

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

### **Saturday, Feb. 01, 2003:**

**Quench Event:** Yellow, 10a-ps3.A **Time of Event:** 18:44:24 (+) 1327451sec

**Beam Permit Fail Time:** 18:44:24 (+) 1327480sec

**Timing Resolver, 1<sup>st</sup> device tripped:** y-A2 QLI

**QPA Ctrl:** No faults listed.

**QDAlarms:** (10a-qd2) Y10QDQ8\_VT, Int. 20, Tq= -24

**Postmortems:** yi10-q89-ps running at 4.95amps suddenly ramped upwards while all the other supplies on the postmortem remained constant.

**Beam Loss Monitors:** Several high losses in sector 9.

(g9-lm14 = 2962rads/hr, g9-lm13 = 3595rads/hr, g9-lm12 = 4645rads/hr, g9-lm10 = 4599rads/hr and g9-lm8 = 2848 rads/hr)

**Qdplots:** YMDC = 5043.13amps, YQMC = 4612.79amps running at store energy.

**Quench Status:** (**REAL**), 5min Delay File: QDLD.1044143065 indicates real quenches at the following:

(9b-qd1) Y9DSA2\_A1VT and (10a-qd2) Y9DRD0\_D0

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

**18:47:04:** comment by TJS... Oooops. I'd tweaked yi10-q89 from 31A to 5A in \*two\* steps before, but changed it back in one step -- obviously too fast, as it tripped the quench link and pulled beam from the machine. So much for trying rebucketing on this fill... Sorry MMB!

**18:49:21** Apparently both quench links got pulled by this, which is odd. Peggy and Chris are contacting Cryo and initiating quench recovery. We will restore a good transmission ramp from yesterday morning to apply to the machine, and will work on a 110-bunch ramp when we return to beam. [TJS](#)

**18:57:50:** comment by TJS... The yellow 9q14 magnet quenched, and re-coolers in that area are drained. Peg and Chris will run ramp recovery to 50amps and we will await further word from Cryo. This was done with only (!) six bunches in the machine. Ouch.

**21:59:31:** comment by ganetis... The yellow quench link trip was caused by quench detector 10a-qd2. The quench detector tripped because yi10-q89-ps was ramped too fast. This trip should not have caused any real quenches but it did! There were real quenches at y9d0 and an arc magnet in sector 9. There were high beam losses in both locations. Another dirty dump? The blue quench link trip was caused by quench detector 10a- qd2. This quench detector tripped due to magnetic coupling between the quenched yellow d0 magnet and the blue d0 magnet.

**23:19:18:** comment by leif... From what I can reconstruct, slowly: The yellow beam was removed 10 ms after the blue. This is what the post mortem loss monitor data shows - all the same time base so must be true. The yellow loss looks fast. The permit pull must fire both aborts, and the V125 modules agree both y and b go on same turn (not with a 10 ms spacing). Looking at the yellow abort voltage readback, it apparently slowly discharged starting about 4:53, two hours before the quench, with a time constant of 4 minutes. So yellow was not charged when the permit pull occurred. We have not seen this before this year. To avoid having the abort system logic pull the permit - which it should do if the voltage moves away from the reference - one has to postulate that the circuitry thought a "stop charge" occurred, which then instructs the circuitry to stop watching. Without voltage, firing the abort should do nothing. So something else killed yellow 10 ms after the permit went down - the quench-link pulled magnets? - and a very fast beam removal, which then was very messy. No help from the kickers at all.

### **Saturday, Feb. 01, 2003:**

**Quench Event:** Blue, 10a-ps3.A **Time of Event:** 18:44:24 (+) 1589851sec

**Beam Permit Fail Time:** 18:44:24 (+) 1327480sec

**Timing Resolver, 1<sup>st</sup> device tripped:** b-A2 QLI, bi9-qf3, qf1 and qd6-qp's indicate a 0.

**QPA Ctrl:** No faults listed.

**QDAlarms:** (8b-qd2) Y8DRD0\_D0, Int. 5, Tq= -23

**Postmortems:** bi9-dhx indicates a 10amps spike on the Iref at -0.18secs, current not affected. Bo10-qf8, current spike from 56.5amps to 58.36amps while the Iref remained constant. Bi9-dh0, slow change in the voltage and current at -0.22secs prior to T=zero, indicating a magnet quench.

**Qdplots:** BMDC = 3966.19amps, BQMC = 3703.11amps running at store energy.

**Quench Status:** Not Real.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003***

### **Monday, Feb. 03, 2003:**

**Quench Event:** Yellow, 9b-ps1 **Time of Event:** 05:12:04 (+) 2441591sec

**Beam Permit Fail Time:** Tripped first at 05:12:04 (+) 2240734sec

**QDAlarms:** (9b-qd1) Y9DSA2\_A1VT, Int. 1, Tq= -23

**Beam Loss Monitors:** Several high losses in sector 9.

(g9-lm20 = 1355rads/hr, g9-lm13 = 1524rads/hr and g9-lm12 = 4646rads/hr.

Sector 10; g10-lm6 = 2105 rads/hr)

**Qdplots:** YMDC = 5043.12amps, YQMC = 4612.79amps running at store energy.

**Quench Status:** (REAL), 5min Delay File: QDLD.1044267126 indicates a real quench at the following:

(9b-qd1) Y9DSA2\_A1VT

**Technical Notes from the Running Logs:** 0505 -- The yellow ring has about  $10 \times 10^9$  debunched beam. The experiments have been notified that gap cleaning will commence shortly. 0512 -- Yellow quench. Note that the gap cleaning had not started when the quench occurred. 0530 -- The CCR reported that the 9q14 recoler had emptied. The Cryo systems are still in the process of being restored.

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

**Quench Event:** Blue, 12a-ps1.A **Time of Event:** 13:40:16 (+) 3126401sec

**Beam Permit Fail Time:** Tripped at 13:31:48 (+) 3676542sec - in preparation for repair to power supply

**Timing Resolver, 1<sup>st</sup> device tripped:** QP05-R12AQD2-bo11-qf8-qp

**QDAlarms:** (12a-qd1) B11QDQ8\_VT, Int. 1, Tq= +1706

**Beam Loss Monitors:** N/A

**Qdplots:** N/A

**Quench Status:** Not real.

**Technical Notes from the Running Logs:** Monday, 23:22:22: comment by Don... bo11-qf8-ps has a bad buffer card. It is missing the -15V. This card sends the p.s. readbacks to the MADC's so none of them are right. The p.s. is regulating fine. CAS did some measurements for me from the current regulator card. I spoke with Sanjee and he said to hold off on changing the buffer card until tomorrow morning since the p.s. is regulating. CAS has instructions on how to change the card if MCR would like to change it before tomorrow morning. All of the p.s.'s must be ramped to zero current before CAS changes the card. CAS will then bring the blue link down when they change the card.

