

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

Wed-Dec 03 **Blue MS-006 File#** = 1070490051 **4b-time.B** **Timestamp:** 17:20:48 +3.453

Technical Notes: Software testing of the main magnet power supply by Carl.

Delay Time: N/A

Wed-Dec 03 **Yellow MS-007 File#** =1070491042 **4b-time.B** **Timestamp:** 17:37:20 +2.729

Technical Notes: Software testing of the main magnet power supply by Carl.

Delay Time: N/A

Wed-Dec 03 **Yellow MS-008 File#** =1070496553 **6b-ps1** **Timestamp:** 19:09:12 +1.561

Technical Notes: 19:29: Mysterious 6b trip again coming from outside building 6b. I am talking to Rob Michnoff about it now. Don Bruno 19:12: Mei 19:40: Rob is going to try and call Ed, they may swap out the fiber optic transmitter at 5b. They need to talk about it. Don Bruno [rhic] 20:18: So, it turns out the permit carrier of quench link in 5b and 6b has a problem. Lee requested yellow to be recovered for now and at the same time he's calling a tech to come in to fix the problem. So, we will try to get the beam into rhic and if time permits we may even be able to get one ramp.

Delay Time: N/A

Wed-Dec 03 **blue MS-009 File#** =1070500343 **9b-ps1** **Timestamp:** 20:12:20 +3024582

Technical Notes: Cause: Ramp from injection to 1st, breaking hysteresis.

Delay Time: N/A

Wed-Dec 03 **Blue MS-010 File#** =1070507003 **2b-ps1** **Timestamp:** 22:03:20 +3531021

| qdprocess.5b-qd1 | No FEC/DSP HS |

Technical Notes: Controls made an entry to work on fiber optic trans, 5bqd1 down, replaced fiber optic trans pulled rtdl knocked b quench detector. Tape did not show error.

Delay Time: N/A

Wed-Dec 03 **Yellow MS-011 File#** =1070507003 **2b-ps1** **Timestamp:** 22:03:20 +3545371

| qdprocess.5b-qd1 | No FEC/DSP HS |

Technical Notes: Controls made an entry to work on fiber optic trans, 5bqd1 down see QLI above.

Delay Time: N/A

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Thu-Dec 04 **Blue MS-012 File#**=1070523307 **10a-ps3.A** **Timestamp:** 02:35:04 +3571722

Technical Notes: **3:24:** Wing Louie asked CAS guys to go to 1002B, 1012A and 1010A, disconnect and then reconnect 6 different cables to QD chassis (namely Beam Bypass Chassis). According to CAS guys, Wing was seeing what he expected. **3:52:** Wing says that things do not look good. He is asking us to do an AC Rest for cfe.10a-ps3. We tried to contact PHOBOS before doing the AC Rest, as instructed by the pop-up warning, but PHOBOS personnel were not there. If this doesn't work Wing is coming in. George also called in. **Sanjee 4:13:** Problem still exists. Wing Louie and Brian Karpin (from power supply group) are coming in.

5:16: Wing got here about 15 minutes ago. He is at 1010A. **5:30:** Wing suspects that this has something to do with the permit link. Rob Mischnoff was called at home. Rob is talking to Wing. **6:11:** Wing and Rob concluded that it is a problem with the quench-link permit link. The permit link carrier does not get transmitted throughout the ring; it has two stopping points, 10 o'clock and 4 o'clock. Wing bypassed the 10 o'clock but the carrier still stops at 4 o'clock. Rob suspects that this may have something to do with the permit link hardware replacement that was done yesterday. Rob and Ralph Schoenfeld are coming in. **Sanjee**

6:42: Rob is here, preparing to enter 5B to work on the permit link module problem. Ed Koropsak is coming in. Bill Venegas is here. **TJS [rhic controls] 6:44:** Rob, do you know why was the permit module replaced yesterday at 4 o'clock? I do not. **dejan 6:47:** According to Rob, this was because of an intermittent yellow permit interlock downstream that is hard to reproduce, so they attempted to replace a module last night to alleviate yesterday's trips. For much of the evening the problems were misdiagnosed as power supply problems, but now it is evident that it really is still a permit link hardware problem. Rob, will be able to figure this out (I am sure). [dejan] **TJS**

8:01: Looks like everything is wired up correctly, according to Bill Venegas. Ed Koropsak and Rob Schoenfeld are arriving to work with Rob. **TJS [rhic controls] 8:14:** It is not Beam Bypass Chassis but quench link bypass chassis. **Ganetis**

Delay Time: N/A

Thu-Dec 04 **Blue MS-013 File#**=1070546865 **4b-time.A** **Timestamp:** 09:07:44 +1995518

Technical Notes: **9:16:** This QLI was due to an FEC AC reset in the field while Rob, Ed, et al are working on the permit link. TJS (Don brought down the link at for maintenance 09:07:44 +1.995, Qtrim.)

Delay Time: N/A

Thu-Dec 04 **Blue MS-014 File#**=1070551498 **2b-ps1** **Timestamp:** 10:24:56 +2183016
| QP11-R2BD2-b2-dhx-qp | qpaCtrl.2b-ps2.A1.0 | Crowbar

Technical Notes: b2-dhx-ps Iref stuck while ramping up then shot upwards to 718amps. Voltage rise went to the rail causing the crowbar. Current Regulator card was swapped out and later it was found to be the K2 relay had faulty contacts.

Delay Time: N/A

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Thu-Dec 04 **Yellow MS-015 File#** =107053550 **2b-ps1** **Timestamp:** 10:59:08 +2113829

Technical Notes: Yellow Dipole Main, Regulator Error (Carl working on codes). The yellow QLI was definitely related to the yellow mains somehow; there was a glitch at the time of the yellow QLI. Wing Louie is investigating in conjunction with Andy. **11:12:** This is a known issue according to Carl Schultheiss, and will trip every time we bring it down to zero. We are recovering at the moment, and should use slow factor 6 when going back to injection. SF 6 is only necessary when going from zero to park after bringing the two rings to zero using tape.

TJS

Delay Time: N/A

Thu-Dec 04 **blue MS-016 File#** =1070561446 **10a-ps3.B** **Timestamp:** 13:10:44 +2037601

B10DQPSW:

Electric Safety Fault, PFN Voltage High, Contactor Fault, Thermal Fault, Over Current Fault, UPS Fault | cfe-10a-ps3

B10DQPSW:

Electric Safety Fault, PFN Voltage High, Contactor Fault, Thermal Fault, Over Current Fault, UPS Fault | cfe-10a-ps3

Technical Notes: **14:25:** According to Don Bruno, we are down for a few hours while he locks out power supplies in Blue 10 o'clock and checks loose contactors. An 110volt DC coil that activates the release mechanism of the main contactor failed (open coil). Signs of heat damage along the casing label made this item suspect. Replaced with a new coil and tested several times before bringing the link back up. **19:57:** The B10DQPSW at 1010A had a failure with the trip coil today. The contactor would not open. The coil was found to be open. Gregg Heppner, Mitch DeLaVergne, and Rich Conte worked on replacing the coil and PK Feng quickly diagnosed the problem. There was also a loose connection somewhere near the PLC, which controls this quench switch. We think this may have been dirty connections on one of the fuse holders but are not sure. The power is not intermittent anymore and we could not make this problem return. This work was completed around 17:00. Then we had problems getting the main power supplies on which Carl said he would look at. We finished doing a hysteresis ramp around 19:30. [Don Bruno](#) [rhic]

Delay Time: 3 hours and 45 minutes.

Thu-Dec 04 **yellow MS-017 File#** = 1070567399 **4b-time.B** **Timestamp:** 14:49:56 +3307542

Yellow Dipole Main PS: Reg Err, Reg Watchdog

Yellow Quad Main PS: Reg Watchdog

Technical Notes: Problems with the Yellow Mains, dipole and quad. Carl is looking into the situation. **15:50:** The link was dropped to do RMMPS software testing. Fixes for the RMMPS tripping at zero current were tested in the Yellow Ring (albeit not using the wfgManager). The results were good, so the changes were also put into the Blue Ring. This should fix not only the trips at zero current, but also the SF 6 requirement Don put in the log previously. [CS](#)

Delay Time: N/A

Thu-Dec 04 **blue MS-018 File#** =1070576413 **4b-time.B** **Timestamp:** 17:20:12 +1432643

Blue Quad Main PS: Reg Err

Technical Notes: Blue quad main brought down the link when trying to run the Recovery Program.

Delay Time: N/A

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Thu-Dec 04 **blue MS-019 File#** =1070577347 **4b-time.B** **Timestamp:** 17:35:44 +3729661
Blue Quad Main PS: Reg PLL, Reg Watchdog

Technical Notes: Failed during the quench recovery, Crash Button pushed at 1004b to stop sequence as the Blue Quad Main had a Reg Fault. Blue quad main Regulator problem.

Delay Time:

Thu-Dec 04 **blue SM-020 File#** =1070579384 **4b-time.B** **Timestamp:** 18:09:44 +406860
Blue Quad Main PS: Reg Watchdog

Technical Notes: Failed during the quench recovery, Crash Button pushed at 1004b to stop sequence as the Blue Quad Main had a Reg Fault. Down Time Delay of 2 hours and 10 min from Blue Quench starting at 17:20 until the reg fault had been cleared and we were able to complete one Hysteresis Ramp. 19:57: Don has handed us the machine. We are trying to inject.

Delay Time: 2 hours and 10 minutes from the start of blue quench of Thu-Dec 04, blue Q-018 File# =1070576414, 4b-time.B Timestamp: 17:20:12 +1432643

Fri-Dec 05 **yellow MS-021 File#** = 1070600611 **6b-ps1** **Timestamp:** 00:03:28 +3965638
Beam Permit Fail Timestamp: 00:03:28 3965638

Technical Notes: On going problem with Controls permit module.

Delay Time:

Fri-Dec 05 **yellow MS-022 File#** = 1070602848 **6b-ps1** **Timestamp:** 00:40:48 +390434

Quench Detector(s) Trip: None indicated.

bo2-qd1-ps | Stby-Error | AC Power, Standby, Remote, Quench, AC Phase

Technical Notes: On going problem with Controls permit module.

Delay Time:

Fri-Dec 05 **blue MS-023 File#** = 1070602917 **9b-ps1** **Timestamp:** 00:41:56 +1026163

Quench Detector(s) Trip: None indicated.

bo2-qd1-ps | Stby-Error | AC Power, Standby, Remote, Quench, AC Phase

----- Checking QPSW Control -----

Y9DQPSW: Closed Contactor, Remote On, PFN Charging | cfe-10a-ps3

Y10DQPSW: Closed Contactor, Remote On, Standby | cfe-10a-ps3

Technical Notes: Quench occurred while ramping to Park.

Delay Time: N/A

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Fri-Dec 05 **yellow MS-024 File#** = 1070604353 **6b-ps1** **Timestamp:** 01:05:52 +1086360
Quench Detector(s) Trip: Yellow Quenched Y6QDQ9_VT Int 1, Tq=-24
Y9DQPSW: UPS Fault, No Quench Link, Open Contactor, Remote On | cfe-10a-ps3

Technical Notes:

1:10: George Ganetis is looking into the quenches from home. [N. Kling](#)

2:05: George tells us that there is a problem with y16-q89. He is trying to narrow down the problem to the particular component that is failing. Also, he suspects that there is a problem with the 6b permit module. Once q89 is fixed, the permit module problem can be tackled. In that case we will have to call someone from the controls group. Rob, are you still awake? [Sanjee](#)

2:54: Of the three recent yellow quench link trips two were faults in the quench link system going to 6b. This is the same problem we had last night. The other one was y6-q89-ps had a sudden decrease in current that caused a trip in the 6b-qd2 quench detector. If this happens again the current regulator card should be replaced. The blow quench link trip was caused when the magnets were down ramped too fast. You cannot use the fast down ramps when you go off the hysteresis cycle. I will try to give better instructions to MCR during the day. The last problem that is preventing the yellow link from coming up is a UPS fault in Y9DQPSW. The UPS is OK (checked by CAS) so it is most likely the PLC interface card in the UPS that needs to be changed. [Ganetis \[quench \]](#)

6:52: CAS investigated for Wing and found the +12V id missing on the Y10DQPSW quench switch. Wing and I are coming in now to look at it. [Don Bruno](#) . **8:59:** According to Wing, a fuse that was removed for electrical LOTO yesterday in 1010 was improperly installed. He removed it, inspected it, and reinstalled it properly, and we are now attempting to perform full quench recovery. Ah, for lack of a fuse! [TJS \[rhic quench \]](#)

13:08: Note that fuses were removed and reinstalled by CAS in 1010 at 5 AM today. We should make sure that this was done correctly or whether it needs better instructions. [TR](#)

Delay Time: N/A

Fri-Dec 05 **yellow MS-025 File#** = 1070631973 **4b-time.A** **Timestamp:** 08:46:12 +1356892
----- Checking PS All -----

y13-qd6-ps: Stby-Error | AC Power, Standby, Remote, Error signal, Quench, AC Phase

Technical Notes: Talked MCR through and pulled the link as a current regulator card was replaced in the Y6-q89 power supply.

