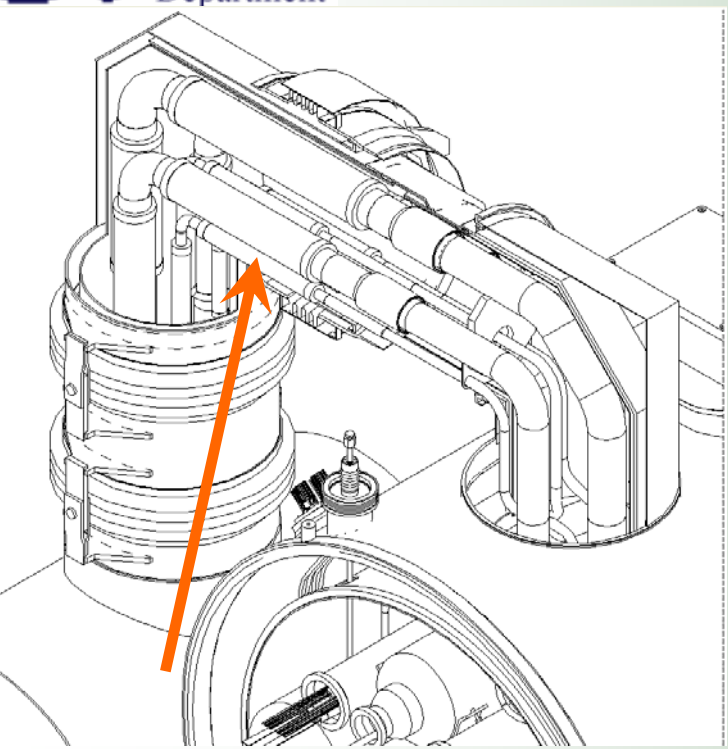
LHC interconnections

- **Leaks in 7-8 : K-C' in Q9R7 and D1/DFBX @ 8L**
- **What remains to be done in sector 3-4 : DSLC and leak @ DFBAG**
- **Helium level gauge : will be presented at MARIC**

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 (Including triplets)	*C Garion / I Slits*
DFBLC / WRL	*I Slits*
Arcs	*A Musso, M Struik, (1...8)*
Reporting	*O Denis*

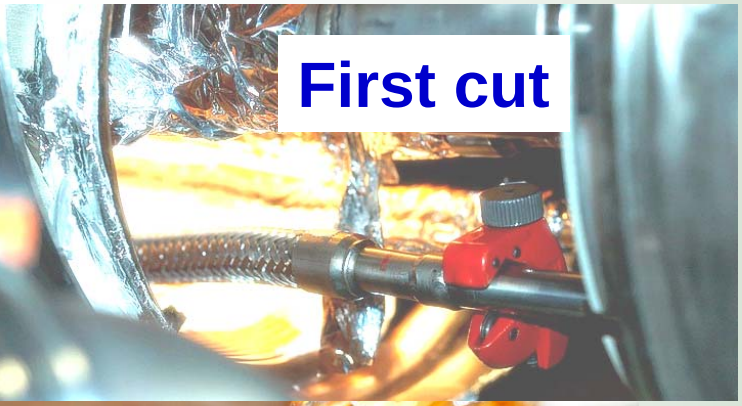
Leak in K-C' at Q9R7 (1/3)



- **Repair method defined and agreed between ACR and MCS**
  Will be done by MCS-ET (19/11)
  Metal hose will be replaced with special adaptors to allow face welding
- **Spare provided by ACR (LHCDFB__0074) [PN 25] bar and tested by TS-MME (3 X LN2 shock + PT @ 25 bar ; no leak > 3.2 10-10 mb l / sec) (20/11)**
- **Cut of leaking hose (20/11) by MCS**
- **Prepare adaptators (20/11) MCS**
- **Analysis of leaking hose (Handed over to VAC; under analysis)**
- **Reweld and step by step leak test (MCS-VAC) (21-22/11)**
- **Reclosure of thermal shields and outside sleeve (MCS) (Foreseen up to 28/11 ; completed for 23/11)**
- **Leak Test of external envelope (VAC) on-going to validate the Vac Sec for the K-C' line**

Leak in K-C' at Q9R7 : Photos (2/3)

Cutting of leaking metal hose / Welding of adapters



First cut

Second cut

Leaking metal hose

Welding of adapter to allow face welding

Homemade leaktest "clamshell"

Adapter welded

Leak in K-C' at Q9R7 : Photos (3/3)