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

**Quench Event:** Yellow, 5b-ps1 **Time of Event:** 17:35:48 (+) 751039sec

**Beam Permit Fail Time:** 17:35:48 (+) 751070sec

**QDAlarms:** (7a-qd1) Y6DSA4\_A3VT, Int. 5, Tq= -23

**Postmortems:** Main Yellow Dipole P.S. Ground indicates a drop from -0.04amps to -0.23amps at -0.136sec.

Main Dipole voltage drops from +142.63 to +135.41volts at -0.04secs before T=zero.

Quad voltage drops from +57.16 to +54.34volts at -0.04secs before T=zero.

**Beam Loss Monitors:** Clean beam abort, no unusual scatter.

**Qdplots:** YMDC ramping upwards to store energy at a rate of 24.66amps.

Y6DSA4\_A3\_VT shows level of -4.25volts with a slight disturbance at -1.083sec but then spikes positive to a value of -3.72volts (0.53volts) at trip off.

**Quench Status:** 5min Delay File: QDLD.1044398148 indicates no real quenches listed.

**Technical Notes from the Running Logs:** 20:06:00: comment by ganetis... Yellow quench link trip was caused by the 5b-qd1 quench detectors. The quench detector tripped because of a voltage dip on the yellow main dipole p.s.  
21:32:11: comment by CS... The raw signal Y4DSA4\_A3VT is disturbed at -0.134 seconds before the quench, the integrator starts counting at this time. The yellow main dipole shows no disturbances at this time, the voltage dip is at -0.033 seconds before the quench link is pulled. This is only one sample period of the quench detector.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003***

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

**Quench Event:** Yellow, 5b-ps1 **Time of Event:** 21:15:32 (+) 2013732sec

**Beam Permit Fail Time:** 21:15:32 (+) 2013763sec

**QDAlarms:** (7a-qd1) Y6DSA4\_A3VT, Int. 5, Tq= -23

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

**Postmortems:** Main Yellow Dipole P.S. Ground indicates a rise from -0.27amps to 0 at -0.122sec.

**Beam Loss Monitors:** Clean beam abort, y9-lm4 = 4652, b9-lm4 = 4935, y10-lm4 = 4699 & b10-lm4 = 4975rads/hr.

**Qdplots:** Y6DSA4\_A3\_VT shows a level of -3.75volts then spikes more negative to -4.54volts at -0.117seconds.

(Difference of 0.79volts) Y8DSA5\_A4VT also level at -3.74v spikes more negative to -4.42v at -0.133sec. (Adding +0.78 volts)

**Quench Status:** 5min Delay File: QDLD.1044411334 indicates no real quenches listed.

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

**21:44:41:** comment by CS... Similar to the earlier incident, the raw signal Y4DSA5\_A4VT starts moving at -0.117 seconds before the quench link. The yellow main power supply voltage starts increasing at -0.084 seconds after the raw signal. The supply doesn't seem to be the cause of the raw signal moving.

**22:06:39:** comment by ganetis... On all quench detectors yellow arc dipole signals there is a real voltage spike about 100 msec before the trip. This is usually a sign of the main dipole p.s. doing something strange. But the p.s. voltage does not show this. I will look for other sources.

**23:00:07:** comment by ganetis... I have looked at all yellow dipole voltage taps and did not find anything that can explain this voltage drop. The problem could be a room temperature connection in the main p.s. output ckt. compartment or the 6 Ka quench switch in 1010a. To investigate this will require a shutdown to inspect the various connection points.

**Wed Feb 5 00:09:23:** comment by ganetis... Finally found the cause, it is a sudden change in ground current on the yellow main dipole ckt. This intermittent ground fault started at the yellow quench link trip at 17:35 this evening. This ground fault does not seem to be caused by "ice balls" or even in the cold magnet ckt. Unfortunately to find and fix this problem will still require a significant shutdown.( 8 hours min. )

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

**Quench Event:** Blue, 6b-ps1 **Time of Event:** 19:51:16 (+) 3809855sec

**Beam Permit Fail Time:** Tripped first at 19:51:16 (+) 3761301sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Quench Detector - QLI

**QDAlarms:** (6b-qd1) B6QFQ2\_VT, Int. 1, Tq= -24

(10a-qd1) B10QFQ4\_6VT, Int. 1, Tq= -13

(11b-qd1) B10DSA5\_A4VT, Int. 1, Tq= -24

**Beam Loss Monitors (rads/hr):** g6-lm1=2665, b6-lm3.1=2711,

Multiple in sector 10 (i.e.) g10-lm20=5152, g10-lm16=2867, g10-lm12=4860.

**Postmortem Plots:** bo6-qd1 & bo6-qf2 indicate strong current and voltage changes before T=zero.

**Qdplots:** BDMC=3966.20amps, BQMC=3703.67amps, bq-qf2-ps=9.348amps. (The voltage taps listed in the file for Real Quenches do in fact indicate changes, verifying that there was indeed real magnet quenches).

**Quench Status:** **(REAL)**, 5min Delay File QDQL.1044492679 indicates the following:

(6b-qd1) B6QFQ2\_VT

(10a-qd1) B10QFQ4\_6VT & B10DSA5\_9VT

(11b-qd1) B10DSA5\_A4VT

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

**23:49:25:** comment by ganetis... This blue quench link was caused by quench detector 6b-qd1. The quench detector tripped because of a real quench at B6QFQ2\_VT. The Beam permit tripped first. There were quenches in magnets b6q2, b10q4, a dipole magnet near b10d6, and an arc magnet near b10d12. There was high beam loss in these locations.

**19:54:13:** comment by fp vp sa... lumi event goes off and blue quench - so long.

It seems we should \*seriously\* consider detuning IP10. There is no room to maneuver at 10 o'clock

*Comments continued on next page.*

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**20:32:10:** comment by vp... After rebucketing some losses increased in Blue abort kicker location. But loss monitor examination in 10 o'clock region did not reveal any of loss monitors, which could trip abort. Leif is analyzing if the losses could lead to Blue kicker misfire.

