

RHIC 2003 – 2004 Physics Run
Daily Quench Analysis for the month of March 2004

Wed-March 03 **Yellow PR-117 File#=1078308756** (Loc: 9b-ps1) **Timestamp: 05:12:36 +380386**

Beam Permit Fail Timestamp: 05:12:36 +330089

Quench Detector(s) Trip: (9b-qd1) Y9QFA2_A1VT Int. 1, Tq=-23

5 Minute: Quench Delay File: (9b-qd1) Y9QFA2_A1VT

Beam Loss Monitors (Rads/Hr): Sector 9, Yellow Dirty Dump: beyond the normal losses past g9-lm5 that has been monitored in the past, greatest levels exceeded as follows: g9-lm6 = 4675, g9-lm7 = 2533, g9-lm8 = 2077, g9-lm14 = 4675, g9-lm15 = 1450

Main Magnet Power Status: Store Energy.

Qdplots: Comparing associating signal, Y9QFA2_A1 showed signs of a magnet Quench.

Quad Magnets affected in Yellow Sector 9: Quad Q20, Q18, Q16, Q14, Q12 and Q10

QLI Recovery TAPE / PS On Checks Commenced: 05:39:04 **Estimated Delay Time: 28 minutes**

Technical Notes: Beam Studies in Progress at the time.

05:12: Studies are off. A loss monitor permit pull and Yellow QLI occurred during further Blue phase jump work.

05:12: Beam Abort, 10a-ps3.A dropped {Loss Monitor 1} [Sequencer](#)

05:14: Beam lost and QLI followed phase jump attempt in Blue. QLI in Yellow?? [Wolfram](#)

05:17: Is there anything listening to ev-rfoo1 in Yellow? [Wolfram](#)

05:15: so once again the hole for the hollow beam was digged a bit too deep...lost beams again. No hollow anymore for the day - we will try and put 3x3 up again and just do the measure with gaussian beams [fp](#)

Mar 3 2004 10:03: yellow quench link trip was caused by 9b-qd1 quench detector. The quench detector tripped because of a real magnet quench at Y9QFA2_A1VT. The beam permit tripped 50 msec. before the quench link. There was a real magnet quench at y9q14 . There was high beam loss at g9-lm14.

There is now 38 beam induced quenches for this run. [Ganetis \[quench \]](#)

Quench Analysis: Beam Induced Quench #038.

Wed-March 03 **Yellow PR-118 File#=1078310691** (Loc: 4b-time.B) **Timestamp: 05:44:48 +3761964**

Beam Permit Fail Timestamp: 05:44:48 +3761995

Quench Detector(s) Trip: All tripped indicating positive Tq values.

5 Minute: Quench Delay File: None Initiated.

Beam Loss Monitors (Rads/Hr): Sector 9 & 10 indicate low levels, No beam in the Machine.

MainMagControl (4b-ps3) Page: Yellow Quad, Regulator Error

Main Magnet Power Status: (Qdplots) Ramping from Injection currents. The Dipole tripped at 838.68amps while the Quad stopped ramping at T= minus 5.419seconds at 731.35amps then began to drop down, tripping at 681.29amps.

QLI Recovery TAPE / PS On Checks Commenced: 06:07:45 **Estimated Delay Time: 63 minutes**

Technical Notes: Beam Studies in Progress at the time, start of hysteresis ramp..

05:45: Beam Abort, 4b-time.B dropped {Yellow Main PS} Quench [Sequencer](#)

05:45: Quench Link Interlock in Yellow ring, 4b-time.B dropped first [Sequencer](#)

06:05: See the post mortem picture dumped at 06:02 below... [JPJ](#)

10:08: yellow quench link trip was caused by the yellow main quad p.s.. The p.s. had a regulator error fault. The permit link tripped after the quench link. [Ganetis \[quench \]](#)

Quench Analysis: Main Yellow Quad P.S., Regulator Error

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Wed-March 03 **Yellow PR-119 File#=1078312750** (Loc: 4b-time.B) **Timestamp: 06:19:08 +2197246**

Beam Permit Fail Timestamp: 06:19:08 +2197277

Quench Detector(s) Trip: All tripped indicating positive Tq values.

5 Minute: Quench Delay File: None Initiated.

Beam Loss Monitors (Rads/Hr): Sector 9 & 10 indicate low levels, No beam in the Machine.

MainMagControl (4b-ps3) Page: Yellow Quad, Regulator Error

Main Magnet Power Status: (Qdplots) Ramping from Injection currents. The Dipole tripped at 838.44amps while the Quad stopped ramping at T= minus 5.419seconds at 731.54amps then began to drop down, tripping at 677.99amps.

QLI Recovery TAPE / PS On Checks Commenced: **06:19:08** Estimated Delay Time: Down for Maintenance Day.

Technical Notes: Beam Studies in Progress at the time, start of hysteresis ramp..

06:19: Beam Abort, 4b-time.B dropped { Yellow Main PS } Quench [Sequencer](#)

06:27: We were seeing a y-qmain contactor alarm after running quench recovery. The QLI came in when we tried to ramp up from injection again. [JPJ](#), [VHS](#)

10:14: yellow quench link trip was caused by the yellow main quad p.s.. The p.s. had a regulator error fault. The permit link tripped after the quench link. [Ganetis](#) [quench]

Quench Analysis: Main Yellow Quad P.S., Regulator Error

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Scheduled Maintenance from 0700 to 1500 Hours, March 03, 2004

Wed-March 03 **Blue PR-120 File# = 1078315174** (Loc: 4b-time.A) **Timestamp: 06:59:32**

Beam Permit Fail Timestamp: Down prior to both links coming down. **Timestamp: 06:19:08**

Quench Detector(s) Trip: No negative Tq values.

Main Magnet Power Status: Zero Current.

Wed-March 03 **Yellow Link** remained down from PR-119, File # 1078312750 (Loc: 4b-time.B) **Timestamp: 06:19:08**

Technical Notes: Main Power Supply maintenance day activities on the RMMPS included checking instrumentation on the Blue Dipole and investigation of the Yellow Quad RegErr trips at 5:45 and 6:19 this morning. The RegErr trips occurred when the yellow quad was switching from flattop to ramp power modules during the up ramp. This type of fault has not been seen before. The regulator chassis was reset when software to investigate the problem was loaded. After the reset the problem could not be reproduced. [Carl Schultheiss](#)

Electrical Power Supply Group: [Don Bruno](#)

1. Setpoint cable connected for bi8-rot3-1.4.ps
2. Swapped out 3u control chassis for yo5-rot3-2.3-ps and repaired signal cables on rear of p.s.
3. Ran up rotators in alcove 7c for cable resistance measurements.
4. Repaired signal cable on rear of bi9-qgt-ps.
5. Swapped out control card of yo12-qgt-ps.
6. Swapped out corrector p.s.'s bi8-th15-ps, yo8-tv17-ps, bo6-tv9-ps, and yi6-th9-ps.
7. Main p.s.'s - See Carl S. comments at 16:44.
8. New qpa fan switches were installed in bo11-tq5-ps and b12-q7-ps.
9. The warm dipole p.s. at 1012A was turned on and tested. It is ready.
10. Examined the current monitoring chassis in Blue 6000A quench switches in 1010A.
11. A fan was replaced in the 8b-qd1 quench detector aux bucket.
12. Signal cables for the snake magnets fed from alcove 9c were pulled and connected (George has details).