Delay Time: 10 minutes, Tech was on the scene waiting for the quench link to come down.

Fri-Dec 05 **yellow MS-026 File#** = 1070636645 **6b-ps1** **Timestamp:** 10:04:04 +1570746

Technical Notes: Controls permit module. **10:04:** We were just starting a hysteresis ramp, zero to park slow factor 6. Did that fine, but then the yellow QLI hit. Carl is investigating. [TJS](#) **10:07:** Carl says that this was the permit module in 6B dropping out again. Travis has contacted Rob Michnoff, and we are not resetting this while he investigates. [TJS, TCS](#)

Delay Time: N/A

Fri-Dec 05 **blue MS-027 File#** = 1070637683 **4b-time.B** **Timestamp:** 10:21:20 +3953979

Blue Dipole Main PS: PFN1 Fault, PFN2 Fault, Reg Watchdog

bo6-qd1-ps | Stby-Error | AC Power, Standby, Remote, Quench, AC Phase

bo2-qd1-ps | Stby-Error | AC Power, Standby, Remote, Quench, AC Phase

Blue Quad Main PS: Reg Watchdog

Technical Notes: Crash button, Carl to work on the mains.

Delay Time: Maintenance

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Fri-Dec 05 **yellow MS-028 File#** = 1070643550 **5b-ps1** **Timestamp:** 11:59:08 +2191815
Quench Detector(s) Trip: Yellow Quenched Y4DSA5_A4VT Int 1, Tq = -24
Technical Notes: Work on the mains
Delay Time: Maintenance

Fri-Dec 05 **yellow MS-029 File#** = 1070657212 = **6b-ps1** **Timestamp:** 15:46:52 +872199
----- Checking PS All -----
| bo6-qd1-ps | Stby-Error | AC Power, Standby, Remote, Quench, AC Phase
| bo2-qd1-ps | Stby-Error | AC Power, Standby, Remote, Quench, AC Phase

----- Checking QPSW Control -----
Y9DQPSW: Closed Contactor, Remote On, PFN Charging | cfe-10a-ps3
Y10DQPSW: Closed Contactor, Remote On, Standby | cfe-10a-ps3
B9DQPSW: Closed Contactor, Remote On, Standby | cfe-10a-ps3
B10DQPSW: Open Contactor | cfe-10a-ps3

Technical Notes: Maintenance including working on the quench switches at 1010.
Delay Time: N/A

Fri-Dec 05 **yellow MS-030 File#** = 1070658551 **4b-time.B** **Timestamp:** 16:09:08 +3774319
Ring Permit : FAIL permit.8b-ps1 input : PASS Division B time : 2003dec05 09:41:00 20681
Yellow Quench : FAIL : Yellow Main PS

Technical Notes: Maintenance
Delay Time: N/A

Fri-Dec 05 **yellow MS-031 File#** = 1070659420 **6b-ps1** **Timestamp:** 16:23:40 +670076

Technical Notes: Maintenance
Delay Time: N/A

Fri-Dec 05 **blue MS-032 File#** = 1070661688 **10a-ps3.A** **Timestamp:** 17:01:28 +168311
----- Checking QPSW Control -----
Y9DQPSW: Over Current Fault, No Quench Link, Open Contactor, Remote On | cfe-10a-ps3
B9DQPSW: Closed Contactor, Remote On, PFN Charging | cfe-10a-ps3
B10DQPSW: Closed Contactor, Remote On, PFN Charging | cfe-10a-ps3
B10DQPSW: Closed Contactor, Remote On, PFN Charging | cfe-10a-ps3

Technical Notes: Maintenance
Delay Time: N/A

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Fri-Dec 05 **yellow MS-033 File#** = 1070668027 **2b-ps1** **Timestamp:** 18:48:32 +1004082
Ring Permit : FAIL permit.8b-ps1 input : PASS Division B time : 2003dec05 09:41:00 20681

Technical Notes: Recovering from Maintenance. 17:24: Yellow quench recovery sequence begun [tape](#)
18:39: We finished our maintenance on the 6KA quench protection switches around 17:00. We tried to bring the yellow quench link up a couple of times and we got the 6b permit fault. The scope the controls group had set up in 6b captured data that now points the problem to 4b. They will move the scope to 4b now.
I was finally able to do a hysteresis loop with both ring, but I am waiting to have the scope set up in 4b before I turn the system over to MCR. [Ganetis](#)
Delay Time:

Fri-Dec 05 **yellow MS-034 File#** = 1070668112 **2b-ps1** **Timestamp:** 18:48:32 + 1004082

Technical Notes: Recovering from Maintenance
Delay Time:

Sat-Dec 06 **blue MS-035 File#** = 1070737822 **12a-ps1.A** **Timestamp:** 14:10:20 + 2215836
Ring Permit : ? : permit.10a-ps3.B input : PASS Division B time : 2003dec06 14:08:48 2801665

Technical Notes: Carl problem with the mains
Delay Time:

Sat-Dec 06 **yellow MS-036 File#** = 1070737822 **4b-time.B** **Timestamp:** 14:10:20 +2256600
Ring Permit : ? permit.10a-ps3.B input : PASS Division B time : 2003dec06 14:08:48 2801665

Yellow Quench : Yellow Main PS
Technical Notes: Carl problem with the mains
Delay Time:

Sun-Dec 07 **blue MS-037 File#** = 1070774032 **4b-time.B** **Timestamp:** 00:13:52 +355382
Ring Permit : FAIL permit.4b-time.B input : Blue Main PS time : 2003dec07 00:13:52 355382
Blue Quench : FAIL : Blue Main PS

Blue Dipole Main PS: Reg Err
Technical Notes: Carl problem with the mains
Delay Time:

Sun-Dec 07 **blue MS-038 File#** = 1070778502 **4b-time.B** **Timestamp:** 01:28:20 +2174965
Ring Permit : FAIL permit.4b-time.B input : Blue Main PS time : 2003dec07 01:28:20 2174965

----- Checking PS All -----
| bi4-qf9-ps | Stby-Error | AC Power, Standby, Remote, Quench, AC Phase
| b-dmain-ps | Reg ON, Auto ON, Main Contactor Open, Quench Indication, SCR Gate Drive OFF | Reg Err

Technical Notes: Carl problem with the mains
Delay Time:

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Mon-Dec 08 **blue MS-039 File#** = 1070903857 **2b-ps1** **Timestamp:** 12:17:36 +1645831
Quench Detector(s) Trip: B2DRDX_VT Int 20, Tq = -23

Technical Notes: 12:17: Beam Abort, 10a-ps3.A dropped Blue Quench.

12:22: This QLI occurred out of the blue (so to speak) when we got to injection, about 30 seconds afterwards. QED indicates | qdprocess.2b-qd1 | Running | Blue Quenched [B2DRDX_VT Int 20] @ 12/08/2003 12:18:03 [rhicMode: AUAU1] Tq = -23 | Tq=-23, perhaps the 2 o'clock DX? [TJS](#)

14:03: Blue quench link trip caused by 2b-qd1-quench detector. The quench detector tripped because of multiple b2-dhx-ps current glitches. Don Bruno is looking at this problem. [Ganetis](#)

Delay Time:

Mon-Dec 08 **Yellow MS-040 File#** = 1070906502 **9b-ps1** **Timestamp:** 13:01:40 +2.371
Quench Detector(s) Trip: 2b-qd1 B2DRDX_VT Int 20, Tq=-23
Quench Detector(s) Trip: 9b-qd1 Y8DSA4_A3VT Int 100, Tq=-24

----- Checking PS All -----
| yo9-qd1-ps | Stby-Error | AC Power, Standby, Remote, Quench, AC Phase

Technical Notes: 13:01: Quench Link Interlock in Yellow ring, dropped first [Sequencer](#)

13:07: Yellow quench recovery sequence begun [tape](#)

13:08: So, Don called in. The reason yellow QLI dropped is because we were off the hysteresis loop, so, we will go ahead to get the yellow recovery going. About blue, he sees some jump in dx in IP2, but for now, he will let us get the blue recovered for now. [Mei](#) 14:29: The hysteresis loop was broken, you have to use the correct slow factors. We will try to automate this in the quench recovery program. [Ganetis](#)

Delay Time:

Mon-Dec 08 **Yellow MS-041 File#** = 1070907134 **4b-time.B** **Timestamp:** 13:12:12 +2.763
----- Checking PS All -----
| y-dmain-ps | Auto Cal Complete, Run Auto Cal, Main Contactor Open, Quench Indication, SCR Gate Drive OFF |

Technical Notes: DC breaker open on the Ramp Supply, possible loose wire, Carl to investigate.

13:57: We modified the slowfactor for injection-2-park to 4 and slowfactor for park-2-injection to 3 in the hysteresis: Down to accommodate the ramp when the magnets are off hysteresis. [Mei](#), [Travis](#)

14:36: I think I would be better to add some intelligence to the quench recover program, sequencer, and or WFG manager to detect when the hysteresis loop is broken and to select the correct slow factors. If you don't you will be slowing down the turn around time and not take advantage of the quench detector tuning I have done. [Ganetis](#)

Delay Time:

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Mon-Dec 08 **blue MS-042 File#** = 1070910838 **2b-ps1** **Timestamp:** 14:13:56 +2246144
----- Checking QD Alarms -----
Quench Detector(s) Trip: 2b-qd1 B2DRDX_VT Int 20, Tq=-23

Technical Notes: **14:17:** Carl just called to claim his innocence. He was tightening up the yellow but blue went down. Carl is calling Don to see what had happened. **Mei 14:28:** Don just called in, he is looking at b2-dhx ps, may have to swap the card.
Mei (Replaced the internal 3 channel Isolation amplifier board)
Delay Time:

Tues-Dec. 09 **Blue MS-043 File#** =1070969270 **6b-ps1** **Timestamp:** 06:27:48 +2486207
Beam Permit Fail Timestamp: 06:27:48 +2457007 First to trip.
Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int. 1, Tq= -24
Dx Heaters Fired: No
QPA Control / TR: b-QD QLI BI1 1st.
Postmortem Plots: bi5-qd2 Voltage and Current changes show signatures of a real quench starting at 0.84 sec before T=0.
5 Minute Quench Delay File: Indicated a Real Quench at 6b-qd1 (B5QFQ2_VT) q2 of the triplet region in sector 5.
Beam Loss Monitors (Rads/Hr): Indications of loss beam near b5-lm3.1 (**4938**), g5-lm1 (**4014**) & b5-lm0 (**2416**)
Main Magnet Power Status: Mains approaching top energy store.

Technical Notes: **9:45:** blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped 30 msec. before the quench link. There was one real quench at b5q2. There was high beam loss at b5-lm3.1 (This is the first beam induced quench of the run). (**George Ganetis**)
Cause of Quench Event: Beam Induced Quench at b5q2 magnet. Delay Time:

Quench Analysis: Beam Induce 001.

Tues-Dec 09 **yellow MS-044 File#** = 1070980890 **4b-time.B** **Timestamp:** 09:41:28 + 2.071
QPA Control / TR: QP02-R11B06-yi11-sxf-qp: Fan Fault

Technical Notes: **9:41:** Maintenance. Quench Link Interlock in Yellow ring, 4b-time.B dropped first. **11:17:** Brought the link down for maintenance on the Yellow Dipole. (**Carl Schultheiss**) Worked performed on the Auxiliary contactor that is attached to the main DC contactor, checking connections.

