

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Sunday, Mar. 02, 2003:**

**Quench Event:** Blue, 10a-ps3.A **Time of Event:** 18:04:20 +3812030

**Beam Permit Fail Time:** Blue Abort Kicker was down at 15:48:36.

**OPA Cntrl / Timing Resolver:** Crowbar indicated at bo7-sxd-qp.

**QDAlarms:** None indicated.

**DX Heaters:** 4b-ps4.A2 & B2, 10a-ps3.A2 & B2 Fired.

**Postmortems:** Indications of many with voltage oscillations followed by current and error responses prior to T=zero.

**Beam Loss Monitors (rads/hr):** N/A

**Main Magnet Power Status:** Mains running at store energy.

**Qdplots:** (10a-qd1) B9DSD9\_5VT Indicates Integrator 1 passing through 2.5volts at -0.00511sec, B9DSA9\_5VT (raw) = 8.0492volts at that time.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1046646263 indicates real quenches at the following:

(4b-qd1) B3DRDX\_VT

(10a-qd1) B9DRDX\_VT

### **Sunday, Mar. 02, 2003:**

**Quench Event:** Yellow, 4b.time.B **Time of Event:** 18:04:20 +120252

**Beam Permit Fail Time:** Already down at 15:48:36.

**OPA Cntrl / Timing Resolver:** Crowbar indications at yo1-sxf-qp, yi3-sxf-qp, yo5-sxd-qp & yo9-sxd-qp.

**QDAlarms:** None indicated.

**Postmortems:** Indications of many with voltage oscillations followed by current and error responses prior to T=zero.

**Beam Loss Monitors (rads/hr):** N/A

**Main Magnet Power Status:** Mains running at store energy.

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1046646264 (See Above).

### **Technical Notes from the Running Logs: MAJOR POWER DIP, MANY SYSTEMS DOWN.**

**18:05:00:** Power dip. Blue and Yellow QLI, Booster and AGS RF are off, as are various other supplies. Linac is off.

**Note:** Quench Summary Page indicated half of the permits giving time stamps while several failed (Pink Condition), all due to the power failure.

### **Tuesday, Mar. 04, 2003:**

**Quench Event:** Yellow, 1b-ps1 **Time of Event:** 06:02:52 +3410487

**Beam Permit Fail Time:** Fractions of a second later at 06:02:52 +3410517 (diff of +0.000030sec)

**OPA Cntrl / Timing Resolver:** No faults indicated.

**QDAlarms:** (1b-qd1) Y12DSA4\_A3VT, Int. 5, Tq= -23

(3b-qd1) Y2DSA5\_A4VT, Int. 5, Tq= -12

(9b-qd1) Y8DSA5\_A4VT, Int. 5, Tq= -11

**Alarm Display:** Indicated y-dmain psGroundCurrent Fault (Range Error)

**Postmortems:** y-dmain ps ground current indicating -0.34amps then snapping upwards prior to T=zero.

**Beam Loss Monitors (rads/hr):** Sector 10 shows erratic spillage not like a normal beam abort condition.

**Main Magnet Power Status:** Mains ramping upwards from Injection to Store Current.

**Qdplots:** Indicate several DSA taps separating as the ramp is in progress. (Same condition that appeared back on January 04 of this run when ice ball built up on the CQS magnet voltage tap/power lead trees.

**Quench Status:** 5min Delay File: QDLD.1046775775 indicates no real quenches.

**Technical Notes from the Running Logs: 10:20:11:** comment by ganetis... Yellow quench link trip was caused by 1b-qd1 quench detector. The quench detector tripped because a shift in yellow main dipole p.s. current. This sudden shift in current was caused by a large ground current. The ground current shifted from -.32 amps to -.13 amps. Typical ground current during the ramp is .015 Amps. Inspection of valve boxes for icing is being done.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Tuesday, Mar. 04, 2003:**

**Quench Event:** Yellow, 3b-ps1 **Time of Event:** 06:38:12 +146581

**Beam Permit Fail Time:** Fractions of a second later at 06:38:12 +146613 (diff of +0.000032sec)

**QPA Cntrl / Timing Resolver:** No faults indicated.

**QDAlarms:** (1b-qd1) Y12DSA5\_A4VT, Int. 1, Tq= -23

(3b-qd1) Y2DSA4\_A3VT, Int. 1, Tq= -24

(9b-qd1) Y8DSA4\_A3VT, Int. 1, Tq= -23

(11b-qd1) Y10DSA5\_A4VT, Int. 1, Tq= -11

**Alarm Display:** Indicated y-dmain psGroundCurrent Fault (Range Error)

**Postmortems:** y-dmain ps ground current indicating -0.50amps then snapping upwards prior to T=zero.

**Beam Loss Monitors (rads/hr):** No beam in the machine at this time.

**Main Magnet Power Status:** Mains ramping upwards from Injection to Store Current.

**Qdplots:** Indicate several DSA taps separating as the ramp is in progress. (Same type of condition that appeared back on January 4th of this run when ice ball built up on the CQS magnet voltage tap/power lead trees.

**Quench Status:** 5min Delay File: QDLD.1046777892 indicates no real quenches.

**Technical Notes from the Running Logs:** 10:21:24: comment by ganetis... Yellow quench link trip was caused by 3b-qd1 quench detector. The quench detector tripped because a shift in yellow main dipole p.s. current. This sudden shift in current was caused by a large ground current. The ground current shifted from -.47 amps to -.06 amps. Typical ground current during the ramp is .015 Amps.

**Note:** The problem was located at the pin 4 ceramic feed thru at magnet Q7, sector 3. The feed thru was cleaned but the ceramic has been damaged with a carbon track and will probably need to be cleaned again. This has been tagged for replacement during the next scheduled summer shutdown.

### **Tuesday, Mar. 04, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 17:15:04 +2382813

**Beam Permit Fail Time:** Tripped first at 17:15:04 +2315103 (diff of -0.06771sec)

**QPA Cntrl / Timing Resolver:** No faults indicated.

**QDAlarms:** (8b-qd2) Y8QFQ2\_VT, Int. 1, Tq= -24

**Postmortems:** Power supplies not the cause, yo8-qt2 indications of a magnet quench starting at -0.06sec prior to T=zero.

**Beam Loss Monitors (rads/hr):** High rates at g8-lm1=2254.

**Main Magnet Power Status:** Mains running at Store Energy.

**Quench Status:** (Real), 5min Delay File: QDLD.1046816106 indicates a real quench at the following:

(8b-qd2) Y8QFQ2\_VT

**Technical Notes from the Running Logs:** 23:50:50: comment by ganetis... Yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real quench in Y8QFQ2\_VT. The beam permit tripped .067 sec before the quench link. There was high beam loss at this location. There was one real magnet quench at y8q2.

### **Wednesday, Feb. 05, 2003:**

**Quench Event:** Yellow, 4b-time.A **Time of Event:** 08:37:36 +3906760

**Beam Permit Fail Time:** Already down in preparations for maintenance day.

**QPA Cntrl / Timing Resolver:** No faults indicated.

**Quench Status:** 5min Delay File: QDLD.1046871459 indicates no real quenches listed.

### **Wednesday, Feb. 05, 2003:**

**Quench Event:** Blue, 4b-time.A **Time of Event:** 08:38:12 +1054218

**Beam Permit Fail Time:** Already down in preparations for maintenance day.

**QPA Cntrl / Timing Resolver:** No faults indicated.

**Quench Status:** 5min Delay File: QDLD.1046871493 indicates no real quenches listed.

**Technical Notes from the Running Logs:** Both links were pulled for maintenance day.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Thursday, Mar. 06, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 02:30:00 +3682163

**Beam Permit Fail Time:** Tripped first at 02:30:00 +3646169 (diff of -0.035994sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, shows all yellow Tq power supplies as first.

