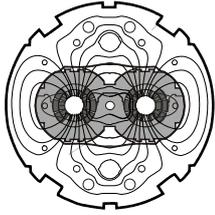


CERN
 CH-1211 Geneva 23
 Switzerland



the
**Large
 Hadron
 Collider**
 project

LHC Project Document No.
LHC-LQX-TP-0001 rev. 0.1

CERN Div/Group or Supplier/Contractor Doc No
TD/FNAL/USA

EDMS Document No.
408010

CERN Part Identifier (19 chars)
 HCLQXB_001-FL000001

Test Procedure Number
 LQXB_Test_Plan

Nonconformity Report

IDENTIFICATION

1. Originator's Name: Tom Nicol	6. Date: 17-Mar-2004
2. Contractor/Supplier: Fermilab	7. Part description: LQXB (Q2) Inner Triplet
3. Contract No: N/A	8. Qty: 1
4. Project Engineer: Jim Kerby	9. Dwg No: 5520-ME-390206 rev. C
5. Quality Manager: Jamie Blowers	

10. Found during what activity:

<input type="checkbox"/> Incoming inspection <input checked="" type="checkbox"/> In-process inspection	<input type="checkbox"/> Final inspection <input type="checkbox"/> Other:
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11. Description of nonconformity (use continuation page if necessary)
A number of the pipe locations are outside of the stated tolerance as defined in section 2.1.10 of the Acceptance Plan (see attachment for details).

12. Action taken to prevent misuse (use continuation page if necessary)
None.

IMPORTANCE

13. <input checked="" type="checkbox"/> Non critical	<input type="checkbox"/> Critical
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DISPOSITION

14. <input checked="" type="checkbox"/> Use-as-is	<input type="checkbox"/> Repair	<input type="checkbox"/> Reject	<input type="checkbox"/> Rework	<input type="checkbox"/> Return to supplier
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Description of proposed action (use continuation page if necessary)
The magnet should be used as-is (see continuation page for a more detailed explanation).

CORRECTIVE/PREVENTIVE ACTION

15. Description of proposed action (use continuation page if necessary)
Upon completion of the review by the CERN Vacuum Group, the FNAL magnet acceptance committee recommends the tolerances be re-visited on all of the pipes.

APPROVAL OF NON CRITICAL NONCONFORMITIES

16	Project Engineer: Jim Kerby	Date: 30-Apr-2004
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APPROVAL OF CRITICAL NONCONFORMITIES

17	Project Management:	Date:
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CLOSURE OF THE NONCONFORMITY

Planned actions have been completed and corrective/preventive actions have been initiated

	For non critical nonconformities Quality Manager or Project Engineer	For critical nonconformities Project Engineer
18	Name: Jamie Blowers Date: 14-Jun-2004	Name: Date:

NONCONFORMITY CONTINUATION PAGE

Proposed action:

For all the lines where the tubes are out of tolerance (with the exception of the V line – see the next paragraph below), neither the assembly of the interconnect flanges on the neighboring magnet assembly (including the interconnect pipe section which spans the ~1m gap between the two), nor the allowable motion due to the desired alignment of the magnets in the tunnel, nor the lifetime of the bellows associated with each individual tube are expected to be limited.

For the V line, at the time of the production of this magnet the length tolerance on the cold bore was not well understood with the vacuum group, and the cold bore was cut several mm short. Potential solutions to this 4.3mm discrepancy include making a special drift tube for the interconnect to make up the difference, or determining that the other cold bore components can acceptably handle the discrepancy and trimming the beam screen shorter for this case. Both are being reviewed with the CERN Vacuum Group.