Quench Detection, Snake Magnets, 20:36: I needed to take more time this maintenance day to install new voltage tap cables and a new card in the 9c snake quench detector. Preliminary test in bldg. 902 of the instrumented snake magnet is showing there is a problem with the present system configuration in detecting certain types of quenches. This new configuration should solve this. I still need to do some data base work and do more testing in bldg. 902 before I will be able to test this new configuration in the ring. [Ganetis](#)

Once both Rings had been brought back up and I performed one complete Hysteresis Cycle, MCR began testing of a new ramp, which pulled both links on the down ramp. Top Energy of mains tripping at: BDMC = 1524amps, BQMC = 1442amps, YMDC = 1524amps, YQMC = 1444amps ([Heppner](#))

Wed-March 03 **Blue PR-121 File# = 1078354416** (Loc: 9b-ps1) **Timestamp: 17:53:37**

Quench Detector(s) Trip: (9b-qd1) B8DSA4_A3VT Int. 20, Tq=-24

Wed-March 03 **Yellow PR-122 File# = 1078354416** (Loc: 3b-ps1) **Timestamp: 17:53:37**

Quench Detector(s) Trip: (3b-qd1) Y2DSA4_A3VT Int. 20, Tq=-24

New Ramp Attempt: 18:07: I tried new Au6 ramp. It reached the top, but down sequence caused QLI (which is I guess expected). [Al Marusic](#)

QLI Recovery TAPE / PS On Checks Commenced: **Blue = 18:24:21**
Yellow = 18:33:15

Estimated Delay Time: 725 minutes
Estimated Delay Time: 734 minutes

Quench Analysis: Scheduled Maintenance.

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Fri-March 05 **Blue PR-123 File#=1078503030** (Loc: 10a-ps3.A) **Timestamp: 11:10:28 +2587001**

Beam Permit Fail Timestamp: 11:10:28 +2538804

Quench Detector(s) Trip: (6b-qd1) B5QFQ3_VT Int. 1, Tq=-12
(10a-qd1) B10QFQ4_6VT, Int. 1, Tq= -25

5 Minute: Quench Delay File: (6b-qd1) B5QFQ3_VT, B6QFQ2_VT
(10a-qd1) B10QFQ4_6VT
(11b-qd1) B10DSA5_A4VT

Beam Loss Monitors (Rads/Hr): Sector 6; b6-lm3.2 = 4754, b6-lm3.1 = 1358, g6-lm-srt.w = 4182

Sector 5, y5-lm3.2 = 4658, y5-lm3.1 = 3511, b5-lm3.1 = 4939, g5-lm1 = 2397, b5-lm0 = 2111

Sector 10 Blue Dump beyond the normal; b10-lm4 = 4970, g10-lm5 = 4615, g10-lm6 = 4739, g10-lm7 = 4728,
g10-lm8 = 4818, g10-lm12 = 4859

Post Mortem Plots: Power Supplies not the cause

Snapshot Plots: bo10-th12 over voltage, quenched magnet at 11:11:22

Main Magnet Power Status: Store Energy.

DX Heaters Fired: None

Qdplots: Indications of Real Magnet Quenches at the following locations:

B5QFQ3_VT = Sector 5 Triplet region, Blue Quad Magnet Q3

B6QFQ2_VT = Sector 6 Triplet region, Blue Quad Magnet Q2

B10QFQ4_6VT = Sector 10, Blue Quad Magnets Q4, Q5 and Q6

B10DSA5_A4VT = Sector 10, Blue Dipole Magnet String D9, D10, D11, D12, D13 & D14

Real Magnet Quenches b5q3, b6q2, b10q6 and b10d12

QLI Recovery TAPE / PS On Checks Commenced: 12:42:57

Estimated Delay Time: 92 minutes

Technical Notes: 11:27: Blue abort kicker pre-fire. **Trav 12:55:** Cryo recovery complete.

12:45: Initial Analysis: Blue quench link trip was caused by the 10a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B10QFQ4_6VT. The beam permit tripped 0.048seconds before the quench link. They're where a real magnet quenches at b5q3, b6q2, b10q6 and b10d12. Multiple High Beam losses see above Beam Loss Monitors. There are now 39 beam induced quenches for this run. **G Heppner**

15:56: Proof Checked Analysis: blue quench link trip was caused by 10a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B10QFQ4_6VT. The beam permit tripped 49 msec. before the quench link. There were at least 4 real quenches. The magnets that quenched where b10q6, b10d12, b5q3, and b6q2.. There were high beam losses at g10-lm12, g10-lm6 , b5-lm3.1 , and b6-lm3.2. There is now 39 beam induced quenches for this run. **Ganetis [quench]**

Quench Analysis: Beam Induced Quench #039.

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Fri-March 05 **Blue** PR-124 File#=1078512964 (Loc: 8b-ps1) **Timestamp: 13:56:04 +95648**
Beam Permit Fail Timestamp: 13:56:04 +95678
Quench Detector(s) Trip: (8b-qd1) B8QFQ2_VT Int. 1, Tq= -24
5 Minute: Quench Delay File: (8b-qd1) B8QFQ2_VT
Beam Loss Monitors (Rads/Hr): Sector 8 beam began at minus 4 seconds to climb; b8-lm3.2 = 3632, b8-lm3.2-c = 2536
Post Mortem Plots: Power Supplies not the cause
Main Magnet Power Status: Almost at Store Energy; Dipole = 5036amps, Quad = 4609amps.
DX Heaters Fired: None
Qdplots: Indications of Real Magnet Quenches at the following locations:
B8QFQ2_VT = Sector 8 Triplet region, Blue Quad Magnet Q2

QLI Recovery TAPE / PS On Checks Commenced: 15:00:14 **Estimated Delay Time: 64 minutes**

Technical Notes: 15:00 **Initial Analysis:** Blue quench link trip was caused by the 8b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B8QFQ2_VT. The beam permit tripped after the quench link. They're was a real magnet quenches at b8q2. High Beam losses found at b8-lm3.2. There are now 40 beam induced quenches for this run. **G Heppner**

15:10: it seems like the blue vertical got a little unstable. Note the total current in this ramp is about 13% higher than the previous ramp where no vertical coherence at same place beam got cleaned out. **Mei [blue quench]**

15:57: **Proof Checked Analysis:** blue quench link trip was caused by 8b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B8QFQ2_VT. The beam permit tripped after the quench link. There was a real magnet quench at b8q2 . There was a high beam loss at b8-lm3.2. There is now 40 beam induced quenches for this run. **Ganetis [quench]**

Quench Analysis: Beam Induced Quench #040.