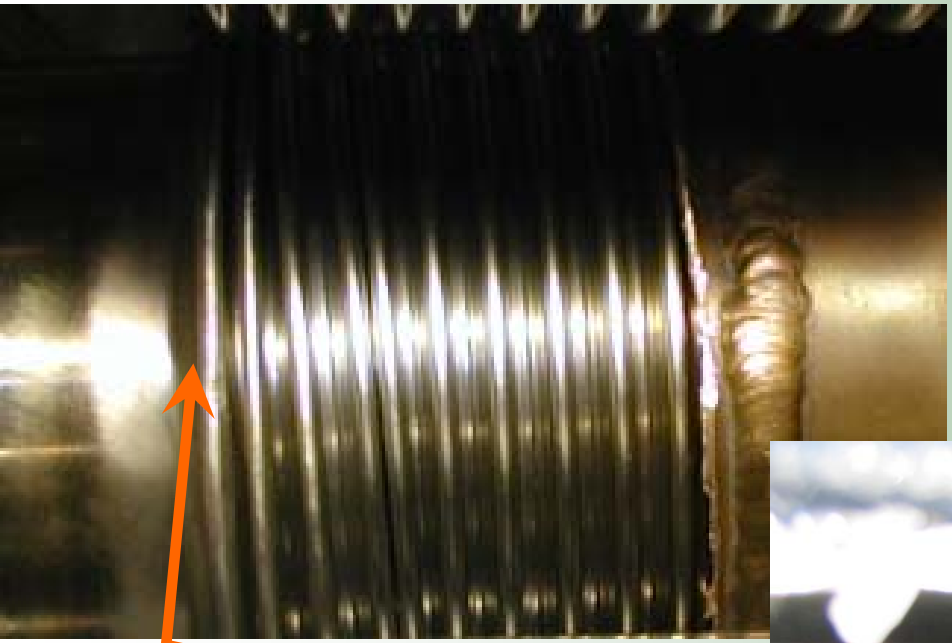
Replacement validated metal hose

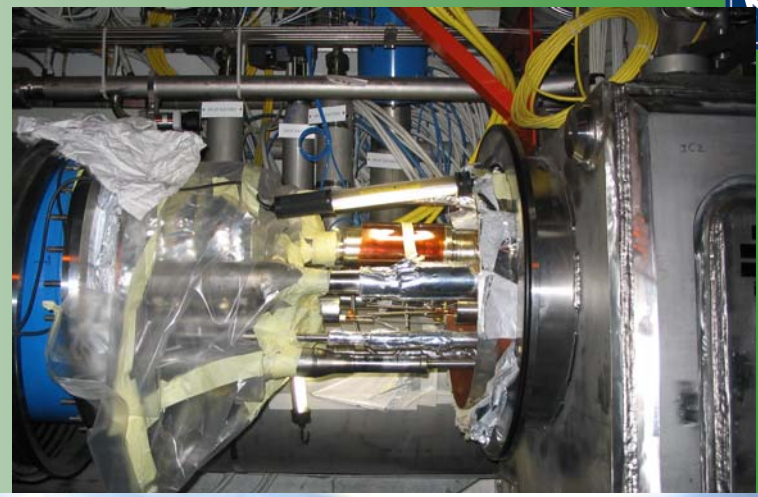
Homemade tool for in-situ inert gaz

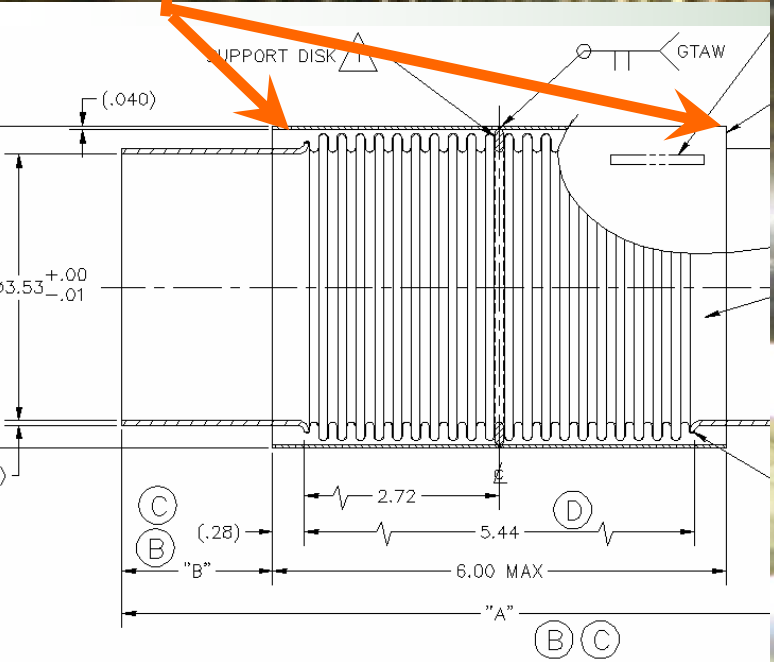
Closure and leak test conditions

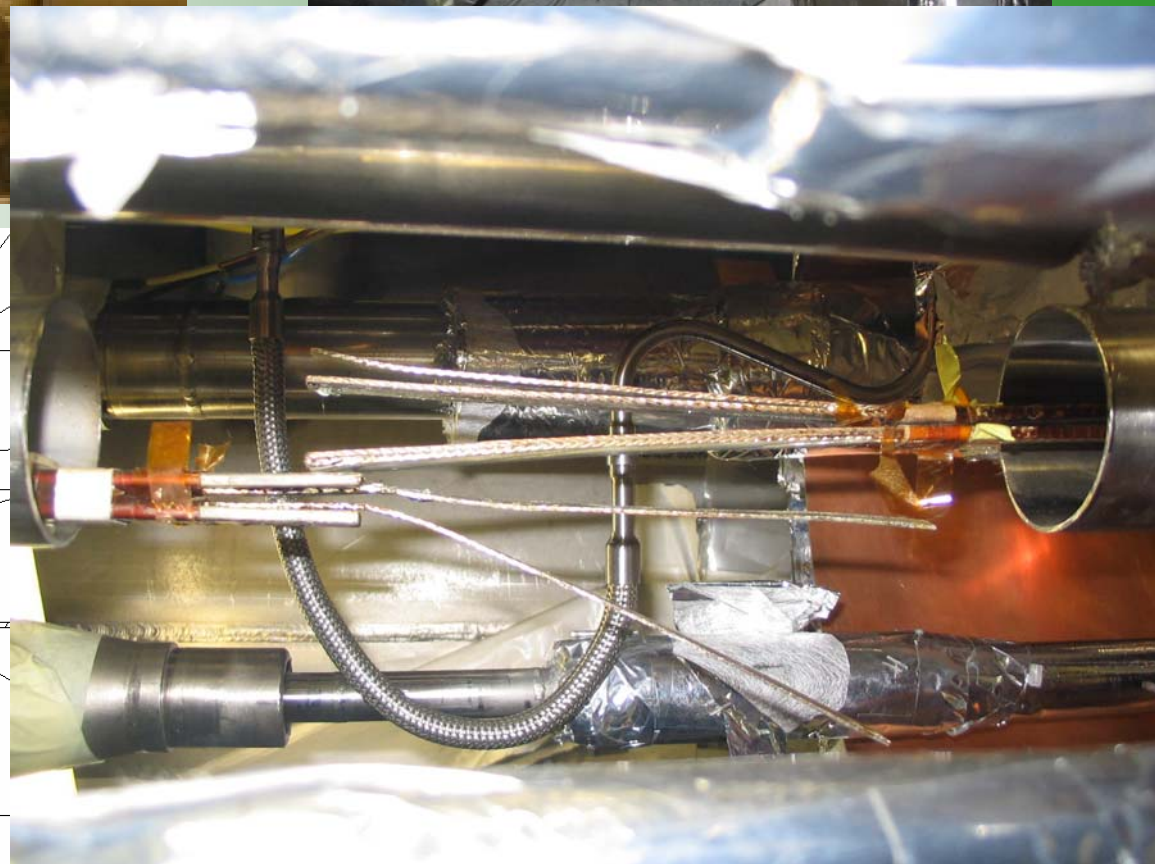
Positioning for a difficult weld

Leak in D1/DFBX @ 8L (1/2)









Leak in D1/DFBX @ 8L (2/2) Schedule

MARIC 21/11/07 "RHIC bellows is on his way to CERN ; start tomorrow for day 1 after confirmation of reception" In fact, bellows was received on Friday 23/11 and effective start on Monday 26/11