**QDAlarms:** (8b-qd2) Y8QFQ2\_VT, Int. 1, Tq= -24

**Postmortems:** Power supplies not the cause, yo8-qr2 indications of a magnet quench starting at -0.04sec prior to T=zero.

**Beam Loss Monitors (rads/hr):** High rates at g8-lm1=4449, y8-lm3.1=4580, sector 9 loss rates higher than usual all the way up to g9-lm7.

**Main Magnet Power Status:** Mains running at Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1046935803 indicates a real quench at the following:

(8b-qd2) Y8QFQ2\_VT

(10a-qd2) Y9QFQ6\_4VT

### **Technical Notes from the Running Logs:**

**02:25:33:** comment by TJS, BvK... Ramp 3112: Not bad! A little loss in yellow around transition, and the bunches are definitely dancing up a storm.

**02:35:33:** comment by TJS, BvK... Soon after cogging, STAR rates went haywire and losses were clear around STAR and the abort areas. Then the QLI hit. I have a sneaky suspicion that we were on the edge of stability, and after cogging the bunches went unstable and got big, and started scraping everywhere. Landau cavities might help? In any event, Brian's going to try another store with 30e9 or less in Au.

**10:03:17:** comment by ganetis... this yellow quench ink 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 .036 sec. before the quench link trip. There were two real magnet quenches at y8q2 and y9q4. There were high beam losses at these locations.

### **Thursday, Mar. 06, 2003:**

**Quench Event:** Yellow, 4b-time.A **Time of Event:** 11:54:24 +3216109

**Beam Permit Fail Time:** Fractions of a second later at 11:54:24 +3216139 (diff of +0.000030sec)

**QPA Cntrl / Timing Resolver:** No faults indicated.

**QDAlarms:** (4b-qd2) Y4QFQ2\_VT, Int. 1, Tq= -24

**Postmortems:** Several supplies oscillating. This is due to power supply nesting.

**Beam Loss Monitors (rads/hr):** No beam in the machine at the time. Waiting for an RF problem to be cleared.

**Main Magnet Power Status:** Mains running at Injection Current.

**Quench Status:** 5min Delay File: QDLD.1046969667 indicates no real quenches.

**Technical Notes from the Running Logs:** Power Supply yo4-qr2 began to oscillate while the ring was sitting at Injection Current waiting for RF to clear up a problem of their own. This was the cause of the quench. The control bucket was cycled to off then back to standby.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Thursday, Mar. 06, 2003:**

**Quench Event:** Yellow, 7b-ps1 **Time of Event:** 13:07:56 +46296

**Beam Permit Fail Time:** Already down from previous quench event 11:54:24.

**QPA Cntrl / Timing Resolver:** No faults indicated.

**QDAlarms:** (7b-qd1) Y6DSA5\_A4VT, Int. 1, Tq= -23

**Postmortems:** yo4-qf2-ps Oscillating.

**Beam Loss Monitors (rads/hr):** No beam in the machine at the time.

**Main Magnet Power Status:** YDM=3760amps, YQM=3520amps and climbing.

**Qdplots:** Ramping to Store Energy.

**Quench Status:** 5min Delay File: QDLD.1046974076 indicates no real quenches.

### **Technical Notes from the Running Logs:**

**1307 --** While performing a RHIC hysteresis ramp, the CCR reported seeing a temperature spike in yellow. A 'hard stop' trigger was used to stop the ramp. A yellow QLI occurred soon afterward, which was caused by the yo4-qf2 supply again.

D. Bruno reported that this supply will be replaced. G. Ganetis reported that the yo4-qf2 supply was oscillating when it was turned on during the quench recovery process. These oscillations caused the 0.5 K temperature rise that Cryo reported.

**15:40:00:** comment by ganetis... This is the second yellow quench link trip caused by yo4-qf2-ps oscillating. The first quench link trip happened at 11:54:27. This ps started to oscillate which caused the 4b-qd2 quench detector to trip. The second time the ps was oscillating when it was turned on. This time the quench detector did not trip. The current oscillations was causing heating in the yellow sector 4 triplet magnet. A .5 degree temperature rise was seen by Cryo and they told MCR. MCR then did a hard stop of the ramp they were doing. This hard stop at 3790 caused 7b-qd1 quench detector to trip.

### **Friday, Mar. 07, 2003:**

**Quench Event:** Yellow, 4b-time.B **Time of Event:** 09:31:00 +644675

**Beam Permit Fail Time:** Down at 09:15:24 for entry into the ring.

**QPA Cntrl / Timing Resolver:** N/A.

**QDAlarms:** None

**Postmortems:** N/A

**Beam Loss Monitors (rads/hr):** No beam in the machine at the time.

**Main Magnet Power Status:** Yellow Dipole and Quad at zero currents.

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1047047460 indicates no real quenches.

### **Technical Notes from the Running Logs:** Maintenance for ceramic feed thru.

**09:20:36** A crew is going into 4B to work on a problem with the yellow storage cavity. This allows time for George and company to inspect and clean the ceramic feed thru (especially pin 4) of the Q7 magnet in sector 3. This was the cause of the ground faults that occurred on Tuesday March 04, 2003.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Saturday, Mar. 08, 2003:**

**Quench Event:** Blue, 7b-ps1 **Time of Event:** 07:56:52 +269706

**Beam Permit Fail Time:** Fractions of a second later at 07:56:52 +269741 (diff of +0.000035sec)

**QPA Cntrl / Timing Resolver:** No faults indicated.

**QDAlarms:** (3b-qd1) B2DSA4\_A3VT, Int. 20, Tq= -12

(7b-qd1) B7DSA3\_A2VT, Int. 20, Tq= -24

**Postmortems:** The blue main dipole at T=-0.65 sec, Ramp Current to Flattop Current glitches, causing a large voltage spike.

**Beam Loss Monitors (rads/hr):** No beam in the machine at the time.

**Main Magnet Power Status:** Blue ramping down from Store energy to Injection Current.

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1047128212 indicates no real quenches.

**Technical Notes from the Running Logs:** 09:24:12: comment by ganetis... Blue quench link trip was caused by 7b-qd1 quench detector. The quench detector tripped because of a problem with the blue main dipole p.s. A problem happened when the p.s. was ramping down from top energy to injection when the current was switching from ramp to flat top power module. The voltage went positive causing the current to increase, this caused the quench detector to trip. If this problem continues, one should contact Carl Schultheiss.

### **Saturday, Mar. 08, 2003:**

**Quench Event:** Yellow, 12a-ps1.A **Time of Event:** 15:04:32 +1631175

**Beam Permit Fail Time:** Down previous at 10:59:20 +3086321

**QPA Cntrl / Timing Resolver:** No faults indicated, y12-dh0-qp first to trip.

**QDAlarms:** None Listed.

**Postmortems:** y12-dh0-ps while running at 1.04amps, the Iref dropped at -0.008sec prior to T=zero.

**Beam Loss Monitors (rads/hr):** No beam in the machine at this time.

**Main Magnet Power Status:** Yellow Main Dipole and Quad power supplies at Park Current.

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1047153873 indicates no real quenches.

