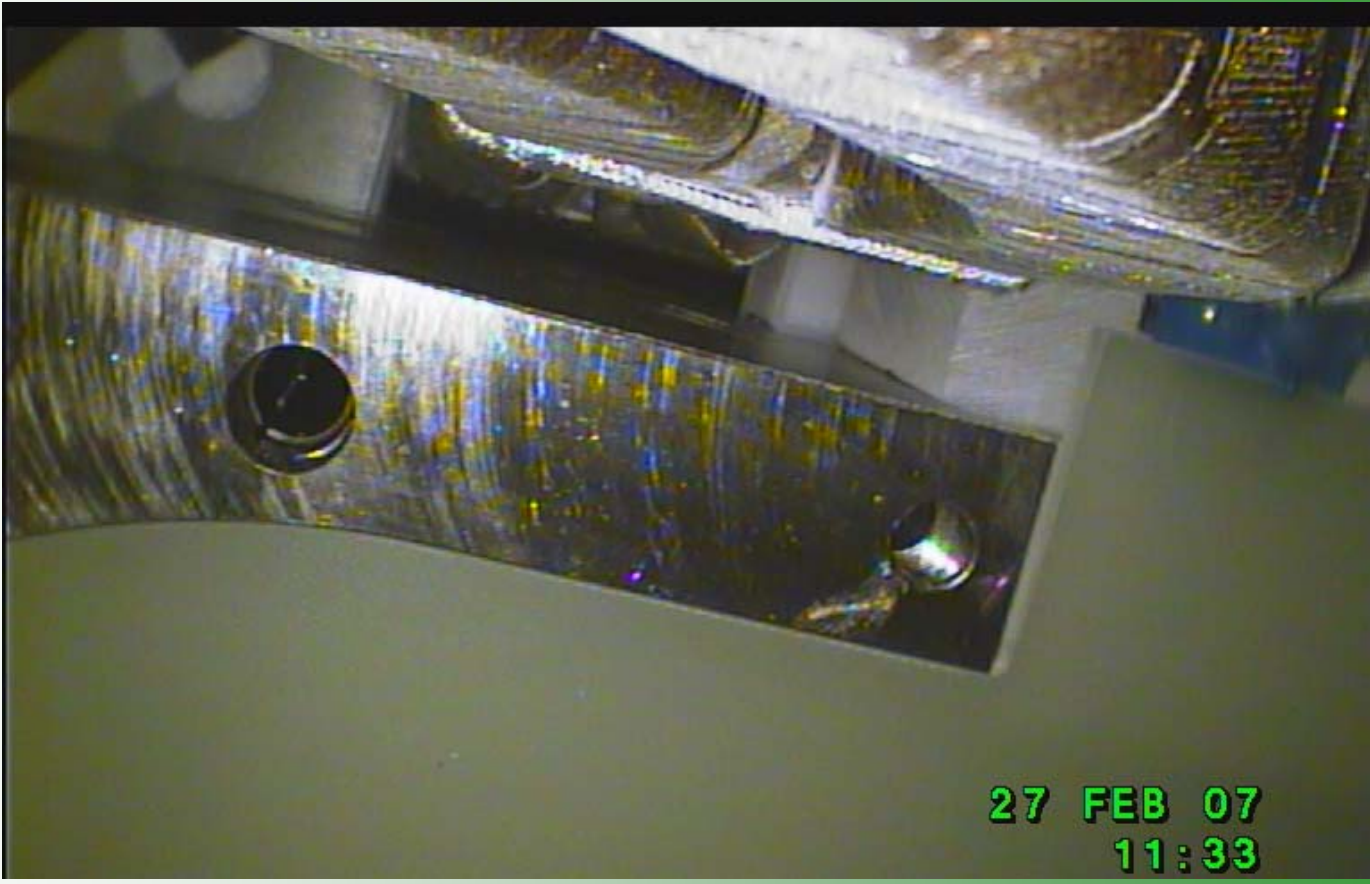


Progress status of the LHC interconnections

SSS 500 Series

Case 1 :