**20:51:00:** comment by leif... the Blue Abort system apparently suffered a prefire. 1) The kicker rise missed the abort gap - not close. 2) The blue power supply tripped off - as one would expect if it received a trigger not preceded by a "stop charge" pulse. Inspecting the relative times of the five pulses indicates that modules 1, 2, and 3 fire together - within 50 ns, and modules 4 and 5 fire about 560 ns later - presumably the inside trigger doing the best that it can. Vadim shows losses at the blue kicker coming with the rebucket, on this "slow" time scale. On the "post mortem" scale - 10 ms - the current transformer is quite flat. However, if we are "dosing" the thyratrons and thereby changing their internal conditions the time scale I suppose could be many seconds. The blue has not been a trouble before, and is running at nominal voltage. I will reduce it.

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

**Quench Event:** Yellow, 10a-ps3.A **Time of Event:** 08:59:20 (+) 2713736sec  
**Beam Permit Fail Time:** 08:31:24 (+) 497203 (in preparations for maintenance period)  
**QDAlarms:** None listed.  
**QPA Control:** No faults listed.  
**Timing Resolver, 1<sup>st</sup> device tripped:** yo9-dh0-qp  
**Postmortems:** Supplies had been run down for maintenance.  
**Quench Status:** 5min Delay File: QDLD.1044539962 indicates no real quenches listed.

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

**Quench Event:** Blue, 4b-time.B **Time of Event:** 09:07:36 (+) 1041332sec  
**Beam Permit Fail Time:** 08:31:24 (+) 497194 (down from last quench link)  
**QDAlarms:** None listed.  
**QPA Control:** No faults listed.  
**Timing Resolver, 1<sup>st</sup> device tripped:** Beam Permit RDY, (2<sup>nd</sup> device b4-dh0-qp)  
**Postmortems:** Supplies had been run down for maintenance.  
**Quench Status:** 5min Delay File: QDLD.1044540457 indicates no real quenches listed.

**Technical Notes from the Running Logs:** Both links were pulled during a brief maintenance session, as power supplies needed TLC.

#### **Power Supply Air Cooling Fan-Fails no indications:**

Bi9-dhx-ps, the rear top fan had to be replaced.

Yo9-dh0-ps, one of the smaller fans was not rotating, cycling the power revived it.

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

**Quench Event:** Blue, 8b-ps1 **Time of Event:** 20:31:32 (+) 3949213sec

**Beam Permit Fail Time:** Tripped first at 20:31:32 (+) 3949244sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Quench Detector - QLI

**QDAlarms:** (8b-qd1) B8DRDX\_GL, Int. 1, Tq= -21

**Beam Loss Monitors (rads/hr):** Appeared to be a clean abort, levels were high near the dump stations all the way down stream to the g9-lm5 and g10-lm5 monitors (CQS 5 magnets).

**Postmortem Plots:** Show nothing unusual.

**Qdplots:** BDMC=3966.20amps, BQMC=3704.14amps, b8-dhx-ps=1471.67amps and running fine.

B8DRDX\_GL (raw) at -25secs = -0.2459 and began to increase to -0.2512 when the quench occurred.

**Quench Status:** 5min Delay File QDQL.1044581495 indicates no real quenches.

**Technical Notes from the Running Logs:** 21:29:59: comment by ganetis... Blue link trip caused by 8b-qd1 quench detector. The quench detector tripped because of a runaway DX gas cooled lead, B8DRDX\_GL. Can't tell too much more because I can not get on control system with server down.

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

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 23:00:04 (+) 3729019sec

**Beam Permit Fail Time:** Tripped first at 23:00:04 (+) 3729019sec

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

**Postmortems:** Power supplies did not cause the trip, yo8-qb2 & yo8-qb3 indicate voltage vs. current change indicating a magnet quench event.

**Beam Loss Monitors (rads/hr):** High losses near the g8-lm18=4840, g8-mlmx.2=5192, g8-mlmx.1=5171, g9-lm12=4645.

**Main Power Ring Power Status:** YDMC=5043.12amps, YQMC=4614.49amps running at store currents.

**Qdplots:** YDMC=5043.12amps, YQMC=4614.49amps.

**Quench Status:** (REAL), 5min Delay File: QDLD.1044676807 indicates the following real quenches listed:

(8b-qd2) Y8QFQ2\_VT & Y8QFQ3\_VT, (9b-qd1) Y8QFA3\_A2VT

**Technical Notes from the Running Logs:** 23:50:28: comment by ganetis... Yellow quench link trip caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench of Y8QFQ3\_VT. The beam permit tripped first. Real magnet quenches were at y8q2, y8q3, and an arc magnet in sector 8 around location 18. High beam loss in these locations.

23:08:32: comment by jak, npl, blb... Yellow abort kicker prefire???

23:18:04: comment by TJS... Sure looks like it, unfortunately. Smells like it too. Leif will be able to confirm, but note that the red trace leads the others by a substantial margin. That's usually a signature of a prefire.

23:27:40: comment by jak... Post Mortem plots show the quench response for the yo8-qb2, yo8-qb3, and yo8-qb1 supplies, where the current walks away from the reference.

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**Saturday, Feb. 08, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 03:40:20 (+) 1067639sec

**Beam Permit Fail Time:** Tripped first at 03:40:20 (+) 1030920sec

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

**Postmortems:** Power supplies did not cause the trip. yo8-qd1, qf2 & qd3 indicate voltage vs. current change indicating a magnet quench event.

**Beam Loss Monitors (rads/hr):** High losses near the g9-lm20=4567, g9-lm16=2358, g9-lm13=4994, g9-lm12=4645, g8-lm18=2331, g8-lm14=4615, y8-lm1=3923 & y8-lm3.1=4580.

**Main Power Ring Power Status:** YDMC=5043.13amps, YQMC=4614.49amps running at store currents.

**Qdplots:**

**Quench Status:** (REAL), 5min Delay File: QDLD.1044693621 indicates the following real quenches listed:

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

(9b-qd1) Y8QFA3\_A2VT & Y9QFA2\_A1VT

**Saturday, Feb. 08, 2003:**

**Quench Event:** Blue, 8b-ps1 **Time of Event:** 03:40:20 (+) 1109664sec

**Beam Permit Fail Time:** Tripped first at 03:40:20 (+) 1030920sec

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

**Postmortems:** Power supplies did not cause the trip.

**Beam Loss Monitors (rads/hr):** High losses near the g7-mlmx.1=2654, g7-mlmx.2=4702, g7-lm5=3369

**Main Power Ring Power Status:** BDMC=3966.20amps, BQMC=3704.21amps running at store currents.

**Qdplots:**

**Quench Status:** (REAL), 5min Delay File: QDLD.1044693621 indicates the following real quenches listed:

(8b-qd1) B8DRDX\_VT

**Technical Notes from the Running Logs:** Sat Feb 8 12:50:37: comment by ganetis... Yellow quench link trip caused by 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench at Y8QFQ3\_VT. The beam permit tripped first. There were real magnet quenches at y8q2, y8q3, an arc quad in sector 8, and an arc quad in sector 9. There was high beam loss in all locations. The blue link also tripped .079 sec. later and was caused by 8b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B8/7DX\_DX. The real magnet quench was b8dx. There was very high beam loss at this location.