#### **Technical Notes from the Running Logs:**

16:17:49: comment by jak... It appears that the current reference for the y12-dh0 supply dropped to zero about 9 ms before the time that the quench link was dropped. I found the supply in the off state when looking on psall.

23:08:02: comment by ganetis... yellow quench link trip was caused by y12-dh0-ps going to the off state. If this happens again contact Don Bruno.

### **Sunday, Mar. 09, 2003:**

**Quench Event:** Yellow, 6b-ps1 **Time of Event:** 15:03:08 +1312208

**Beam Permit Fail Time:** Fractions of a second later at 15:03:08 +1312238 (diff of +0.000030sec)

**QPA Cntrl / Timing Resolver:** Crowbar at y6-dh0-qp.

**QDAlarms:** None Listed.

**Postmortems:** y6-dh0-ps while running at 479.43amps, voltage oscillation then spikes to full (+10.0v) at -0.031sec.

**Beam Loss Monitors (rads/hr):** Indications of a normal beam abort

**Main Magnet Power Status:** Yellow Main Dipole and Quad power supplies at Store Energy.

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1047240189 indicates no real quenches.

**Technical Notes from the Running Logs:** 18:44:07: comment by Ganetis... yellow quench link trip was caused by a crow bar fault on y6-dh0-qp. The crow bar was caused when the p.s. went to full voltage. Before the p.s. went to full voltage the p.s. was oscillating. If this happens again contact Don Bruno. The p.s. looks OK now.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Monday, Mar. 10, 2003:**

**Quench Event:** Blue, 10a-ps3.A **Time of Event:** 13:34:00 +349117

**Beam Permit Fail Time:** Pulled first at 13:34:00 +273819 (diff of -0.075298sec)

**QPA Cntrl / Timing Resolver:** No faults indicated.

**QDAlarms:** (10a-qd1) B10QFQ4\_6VT, Int. 1, Tq= -25

**Postmortems:** Power Supplies did not cause the quench, several indicate current vs voltage changes prior to T=zero.

**Beam Loss Monitors (rads/hr):** High losses in sector 10, g10-lm6=4739.39, g10-lm7=4728.06, g10-lm12=4859.53 and g10-lm20=5151.40. Sector 8 indicates unbunched beam occurrences.

**Main Magnet Power Status:** Yellow Main Dipole and Quad power supplies at Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLLD.1047321240 indicates real quenches at the following:

(10a-qd1) B10QFQ4\_6VT  
(11b-qd1) B10DSA5\_A4VT

**Technical Notes from the Running Logs:** Cause appeared to be high beam losses pulling the 10-qd1 quench detector which in turn brought down the link.

**Note:** Physics and E-Logs were down due to computer systems failure

### **Tuesday, Mar. 11, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 00:34:52 +2019853

**Beam Permit Fail Time:** Pulled first at 00:34:52 +1967736 (diff of -0.052117sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, Yellow Quench Detector 1<sup>st</sup> to trip.

**QDAlarms:** (8b-qd2) Y8QFQ2\_VT, Int. 1, Tq= -24

**Postmortems:** Power Supplies did not cause the quench.

(yo8-qd1, qf2 & qd3 all indicate current vs voltage changes prior to T=zero).

**Beam Loss Monitors (rads/hr):** High losses near Triplet Magnets sector 8, g8-lm1=4448.56, y8-lm3.1=4579.31 (Sector 9 Beam Dump appears to be dirty dump.)

**Main Magnet Power Status:** Yellow Dipole and Quad running at Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLLD.1047360894 indicates real quenches at the following:

(8b-qd2) Y8QFQ2\_VT, Y8QFQ3\_VT

### **Technical Notes from the Running Logs:**

**00:35:00:** Yellow abort kicker misfire. The two modules appear to have fired together but completely missed the abort gap. A large amount of noise appeared on channel 4 100 units (ns?) before firing. A yellow quench on y8-q2 and y8-q3 followed. Ramping down

**02:02:24:** comment by trav... This may have been our fault - during a brain fart we ran a down to injection instead of down to park after the quench. We did a stop once we were at park, but the magnets did start to ramp up a couple of amps so we could have broken the hysteresis loop. Or it could be because the AGS is smokin' and there is too much beam in the machine

**13:23:33:** comment by ganetis... 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 .052 sec. before the quench link. There were two real quenches at y8q2 and y8q3. There were high beam losses at these locations.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Tuesday, Mar. 11, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 04:10:36 +3969084

**Beam Permit Fail Time:** Pulled first at 04:10:36 +3934162 (diff of -0.034922sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, Yellow Quench Detector 1<sup>st</sup> to trip.

**QDAlarms:** (8b-qd2) Y8QFQ2\_VT, Int. 1, Tq= -24

**Postmortems:** Power Supplies did not cause the quench.

(yo8-qd1, qf2 & qd3 all indicate current vs voltage changes prior to T=zero).

**Beam Loss Monitors (rads/hr):** High losses near Triplet Magnets sector 8, g8-lm1=4448.42, y8-lm3.1=4579.17

**Main Magnet Power Status:** Yellow Dipole and Quad running at Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1047373839 indicates real quenches at the following:

(8b-qd2) Y8QFQ2\_VT

### **Technical Notes from the Running Logs:**

**04:10:00:** Yellow abort kicker fire outside the abort gap.

**04:35:00:** Recovery complete. Waiting for the go ahead from Cryo.

**13:19:59:** comment by ganetis... 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 .035 sec. before the quench link. There was one real quench at y8q2. There was high beam loss at this location.

### **Tuesday, Feb. 11, 2003:**

**Quench Event:** Blue, 10a-ps3.A **Time of Event:** 11:12:00 +2526385

**Beam Permit Fail Time:** Already down in preparations for a brief maintenance due to Yellow Injector Work.

**QPA Cntrl / Timing Resolver:** No faults indicated.

**Main Magnet Power Status:** Blue Dipole and Quad running at Park Currents.

**Quench Status:** 5min Delay File: QDLD.1047399122 indicates no real quenches listed.

### **Tuesday, Feb. 11, 2003:**

**Quench Event:** Yellow, 10a-ps3.A **Time of Event:** 11:12:40 +2664825

**Beam Permit Fail Time:** Already down in preparations for a brief maintenance due to Yellow Injector Work.

**QPA Cntrl / Timing Resolver:** No faults indicated.

**Main Magnet Power Status:** Yellow Dipole and Quad running at Park Currents.

**Quench Status:** 5min Delay File: QDLD.1047399162 indicates no real quenches listed.

**Technical Notes from the Running Logs:** Both links were pulled due to a **Re-boot on CFE-10a-qd1 and qd2.**

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Tuesday, Mar. 11, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 15:14:36 +1837106

**Beam Permit Fail Time:** Pulled first at 15:14:36 +1804794 (diff of -0.032312sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, Yellow Quench Detector 1<sup>st</sup> to trip.

**QDAlarms:** (8b-qd2) Y8QFQ3\_VT, Int. 1, Tq= -24

**Postmortems:** Power Supplies did not cause the quench.

(yo8-qd1, qf2 & qd3 all indicate current vs voltage changes prior to T=zero).

**Beam Loss Monitors (rads/hr):** High losses near Triplet Magnets sector 8, g8-lm1=3006.57, y8-lm3.1=4579.73

**Main Magnet Power Status:** Yellow Dipole and Quad running at Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1047413677 indicates real quenches at the following:

(8b-qd2) Y8QFQ3\_VT

### **Technical Notes from the Running Logs:**

1625 -- Machine setup. The sextupoles in the five o'clock region had been ramped to 10 Amps to tune the quench detectors.