INSTRUCTIONS FOR COMPLETING THE NONCONFORMITY REPORT

1. Originator	Name of the person who identifies the nonconformity
2. Contractor/Supplier	Organisation where the nonconformity is detected
3. Contract No	CERN's contract or order No
4. Project Engineer	Name of the CERN or Institute engineer in charge of the contract
5. Quality Manager	Name of the person responsible for quality control
6. Date	Date when the nonconformity is identified
7. Part description	Name of the part such as it appears on drawing or contract or order
8. Qty	Number of parts or lots affected
9. Dwg No	Part drawing number and revision index
10. Found during what activity	Tick the appropriate box. If ticking <i>Other</i> explain the circumstances
11. Description of the nonconformity	Describe the problem, identify the requirements that are not met, give references to specifications, procedures etc. If possible describe the possible causes of the nonconformity, such as inadequate procedure, wrong test set-up and so on.
12. Action taken to prevent misuse	Describe what steps have been taken to ensure that the item is segregated from the normal production while the nonconformity remains unresolved.
13. Importance	P.E. to decide if the nonconformity is critical or not and tick appropriate box
14. Disposition	P.E. to decide on disposition, tick appropriate box and outline the details of the proposed actions.
15. Corrective/preventive action	P.E. to decide what action should be taken with the design, the manufacturing process, the testing procedure or any other circumstance to prevent the reoccurrence of the problem.
16. Approval of non critical nonconformities	Complete with the name of the Project Engineer and the date of approval.
17. Approval of critical nonconformities	Complete with the name of the Project Manager, the name of the approval list if appropriate, and the date of approval.
18. Closure of the nonconformity	For a non critical NC, complete with the name of the Quality Manager and the date of the verification. For a critical NC, complete with the name of the CERN Project Engineer and the date of the verification.

Note that points 16, 17 and 18 may be left blank for all nonconformities that are tracked using the EDMS system as described in chapter 3 of document LHC-PM-QA-611.00 "Management of Nonconformities"

LHC IRQ Cryostat Pipe Location Survey Results

Magnet assembly number	LQXB01
Magnet serial number	HCLQXB 001-FL000001
Date measured	17-Mar-04

Non-IP end connections	Measured values				Deviations from nominal				Out of tolerance				Disposition (see notes)	
	X	Y	Z	Diam	dX	dY	dZ	dr	dX	dY	dZ	dr	Radial deviation (x and z)	Axial deviation (y)
EE	-389.9	-222.3	77.7	74.6	-0.3	0.2	2.7	2.8	-	-	0.7	-		
LD1	-243.0	-226.6	279.0	74.4	-3.0	-4.1	1.5	3.4	0.0	2.1	-	-		Use as is (2).
L	-2.3	-228.8	379.2	199.9	-2.3	-6.3	2.3	3.2	-	4.3	-	-		Use as is (2).
XBt	242.7	-226.9	277.9	133.7	2.7	-4.4	0.4	2.8	0.7	2.4	-	-		Use as is (2).
FF	386.3	-222.3	77.3	74.7	-3.3	0.2	2.3	4.0	1.3	-	0.3	1.2	Use as is (1).	
M1	0.3	-18.7	-149.9	126.1	0.3	1.2	0.1	0.4	-	-	-	-		
M2	-149.6	-19.2	0.0	126.1	0.4	0.7	0.0	0.4	-	-	-	-		
M4	-0.5	-19.4	149.9	126.1	-0.5	0.5	-0.1	0.5	-	-	-	-		
V	0.2	0.0	-0.4	114.1	0.2	0.0	-0.4	0.4	-	-	-	-		
W'	-1.1	123.3	78.4	1007.1	-1.1	-4.2	3.4	3.6	-	1.2	0.4	-		Use as is (2).

