LQXB01 Test Report

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Quench Training

In the first test cycle, MQXB01 was ramped to 13000 A (234 T/m[1]) without quenching exceeding the quench training requirement of 230 T/m. MQXB02 quenched at 12710 A (229 T/m), then at 12955 A (233 T/m). Following a thermal cycle, both magnets were ramped to 12203 A (220 T/m) without quenching. A quench was induced in both magnets at 12000 A with the dump delayed (i.e. no energy extraction). The magnets were then successfully ramped to 12330 A during subsequent magnetic measurements.

Quench training results are compared to the last five model magnets and the prototype in Fig. 1. Table 1 is a list of quenches executed as part of quench current studies (quench training, and ramp rate studies) as well as other ramps of interest.

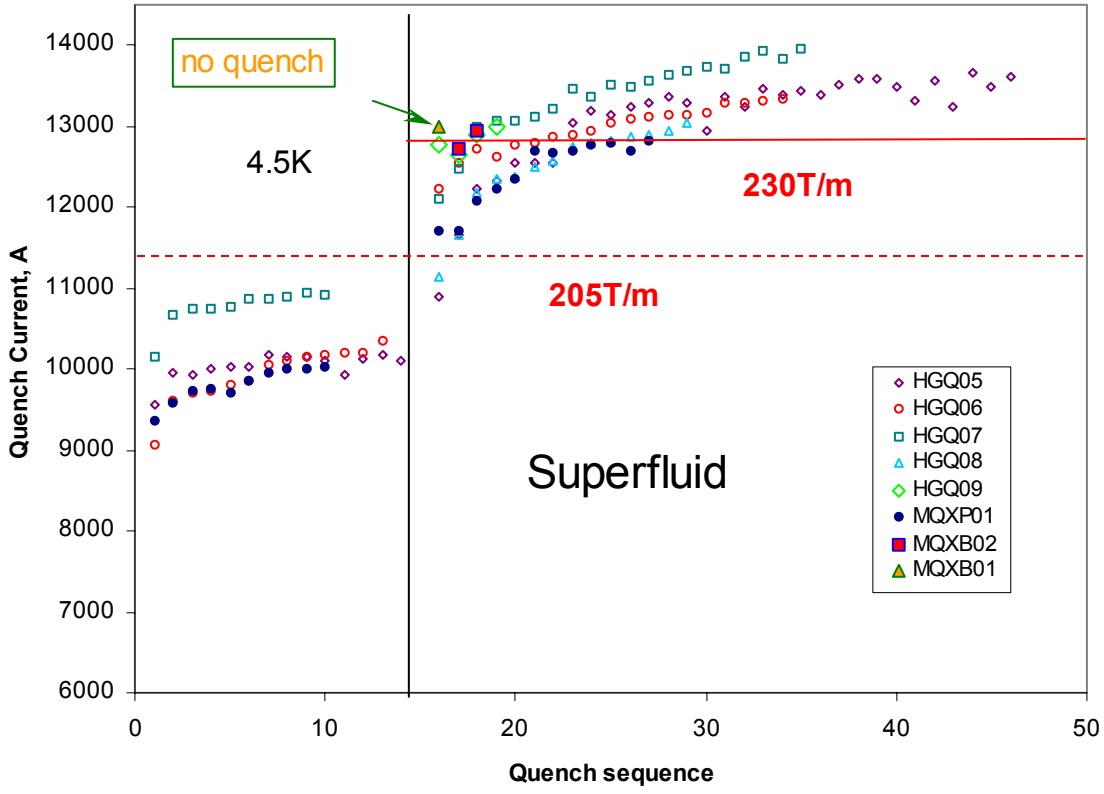

Figure 1: LQXB01 quench training. The horizontal dashed and solid lines correspond to 205 and 230 T/m field gradient respectively.

[1]Gradiant quoted is body gradiant based on HGQ09 body transfer function measurements.

Table 1: List of quenches

date	time	test cycle	current (A)	ramp rate (A/s)	location	gradient $(T/m)^2$
MQXB01						
11/15/02	1319	1	13000	20	no quench	234
MQXB02						
11/26/02	1909	1	12710	20	Q3i	229
11/27/02	2245	1	12955	20	Q2i	233
12/06/02	0946	1	10676	300	Q2i	193
02/09/03	1459	2	12330		no quench	222
02/09/03	1516	2	12122	300		219
02/14/03	1740	2	12000		heater induced, dump delayed	216
3/10/03	2225	2	12330	20	no quench	222

Summary: Quench performance was better than that of the model magnets and the prototype. The requirements for acceptance (2.2.4, 2.2.5) are satisfied.

Magnetic Field Quality Measurements

Field quality measurements were made with rotating coils in two test cycles. Integral field measurements were made with a multi-sectioned probe of 3 sections matched to the pitch length of the inner coil with one pitch length between sections. Longitudinal scans were made with a probe of length 0.82 m. The program consisted of the following measurement types.

- A "DC loop" in which the magnet was ramped in a series of steps with the field characterized at DC field at each level on the up and down ramp which we use to establish the geometric component of the harmonic.
- A prototypical accelerator cycle in which the field was measured during a conditioning pre-cycle to full field followed by a ramp down, a stop at an extended injection porch with a ramp to full field afterwards. This serves to characterize the field at injection including decay and snapback effects.
- A series of continuous ramps to full field at different ramp rates: 10, 40, and 80 A/s to check for eddy current effects. (Note that the aforementioned accelerator cycle is the 10 A/s loop.)
- A DC loop with a longitudinal scan at each stopping point. This allows body-end field separation.
- Cleansing quenches preceded the accelerator cycle and the DC loops.

A list of the measurements made is given in Appendix A. Data is posted at the following URL.

HTTP://wwwtsmtf.fnal.gov/~dimarco/usrAnalysisLQX/web_summaries/LQXB01/magneticMeasurements/LQXB01_mag_meas.html

[2] This is the equivalent body gradient based on HGQ09 measurements. The linear fit parameters to the high current transfer function are slope 0.0174 and intercept 7.34.

Figures 2-5 and Table 2 summarize the field quality measurements with respect to the harmonics acceptance criteria[3] for the magnet.

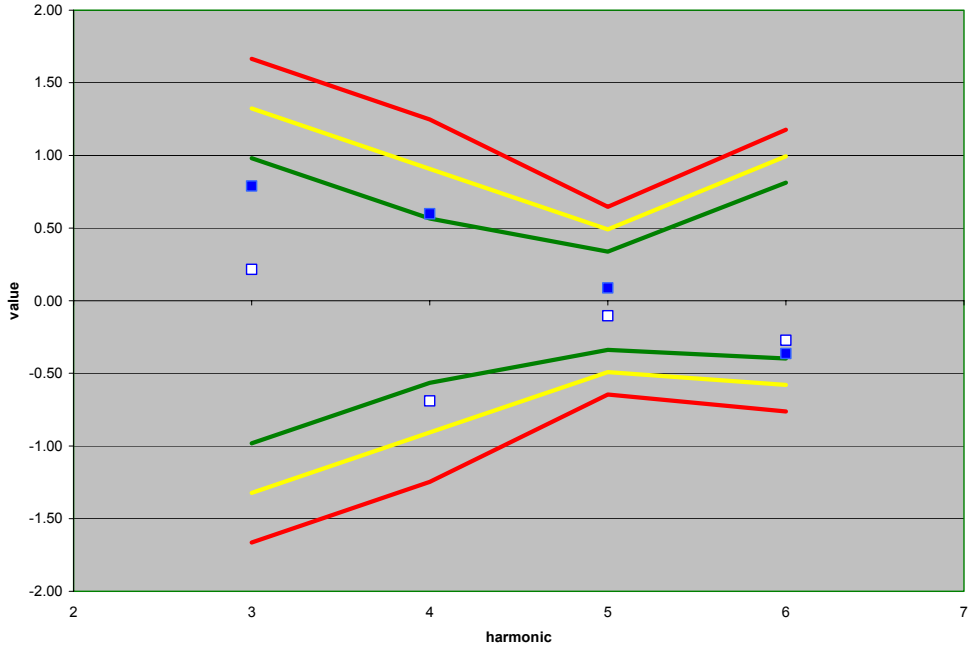

Figure 2: Low order normal harmonics at 200 T/m compared to 1, 2, 3 σ acceptance bands. Solid (open) squares show data from MQXB01 (MQXB02).

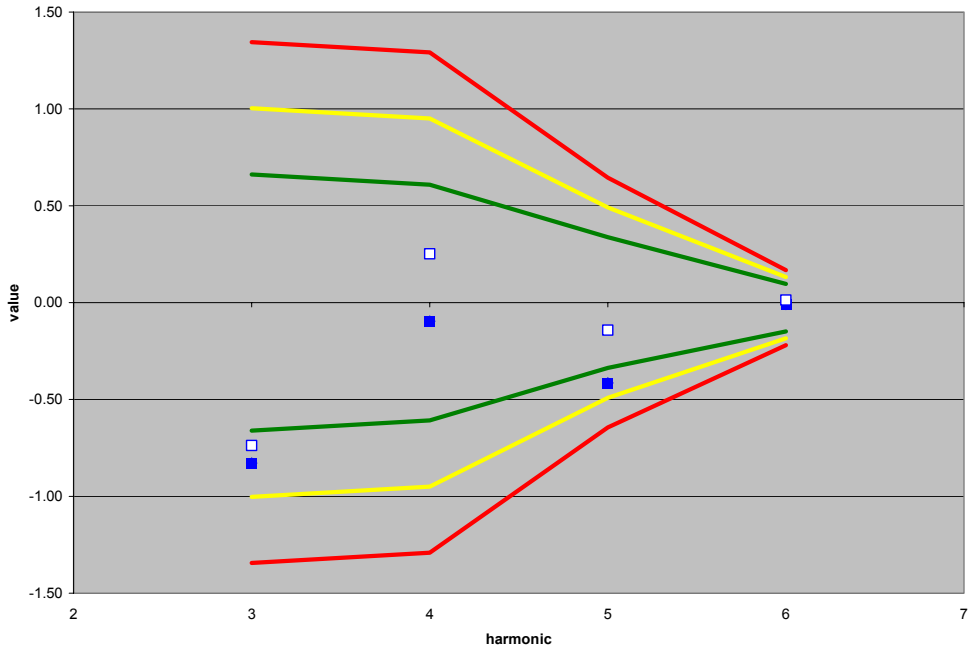

Figure 3: Low order skew harmonics at 200 T/m compared to 1, 2, 3 σ acceptance bands. Solid (open) squares show data from MQXB01 (MQXB02).