1635 -- The yellow abort kicker module 2 indicates a grid1, grid2 bias fault. Support and J. Addressi are investigating.

1725 -- Pulsed Power Supply personnel reported that the fiber optic interface chassis was replaced for the yellow abort kicker module 2.

**17:00:46:** comment by ganetis... yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ3\_VT. The beam permit tripped .033 sec. before the quench link. There was one real quench at y8q3. There was high beam loss at this location.

### **Tuesday, Mar. 11, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 18:20:08 +2212813

**Beam Permit Fail Time:** Pulled first at 18:20:08 +2169217 (diff of -0.043596sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, Yellow Quench Detector 1<sup>st</sup> to trip.

**QDAlarms:** (8b-qd2) Y8QFQ3\_VT, Int. 1, Tq= -24

**Postmortems:** Power Supplies did not cause the quench.

Multiple power supplies indicate current vs voltage changes prior to T=zero, signs of magnet quenches.

**Beam Loss Monitors (rads/hr):** High losses near Triplet and DX Magnets in sector 8.

(y8-lm3.1=4579.59, y9-lm4=4651.75)

**Main Magnet Power Status:** Yellow Dipole and Quad running at Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1047424810 indicates real quenches at the following:

(8b-qd2) Y8QFQ3\_VT

(10a-qd2) Y9QFQ6\_4VT

### **Technical Notes from the Running Logs:**

**18:24:51** Yellow abort kicker prefire caused the yellow ring to quench. [jak](#)

**18:36:20:** comment by leif... beam removed from yellow crisply 6ms before permit pull. Surely another yellow prefire. Lots of radiation at the kickers (see pic) but whether this is relevant is anyone's guess. This time one of the scopes looking at the pulses failed to fire, despite firing nicely during the injection setup.

**23:31:10:** comment by ganetis... yellow quench link trip was caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ3\_VT. The beam permit tripped .043 sec. before the yellow quench link. There were two magnet quenches at y8q3 and y9q4. There were high losses at these locations.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Wednesday, Mar. 12, 2003:**

**Quench Event:** Yellow, 12a-ps1.A **Time of Event:** 08:59:48 +3969096

**Beam Permit Fail Time:** Fractions of a second later at 08:59:48 +3969125 (diff of +0.000029sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, y12-dh0-qp tripped 1<sup>st</sup>.

**QDAlarms:** None indicated.

**Postmortems:** y12-dh0-ps running at 50.36amps then Iref dropped to 0 at -0.013sec prior to T=zero.

**Beam Loss Monitors (rads/hr):** No beam in yellow at the time.

**Main Magnet Power Status:** Yellow Dipole and Quad running at Injection Current.

**Quench Status:** 5min Delay File: QDLD.1047478474 indicated no real quenches.

**Technical Notes from the Running Logs:** Cause of the trip was do to y12-dho-ps suddenly dropping to zero while the ring was sitting at Injection Current.

### **Thursday, Mar. 13, 2003:**

**Quench Event:** Blue, 8b-ps1 **Time of Event:** 01:45:16 +3720902

**Beam Permit Fail Time:** Fractions of a second later at 01:45:16 +3720932 (diff of +0.000030sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, Blue Quench Detector 1<sup>st</sup>.

**QDAlarms:** None indicated.

**Postmortems:** Power Supplies ramping, bo7-qd1 Iref drops to zero at -0.186sec at 96.72amps prior to T=zero.

**Beam Loss Monitors (rads/hr):** Appeared to be a normal abort.

**Main Magnet Power Status:** Ramping upwards from Injection towards Store Energy.

**Quench Status:** 5min Delay File: QDLD.1047537919 indicates no real quenches.

**Technical Notes from the Running Logs:** Cause of quench link due to bo7-qd1-ps tripping off.

### **Thursday, Mar. 13, 2003:**

**Quench Event:** Blue, 8b-ps1 **Time of Event:** 08:00:40 +86296

**Beam Permit Fail Time:** Pulled first at 08:00:40 +11176 (diff of -0.07512sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, Blue Quench Detector 1<sup>st</sup>.

**QDAlarms:** (8b-qd1) B7QFQ1\_VT, Int. 5, Tq= -24

**Postmortems:** Power Supply bo7-qd1 same problem as previous quench, Iref dropped to zero at -0.19sec.

**Beam Loss Monitors (rads/hr):** Sector 8 shows multiple high losses, y8-lm3.1=4579.87

**Main Magnet Power Status:** Blue Dipole and Quad running at Store Energy.

**Quench Status:** 5min Delay File: QDLD.1047560440 indicates no real quenches.

**Technical Notes from the Running Logs:** (Permit link dropping first, Tq= -24 value, Quench Detector tripping first, all show signs of a real quench. However, the 5 min delay file did not indicate. Need to check with George) Cause of quench link due to bo7-qd1-ps tripping off, replaced the current reg card.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### **Thursday, Mar. 13, 2003:**

**Quench Event:** Blue, 10a-ps3.A **Time of Event:** 11:23:24 +2351989

**Beam Permit Fail Time:** Pulled first at 11:23:24 +2278955 (diff of -0.073034sec)

**QPA Cntrl / Timing Resolver:** No faults indicated.

**QDAlarms:** (10a-qd1) B10QFQ4\_6VT, Int. 1, Tq=- 25  
(11b-qd1) B10DSA5\_A4VT, Int. 1, Tq= -12

**Postmortems:** Power Supplies did not cause the quench.

**Beam Loss Monitors (rads/hr):** High losses in sector 10, g10-lm12=4859.24, g10-lm16=4439.20, g10-lm20=4859.24

**Main Magnet Power Status:** Blue Dipole and Quad running at Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1047572606 indicates real quenches at the following:

(10a-qd1) B10QFQ4\_6VT  
(11b-qd1) B10DSA5\_A4VT

#### **Technical Notes from the Running Logs:**

**11:23:29** Beam Abort, 5e-ps2.A dropped {Loss Monitor 1} [Sequencer](#)

**11:26:16:** comment by TJS, SA... QLI. Looks like blue beam completely debunched before the quench. We'll investigate and work on recovery; Tom Hayes and Mike Brennan are in 1004 and ready to proceed with more work on rebucketing. They are also investigating to see if something they did created the debunch.

**11:31:38:** comment by TJS... Losses rising at b5-lm3.1 for about 500 ms before the permit was pulled -- this loss monitor went above its trip threshold. Then abort kickers fired, but all beam was debunched, and then the loss monitor *\*really\** got unhappy.

**13:17:57:** comment by ganetis... blue quench link trip caused by 10a-qd1 quench detector. The quench detector tripped because of a real magnet quench in B10QFQ4\_6VT. The beam permit tripped .073 sec. before the quench link trip. There were real magnet quenches at b10q4 and b10d12. There were high beam losses at these locations.

### **Thursday, Mar. 13, 2003:**

**Quench Event:** Blue, 10a-ps3.A **Time of Event:** 14:58:04 +3241139

**Beam Permit Fail Time:** Pulled first at 14:58:04 +3182283 (diff of -0.058856sec)

**QPA Cntrl / Timing Resolver:** No faults indicated.

**QDAlarms:** (10a-qd1) B10QFQ4\_6VT, Int. 1, Tq=- 24

**Postmortems:** Power Supplies did not cause the quench.

**Beam Loss Monitors (rads/hr):** High losses in Sector 8 past the usual g10-lm5 to g10-lm7, also at g10-lm12=4859.38, g10-lm16=4439.34, g10-lm20=5150.93

**Main Magnet Power Status:** Blue Dipole and Quad running at Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1047572606 indicates real quenches at the following:

(10a-qd1) B10QFQ4\_6VT  
(11b-qd1) B10DSA5\_A4VT

#### **Technical Notes from the Running Logs:**

**15:00:51:** comment by TJS... I was steering in STAR when this QLI occurred, but it also looks like blue debunched before the beam was lost again. Time to look at the postmortem.