- * Focusing
- * Without corrector



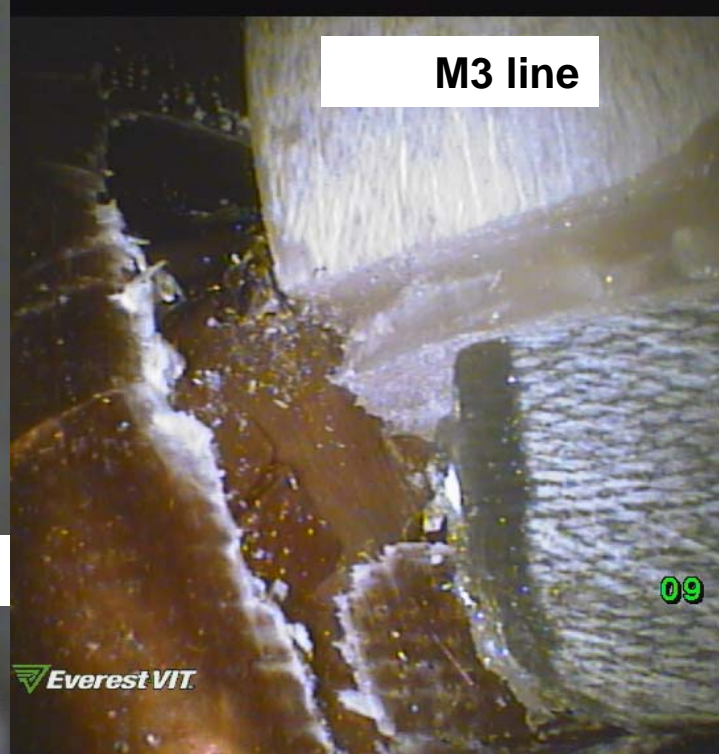
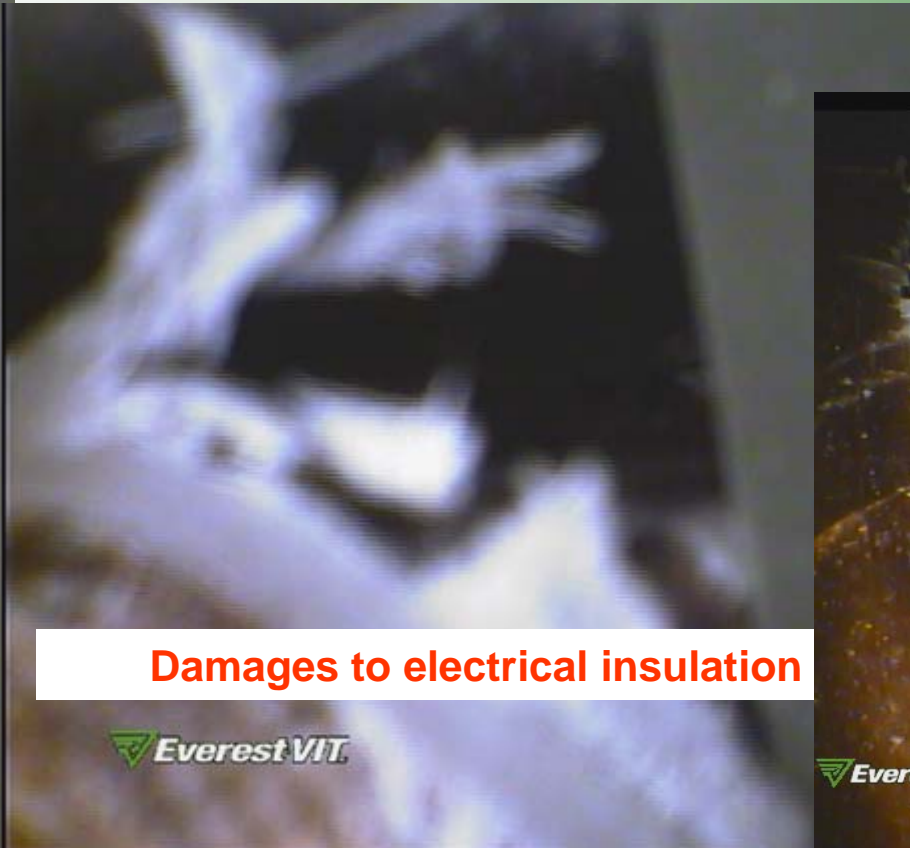
Progress status of the LHC interconnections