[3] Acceptance criteria for harmonics are from v7 of the acceptance document. Acceptance bands are from v3.2 of the reference harmonics table.

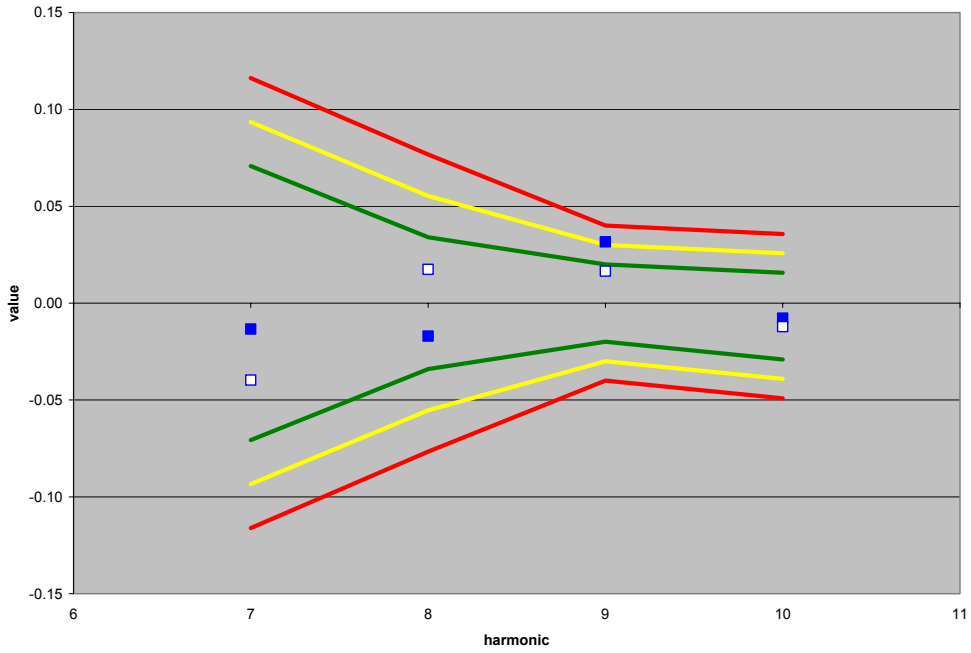

Figure 4: High order normal harmonics at 200 T/m compared to 1, 2, 3 σ acceptance bands. Solid (open) squares show data from MQXB01 (MQXB02).

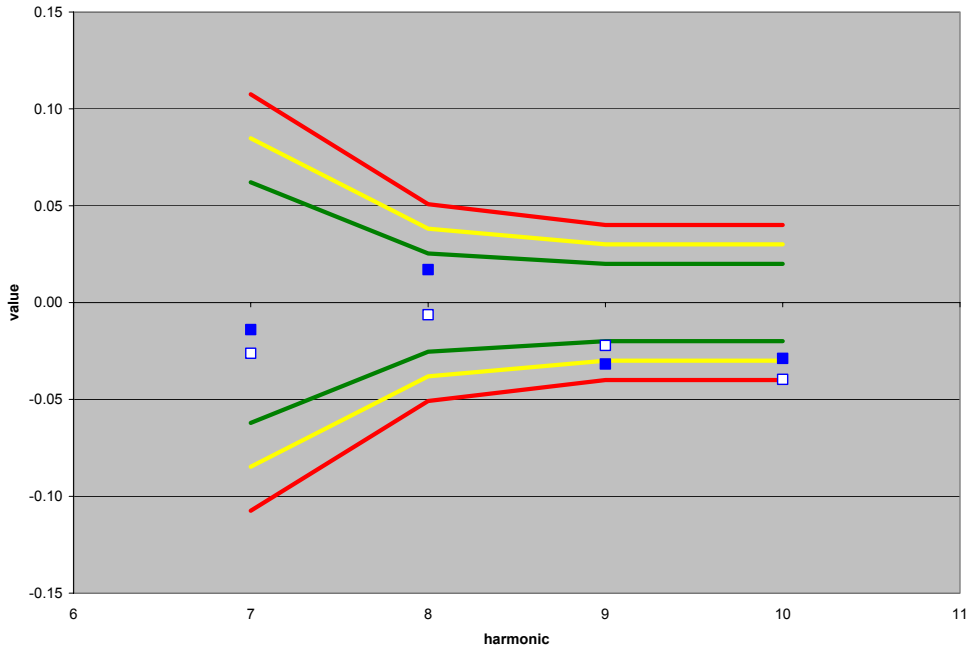

Figure 5: High order skew harmonics at 200 T/m compared to 1, 2, 3 s acceptance bands. Solid (open) squares show data from MQXB01 (MQXB02).

Table 2: Integral normal dodecapole (b_6) at injection. (G=12.3 T/m.)

1σ		2σ		3σ		MQXB01	MQXB02
low	high	low	high	low	high	measured value	measured value
-2.26	-0.10	-2.79	0.43	-3.32	0.96	-2.0	-1.7

Drift of the normal dodecapole at injection field is similar to that of the model magnets and the prototype, 0.5-0.6 units after 15 minutes. Hysteresis width changes with faster ramp rates are also small and similar to model magnets [1][2].

Summary: Field quality is good (Acceptance criteria 2.2.7). Most harmonics are within one sigma of the target. Not surprisingly, a few of the low order harmonics are in the 1-2 σ band. There are 3 high order (n≥7) harmonics between 2 and 3 σ. It is quite possible that these are due to inaccuracy in the measurement system. It was being commissioned during the measurement program and may not have had the gain of the data acquisition optimized when this data was taken.

Magnetic Field Strength Measurements

SSW measured integral field strength with magnets powered individually and in series is given in Table 3.

Table 3: Field strength vs. current.

	Transfer Function (T/kA)			Field Strength (T)		
Current (A)	Q2a	Q2b	Q2a+Q2b	Q2a	Q2b	Q2a+Q2b
669	101.10	101.09	202.25	67.6	67.6	135.3
5460	100.41	100.45		548.2	548.5	
11345	99.05	98.97		1123.7	1122.8	
11923	98.85	98.89	197.76	1178.6	1179.1	2357.9

Summary: The strength at 11345 A is within the acceptance band of 1127±4 T. (2.2.6)

Alignment

LQXB01 had alignment measurements at each stage of testing at MTF. Initial alignment was done 05Sep02 before cryogenic connections from magnet to test stand were made. The measurements at the end of September (27Sep02) showed a change upward at the center position, which corresponded to a change made to better align the cryo pipes. The last warm measurement before initial cool-down was 05Nov02 and was nearly identical to 27Sep02. Both these last two were made under vacuum. Small changes (0.1mm) could be seen in the cold mass end positions when the measurements were made with the single phase pressurized to 30psi.Though the z-position of the magnet on the test stand changed by a few mm on the first application of vacuum, the relative Q2a/Q2b positions remained stable (the excessive motion was subsequently eliminated using shims at the test stand supports).

Measurements were made at 4.5K during the first thermal cycle (TC). These included a full set of strength measurements on Q2a. The warm to cold change was rather non-uniform, with the end supports moving vertically downward perhaps ~0.1mm, and the center support (at the interconnect weld) falling by 0.7mm (presumably at the support

since both Q2a and Q2b saw this change). Also, the horizontal position of Q2a changed by 0.5mm at its interconnect weld end. The reason for these changes is not understood, and it is not clear if it is particular to the assembly history of LQXB01. Measurements were also made at ~30K using AC current. These results agreed very well with those at 4.5K.

The warm measurements after TC1 were like those before the TC, except that there was a roughly uniform motion downward (~0.3mm at then ends and ~0.2mm at the center) (there was also perhaps a 0.1mm motion in +X).

Since the cold TC1 results showed Q2a and Q2b to be roughly parallel to each other but separated by ~0.8mm in X and Y, it was decided to try and adjust Q2b so that at least one end could be brought in line with the Q2a axis, thereby reducing its average offset. These adjustments were made at the cryo feedbox using the magnet lugs (which are at 45 degrees) to attempt to move the Q2b magnet by 0.7mm in the vertically downward (–Y) and in +X directions. Measurements showed that the cold mass positions changed predictably with the adjustments. There was also a change in roll angle of ~0.2mrad as a result of these adjustments.

Cold integral strength measurements of Q2b were made during TC2 at 1.9K, and alignment was done at 4.5K with AC current. The warm cold change was similar to that of TC1 (except that Q2b had ~0.3mm different behavior at the weld end than in TC1; the x, y directions of these were opposite to the feed-end adjustments, as if there was a lever effect across the feed-end spider support). There was a small change in Q2b roll caused by TC2 cool-down (0.06mrad), but seemingly a much larger one in Q2a (~0.16mrad). The Q2b 0.06mrad change repeated again when the magnet was warmed (returning to its original position), while the Q2a also changed by ~0.06mrad on warm-up, and so was still ~0.1mrad different than its before TC2 value. It is not clear how much the measurement error contributes to this – the warm roll measurements have uncertainty with s.d. ~0.03mrad. The cold TC2 measurements represent the final cold data relating cold magnet positions to the external fiducials. The alignment results are within the specified tolerances.

The warm measurements after TC2 were like those before TC2 except again for a small roughly uniform shift downward (~0.2mm at the ends and 0.1mm at center); perhaps these shifts recurred (though with different amplitudes) because of the lug adjustments.