**15:09:08:** comment by TJS... Not many leading losses anywhere except the abort kicker area. This may well have been another one of those debunch events associated with work on the storage cavities during the store.

**16:02:11:** comment by ganetis... blue quench link trip caused by 10a-qd1 quench detector. The quench detector tripped because of a real magnet quench in B10QFQ4\_6VT. The beam permit tripped .059 sec. before the quench link trip. There were real magnet quenches at b10q4 and b10d12. There were high beam losses at these locations.

**CAUSE:** 15:00 Blue QLI. It is suspected that Blue beam was debunched before QLI. Mike Brennan is investigating the RF debunch problem. RF group has resolved most problems and has decided to run without YS2 cavity. YS2 cavity is locked out.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

### Saturday, Mar. 15, 2003:

Quench Event: Yellow, 4b-time.A Time of Event: 01:01:12 +1449363

Beam Permit Fail Time: Pulled fractions of a second later at 01:01:12 +1449393 (diff of +0.000030sec)

QPA Cntrl / Timing Resolver: No faults indicated.

QDAlarms: (4b-qd2) Y4QFQ3\_VT, Int. 1, Tq= -24

Postmortems: Power Supply yo4-qf2 (Suncraft 150) Voltage spike at -0.044 seconds prior to T=zero.

Beam Loss Monitors (rads/hr): Appeared to be a good beam abort, no losses in sector 4.

Main Magnet Power Status: Yellow Dipole and Quad running at Store Energy.

Quench Status: 5min Delay File: QDLD.1047708073 indicates no real quenches.

**Technical Notes from the Running Logs:** 06:48:55: comment by ganetis... yellow quench link trip was caused by 4b-qd2 quench detector. The quench detector tripped because of a p.s. glitch in yo4-qd3-ps. That p.s. glitch was caused by another p.s. glitch in yo4-qf2-ps.

### Saturday, Mar. 15, 2003:

Quench Event: Yellow, 8b-ps1 Time of Event: 05:20:52 +2176563

Beam Permit Fail Time: Pulled first at 05:20:52 +2098680 (diff of -0.077883sec)

QPA Cntrl / Timing Resolver: No faults indicated, y-QD first.

QDAlarms: (8b-qd2) Y8QFQ3\_VT, Int. 1, Tq= -24

Postmortems: Power supplies not the cause, yo8-qd1, qf2 and qd3 all show signs of magnet quenching.

Beam Loss Monitors (rads/hr): High losses at the following: g8-lm1-2822.89, y8-lm3.1=4579.73, and near the Phoenix Experimental collision area.

Main Magnet Power Status: Yellow Dipole and Quad running at Store Energy.

Quench Status: **(Real)**, 5min Delay File: QDLD.1047723654 indicates a real quench at the following:  
(8b-qd2) Y8QFQ3\_VT

### **Technical Notes from the Running Logs:**

05:25:00: Yellow ground fault indication during down ramp. G. Ganetis was contacted and is looking into it. Cryo needs to make an access to the 1 o'clock sector. 06:40:00: G. Ganetis hasn't found anything unusual and has given us permission to recover.

06:52:35: comment by ganetis... 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 .078 sec. before the yellow quench link. There was one real magnet quench at y8q2 . There was a high beam loss at this location.

### Monday, Mar. 17, 2003:

Quench Event: Yellow, 12a-ps1.A Time of Event: 11:00:56 +1023323

Beam Permit Fail Time: Pulled fractions of a sec later at 11:00:56 +1023352 (diff of +0.000030sec)

QPA Cntrl / Timing Resolver: No faults indicated, y12-dh0-qp 1<sup>st</sup>.

QDAlarms: No negative Tq alarms indicated.

Postmortems: Power supply y12-dh0 dropped to Off at -0.0125sec before T=zero at 495amps.

Beam Loss Monitors (rads/hr): Normal beam abort condition.

Main Magnet Power Status: Yellow Dipole and Quad running at Store Energy.

Quench Status: 5min Delay File: QDLD.1047916857 indicates no real quenches.

**Technical Notes from the Running Logs:** Found nothing unusual so performed a Vibe test, nothing loose. Checked all connections to the Node card, and 3U bucket, replaced the 3U backplane and digital IO card.

## *RHIC Physics Run 2002 – 2003, Daily Quench Events* *For the month of March 2003*

### Wednesday, Mar. 19, 2003:

Quench Event: Yellow, 4b-time.A Time of Event: 17:17:44 +1970117

Beam Permit Fail Time: Pulled fractions of a sec later at 17:17:44 +1970147 (diff of +0.000030sec)

QPA Cntrl / Timing Resolver: No faults indicated.

QDAlarms: (4b-qd2) Y4QFQ2\_VT, Int. 1, Tq= -24

Postmortems: Power supply yo4-qf2 voltage begins to oscillate at 0.048sec at 6.74amps. This oscillation increases greatly, eventually tripping the link.

Beam Loss Monitors (rads/hr): No beam in Yellow.

Main Magnet Power Status: Yellow Dipole and Quad running at Injection current.

Quench Status: 5min Delay File: QDLD.1048112265 indicates no real quenches.

**Technical Notes from the Running Logs:** yo4-qf2-ps Oscillating, caused the trip.

17:52:05: comment by Nick K, Carl S... yo4-qf2 appears to be the cause of the yellow QLI. Don Bruno says the supply had the same problem a week ago so we will see if it continues to misbehave and replace it if necessary.

### Wednesday, Mar. 19, 2003:

Quench Event: Yellow, 4b-time.A Time of Event: 18:18:08 +2445241

Beam Permit Fail Time: Pulled fractions of a sec later at 18:18:08 +2445271 (diff of +0.000030sec)

QPA Cntrl / Timing Resolver: yo4-qf2-qp with no faults indicated.

QDAlarms: None indicated.

Postmortems: Power supply yo4-qf2 large oscillation on turn on.

Beam Loss Monitors (rads/hr): No beam in the machine at this time.

Main Magnet Power Status: Yellow Dipole and Quad running at near zero current.

Quench Status: 5min Delay File: QDLD.1048115890 indicates no real quenches.

**Technical Notes from the Running Logs:** yo4-qf2-ps Oscillating, caused the trip.

18:20:14 Yellow QLI due to yo4-qf2 oscillations. Per Don Bruno, current regulator card needs to be replaced. If the problem persists afterwards then the power supply has to be replaced, which requires a ring access .[Sanjee](#) (Yo4-qf2 is located in service building 1004B, tunnel entry not required)

### Thursday, Mar. 20, 2003:

Quench Event: Blue, 6b-ps1 Time of Event: 06:59:24 +1918250

Beam Permit Fail Time: Pulled fractions of a sec later at 06:59:24 +1918280 (diff of +0.000030sec)

QPA Cntrl / Timing Resolver: b-QD, no faults indicated.

QDAlarms: (6b-qd1) B6DRDX\_GL, Int. 1, Tq= -21

Postmortems: Power supplies did not cause this event.

Beam Loss Monitors (rads/hr): Normal Beam Dump.

Main Magnet Power Status: Blue Dipole and Quad running at Store Energy current.