Quench Recovery Notes: Two attempts made from the LINUX MCR machine failed, Sun System from 1004B was then used to successfully bring up the link. **First attempt 10:17:** Yellow quench recovery sequence begun **tape 11:19:** Tape died while running on Linux box in MCR. (**Carl Schultheiss**) **Second Attempt 10:27:** Yellow quench recovery sequence begun **tape 11:20:** Tape died a second time while running on a Linux box in MCR. (**Carl Schultheiss**) **Third attempt 10:36:** Yellow quench recovery sequence begun **tape 11:21:** Tape run successfully on a Unix box from 1004B. (**Carl Schultheiss**)

Quench Analysis: Maintenance

Delay Time: 60 minutes

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Tues-Dec 09 **blue MS-045 File#** = 1070995167 **6b-ps1** **Timestamp:** 13:39:24 +3507552
Beam Permit Fail Timestamp: 13:39:24 +3507552
Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int. 1, Tq= -24
Dx Heaters Fired: No
QPA Control / TR 1st Alarm: b-QD QLI B11
Postmortem Plots: bi5-qd2 Voltage and Current changes show signatures of a real quench starting at 0.05 sec before T=0.
5 Minute Quench Delay File: Indicated a Real Quench at 6b-qd1 (B5QFQ2_VT) q2 of the triplet region in sector 5.
Beam Loss Monitors (Rads/Hr): Indications of loss beam near b5-lm3.1 (**66.34**), g5-lm1 pulses starting at -8 sec before peak value of **456** just before T=zero mark & b5-lm0 (**231**)
Main Magnet Power Status: Mains approaching top energy store.

Technical Notes: The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped after the quench link. There was one real quench at b5q2. There was moderate beam loss at g5-lm1 (**George Ganetis**)

Cause of Quench Event: Beam Induced Quench at b5q2 magnet. Delay Time:

Quench Analysis: Beam Induce 002.

Wed-Dec 10 **blue MS-046 File#** = 1071035596 **6b-ps1** **Timestamp:** 00:53:16 +362886
Beam Permit Fail Timestamp: 00:53:16 +328680
Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int. 1, Tq= -24
Dx Heaters Fired: No
QPA Control / TR 1st Alarm: No faults indicated, TR #1 trip=b-QD QLI B11
Postmortem Plots: bi5-qd2, bi5-qf3 and bi5-qf1 all indicate Voltage and Current signatures of a real quench prior to T=0.
5 Minute Quench Delay File: Indicated a Real Quench at 6b-qd1 (B5QFQ2_VT) q2 of the triplet region in sector 5.
Beam Loss Monitors (Rads/Hr): Indications of loss beam near b5-lm3.1 (**604.53**), g5-lm1 (**4959.82**), b5-lm0 (**3141.88**) & g5-mlmx.2 (**2028.96**)
Main Magnet Power Status: Mains approaching top energy store.

Technical Notes: Quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped first (0.034sec) before quench link. High beam losses seen at three of the BLM near the triplet magnet with g5-lm1 being the greatest. Checking QD Plot indicated a real quench occurred at b5q2. (**Gregory Heppner**) **MCR-** 02:35, Machine Setup, Blue Quench Link is up and the CCR has cleared to ramp.

10:51: 6b-qd1-quench detector caused blue quench link trip. The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped 34 msec. before the quench link. There was one real quench at b5q2. There was high beam loss at g5-lm1. There is now 3 beam induced quenches for this run. (**Certified by George Ganetis**)

Cause of Quench Event: Beam Induced Quench at b5q2 magnet. Recovery Time: 102minutes

Quench Analysis: Beam Induce 003.

Fri-Dec 12 **blue MS-047 File#** = 1071196390 **6b-ps1** **Timestamp:** 21:33:08 +2190060
Beam Permit Fail Timestamp: 21:33:08 +2190091, tripping after the Quench Link.
Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int. 1, Tq= -24
Dx Heaters Fired: No

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QPA Control / TR 1st Alarm: No faults indicated, TR #1 trip=b-QD QLI B11

Postmortem Plots: bi5-qd2, bi5-qi3 and bi5-qi1 all indicate Voltage and Current signatures of a real quench prior to T=0.

5 Minute Quench Delay File: Indicated a Real Quench at 6b-qd1 (B5QFQ2_VT) q2 of the triplet region in sector 5.

Beam Loss Monitors (Rads/Hr): Indications of loss beam near b5-lm3.1 (**1133.40**) Increase in level starting at -8 sec then spike to level at T=zero, g5-lm1 (**794.93**) Shows a much greater rise starting at -9 sec with peak value -0.03 sec before T=zero.

Main Magnet Power Status: Mains approaching top energy store.

Technical Notes: Quench detector tripped because of a real magnet quench at B5QFQ2_VT. Medium beam losses seen at two of the BLM near the triplet magnet with b5-lm3.1 being the greatest. Checking QD Plot indicated a real quench occurred at b5q2. (Gregory Heppner) MCR- 21:49: Cryo reports that they are seeing heat load in sectors 5 and 6. They estimate one half hour before they can make a full assessment. 22:41: Cryo reports that their temperatures have stabilized and they give us permission to recover.

21:39: blue quench between t230m and t260 - will investigate [fulvia 21:49](#): blue tunes from the previous ramp and the last ramp - blue beam loss started after t200 - big loss between t230 and t260 [fulvia 22:09](#): 30 minutes are necessary to assess our hopes from quench recovery [fulvia 22:12](#): PLL blue horiz clearly shows tune crossing .25 at time of beam loss. [pc 22:40](#): Blue quench recovery sequence begun [tape](#)

23:38: 6b-qd1-quench detector caused blue quench link trip. The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped after blue quench link. There was one real magnet quench at b5q2. There were moderate beam losses at b5-lm3.1 and g5-lm1. There are now four beam induced quenches for this run. (Certified by George Ganetis)

Cause of Quench Event: Beam Induced Quench at b5q2 magnet.

Recovery Time: 67minutes

Quench Analysis: Beam Induce 004.

Fri-Dec 12 yellow MS-048 File# = 1071208381

6b-ps1

Timestamp: 00:53:00 + 1512389

Beam Permit Fail Timestamp: Down from previous quench.

QPA Control / TR 1st Alarm: No faults indicated.

Quench Detector(s) Trip: None listed.

Postmortem Plots: Nothing unusual to indicate, power supplies sitting at Injection Current.

5 Minute: Quench Delay File: Nothing Indicated.

Beam Loss Monitors (Rads/Hr): Beam appears to have been dumped without spillage to our magnets.

Main Magnet Power Status: Mains approaching top energy store.

Technical Notes: 00:57: Yellow quench link drops (out of injection, no activity with yellow beam at the time), coming from 6b-ps1 (as before). [Ad 1:02](#): Andy checked, there is no post mortem data (seems beam loss was not the culprit then). [ad 1:08](#): Correction - There is data, there are just no smoking guns. [ADM 9:44](#): [Ganetis](#) Yellow quench link fault. No ps or quench detector caused this trip.

Quench Analysis: Permit Module-Controls Group

Delay Time: Next Quench File

Fri-Dec 12 blue MS-049 File# = 1071209345

9b-ps1

Timestamp: 01:09:04 +1929445

Beam Permit Fail Timestamp: Down from previous quench.

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

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: Nothing indicating a power supply was at fault.

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5 Minute Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Mains sitting at Injection Current, then switch over to ramping down.

Technical Notes: **MCR** 01:12: Blue suffers a quench link interlock after accidentally ramping down from injection to park. We begin running the recovery sequence for both rings.

9:49: **Ganetis** MCR used wrong Slow Factor, went off hysteresis loop.

Delay Time: Next Quench File

Quench Analysis: Wrong Slow Factor

Fri-Dec 12 **yellow MS-050 File#** = 1071210019

6b-ps1

Timestamp: 01:20:16 + 3253575

Beam Permit Fail Timestamp: Down from previous quench.

QPA Control / TR 1st Alarm: y-PM QLO, YO1

Quench Detector(s) Trip: None listed.

Postmortem Plots: No indications of a power supply as the cause of this trip.

5 Minute Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Level at Park Current.

Technical Notes: **MCR** 01:22: Yellow has another quench link interlock while we recovering blue ring. 6b-ps1 shows the earliest indication. 01:41: Machine setup. Running hysteresis ramp. 02:39: Ramping in RHIC.

Delay Time: 248 minutes from the start of

Quench Analysis: Permit Module-Controls Group

Fri-Dec 12 **blue MS-051 File#** = 1071249241

9b-ps1

Timestamp: 12:14:00 +1262180

Beam Permit Fail Timestamp:

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

Dx Heaters Fired: No

5 Minute Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Injection Current

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Fri-Dec 12 **yellow MS-052 File#** = 1071249241 **5b-ps1** **Timestamp:** 12:14:00 + 1354251

Beam Permit Fail Timestamp:

QD Alarms Listed: (5b-qd1) Y4DSA4_A3VT, Int. 20, Tq= -24
(9b-qd1) Y8DSA4_A3VT, Int. 20, Tq= -11

5 Minute: Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Injection Current

Technical Notes: **12:08:** bo10-tv11 tripped again. Mike and Tom want a ramp with beam for the next ramp. **TJS, JLN**
12:14: An interesting set of operator errors. Jen was restoring the tripped corrector, but accidentally did a 'here2last' instead of a 'here2first' in the wfgManager. (I've advised her to do an 'activate' in the ramp editor in the future instead.) We noticed a few moments later, but by then we'd pulled ourselves off the FirstStone, so we could not prep to ramp to reset hysteresis. We then tried to do a 'here2injection' to return to the first stone, but the quench link tripped. Oops! **TJS, JLN, other guilty parties**
12:14: Quench Link Interlock in Blue ring, 9b-ps1 dropped first **Sequencer 12:21:** R. Michnoff and E. Koropsak are taking advantage of the QLI to install a monitoring system on 6b-ps1. Should take <15 minutes. **JLN 12:43:** Blue quench recovery sequence begun **tape 12:44:** R. Michnoff and E. Koropsak have completed their work on 6b-ps1, running TAPE to restore permits. **JLN 12:48:** Blue quench recovery sequence begun **tape 12:58:** Yellow quench recovery sequence begun **tape**

Delay Time: 44 minutes

Quench Analysis: MCR Operator Error

Sat-Dec 13 **blue MS-053 File#** = 1071364096 **8b-ps1** **Timestamp:** 20:08:16 +61034

Beam Permit Fail Timestamp: 20:08:12 +3857303, tripped 4 seconds earlier.

Quench Detector(s) Trip: (8b-qd1) B7QFQ2_VT, Int. 1, Tq= -24

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated, TR #1 trip=b-A2 QLO BO6, TR #7 trip=b-QD QLI BI1

Postmortem Plots: bo7-qd3, bo7-qf2 and bo7-qd1 indicate Voltage and Current signatures of a real quench prior to T=0.

5 Minute Quench Delay File: Indicated a Real Quench at 8b-qd1 (B7QFQ2_VT) q2 of the triplet region in sector 7.

Beam Loss Monitors (Rads/Hr): Indications of loss beam near b7-lm3.1 (**123.53**), b7-lm0 (**1490.06**) and the highest near g7-lm1 (**4584.90**).

Main Magnet Power Status: Mains at Top Energy Store.

Technical Notes: **20:08:** Quench Link Interlock in Blue ring, 8b-ps1 dropped first **Sequencer**
21:53: blue quench link trip was caused by the 8b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B7QFQ2_VT. The beam permit tripped .104 sec. before the blue quench link. There was a real magnet quench at b7q2. There was high beam loss at b7-lm1. (**Certified by George Ganetis**)

20:08: Beam Abort, 8b-ps1 dropped {Loss Monitor 1} **Sequencer** 20:08: Setup is off. A beam loss caused a Blue quench link interlock at B7QFQ2_VT. Optics measurements were being taken using the RHIC AC dipole at the time. The cryo system is recovering. **20:21:** Mei, shouldn't we trigger an abort at 2000rad/hr? **Wolfram 20:36:** Yes, but the loss is faster. **Mei 20:28:** So, I am confused, the ac dipole was definitely the 1st and looks like the cause. But, how could the beam abort occurred 4 seconds earlier than the blm decided to pull the permit, according to the Alarm Log. So, should I trust the time stamps on the Alarm Log?