SSS 500 Series

Case 2 :

- * Focusing
- * With corrector

Endoscopic examination of 530 not yet interconnected but at IC extension

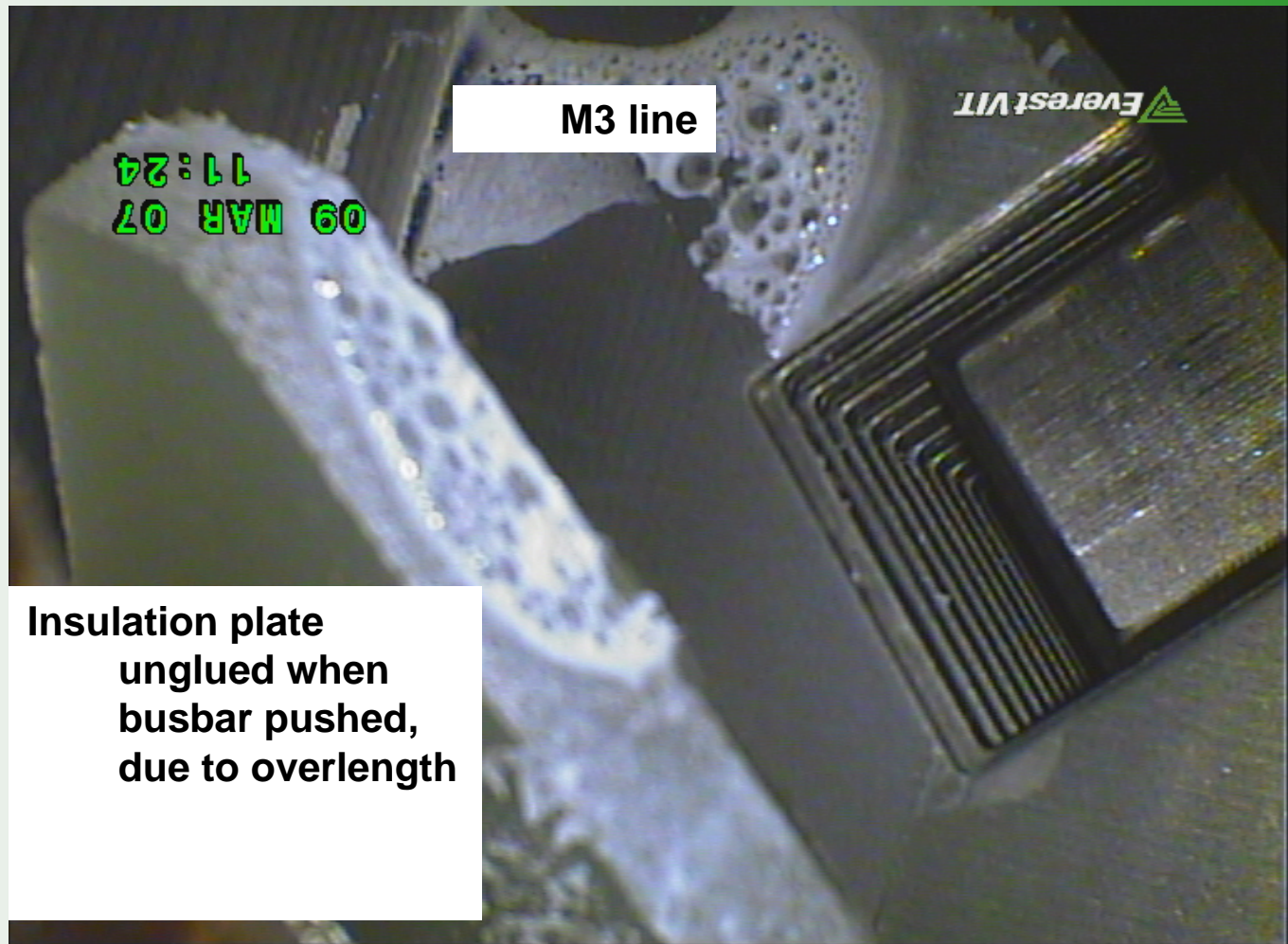