Qdplots: Shows B6DRDX\_GL (Raw Signal) slowly drifting downwards.

Quench Status: 5min Delay File: QDLD.1048161565 indicates no real quenches.

**Technical Notes from the Running Logs:** 07:48:41: comment by jak... The quench detector status showed that the quench originated from B6DRDX\_GL. The Cryo Control Room reported that a 1600 Amp gas cooled lead in the 6 o'clock region had a flow mismatch. The system was requesting 0.02 grams per second, but it was receiving 0.06 grams per second.

10:00:16: comment by ganetis... The blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a gas cooled lead over voltage condition on B6DRDX\_GL. The slog data for all the gas cooled leads show that a problem started at 05:48 , an hour and 10 min. before this lead tripped. All gas cooled leads show an increase in voltage at this time. Some how the flow was reduced to all the leads in this valve box.

10:20:14: comment by ganetis... The quench detector slog show the same problem of low flow for all the gas cooled leads for the yellow 6 o'clock valve box. The problem started at the same time as blue. Cryo is looking into it.

### Thursday, Mar. 20, 2003:

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

**Quench Event:** Blue, 11b-ps1 **Time of Event:** 17:59:24 +236288

**Beam Permit Fail Time:** Pulled first at 17:59:24 +116224, (diff of -0.120064sec)

**QPA Cntrl / Timing Resolver:** N/A.

**QDAlarms:** (11b-qd1) B10QFA3\_A2VT, Int. 1, Tq= -24

**Postmortems:** Power supplies did not cause this event.

**Beam Loss Monitors (rads/hr):** Beam Dump Sectors 9 & 10 indicate losses extending way past the normal g9 & 10-lm5 readings. Also found multiple high losses throughout Sectors 2, 5, 6, 7 and 8.

**Main Magnet Power Status:** Blue Dipole and Quad ramping to Store Energy current.

**Qdplots:** Mains were ramping at the rate of 20amps per second.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1048201164 indicates real quenches at the following:

(10a-qd1) B10DSA5\_9VT

(11b-qd1) B10DSA5\_A4VT, B10QFA3\_A2VT

### **Technical Notes from the Running Logs:**

17:05:00: A RHIC ramp failed due to poor Blue tunes or chromaticity on the flattop stone during rebucketing. The AGS damper was found after the injectors were switched to deuterons.

17:59:00: Setup off. Blue Quench Link interlock starting from 11b-ps1. The MCR is investigating. The Cryo system is recovering and the MCR cannot re-inject for one hour as the Blue losses have reached the BLAM hourly limit.

23:24:21: comment by ganetis... blue quench link trip was caused by 11b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B10QFA3\_A2VT. The beam permit tripped .120 sec. before the blue quench link. There were three real magnet quenches at b10d5, b10q10 and b10d12. There were high losses at these locations.

### **Friday, Mar. 21, 2003:**

**Quench Event:** Blue, 2b-ps1 **Time of Event:** 18:05:52 +960008

**Beam Permit Fail Time:** Already down at 17:31:52 in preparation for severe weather alert.

**DX Heaters Fired:** All were fired throughout the Ring (discharged).

**Main Magnet Power Status:** Blue Dipole and Quad to Off.

**Quench Status:** 5min Delay File: QDLD.1048287952 indicates no real quenches.

### **Friday, Mar. 21, 2003:**

**Quench Event:** Yellow, 2b-ps1 **Time of Event:** 18:07:00 +1335504

**Beam Permit Fail Time:** Already down at 17:31:52 in preparation for severe weather alert.

**Main Magnet Power Status:** Yellow Dipole and Quad to Off.

**Quench Status:** 5min Delay File: QDLD.1048288021 indicates no real quenches.

### **Technical Notes from the Running Logs:**

17:42:00: The MCR is consulting with J. Sandberg about **approaching severe weather.**

17:52:00: Jon has asked the MCR to suspend operations due to the severe weather. P^ setup is off. The MCR is securing Power supplies.

17:58:00: G. Ganetis called to insist that the full severe weather procedure be implemented regarding RHIC power supplies.

### **Friday, Mar. 21, 2003:**

**Quench Event:** Yellow, 4b-time.A **Time of Event:** 21:24:00 +743454

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events*** ***For the month of March 2003***

Beam Permit Fail Time: Already down at 17:31:52 from severe weather alert status.

QPA Cntrl / Timing Resolver: yi2-tq6-qp at qpaCtrl.2b-ps2.B1.13 (Fuse Fault)

DX Heaters: Charged.

Quench Status: 5min Delay File: QDLD.1048299840 indicates no real quenches.

**Technical Notes from the Running Logs:** Recovering from the severe weather alert.

2110 -- D. Bruno is investigating a fuse fault for the yi2-tq6 QPA from home. 2126 -- D. Bruno reported that Support should replace the QPA for yi2-tq6. He is giving instructions to Support. 2245 -- F. Scheifele and G. Murdock have replaced the QPA for yi2-tq6. The yellow quench link is being recovered.

### **Saturday, Mar. 22, 2003:**

**Quench Event:** Blue, 4b-time.A **Time of Event:** 08:44:20 +2717205

Beam Permit Fail Time: Pulled fractions of a sec later at 08:44:20 +2717235 (diff of +0.000030sec)

QPA Cntrl / Timing Resolver: b4-dhx-qp, no faults indicated.

DX Heaters Fired: All 4 in 4b-ps4.

Postmortems: b4-dhx-ps voltage oscillating, largest spike at -1.42sec, supply shut off before T=zero.

Beam Loss Monitors (rads/hr): Sector 10 beam dump appears normal; g10-lm12 shows high rates of 2102.86.

Main Magnet Power Status: Running at Store Energy.

Quench Status: **(Real)**, 5min Delay File: QDLD.1048340662 indicates real quenches at the following:  
(4b-qd1) B4DRDX\_VT, B3DRDX\_VT

### **Saturday, Mar. 22, 2003:**

**Quench Event:** Yellow, 4b-time.A **Time of Event:** 08:44:20 +3629455

Beam Permit Fail Time: Pulled fractions of a sec later at 08:44:20 +2717235 (diff of +0.000030sec)

QPA Cntrl / Timing Resolver: No faults indicated.

Beam Loss Monitors (rads/hr): Sector 9 beam dump appears normal.

Main Magnet Power Status: Running at Store Energy.

Quench Status: 5min Delay File: QDLD.1048340663 indicates same as above.

### **Technical Notes from the Running Logs:**

08:45:00: C. Schultheiss has been contacted about a ground Fault alarm on the ADT for the yellow main quad.

08:47:00: Cryo Control Room has been contacted about the QLI, they report that re-coolers: 4, 5, 6, 7, 8, 9, 10, & 11 were affected.

09:58:22: comment by ganetis... The blue quench link tripped first. It was caused by b4-dhx-ps losing all AC power. It did not go into the off state. This caused 4b-qd1 quench detector to trigger all the DX quench heater p.s. This in turn caused b4dx and b3dx to quench. Once these magnets quenched this caused the current going through the b3-dh0 and b4-dh0 magnets to change rapidly, which caused the yellow quench link to trip because of magnetic coupling between d0 magnets.

09:34:00: b4-dhx-ps says that it is in local and G. Ganetis called in saying that there is no AC power to it. 09:40:00: D.

