

- **Sector by sector**
- **DFBs interconnections**
- **LSS : Jumpers and cryomagnets**
- **Inner triplet heat exchanger**
- **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 :*

<i>LSSs</i>	<i>C Garion / I Slits</i>
<i>DS</i>	<i>T Colombet</i>
<i>DFBA / DFBA</i>	<i>F Laurent</i>
<i>DFBL / Cryo ext / WRL</i>	<i>I Slits</i>
<i>Arcs</i>	<i>P Fessia, A Musso, M Struik, C Vollinger (1...7)</i>
	<i>F Seyvet (7-8)</i>
	<i>F Bertinelli (8-1)</i>

# Progress status of the LHC interconnections

## Sector 1-2

- Preparation of jumpers completed end of this week (W49)
- IC works should start en of March 2007

## Sector 2-3

- Interconnections started W51 with 2 reduced teams
- Detailed planning is available ; delay in the starting phase
- About 100 ICs are available for IEG
- Some resources (TIG) in sector 8-1

## Sector 3-4

- Interconnection of inner lines at more than 90 %
- Line N insertion according to schedule
- One SSS due to be brought back to surface due to damaged beam screen  
SSS233 – NC801739 (IEG error)
- Passage to be free everyday for transport of warm magnets to pt 3  
Impact is to be minimised but will be present

# Progress status of the LHC interconnections

## Sector 4-5

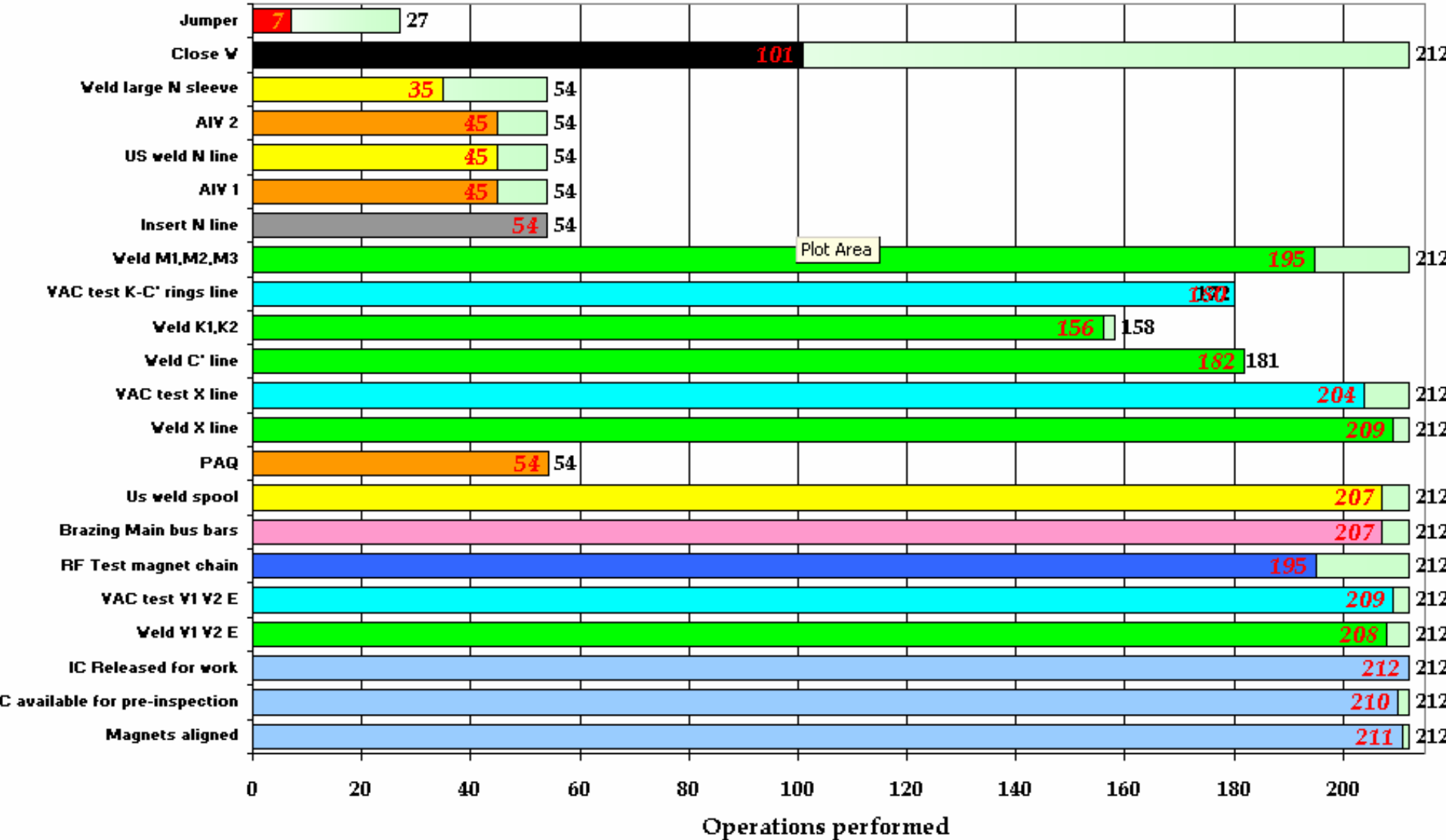
- Interconnection of inner lines completed except 5 that are open for tests and in DS zones (coactivity to manage)
- Line N inserted in the whole sector including DS4R and 5L
- IC closure has started (About 100 done but only one VAC sector)