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

### Saturday, Feb. 08, 2003:

Quench Event: Yellow, 8b-ps1 Time of Event: 21:12:00 (+) 370709sec

Beam Permit Fail Time: Tripped first at 21:12:00 (+) 335428sec

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

Postmortems: Power supplies did not cause the trip. Y8-q6, yo8-qd1, qf2 & qd3 indicate voltage vs. current change indicating a magnet quench event. (Files for power supplies yi7-qd2 and qd3 out of range).

Beam Loss Monitors (rads/hr): High losses near the g8-lm14=4615, g8-lm18=2274, dhx to the triplet region indicating high losses.

Main Power Ring Power Status: YDMC=5043.14amps, YQMC=4614.50amps running at store currents.

Qdplots:

Quench Status: **(REAL)**, 5min Delay File: QDLD.1044756720 indicates the following real quenches listed:  
(8b-qd2) Y8QFQ2\_VT & Y8QFQ3\_VT

### Saturday, Feb. 08, 2003:

Quench Event: Blue, 8b-ps1 Time of Event: 21:12:00 (+) 495759sec

Beam Permit Fail Time: Tripped first at 21:12:00 (+) 335428sec

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

Beam Loss Monitors (rads/hr):

Postmortem Plots: Show nothing unusual.

Main Power Ring Power Status: BDMC=3966.20amps, BQMC=3704.23amps running at store currents.

Qdplots:

Quench Status: **(REAL)**, 5min Delay File: QDLD.1044756720 indicates the following real quenches listed:  
(8b-qd1) B8DRDX\_VT

**Technical Notes from the Running Logs:** Sun Feb 9 11:59:59: comment by ganetis... Yellow quench link trip caused by 8b-qd2 quench detector. The quench detector tripped because of real quench on Y8QFQ3\_VT. The permit tripped first. There were real quenches at y8q2 and y8q3. Blue quench link trip caused by 8b-qd1 quench detector. The quench detector tripped because of a real quench in B8/7DX\_DX. The blue link tripped after the yellow link. There was a real quench at b8dx. There was high beam loss at all locations.

21:19:21: comment by jak... Yellow abort kicker pre-fired. Cryo reported that the blue ring 8 o'clock section after the triplet is at 8 K!

21:35:26: comment by leif... The loss monitors beside the yellow thyratrons were running "dc" as 50 counts over the 10 ms captured by the lm post mortem. I am reluctantly coming to believe that the thyratrons cannot take this constant ionizing bath, but I haven't quantified what amount is acceptable, not whether this year is different from last year. Presumably just vertical, scraping at the upstream end.

21:54:05: comment by leif... total yellow loss rate, rather constant for pre-ceding 9 minutes, 4e6ions/sec.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003***

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

**Quench Event:** Blue, 2b-ps1 **Time of Event:** 22:24:40 (+) 1763224sec

**Beam Permit Fail Time:** Down from previous quench event at 21:12:00 (+) 335428sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** QP11-R2BD2-b2-dhx-qp

**Alarm Log:** Indicates that b2-dh0-ps has an AC Phase fault.

**QDAlarms:** None listed.

**Postmortems:** Supplies sitting at park currents.

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

**Main Power Ring Power Status:** Recovering the TAPE.

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1044761081 indicates no real quenches listed.

**Technical Notes from the Running Logs:** Sun Feb 9 12:05:23: comment by ganetis... blue quench link trip was caused by b2-dhx-qp during turn on. But b2-dh0-ps had error and AC phase fault in alarm logs. Will have to investigate this.

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

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 10:35:20 (+) 1061322sec

**Beam Permit Fail Time:** Tripped first at 10:35:20 (+) 1007594sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

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

**Postmortems:** Power supplies did not cause the trip. yo8-qr2 & qr3 indicate voltage vs. current change indicating a magnet quench event.

**Beam Loss Monitors (rads/hr):** Highest levels at g8-lm14=2040, g8-lm18=4840, dhx range high, g9-lm20=3444, g9-lm13=3724, g9-lm12=4645, g9-lm10=2601, g9-lm7=3124.

**Main Power Ring Power Status:** YDMC=5043.12amps, YQMC=4614.48amps running at store currents.

**Qdplots:** N/A

**Quench Status:** **(REAL)**, 5min Delay File: QDLD.1044804921 indicates the following real quenches listed:

(8b-qd2) Y8QFQ2\_VT

(9b-qd1) Y9DSA2\_A1VT & Y8QFA3\_A2VT

**Technical Notes from the Running Logs:** 12:24:29: 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 first. There were real magnet quenches at y8q2, an arc dipole magnet in sector 9 near location 12, and an arc quad near location 18. There was high beam loss at these locations.

10:50:31: comment by TJS... The store ended with another yellow abort kicker prefire; Thomas calls and recommends that we inform Arlene of the situation. In the meantime we are ramping down and preparing to go into dAu3 ramp development, and contacting Cryo for a thermal update. The loss pattern is a clear signature of a yellow abort kicker prefire as well.

13:24:48: comment by leif... two measures associated with this abort. The losses at the yellow kickers during the last 10 ms (post mortem report) were very small, 2 counts (dc) on 3.3kA2, 0 on others. The slope on the yellow DCCT is below least count over this 10 ms interval. The 1st, 4th, and 5th (PFN modules) current waveforms rise together to better than 20 ns, the 2nd is 150 ns delayed, and the 3rd is 770 ns delayed.

***RHIC Physics Run 2002 – 2003, Daily Quench Events  
for the month of February 2003***

**Monday, Feb. 10, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 10:43:20 (+) 578626sec

**Beam Permit Fail Time:** Tripped first at 10:43:20 (+) 540580sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

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

**DX heaters that Fired:** 8b-ps2.A1 & B1 = 7dhx magnet

**Postmortems:** Power supplies did not cause the trip. Y8-q6, yo8-qd1, qf2 & qd3 indicate voltage vs. current change indicating a magnet quench event.

**Beam Loss Monitors (rads/hr):** Highest levels at g8-mlmx.1=5171, b8-lmx=4649, dhx range high, g8-lm1=4449, y8-lm3.1=4227.