Sat-March 06 **Yellow** PR-125 File#=1078620053 (Loc: 6b-ps1) **Timestamp: 19:40:52 +1638196**
Beam Permit Fail Timestamp: 19:40:52 +1638227
Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.
5 Minute: Quench Delay File: None Initiated.
QPAControl / Timing Resolver: No Faults: y-A2 QLO YO6 and y-B1 QLO YO5 first to trip.
Beam Loss Monitors (Rads/Hr): Sector 5 & 6 clean, Sector 9 Yellow dmp, lower levels then seen, clean abort.
Post Mortem Plots: Nothing unusual, supplies okay 1006B
Main Magnet Power Status: Dipole = Injection Current, Quad = Injection Current
Qdplots: None Initiated to view.

QLI Recovery TAPE / PS On Checks Commenced: 20:07:21 **Estimated Delay Time: 64 minutes**

Technical Notes:

20:05: I asked George to investigate this QLI, since I haven't found a clear cause for it. I don't think it was a real quench, and I don't see a power supply problem. **JPJ**

20:25: Yellow quench link trip was caused by the permit module. This is an on going control system problem. **Ganetis [quench]**

Quench Analysis: Controls, Permit Module at 1006B.

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Wed-March 10 **Blue PR-126 File#=1078911646** (Loc: 12a-ps1.A) **Timestamp: 04:40:44 +2987554**

Beam Permit Fail Timestamp: 04:40:44 +2949177

Quench Detector(s) Trip: 6b-qd1, B5QFQ3_VT Int. 1, Tq=-12
12a-qd1, B11QFQ2_VT Int. 1, Tq=-24
No Auxiliary trips.

5 Minute: Quench Delay File: 6b-qd1: B5QFQ3_VT and B6QFQ2_VT, 12a-qd1: B11QFQ2_VT

Beam Loss Monitors (Rads/Hr): Sector 10, Blue Beam Dump: High losses beyond the normal b10-lm4 to b10-lm6

Sector 11: g11-lm21 = 3 778, g11-lm20 = 1163, g11-lm1 = 4705, b11-lm0 = 3856, b11-lm3.1 = 1236

Sector 5: y5-lm3.2 = 4658, y5-lm3.1 = 4175, b5-lm3.1 = 4939 (pulse width of 0.43 sec), g5-lm1 = 2895, b5-lm0 = 2528

Sector 6: b6-lm3.1 = 1344, b6-lm3.2 = 4753, g6-lm-srt.w = 4428

Post Mortem Plots: No indications that a Power Supply had been the cause of this event.

Main Magnet Power Status: Running at Store Energy

DX Heaters Fired: None

Qdplots: Indications of Real Magnet Quenches at the following locations:

B5QFQ3_VT = Sector 5 Triplet region, Blue Quad Magnet Q3

B6QFQ2_VT = Sector 6 Triplet region, Blue Quad Magnet Q2

B11QFQ2_VT = Sector 11 Triplet region, Blue Quad Magnet Q2

QLI Recovery TAPE / PS On Checks Commenced: 05:48:23

Estimated Delay Time: 69 minutes

Technical Notes:

Mar 10 2004 5:45: It seems as if that the blue kicker pre-fired. The kicker voltage rise is clearly outside of the gap, and, from the current transformer trace above, it appears the blue beam is ejected from the machine some 4 to 6 ms before the abort. In addition, the beam loss monitor timestamps are all earlier than the earliest quench detector timestamp (12a-ps1). So one scenario appears to be that a blue abort kicker pre-fire, sprays beam into a magnet, causing a quench.

Mar 10 2004 9:19: blue quench link trip was caused by 12a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B11QFQ2_VT. The beam permit tripped 38 msec. before the quench link. There were 3 real quenches. The magnets that quenched were b11q2, b6q2, and b5q3. There were high beam losses at g11-lm1, b5-lm3.1 and b6-lm3.2. There is now 41 beam induced quenches for this run. [Ganetis \[quench \]](#)

Quench Analysis: Beam Induced Quench #041.

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Thurs-March 11 **Yellow PR-127 File#=1079014539** (Loc: 6b-ps1) **Timestamp: 09:15:36 +3650730**

Beam Permit Fail Timestamp: 09:15:36 +3650761

Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None Initiated.

QPAControl / Timing Resolver: QP05-R6BQD3-yi6-qf9-qp first to trip, no faults indicated.

Beam Loss Monitors (Rads/Hr): Beam aborted; Sector 9 & 10 Beam Dumps appear normal.

Post Mortem Plots: Nested Supplies yo5-qf8, yi6-qf9 and y6-q89 all show signs of tripping before T=zero.

Snapshot Plots: yi6-qf9-ps DC Overcurrent fault

Main Magnet Power Status: At Store

Qdplots: None Initiated to view.

QLI Recovery TAPE / PS On Checks Commenced: 09:49:52 **Estimated Delay Time: 35 minutes**

Technical Notes: BEAM STUDIES in progress.

Ramping of the IR Supplies, Yi6-qf9 tripped on DC Overcurrent. Upon checking the Voltage Regulator card settings, found that the supply was set to trip at 100amps. This Supply with new cards had been replaced prior to the Physics Run and the DCOC was not properly set.

9:41: The timing resolver picked out yi6-qf9-ps as bringing down the yellow link. It tripped on a DCOC. The power supply was running around 100A and is a 200A p.s., so it should not have tripped on a DCOC unless the DCOC is not set correctly. I will check the DCOC setting when MCR says I can but right now they do not want me to check it because they are going back to a ramp where this supply was possibly running at a lower current. I will check some old ramps and see where this supply was running at in the meantime. Link still down, checked DCOC and found that it was set to 100amps. Re-set to 205amps. **Don Bruno** [rhic p.s.]

Quench Analysis: yi6-qf9-ps, (New supply and Cards) DCOC not properly set.

Thurs-March 11 **Yellow PR-128 File#=1079016911** (Loc: 4b-time.B) **Timestamp: 09:55:12 +202011**

Beam Permit Fail Timestamp: 09:55:12 +202042

Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None Initiated.

QPAControl / Timing Resolver: No faults indicated.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Post Mortem Plots: Yellow Main Quad P.S. Regulation appears unsteady; current separates from the Iref on the up ramp.

Main Magnet Power Status: Ramping from Injection Current, tripping at the following currents

Yellow Main Dipole = 839amps, Yellow Main Quad = 680amps

Qdplots: None Initiated to view.

QLI Recovery TAPE / PS On Checks Commenced: 10:15:52 **Estimated Delay Time: 20 minutes**

Technical Notes: BEAM STUDIES in progress.

The yellow quench link trip was caused by the yellow main quad p.s. whereas a regulator error fault had occurred. The permit link tripped 0.031 seconds after the quench link. **Heppner**

10:13: After the beta squeeze experiments, the ramp was reverted to the previous store ramp. This new ramp was not activated before executing the hysteresis ramp, and this caused the quench links to fail. **JL JLN**

10:23: Update: quench recovery in progress after an unfortunate hiccup that crated another quench on the hysteresis ramp. When we have beam back we will start with driving terms. IBS postponed to later in the day - as experimenters are needed apparently at the MAC. **Fulvia**

15:56: yellow quench link trip was caused by the yellow main quad p.s.. The p.s. had a regulator error fault. The permit link tripped after the quench link. **Ganetis** [quench]

Quench Analysis: Yellow Main Quad Reg Error.