A partial list of the measurements performed is given in Table 4 with a full list in Appendix B.

Table 4: Major alignment data sets

data set	description
Wm_befTC1_05Nov02	Warm before TC1, 5Nov02
Cd_4.5TC1_10Dec02	Cold TC1, 10Dec02
Wm_aftTC1_17Dec02	Warm after TC1 17Dec02
Wm_aftAdj_31Jan03	Warm aft mech adj, bef TC2, 31Jan03
Cd_4.5TC2_20Feb03	Cold TC2, 20Feb03
Wm_aftTC2_20Mar03	Warm aft TC2 20Mar03

Data are posted at the following URL.

HTTP://wwwtsmtf.fnal.gov/~dimarco/usrAnalysisLQX/LQXB01/SSW/LQXB01_align.html

Relative alignment of the magnet assemblies compared to AP requirements is given in Table 5. A summary plot showing the changes in cold mass positions at various points in

Table 5: Relative alignment of magnet assemblies (cold).

relative alignment of MQX magnets in composite Q2			relative alignment	
Q2a/Q2b transverse alignment	500	μm	x -193	y 251
Q2a/Q2b relative roll	1	mrad (rms)	1	
Q2a/Q2b relative pitch	0.1	mrad	-0.23	
Q2a/Q2b relative yaw	0.1	mrad	0.17	
relative alignment of MCBX to MQXB				
corrector displace-ment	500	μm	n.a.	
corrector roll	5	mrad		
b1			3.33	
a1			-1.07	

the test program is shown in Fig. 6. The positions are given relative to the Cold TC2 measurements being on the average axis.

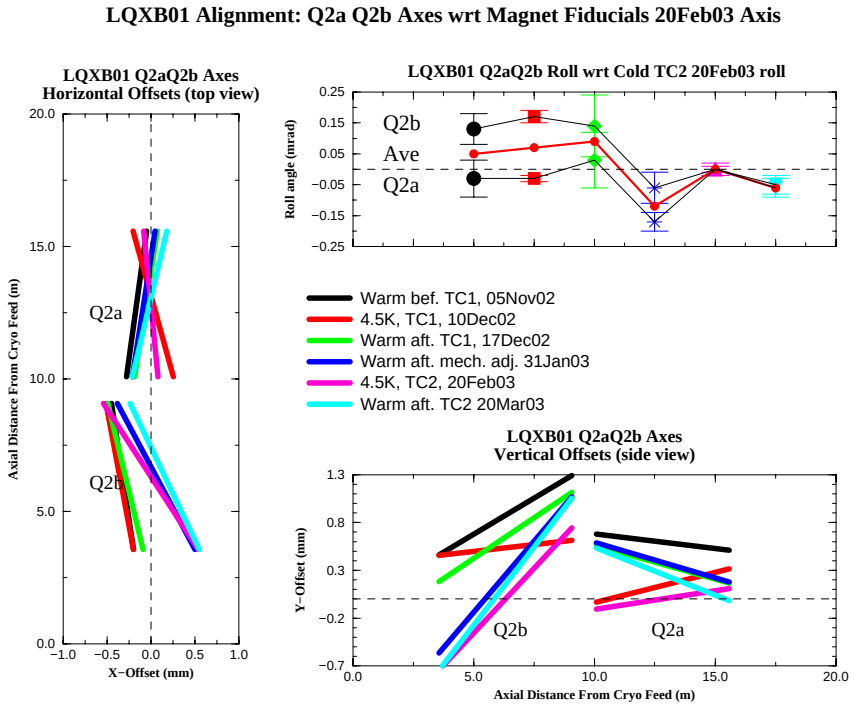

Figure 6: Alignment summary plot.

Summary: The final cold measurements were well within tolerances. Warm/cold changes are fairly large at the center (~0.7mm) but are fairly reproducible in the two TCs. Changes to the lugs to adjust the cold mass position worked predictably. (2.1.11, 2.2.8)

Other tests performed

Heater studies were performed. Ramp rate dependence of quench current was studied.

Other items of interest

Further analysis of test results can be found in [2].

The warm bore was installed upside down.

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[1] N. Andreev et al., "Field quality in Fermilab-built models of quadrupole magnets for the LHC interaction region", IEEE Trans. Appl. Supercond., Vol. 11, No. 1, March 2001.
[2] G. Velev et al., "Field Quality of the LHC Inner Triplet Quadrupoles Being Fabricated at Fermilab", PAC-03, May 2003.

Appendix A: List of field quality measurements

Note that a longitudinal scan of the magnetic field with a rotating coil of the warm collered coil and cold mass were made during production as part of the quality assurance program but are not listed here.

q2a (MQXB02), TC1			
size	**date taken**	**unpacked file name**	**remarks: probe, meas. type, ramp, current**
			IP=Integral, SP=short
83306	27-Nov-02	q2a_10211_up_tf.dat	IP stair up 10211 A
51396	27-Nov-02	q2a_10221_down_tf.dat	IP stair down 10211 A
43258	27-Nov-02	q2a_11063_down_tf.dat	IP stair down 11063 A
53041	27-Nov-02	q2a_11063_up_tf.dat	IP stair up 11063 A
60434	27-Nov-02	q2a_5459_down_tf.dat	IP stair down 5459 A
45683	27-Nov-02	q2a_5459up_tf.dat	IP stair up 5459 A
67598	27-Nov-02	q2a_669_down_tf.dat	IP stair down 669 A
39164	27-Nov-02	q2a_669_up_tf.dat	IP stair up 669 A
406430	5-Dec-02	q2a_acc_profile10_tf.dat	IP acc profile good at 1.9K with clean magnet
435558	27-Nov-02	q2a_acc_profile2_tf.dat	IP acc profile witout clean magnet
1015842	27-Nov-02	q2a_loop10Apersec_tf.dat	IP 10 A/s loop
439785	27-Nov-02	q2a_loop40Apersec_tf.dat	IP 40 A/s loop
331824	27-Nov-02	q2a_loop80Apersec_tf.dat	IP 80 A/s loop
138778	6-Dec-02	q2a_10211A_down_zscan_tf.dat	SP z-scan stop down at 10211A
200255	6-Dec-02	q2a_10211A_up_zscan_tf.dat	SP z-scan stop up at 10211A
199344	6-Dec-02	q2a_11063A_down_zscan_tf.dat	SP z-scan stop down at 11063A
203482	6-Dec-02	q2a_11063A_up_zscan_tf.dat	SP z-scan stop up at 11063A □
273772	6-Dec-02	q2a_11922A_up_zscan_tf.dat	SP z-scan stop at 11922A
199393	6-Dec-02	q2a_5459A_down_zscan_tf.dat	SP z-scan stop down at 5459A
198563	6-Dec-02	q2a_5459A_up_zscan_tf.dat	SP z-scan stop up 5459A
210457	6-Dec-02	q2a_669A_down_zscan_tf.dat	SP z-scan stop down 669A □
26183	6-Dec-02	q2a_669A_up_zscan_test_tf.dat	SP z-scan stop up 669A test
302683	6-Dec-02	q2a_669A_up_zscan_tf.dat	SP z-scan stop up 669A
392750	6-Dec-02	q2a_acc_profile_short_tf.dat	SP acc. profile
398921	6-Dec-02	q2a_loop40Apersec_short_tf.dat	SP 40 A/s loop
223177	6-Dec-02	q2a_loop80Apersec_short_tf.dat	SP 80 A/s loop

q2a (MQXB02), TC2			
size	**date taken**	**unpacked file name**	**remarks: probe, meas. type, ramp, current**
			IP=Integral, SP=short
449922	12-Feb-03	q2a_accCycle_1_96K_tf.dat	IP acc profile at 1.96K at the end of the measurements
1391358	12-Feb-03	q2a_loop10Apersec_tf.dat	IP 10 A/s loop
394162	12-Feb-03	q2a_loop40Apersec_tf.dat	IP 40 A/s loop
216224	12-Feb-03	q2a_loop80Apersec_tf.dat	IP 80 A/s loop
155872	10-Feb-03	q2a_10211A_down_zscan_tf.dat	SP z-scan stop down at 10211A
154156	10-Feb-03	q2a_10211A_up_zscan_tf.dat	SP z-scan stop up at 10211A
147663	10-Feb-03	q2a_11063A_down_zscan_tf.dat	SP z-scan stop down at 11063A
160736	10-Feb-03	q2a_11063A_up_zscan_tf.dat	SP z-scan stop up at 11063A
303009	10-Feb-03	q2a_11922A_up_zscan_tf.dat	SP z-scan stop at 11922A
239135	10-Feb-03	q2a_5459A_down_zscan_tf.dat	SP z-scan stop down at 5459A
235827	10-Feb-03	q2a_5459A_up_zscan_tf.dat	SP z-scan stop up 5459A
274745	10-Feb-03	q2a_669A_down_zscan_tf.dat	SP z-scan stop down 669A
228186	10-Feb-03	q2a_669A_up_zscan2_tf.dat	SP z-scan stop up 669A check it
97885	10-Feb-03	q2a_669A_up_zscan_tf.dat	SP z-scan stop up 669A
453397	10-Feb-03	q2a_body_loop40As_short_tf.dat	SP 40 A/s loop
254372	10-Feb-03	q2a_body_loop80As_short_tf.dat	SP 80 A/s loop
370150	10-Feb-03	q2a_le_loop40As_short_tf.dat	SP 40 A/s loop LE end
307102	10-Feb-03	q2a_re_loop40As_short_tf.dat	SP 40 A/s loop RE end