IP end connections	X	Y	Z	Diam	dX	dY	dZ	dr	dX	dY	dZ	dr	Radial deviation (x and z)	Axial deviation (y)
EE	-390.5	12859.9	72.5	74.8	-0.9	-1.5	-2.5	2.6	-	-	0.5	-		
LD1	-246.6	12855.7	274.8	133.7	-6.6	-5.7	-2.7	7.2	3.6	3.7	-	2.9	Use as is (1).	Use as is (2).
L	4.8	12856.5	378.9	200.0	4.8	-4.9	2.0	5.2	1.8	2.9	-	1.0	Use as is (1).	Use as is (2).
XBt	234.8	12858.2	279.4	74.8	-5.2	-3.2	1.9	5.6	3.2	1.2	-	2.7	Use as is (1).	Use as is (2).
FF	386.2	12862.1	77.3	74.8	-3.4	0.7	2.3	4.1	1.4	-	0.3	1.3	Use as is (1).	
M1	0.7	12932.6	-153.2	88.7	0.7	-3.8	-3.2	3.3	-	1.8	1.2	0.4	Use as is (1).	Use as is (2).
M2	-146.9	12934.7	-2.0	88.9	3.1	-1.7	-2.0	3.6	1.1	-	-	0.8	Use as is (1).	
M4	3.3	12934.5	146.3	89.0	3.3	-1.9	-3.7	5.0	1.3	-	1.7	2.2	Use as is (1).	
V	-0.2	12633.6	0.4	114.0	-0.2	-5.3	0.4	0.4	-	4.3	-	-		Use as is (2).
W'	2.8	12508.4	77.0	1006.8	2.8	-3.0	2.0	3.4	-	-	-	-		

Notes:

1. Within range of bellows lateral installation range.
2. Within range of bellows allowed axial extension/contraction.

LHC IRQ Cryostat Pipe Location Nominal Values

All dimensions are in mm.

Non-IP end connections	Nominal (as designed) dimensions			
	X	Y	Z	Diam (ref only)
EE	-389.6	-222.5	75.0	75.0
LD1	-240.0	-222.5	277.5	75.0
L	0.0	-222.5	376.9	201.0
XBt	240.0	-222.5	277.5	134.0
FF	389.6	-222.5	75.0	75.0
M1 (1)	0.0	-19.9	-150.0	124.5
M2 (1)	-150.0	-19.9	0.0	124.5
M4 (1)	0.0	-19.9	150.0	124.5
V	0.0	0.0	0.0	114.0
W'	0.0	127.5	75.0	1009.6

Allowed tolerance			
dX (+/-)	dY (+/-)	dZ (+/-)	dr (radial position tolerance)
2.0	2.0	2.0	2.8
3.0	2.0	3.0	4.2
3.0	2.0	3.0	4.2
2.0	2.0	2.0	2.8
2.0	2.0	2.0	2.8
2.0	2.0	2.0	2.8
2.0	2.0	2.0	2.8
2.0	2.0	2.0	2.8
1.0	1.0	1.0	1.4
3.0	3.0	3.0	4.2

IP end connections	Nominal (as designed) dimensions			
	X	Y	Z	Diam (ref only)
EE	-389.6	12861.4	75.0	75.0
LD1	-240.0	12861.4	277.5	75.0
L	0.0	12861.4	376.9	201.0
XBt	240.0	12861.4	277.5	134.0
FF	389.6	12861.4	75.0	75.0
M1 (2)	0.0	12936.4	-150.0	88.9
M2 (2)	-150.0	12936.4	0.0	88.9
M4 (2)	0.0	12936.4	150.0	88.9
V	0.0	12638.9	0.0	114.0
W'	0.0	12511.4	75.0	1009.6

2.0	2.0	2.0	2.8
3.0	2.0	3.0	4.2
3.0	2.0	3.0	4.2
2.0	2.0	2.0	2.8
2.0	2.0	2.0	2.8
2.0	2.0	2.0	2.8
2.0	2.0	2.0	2.8
2.0	2.0	2.0	2.8
1.0	1.0	1.0	1.4
3.0	3.0	3.0	4.2

Notes

- Nominal in specification is -222.5. Value here is corrected to back of bellows assembly flange. See 202.6 mm dimension on drawing MC-390073.
- Nominal in specification is 13011.4. Value here is corrected to reflect 75 mm cutoff dimension.

