1/20/92 (?)

DCA312 Open Voltage Taps: Correction to Discrepancy Report 374

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TS - SSC 92-012

The Original Report: Discrepancy Report 374 [1], dated January 6, 1992, reported the discovery of two open voltage taps on magnet DCA312 during its final electrical checkout in Industrial Building 4.

The cause of non-conformance was recorded as "unknown." In addition, it was remarked that "readings for both [open taps] had been normal until final shipping from MTF to IB4, so that damage seems to have occurred during shipping to IB4." This latter remark was false [2]. The disposition was to "continue processing (i.e., ship to Dallas) after checking for detachment of relevant wires at connector and repairing if possible."

New Information: Some problems with the voltage taps of DCA312 had already been observed and recorded during testing at MTF. In particular, during the second thermal cycle of the magnet, seven voltage taps were found to be open [3]. Somewhat later at MTF, it was found that five of the original seven taps were still open [4], and it was concluded that these taps were prone to intermittent failure.

Since the failure and/or intermittent behavior of several voltage taps had been duly recorded in the MTF log book, no further action was taken by MTF or SSC test personnel. The voltage taps were not re-measured before the magnet left MTF, since this was not then part of standard procedure [5], and so the first indications of any abnormal behavior to be recorded in the DCA312 traveller were the IB4 observations.

Conclusions: It may be necessary to examine better ways of connecting voltage taps to the coils. Cold-shocking of solder joints may be contributing to intermittent connections, as may vibrations due to quenching. In order to isolate insofar as possible the stage of construction, testing, and shipping at which voltage tap failures occur in subsequent magnets, MTF has instituted an automatic voltage tap scanning procedure which will be performed before a magnet has been hooked up to the test stand, and prior to shipping from MTF.

References

1. DR-374 original, copy attached as Appendix 1 to this memo.

2. This conclusion was based on mis-interpretation of information from MTF by the physicist who filled out the original DR. In fact, the only data from MTF examined by the physicist had been taken before DCA312 was first cooled down, before any damage to the voltage taps had occurred.

3. DCA312 Test Log Book, page 123, attached as Appendix 2 to this memo.

4. Darryl Orris, private communication.

5. However, I was told by Darryl Orris that had he been there, he would typically have done a final check of the voltage taps.

APPENDIX 1

TS / SUPERCONDUCTING MAGNET PRODUCTION | 0102-ES-298025 | REV. D

FNAL/SSC DISCREPANCY REPORT

1) Traveler Title:	2) Traveler No.:	3) Rev. No.:	4) DR No.:
FINAL INSP./OFF-SITE SHIP	ES-298634	-	374

5) Step No.:	6) Drawing/Revision No.:	7) Magnet/Coil Serial No.:	QA Assigned: Class: I or II
5.5	N/A	DCA 312	

8) Nonconformance Description by First Hand Observer:

LOWER INNER VOLTAGE TAP MEASUREMENTS (COIL 15M-50-1006) 16B AND 14B - FAIL ACCEPTANCE CRITERIA

COPY

9) Name Lally Godoy Title: Q.A. TECH Date: 1/6/92

10) Cause of Nonconformance:

UNKNOWN. READINGS FOR BOTH 16B AND 14B HAD BEEN NORMAL UNTIL FINAL SHIPPING FROM MTF TO 184, SO THAT DAMAGE IF SEEMS TO HAVE OCCURRED DURING SHIPPING TO 184.

11) Responsible Authority/Physicist [signature] Date: 1/7/92

12) Disposition:

CONTINUE PROCESSING (IE, SHIP TO DALLAS) AFTER CHECKING FOR DETATCHMENT OF RELEVANT WIRES AT CONNECTOR AND REPAIRING IF POSSIBLE.

11) Responsible Authority/Physicist [signature] Date: 1/7/92

13) Corrective Action to Prevent Recurrence:

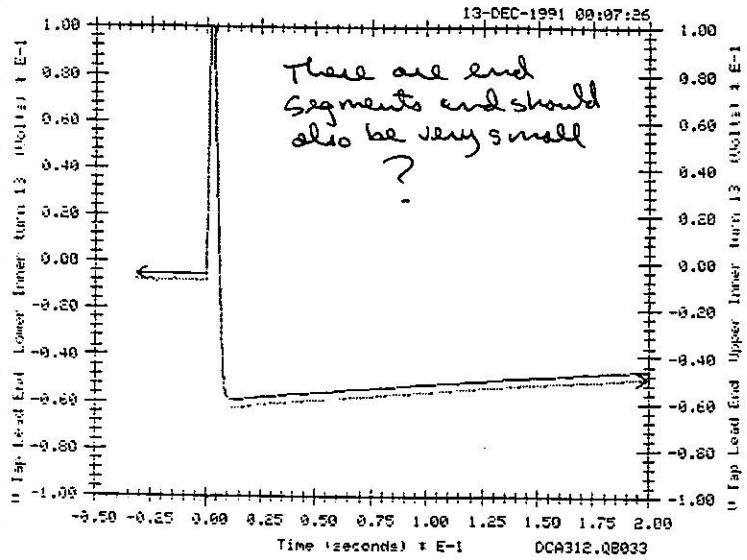
COPY

14) Responsible Authority/ Physicist Title: Date:

15) Corrective Action/Disposition Verified By:	16) Approved By:
	QA/QC Project Manager Date:
11) Responsible Authority/Physicist Date: Class: I or II Will Configuration be effected? [ ] Yes [ ] No	17) Reviewed By: SSCL Q.A. Engineer Date:

LAST REV. 9/10/91

APPENDIX 2



check the resistance between taps at the breakout box in the ACR

find the following open taps (see next page)

LI 14B	UI 14B	All these taps functioned ok.
LI 15B	UI 15B	in the first TC 1000 A dump!
LI 16B	UI 15B	
LI 17A		

I change Quench_Data to reflect the changes in segments.

Will proceed with 4KA trip and quench tests

Darryl should verify the changes made first thing in the morning

U Tap St. section(L)	Lower Inner turn 14	Volts	20810.2500E+000.1000E+010+
U Tap Lead End	Lower Inner turn 14	Volts	20910.1000E+020.1000E+010+
U Tap St. section(R)	L.I. t15 + t14 L.E.	Volts	21010.2500E+000.1000E+010+
U Tap Non-Lead end	Lower Inner turn 15	Volts	21110.1000E+020.1000E+010+
U Tap St. section(L)	Lower Inner turn 15	Volts	21210.2500E+000.1000E+010+
U Tap St. section(R)	L.I. t16 + t15 L.E.	Volts	21410.2500E+000.1000E+010+
U Tap Non-Lead end	Lower Inner turn 16	Volts	21510.1000E+020.1000E+010+
U Tap St. section(L)	Lower Inner turn 16	Volts	21610.2500E+000.1000E+010+
U Tap St. section(R)	L.I. t17 + t16 L.E.	Volts	21210.2500E+000.1000E+010+
U Tap Non-Lead end	Lower Inner turn 17	Volts	21910.1000E+020.1000E+010+
U Tap St. section(L)	L.I. t17 + t17 L.E.	Volts	22010.2500E+000.1000E+010+
U Tap St. section(R)	Lower Inner turn 18	Volts	22210.2500E+000.1000E+010+

U Tap Lead End	Upper Inner turn 14	Volts	41010.1000E+020.1000E+010+
U Tap St. sect. (R)	L.I. t15 + t15 L.E.	Volts	41210.2500E+000.1000E+010+
U Tap Lead End	Upper Inner turn 17	Volts	414[illegible].1000E+020.1000E+[illegible]+