q2b (MQXB01), TC1			
size	**date taken**	**unpacked file name**	**remarks: probe, meas. type, ramp, current**
			IP=Integral, SP=short
53059	25-Nov-02	q2b_10211A_down_tf.dat	IP stair down 10211 A
55485	25-Nov-02	q2b_10211A_up_tf.dat	IP stair up 10211 A
50604	25-Nov-02	q2b_11063A_down_tf.dat	IP stair down 11063 A
57955	25-Nov-02	q2b_11063A_up_tf.dat	IP stair up 11063 A
59587	25-Nov-02	q2b_11922A_up_tf.dat	IP stair 11922 A
48206	25-Nov-02	q2b_5459A_down_tf.dat	IP stair down 5459 A
59652	25-Nov-02	q2b_5459A_up_tf.dat	IP stair up 5459 A
54752	25-Nov-02	q2b_669A_down_tf.dat	IP stair down 669 A
56316	25-Nov-02	q2b_669a_up_tf.dat	IP stair up 669 A
421711	22-Nov-02	q2b_acc_profile3_tf.dat	IP high temperature clean magnet 2.0K
384444	25-Nov-02	q2b_acc_profile_5_tf.dat	IP acc profile 1.9K non-quenched magnet
994425	25-Nov-02	q2b_loop10Apers_2_tf.dat	IP loop 10 A/s low temperature
986567	22-Nov-02	q2b_loop10As_tf.dat	IP loop 10 A/s high temperature
278755	22-Nov-02	q2b_loop40Apers_2_1K_tf.dat	IP loop 40 A/s high temperature
419103	25-Nov-02	q2b_loop40Apers_tf.dat	IP loop 40 A/s low temperature
223773	25-Nov-02	q2b_loop80Apers_tf.dat	IP loop 80 A/s low temperature
191814	20-Nov-02	q2b_10211A_down_zscan_tf.dat	SP z-scan down 10211 A
259588	20-Nov-02	q2b_10211A_up_zscan_tf.dat	SP z-scan up 10211 A
195893	20-Nov-02	q2b_11063A_down_zscan_tf.dat	SP z-scan down 11063 A
261201	20-Nov-02	q2b_11063A_up_zscan_tf.dat	SP z-scan up 11063 A
197545	20-Nov-02	q2b_11922A_up_zscan_tf.dat	SP z-scan 11922 A
195893	20-Nov-02	q2b_5459A_down_zscan_tf.dat	SP z-scan down 5459 A
279941	20-Nov-02	q2b_5459A_up_zscan_tf.dat	SP z-scan up 5459 A
273890	20-Nov-02	q2b_669A_down_zscan_tf.dat	SP z-scan down 669 A
260643	20-Nov-02	q2b_669A_up_zscan_tf.dat	SP z-scan up 669 A
q2b (MQXB01), TC2			
size	**date taken**	**unpacked file name**	**remarks: probe, meas. type, ramp, current**
			IP=Integral, SP=short
462251	14-Feb-03	q2b_accCycle_tf.dat	IP acc profile 1.9K
1429043	14-Feb-03	q2b_loop10Apersec_tf.dat	IP loop 10 A/s
402358	14-Feb-03	q2b_loop40Apersec_tf.dat	IP loop 40 A/s
153634	14-Feb-03	q2b_loop80Apersec_tf.dat	IP loop 80 A/s
163714	10-Mar-03	q2b_10211A_down_zscann_tf.dat	SP z-scan down 10211 A
166976	10-Mar-03	q2b_10211A_up_zscann_tf.dat	SP z-scan up 10211 A
176735	10-Mar-03	q2b_11063A_up_zscann_tf.dat	SP z-scan up 11063 A
170175	10-Mar-03	q2b_11063A_down_zscann_tf.dat	SP z-scan down 11063 A
273826	10-Mar-03	q2b_11922A_up_zscann_tf.dat	SP z-scan up 11922 A
162158	10-Mar-03	q2b_5459A_down_zscann_tf.dat	SP z-scan down 5459 A
153934	10-Mar-03	q2b_5459A_up_zscann_tf.dat	SP z-scan up 5459 A
162215	10-Mar-03	q2b_669A_down_zscann_tf.dat	SP z-scan down 669 A
200628	10-Mar-03	q2b_669A_up_zscann_tf.dat	SP z-scan up 669 A
493768	3-Mar-03	q2b_acc_profile_short_tf.dat	SP Acc. profile, non-quenched magnet, 1.5 Hz rotation at inj porch
280474	10-Mar-03	q2b_acc_profile_shortn_tf.dat	SP Acc. profile, non-quenched magnet, 0.5 Hz rotation at inj porch
1129619	3-Mar-03	q2b_loop10Apers_short_tf.dat	SP 10 A/s
285403	3-Mar-03	q2b_loop20Apers_short_tf.dat	SP 20 A/s
455109	3-Mar-03	q2b_loop40Apers_short_tf.dat	SP 40 A/s loop
270832	3-Mar-03	q2b_loop80Apers_short_tf.dat	SP 80 A/s loop

Appendix B: List of alignment measurements

LQXB01 SSW Measurements Log

(Column 1 is status: R indicates used directly for results; “a” indicates ancillary)

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ICB measurements during production and assembly

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/usr/analysis/MQX/

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a 020603_13:54 MQXAB/020603_13:54.checkX
a 020603_14:54 MQXAB/020603_14:54.checkX
a 020603_15:13 MQXAB/020603_15:13.centerX
a 020603_15:31 MQXAB/020603_15:31.centerY_noSag
R 020604_07:19 MQXAB/020604_07:19.B_sagCal_XY_roll
R 020604_11:15 MQXAB/020604_11:15.A_sagCal_XY_roll
a 020604_14:53 MQXAB/020604_14:53.B_checkXY
a 020604_15:50 MQXAB/020604_15:50.B_checkXY_deltaLead
a 020604_16:38 MQXAB/020604_16:38.dipRoll_horizontal
a 020604_16:50 MQXAB/020604_16:50.dipRoll_vertical
a 020604_17:15 MQXAB/020604_17:15.dipRoll_vertical_rotWire
a 020607_06:51 MQXAB/020607_06:51.A_checkXY_afterWeld_Clamped
a 020607_07:21 MQXAB/020607_07:21.B_checkXY_afterWeld_Clamped
a 020607_07:41 MQXAB/020607_07:41.B_rotWire_afterWeld_Clamped
a 020607_08:19 MQXAB/020607_08:19.A_rotWire_afterWeld_Clamped
a 020607_09:12 MQXAB/020607_09:12.B_checkXY
a 020607_09:40 MQXAB/020607_09:40.B_checkXY
R 020607_10:02 MQXAB/020607_10:02.B_checkXY
R 020607_10:23 MQXAB/020607_10:23.B_rollMeas
a 020607_11:23 MQXAB/020607_11:23.B_measX_y=+17.5mm
a 020607_11:32 MQXAB/020607_11:32.B_measX_y=-17.5mm
R 020607_11:52 MQXAB/020607_11:52.A_checkXY_roll
a 020607_11:44 MQXAB/020607_11:44.A_checkXY_roll
a 020610_07:22 MQXAB/stagesSwapped_06072002/020610_07:22.B_centerX
a 020610_07:39 MQXAB/stagesSwapped_06072002/020610_07:39.B_checkX
a 020610_07:52 MQXAB/stagesSwapped_06072002/020610_07:52.B_centerY
a 020610_08:18 MQXAB/stagesSwapped_06072002/020610_08:18.A_checkXY
a 020610_08:49 MQXAB/stagesSwapped_06072002/020610_08:49.A_checkXY_upBstage1mm
a 020610_09:04 MQXAB/stagesSwapped_06072002/020610_09:04.A_roll
a 020610_12:02 MQXAB/stagesSwapped_06072002/020610_12:02.B_centerXY_rollMag90
R 020610_12:48 MQXAB/stagesSwapped_06072002/020610_12:48.B_checkXY_rollMag90
R 020610_13:11 MQXAB/stagesSwapped_06072002/020610_13:11.A_checkXY_rollMag90
a 020610_13:39 MQXAB/stagesSwapped_06072002/020610_13:39.A_checkX_rollMag90
a 020610_14:01 MQXAB/stagesSwapped_06072002/020610_14:01.B_checkX_rollMag90
a 020610_14:17 MQXAB/stagesSwapped_06072002/020610_14:17.B_checkX_rollMag90_DC
a 020610_14:20 MQXAB/stagesSwapped_06072002/020610_14:20.B_checkX_rollMag90_DC
a 020610_14:27 MQXAB/stagesSwapped_06072002/020610_14:27.B_checkX_rollMag90_leadsAtStage
a 020610_14:54 MQXAB/stagesSwapped_06072002/020610_14:54.B_checkX_rollMag90_rotWire
a 020610_15:48 MQXAB/stagesSwapped_06072002/020610_15:48.B_checkX_rollMag90_extRetWire
a 020610_15:59 MQXAB/stagesSwapped_06072002/020610_15:59.B_checkX_rollMag90_extRetWire
a 020611_07:32 MQXAB/stagesSwapped_06072002/020611_07:32.B_checkX_rollMag90_visualCentered6.4mm
a 020611_08:47 MQXAB/stagesSwapped_06072002/020611_08:47.B_checkX_rollMag90_visualCentered6.4mm
a 020611_09:06 MQXAB/stagesSwapped_06072002/020611_09:06.B_checkX_rollMag90_visualCentered6.4mm_200Vps
a 020610_14:41 MQXAB/stagesSwapped_06072002/020610_14:41.B_checkX_rollMag90_leadsAtAStage_betterBleads
a 020611_11:42 MQXAB/020611_11:42.B_centerX
a 020611_12:01 MQXAB/020611_12:01.B_checkX
a 020611_12:24 MQXAB/020611_12:24.A_checkX
a 020611_12:54 MQXAB/020611_12:54.B_rotWire
a 020611_13:35 MQXAB/020611_13:35.B_checkX_wireOnABCenter
R 020611_15:13 MQXAB/020611_15:13.B_centerXY_magnetRolledBackTo0
R 020611_16:07 MQXAB/020611_16:07.A_checkXY_magnetRolledBackTo0
a 020612_09:05 MQXAB/020612_09:05.A_roll_magnetRolledBackTo0
a 020416_12:11 MQXAB/initialAlignment/020416_12:11.centerQB_x
a 020416_12:55 MQXAB/initialAlignment/020416_12:55.sagCalib_QB
a 020416_15:03 MQXAB/initialAlignment/020416_15:03.checkY_QB
a 020416_15:26 MQXAB/initialAlignment/020416_15:26.checkX_QA
a 020416_15:42 MQXAB/initialAlignment/020416_15:42.sagCalib_QA
a 020417_08:49 MQXAB/initialAlignment/020417_08:49.centerXY_QB
a 020417_09:49 MQXAB/initialAlignment/020417_09:49.centerXY_QA
a 020417_10:39 MQXAB/initialAlignment/020417_10:39.checkXY_QA_intRetWire
a 020417_11:40 MQXAB/initialAlignment/020417_11:40.checkXY_QB_intRetWire
a 020417_12:03 MQXAB/initialAlignment/020417_12:03.roll_QB
a 020417_12:46 MQXAB/initialAlignment/020417_12:46.roll_QA
a 020417_14:02 MQXAB/initialAlignment/020417_14:02.checkXY_QA_noTopClamp
a 020417_15:18 MQXAB/initialAlignment/020417_15:18.checkXY_QA_60milShim
a 020418_10:18 MQXAB/initialAlignment/020418_10:18.checkXY_QB