Progress status of the LHC interconnections

SSS 500 Series

Case 3 :

- * Defocusing
- * With corrector



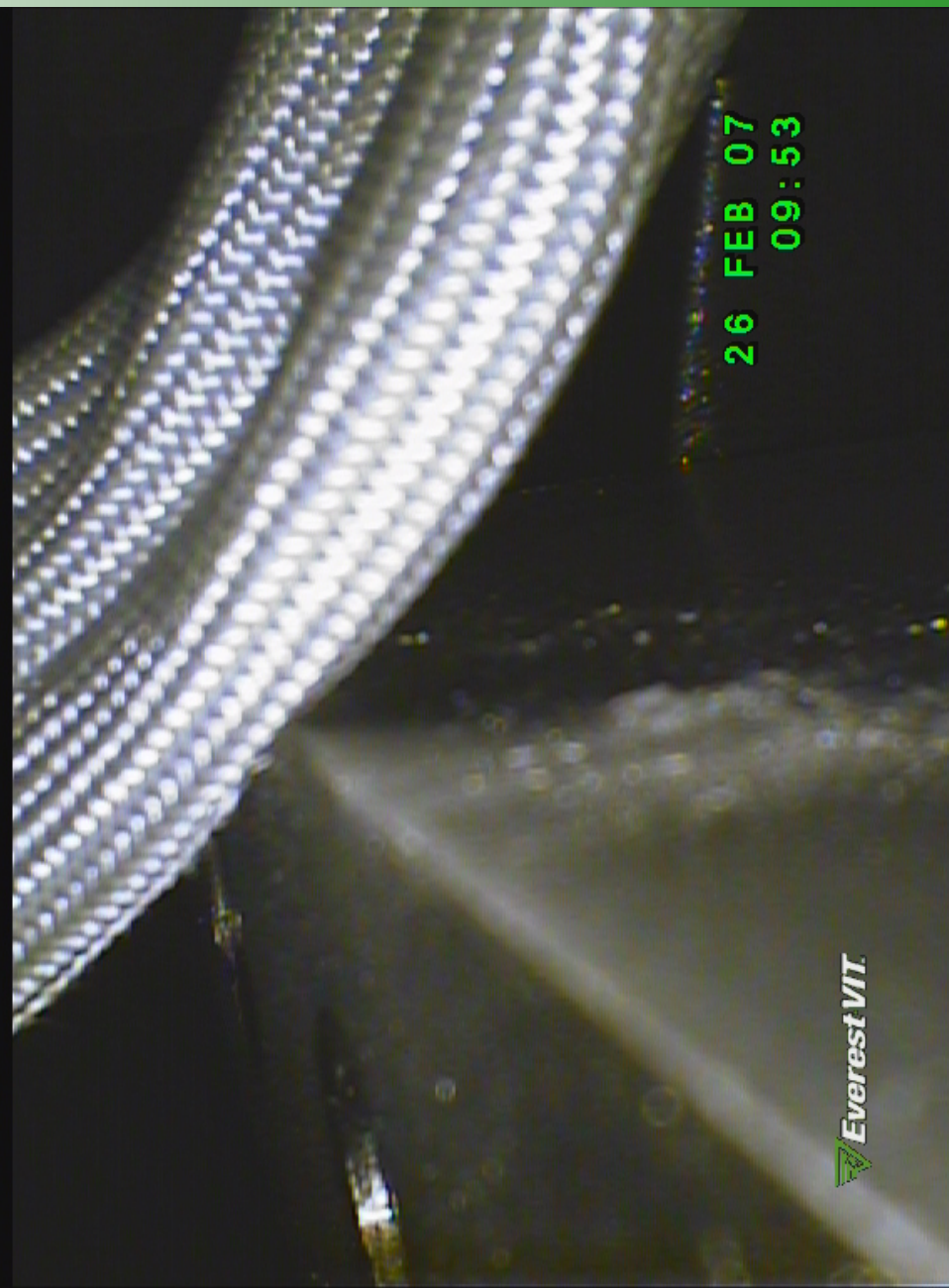
**Insulation plate
unglued when
busbar pushed,
due to overlength**