See snapshot next page

# Progress status of the LHC interconnections

## Sector 4-5

Sector 4-5 Snapshot 16-Jan-2007



# Progress status of the LHC interconnections

## Sector 5-6

- Interconnection of inner line is progressing (2 teams) but
  - \* delay on V1-V2-E lines welding activities ; to be recovered
  - \* on time for electrical connections
  - \* initial delay on C' line was recovered
- Line N insertion not yet started
- Aluminium foil pumped in V lines during leak testing ;  
RF test and PIM cutting to be done to investigate (not priority for cutting)

## Sector 6-7

- No activity yet ; interconnections will start mid-February 2007

## Sector 7-8

- Repair of insulation in the dipole is validated
- Cooldown started (**Debris probably from IC works found in filters !!**)
- Triplet : see LSS progress

# Progress status of the LHC interconnections

## Sector 8-1

- Available resources are used (not priority) / More than contractual / valuable progress ;

- Wrong PIM in DS zones were cut by IEG last December

- Procedure not applied by IEG, Lack of on-site supervision

From now, the removal of the PIMs are done by CERN MCS staff (+FSU)

This happened also in 3-4, 4-5. The possibility to repair in-situ is under study

Financial consequences to be discussed with IEG

# Progress status of the LHC interconnections

Pt								Sect								Pt #IC	Prog. [%]												
1						LC	HC	AT	Q7	1-2	Q7	AT	HC	LC		Q6	DMC	Q5	DMA	Q4	2	9	0%						
2					LCM		HC	AT	Q7	2-3	Q7	AT	HC		DMD	Q6					3	6	0%						
3					Q6		DMD		HC	AT	Q7	3-4	Q7	AT	HC	DMG		Q6	DMF	Q5	DME	Q4	4	9	46%				
4	Q4		DMK		Q5		DML		Q6		DMG	LC	HC	AT	Q7	4-5	Q7	AT	HC	LC							5	8	41%
5							LC	HC	AT	Q7	5-6	IM	AT		HC	LC		DMM	Q5	DMM	Q4	6	8	17%					
6	Q4		DMM		Q5		DMM		LC	HC	AT	MB	6-7	Q7	AT	HC	DMH	Q6					7	8	0%				
7					Q6		DMH		HC	AT	Q7	7-8	Q7	AT	HC	LC	Q6	DMC	Q5	DMA	Q4	8	9	100%					
8	Q4		DMB		Q5		DMI		Q6		DMJ	LC	HC	AT	Q7	8-1	Q7	AT	HC	LC						1	9	60%	
												Global	66	35%															

Elec connect.
Cryo lines
Thermal shields
Insulation vacuum
Completed & Checked
NC
Going on