a 020418_11:19 MQXAB/initialAlignment/020418_11:19.checkXY_QA_60milShim+newShim
a 020418_13:22 MQXAB/initialAlignment/020418_13:22.checkXY_QA_60milShim+newShim+5milShim
a 020418_14:19 MQXAB/initialAlignment/020418_14:19.checkXY_QA_60milShim+newShim+3milShim
a 020418_14:51 MQXAB/initialAlignment/020418_14:51.checkXY_QA_60milShim+newShim+3milShim+3milLE
a 020418_15:29 MQXAB/initialAlignment/020418_15:29.checkXY_QA_sameAsPrevWLift
a 020418_16:00 MQXAB/initialAlignment/020418_16:00.checkXY_QA_sameAsPrev
a 020418_16:23 MQXAB/initialAlignment/020418_16:23.checkXY_QA_noShims
a 020419_15:29 MQXAB/initialAlignment/020419_15:29.checkRoll_repeat/020419_15:29.checkRoll
a 020419_15:29 MQXAB/initialAlignment/020419_15:29.checkRoll_repeat/020419_16:07.checkRoll
a 020419_15:29 MQXAB/initialAlignment/020419_15:29.checkRoll_repeat
a 020422_07:40 MQXAB/initialAlignment/020422_07:40.checkRoll_rotWire
a 020422_11:38 MQXAB/initialAlignment/020422_11:38.checkXY_fixtureAdj
a 020422_13:45 MQXAB/initialAlignment/020422_13:45.checkXY_fixtureAdj_1mmShim
a 020423_10:15 MQXAB/initialAlignment/020423_10:15.checkXY_fixtureAdj_1mmShim
a 020423_10:34 MQXAB/initialAlignment/020423_10:34.checkRoll_fixtureAdj_1mmShim
a 020423_12:20 MQXAB/initialAlignment/020423_12:20.checkXY_QB
a 020423_12:43 MQXAB/initialAlignment/020423_12:43.checkRoll_QB
a 020423_14:35 MQXAB/initialAlignment/020423_14:35.checkRoll_adjMagOffset_QA
a 020423_16:56 MQXAB/initialAlignment/020423_16:56.checkXY_final_QA
a 020423_17:14 MQXAB/initialAlignment/020423_17:14.checkXY_final_QA
a 020424_11:01 MQXAB/initialAlignment/020424_11:01.sysTest_repeat/020424_12:43.sysTest
a 020424_11:01 MQXAB/initialAlignment/020424_11:01.sysTest_repeat
a 020424_12:58 MQXAB/initialAlignment/020424_12:58.rollTest_repeat/020424_12:58.rollTest
a 020424_12:58 MQXAB/initialAlignment/020424_12:58.rollTest_repeat/020424_13:35.rollTest
a 020424_12:58 MQXAB/initialAlignment/020424_12:58.rollTest_repeat/020424_14:13.rollTest
a 020424_12:58 MQXAB/initialAlignment/020424_12:58.rollTest_repeat/020424_14:49.rollTest
a 020424_12:58 MQXAB/initialAlignment/020424_12:58.rollTest_repeat
a 020612_09:29 MQXAB/020612_09:29.B_roll_magnetRolledBackTo0
a 020612_12:08 MQXAB/020612_12:08.B_rotWire_magnetRolledBackTo0
a 020612_14:10 MQXAB/020612_14:10.B_centerXY_rolledMagnet-90
R 020612_14:55 MQXAB/020612_14:55.B_checkXY_rolledMagnet-90
R 020612_15:17 MQXAB/020612_15:17.A_checkXY_rolledMagnet-90
a 020612_15:49 MQXAB/020612_15:49.A_checkX
a 020612_15:58 MQXAB/020612_15:58.A_roll_rolledMagnet-90
a 020612_16:28 MQXAB/020612_16:28.B_roll_rolledMagnet-90
a 020613_14:36 MQXAB/020613_14:36.B_centerXY_rolledBackTo0_flangeOn
a 020613_15:07 MQXAB/020613_15:07.B_checkXY_rolledBackTo0_flangeOn
a 020620_09:52 MQXAB/020620_09:52.B_centerXY_cryoSupport
a 020620_10:29 MQXAB/020620_10:29.B_checkXY_cryoSupport
a 020614_07:39 MQXAB/020614_07:39.B_checkXY_rolledBackTo0_flangeOn
a 020614_12:17 MQXAB/020614_12:17.B_checkXY_afterFinalFlangeWeld
a 020620_12:06 MQXAB/020620_12:06.A_checkRoll_cryoSupport
R 020620_15:24 MQXAB/020620_15:24.B_centerXY_cryoSupport_0.5mmShim
R 020620_16:08 MQXAB/020620_16:08.A_checkXY_cryoSupport_0.5mmShim
a 020621_10:07 MQXAB/020621_10:07.B_centerXY_cryoSup_0.5mm-X_1.0mm+X_shims
R 020620_10:58 MQXAB/020620_10:58.A_checkXY_cryoSupport
R 020614_09:15 MQXAB/020614_09:15.A_checkXY_rolledBackTo0_flangeOn
a 020614_09:36 MQXAB/020614_09:36.A_checkXY_rolledBackTo0_flangeOn
R 020621_12:51 MQXAB/020621_12:51.B_centerXY_cryoSup_1mm-X_0.5mm+X_shims
R 020621_13:38 MQXAB/020621_13:38.A_checkXY_cryoSup_1mm-X_0.5mm+X_shims
a 020620_12:41 MQXAB/020620_12:41.B_checkRoll_cryoSupport
a 020624_15:03 MQXAB/020624_15:03.B_centerXY_weldStraightened
R 020625_10:30 MQXAB/020625_10:30.B_weldStraightenedXY
R 020625_11:14 MQXAB/020625_11:14.A_checkXY_weldStraightenedXY
a 020624_15:38 MQXAB/020624_15:38.B_checkXY_weldStraightened
R 020621_10:40 MQXAB/020621_10:40.B_checkX_cryoSup_0.5mm-X_1.0mm+X_shims
R 020621_11:00 MQXAB/020621_11:00.A_checkXY_cryoSup_0.5mm-X_1.0mm+X_shims
R 020624_15:58 MQXAB/020624_15:58.A_checkXY_weldStraightened

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MTF Measurements during test and alignment

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/usr/analysis/LQX/LQXB01/SSW

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WarmBefore TC1

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a 020821_13:02 QB_LE/warm_befTC1_noVac/020821_13:02.test
a 020821_13:08 QB_LE/warm_befTC1_noVac/020821_13:08.test
a 020821_13:14 QB_LE/warm_befTC1_noVac/020821_13:14.test
a 020821_13:19 QB_LE/warm_befTC1_noVac/020821_13:19.test
a 020821_13:28 QB_LE/warm_befTC1_noVac/020821_13:28.test
a 020821_13:38 QB_LE/warm_befTC1_noVac/020821_13:38.test
a 020821_13:48 QB_LE/warm_befTC1_noVac/020821_13:48.test
a 020821_14:03 QB_LE/warm_befTC1_noVac/020821_14:03.test
a 020821_14:14 QB_LE/warm_befTC1_noVac/020821_14:14.testY
a 020821_14:31 QB_LE/warm_befTC1_noVac/020821_14:31.calSag
a 020821_15:56 QB_LE/warm_befTC1_noVac/020821_15:56.calSag
a 020821_17:52 QB_LE/warm_befTC1_noVac/020821_17:52.testX_BeCu
R 020821_18:01 QB_LE/warm_befTC1_noVac/020821_18:01.calSag_BeCu