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Thurs-March 10 **Blue PR-129 File#=1079017121** (Loc: 6b-ps1) **Timestamp: 09:58:40 +1514864**

Beam Permit Fail Timestamp: **Down from previous Quench PR-128**

Quench Detector(s) Trip: (6b-qd1) B5QFQ6_4VT, Int. 20, Tq= -24

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Post Mortem Plots: No indications that a Power Supply had been the cause of this event.

Main Magnet Power Status: Store Energy

DX Heaters Fired: None

Qdplots: Voltage Tap B5QFQ6_4VT, Sector 5 magnets: Q4, Q5 and Q6, responded as a no real quench.

QLI Recovery TAPE / PS On Checks Commenced: **10:24:18** Estimated Delay Time: 27 minutes

Technical Notes: BEAM STUDIES in progress.

10:13: After the beta squeeze experiments, the ramp was reverted to the previous store ramp. This new ramp was not activated before executing the hysteresis ramp, and this caused the quench links to fail. JL [JLN](#)

10:23: Update: quench recovery in progress after an unfortunate hiccup that crated another quench on the hysteresis ramp. When we have beam back we will start with driving terms. IBS postponed to later in the day - as experimenters are needed apparently at the MAC. [Fulvia](#)

15:54: blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because induced signal in B5QFQ6_4VT. It looks like a voltage was induced in this voltage tap signal. This voltage is induced only if some fraction of the IR power supplies are ramped at a faster than normal rate. b8-q89 seems to have the highest di/dt. The most likely place for this to happen is in the spin rotator b5rot3. There is a known problem with the routing of the IR buses and voltage taps through all helical magnets that makes them susceptible to this problem. The only solution is to ramp the magnets slower when doing these types of tests. [Ganetis](#) [[quench](#)]

Quench Analysis: Operations Error.

Fri-March 12 **Yellow PR-130 File#=1079118151** (Loc: 6b-ps1) **Timestamp: 14:02:28 +3870736**

Beam Permit Fail Timestamp: **14:02:28 +3870767**

Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None Initiated.

QPAControl / Timing Resolver: No Faults indicated, Timing Resolver indicated yo2 first, y-pm-QLO then yo1, y-pm-QLO.

Beam Loss Monitors (Rads/Hr): Appears to have been a good Beam Abort.

Post Mortem Plots: Nothing unusual, supplies okay 1006B

Main Magnet Power Status / Qdplots: Store Energy

QLI Recovery TAPE / PS On Checks Commenced: **14:26:49** Estimated Delay Time: 24 minutes

Technical Notes: **15:04:** Yellow quench link trip was caused by an on going permit module fault. This fault seems to show up every couple of weeks. [Ganetis](#) [[quench](#)]

Quench Analysis: Controls, Permit Module at 1006B.

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Fri-March 12 Yellow PR-131 File#=1079016911 (Loc: 4b-time.B) Timestamp: 14:31:48 +184588

Beam Permit Fail Timestamp: Still down from PR-130

Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None Initiated.

QPAControl / Timing Resolver: No faults indicated.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Post Mortem Plots: Y-main Quad P.S. Regulation appears unsteady; current separates from the Iref on the up ramp.

MainMagControl page 4b-ps3: Reg Error

Main Magnet Power Status: Ramping from Injection Current, tripping at the following currents

Yellow Main Dipole = 839amps

Yellow Main Quad reached 731amps at T-5.44sec then began to fall tripping at = 677amps

QLI Recovery TAPE / PS On Checks Commenced: 15:29:44 Estimated Delay Time: 58 minutes

Technical Notes: While recovering from Quench File PR-130, the yellow main quad power supply went into Reg Error. Techs replaced the Ramp Digital Firing Card.

Quench Analysis: Yellow Main Quad Reg Error.

Fri-March 12 Yellow PR-132 File#=1079124011 (Loc: 4b-time.B) Timestamp: 15:40:08 + 3452560

Beam Permit Fail Timestamp: Still down from PR-130

Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.

Post Mortem Plots: Y-main Quad P.S. Regulation appears unsteady; current separates from the Iref on the up ramp.

MainMagControl page 4b-ps3: Reg Error

Main Magnet Power Status: Ramping from Injection Current, tripping at the following currents

Yellow Main Dipole = 837amps

Yellow Main Quad reached 731amps at T-5.45sec then began to fall tripping at = 671amps

QLI Recovery TAPE / PS On Checks Commenced: 17:34:41 Estimated Delay Time: 114 minutes

Technical Notes: While recovering from Quench File PR-131, the yellow main quad power supply went into Reg Error. Carl notified and working on problem.

Quench Analysis: Yellow Main Quad Reg Error.

Fri-March 12 Yellow PR-133 File#=1079131316 (Loc: 4b-time.B) Timestamp: 17:41:56 + 179907

Beam Permit Fail Timestamp: 17:41:56 + 179938

Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

MainMagControl page 4b-ps3: Reg Error

Main Magnet Power Status: Ramping from Injection Current, tripping at the following currents

Yellow Main Dipole = 838amps

Yellow Main Quad reached 731amps at T-5.41sec then began to fall tripping at = 677amps

QLI Recovery TAPE / PS On Checks Commenced: 19:08:09 Estimated Delay Time: 87 minutes

Technical Notes: 21:55: The problem with the Yellow Quad Ramp Power Module was a loose AC wire feeding the SCR gate driver boards. During the course of the troubleshooting a spare firing spare board was installed in the regulator for the Yellow Quad. This board had a bent pin the prevented it from operating properly. After fixing these two problems a hysteresis ramp was run. CS

Quench Analysis: Yellow Main Quad Reg Error.

RHIC 2003 – 2004 Physics Run ***Daily Quench Analysis for the month of March 2004***

Fri-March 12 **Blue PR-134 File#=1079147510** (Loc: 5b-ps1) **Timestamp: 22:11:48 +2547656**

Beam Permit Fail Timestamp: 22:11:48 +2547687

Quench Detector(s) Trip: 5b-qd1 in the Pink

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Blue Dump shows no beam in the machine.

Post Mortem Plots: No indications that a Power Supply had been the cause of this event.

Main Magnet Power Status: Injection Current

DX Heaters Fired: None

Qdplots: Voltage Tap B5QFQ6_4VT, Sector 5 magnets: Q4, Q5 and Q6, responded as a no real quench.

QLI Recovery TAPE / PS On Checks Commenced: 22:25:33 **Estimated Delay Time:** 14 minutes

Technical Notes: 22:10: We receive a No Heartbeat alarm for FEC 5b-qd1. We contact G. Ganetis to assist in diagnosing this FEC since it is a component in the quench detection system.

22:15: Could not talk to fec 5b-qd1 , had to reset fec. This brought both links down. [Ganetis \[quench \]](#)

Quench Analysis: FEC 5b-qd1 no Heartbeat, Reset - Other

Fri-March 12 **Yellow PR-135 File#=1079131316** (Loc: 5b-time.B) **Timestamp: 22:11:48 +2548681**

Beam Permit Fail Timestamp: 22:11:48 +2547687

Quench Detector(s) Trip: 5b-qd1 in the Pink

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Yellow Beam Dump shows no beam in the machine.