Anyway, let me explain what I was doing. I was kicking the beam at 0.01 away from both H&V tunes. By setting the ac dipole amplitude at maximum, I still couldn't see any useful coherence signals in the H plane and vertical data looked crappy with about 0.15mm coherent oscillation. So, I made a bold move, I then lowered the amplitude to 0.6 and pushed the drive tune closer to the resonance by 0.002 hoping to get a sizable coherence. Well, I guess, I was just a little too brave. Should have backed off more on amplitude. **Mei**

21:35: going to the right on the event link display, get better timing resolution and learn that the blue quench link occurred about 200ms after the loss monitor in 8b ps1 pulled the permit. **Leif**

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20:35: Blue quench recovery sequence begun [tape](#)

Cause of Quench Event: Beam Induced Quench at b7q2 magnet.

Recovery Time: 27minutes

Quench Analysis: Beam Induce 005

Sat-Dec 13 **yellow MS-054 File#** = 1071365885 **4b-time.B** *Timestamp:* 20:38:04 + 1393434

Beam Permit Fail Timestamp: Down from previous quench event at 20:08:12

Quench Detector(s) Trip: None indicated.

5 Minute: Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Dipole Ground Current Trip.

Technical Notes: 20:38: Quench Link Interlock in Yellow ring, 4b-time.B dropped first [Sequencer](#)

20:38: Hey, yellow quenched at zero. Not my fault this time! [Mei](#) 20:39: I had Vincent run recovery with Yellow at 50A. I thought that this was ok, but maybe I was wrong. Nick saw that it was ramping at slowfactor 6, which is what we were expecting. [JPJ](#) 22:13: yellow quench link trip caused by yellow main dipole ps. The ps. had a ground current fault while the ps was being ramped to zero by the blue recovery. [Ganetis](#) 23:34: The ground current fault was real, PMViewer showed ground currents on the PS ground and the quench ground. They both jumped up suddenly and then gradually were dying away when the trip occurred. The power supply ground was saturated at 10 Amps for about 1 second. Both the ground current warning and then the ground current trip were displayed on the alarm page. 21:07: The CCR has given us clearance to ramp, and the Blue Quench Link is up. We're just waiting to hear the prognosis from Carl before we continue. [JPJ](#) 21:44 Carl has asked the MCR to run Yellow Quench Recovery. 22:01: The Yellow quench link is up are the magnets are going through a hysteresis ramp. Carl will continue to watch from home. 22:16: There is no quench detector data because that didn't trip. The current is below the threshold where the quench detectors become active. [Ganetis](#)

Delay Time: 83 minutes

Quench Analysis: Yellow Dipole Main Ground Current.

Sat-Dec 13 **yellow MS-055 File#** = 1071375070 **8b-ps1** *Timestamp:* 23:11:08 +2549596

Beam Permit Fail Timestamp: 23:11:08 +2480459, pulled first by 0.069137sec.

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

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: yo8-qd3, yo8-qf2 and yo8-qd1 all indicate Voltage and Current signatures of a real quench prior to T=0.

5 Minute Quench Delay File: Indicated two Real Quenches at 8b-qd1.

(Y8QFQ2_VT and Y8QFQ3_VT) q2 & q3 of the triplet region in sector 8.

Beam Loss Monitors (Rads/Hr): Indications of loss beam near y8-lm3.1 (**4578.05**), g8-lm1 (**4000.21**), y8-lm0 (**2600.73**) & b8-lm3.1 (**2976.43**)

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Main Magnet Power Status: Mains operating at Top Energy.

Technical Notes: 23:11: Setup is off. A Yellow quench occurred at Y8QFQ2_VT when a down ramp was executed after both Yellow RF stations tripped to standby. The Yellow beam intensity at the time was 30e9. The cryo system is recovering. 23:23: A Blue QLI occurred while running Yellow Quench Recovery. 23:15: Yellow Rf dropped out right before the down sequence was run. Result a very dirty dump and a yellow quench. NAK 23:18: Any one among the home audience knows that where to dig out postmortem data for RF. We would like to understand why yellow cavities tripped at the same time. A thought, maybe for the future it is worthwhile to have the rf cavities on the permit, so beam get aborted at the same time when the cavity trips, this maybe able to avoid dump all the unbunched beam everywhere. Mei

Dec 14, 11:01: 8b-qd2-quench detector caused yellow quench link trip. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped .069 sec. before the yellow quench link. There were two magnet quenches at y8q2 and y8q3. There were high beam losses at y8-lm3.1 and y8-lm1. There are now 6 beam induced quenches for this run. (Certified by George Ganetis)

Cause of Quench Event: Beam Induced Quench at y8q2 & y8q3 magnet. Recovery Time: minutes

Quench Analysis: Beam Induce 006.

Sat-Dec 13 **blue MS-056 File#** = 1071375795 **4b-time.B** **Timestamp:** 23:23:12 +3887077

Beam Permit Fail Timestamp: Down from previous quench at 23:11:08.

Quench Detector(s) Trip: None listed.

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: Blue Main Dipole show large voltage oscillations prior to T=zero.

5 Minute Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Appears to be ramping down from Park to Zero.

Technical Notes: **PHY 23:23:** Quench Link Interlock in Blue ring, 4b-time.B dropped first **Sequencer**

Dec 14 2003 11:07: blue quench link trip was caused by blue main dipole ps. The main ps pet page showed a PFN fault. This was on the down ramp to zero current. Ganetis

Mei 23:54: Carl is modifying the main dipole coefficients to allow us to ramp them down to zero without causing a QLI. JPJ

Dec 14 2003 00:21: The Dipoles have tripped twice while ramping to zero during the TAPE sequence. I was able to bring the Yellow Dipole to zero without incident by hand. The slow factor used in TAPE between park and zero may have to be made larger. For now I have reduced the current loop gain, this will probably make the error during a ramp larger. There may have to be a compromise between the dipole error and the slow factor between park and zero. **CS Dec 14 2003 00:08:** Blue quench recovery sequence begun **tape**

Delay Time: 45 minutes

Quench Analysis: Blue Main Dipole Fault

Tues-Dec 16 **blue MS-057 File#** = 1071566845 **8b-ps1** **Timestamp:** 04:27:24 +1239607

Beam Permit Fail Timestamp: Pulled second at 04:27:24 +1239637.

Quench Detector(s) Trip: B8QDQ9_VT, Int. 1, Tq= -24

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated, TR #1= b-QD-QLI, BI1.

Postmortem Plots: bi8-qi9-ps, 1) glitch at T-2.63 sec at 86 amps. 2) Begins to ramp down at T-1.11 sec. 3) Erratic signal from T-0.68 sec. 4) Supply trips, DC Overcurrent, Quench. B8-q89 and bo7-qi8 also effected but this was caused by nesting of the supplies.

5 Minute Quench Delay File: None listed.

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Beam Loss Monitors (Rads/Hr): y8-lm3.1 (638.90), g8-lm9 (Low).

Main Magnet Power Status: Qdplot indicated that the main supplies were sitting at Top Energy Store.

Technical Notes: 5:36: bi8-qf9 is preventing quench recovery. Don Bruno is looking into it from home. ADM
05:12: C. Schultheiss indicates that we can proceed. He believes that the warning indication may have resulted from modifications that he has been making to the control software for the yellow ring. He will investigate further during the day.
6:25: CAS is working with Don on the bi8-qf9 supply. They noticed no -15vdc on any of the cards in the control bucket. At this point, CAS checked the fuses to the housekeeping supply and they were good. Tech called in to replace the housekeeping supply.

Delay Time: 90 minutes

Machine Down Time: 287 minutes

Quench Analysis: bi8-qf9 power supply, Housekeeping Power Supply Fail (no negative 15 volts output)

Tues-Dec 16 **blue MS-058 File#** = 1071584663 **4b-time.B** **Timestamp:** 09:24:20 +3792337

Beam Permit Fail Timestamp: Pulled second at 09:24:20 +3792367

Quench Detector(s) Trip: None indicated.

Dx Heaters Fired: No

OPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: B-quad main ramping from Park to Injection, the error signal consistently dropping towards -10.

5 Minute Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Blue Main Quad, Regulator Error Fault during the recovery from the previous quench event.

Technical Notes: 9:24: Beam Abort, 4b-time.B dropped {Blue Main PS} Quench Sequencer

9:24: Quench Link Interlock in Blue ring, 4b-time.B dropped first Sequencer

9:30: Blue quench link trip caused by blue main quad ps regulator error. Ganetis

9:45: Blue quench recovery sequence begun tape

Delay Time: 21 minutes

Machine Down Time: See next Quench.

Quench Analysis: Blue Main Quad, Reg Error

Tues-Dec 16 **yellow MS-059 File#** = 1071587973 **4b-time.B** **Timestamp:** 10:19:32 +1708082

Beam Permit Fail Timestamp: Pulled second at 10:19:32 +1708113

Quench Detector(s) Trip: None indicated.

OPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: Yellow Dipole Main Iref from Park to Zero current caused a large voltage spike followed by ground current spikes on the psgnd & qgnd signals all before T=zero. This caused the QLI event. (Voltage Spike as per Postmortem: steady 40v at Park, Iref drops to zero, the Voltage spikes goes positive to 434 volts then passes through zero to negative 427 volts)

5 Minute Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Yellow Main Dipole PS, PS Ground Current Fault.

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Technical Notes: 10:10: C. Schultheiss is investigating the Yellow Main Dipoles BvK

10:23: Bringing RHIC to zero at the request of C. Schultheiss. BvK

10:35: Yellow quench recovery sequence begun [tape](#)

11:14: Carl Schultheiss caused the interlock trying to bring the Yellow Dipole to zero to change coefficients. He also changed the coefficients in the Blue Dipole. CS

Delay Time: 16 minutes

Machine Down Time: 71 minutes

Quench Analysis: Yellow Main Dipole, Ground Current Fault

Tues-Dec 16 **blue MS-060 File#** = 1071632423 **6b-ps1** **Timestamp:** 22:40:20 +3062200

Beam Permit Fail Timestamp: Tripped second at 22:40:20 +3062230

Quench Detector(s) Trip: (6b-qd1) B6QFQ3_VT, Int. 1, Tq= -24

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated. B-QD QLI, B11

Postmortem Plots: bo6-qd1, bo6-qf2 and bo6-qd3 all indicate Voltage and Current signatures of a real quench prior to T=0 with bo6-qd3 showing the greater change of 6amps.

5 Minute Quench Delay File: Indicated two Real Quenches at 6b-qd1.

(B6QFQ3_VT): q3 of the triplet magnet region in sector 6.

Beam Loss Monitors (Rads/Hr): Largest indications of loss beam near b6-lm3.1 where the level begins to rise at T-9 seconds, oscillating as it steadily rises to a peak value of **1278**. The highest level peak value at g6-lm-srt.w, near the spin rotator not operational at this time of **3279**.

Main Magnet Power Status: Mains operating at Top Energy.

Technical Notes: These indications show me that a real magnet quench had occurred at the q3 magnet of the triplets in sector 6 due to beam loss, ([Gregory P. Heppner](#)) 23:23: blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B6QFQ3_VT. The beam permit tripped after blue quench link. There was a real magnet quench at b6q3. There were a high loss at b6-lm=3.1. Is the threshold for this BLM set correctly? There are now 7 beam induced quench link trips for this run. ([Certified by George Ganetis](#))

Causes Leading up to the Quench: 22:41: Oops - guess that was me playing with vertical angle bumps in STAR. :(we need to revert history before we ramp up again. [ad](#) 22:43: I used LISA optimize to see if STAR was still "ok" and it confirmed that we were at the maximum already. Since I kind of couldn't believe it I check "manually" but LISA decision seems right. [ad](#)

22:53: Blue quench recovery sequence begun [tape](#)

23:30: Cryo sees heat at 6 o'clock. We ran the recovery and are awaiting word from them. [PHO](#)

23:40: Cryo reports that temperatures have stabilized. We proceed with machine setup.