**Main Power Ring Power Status:** YDMC=5043.12amps, YQMC=4614.48amps running at store currents.

**Qdplots:** N/A

**Quench Status:** (REAL), 5min Delay File: QDLD.1044891800 indicates the following real quenches listed:  
(8b-qd2) Y8QFQ2\_VT & Y8QFQ3\_VT

**Monday, Feb. 10, 2003:**

**Quench Event:** Blue, 8b-ps1 **Time of Event:** 10:43:20 (+) 586826sec

**Beam Permit Fail Time:** Tripped first at 10:43:20 (+) 540580sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

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

**DX heaters that Fired:** 8b-ps2.A1 & B1 = 7dhx magnet

**Postmortems:** Power supplies did not cause the trip.

**Beam Loss Monitors (rads/hr):** Highest levels at y9-lm7.1-snk=3069, b9-lm7.1-snk=2846 and g9-lm10=2048.

**Main Power Ring Power Status:** BDMC=3966.19amps, BQMC3701.79amps running at store currents.

**Qdplots:** N/A

**Quench Status:** (REAL), 5min Delay File: QDLD.1044891800 indicates the following real quenches listed:  
(8b-qd1) B8DRDX\_VT

**Technical Notes from the Running Logs:** 13:38:43: comment by ganetis... Beam permit tripped first. The yellow quench link tripped. It was caused by quench detector 8b-qd2, which had a real magnet quench in Y8QFQ2\_VT. Then the blue quench link tripped. It was caused by quench detector 8b-qd1, which has a real magnet quench in B8/7DX\_DX. There were real magnet quenches at y8q2,y8q3, and b8dx. There were high beam losses in these location.

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

### Tuesday, Feb. 11, 2003:

**Quench Event:** Yellow, 6b-ps1 **Time of Event:** 01:25:52 (+) 3287810sec

**Beam Permit Fail Time:** Tripped first at 01:21:56 (+) 2623165sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QDAlarms:** None listed

**Postmortems:** Power supplies did not cause the trip.

**Beam Loss Monitors (rads/hr):** Normal beam abort g9-lm5 to y9-lm3.5dmp.

**Main Power Ring Power Status:**

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1044944755 indicates no real quenches listed.

### Tuesday, Feb. 11, 2003:

**Quench Event:** Blue, 8b-ps1 **Time of Event:** 01:25:52 (+) 3282801sec

**Beam Permit Fail Time:** Tripped first at 01:21:56 (+) 2623172sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QDAlarms:** None listed

**Postmortems:** Power supplies did not cause the trip.

**Beam Loss Monitors (rads/hr):** Normal beam abort b10-lm3.5dmp to g10-lm6.

**Main Power Ring Power Status:**

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1044944755 indicates no real quenches listed.

**Technical Notes from the Running Logs:** FEC's 4a-rftime and 3b-ps1 are down. 4a-rftime controls the high level RF plcs (JMB, personal communication). 3b-ps1 requires an AC reset as the next step in troubleshooting. This will pull the permit and may pull the quench link (Tom Clifford, consulted by phone). Therefore, leaving alone until the last possible moment. Experimenters are being informed.

01:24:20: comment by Sanjee... After gap cleaning. Beams are dumped, and no quenches. Resetting cfe-4a-rftime and cfe-3b-ps1 to ramp down. 01:28:31 Did a AC reset on cfe-3b-ps1 as advised by previous shift crew (per Tom Clifford). Both quench links are down. SA, NK 01:25:52 Quench Yellow, 6b-ps1 \_ Quench Blue 8b-ps1 01:40:04 We tried to initialize wfg, load sat, load limit in wfgman, and they failed. 9a-ps2 was soft rebooted. no answer. Called Al Marusic, then we did a reset for the wfg. Now all is well. Recovering the links.

### Tuesday, Feb. 11, 2003:

**Quench Event:** Blue, 10a-ps3.A **Time of Event:** 02:05:36 (+) 2604190sec

**Beam Permit Fail Time:** Tripped same time at 02:05:36 (+) 2604219sec.

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** bi9-qp7-qp

**QDAlarms:** None listed

**Postmortems:** Ramping, bi7-qp7 current did not follow setpoint, tripped on error.

**Beam Loss Monitors (rads/hr):** Appeared that no beam was in the machine, recovering from earlier quench event.

**Main Power Ring Power Status:** Ramping.

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1044947138 indicates no real quenches listed.

**Technical Notes from the Running Logs:** 10:19:17: comment by ganetis... Blue quench link trip caused by an error fault on bi9-qp7-ps while ramping to injection. The current stayed at zero while the iref was ramping.

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

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

**Quench Event:** Blue, 10a-ps3.A **Time of Event:** 03:32:48 (+) 1827754sec

**Beam Permit Fail Time:** Tripped first at 03:32:48 (+) 1762256sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal cycle.

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

**Postmortems:** bo10-qd1, qf2, qd3 and qf6 all show current vs voltage changes indicating possible real quench.

**Beam Loss Monitors (rads/hr):** Highest levels at g10-lm6=4739, g10-lm7=4727 & g10-lm12=4859.

**Main Power Ring Power Status:**

**Qdplots:** N/A

**Quench Status:** **(REAL)**, 5min Delay File: QDLD.1044952369 indicates the following real quenches listed:

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

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

**10:24:24:** comment by ganetis... Beam permit tripped first. Then blue quench link tripped because of quench detector 10a-qd1. The quench detector tripped because of a real magnet quench in B10QFQ4\_6VT. There were real magnet quenches at b10q4 and b10d12. There were high beam losses in these location.

**04:23:59** Cryo says that 10-q3 magnet is showing high temp. They ask us to wait 15min. Besides we have to wait another 10min for BLAM 90% limit to clear. [Sanjee](#)

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

**Quench Event:** Blue, 10a-ps3.A **Time of Event:** 04:57:20 (+) 3979656sec

**Beam Permit Fail Time:** Tripped first at 04:57:20 (+) 3914550sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal cycle.

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

**Postmortems:** bo10-qd1, qf2, qd3, qf6 and qf7 all show current vs voltage changes indicating possible real quench.

**Beam Loss Monitors (rads/hr):** Highest levels at g10-lm6=4739, g10-lm7=4728 & g10-lm12=4859, g10lm13 & 16 medium levels.

**Main Power Ring Power Status:**

**Qdplots:** N/A

**Quench Status:** **(REAL)**, 5min Delay File: QDLD.1044957443 indicates the following real quenches listed:

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

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

**05:21:26** Cryo saw some high temperature alarms. 30 minute wait before finishing the quench recovery script

**10:26:12:** comment by ganetis... Beam permit tripped first. Then blue quench link tripped because of quench detector 10a-qd1. The quench detector tripped because of a real magnet quench in B10QFQ4\_6VT. There were real magnet quenches at b10q4 and b10d12. There were high beam losses in these location.