Main Magnet Power Status: Injection Current

QLI Recovery TAPE / PS On Checks Commenced: 22:33:41 **Estimated Delay Time:** 22 minutes

Technical Notes: 22:10: We receive a No Heartbeat alarm for FEC 5b-qd1. We contact G. Ganetis to assist in diagnosing this FEC since it is a component in the quench detection system.

22:15: Could not talk to fec 5b-qd1 , had to reset fec. This brought both links down. [Ganetis \[quench \]](#)

Quench Analysis: FEC 5b-qd1 no Heartbeat, Reset - Other

Sat-March 13 **Yellow PR-136 File#=1079180797** (Loc: 6b-ps1) **Timestamp: 07:26:36 +1992995**

Beam Permit Fail Timestamp: 07:26:36 +1993026

Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None Initiated.

QPAControl / Timing Resolver: No Faults indicated, Timing Resolver indicated yo2 first, y-pm-QLO then yo1, y-pm-QLO.

Beam Loss Monitors (Rads/Hr): Normal Beam Dump conditions in Yellow and Blue.

Post Mortem Plots: Nothing unusual, supplies okay 1006B

Main Magnet Power Status / Qdplots: Store Energy

QLI Recovery TAPE / PS On Checks Commenced: 07:54:02 **Estimated Delay Time:** 28 minutes

Technical Notes:

7:50: This looks like the ongoing 6b permit module problem. Unfortunately, it appears to have happened as recently as yesterday afternoon. I'm opting to continue for now. If it happens again in the near future, we will call the Controls Group.

JPJ

11:07: Yellow quench link trip was caused by the permit module. This is an on going control system problem. This is the 2nd trip in the last 24 hours. [Ganetis \[quench \]](#)

Quench Analysis: Controls, Permit Module at 1006B.

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Daily Quench Analysis for the month of March 2004

Sat-March 13 **Yellow PR-137 File#=1079190974** (Loc: 6b-ps1) **Timestamp: 10:16:12 +2596588**

Beam Permit Fail Timestamp: 10:16:12 +2596618

Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None Initiated.

QPAControl / Timing Resolver: No Faults indicated, Timing Resolver indicated yo2 first, y-pm-QLO then yo1, y-pm-QLO.

Beam Loss Monitors (Rads/Hr): Normal Beam Dump conditions in Yellow and Blue.

Post Mortem Plots: Nothing unusual, supplies okay 1006B

Main Magnet Power Status / Qdplots: Store Energy

QLI Recovery TAPE / PS On Checks Commenced: 11:36:01 **Estimated Delay Time: 80 minutes**

Technical Notes:

10:27: This is the second time this shift, third that I know of in the last day. George is investigating from home before we call the Controls Group. JPJ

10:57: Yellow quench link trip was caused by the permit module. This is an on going control system problem. This is the 3rd trip in the last 24 hours. Ganetis [quench]

11:14: We've delayed running quench recovery so far. Rob Michnoff and Ed Koropsak, the primary investigators of this ongoing permit module problem, are not currently available (and Ralph Schoenfeld too). I've spoken with Bill Venegas, and I've also attempted to speak with Brian Oerter. Based on what Bill said, I'm not sure that we should wait for people to call back. JPJ

11:26: Yellow quench recovery sequence begun tape

11:28: In the midst of polling the experiments, Ed called back. He recommended that we continue for now. If it happens again, he may have to come in to improve the rack grounding. JPJ

Quench Analysis: Controls, Permit Module at 1006B.

Mon-March 15 **Yellow PR-138 File#=1079356243** (Loc: 6b-ps1) **Timestamp: 08:10:40 +3503793**

Beam Permit Fail Timestamp: 08:10:40 +3503824

Quench Detector(s) Trip: All tripped indicating Positive Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None Initiated.

QPAControl / Timing Resolver: No Faults indicated, Timing Resolver indicated yo2 first, y-pm-QLO then yo1, y-pm-QLO.

Beam Loss Monitors (Rads/Hr): Normal Beam Dump conditions in Yellow, Blue slightly higher.

Post Mortem Plots: Nothing unusual, supplies okay 1006B

Main Magnet Power Status / Qdplots: Store Energy

QLI Recovery TAPE / PS On Checks Commenced: 09:27:08 **Estimated Delay Time: 87 minutes**

Technical Notes:

8:44: yellow quench link trip was caused by an on going permit module fault. This is the 4th trip from this in the last 3 days. Ganetis [quench]

8:57: Controls personnel are setting up a ground on the permit I/O module in 6B. jak

Quench Analysis: Controls, Permit Module at 1006B.

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Daily Quench Analysis for the month of March 2004

Scheduled Maintenance from 0700 to 1500: extended to 2000 Hours, March 17, 2004

Wed-March 17 **Blue PR-139 File# = 1079525411** (Loc: 4b-time.A) *Timestamp: 07:10:12*

Wed-March 17 **Yellow PR-140 File# = 1079525424** (Loc: 4b-time.A) *Timestamp: 07:10:25*

Beam Permit Fail Timestamp: Down prior to both links coming down. *Timestamp: 07:00:32*

Main Magnet Power Status: Called MCR, they ramped to Zero Current.

Technical Notes: 19:21: RHIC p.s. maintenance performed:

- 1) Yo4-th12-ps replaced.
- 2) Repaired the J2 D Connector on yo12-qgt-ps. We believe this was causing the p.s. to trip to the OFF state.
- 3) Replaced the control card of yo9-qgt-ps and reseated cards.
- 4) Replaced qpaic B1 in rack R2BBQF3 in 1002B.
- 5) Pulled in new quench detection cable for the rest of the snakes and rotators.
- 6) Some of the new quench detection cable has been terminated, see George for more details.
(21:07: Hardware and software modifications to the quench detectors in 9c, 3c, and 9a are complete and tested. The hardware modifications are complete in 7c. There is still one day of tunnel work to complete 7a and 5c. All the testing done so far has been at low current. I will need at least one more long day to test the magnets to high current after all the modifications are done. If there are blocks of 4 hours of down time I might be able to do the high current testing on some of the magnets then. [Ganetis](#))
- 7) Tested new snapshot software in alcove 5C. [Don Bruno](#) [rhic ps]

Quench Recovery Notes: [Heppner](#)

- 1) Blue Recovery Sequence (TAPE) paused at 19:23:59 due to Reg Off on the blue main dipole power supply. Called Carl Schultheiss and he was able to reset software from home.
- 2) Yellow Recovery Sequence (TAPE) Cancelled at 19:38:27 due to a fault in the Y9DQPSW switch, PFN Fault. A new chassis had been installed during the day and was not able to be tested until the links were brought up. Removed chassis and installed the original for now.

QLI Recovery TAPE / PS On Checks Commenced: **Blue = 19:33:58**
Yellow = 20:41:49

Estimated Delay Time: 744 minutes
Estimated Delay Time: 812 minutes

Quench Analysis: Scheduled Maintenance.