Cause of Quench Event: Beam Induced Quench at the b6q3 magnet. Recovery Time: 60 minutes

Quench Analysis: Beam Induce 007.

Wed-Dec 17 **yellow MS-061 File#** = 1071653627 **6b-ps1** **Timestamp:** 04:33:44 +3038594

Beam Permit Fail Timestamp: Pulled second at 04:33:44 +3038624

Quench Detector(s) Trip: 6b-qd2, Y6QDQ9_VT, Int. 1, Tq= -24

QPA Control / TR 1st Alarm: No faults indicated, b-QD QLI, B11.

Postmortem Plots: Indication that the supply continued to follow an Iref signal even after the supply had tripped to standby. Further investigation of Qdplots show that once the supply had tripped, the output current had gone to a negative value of 253amps. At the time, the supply was operating in the positive current direction. A similar indication of the same occurred on Dec 5, 2003 at 01:05 in the morning when the supply had been operating in a negative current direction.

5 Minute Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): Levels indicating extremely low in this area

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Main Magnet Power Status: Top Energy Store.

Technical Notes: It appears the quench detector had tripped due to erratic signals caused by the y6-q89 power supply after it had tripped to standby. (Gregory P. Heppner)

04:49: Experimental setup off. Physics Log Comments: Quench link interlock in yellow ring. 6b-ps1 shows the earliest indication. Y6QDQ9_VT on 6b-qd2 appears to be the origin of the quench link interlock event (Tq=-24). They also briefly encountered network problems. The RHIC alarm display lost communication with alarm server and the wfgManager was briefly inoperative, preventing them from immediately ramping down the blue magnets. After about two minutes, network communications had been restored. **05:11:** Cryo reports that they are seeing small heat loads in sector 7, but they do not have any interlocks, and they grant clearance to begin recovery.

05:14: Quench recovery started in the yellow ring.

05:24: Quench recovery is complete. We run a hysteresis ramp.

Delay Time: 41minutes

Machine Down Time: 41minutes

Quench Analysis: y6-q89 power supply, unknown fault at this time.

MAINTENANCE DAY 07:00 to 15:00

Wed-Dec 17 **blue MS-062 File#** = 1071663526 **10a-ps3.A** **Timestamp:** 07:18:44 +2468392

Wed-Dec 17 **yellow MS-063 File#** = 1071663526 **4b-time.A** **Timestamp:** 07:18:44 +2473310

Technical Notes: George, Gregg, around 7:15am MCR said both links came down because they re-booted 3b-ps1. I don't know if that is true but that is what they said. Don MCR: During the course of the shift, we also encountered a brief but significant network problem that affected RHIC alarm displays and the wfgManager, momentarily preventing us from ramping the magnets in RHIC. Furthermore, at the end of the shift, cfe-3b-ps1 became inoperative, preventing us from ramping down from flattop. T. Clifford was contacted to assist with the problem, and ultimately, an AC reset was issued to the front-end, causing both the yellow and blue quench links to fail. This occurred at the beginning of the maintenance period and had no impact on beam operations.

Wed-Dec 17 **blue MS-064 File#** = 1071695581 **4b-time.B** **Timestamp:** 16:13:00 +1268842

Technical Notes: Attempt to recover from maintenance day, the Blue Main Quad power supply indicated a Reg Error during the recovery program. A User Stop command was initiated to fix, the Links came up fine after repairs by Carl had been done to the software.

Delay Time: 0 minutes

Machine Down Time: N/A, not handed back to MCR until recovery was successful.

Quench Analysis: Blue Main Quad PS, Reg Error

Thur-Dec 18 **yellow MS-065 File#** = 1071780000 **6b-ps1** **Timestamp:** 15:40:00 +643569

Beam Permit Fail Timestamp: Down since morning 08:25:56.

QPA Control / TR 1st Alarm: No faults indicated,

Quench Detector(s) Trip: None listed.

Postmortem Plots: No indications of a power supply as the cause of this trip.

5 Minute: Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A, no beam in the machine at this time.

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

Main Magnet Power Status: Sitting at Injection Current.

Technical Notes: 16:59: I spoke with Rob who said he was out at 6b and disconnected a scope probe that was connected to a test point in the Permit I/O panel and he thinks this caused the trip at 6b. I am not positive if it Rob said the I/O panel or a different part of the Permit Module but it was somewhere in there on a test point the scope probe was connected to. (Don Bruno)

16:59: Yellow quench recovery sequence begun [tape](#)

Delay Time: 79 minutes

Machine Down Time: N/A, Physics not running, previous Controls Failure.

Quench Analysis: Permit Module-Controls Group

Thur-Dec 18 **blue MS-066 File#** = 107180409 **9b-ps1** **Timestamp:** 15:46:48 +1141027

Beam Permit Fail Timestamp: Down since morning 08:25:56.

Quench Detector(s) Trip: (9b-qd1) B8DSA4_A3VT, Int. 100, Tq= -24

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: 1004B indicate the supplies were sitting at Injection current and ramping down.

5 Minute: Quench Delay File: None listed.

Beam Loss Monitors (Rads/Hr): N/A, no beam in the machine at this time.

Main Magnet Power Status: Sitting at Injection Current. (Logview indicated that the supplies had been previously ramped from Park to Injection. The next step would be to Top (Store) Energy, however, the supplies had been ramped back down to Park causing the quench detector to trip.

Technical Notes: 17:02: This trip was caused by ramping off hysteresis. The supplies were also sitting at Injection for about 5.5 hours before they were told to go from Injection to Park. (Don Bruno)

17:08: Blue quench recovery sequence begun [tape](#)

Delay Time: 82 minutes

Machine Down Time: N/A, Physics not running, previous Controls Failure.

Quench Analysis: MCR off the Hysteresis Ramp

Fri-Dec 19 **yellow MS-067 File#** = 1071894126 **8b-ps1** **Timestamp:** 23:22:04 +2090424

Beam Permit Fail Timestamp: 23:22:04 +2042900

QPA Control / TR 1st Alarm: No faults indicated,

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

Postmortem Plots: yo8-qd1, yo8-qf2 and yo8-qd3 all indicate current & voltage changes prior to T=zero

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

Beam Loss Monitors (Rads/Hr): Highest losses at y8-lm0 (**4803**), y8-lm1 (**4447**), b8-lm3.1 (**4916**) and y8-lm3.1 (**4578**)

Main Magnet Power Status: Ramping at top end of Store Energy.

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Technical Notes: Dec 20 2003 00:53: 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 .048 sec. before the yellow quench link. There was a magnet quenches at y8q2. There were high beam losses at g8-lm1 and y8-lm3.1. [Ganetis](#)

Fri-Dec 19 **blue MS-068 File#** = 1071894126 **6b-ps1** **Timestamp:** 23:22:04 +2042932
Beam Permit Fail Timestamp: Down since morning 08:25:56.
Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int. 1, Tq= -24
Dx Heaters Fired: No
QPA Control / TR 1st Alarm: No faults indicated.
Postmortem Plots: bi5-ql1, bi5-qd2 and bi5-ql3 all indicate current & voltage changes prior to T=zero
5 Minute: Quench Delay File: (6b-qd1) B5QFQ2_VT
Beam Loss Monitors (Rads/Hr): Highest beam loss near g5-lm1 (**4959**) and b5-lm0 (**3311**)
Main Magnet Power Status: Ramping at top end of Store Energy.

Technical Notes: Dec 20 2003 00:49: blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped .003 sec. before the blue quench link. There was a real magnet quench at b5q2. There was a moderate beam loss at b5-lm=3.1 and high loss at g5-lm1. There is now 8 beam induced quench link trips for this run. [Ganetis](#)

23:56: Blue quench recovery sequence begun [tape](#)
Dec 20 2003 00:32: Yellow quench recovery sequence begun [tape](#)
Dec 20 2003 00:39: Beam Abort, 10a-ps3.A dropped Yellow Quench [Sequencer](#)

Delay Time: 70 minutes Machine Down Time: 70 minute

Quench Analysis: Beam Induce 008.

Sat-Dec 20 **yellow MS-069 File#** = 1071898790 **10a-ps3.A** **Timestamp:** 00:39:48 +2857108
Beam Permit Fail Timestamp: 00:39:48 +2857137
QPA Control / TR 1st Alarm: yo9-qd3-qp first to fail, no faults indicated.
Quench Detector(s) Trip: None
Postmortem Plots: Nothing unusual
5 Minute: Quench Delay File: None indicated
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status:

Technical Notes: Dec 20 2003 1:10: yellow quench link trip was caused by yo9-qd3-ps. It had an error fault when the ps was turned on. The aux. contacts will have to be replaced. [Ganetis](#)

Dec 20 2003 00:43: Yellow quench recovery sequence begun [tape](#)

Delay Time: 4 minutes Machine Down Time: N/A

Quench Analysis: yo9-qd3 stopped the recovery script.

Sat-Dec 20 **blue MS-070 File#** = 1071929602 **9b-ps1** **Timestamp:** 09:13:20 +2606593
Beam Permit Fail Timestamp: 09:13:20 +2606623
Quench Detector(s) Trip: (9b-qd1) B8DSA4_A3VT, Int. 100, Tq= -24
Dx Heaters Fired: No
QPA Control / TR 1st Alarm: No faults indicated.
Postmortem Plots:
5 Minute: Quench Delay File: None indicated
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status:

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Sat-Dec 20 **yellow MS-071 File#** = 1071929603 **7b-ps1** **Timestamp:** 09:13:20 +3695045
Beam Permit Fail Timestamp: 09:13:20 +2606627
QPA Control / TR 1st Alarm: No faults indicated,
Quench Detector(s) Trip: (8b-qd2) Yellow Aux 3, Y8TQ4-VT, Int. 1, **Time in 09:13:27**
(7b-qd1) Y7DSA3_A2VT, Int. 100 Tq= -23 and (9b-qd1) Y8DSA4_A3VT, Int. 11, Tq= -11 **Time in 09:13 49**
Postmortem Plots:
5 Minute: Quench Delay File: None indicated
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status:

Technical Notes: 9:15: CAS just called, they asked us to ramp everything back to zero. They need to replace the QPA for yo8-tq6. Well, on the other hand, blue and yellow got quenched due to the wrong slow factor Nick used for ramping down to zero. Mei

Delay Time: minutes Machine Down Time: minutes

Quench Analysis: Wrong Slow Factor brought down Blue and Yellow.

Sat-Dec 20 **blue MS-072 File#** = 1071931681 **12a-ps1.A** **Timestamp:** 09:48:00 +1412984
Beam Permit Fail Timestamp: Down from previous QLI.
Quench Detector(s) Trip: None indicated.
Dx Heaters Fired: No
QPA Control / TR 1st Alarm: bo11-qd1-qp 1st to fail, no faults indicated.
Postmortem Plots: Nothing unusual, except voltage drops steadily as Iref and Current remain at zero.
5 Minute: Quench Delay File: None indicated
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status:

Technical Notes:

Delay Time: minutes Machine Down Time: minutes

Quench Analysis:

Sat-Dec 20 **yellow MS-073 File#** = 1071932709 **10a-ps3.A** **Timestamp:** 10:05:08 +1853961
Beam Permit Fail Timestamp: 10:05:08 +1853990
QPA Control / TR 1st Alarm: yo9-qd3-qp 1st to fail, no faults indicated,
Quench Detector(s) Trip: None indicated.
Postmortem Plots: Nothing unusual.
5 Minute: Quench Delay File: None indicated
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status:

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Technical Notes:

Delay Time: minutes Machine Down Time: 70 minute

Quench Analysis: yo9-qd3 stopped the recovery script

Sat-Dec 20 **yellow MS-074 File#** = 1071933630 **10a-ps3.A** **Timestamp:** 10:20:28 +2025895
Beam Permit Fail Timestamp: 10:20:28 +2025924
QPA Control / TR 1st Alarm: yo9-qd3-qp first to fail, no faults indicated.
Quench Detector(s) Trip: None
Postmortem Plots: Nothing unusual
5 Minute: Quench Delay File: None indicated
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status:

Technical Notes:

Delay Time: 4 minutes Machine Down Time: N/A

Quench Analysis: yo9-qd3 stopped the recovery script.