a 020822_05:20 QB_LE/warm_befTC1_noVac/020822_05:20.centerXY
a 020822_06:24 QA_NLE/020822_06:24.checkX
R 020822_06:47 QA_NLE/020822_06:47.calSag_QA
a 020822_08:36 QA_NLE/020822_08:36.checkY
a 020822_12:03 QA_NLE/020822_12:03.rotWire_XYRoll
a 020822_12:29 QA_NLE/020822_12:29.checkX
a 020822_12:45 QB_LE/warm_befTC1_noVac/020822_12:45.checkX
a 020822_13:35 QB_LE/warm_befTC1_noVac/020822_13:35.checkXY_aftQAadj
a 020822_13:58 QA_NLE/020822_13:58.checkXY_aft1stQAadj
a 020823_09:58 QB_LE/warm_befTC1_noVac/020823_09:58.checkXY_aftQAadj2
a 020823_10:33 QA_NLE/020823_10:33.checkXY_aft2ndAdj
a 020823_11:20 QB_LE/warm_befTC1_noVac/020823_11:20.checkXY_aftQAadj2
R 020823_11:39 QB_LE/warm_befTC1_noVac/020823_11:39.calSag
R 020826_11:32 QA_NLE/020826_11:32.calSag
R 020826_14:27 QA_NLE/020826_14:27.calSag
R 020827_05:54 QB_LE/warm_befTC1_noVac/020827_05:54.calSag
a 020827_07:52 QB_LE/warm_befTC1_noVac/020827_07:52.centerXY
a 020827_08:41 QA_NLE/020827_08:41.checkXY_befNewTools
a 020829_10:36 QB_LE/warm_befTC1_noVac/020829_10:36.centerXY
a 020829_11:38 QB_LE/warm_befTC1_noVac/020829_11:38.checkY
a 020829_11:54 QB_LE/warm_befTC1_noVac/020829_11:54.checkXY
a 020829_12:20 QA_NLE/020829_12:20.checkXY_aft3rdAdj
a 020829_14:05 QB_LE/warm_befTC1_noVac/020829_14:05.checkXY_aft4adj
a 020829_14:39 QA_NLE/020829_14:39.checkXY_aft4thAdj
a 020829_15:16 QB_LE/warm_befTC1_noVac/020829_15:16.checkXY
a 020829_15:45 QB_LE/warm_befTC1_noVac/020829_15:45.checkXY_aft5thAdj
a 020829_16:08 QA_NLE/020829_16:08.checkXY_aft5thAdj
a 020829_16:43 QB_LE/warm_befTC1_noVac/020829_16:43.checkXY
a 020830_08:29 QB_LE/warm_befTC1_noVac/020830_08:29.checkXY_moveBack
a 020830_08:56 QA_NLE/020830_08:56.checkXY_aft6thAdj
a 020830_09:35 QB_LE/warm_befTC1_noVac/020830_09:35.checkXY
a 020830_10:23 QB_LE/warm_befTC1_noVac/020830_10:23.checkXY
a 020830_10:47 QB_LE/warm_befTC1_noVac/020830_10:47.checkX
a 020830_11:11 QB_LE/warm_befTC1_noVac/020830_11:11.checkXY
a 020830_11:37 QA_NLE/020830_11:37.checkXY_aft6thAdj_redo
a 020830_12:07 QA_NLE/020830_12:07.checkXY_aft6thAdj_redo
a 020830_12:27 QB_LE/warm_befTC1_noVac/020830_12:27.checkXY
a 020904_08:25 QB_LE/warm_befTC1_noVac/020904_08:25.checkXY
a 020904_08:54 QB_LE/warm_befTC1_noVac/020904_08:54.checkXY
a 020904_09:13 QA_NLE/020904_09:13.checkXY_befSurvey
a 020904_09:54 QA_NLE/020904_09:54.checkXYRoll_befSurvey
a 020904_12:58 QAQB/020904_12:58.checkXY
a 020904_14:44 QAQB/020904_14:44.sagCalQAQB
a 020904_17:08 QAQB/020904_17:08.checkXY
a 020905_12:28 QAQB/020905_12:28.checkXY_aftSurvey
a 020905_12:52 QAQB/020905_12:52.Roll
R 020905_14:19 QB_LE/warm_befTC1_noVac/020905_14:19.checkXY_aftSurvey
R 020905_14:38 QB_LE/warm_befTC1_noVac/020905_14:38.Roll
R 020905_15:35 QA_NLE/020905_15:35.checkXYRoll_aftSurvey
a 020905_17:10 QAQB/020905_17:10.sagCal_repeat
R 020905_17:10 QAQB/020905_17:10.sagCal_repeat/020905_17:10.sagCal
R 020905_17:10 QAQB/020905_17:10.sagCal_repeat/020905_18:42.sagCal
a 020916_11:56 QB_LE/warm_befTC1_vac_Sep02/020916_11:56.test
a 020916_12:43 QB_LE/warm_befTC1_vac_Sep02/020916_12:43.checkXY
a 020916_13:40 QB_LE/warm_befTC1_vac_Sep02/020916_13:40.checkXY
a 020916_15:15 QB_LE/warm_befTC1_vac_Sep02/020916_15:15.checkXY
a 020916_15:51 QB_LE/warm_befTC1_vac_Sep02/020916_15:51.checkXY
a 020916_16:15 QB_LE/warm_befTC1_vac_Sep02/020916_16:15.checkX
a 020917_10:11 QB_LE/warm_befTC1_vac_Sep02/020917_10:11.checkXY
a 020917_10:55 QB_LE/warm_befTC1_vac_Sep02/020917_10:55.checkXY
a 020917_12:00 QB_LE/warm_befTC1_vac_Sep02/020917_12:00.checkXY
a 020917_12:33 QB_LE/warm_befTC1_vac_Sep02/020917_12:33.checkXY
a 020917_13:09 QB_LE/warm_befTC1_vac_Sep02/020917_13:09.checkY
a 020917_15:44 QB_LE/warm_befTC1_vac_Sep02/020917_15:44.checkX_noVac_negLegShunt
a 020917_15:51 QB_LE/warm_befTC1_vac_Sep02/020917_15:51.checkX_noVac_posLegShunt
a 020917_16:17 QB_LE/warm_befTC1_vac_Sep02/020917_16:17.checkX_noVac_posLegShunt
a 020917_16:23 QB_LE/warm_befTC1_vac_Sep02/020917_16:23.checkX_noVac_posLegShunt
a 020917_16:30 QB_LE/warm_befTC1_vac_Sep02/020917_16:30.checkX_noVac_posLegShunt
a 020917_16:39 QB_LE/warm_befTC1_vac_Sep02/020917_16:39.checkX_noVac_negLegShunt
a 020917_16:47 QB_LE/warm_befTC1_vac_Sep02/020917_16:47.checkX_noVac_negLegShunt_DC
a 020917_16:52 QB_LE/warm_befTC1_vac_Sep02/020917_16:52.checkX_noVac_negLegShunt_DC
a 020925_15:09 QB_LE/warm_befTC1_vac_Sep02/020925_15:09.centerXY_befCooldown
a 020925_15:49 QB_LE/warm_befTC1_vac_Sep02/020925_15:49.checkY
a 020925_16:06 QA_NLE/020925_16:06.checkXY_befCooldown
a 020925_16:31 QA_NLE/020925_16:31.checkY
a 020925_17:01 QA_NLE/020925_17:01.checkXY_QAQB_avgAxis
a 020925_17:19 QB_LE/warm_befTC1_vac_Sep02/020925_17:19.checkXY_QAQB_avgAxis
a 020926_13:47 QB_LE/warm_befTC1_vac_Sep02/020926_13:47.checkXYRoll_QAQB_avgAxis_aftSurvey
a 020926_15:10 QA_NLE/020926_15:10.checkXYRoll_QAQB_avgAxis_aftSurvey
a 020926_16:16 QB_LE/warm_befTC1_vac_Sep02/020926_16:16.checkXY_rmCenterSupportTilt

a 020926_16:44 QB_LE/warm_befTC1_vac_Sep02/020926_16:44.checkXY_rmCenterSupportTilt
a 020926_17:40 QA_NLE/020926_17:40.checkXY_rmCenterSupportTilt
R 020927_06:33 QA_NLE/020927_06:33.checkXY_QAQB_avgAxis
R 020927_06:54 QB_LE/warm_befTC1_vac_Sep02/020927_06:54.checkXY_QAQB_avgAxis
R 020927_07:23 QB_LE/warm_befTC1_vac_Sep02/020927_07:23.rollBefTC1
R 020927_08:20 QA_NLE/020927_08:20.rollBefTC1
R 020927_11:59 QB_LE/warm_befTC1_vac_Sep02/020927_11:59.checkXY_aftSurv
R 020927_12:23 QA_NLE/020927_12:23.checkXY_aftSurvey
a 021104_15:45 QB_LE/warm_befTC1_vac_Nov02/021104_15:45.centerXY
a 021104_15:50 QB_LE/warm_befTC1_vac_Nov02/021104_15:50.centerXY
a 021105_07:40 QB_LE/warm_befTC1_vac_Nov02/021105_07:40.centerXY
R 021105_08:04 QB_LE/warm_befTC1_vac_Nov02/021105_08:04.centerXY
R 021105_08:33 QA_NLE/021105_08:33.centerXY
R 021105_08:58 QA_NLE/021105_08:58.checkXY_wireOnAvgAxis
R 021105_09:21 QB_LE/warm_befTC1_vac_Nov02/021105_09:21.checkXY_wireOnAvgAxis
a 021105_12:23 QB_LE/warm_befTC1_vac_Nov02/021105_12:23.checkXY_aftSurvey
a 021105_12:49 QA_NLE/021105_12:49.checkXY_aftSurvey
a 021105_13:37 QA_NLE/021105_13:37.checkXY_aftWireCorrect
a 021105_13:50 QB_LE/warm_befTC1_vac_Nov02/021105_13:50.checkXY_aftWireCorrect
R 021105_16:14 QB_LE/warm_befTC1_vac_Nov02/021105_16:14.roll
R 021105_16:49 QA_NLE/021105_16:49.roll