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Daily Quench Analysis for the month of March 2004

Fri-March 19 **Yellow PR-141 File#=1079721665** (Loc: 8b-ps1) **Timestamp: 13:41:04 +1667491**

Beam Permit Fail Timestamp: 13:41:04 +1667521

Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT Int. 1, Tq=-24

Yellow Auxiliary Quench: Y8TQ5_VT, Int. 100 at 13:43:03,

5 Minute: Quench Delay File: (8b-qd2) Y8QFQ2_VT

Beam Loss Monitors (Rads/Hr): Sector 8, Highest levels around the triplet magnets:

Yellow: y8-lm0 = 2191, g8-lm1 = 4448, y8-lm3.1 = 2026

Postmortems 1008B: Power supplies not the cause.

However, y8-qd1, yo8-qf2 and yo8-qd3 all indicate a quench had taken place.

Main Magnet Power Status: Store Energy.

Qdplots: Y8QFQ2_VT indicates a Real Magnet Quench had taken place..

Sector 8 Triplet Magnet: Yellow Quad Focus Magnet Q2 (y8q2)

QLI Recovery TAPE / PS On Checks Commenced: 14:04:50

Estimated Delay Time: 24 minutes

Technical Notes: **14:35** **Initial Analysis:** Yellow quench link trip was caused by the 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped after the quench link. There was a real magnet quench at y8q2. High Beam losses found at g8-lm1 and y8-lm3.1. There are now 42 beam induced quenches for this run. [G Heppner](#)

13:41: A yellow quench at y8q2 occurred after the yellow beam dump. The blue beam was aborted cleanly. After investigating the issue with L. Ahrens, it was determined that there was beam in the yellow abort gap and at the low kick edge of the abort gap when the kicker fired. The beam at the low kick edge of the gap would have obtained a small kick, thereby causing the quench that ensued after the beam dump. Presumably, the beam was moved into the abort gap when Operations attempted to manually cog the beam at flattop.

14:38: Investigating the cause of the yellow quench... The xfmr data show that the beam was removed from the machine before the t=0 marker. The scope pics for the yellow abort kicker look okay (no pre-fire). The beam ions plots shows that the yellow dump event occurred shortly before the beam abort event. [jak](#)

17:24: After investigating the issue further with Leif, it was determined that beam was in the yellow abort gap and at the low kick edge of the abort gap when the kicker fired. The beam at the low kick edge of the gap obtained a small kick, which would have been the source of the quench that ensued after the beam dump. The beam presumably slipped into the abort gap due to two reasons: 1) the beam had jumped a bucket at transition, 2) Operations attempted to cog the beam manually and apparently moved the beam into of the abort gap. [jak](#)

16:54: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped after the quench link. There was one real quench at y8q2. There was a high beam losses at g8-lm1. There is now 42 beam induced quenches for this run. [Ganetis \[quench \]](#)

Quench Analysis: Beam Induced Quench #042.

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Daily Quench Analysis for the month of March 2004

Mon-March 22 **Yellow PR-142 File#=1079939652** (Loc: 6b-ps1) **Timestamp: 02:14:12 +731746**

Beam Permit Fail Timestamp: 02:14:12 +731776

QPAControl / Timing Resolver: 1st, y-PM QLO-YO2 then next 1st, y-PM-QLO-YO1.

No Indications of a QPA or Power Supply Fault.

Quench Detector(s) Trip: All Tripped, no negative Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Sectors 5 & 6 clean, Beam Dump at Sector 9, proper Abort.

Postmortems 1006B: Power supplies not the cause.

Main Magnet Power Status: Steady at Injection Current.

Qdplots: Nothing to report.

QLI Recovery TAPE / PS On Checks Commenced: 02:41:00

Estimated Delay Time: 28 minutes

Tape Recovery Notes:

1) qdprocess.2b-qd2, Tripped; ERROR: Task paused due to an error; (02:31:18) User invoked retry

2) qdprocess.2b-qd2, Tripped; ERROR: Task paused due to an error; (02:32:32) User invoked retry

Technical Notes:

MCR Chain of Events: 02:14: Yellow ring quench link interlocked at Injection. The 6B permit was the cause yellow QLI. ramping RHIC to zero to run the yellow quench recovery program. 02:32: Running the yellow quench recovery program. 02:49: Cycling RHIC through a hysteresis ramp. 03:30: Physics running

8:21: The yellow quench link trip was caused by the on going permit module fault in 6b-ps1. [Ganetis \[quench \]](#)

Quench Analysis: Controls, Permit Module at 1006B.

Mon-March 22 **Blue PR-143 File#=1079979308** (Loc: 10a-ps3.A) **Timestamp: 13:15:08 +521460**

Beam Permit Fail Timestamp: 13:15:08 +521489

Quench Detector(s) Trip: (10a-qd1) B10QFQ4_6VT Int. 1, Tq=-25, No Auxiliary Trips

5 Minute: Quench Delay File: (10a-qd1) B10QFQ4_6VT

Beam Loss Monitors (Rads/Hr): g10-lm12 = 2967, g10-lm6 = 4740, g10-lm5 = 4620 and b10-lm4 = 4970

Postmortems 1010A: Power supplies not the cause.

Main Magnet Power Status: Store Energy.

Qdplots: B10QFQ4_6VT indicates a Real Magnet Quench had taken place.

Sector 10: Blue Quad Focus Magnet String Q4, Q5 and Q6; magnet quenched: (b10q4)

QLI Recovery TAPE / PS On Checks Commenced: 14:00:26

Estimated Delay Time: 46 minutes

Technical Notes:

13:05: John Butler was notified of strange RF cavity behavior coinciding with the blue beam de-bunching. [Libby](#)

13:15: Setup is off. A real quench occurred in Blue when the store was dumped due to the escalating amount of de-bunched beam. (MCR LOG)

14:18: This was a real quench caused by dumping the beam with 10e9 de-bunched ions in Blue. I don't think that we could have gap cleaned to avoid this. [JPJ](#)

14:23: John believes that the problem is that the Blue storage cavities are going from phase loop to position loop at the time of "the event". The equipment shared by these cavities is the V102 board in cfe-4a-rfb1. The event log was checked, and the relevant events had not been broadcast on the event link. [JPJ, John Butler](#)

17:06: blue quench link trip was caused by 10a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B10QFQ4_6VT. The beam permit tripped after the quench link. There was a real magnet quench at b10q4. There was high beam loss at b10-lm4. There is now 43 beam induced quenches for this run. [Ganetis \[quench \]](#)

Quench Analysis: Beam Induced Quench #043.

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Mon-March 22 **Blue PR-144 File#=1079986010** (Loc: 4b-time.B, Blue Main PS) **Timestamp: 15:06:48 +2605695**

Beam Permit Fail Timestamp: 15:06:48 +2605725

Quench Detector(s) Trip: All tripped with positive Tq Values, no auxiliary trips

5 Minute: Quench Delay File: None initiated

DX Heaters Fired: None fired

Beam Loss Monitors (Rads/Hr): Sector 10, Blue Dump appears normal.

Postmortems 1004B: IR Power supplies not the cause.

Main Magnet Control 4b-ps3: Blue Main Quad: Current Monitor

Main Magnet Power Status: Store Energy.