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

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

**Quench Event:** Blue, 11b-ps1 **Time of Event:** 11:24:32 (+) 478382sec

**Beam Permit Fail Time:** Tripped first at 11:24:32 (+) 406870sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal cycle.

**QDAlarms:** (11b-qd1) B10DSA5\_A4VT, Int. 1, Tq=-24

**Postmortems:** N/A

**Beam Loss Monitors (rads/hr):** Highest levels at g10-lm6=3747, g10-lm7=2131, g10-lm12=4860 & b10-lm4=2473.

**Main Power Ring Power Status:**

**Qdplots:** N/A

**Quench Status:** **(REAL)**, 5min Delay File: QDLD.1044980672 indicates the following real quenches listed:  
(11b-qd1) B10DSA5\_A4VT

**Technical Notes from the Running Logs:** 14:40:53: comment by ganetis... The beam permit tripped first. Then the blue quench link was tripped by 11b-qd1 quench detector. The quench detector tripped because of a real magnet quench at B10DSA5\_A4VT. There was a real magnet quench at b10d12. There was high beam loss at this location.

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

**Quench Event:** Yellow, 4b-time.B **Time of Event:** 13:38:36 (+) 3692600sec

**Beam Permit Fail Time:** Tripped same time at 13:38:36 (+) 3692630sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QDAlarms:** None listed

**Postmortems:** Power supplies did not cause the trip, running at store energy.

**Beam Loss Monitors (rads/hr):** Normal beam abort sector 9 & 10dmp.

**Main Power Ring Power Status:**

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1044988719 indicates no real quenches listed.

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

14:47:59: comment by ganetis... Yellow quench link trip was caused by main yellow p.s. . We do not see the reason for this trip. The beam permit tripped after the yellow quench link.

14:04:28 Cryo has given us the ok to ramp the RHIC magnets. Carl Schultheiss is looking into a possible MMPS cause of the QLI from the previous shift. We are waiting for his analysis to continue. [Jim](#)

14:16:36 Yellow quench recovery sequence begun [tape](#)

14:27:08: comment by Jim... Carl did not find a clear cause of the QLI, but he was able to confirm that it came from 4b-time.b and that it probably wasn't a ground fault.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003***

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

**Quench Event:** Blue, 11b-ps1 **Time of Event:** 15:22:04 (+) 3158721sec

**Beam Permit Fail Time:** Tripped first at 15:22:04 (+) 3087247sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal cycle.

**QDAlarms:** (10a-qd1) B10QFQ4\_6VT, Int. 1, Tq= -13  
(11b-qd1) B10DSA5\_A4VT, Int. 1, Tq= -24

**Postmortems:** Shows b-qmain ramp current switching to flat current at -0.125secs, normal condition.

Bo10-qf6-ps shows voltage vs current change at -0.08secs, possible real magnet quench.

**Beam Loss Monitors (rads/hr):** Highest levels at g10-lm12=4860, b10-lm4=4975, g10-lm5=4630, g10-lm6=4740 and g10-lm7=4728.

**Main Power Ring Power Status:** Ramping to store energy.

**Qdplots:** N/A

**Quench Status:** **(REAL)**, 5min Delay File: QDLD.1044994927 indicates the following real quenches listed:

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

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

**16:01:12:** comment by ganetis... The beam permit tripped first. Then .071 sec. later the blue quench link is tripped by 11b-qd1 quench detector. The quench detector tripped because of a real magnet quench in B10DSA5\_A4VT. There were real magnet quenches at b10q4 and b10d12. There were high beam losses at these locations. The losses do not start until the abort.

**15:24:28:** comment by TJS... Aborts fired cleanly, at least... This unfortunately indicates that this is in fact a beam-induced quench. Time to revert ramps.

**16:26:50:** comment by TJS... To clarify, the events that seemed to lead to this were (a) slow blue losses from grazing the 0.25 resonance forced a loss-induced permit pull (b) permit pulled the abort (c) abort kickers fired, but blue kicker timing is slightly off, resulting in a bunch or two going awry (d) awry bunches go Somewhere Bad, creating a real blue magnet quench. Leif is addressing the blue kicker timing for the next ramp, and we've changed tunes so to hopefully not pull the permit in the first place.

**16:01:59:** comment by TJS... This is a zoom of an earlier 6-bunch ramp, showing a loss in the same area where we QLIed on this past ramp. On the basis of this, and after examination of Sanjeev's tune measurements earlier and discussions with Thomas, we've lowered the blue tunes (both horizontal and vertical) at the beta2d25 and beta2 stones by 0.01. This should move us away from that dangerous 1/4 resonance and hopefully restore good transmission. Leif is also addressing timing issues on the blue abort kickers that seem to have contributed to the latest quench -- not a prefire, but a small difference in the timing relative to the gap.

**19:59:19:** comment by dejan... I have tried to look at this ramp, and there are no ARTUS data nor sddsviiew data??? May be ARTUS was turned off?

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

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

**Quench Event:** Blue, 4b-time.B **Time of Event:** 03:44:40 (+) 3568664sec

**Beam Permit Fail Time:** Tripped same time at 03:44:40 (+) 3568694sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal cycle.

**QDAlarms:** none listed.

**Postmortems:** Power supplies not the cause, nothing unusual.

**Beam Loss Monitors (rads/hr):** Normal beam abort at sectors 9 & 10.

**Main Power Ring Power Status:** b-dmain-ps indicating "PLC Not Running"

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1045039483 indicates no real quenches listed.

**Technical Notes from the Running Logs:** Unexplained.

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

**Quench Event:** Blue, 6b-ps1 **Time of Event:** 07:39:32 (+) 2189910sec

**Beam Permit Fail Time:** Tripped first at 07:39:32 (+) 2132211sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal cycle.

**QDAlarms:** (6b-qd1) B6QFQ3\_VT, Int. 1, Tq= -24

**Postmortems:** Power supplies not the cause, nothing unusual.

**Beam Loss Monitors (rads/hr):** Highest levels at b6-lm3.1=4472.

**Main Power Ring Power Status:** Finishing a ramp at store energy.

**Qdplots:** BDMC=3966.20, BQMC=3700.40

**Quench Status:** (**REAL**), 5min Delay File: QDLD.1045053574 indicates the following real quenches listed:  
(6b-qd1) B6QFQ3\_VT

**Technical Notes from the Running Logs:** Beam induced quench.

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

**Quench Event:** Blue, 8b-ps1 **Time of Event:** 08:36:04 (+) 1628569sec

**Beam Permit Fail Time:** Still down from previous quench event, 07:39:32 (+) 2132211sec

**QPA Control:** N/A

**Timing Resolver, 1<sup>st</sup> device tripped:** N/A

**QDAlarms:** N/A

**Postmortems:** N/A.

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

**Main Power Ring Power Status:** N/A

**Qdplots:** N/A

**Quench Status:** N/A

**Technical Notes from the Running Logs:** Unexplained. Data was lost on this quench event as the Postmortem Server was down for maintenance. Possibly that a power supply in 1008b was the fault during the recovery tape.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003***

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

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 07:31:36 (+) 2511692sec

**Beam Permit Fail Time:** Tripped first at 07:31:36 (+) 2473403sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

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

**Postmortems:** Power supplies did not cause the trip, yo8-qd1, qf2, qd3 and yi7-qf3 all show current / voltage changes indicating a real quench.