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Cold, TC1

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a 021115_16:39 QB_LE/cold_TC1/021115_16:39.testX
a 021115_16:54 QB_LE/cold_TC1/021115_16:54.checkX
R 021115_17:01 QB_LE/cold_TC1/021115_17:01.coldSagCal
R 021115_18:13 QB_LE/cold_TC1/021115_18:13.coldTC1Roll
R 021115_18:50 QB_LE/cold_TC1/021115_18:50.coldTC1Roll
a 021205_17:12 QA_NLE/cold_TC1/021205_17:12.xStrength
R 021205_17:20 QA_NLE/cold_TC1/021205_17:20.xStrengthVsT
R 021205_17:49 QA_NLE/cold_TC1/021205_17:49.xStrengthVsT_5460A_up
a 021205_18:17 QA_NLE/cold_TC1/021205_18:17.test_11345A
R 021205_18:20 QA_NLE/cold_TC1/021205_18:20.xStrengthVsT_11345A
R 021205_18:46 QA_NLE/cold_TC1/021205_18:46.xStrengthVsT_11923A
R 021205_19:20 QA_NLE/cold_TC1/021205_19:20.xStrengthVsT_5460A_dn
R 021205_19:45 QA_NLE/cold_TC1/021205_19:45.xStrengthVsT_669A_dn
a 021205_20:18 QA_NLE/cold_TC1/021205_20:18.xStrength_669A_dn_mg
R 021205_20:33 QA_NLE/cold_TC1/021205_20:33.xStrengthVsT_11345A_mg
a 021208_20:21 QA_NLE/cold_TC1/021208_20:21.testX_669A
a 021208_20:25 QA_NLE/cold_TC1/021208_20:25.centerX
R 021208_20:40 QA_NLE/cold_TC1/021208_20:40.sagCal_4.5K
R 021208_21:48 QA_NLE/cold_TC1/021208_21:48.sagCal_4.5K
a 021208_22:37 QA_NLE/cold_TC1/021208_22:37.centerY
R 021208_22:50 QA_NLE/cold_TC1/021208_22:50.checkX
R 021208_22:54 QA_NLE/cold_TC1/021208_22:54.roll
a 021209_16:44 QB_LE/cold_TC1/021209_16:44.centerXY
R 021209_16:55 QB_LE/cold_TC1/021209_16:55.centerXY
a 021209_17:15 QB_LE/cold_TC1/021209_17:15.checkXY_wireOnAvgAxis
a 021210_16:27 QB_LE/cold_TC1/021210_16:27.test_cold_AC
a 021210_22:21 QB_LE/cold_TC1/021210_22:21.testDC
a 021210_22:24 QB_LE/cold_TC1/021210_22:24.xStrength_669A_up
a 021210_22:45 QB_LE/cold_TC1/021210_22:45.xStrengthVsT_5460A_up
R 021213_10:37 QB_LE/cold_TC1/021213_10:37.checkXY_30K_AC
R 021213_11:08 QA_NLE/cold_TC1/021213_11:08.checkXY_30K_AC

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WarmAfter TC1

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R 021216_11:16 QA_NLE/warm_aftTC1/021216_11:16.checkXY_aftTC1
R 021216_11:41 QB_LE/warm_aftTC1/021216_11:41.checkXY
a 021216_12:13 QA_NLE/warm_aftTC1/021216_12:13.checkXY_aftTC1_onQAaxis
a 021216_12:33 QB_LE/warm_aftTC1/021216_12:33.checkXY_aftTC1_onQAaxis
a 021216_14:56 QB_LE/warm_aftTC1/021216_14:56.checkXY_aftTC1_onQAaxis
a 021216_15:22 QA_NLE/warm_aftTC1/021216_15:22.checkXY_aftTC1_onQAaxis
a 021216_16:37 QA_NLE/warm_aftTC1/021216_16:37.checkXY_aftTC1_onQAaxis
a 021216_16:59 QA_NLE/warm_aftTC1/021216_16:59.checkXY_aftTC1_onQAaxis_repeat
a 021216_16:59 QA_NLE/warm_aftTC1/021216_16:59.checkXY_aftTC1_onQAaxis_repeat/021216_16:59.checkXY_aftTC1_onQAaxis
a 021216_16:59 QA_NLE/warm_aftTC1/021216_16:59.checkXY_aftTC1_onQAaxis_repeat/021216_17:15.checkXY_aftTC1_onQAaxis
a 021216_16:59 QA_NLE/warm_aftTC1/021216_16:59.checkXY_aftTC1_onQAaxis_repeat/021216_17:31.checkXY_aftTC1_onQAaxis
a 021216_16:59 QA_NLE/warm_aftTC1/021216_16:59.checkXY_aftTC1_onQAaxis_repeat/021216_17:47.checkXY_aftTC1_onQAaxis
a 021216_16:59 QA_NLE/warm_aftTC1/021216_16:59.checkXY_aftTC1_onQAaxis_repeat/021216_18:04.checkXY_aftTC1_onQAaxis
a 021217_07:38 QA_NLE/warm_aftTC1/021217_07:38.checkXY_aftTC1_onQAaxis
a 021217_11:47 QA_NLE/warm_aftTC1/021217_11:47.checkXY_aftTC1_onQAaxis
a 021217_12:20 QA_NLE/warm_aftTC1/021217_12:20.checkXY_aftTC1_onQAaxis_repeat
R 021217_16:22 QA_NLE/warm_aftTC1/021217_16:22.checkXY_aftTC1_onQAaxis
a 021217_16:40 QA_NLE/warm_aftTC1/021217_16:40.checkY_aftTC1_onQAaxis
a 021217_17:03 QA_NLE/warm_aftTC1/021217_17:03.checkY_aftTC1_onQAaxis
a 021217_17:14 QA_NLE/warm_aftTC1/021217_17:14.checkY_aftTC1_onQAaxis
R 021217_17:33 QB_LE/warm_aftTC1/021217_17:33.checkXYRoll_aftTC1_onQAaxis

R 021218_08:33 QB_LE/warm_aftTC1/021218_08:33.checkXY_aftTC1_onAveAxis
R 021218_08:53 QA_NLE/warm_aftTC1/021218_08:53.checkXY_aftTC1_onAveAxis
a 021218_16:45 QA_NLE/warm_aftTC1/021218_16:45.checkXY_aftTC1_onAveAxis_aftSurvey
R 021218_17:08 QA_NLE/warm_aftTC1/021218_17:08.roll_aftTC1
a 030108_14:23 QB_LE/warm_aftTC1_noVac_8Jan03/030108_14:23.checkXY
a 030108_14:44 QA_NLE/warm_aftTC1_noVac_8Jan03/030108_14:44.checkXY
a 030108_15:13 QA_NLE/warm_aftTC1_noVac_8Jan03/030108_15:13.checkXY
R 030108_16:12 QA_NLE/warm_aftTC1_noVac_8Jan03/030108_16:12.checkXY
R 030108_16:30 QA_NLE/warm_aftTC1_noVac_8Jan03/030108_16:30.checkXY
R 030108_16:54 QB_LE/warm_aftTC1_noVac_8Jan03/030108_16:54.checkXY
R 030108_17:11 QB_LE/warm_aftTC1_noVac_8Jan03/030108_17:11.checkXY
R 030109_14:03 QB_LE/warm_aftTC1_noVac_8Jan03/030109_14:03.checkXY_aftAdj1
R 030109_14:22 QA_NLE/warm_aftTC1_noVac_8Jan03/030109_14:22.checkXY_aftAdj1
R 030109_14:40 QB_LE/warm_aftTC1_noVac_8Jan03/030109_14:40.checkXY_aftAdj1
R 030109_16:20 QB_LE/warm_aftTC1_noVac_8Jan03/030109_16:20.checkXY_aftAdj2
R 030110_10:41 QB_LE/warm_aftTC1_noVac_8Jan03/030110_10:41.checkXY_aftAdj3
R 030110_11:00 QA_NLE/warm_aftTC1_noVac_8Jan03/030110_11:00.checkXY_aftAdj3
a 030110_15:27 QA_NLE/warm_aftTC1_noVac_8Jan03/030110_15:27.checkXY_aftAdj3_1atm
a 030110_16:01 QB_LE/warm_aftTC1_noVac_8Jan03/030110_16:01.checkXY_aftAdj3_1atm
R 030110_16:25 QB_LE/warm_aftTC1_noVac_8Jan03/030110_16:25.checkXY_aftAdj3_1atm
a 030110_16:46 QA_NLE/warm_aftTC1_noVac_8Jan03/030110_16:46.checkXY_aftAdj3_1atm
R 030110_17:16 QA_NLE/warm_aftTC1_noVac_8Jan03/030110_17:16.checkXY_aftAdj3_1atm
a 030113_07:52 QA_NLE/warm_aftTC1_noVac_8Jan03/030113_07:52.checkXY_aftAdj3_1atm_repeat
a 030113_07:52
QA_NLE/warm_aftTC1_noVac_8Jan03/030113_07:52.checkXY_aftAdj3_1atm_repeat/030113_07:52.checkXY_aftAdj3_1atm
a 030113_07:52
QA_NLE/warm_aftTC1_noVac_8Jan03/030113_07:52.checkXY_aftAdj3_1atm_repeat/030113_08:10.checkXY_aftAdj3_1atm
a 030113_08:52 QA_NLE/warm_aftTC1_noVac_8Jan03/030113_08:52.checkXY_aftAdj3_1atm_repeat
a 030113_08:52
QA_NLE/warm_aftTC1_noVac_8Jan03/030113_08:52.checkXY_aftAdj3_1atm_repeat/030113_08:52.checkXY_aftAdj3_1atm
a 030113_08:52
QA_NLE/warm_aftTC1_noVac_8Jan03/030113_08:52.checkXY_aftAdj3_1atm_repeat/030113_09:11.checkXY_aftAdj3_1atm
R 030113_09:55 QA_NLE/warm_aftTC1_noVac_8Jan03/030113_09:55.checkXY_aftAdj3_1atm
R 030113_10:37 QA_NLE/warm_aftTC1_noVac_8Jan03/030113_10:37.checkXY_aftAdj3_1atm
R 030113_11:35 QB_LE/warm_aftTC1_noVac_8Jan03/030113_11:35.checkXY_aftAdj3_1atm_repeat
R 030113_11:35
QB_LE/warm_aftTC1_noVac_8Jan03/030113_11:35.checkXY_aftAdj3_1atm_repeat/030113_11:35.checkXY_aftAdj3_1atm
R 030113_11:35
QB_LE/warm_aftTC1_noVac_8Jan03/030113_11:35.checkXY_aftAdj3_1atm_repeat/030113_12:09.checkXY_aftAdj3_1atm
R 030114_11:22 QB_LE/warm_aftTC1_noVac_8Jan03/030114_11:22.checkXY_aftAdj3_4atm_repeat
R 030114_11:22
QB_LE/warm_aftTC1_noVac_8Jan03/030114_11:22.checkXY_aftAdj3_4atm_repeat/030114_11:22.checkXY_aftAdj3_4atm
R 030114_11:22
QB_LE/warm_aftTC1_noVac_8Jan03/030114_11:22.checkXY_aftAdj3_4atm_repeat/030114_11:49.checkXY_aftAdj3_4atm
R 030114_12:25 QA_NLE/warm_aftTC1_noVac_8Jan03/030114_12:25.checkXY_aftAdj3_4atm_repeat
R 030114_12:25
QA_NLE/warm_aftTC1_noVac_8Jan03/030114_12:25.checkXY_aftAdj3_4atm_repeat/030114_12:25.checkXY_aftAdj3_4atm
R 030114_12:25
QA_NLE/warm_aftTC1_noVac_8Jan03/030114_12:25.checkXY_aftAdj3_4atm_repeat/030114_12:51.checkXY_aftAdj3_4atm
a 030131_08:41 QB_LE/warm_aftTC1_vac_30Jan03/030131_08:41.checkXY_beforeTC2
a 030131_09:31 QB_LE/warm_aftTC1_vac_30Jan03/030131_09:31.checkXY_beforeTC2
a 030131_10:03 QA_NLE/warm_aftTC1_vac_30Jan03/030131_10:03.checkXY_befTC2
R 030131_10:45 QA_NLE/warm_aftTC1_vac_30Jan03/030131_10:45.checkXY_befTC2_wireOnAvgAxis
R 030131_11:21 QB_LE/warm_aftTC1_vac_30Jan03/030131_11:21.checkXY_beforeTC2_wireOnAvgAxis
a 030131_12:17 QB_LE/warm_aftTC1_vac_30Jan03/030131_12:17.roll_beforeTC2
a 030131_12:17 QB_LE/warm_aftTC1_vac_30Jan03/030131_12:17_12:56_roll_beforeTC2
a 030131_12:56 QB_LE/warm_aftTC1_vac_30Jan03/030131_12:56.roll_beforeTC2
a 030131_16:42 QB_LE/warm_aftTC1_vac_30Jan03/030131_16:42.checkXY_aftSurvey
a 030131_16:55 QA_NLE/warm_aftTC1_vac_30Jan03/030131_16:55.roll_befTC2
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Cold, TC2