Qdplots: N/A

QLI Recovery TAPE / PS On Checks Commenced: 15:48:47 **Estimated Delay Time: 42 minutes**

Technical Notes:

15:25: Called Carl about a *curr mon* indication for the blue main quad. Beam dumped cleanly and no magnets quenched during this QLI. [jak](#)

16:15: Carl adjusted the current trip point for SCR26. [jak](#)

Quench Analysis: Blue Main Quad, Current Monitor.

Tues-March 23 **Yellow PR-145 File#=1080040812** (Loc: 6b-ps1) **Timestamp: 06:20:12 +994152**

Beam Permit Fail Timestamp: 06:20:12 + 994181

QPAControl / Timing Resolver: 1st, y-PM QLO-YO2 then next 1st, y-PM-QLO-YO1.

No Indications of a QPA or Power Supply Fault.

Quench Detector(s) Trip: All Tripped, no negative Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Sectors 5 & 6 clean, Beam Dump at Sector 9, proper Abort.

Postmortems 1006B: There was no proof of evidence that the power supplies caused this event.

Main Magnet Power Status: Steady at Injection Current.

Qdplots: Nothing to report.

QLI Recovery TAPE / PS On Checks Commenced: 06:39:40 **Estimated Delay Time: 20 minutes**

Technical Notes:

MCR LOG: 06:20: Yellow ring quench link interlocked at Injection energy. The 6 o'clock permit pulled the quench link down.

08:54: Yellow quench link trip was caused by the on going permit module fault in 6b-ps1. [Ganetis \[quench \]](#)

Quench Analysis: Controls, Permit Module at 1006B.

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Tues-March 23 Blue PR-146 File#=1080041313 (Loc: 4b-time.B, Blue Main PS) Timestamp: 06:28:32 +1355683

Beam Permit Fail Timestamp: Still down from Yellow PR-145 Quench Event

Quench Detector(s) Trip: None tripped, all running.

5 Minute: Quench Delay File: None initiated

DX Heaters Fired: None fired

Beam Loss Monitors (Rads/Hr): No beam in the machine at the time.

Main Magnet Control 4b-ps3: Blue Main Dipole: PFN1 Fault, PFN2 Fault

Main Magnet Power Status: Zero currents, Postmortem 1004B: Indicates that the Blue Main Dipole Power Supply Ramp Current suddenly spiked from 1.53amps to 1698 amps at -0.59 seconds prior to T=zero.

Qdplots: N/A

QLI Recovery TAPE / PS On Checks Commenced: 06:48:52 Estimated Delay Time: 20 minutes

Technical Notes: This QLI happened during ramp down at approximately 9amps on the Main Dipole.

6:32: spontaneous quench - recovery in process. ATR flags set up in progress as well. [fulvia](#)

8:54: blue quench link trip was caused by the blue main dipole p.s.. The p.s. had a PFN1 Fault and a PFN2 Fault. The permit link tripped after the quench link. [Ganetis \[quench \]](#)

Quench Analysis: Blue Main Dipole, PFN1 Fault, and PFN2 Fault

Tues-March 23 Yellow PR-147 File#=1080074423 (Loc: 6b-ps1) Timestamp: 15:40:20 +3244122

Beam Permit Fail Timestamp: 15:40:20 +3244151

QPAControl / Timing Resolver: (y-PM QLO-YO2, y-PM-QLO-YO1)

No Indications of a QPA or Power Supply Fault.

Quench Detector(s) Trip: All Tripped, no negative Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Sector 5 indicated slight elevated levels at y5-lm3.2 and b5-lm3.1

Sector 9 Beam Dump is good but there where slight elevated levels to the Q21 magnet.

Postmortems 1006B: There was no sufficient evidence that the supplies had caused this Quench event.

Main Magnet Power Status: Steady at Store Energy.

Qdplots: Nothing to report.

QLI Recovery TAPE / PS On Checks Commenced: 16:16:16 Estimated Delay Time: 36 minutes

Technical Notes:

MCR: 15:50: The QLI appears to not be due to a power supply issue. W. Louie and G. Ganetis have been contacted to confirm this.

16:00: The Quench Detection group has confirmed that the outgoing QLI signal from the 6b-ps1 permit module dropped before the incoming signal. R. Michnoff is being contacted to investigate further.

15:58: yellow quench link trip was caused by the on going permit module fault in 6b-ps1. This is the 2nd one in the last 24 hours. [Ganetis \[quench \]](#)

Quench Analysis: Controls, Permit Module at 1006B.

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Tues-March 23 Yellow PR-148 File#=1080091451 (Loc: 6b-ps1)

Timestamp: 20:24:08 +3324301

Beam Permit Fail Timestamp: 20:24:08, 3324330

QPAControl / Timing Resolver: (y-PM QLO-YO2, y-PM-QLO-YO1), No Indications of a QPA or Power Supply Fault.

Quench Detector(s) Trip: All Tripped, no negative Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Sector 5 slight elevations near y5-lm3.2 and b5-lm3.1.

Sector 9 Beam Dump good, slight elevations from g9-lm6 to g9-lm21

Postmortems 1006B: There was no sufficient evidence that the supplies had caused this Quench event.

Main Magnet Power Status: Steady at Store Energy.

Qdplots: Nothing to report.

QLI Recovery TAPE / PS On Checks Commenced: **21:03:06**

Estimated Delay Time: 39 minutes

Tape Recovery Notes:

1) Timestamp: 20:50:10, QP05-R12AQD3-yo12-ql8-qpstatusStringM, On (NO), ERROR: Task paused due to an error

2) Timestamp: 20:51:30, QP05-R12AQD3-yo12-ql8-qpstatusStringM, On (NO), ERROR: Task paused due to an error,
(08:54:56) User invoked cancel

Technical Notes:

20:46: This appears to be the permit module problem in 6b-ps1. [jak](#)

22:39: yellow quench link trip was caused by the permit module . This is a on going control system problem. This is the 3rd trip in the last 24 hours. Could someone from the controls group please put a comment in the e-log on the status of the investigation into this problem. [Ganetis \[quench \]](#)

Quench Analysis: Controls, Permit Module at 1006B.

Wed-March 24 Yellow PR-149 File#=1080110903 (Loc: 8b-ps1)

Timestamp: 01:48:20 +3997561

Beam Permit Fail Timestamp: 01:48:20, 3948868

QPAControl / Timing Resolver: (y-B1 QLI-YI4, y-QD QLI-YI1), No Faults, checking Quench Detector.

Quench Detector(s) Trip: (8b-qd2) Y8QFQ3_VT, Int. 1, Tq = -24, No Auxiliary Trips.

5 Minute: Quench Delay File: (8b-qd2) Y8QFQ3_VT

Beam Loss Monitors (Rads/Hr): Sector 8: y8-lm0 = 1902, g8-lm1 = 3065, y8-lm3.1 = 4578 (1/2 sec Pulse).

Postmortems: 1008B, no sufficient evidence that the supplies had caused this Quench event.

However, there are signs that yo8-qd1, qf2 and qd3 where affected by the Quench.

Main Magnet Power Status: Steady at Store Energy.