Progress status of the LHC interconnections

SSS 500 Series

Case 4 :

- * Defocusing
- * Without corrector
- * Q9R3 same as 514



Progress status of the LHC interconnections

SSS 500 Series [32 SSSs are concerned]

Conclusions :

Drawing analysis shows that busbars are too long by 40 mm

Case 1 : (# 8)

- * Use as is for already interconnected (# 4)
- * Shorten busbars by 40 mm for not yet IC (# 4)

Case 2 : (# 12)

- * To be repaired for already interconnected (# 7)
- * Shorten busbars by 40 mm for not yet IC (# 5)

Case 3 : (# 4)

- * To be repaired for already interconnected (# 2)
- * Shorten busbars by 40 mm for not yet IC (# 2)

Case 4 : (# 8)

- * To be repaired for already interconnected (# 6)
- * Shorten busbars by 40 mm for not yet IC (# 2)

Progress status of the LHC interconnections

SSS 500 Series

On-going actions

- Meeting tomorrow with specialists to finalise repair actions ; never done before
- Visit scheduled to Accel to witness the last DS cold mass assembly
- No impact on arc SSSs

No	Position	Sector	Installed	cas
501	Q7L3	2-3	YES	1
506	Q9R7	7-8	YES	1
509	Q9L3	2-3	YES	1
511	Q7R7	7-8	YES	1
513	Q8R3	3-4	YES	1
515	Q10R3	3-4	YES	1
516	Q10L7	6-7	NO	1
518	Q8L7	6-7	YES	1
502	Q11L3	2-3	YES	2
503	Q11R8	8-1	YES	2
507	Q11L8	7-8	YES	2
508	Q11R7	7-8	YES	2
521	Q11R1	1-2	YES	2
522	Q11L2	1-2	NO	2
523	Q11R2	2-3	NO	2
524	Q11L1	8-1	YES	2
527	Q11R4	4-5	YES	2
528	Q11L5	4-5	YES	2
529	Q11R5	5-6	NO	2
530	Q11L6	5-6	NO	2
525	Q11R3	3-4	YES	3
526	Q11L4	3-4	YES	3
531	Q11R6	6-7	YES	3
532	Q11L7	6-7	YES	3
504	Q10R7	7-8	YES	4
505	Q8R7	7-8	YES	4
510	Q10L3	2-3	YES	4
512	Q7R3	3-4	YES	4
514	Q9R3	3-4	YES	4
517	Q9L7	6-7	YES	4
519	Q7L7	6-7	NO	4
520	Q8L3	2-3	YES	4

Status of the LHC interconnections

By sectors:

- 4-5 : 2 cases 2 to be repaired
- 3-4 : # 6 ; 4 to be repaired
- 5-6 : 2 cases 2 to be repaired
- 2-3 : # 6 : 4 to be repaired
- 6-7 : # 6 : 4 to be repaired
- 1-2 : 2 cases 2 to be repaired
- 8-1 : 2 cases 2 to be repaired
- 7-8 : # 6 : 4 to be repaired