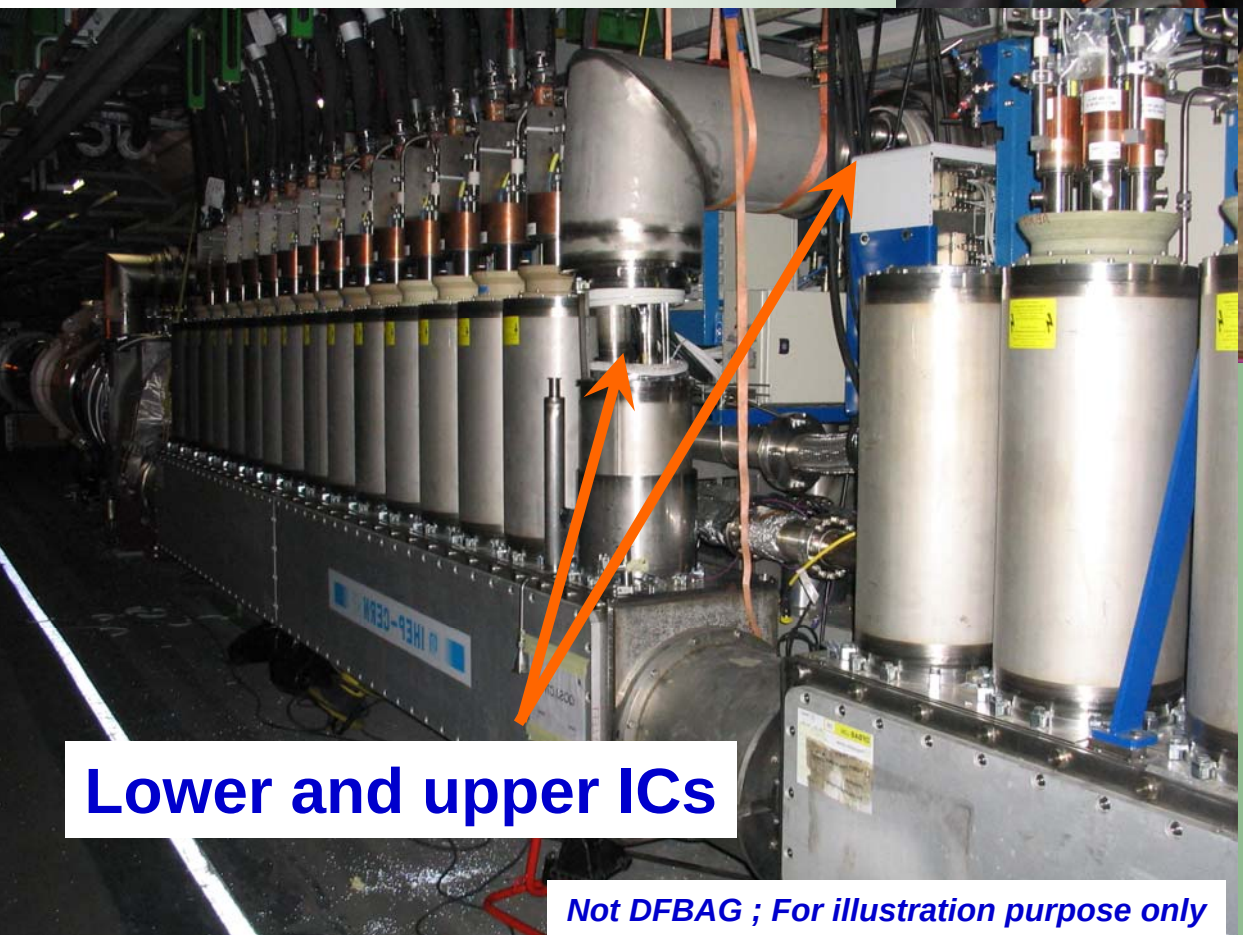
MARIC recommended to try a repair by redoing the 2 external accessible welds ; it was done on 22/11 and leak tested but with same leak level at same location ☹

TCC	Date	Activities
1	26/11/07	Cut the bellows (depends on replacing one)
2	27/11/07	Unsolder busbars and remove leaking bellows
	Available 30/11 AM	// Leak test of bellows after LN2 cold schocks
3	30/11/07	Prepare extremities and insert replacing bellows
4&5	30/11/07-3/12/07	Resolder busbars
6	3/12/2007	Electrical test and insulation
7	4/12/2007	Welding of cryogenic line
8	5/12/2007	Local leak test
9&10	6-7/12/07	Closure of IC

We try to recover delay in availability of validated bellows but this is very tight !

Leak in jumper DFBA @ 4L

Repaired jumper by TS-MME



Lower and upper ICs

Not DFBAG ; For illustration purpose only

Progress status of the LHC interconnections

What remains in sector 3-4 :

- DSLC :
  - All internal lines are welded and leak tested successfully
  - Insulation vacuum is under closure (for beginning of W49)
- Leak at 4L : Inner lines are connected (lower and upper part) ; lower part leak tested successfully / upper part under leak test ; closure of insulation vacuum for mid W49
- Line E to re-interconnect in QBQI.12L24
- 2 ICs to re-close