Qdplots: Indicates a Real Quench occurred at Y8QFQ3, Sector 8: Yellow Quad-Focus, (y8q3) of the Triplet Magnet.

QLI Recovery TAPE / PS On Checks Commenced: **02:13:51**

Estimated Delay Time: 26 minutes

Technical Notes: 1:46: Transition

1:48: Beam Abort, 8b-ps1 dropped {Loss Monitor 1 }

2:04: RHIC BLMs 10a-blm1 and 8b-blm2 were pulled when the store was lost. [dad](#)

2:20: Ramps 4854, 4866, & 4840. Ramp 4854 was the last successful ramp that started around 0800 Tuesday morning and ended at ~1300 hours. Ramp 4840 was the store that started around 0300 hours Monday morning and ramp 4866 was the the last ramp which failed with a yellow quench. The yellow tunes for the last ramp, seems to be higher (at least in the beginning) then the other two ramps. [BvK \[rhic \]](#)

8:38: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ3_VT. The beam permit tripped .049 sec. before the quench link. There was one real quench at y8q3. There was a high beam loss at y8-lm3.1. There is now 44 beam induced quenches for this run. [Ganetis \[quench \]](#)

09:35: Systems responded as expected: Found no evidence of power supplies as the cause to the QLI. Cause of the event was Beam Induced. Magnet y8q3 in Sector 8 of the yellow quad focus Triplet Magnet was a real quench. Beam Loss monitors show high losses in that area and the postmortem plots show several other magnets within that area also responding to the loss of the beam. [G. Heppner](#)

Quench Analysis: Beam Induced Quench #044.

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Wed-March 24 **Yellow PR-150 File#=1080124735** (Loc: 6b-ps1) **Timestamp: 05:38:52 +3123637**

Beam Permit Fail Timestamp: 05:38:52 +3123667

QPAControl / Timing Resolver: (y-PM QLO-YO2, y-PM-QLO-YO1)

No Indications of a QPA or Power Supply Fault.

Quench Detector(s) Trip: All Tripped, no negative Tq Values, No Auxiliary Trips.

5 Minute: Quench Delay File: None initiated.

Beam Loss Monitors (Rads/Hr): Sector 5 slightly higher elevations near y5-lm3.2 = 781 and b5-lm3.1 = 1089.

Sector 9 Beam Dump good, slight elevations from g9-lm6 to g9-lm21

Postmortems: 1006B, no sufficient evidence that the supplies had caused this Quench event.

Main Magnet Power Status: Steady at Store Energy.

Qdplots: Nothing to report.

QLI Recovery TAPE / PS On Checks Commenced: 06:02:15

Estimated Delay Time: 24 minutes

Technical Notes: 8:39: yellow quench link trip was caused by the on going permit module fault in 6b-ps1. This is the 4th one in the last 36 hours. [Ganetis \[quench \]](#)

Quench Analysis: Controls, Permit Module at 1006B.

The following PR-151 and PR-152: Requested Maintenance by Controls:

Wed-March 24 PR-151, File # = 1080140049

Blue Quench: permit.12a-ps1.A, 09:54:08 +1945300

Beam Permit Fail: 09:29:24

TAPE Recovery: Timestamp, 11:04:55

First Attempt Failed: Timestamp: 10:54:23, User invoked cancel; QP11-R12AD2-b12-dhx-qpstatusStringM, On (NO) ERROR: Task paused due to an error

Estimated Time to Recovery Link: 70 minutes

Wed-March 24 PR-152, File # = 1080140049

Yellow Quench: permit.12a-ps1.A, 09:54:08 + 1950425

Beam Permit Fail: 09:29:24

TAPE Recovery: Timestamp, 11:13:04

Estimated Time to Recovery Link: 79 minutes

Tech Notes: Ring access requested, Brief maintenance for Controls to investigate 6b-ps1 trips, All systems fine, work had been done on the 6b-ps1 System as the Quench Summary page when viewed Real Time showed (in the RED) that it had been taken off line. Later when Archives was brought up for viewing, it was confirmed that Blue and Yellow 6b-ps1 was indeed being worked on (in the Pink). This had pulled both links. [G. Heppner](#)

MCR Log: In further troubleshooting of the 6b Yellow quench permit problem, E. Koropsak has removed a shunt resistor that connected the quench input to the opto isolator in the permit I/O module. Most of the work was performed behind the tunnel access, although recovery of the quench links did delay the start of machine development for a few minutes.

Quench Analysis: Requested Maintenance, Controls.

NOTE: March 24, 2004: Start up at 1200 for RHIC Low Energy Run (31GeV/u).

RHIC 2003 – 2004 Physics Run
Daily Quench Analysis for the month of March 2004

Thursday-March 25: PR-153, Blue Quench: File# = 1080222765

Permit ID: 9b-ps1 Timestamp: 08:52:44 +1682591 Beam Permit Fail Timestamp: 08:40:24 + 3393870

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: (9b-qd1) Blue Quenched: B8DSA4_A3VT, Int. 20, Tq = -24, No Auxiliary Trips.

5 Minute: Quench Delay File: None initiated.

Main Magnet Power Status / Qdplots: Injection Current, ramping down for Ring Access.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Postmortems / Snapshot: Supplies ramping down.

DX Heaters: None fired.

QLI Recovery TAPE / PS On Checks Commenced: 09:10:49

Estimated Delay Time: 18 minutes

Tech Notes:

9:01: QLI while ramping down the magnets. [Haixin](#)

9:00: Blue quench recovery sequence begun [tape](#)

9:29: Both links tripped because the magnets were ramped too fast for a ramp that is off the hysteresis cycle. The WFG manger is supposed to prevent this. Ask Al Marusic to investigate this. [Ganetis \[quench \]](#)

12:25: The ramp was from injection to zero, instead of injection to park to zero. [Al Marusic](#)

Quench Analysis: Controls Related, Off the Hysteresis Cycle.

Thursday-March 25, 2004: PR-154 Yellow Quench: File# = 1080222765

Permit ID: 11b-ps1 Timestamp: 08:52:44 +1823644 Beam Permit Fail Timestamp: 08:40:24 + 3393875

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: (11b-qd1) Yellow Quenched: Y11DSA3_A2VT, Int. 20, Tq = -23, No Auxiliary Trips

5 Minute: Quench Delay File: None initiated.

Main Magnet Power Status / Qdplots: Injection Current, ramping down for Ring Access.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Postmortems / Snapshot: Supplies ramping down.

QLI Recovery TAPE / PS On Checks Commenced: 09:21:37

Estimated Delay Time: 29 minutes

Technical Notes:

9:01: QLI while ramping down the magnets. [Haixin](#)

9:11: Yellow quench recovery sequence begun [tape](#)

9:29: Both links tripped because the magnets were ramped too fast for a ramp that is off the hysteresis cycle. The WFG manger is supposed to prevent this. Ask Al Marusic to investigate this. [Ganetis \[quench \]](#)

12:25: The ramp was from injection to zero, instead of injection to park to zero. [Al Marusic](#)

Quench Analysis: Controls Related, Off the Hysteresis Cycle.