**Beam Loss Monitors (rads/hr):** g8-mlmx.2=5192, g8-mlmx.1=5171, g8-lm1=4414, sector 7 shows multiple high losses from g7-lm7 to y7-lm3.2-c ranging 4000+, sector 9dmp higher losses than normal at g9-lm7=2946, g9-lm6=4617 and g9-lm5=4751.

**Main Power Ring Power Status:** YDMC=5043amps, YQMC=4608amps

**Qdplots:** N/A

**Quench Status:** **(REAL)**, 5min Delay File: QDLD.1045139498 indicates the following real quenches listed:  
(8b-qd2) Y8QFQ2\_VT

**Technical Notes from the Running Logs:** 10:04:53: comment by ganetis... The beam permit tripped first. Then .038 sec. later the yellow quench link tripped because of 8b-qd2 quench detector. The quench detector tripped because of a real magnet quench in Y8QFQ2\_VT. There was one real magnet quench at y8q2. There was beam loss at this location. The voltage increase in yo8-qf2-ps (on postmortem plots) is because of the magnet quenching. When looking at postmortem beam loss and power supply plots and knowing the time difference between the permit and quench link trips, it seems the beam loss was present at the magnet for 3 to 5 msec. before the magnet starts to quench.

### **Thursday, Feb. 13, 2003: *Maintenance Break (approximately 3 hours)***

**Quench Event:** Blue, 4b-time.A **Time of Event:** 09:21:24 (+) 1213262sec

**Beam Permit Fail Time:** Tripped first at 08:29:44 (+) 2482429 in preparations for a brief maintenance.

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** QP06-R4BOFF1-b-qtrim-qp

**Quench Status:** 5min Delay File: QDLD.1045146085 indicates no real quenches listed.

**Quench Event:** Yellow, 4b-time.A **Time of Event:** 09:22:52 (+) 2652613sec

**Beam Permit Fail Time:** Tripped first at 08:29:44 (+) 2482429 in preparations for a brief maintenance.

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** QP06-R4BOFF2-y-qtrim-qp

**Quench Status:** 5min Delay File: QDLD.1045146174 indicates no real quenches listed.

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

Blue link down because the b-qtrim power supply was put into the OFF state. Yellow link down because the y-qtrim power supply was put into the OFF state. Yo1-tv5-ps had tripped off several times according MCR so time was permitted to go into the tunnel and swap it out since it was a major magnet to their physics. Monitoring equipment was removed from 1006B and put into action in building 1004B to try and find the source of the problem for the unexplained 4b-time.B trips.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003***

### **Friday, Feb. 14, 2003:**

**Quench Event:** Blue, 1b-ps1 **Time of Event:** 16:00:20 (+) 3541733sec

**Beam Permit Fail Time:** Tripped first at 15:56:36 (+) 3085978sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QDAlarms:** (1b-qd1) B12DSA4\_A3VT, Int. 5, Tq= -24  
(3b-qd1) B2DSA4\_A3VT, Int. 5, Tq= -12

**Postmortems:** Shows the Blue Main Dipole P.S. as it appears to get hung up switching from flat current to ramp current.

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

**Main Power Ring Power Status:** Ramping down from store energy.

**Qdplots:** N/A

**Quench Status:** File QDL.D.1045256423 dumping data, none listed.

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

**17:18:48:** comment by ganetis... The blue quench link trip on the down ramp from top energy was caused by the 1b-qd1 quench detector. The quench detector tripped because of a blue main dipole p.s. problem. There was a problem with the current transfer from flattop to ramp power module. This caused very large voltage swing on the p.s. voltage. Carl S. believes he can fix this with a software change in his DSP code. If this keeps happening MCR should contact Carl S.

### **Saturday, Feb. 15, 2003:**

**Quench Event:** Blue, 4b-time.B **Time of Event:** 17:40:16 (+) 156908sec

**Beam Permit Fail Time:** Tripped same time at 17:40:16 (+) 156938sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QDAlarms:** None listed.

**Postmortems:** Indicates nothing unusual.

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

**Main Power Ring Power Status:**

**Qdplots:** N/A

**Quench Status:** File QDL.D.1045348816, none listed.

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

**21:39:58:** comment by ganetis... Why wasn't there a normal entry to the e-log for this blue QLI? The blue quench link trip was caused by the blue main p.s. There is no indication of what caused it.

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

### **Monday, Feb. 17, 2003:**

**Quench Event:** Blue, 8b-ps1 **Time of Event:** 04:52:16 (+) 975699sec

**Beam Permit Fail Time:** Tripped first at 04:52:16 (+) 943370sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QDAlarms:** (6b-qd1) B5QFQ3\_VT, Int. 1, Tq= -24  
(8b-qd1) B7QFQ2\_VT, Int. 1, Tq= -24

**Postmortems:** Bi8-qf3, qd2, bo7-qf2, qd3, qd1 and b8-q6 show signs of magnet quenches occurring.

**QPA Control for Sextupole Magnets:** bi5-sxf-qp & bi5-sxd-qp (Crowbar)

**Beam Loss Monitors (rads/hr):** Multiple beam losses in many sectors.

**Main Power Ring Power Status:**

**Qdplots:** Unable to bring up plots.

**Quench Status:** **(REAL)**, 5min Delay File: QDLLD.1045475536 indicates Real quenches at the following:  
(8b-qd1) B7QFQ2\_VT  
(6B-qd1) B5QFQ3\_VT, B5QFQ2\_VT, B6QFQ2\_VT, B5DRD0-D0  
(2b-qd1) B2QFQ2\_VT, B2QDQ8\_VT, B2DSD5\_9VT  
(5b-qd1) B4QFA6\_A7VT

### **Monday, Feb. 17, 2003:**

**Quench Event:** Yellow, 6b-ps1 **Time of Event:** 04:52:16 (+) 1357908sec

**Beam Permit Fail Time:** Tripped first at 04:52:16 (+) 943402sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QDAlarms:** (6b-qd2) Y5DRDo\_D0, Int. 5, Tq= -23

**Postmortems:** Some supplies indicate magnet quenches taking place after =zero.

**Main Power Ring Power Status:**

**Qdplots:** Unable to bring up plots.

**Quench Status:** **(REAL)**, 5min Delay File: QDLLD.1045475537 indicates real quenches at the following:  
(See List above)

**Technical Notes from the Running Logs:** 11:14:51: comment by ganetis... The beam permit went first. Then .032 sec later the blue quench link tripped due to quench detector 8b-qd1. The quench detector tripped because of a real magnet quench in B7QFQ2\_VT. There were 9 real magnet quenches located at b2q2,b2q8,b2d8,b4q13,b5q2,b5q3,b5d0,b6q2 and b7q2. This could be a record for beam induced quenches. There were high beam losses in all these locations.