Sun-Dec 21 **yellow MS-075 File#** = 1072021149 **8b-ps1** **Timestamp:** 10:39:08 +1663163
Beam Permit Fail Timestamp: 10:39:08 +1616673
QPA Control / TR 1st Alarm: No faults indicated,
Quench Detector(s) Trip: (8b-qd2) Y8QFQ2_VT, Int. 1 Tq= -24
Postmortem Plots: yo8-qd1, yo8-qf2 yo8-qd3 and y8-dh0 all indicate current & voltage changes prior to T=zero
5 Minute: Quench Delay File: (8b-qd2) Y8QFQ1_VT, Y8QFQ2_VT, Y8QFQ3_VT, Y8DRD0_D0 and Y8DRBU9_0VT
Beam Loss Monitors (Rads/Hr): Highest losses at g8-mlmx.2 (**3471**), g8-mlmx.1 (**5168**), y8-lmx (**4536**), b8-lmx (**2992**), g8-lmx (**3197**), b8-lm0 (**4564**), y8-lm0 (**4803**), y8-lm1 (**4447**), b8-lm3.1 (**4916**) and y8-lm3.1 (**4578**)
Main Magnet Power Status: Store Energy

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Sun-Dec 21 **blue MS-076 File#** = 1072021149 **8b-ps1** **Timestamp:** 10:39:08 +1729788
Beam Permit Fail Timestamp: 10:39:08 +1616673
Quench Detector(s) Trip: (8b-qd1) B8DRD0_D0, Int. 1, Tq= -23
Dx Heaters Fired: No
QPA Control / TR 1st Alarm: No faults indicated.
Postmortem Plots: b8-dh0 shows a voltage spike during the trip.
5 Minute: Quench Delay File: None indicated
Main Magnet Power Status: Store Energy

Technical Notes: **Dec 22 2003 00:21:** 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 .047 sec. before the yellow quench link. There were four real magnet quenches at y8d0,y8q1,y8q2 and y8q3. There were high beam losses at y8-lm0 , g8-lm1 and y8-lm3.1. There is now 9 beam induced quench link trips for this run . [Ganetis](#)

Dec 22 2003 00:26: blue quench link tripped because of 8b-qd1 quench detector. The quench detector tripped because of magnetic coupling between the D0 magnets. When the yellow D0 quenched it caused the blue magnet to have a voltage signal that the quench detector veivs as a quench. [Ganetis](#)

Delay Time: minutes Machine Down Time: minutes

Quench Anaylisis: Beam Induce 009.

Sun-Dec 21 **yellow MS-077 File#** = 1072026022 **8b-ps1** **Timestamp:** 12:00:20 +2163271
Beam Permit Fail Timestamp: Down from previous QLI.
QPA Control / TR 1st Alarm: N/A
Quench Detector(s) Trip: (8b-qd2) Y7QFQ6_4VT, Int. 100, Tq= -25
Postmortem Plots: Nothing unusual
5 Minute: Quench Delay File: None indicated
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status:

Technical Notes: **Dec 22 2003 00:16:** While ramping to injection the 8b-qd2 quench detector tripped. It looks like the main quad ps went into some kind of oscillations. This will cause a quench detector to view this as a quench. [Ganetis](#)

Delay Time: minutes Machine Down Time: N/A

Quench Anaylisis: Yellow Main Quad Oscillating

Sun-Dec 21 **blue MS-078 File#** = 1072060565 **6b-ps1** **Timestamp:** 21:36:04 +1250836
Beam Permit Fail Timestamp: 21:36:04 +1230591
Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int. 1, Tq= -24
Dx Heaters Fired: No
QPA Control / TR 1st Alarm: No faults indicated.
Postmortem Plots: bi5-ql1, bi5-qd2 and bi5-ql3 all indicate current & voltage changes prior to T=zero
5 Minute: Quench Delay File: (6b-qd1) B5QFQ2_VT
Beam Loss Monitors (Rads/Hr): Highest beam loss near g5-lm1 (**2620**) and b5-lm0 (**1467**)
Main Magnet Power Status: At the top end of the Ramp to Store Energy.

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Technical Notes: 23:28: blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped .02 sec. before the blue quench link. There was a real magnet quench at b5q2. There were a high loss at g5-lm1 and a moderate loss at b5-lm3.1.

There is now 10 beam induced quench link trips for this run. [Ganetis](#)

21:54: Blue quench recovery sequence begun [tape](#)

22:09: Running hysteresis ramp. [ADM](#)

Delay Time: minutes

Machine Down Time: minutes

Quench Analysis: Beam Induce 010.

Mon-Dec 22 **blue MS-079 File#** = 1072095482 **4b-time.A** **Timestamp:** 07:18:00
QPA Control / TR 1st Alarm: bi4-qd2-qp 1st to fail, no faults indicated.

Mon-Dec 22 **yellow MS-080 File#** = 1072099483 **10a-ps3.A** **Timestamp:** 08:24:40
QPA Control / TR 1st Alarm: yo9-qr8-qp 1st to fail, no faults indicated.

Quench Detector(s) Trip: None indicated.

5 Minute: Quench Delay File: Indicated (4b-qd1) B4QFQ2_VT
(8b-qd1) B7QFQ2_VT and B8QFQ2_VT
(12a-qd1) B11QFQ2_VT and B12QFQ2_VT (None are real.)

Mon-Dec 22 **blue MS-081 File#** = 1072112947 **4b-time.B** **Timestamp:** 12:09:04

Technical Notes: Recovering from Maintenance, Blue Main Quad PS failed on Reg Watchdog.

Delay Time: minutes

Technical Notes: 16:51: RHIC p.s. Maintenance performed today: 1. Corrector bo3-th8 was swapped out. 2. The control card, digital isolation card and node card cable were swapped out for yo9-qgt-ps. 3. Heaters were put into the tunnel near the triplets of sector eight. 4. A heater was replaced on top of the 8b blue valve box. 5. We looked at YP1 in the ATR line. We could not reproduce the problem but we did swap the TOLDO box of YQ3 with YP1 and installed a spare TOLDO box on YP1. We must keep an eye on YP1 and YQ3. [Don Bruno](#) [rhic]

Quench Analysis: MAINTENANCE DAY.

Mon-Dec 22 **yellow MS-082 File#** = 1072153968 **4b-time.B** **Timestamp:** 23:32:48 +795383

Beam Permit Fail Timestamp: 23:32:48 +795413

QPA Control / TR 1st Alarm: No faults indicated.

Quench Detector(s) Trip: None

Postmortem Plots: Nothing unusual

5 Minute: Quench Delay File: 1b-qd1, 3b-qd1 and 9b-qd1 all indicate SYS ERROR

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status:

Technical Notes: Yellow Main Dipole PS PFN1 & PFN2 Fault

Delay Time: minutes

Machine Down Time: N/A

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Quench Analysis: Yellow Main Dipole PFN Fault.

Tues-Dec 22 **yellow MS-083 File#** = 1072166030 **4b-time.B** **Timestamp:** 02:53:48 +2337905
Beam Permit Fail Timestamp: 02:53:48 +2337935
QPA Control / TR 1st Alarm: No faults indicated.
Quench Detector(s) Trip: None
Postmortem Plots: Nothing unusual
5 Minute: Quench Delay File: None indicated.
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status:
Technical Notes: Yellow Main Dipole PS PFN1 & PFN2 Fault

Delay Time: minutes Machine Down Time: N/A

Quench Analysis: Yellow Main Dipole PFN Fault.

Maintenance on the Mains

Tues-Dec 23 **yellow MS-084 File#** = 1072216916 **4b-time.B** **Timestamp:** 17:01:56 +712170
Technical Notes: Maintenance by Carl on the Main Power Supplies
17:01: Quench Link Interlock in Yellow ring, 4b-time.B dropped first **Sequencer**
17:02: Beam Abort, 4b-time.B dropped {Yellow Main PS} Quench **Sequencer**
17:12: Carl estimated 30-45 minutes work. Cryo needs to call somebody in. **Haixin**
17:55: Yellow quench recovery sequence begun **tape**
17:15: I pushed the crash button to work on the Yellow Dipole. **CS**

Quench Analysis: Work on tightening possible loose connections on the Yellow Main Dipole PFN Fault.

Maintenance on the Mains

Tues-Dec 23 **blue MS-085 File#** = 1072221592 **2b-ps1** **Timestamp:** 18:19:52 +88464
Technical Notes: Maintenance by Carl on the Main Power Supplies
18:24: Probable Building 2 Quench Link Bypass Chassis Problem. **CS**
18:19: Quench Link Interlock in Blue ring, 2b-ps1 dropped first **Sequencer**
18:25: Blue Link came down when the power was cycled to the Quench Link Bypass Chassis. **CS**
18:24: Yellow quench recovery sequence begun **tape**

Delay Time: minutes Machine Down Time: N/A

Quench Analysis: Bldg 1002, Quench Link Bypass Chassis power cycled.

Tues-Dec 23 **blue MS-086 File#** = 1072224078 **10a-ps3.B** **Timestamp:** 19:01:16 +2008764
Beam Permit Fail Timestamp: Still down from previous 17:01:56 permit fail.
Quench Detector(s) Trip: None initiated.
Dx Heaters Fired: No
QPA Control / TR 1st Alarm: No faults indicated.
Postmortem Plots: N/A
5 Minute: Quench Delay File:
Beam Loss Monitors (Rads/Hr):
Main Magnet Power Status: Blue main Dipole & Quad, Auto ON/OFF Sequencer Off, Reg Off,

Technical Notes:

18:59: Blue quench recovery sequence begun **tape**

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19:01: Quench Link Interlock in Blue ring, 10a-ps3.B dropped first [Sequencer](#)
20:56: caused by running the Quench Recovery script.

Delay Time: minutes Machine Down Time: minutes

Quench Anaylisis: Caused by running the Quench Recovery script.

Tues-Dec 23 **yellow MS-087 File#** = 1072228505 **8b-ps1** **Timestamp:** 20:15:04 +1549613

Beam Permit Fail Timestamp: 20:15:04 +1484861

Quench Detector(s) Trip: (8b-qd1) Y7QFQ2_VT, Int. 1, Tq= -24

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots:

5 Minute Quench Delay File: Indicates 8b-qd2 (Y7QFQ2_VT).

Beam Loss Monitors (Rads/Hr): Highest rates at y7-lm3.2c (three peak values starting at -2.0sec = **700**, -1.0sec = **2474** and T=zero Sec, a value of **4518**. At y7-lm3.1, moderate peak values at then same intervals of -2.0sec = **228**, -1.0sec = **779** and T=zero Sec, a value of **1474**.

Main Magnet Power Status: Mains operating at Top Energy.

Technical Notes: 20:10: RHIC acceleration ramp started, ramp id Au4_1072213799 [Sequencer](#)

20:15: Beam Abort, 8b-ps1 dropped {Loss Monitor 1} [Sequencer](#)

20:15: Quench Link Interlock in Yellow ring, 8b-ps1 dropped first [Sequencer](#)

22:37: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y7QFQ2_VT. The beam permit tripped .065 sec. before the yellow quench link. There was a real magnet quench at y7q2. There were high beam losses at y7-lm3.2. There is now 11 beam induced quench link trips for this run. [Ganetis](#)

Cause of Quench Event: Beam Induced Quench at y7q2. Recovery Time: minutes

Quench Anaylisis: Beam Induce 011.

Wed-Dec 24 **yellow MS-088 File#** = 1072249913 **5b-ps1** **Timestamp:** 02:11:52 +1585811

Beam Permit Fail Timestamp: 02:11:52 +1585842

Quench Detector(s) Trip: (1b-qd1) Y12DSA5_A4VT, Int. 1, Tq= -11
(5b-qd1) Y4DSA5_A4VT, Int. 1, Tq= -24

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: 1004B shows nothing unusual.

5 Minute Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr):

Main Magnet Power Status: Mains operating at Top Energy. Qdplot shows that the main appears to drop -0.8 seconds before T=zero.