Bruno instructed CAS to reset a circuit breaker on the front of the b4-dhx-ps. This did not work so Don, Mitch and Joe came in to look into the fault, possibly that the supply would have to be swapped out. Upon inspection, they discovered that the main contactor phase A had melted away. **{Comment by Don, after the contactor was replaced, the currents in the 3 AC lines going to the transformers were measured to make sure there were no transformer problems. At maximum energy the line currents looked balanced (53A, 53A and 54A) and the DC ripple looked very good. The DC current for this p.s. at maximum energy is about 1400A. At this point we believe there was a loose connection on the secondary side of the contactor that caused this problem. We are still looking at the contactor and trying to determine if the contactor itself was faulty but it does not look like it.}**

**Note: Photos for the Breaker Melt Down available in the Physics Log (rhic\_dau\_fy03)**

### **Sunday, Mar. 23, 2003:**

**Quench Event:** Yellow, 9b-ps1 **Time of Event:** 05:59:16 +2982869

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events*** ***For the month of March 2003***

Beam Permit Fail Time: Had been down since 03:56:32 +2001251

QPA Cntrl / Timing Resolver: N/A.

QDAlarms: (3b-qd1) Y2DSA5\_A4VT, Int. 1, Tq= -12, (5b-qd1) Y4DSA5\_A4VT, Int. 1, Tq= -12,  
(7b-qd1) Y6DSA5\_A4VT, Int. 1, Tq= -11, (9b-qd1) Y8DSA5\_A4VT, Int. 1, Tq= -23,  
(11b-qd1) Y10DSA5\_A4VT, Int. 1, Tq= -23

Postmortems: Indicates a voltage spike / change at -0.033sec for the yellow main dipole supply.

Beam Loss Monitors (rads/hr): No file available at this time.

Main Magnet Power Status: Running at Store Energy.

QD Plots: Oscillation occurring on the yellow main dipole current.

Quench Status: 5min Delay File: QDLD.1048417158 indicates no real quenches, Quench Detectors Running.

### **Technical Notes from the Running Logs:**

**11:01:29:** comment by ganetis... yellow quench link trip was caused by 9b-qd1 quench detector. The quench detector tripped because of a yellow main dipole p.s. current spikes. These p.s. current spikes caused 4 other quench detectors to trip.

### **Sunday, Mar. 23, 2003:**

Quench Event: Yellow, 8b-ps1 Time of Event: 14:22:12 +2312689

Beam Permit Fail Time: Pulled first at 14:22:12 +2286783 (diff of -0.025897sec)

QPA Cntrl / Timing Resolver: No faults indicated.

QDAlarms: (8b-qd2) Y8QFQ2\_VT, Int. 1, Tq= -24

Postmortems: Power supplies operating normally.

Beam Loss Monitors (rads/hr): High loss rates at g8-lm1=3509.46, y8-lm3.1=4580.01

Main Magnet Power Status: Running at Store Energy.

Quench Status: **(Real)**, 5min Delay File: QDLD.1048447334 indicates real quenches at the following:  
(8b-qd2) Y8QFQ2\_VT, Y8QFQ3\_VT

### **Technical Notes from the Running Logs:**

14:22:00: End of Store. Looks like the yellow abort kicker may have pre-fired.

**14:22:23** Beam Abort, 10a-ps3.B dropped {Yellow Abort Kicker}

23:20:08: comment by ganetis... 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 .028 sec. before the yellow quench link. There were two magnet quenches at y8q2 and y9q3. There were high losses at these locations.

### **Monday, March 24, 2003**

Quench Event: Blue, 8b-ps1 Time of Event: 05:39:56 +1792091

Beam Permit Fail Time: Pulled first at 05:39:56 +1633092 (diff of -0.158999sec)

QPA Cntrl / Timing Resolver: No faults indicated, blue quench detector 1<sup>st</sup> detected.

QDAlarms: (8b-qd1) B8/7DX\_DX, Int. 1, Tq= -20

DX Heaters Fired: 8b-ps2.A1 and B1

Postmortems: Supplies appear to be in normal condition.

Beam Loss Monitors (rads/hr): High rates near the b8-dhx magnet.

Main Magnet Power Status: Running at Store Energy.

Quench Status: **(Real)**, 5min Delay File: QDLD.1048502397 indicates a real quench at the following:  
(8b-qd1) B8DRDX\_VT

**Technical Notes from the Running Logs:** Beam studies were in progress at the time, High radiation losses at the dhx magnets caused the dx heaters to fire causing a real quench in the b8dx magnet.

### **Monday, March 24, 2003**

Quench Event: Yellow, 8b-ps1 Time of Event: 08:33:36 +2079182

***RHIC Physics Run 2002 – 2003, Daily Quench Events  
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Beam Permit Fail Time: Pulled first at 08:33:36 +2079182 (diff of -0.03947sec)

QPA Cntrl / Timing Resolver: No faults indicated, yellow quench detector 1<sup>st</sup> detected.

QDAlarms: (8b-qd2) Y8QFQ3\_VT, Int. 1, Tq= -24

Postmortems: Supplies operating normally. However, there are several indicating voltage / current swing changes that are usually seen when magnets are quenching.

Beam Loss Monitors (rads/hr): High rates all throughout the machine.

Main Magnet Power Status: Running at Store Energy.

Quench Status: **(Real)**, 5min Delay File: QDLD.1048512818 indicates real quenches at the following:

(1b-qd1) Y1DSA2\_A1VT

(2b-qd2) Y1DSD9\_5VT

(8b-qd2) Y8QFQ2\_VT, Y8QFQ3\_VT

(10a-qd2) Y10QFQ3\_VT

**Monday, March 24, 2003**

→ **Quench Event:** Blue, 8b-ps1 **Time of Event:** 08:33:36 +2084307

Beam Permit Fail Time: Pulled first at 08:33:36 +2079182 (diff of -0.044595sec)

QPA Cntrl / Timing Resolver: No faults indicated, yellow quench detector 1<sup>st</sup> detected.

QDAlarms: (8b-qd1) B8DRDX\_VT, Int. 1, Tq= -23

Main Magnet Power Status: Running at Store Energy.

DX Heaters Fired: 8b-ps2.A1 and B1

Quench Status: **(Real)**, 5min Delay File: QDLD.1048512818 indicates real quenches at the following:

(8b-qd1) B8DRDX\_VT

**Technical Notes from the Running Logs:** Beam studies where in progress at the time, High radiation losses throughout the machine caused multiple quenches.

08:33:00: A **QLI in Blue and Yellow** (due to Yellow abort kicker misfire) has effectively ended the Study. Scheduled Maintenance commencing.

**Scheduled Maintenance**

***Converting over to the Polarized Proton Collision Run!!!  
(rhic\_pp\_fy03)***

**Friday, March 28, 2003**

**Quench Event:** Yellow, 2b-ps1 **Time of Event:** 05:46:08 +3718389

Beam Permit Fail Time: Pulled first at 05:34:16 +1895859 from 5e-ps2.A Loss Monitor 1

QPA Cntrl / Timing Resolver: y2-q89-qp, with no faults indicated.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events*** ***For the month of March 2003***

QDAlarms: (2b-qd2) Y2QDQ0\_VT, Int. 5, Tq= +1681 at 05:46:40

Postmortems: Supplies at zero currents, y2-q89-ps wfg input shows large oscillations.

Beam Loss Monitors (rads/hr): Sector 9 Yellow Dump shows no beam, Sector 10 Dump normal beam abort. There was one high rate indicated at b5-lm3.1=2434.62 as per 5e-ps2.a Loss Monitor 1.

Main Magnet Power Status: Yellow at Zero current.

Quench Status: 5min Delay File: QDLD.1048848371 indicates no real quenches.