This could delay closure of 4-5 and 3-4 by ... a certain time Sector 7-8 ? (2 cases 2)

Progress status of the LHC interconnections

Plug-in modules

- Due to missing PIMs, they are not installed in 1-2 and 6-7
Date of last delivery is not yet confirmed (June ?)
- Interconnection sequence adapted (PIM installed in a second phase) so more displacements and not optimum
- A lot of damages are noticed ;
 - New protection procedure defined and applied
 - Acceptable defect when delivered are to be defined
 - Tests to calibrate acceptable damages are going on
 - Small number of spares so cut a limited quantity

Progress status of the LHC interconnections DFBL

- 5 L (DFBLD)

* Work is going on on DFBL/DSL interconnection (preparation of extremities for connection)

- Repartition of wires not conform in the cables

	Cable 1			Cable 2			Cable 3			Cable 4		
DFBLA	D2.A	D2.B	Q6.A	Q6.B	Q6.C	nu	Q4.A	Q4.B	Q4.C	Q5.A	Q5.B	Q5.C
DFBLB	D2.A	D2.B	Q6.A	Q6.B	Q6.C	nu	Q4.A	Q4.B	Q4.C	Q5.A	Q5.B	Q5.C
DFBLD	D2.A	D2.B	Q6.A	Q6.B	Q6.C	nu	Q4.A	Q4.B	Q4.C	Q5.A	Q5.B	Q5.C
DFBLE	D2.A	D2.B	nu	Q6.A	Q6.B	Q6.C	Q4.A	Q4.B	Q4.C	Q5.A	Q5.B	Q5.C

From A Perin

Decision to be taken tomorrow to avoid delaying the interconnection work ;
If repair or correction required, this will have an impact.

Progress status of the LHC interconnections DFBL

- 5 R (DFBLE)

Electrical interconnection is going on ;
Thermal shield missing on DSLE at DFBLE
extremity
To be put in place by ACR/Criotec?

- Point 3 (DFBLC)

Work to be started next week
As soon as greenlight is given



Progress status of the LHC interconnections Inner Triplets

- 5 L :

- * M4 bellows are under installation
- * New heat exchanger tubes to be inserted this week (MEL)
- * H pieces are ready for 5 Left