Technical Notes: 2:11: Beam Abort, 5b-ps1 dropped Yellow Quench [Sequencer](#)

2:11: Quench Link Interlock in Yellow ring, 5b-ps1 dropped first [Sequencer](#)

2:13: This happened at the start of the down ramp; looks like a real quench with a negative Tq at 5b-qd1. [trav](#)

10:15: yellow quench link trip was caused by 5b-qd1 quench detector. The quench detector tripped because of a yellow main dipole ps current glitch. It looks like a problem with the DCCT in the ps. . The beam permit tripped after the quench link.

There were no real magnet quenches. [Ganetis](#)

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Wed-Dec 24 **blue MS-091 File#** = 1072310083 **9b-ps1** **Timestamp:** 18:54:40 +3836747

Beam Permit Fail Timestamp: Down from previous QLI.

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

5 Minute Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Injection current, ramping downwards. (Logview indicated that the ramp went from Park to Injection then back to Park, indicating Off the Hysteresis Loop had occurred).

Technical Notes: 18:54: Quench Link Interlock in Blue ring, 9b-ps1 dropped first Sequencer

19:10: probably cause by the wrong sf?

23:52: Wrong slow factor was used for a ramp off the hysteresis loop. Ganetis

19:00: Blue quench recovery sequence begun [tape](#)

Delay Time:

Recovery Time: minutes

Quench Analysis: Wrong Ramp, Off the Hysteresis Loop

Wed-Dec 24 **yellow MS-092 File#** = 1072322484 **3b-ps1** **Timestamp:** 22:21:24 +403014

Beam Permit Fail Timestamp: 22:21:20 +3262529

Quench Detector(s) Trip: (3b-qd1) Y2DSA4_A3VT, Int. 100, Tq= -24

5 Minute Quench Delay File: None indicated

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Store Energy, Qdplot shows YDMC (Raw) slight Oscillating before T=zero.

Technical Notes: 22:21: Beam Abort, 2b-ps1 dropped {PASS Division B} Sequencer

22:21: Quench Link Interlock in Yellow ring, 3b-ps1 dropped first Sequencer

23:54: yellow quench link trip was caused by 3b-qd1 quench detector. The quench detector tripped because of a yellow main dipole erroneous current signal. This is the same problem as earlier today. This looks like a problem in the DCCT for the yellow main dipole ps. The beam permit tripped 1.141 sec before the yellow quench link. Ganetis

Dec 25 2003 13:52: I've been watching. I want to know if this is a loose connection, or a card that needs reseating, or something in the DCCT. The redundant DCCT data was not logging properly, I fixed that, and now I want to wait for the next event before I do anything so I can look at that data. CS

22:30: QLI in yellow; 3b-ps1 pulled the link. The quench occurred while we were trying to execute the down ramp. Sequencer hung up. Other strange events are under investigation.. ATR went to A=B about the time NMO219 went into an active/bypass mode. This event was just prior to the QLI AJK, BvK

22:36: Yellow quench recovery sequence begun [tape](#)

Delay Time:

Recovery Time: minutes

Quench Analysis: Yellow Main Dipole Current Glitch

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Thur-Dec 25 **yellow MS-093 File#** = 1072331578 **3b-ps1** **Timestamp:** 00:52:56 +2485462
Beam Permit Fail Timestamp: 00:52:56 +1122239
Quench Detector(s) Trip: (3b-qd1) Y2DSA4_A3VT, Int. 100, Tq= -24
5 Minute Quench Delay File: None Indicated
Beam Loss Monitors (Rads/Hr): Highest loss rates at y2-lm3 (**2342**) and b2-lm3.1.ipm (**3188**)
Main Magnet Power Status: Store energy, Qdplot shows YDMC (Raw) slight current rise before T=zero.

Technical Notes: **Dec 25 2003 00:53:** Quench Link Interlock in Yellow ring, 3b-ps1 dropped first [Sequencer](#)
Dec 25 2003 15:18: The beam permit tripped first then the yellow link tripped and then the blue link. yellow quench link trip was caused by 3b-qd1 quench detector. The quench detector tripped because of a yellow main dipole erroneous current signal. This is the 5th time this has happened. This looks like a problem in the DCCT. The beam permit tripped 1.365 sec. before the yellow quench link. There were NO real magnet quenches. [Ganetis](#)
Dec 25 2003 1:01: Loss monitors at 2a pulled the link and then we had real quenches at 2b-qd1 in blue and 3b-qd1 in yellow. Cryo is seeing elevated levels. Ramping supplies down to park.
Dec 25 2003 15:39: There were no real quenches ! How did you determine that there were magnet quenches [Ganetis](#)
Dec 25 2003 1:05: Blue quench recovery sequence begun [tape](#)
Dec 25 2003 1:18: Yellow quench recovery sequence begun [tape](#)

Delay Time: Recovery Time: minutes

Quench Analysis: Yellow Main Dipole Current Glitch

Thur-Dec 25 **blue MS-094 File#** = 1072331579 **2b-ps1** **Timestamp:** 00:52:56 +3442743
Beam Permit Fail Timestamp: 00:52:56 +1122275
Quench Detector(s) Trip: (2b-qd1) B2DRD0_D0, Int. 20, Tq= -23
QPA Control / TR 1st Alarm: No Faults indicated.
5 Minute Quench Delay File: None Indicated
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status: Store Energy

Technical Notes: **Dec 25 2003 00:53:** Beam Abort, 2a-bcm1 dropped {Loss Monitor 1} [Sequencer](#)
Dec 25 2003 00:53: Quench Link Interlock in Blue ring, 2b-ps1 dropped first [Sequencer](#)
Dec 25 2003 15:21: blue quench link trip was caused by 2b-qd1 quench detector. The quench detector tripped because of a faulty signal that tell the quench detector when the other ring has tripped. The signal is needed to prevent false quenched in D0 magnets that have a large magnetic coupling. This looks like a problem in the permit by-pass chassis. It will have to be looked at tomorrow. [Ganetis](#)

Delay Time: Recovery Time: minutes

Quench Analysis: Faulty Quench Signal

Thur-Dec 25 **blue MS-095 File#** = 1072335548 **2b-ps1** **Timestamp:** 01:59:08 +516379
Beam Permit Fail Timestamp: Down from previous QLI.
Quench Detector(s) Trip: None indicated.
5 Minute Quench Delay File: None Indicated
Beam Loss Monitors (Rads/Hr): N/A
Main Magnet Power Status: N/A

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Technical Notes: Dec 25 2003 1:38: Yellow recovery has an error at Quench Link Status. We contacted George, he asked us to call Wing. [ph, tr](#)

Dec 25 2003 1:59: Quench Link Interlock in Blue ring, 2b-ps1 dropped first [Sequencer](#)

Dec 25 2003 2:02: Yellow quench recovery sequence begun [tape](#)

Dec 25 2003 2:15: CAS cycled AC power to the bypass chassis at Wing's request. This brought down the blue link again.

Dec 25 2003 2:13: Blue quench recovery sequence begun [tape](#)

After both the blue and yellow rings went down, MCR was able to bring the blue ring back up but not the yellow. George found the permit bypass chassis was not working properly. An operator was sent to 1002B, he recycled the power to the chassis by removing the 25 D-connector from the node card chassis (Permit bypass chassis gets the power the node card chassis) and that fixed the problem. I suspect the 5-volt from the node card chassis was too low (I measured 4.75 volts during the last maintenance). I talked to Jeff, he said he has been replacing the 5-volt ps in node card chassis that dropped below 4.7 volts. In the coming maintenance period (Monday), those low voltage power supplies should be replaced. I'll check the Bypass chassis in all service buildings, but at least the 1002B and 1012A's node card 5-volt ps should be replaced. [Wing](#)

Delay Time:

Recovery Time: minutes

Quench Analysis: Faulty Quench Signal

Thur-Dec 25 **blue MS-096 File#** = 1072354789 **6b-ps1** **Timestamp:** 07:19:48 +1095607

Beam Permit Fail Timestamp: 07:19:48 +1072874

Quench Detector(s) Trip: (6b-qd1) B5QFQ2_VT, Int. 1, Tq= -24

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: bi5-ql1, bi5-qd2 and bi5-ql3 all show voltage / current swings before T=zero. Magnet Quenches as per previous events.

5 Minute: Quench Delay File: (6b-qd1) B5QFQ2_VT

Beam Loss Monitors (Rads/Hr): Highest Rates at g5-lm1 (**4209**), b5-lm3.1 (**506**) and b5-lm0 (**2518**)

Main Magnet Power Status: Store Energy, Qdplot shows (B5QFQ2_VT (Raw) signal responding to a magnet quench.

Technical Notes: 7:14: RHIC acceleration ramp started, ramp id Au4_1072338504 [Sequencer](#)

7:19: Quench Link Interlock in Blue ring, 6b-ps1 dropped first [Sequencer](#)

15:45: blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B5QFQ2_VT. The beam permit tripped .022 sec. before the blue quench link. There was a real magnet quench at b5q2. There were a high loss at g5-lm1 and a moderate loss at b5-lm3.1.

There is now 12 beam induced quench link trips for this run. [Ganetis](#)

07:22: Loss monitor in 5e-ps2 pulled the permit link once the ramp finished. A blue quench link followed.

7:33: bi5-ql1 and bi5-qd2 don't follow their reference.

These ps don't follow their references because the magnet there are powering has quenched. [Ganetis](#)

7:35: Blue quench recovery sequence begun [tape](#)

7:53: Recovery scripts complete, waiting on word from cyro. [PH](#)

Delay Time: minutes

Machine Down Time: minutes

Quench Analysis: Beam Induce 012.

Thur-Dec 25 **yellow MS-097 File#** = 1072395937 **7b-ps1** **Timestamp:** 18:45:36 +1159392

Beam Permit Fail Timestamp: 18:45:36 +1159427

Quench Detector(s) Trip: (7b-qd1) Y6DSA4_A3VT, Int. 1, Tq= -23

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5 Minute Quench Delay File: None indicated

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Coming down from Store Energy to Injection, then appears to continue downwards. Qdplot indicates a upwards current glitch as the supply is ramped downwards near the Injection Current level.

Technical Notes: 18:45: Quench Link Interlock in Yellow ring, 7b-ps1 dropped first [Sequencer](#)

23:25: yellow quench link trip was caused by 7b-qd1 quench detector. The quench detector tripped because of a yellow main dipole erroneous current signal. This is the 6th time this has happened in the last two days. This looks like a problem in the DCCT. The beam permit tripped after the yellow quench link. [Ganetis](#)

18:45: Beam Abort, 7b-ps1 dropped Yellow Quench [Sequencer](#)

18:46: The yellow QLI occurred while starting to ramp from injection down to park during a normal down sequence. QED indicates Y6DSA4_A3VT as the source in 7b-qd1. Nick is looking at power supplies in postmortem, but nothing appears obviously wrong. [TJS](#), [Nick](#)

18:53: Yellow quench recovery sequence begun [tape](#)

Delay Time:

Recovery Time: minutes

Quench Analysis: Yellow Main Dipole Current Glitch

Sat-Dec 27 **blue MS-098 File#** = 1072522071

9b-ps1

Timestamp: 05:47:48 +3194693

Beam Permit Fail Timestamp: 05:47:48 +3194723

Quench Detector(s) Trip: (9b-qd1) No FEC/DSP

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated.

5 Minute: Quench Delay File: qdprocess 9b-qd1 No FEC/DSP HS

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: N/A

Technical Notes: See Next Entry

Sat-Dec 27 **yellow MS-099 File#** = 1072522071

9b-ps1

Timestamp: 05:47:48 +3194693

Beam Permit Fail Timestamp: 05:47:48 +3194723

5 Minute Quench Delay File: qdprocess 9b-qd1 No FEC/DSP HS

Technical Notes:

5:47: Beam Abort, 10a-ps3.B dropped {PASS Division A} [Sequencer](#)

5:47: Quench Link Interlock in Yellow ring, 9b-ps1 dropped first [Sequencer](#)

6:06: Blue quench recovery sequence begun [tape](#)

6:10: Yellow quench recovery sequence begun [tape](#)

7:50: This looks like a loss of control signals. The blue and yellow quench link tripped exactly at the same time to the micro-sec. There is a loss of 720hz event going into the quench detectors. Also there are numerous link errors on fec 9b-ps1 and the plc is not reporting the correct status. One thing in common is the fiber optic transceiver chassis. Could this be the problem? As best as I can tell there were no real quenches for this event. [Ganetis](#)

07:56: W. Venegas calls in to report that he believes that the problem in the 9B alcove may be related to the fiber optic receiver. Bill speculates that the problem could be either the receiver itself, the power supply, or the chassis in which the receiver resides. R. Schoenfeld to work on the fault.