17.01.2007

- 7-8 : All DFBs are connected
- 8-1 : DFBMs are connected (3)  
Stand-by on R8 DFBA waiting decision on damaged beam screen (Q9)
- 1L : HCM/LCM connected
- Point R4 and L4 : half links installed on DFBMs and Qs ; electrical connections on-going
- Progress (35%) compatible with overall schedule

## DSL R5 : Problem on Q4/DSL IC (New!)

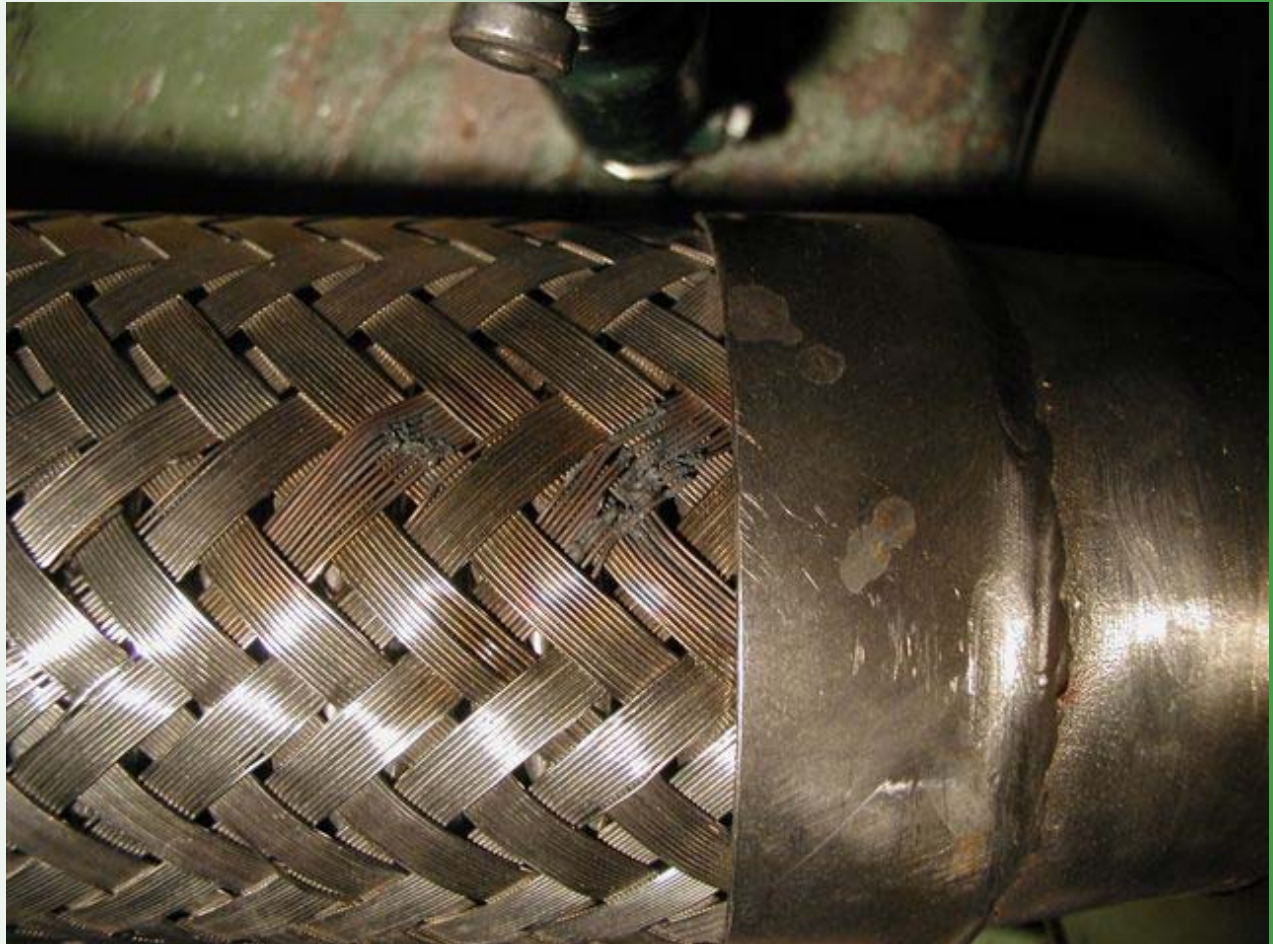
- Cable damaged during cutting
- DSL cable too short by about 500 mm
- Meeting today