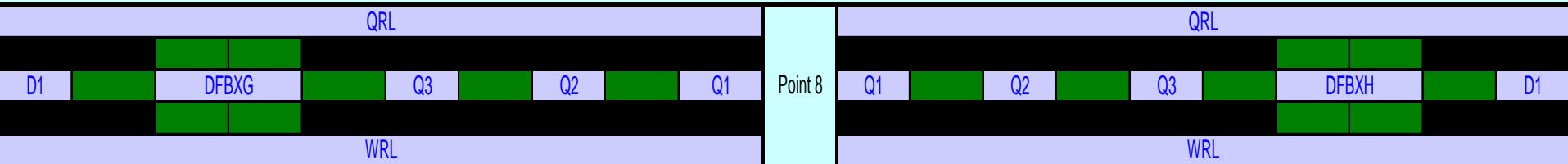
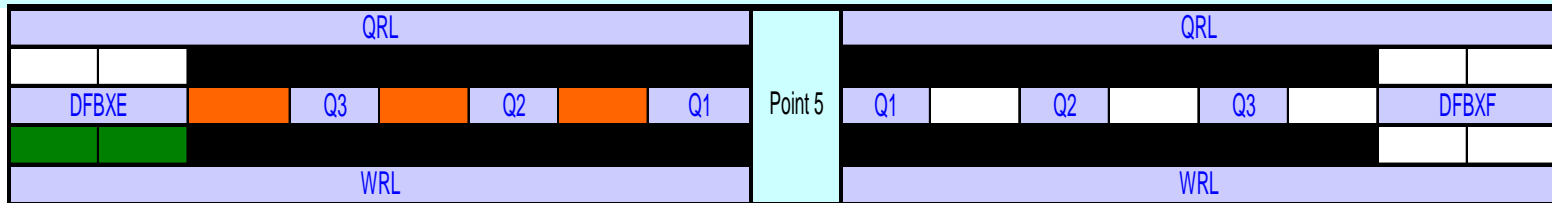
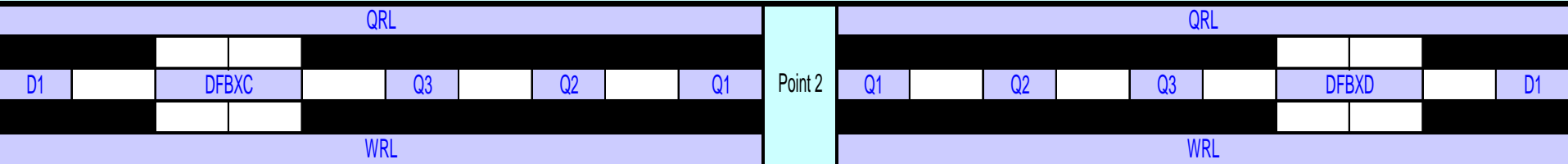
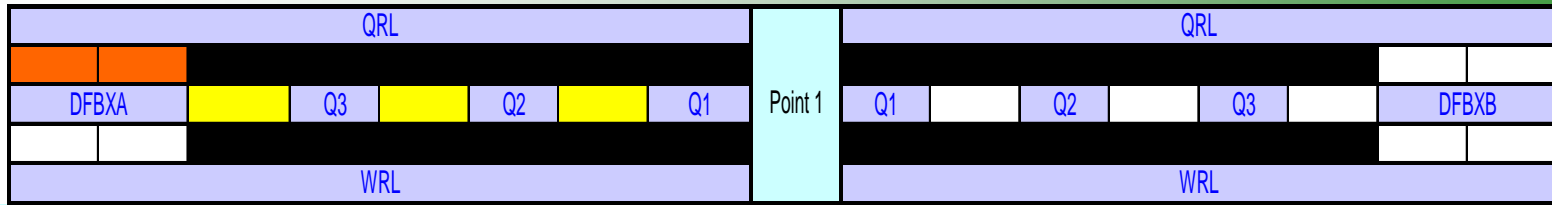
- 5R

- * IC works is going on in 5R (electrical connections) ; not priority

- Other locations :

- * Preparation of extremities (cutting) is completed everywhere
- * 8L repair to be scheduled with warm-up of 7-8

Progress status of the LHC interconnections Inner Triplets



Cryomagnet IC

Jumpers

Courtesy of O Denis

	not started
	electrical
	vacuum
	cryogenic
	closure

	not started
	in progress
	closure

Overall progress : 38 %

Progress status of the LHC interconnections

Overall progress in LSSs

* Cryomagnet IC : # 40

15 are completed ; 10 are in progress ; 15 not started
(Not taking triplet repair into account; 8L&R are completed)

* Jumpers : # 92

33 are completed ; 14 are in progress ; 45 not started
(Double jumpers count for 2 units)

* DFBLs : # 23

12 are completed ; 7 are in progress ; 4 not started

* DFBLs : # 21

5 are completed ; 5 in progress ; 11 not started

* HCM/LCM/Q6 : # 15

3 are completed ; 4 are in progress ; 8 not started
(Various difficulties / linked to DS)

Progress status of the LHC interconnections

Conclusions

- * Necessity to have additional workforce (IEG on Fridays as a first step) even if not optimised cost to face aleas in the arcs
- * SSS-500 : Could have a huge impact on sectors 4-5 and 3-4 completion , repair actions not yet finalised
- * PIMs : situation to be cleared ; could be critical
- * Triplets : Repair of 5L started...
Should be OK with proposed schedule
- * DFBMs : Progress according to availability (About 55 %)
- * DFBLD : Status about wires distribution to be given
- * DS zones : See C Vollinger's presentation
Many teams involved : MCS, MEL, VAC, IEG, ICIT,...