08:43: R. Schoenfeld finishes his work. He found a bad fan in one of the racks in the 9B alcove. The fan fault caused a circuit breaker to trip for the rack. Ralph has separated the fan switch from the breaker. The fan problem will be addressed on Monday.

8:57: Blue ring has been recovered. 9:04: Yellow ring has been recovered.

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13:40: After ramping, we suffer quench link interlocks on bi9-sxd-ps and yo9-sxd-ps as we did previously. We call D. Bruno to diagnose from home.

14:07: Don is trying to 're-train' the sextupoles at injection - let the QP re-teach itself how to deal with them. They are now set at 10 amps for about 20 minutes. No beam lifetime at injection in the meanwhile. [fp](#)

22:11: Since 9b-qd1 quench detector lost 720Hz the sextupoles kept on tripping. 9b-qd1 lost 720Hz when the circuit breaker in one of the racks of alcove 9b tripped. Ralph from the controls group found this tripped breaker. There is an algorithm in the quench detector that determines what the resistance of the sextupoles are. The p.s.'s must sit at 10amps for a few minutes for the quench detector to re-train itself. [Don Bruno](#)

22:16: I let all 4 sextupoles in alcove 9b run at 10 amps for a few minutes and then handed them back over to MCR. [Don Bruno](#)

Delay Time: minutes

Recovery Time: minutes

Quench Analysis: Fan Fault in alcove 9B rack, caused the circuit breaker to trip, taking down the power to the rack, loosing the 720 Hz communication which causes all systems to go down.

Sat-Dec 27 **yellow MS-100 File# = 1072581120** **8b-ps1** **Timestamp: 22:12:00 +579039**

Beam Permit Fail Timestamp: 22:12:00 +579069

Quench Detector(s) Trip: (8b-qd2) Y7QFQ2_VT, Int. 1, Tq= -24

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: yi7-ql1, yi7-ql2 and yi7-ql3 all show indications of current / voltage changes prior to T=zero.

5 Minute Quench Delay File: Indicates 8b-qd2 (Y7QFQ2_VT).

Beam Loss Monitors (Rads/Hr): Highest losses found near y7-lm3.2-c (**3589**) and y7-lm3.1 (**1070**).

Main Magnet Power Status: Mains operating at Top Energy.

Technical Notes: **22:12:** Beam Abort, 8b-ps1 dropped Yellow Quench [Sequencer](#)

22:12: Quench Link Interlock in Yellow ring, 8b-ps1 dropped first [Sequencer](#)

23:28: yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y7QFQ2_VT. The beam permit tripped after the yellow quench link. There was a real magnet quench at y7q2.

There was high beam loss at y7-lm3.2. The high beam loss was present for 2 sec. before the quench occurred. Is the BLM threshold set correctly? There is now 13 beam induced quench link trips for this run. [Ganetis](#)

Dec 28 2003 00:12: It is impossible to look at PMViewer Blm data from home, takes forever and flashes all the time. But I did see the pattern is rather unusual, the loss peaks up about 2sec before the beamabort and started to decrease. Wasn't luck enough to get a chance to see the loss data around y7-Q2, data of y7-lm1, y7-lm2, y7-lm3. Did see a large loss at the collimator and spin rotator, unfortunately, their blms are all masked out. One remedy I would suggest is to unmask the blms at collimators and spin rotators for the ramp and mask them out once the store is established. [Mei](#)

Delay Time: minutes

Recovery Time: minutes

Quench Analysis: Beam Induce 013.

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Sun-Dec 28 **yellow MS-101 File#** = 1072653331 **10a-ps3.B** **Timestamp:** 18:15:28 +3043731
Beam Permit Fail Timestamp: 18:15:28 +3019381
Quench Detector(s) Trip: None indicated
QPA Control / TR 1st Alarm: No faults indicated.
Postmortem Plots:
5 Minute Quench Delay File:
Beam Loss Monitors (Rads/Hr):
Main Magnet Power Status:

Technical Notes: 18:19: **Big power dip.** Multiple alarms. [crew](#)
18:25: Cryo Control Room (CCR) reports that they are still out of power. A line crew has been called in.
20:33: Blue quench recovery sequence begun [tape](#)

Quench Analysis: Power Dip.

Sun-Dec 28 **blue MS-102 File#** = 1072664102 **4b-time.B** **Timestamp:** 21:15:00 +2125526
Beam Permit Fail Timestamp: Down from power dip.
Dx Heaters Fired: No
Main Magnet Power Status: N/A

Technical Notes: 21:15: Quench Link Interlock in Blue ring, 4b-time.B dropped first [Sequencer](#)
Dec 29 2003 8:51: Working from home and I dropped the link to recover after the power dip. [CS](#)
21:21: Blue quench recovery sequence begun [tape](#)
21:32: Yellow quench recovery sequence begun [tape](#)
21:33: We are still recovering all systems in the Booster, AGS and RHIC. Tandem is still recovering as well. Cryo is up. We are recovering links with Carl's help. [Sanjee](#)

Quench Analysis: Recovering from Power Dip, All 4 Phase lock Loops in the Mains lost lock and required resetting by Carl.

Sun-Dec 28 **blue MS-103 File#** = 1072667915 **10a-ps3.B** **Timestamp:** 22:18:32 +3140419
Beam Permit Fail Timestamp: Down from power dip.
Dx Heaters Fired: No
QPA Control / TR 1st Alarm: No faults indicated.
Main Magnet Power Status: N/A

Technical Notes: 21:50: Blue quench recovery sequence begun [tape](#)
21:59: Blue quench recovery sequence begun [tape](#)

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22:18: Quench Link Interlock in Blue ring, 10a-ps3.B dropped first [Sequencer](#)

22:19: Blue quench recovery sequence begun [tape](#)

As of Monday Dec-29, 00:00: Recovery from the Power Dip that occurred early last shift is still in progress.

Delay Time: minutes

Recovery Time: minutes

Quench Anaylisis: Quench Recovery, User Invoked.

Mon-Dec 29 **blue MS-104 File#** = 1072698347 **4b-time.A** **Timestamp:** 06:45:44
QPA Control / TR 1st Alarm: bi4-qd2-qp 1st to fail, no faults indicated. (Turned to OFF)

Mon-Dec 29 **yellow MS-105 File#** = 1072700088 **4b-time.A** **Timestamp:** 07:14:44
QPA Control / TR 1st Alarm: yi3-qp7-qp 1st to fail, no faults indicated. (Breaker shut down by accident)

Technical Notes: RHIC p.s. Maintenance performed. 1) Replaced 5v p.s. in node card chassis in 1002B that feeds the quench link bypass chassis. 2) Replaced fiber optic interface card yi2-qp9-ps. 3). Lead heaters inspected in 1008B blue valve box. 4) Main p.s. signal connections disconnected and cleaned. 5) Quench detectors for sextupoles re-trained. 6) Alcove 9c quench detector network connection fixed. [Don Bruno](#)

Quench Anaylisis: MAINTENANCE DAY 07:00 to 15:00.

Mon-Dec 29 **blue MS-106 File#** = 1072722724 **4b-time.B** **Timestamp:** 13:32:04 +218361

Quench Detector(s) Trip: None indicated

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: N/A

5 Minute: Quench Delay File: None indicated

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

Main Magnet Power Status: b-qmain Reg Error

Technical Notes: **Dec 29 2003 12:56:** Blue quench recovery sequence begun [tape](#)

Dec 29 2003 12:57: Starting to bring blue link back up after RHIC p.s. maintenance. [Don Bruno](#)

Dec 29 2003 13:32: Quench Link Interlock in Blue ring, 4b-time.B dropped first [Sequencer](#)

Dec 29 2003 13:36: Main p.s. problems. Main Blue Dipole would not come up to current. Then Blue Quad had a Reg error. Not sure which came first. Carl is looking into it. [Don Bruno](#)

Delay Time: minutes

Machine Down Time: minutes

Quench Anaylisis: Blue Quad Main PS, Regulator Error

Mon-Dec 29 **blue MS-107 File#** = 1072724362 **4b-time.B** **Timestamp:** 13:59:20 +2638204

Quench Detector(s) Trip: None indicated

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: No faults indicated.

Postmortem Plots: N/A

5 Minute: Quench Delay File: None indicated

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

Main Magnet Power Status: b-qmain Reg Error

Technical Notes: **Dec 29 2003 13:40:** Blue quench recovery sequence begun [tape](#)

Dec 29 2003 13:59: Quench Link Interlock in Blue ring, 4b-time.B dropped first [Sequencer](#)

Dec 29 2003 14:02: Reg Error on Blue Main Quad brought the blue link down. Carl is looking into it. [Don Bruno](#)

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Delay Time: minutes

Machine Down Time: minutes

Quench Analysis: Blue Quad Main PS, Regulator Error

Mon-Dec 29 **blue MS-108 File#** = 1072726439 **10a-ps3.A** **Timestamp:** 14:33:56 +3193839

Quench Detector(s) Trip: None indicated

Dx Heaters Fired: No

QPA Control / TR 1st Alarm: bo10-dhx-qpa 1st, no faults indicated.

Postmortem Plots: N/A

5 Minute: Quench Delay File: None indicated

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

Main Magnet Power Status: N/A

Technical Notes: Dec 29 2003 14:14: The yellow link is up. [Don Bruno](#)

Dec 29 2003 14:25: Blue quench recovery sequence begun [tape](#)

Dec 29 2003 14:33: Quench Link Interlock in Blue ring, 10a-ps3.A dropped first [Sequencer](#)

Dec 29 2003 14:37: The blue link was up but then bo10-dhx p.s. or qpa brought the link down. No faults were seen on the qpa pet page or p.s. pet page. Will try to bring blue link back up. [Don Bruno](#)

Dec 29 2003 14:39: Blue quench recovery sequence begun [tape](#)

Dec 29 2003 14:49: Blue link came up. We will investigate bo10-dhx next maintenance day unless it comes back sooner. Carl will investigate main quad reg error also next maintenance day but so far did not find anything. [Don Bruno](#) [rhic]

Delay Time: minutes

Machine Down Time: minutes

Quench Analysis: bo10-dhx caused Recovery to fail, no faults indicated.

Wed-Dec 31 **yellow MS-109 File#** = 1072864652 **4b-time.B** **Timestamp:** 04:57:32 +666560

Beam Permit Fail Timestamp: 04:57:32 +666590

Quench Detector(s) Trip: No negative Tq's indicated.

QPA Control / TR 1st Alarm: Main supply, y-dmain-ps PFN1 and PFN2 Fault.

Postmortem Plots: 1004B show nothing unusual.

5 Minute Quench Delay File: None indicated.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Ramping upwards to Store Energy passing thru 1676 amps then tripped.

Technical Notes: Problem still unidentified with the PFN faults in the Yellow Main Dipole Supply.

Dec 31 2003 10:24: Yellow main dipole ps PFN1 and PFN2 Faults. [Ganetis](#)

Quench Analysis: Yellow Main Dipole PS, PFN1 and PFN2 Faults.

Wed-Dec 31 **yellow MS-110 File#** = 1072865924 **10a-ps3.A** **Timestamp:** 05:18:44 +269061

Beam Permit Fail Timestamp: 05:18:44 +269090

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

QPA Control / TR 1st Alarm: yi10-qf9-qp first to fail, no faults indicated.

Postmortem Plots: Nothing unusual.

5 Minute Quench Delay File: All clear, none initiated.

Beam Loss Monitors (Rads/Hr): N/A

Main Magnet Power Status: Park current, recovering from previous QLI.

Technical Notes: Quench Recovery Program shows User Invoked.

Dec 31 2003 10:25: Upon turn on yi10-qf9-ps had an error fault. The AUX. contacts need to be replaced on the next maintenance day. [Ganetis](#)

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Quench Anaylisis: Quench Recovery, User Invoked, yi10-qf9-ps.