**Technical Notes from the Running Logs:** Barshow and Snap Ramp show that y2-q89-ps Iref /current did not follow the wfg. (Cause: Fiber Optics Card Replaced)

**06:36:06** Joe Curley and Charles Gardner have swapped out the fiber optic interface card for y2-q89. It now looks like the supply iref and output currents are following the WFG. Don Bruno gave us the instructions on troubleshooting the problem. [JPJ](#)

**06:57:05** the beam looks fine at injection in Yellow since the y2-q89 repair. I guess that it also means that the problem didn't arise until we ramped for the first time, otherwise we would have to revisit Fulvia's tuning efforts. [JPJ](#)

### **Saturday, March 29, 2003**

**Quench Event:** Blue, 6b-ps1 **Time of Event:** 10:17:08 +1846834

**Beam Permit Fail Time:** Tripped fractions of a second later at 10:17:08 +1846864 (diff of +0.00003sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, blue quench detector 1<sup>st</sup> detected.

**QDAlarms:** (6b-qd1) B5QFQ2\_VT, Int. 5, Tq= -24

**Beam Loss Monitors (rads/hr):** High rates near the 5 O'clock Triplets. B5-lm3.1=3445.07, g5-lm1=3648.01

**Main Magnet Power Status:** Blue Dipole=1941.18amps at Store Energy. Blue Quad=1837 approaching to Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1048951029 indicates real quenches at the following:  
(6b-qd1) B5QFQ2\_VT

**Technical Notes from the Running Logs:** High radiation loss had caused the magnet to quench.

**10:55:21** Johannes found the potential problem. After 196 sec (beta3), we request the tunes to go down in beta 2, that causes the main quad bus to decrease current, ie jumping to the down hysteresis cycle. To verify this conjecture we will keep the tunes constant after beta3 and see what happens. IF we lose the beam, likely, then we will build a ramp with final beta3 - to do corrections in beta3 before further squeezing. [fulvia](#)

### **Saturday, March 29, 2003**

**Quench Event:** Blue, 6b-ps1 **Time of Event:** 15:23:12 +1782804

**Beam Permit Fail Time:** Tripped fractions of a second later at 15:23:12 +1782834 (diff of +0.00003sec)

**QPA Cntrl / Timing Resolver:** No faults indicated, blue quench detector 1<sup>st</sup> detected.

**QDAlarms:** (6b-qd1) B5QFQ2\_VT, Int. 5, Tq= -24

**Beam Loss Monitors (rads/hr):** High rates near the 5 O'clock Triplets. B5-lm3.1=3966.28 (first peak) 4938.0 (second peak)

**Main Magnet Power Status:** Blue Dipole=1941.18amps at Store Energy. Blue Quad=1837.14 approaching to Store Energy.

**Quench Status:** **(Real)**, 5min Delay File: QDLD.1048969393 indicates real quenches at the following:  
(6b-qd1) B5QFQ2\_VT

**Technical Notes from the Running Logs:** High radiation loss had caused the magnet to quench.

### **Sunday, March 30, 2003**

***Permit.3c-ps1, Snake Link Failure Time: (hh:mm:ss +xxxxxxx)***

**Quench Event:** Yellow Snake: yi3-snk7-2.3-ps **Time of Event:** (Snapshot = 01:51:23)

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events For the month of March 2003***

QPA Cntrl / Timing Resolver: No data available at this time.

Snapshot Data: Power supply was running at operating current of 326.60amps, than tripped to off.

Beam Loss Monitors (rads/hr): Not available at this time.

Main Magnet Power Status: Yellow Main Dipole running at Injection Current (473.169amps)

Quench Status: **(Real)**

→ **Quench Event:** Yellow Snake: yi3-snk7-1.4-ps **Time of Event:** (Snapshot = 01:51:25)

QPA Cntrl / Timing Resolver: No data available at this time.

Snapshot Data: Power supply was running at operating current of 99.86amps, then tripped to off.

QD Plots: Voltage taps indicate perturbation (Heat transfer) occurred 2.6827 seconds after yi7-snk7-2.3 magnet quenched.

Quench Status: **(Real)**

**Technical Notes:** Beam loss monitor not operational, Timing Resolver and QPA Data not functional at this time, the cause is unknown. Because these magnets share the same Cryostat vessel, yi3-snk7-1.4 magnet quenched 2.68 seconds after the yi3-snk7-2.3 magnet quenched do to the transfer of heat within the vessel.

**08:16:55:** comment by Waldo... Logview data from last nights snake "quench" yi3-snk7. The snakes are not pulling the permit are they? We should abort the beam. A question for George: Why didn't the yellow ring quench? I guess the heat from the snake does not necessarily cause a quench in the rest of the ring at injection.

**08:25:42:** comment by Waldo... It appears that the yi3-snk-2.3-ps went first. This is consistent with a beam-induced quench.

**08:27:53:** comment by Waldo... Interesting. The bunch was in the ring for more than a minute before the snake quenched. It looks like the quench happened when the bunch was dumped.

### Sunday, March 30, 2003

*Permit.3c-ps1, Snake Link Failure Time: (hh:mm:ss +xxxxxxx)*

**Quench Event:** Yellow Snake: yi3-snk7-2.3-ps **Time of Event:** (Snapshot = 02:11:16)

QPA Cntrl / Timing Resolver: No data available at this time.

Snapshot Data: Power supply was ramping upwards when it began to level off at 195.07 amps before being ramped back down. It appeared the Iref and wfg continued downwards while the power supply current suddenly separated around 190amps and began to ramp at a slower rate.

Beam Loss Monitors (rads/hr): Not available at this time.

Main Magnet Power Status: Yellow Main Dipole running at Injection Current (473.169amps)

Quench Status: Not real

**Technical Notes:** Beam loss monitor not operational, Timing Resolver and QPA Data not functional at this time. *Comment by Ganetis:* This magnet had quenched only 20 minutes earlier, MCR should have waited longer before recovering, magnet was being ramped down and this caused it to trip.

### Sunday, March 30, 2003

→ **Quench Event:** Blue, 10a-ps3.A **Time of Event:** 19:29:44 +1781938

Beam Permit Fail Time: Tripped fractions of a second later at 19:29:44 +1781967 (diff of +0.000029sec)

QPA Cntrl / Timing Resolver: No faults indicated.

***RHIC Physics Run 2002 – 2003, Daily Quench Events***  
***For the month of March 2003***

QDAlarms: 2b-qd1, 4b-qd1, 8b-qd1, 10b-qd1 & 12a-qd1 are all in the pink with no readings.

Postmortems: Supplies operating at zero currents.

DX Heaters Fired: all 6b, 8b, 10a and 12a.

Beam Loss Monitors (rads/hr): Indicate that there was no beam in the machine.

Main Magnet Power Status: Zero currents.

Quench Status: 5min Delay File: QDLD.1049070585 indicates no real quenches.

**Sunday, March 30, 2003**

→ Quench Event: Yellow, 10a-ps3.A Time of Event: 19:30:00 +3119240

Beam Permit Fail Time: Tripped at 19:29:44 +1781967 (same as blue 10a-ps3.A)

OPA Cntrl / Timing Resolver: No faults indicated.

QDAlarms: same as above, no values listed

Main Magnet Power Status: Zero currents.

Quench Status: 5min Delay File: QDLD.1049070603 indicates no real quenches.

**Technical Notes from the Running Logs**: FitReader shows that multiple front-end computers for several of the quench detectors had been re-booted. This brought down the two Rings.