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a 030219_10:47 QB_LE/cold_TC2_4.5K/030219_10:47.checkXY_4.5K_AC
a 030219_11:21 QA_NLE/cold_TC2_4.5K/030219_11:21.checkXY_4.5K_AC
a 030219_11:45 QA_NLE/cold_TC2_4.5K/030219_11:45.checkXY_4.5K_AC_coDir_avgCen
a 030219_12:13 QA_NLE/cold_TC2_4.5K/030219_12:13.checkXY_4.5K_AC_avgCen
a 030219_12:31 QB_LE/cold_TC2_4.5K/030219_12:31.checkXY_4.5K_AC_coDir_avgCen
a 030219_12:45 QB_LE/cold_TC2_4.5K/030219_12:45.checkXY_4.5K_AC_coDir_avgCen
a 030219_16:36 QA_NLE/cold_TC2_4.5K/030219_16:36.checkXYRoll_4.5K_AC
a 030219_18:09 QB_LE/cold_TC2_4.5K/030219_18:09.checkXY_4.5K_AC_avgCen
a 030219_18:41 QB_LE/cold_TC2_4.5K/030219_18:41.checkX_4.5K_DC_10A
a 030219_18:53 QB_LE/cold_TC2_4.5K/030219_18:53.checkXY_4.5K_AC_avgCen
R 030220_10:20 QB_LE/cold_TC2_4.5K/030220_10:20.checkXY_4.5K_AC
R 030220_11:00 QA_NLE/cold_TC2_4.5K/030220_11:00.checkXY_4.5K_AC
R 030220_11:23 QB_LE/cold_TC2_4.5K/030220_11:23.checkXY_4.5K_AC
R 030220_11:49 QA_NLE/cold_TC2_4.5K/030220_11:49.checkXY_4.5K_AC
a 030220_12:16 QA_NLE/cold_TC2_4.5K/030220_12:16.roll_4.5K_AC
a 030220_16:23 QB_LE/cold_TC2_4.5K/030220_16:23.checkXYRoll_4.5K_AC_aftSurvey
a 030221_15:48 QAQB/cold_TC2/030221_15:48.Roll_1.9K_669A
a 030221_16:11 QAQB/cold_TC2/030221_16:11.Roll_1.9K_669A

a 030221_16:39 QAQB/cold_TC2/030221_16:39.xStr_BeCu_11923A
a 030221_16:58 QAQB/cold_TC2/030221_16:58.xStr_BeCu_11923A
a 030221_17:19 QAQB/cold_TC2/030221_17:19.xStr_pureCU_11923A
a 030221_17:28 QAQB/cold_TC2/030221_17:28.xStr_pureCU_11923A
a 030221_17:32 QAQB/cold_TC2/030221_17:32.xStr_pureCU_11923A
a 030221_17:36 QAQB/cold_TC2/030221_17:36.xStr_pureCU_11923A
a 030311_16:42 QB_LE/cold_TC2_1.9K/030311_16:42.testX
a 030311_16:46 QB_LE/cold_TC2_1.9K/030311_16:46.testY
a 030311_16:52 QB_LE/cold_TC2_1.9K/030311_16:52.Roll_TC2_1.9K
a 030311_17:09 QB_LE/cold_TC2_1.9K/030311_17:09.Roll_TC2_1.9K
R 030311_17:24 QB_LE/cold_TC2_1.9K/030311_17:24.Roll_TC2_1.9K
R 030311_17:43 QB_LE/cold_TC2_1.9K/030311_17:43.strX_11345A
R 030311_18:07 QB_LE/cold_TC2_1.9K/030311_18:07.strX_11923A
a 030311_18:35 QB_LE/cold_TC2_1.9K/030311_18:35.strX_5460A
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WarmAfter TC2
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a 030319_10:01 QB_LE/warm_aftTC2_vac_19Mar03/030319_10:01.testX
a 030319_10:09 QB_LE/warm_aftTC2_vac_19Mar03/030319_10:09.checkXY_aftTC2
a 030319_10:41 QA_NLE/warm_aftTC2_vac_19Mar03/030319_10:41.checkXY_aftTC2
a 030319_11:24 QA_NLE/warm_aftTC2_vac_19Mar03/030319_11:24.checkXY_aftTC2_aveAxis
R 030319_11:44 QA_NLE/warm_aftTC2_vac_19Mar03/030319_11:44.roll_aftTC2_repeat
R 030319_11:44 QA_NLE/warm_aftTC2_vac_19Mar03/030319_11:44.roll_aftTC2_repeat/030319_11:45.roll_aftTC2
R 030319_11:44 QA_NLE/warm_aftTC2_vac_19Mar03/030319_11:44.roll_aftTC2_repeat/030319_12:34.roll_aftTC2
R 030319_11:44 QA_NLE/warm_aftTC2_vac_19Mar03/030319_11:44.roll_aftTC2_repeat/030319_13:24.roll_aftTC2
R 030319_11:44 QA_NLE/warm_aftTC2_vac_19Mar03/030319_11:44.roll_aftTC2_repeat/030319_14:13.roll_aftTC2
a 030319_15:49 QB_LE/warm_aftTC2_vac_19Mar03/030319_15:49.checkXY_aftTC2_aveAxis
R 030319_16:13 QB_LE/warm_aftTC2_vac_19Mar03/030319_16:13.roll_aftTC2_repeat
R 030319_16:13 QB_LE/warm_aftTC2_vac_19Mar03/030319_16:13.roll_aftTC2_repeat/030319_16:13.roll_aftTC2
R 030319_16:13 QB_LE/warm_aftTC2_vac_19Mar03/030319_16:13.roll_aftTC2_repeat/030319_17:03.roll_aftTC2
R 030319_16:13 QB_LE/warm_aftTC2_vac_19Mar03/030319_16:13.roll_aftTC2_repeat/030319_17:52.roll_aftTC2
a 030320_13:01 QB_LE/warm_aftTC2_vac_19Mar03/030320_13:01.check_XY_aftTC2
a 030320_13:26 QB_LE/warm_aftTC2_vac_19Mar03/030320_13:26.checkY
a 030320_13:40 QB_LE/warm_aftTC2_vac_19Mar03/030320_13:40.checkY
R 030320_16:38 QB_LE/warm_aftTC2_vac_19Mar03/030320_16:38.checkXY_aftSurvey
R 030320_17:05 QA_NLE/warm_aftTC2_vac_19Mar03/030320_17:05.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_09:35.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_09:51.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_10:07.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_10:23.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_10:38.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_10:54.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_11:10.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_11:26.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_11:41.checkXY_afterSurvey
R 030321_09:35 QA_NLE/warm_aftTC2_vac_19Mar03/030321_09:35.checkXY_afterSurvey_repeat/030321_11:58.checkXY_afterSurvey
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat/030321_13:32.checkXY_aftSurvey
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat/030321_13:48.checkXY_aftSurvey
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat/030321_14:05.checkXY_aftSurvey
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat/030321_14:20.checkXY_aftSurvey
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat/030321_14:35.checkXY_aftSurvey
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat/030321_14:51.checkXY_aftSurvey
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat/030321_15:08.checkXY_aftSurvey
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat/030321_15:23.checkXY_aftSurvey
R 030321_13:32 QB_LE/warm_aftTC2_vac_19Mar03/030321_13:32.checkXY_aftSurvey_repeat/030321_15:38.checkXY_aftSurvey

Appendix C: Q2A/Q2B->MQXB02/MQXB01

Inside LQXB01, Q2A, the IP end of the magnet, closest to the MTF return can, the CDF side of the building, is MQXB02. Q2B, the non-IP end of the magnet, closest to the MTF feed can, away from CDF, is MQXB01.