## DSL L5 : Problem on Q6/DSL IC (New!)

- Flexible braid damaged
- Check if flexible is still OK...;
- Meeting toda



# Progress status of the LHC interconnections

## Jumper connections in the LSS

Pt							Sect							Pt	#IC	Progress [%]		
1	DXA	DXB	D2	Q4		Q5	Q6	1-2	Q6*	Q5	Q4	D2		DXB	DXA	2	13	0%
2	DXA	DXB	D2	Q4		Q5	Q6	2-3	Q6							3	7	0%
3							Q6	3-4	Q6	Q5	D4	D3		ACS		4	6	8%
4	ACS		D3	D4	Q5		Q6	4-5	Q6	Q5	Q4	D2		DXB	DXA	5	11	7%
5	DXA	DXB	D2	Q4		Q5	Q6	5-6		Q5	Q4					6	8	3%
6				Q4		Q5		6-7	Q6							7	3	0%
7							Q6	7-8	Q6	Q5	Q4	D2		DXB	DXA	8	7	100%
8	DXA	DXB	D2	Q4		Q5	Q6*	8-1	Q6	Q5	Q4	D2		DXB	DXA	1	13	65%
															Global:	68	25%	

\* High jumper

Jumper not available

Inner lines

Thermal shields

Insulation vacuum

Jumper completed

NC

Going on

17.01.2007

- At 1L and 5L : Jumpers open for DSL leak test
- Stand-by on DFBX jumpers
- Global progress of 25 %, compatible with overall schedule

# Progress status of the LHC interconnections

## Cryomagnets interconnections in the LSS (C Garion/I Slits)

Pt									Sect									Pt	#IC	Progress [%]
1	Q1	Q2	Q3	DX			D2	Q4	1-2	Q4	D2		D1	DX	Q3	Q2	Q1	2	9	0%
2	Q1	Q2	Q3	DX	D1		D2	Q4	2-3									3	5	0%
3									3-4	Q5	D4		D3	Und				4	2	50%
4					Und	D3	D4	Q5	4-5	Q4	D2			DX	Q3	Q2	Q1	5	6	29%
5	Q1	Q2	Q3	DX			D2	Q4	5-6									6	4	0%
6									6-7									7	0	0%
7									7-8	Q4	D2		D1	DX	Q3	Q2	Q1	8	5	100%
8	Q1	Q2	Q3	DX	D1		D2	Q4	8-1	Q4	D2			DX	Q3	Q2	Q1	1	9	67%
												Global	40	34%						

Magnet aligned
Elec connect
Beam lines
Cryo lines
Thermal shields
Insulation vacuum
Completed & Checked
NC
Going on

17.01.2007

- 7-8 : Triplet insulated from the arc
- 8-1 : completed, triplets open for disconnection of H pieces
- Connection of inner lines going on at L4, R4 and L5
- Global progress (34 %), compatible with overall schedule not taking into account the triplets.

## Inner Triplet : MCS contribution

- IC (Q1/Q2/Q3) opened by IEG at 1L for removal of H pieces
- New design (with T Renaglia TS) is almost finalised
- Preparation of tooling for cutting
- Test of adaptation of line E expansion joint performed

Open points:

- \* Verification of repair solution
- \* Location of the repair



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# Progress status of the LHC interconnections

## Conclusions

- Progress of IC work in the arc presents some delays but seems recoverable
- Lack of on-site supervision by IEG and mistakes are seen
- Progress of LSS IC is compatible with the schedule (DS zones will be on the critical path)
- Triplet heat exchanger waiting validation of the repair scenario
- Priority : 4-5/8-1 ? Is it worth cooling a sector (8-1) without triplets ?