11:19:38: comment by ganetis... The yellow quench link trip was caused by 6b-qd2 quench detector. The quench detector tripped because D0 magnetic coupling between the quenching magnet b5d0 and y5d0. There was no real magnet quench.

### **Tuesday, Feb. 18, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 00:16:44 (+) 1475005sec

**Beam Permit Fail Time:** Tripped first at 00:16:44 (+) 1436673sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

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

**Postmortems:** yo8-qf2, qd3 and qd1 indicate magnet quenches taking place after =zero.

**Beam Loss Monitors (rads/hr):** high rates at g8-mlmx.2=5192, g8-mlmx.1=5170, g8-lm1=4449 & y8-lm3.1=3519

**Main Power Ring Power Status:** YQMC=4607.69amps, YDMC=5043.13amps.

**Qdplots:** Unable to bring up plots.

**Quench Status:** **(REAL)**, 5min Delay File: QDLLD.1045545405 indicates real quenches at the following:  
(8b-qd2) Y8QFQ2\_VT, Y8QFQ3\_VT

**Technical Notes from the Running Logs:** 11:49:46: comment by ganetis... Beam permit tripped first. Then .039 sec. latter the yellow quench link tripped because of 8b-qd2 quench detector. The quench detector tripped because of a real quench of Y8QFQ2\_VT. There were real magnet 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 February 2003*

### **Tuesday, Feb. 18, 2003:**

**Quench Event:** Blue, 4b-time.B **Time of Event:** 21:31:48 (+) 523545sec

**Beam Permit Fail Time:** Tripped first at 22:29:12 (+) 3110259sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QD-Alarms:** None listed.

**Postmortems:** Nothing unusual.

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

**Main Power Ring Power Status:** No indications on the postmortems that they caused a fault

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045625508 indicates no real quenches.

**Technical Notes from the Running Logs:** bo2-qd1-ps indicated: Standby Error (AC Power, Standby, Remote, Quench, AC Phase). No action taken as supply reset okay.

**22:29:12** Beam Abort at 10a-ps3.A dropped {Loss Monitor 1}

**22:30:32** Based on the BLM data along the ramp, the total intensity that can be tolerated is 3064.28 nit[Blue:e11+Yellow:e9]

### **Wednesday, Feb. 19, 2003:**

**Quench Event:** Blue, 4b-time.B **Time of Event:** 01:41:08 (+) 3090052sec

**Beam Permit Fail Time:** Tripped same time at 01:41:08 (+) 3090082sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QD-Alarms:** None listed.

**Postmortems:** Nothing unusual.

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

**Main Power Ring Power Status:** No indications on the postmortems that they caused a fault

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045636871 indicates no real quenches.

**Technical Notes from the Running Logs:** **03:03:35:** comment by Jim... I didn't find a clear power supply cause in PMViewer. 4b-time.b pulled the link first. The error signal for several power supplies began to change shortly before the trip (i.e. bi4-qf9). If this is a MMPS problem, than I think it will get taken care of during Maintenance today.

### **Wednesday, Feb. 19, 2003:**

**Quench Event:** Blue, 4b-time.B **Time of Event:** 09:32:40 (+) 3512265sec

**Beam Permit Fail Time:** Tripped same time at 09:23:08 (+) 3873793sec

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QD-Alarms:** None listed.

**Postmortems:** Power Supplies were ramping down.

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

**Main Power Ring Power Status:** No indications on the postmortems that they caused a fault

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045665163 indicates no real quenches.

**Technical Notes from the Running Logs:** On going unexplained trips with the Blue Dipole Main Magnet Power Supply.

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

### **Wednesday, Feb. 19, 2003: *Maintenance Day***

**Quench Event:** Blue, 4b-time.A **Time of Event:** 12:01:16 (+) 3346832sec

**Beam Permit Fail Time:** Tripped first at 11:34:40 (+) 732587 in preparations for maintenance.

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** QP06-R4BOFF1-b-qtrim-qp

**Quench Status:** 5min Delay File: QDLD.1045674079 indicates no real quenches listed.

**Quench Event:** Yellow, 4b-time.A **Time of Event:** 12:01:24 (+) 569883sec

**Beam Permit Fail Time:** Tripped first at 11:34:40 (+) 732587 in preparations for maintenance.

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** QP06-R4BOFF2-y-qtrim-qp

**Quench Status:** 5min Delay File: QDLD.1045674084 indicates no real quenches listed.

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

Blue link down because the b-qtrim power supply was put into the OFF state. Yellow link down because the y-qtrim power supply was put into the OFF state. A list of maintenance to be performed has been issued.

### **Thursday, Feb. 20, 2003: *Maintenance Day – Extended*** **Extensive work continues on the Yellow Main Magnet Supplies.**

#### **Thursday, Feb. 20, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 10:44:48 (+) 1305789sec

**Beam Permit Fail Time:** Still down from previous permit.4b-time.B Blue Main PS at 10:26:08 (+) 3240363sec.

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QD-Alarms:** None listed.

**Postmortems:**

**Main Power Ring Power Status:** Working on recovering the system.

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045755889 indicates no real quenches listed.

**Technical Notes from the Running Logs:** yi6-qi9-ps indicated: Standby Error (AC Power, Standby, Remote, Quench, AC Phase). No action taken at this time as supply was able to reset.

#### **Thursday, Feb. 20, 2003:**

**Quench Event:** Blue, 4b-time.B **Time of Event:** 11:58:36 (+) 698538sec

**Beam Permit Fail Time:** Still down from previous permit.4b-time.B Blue Main PS at 10:35:08 (+) 33140796sec.

**QPA Control:** No faults listed.

**Timing Resolver, 1<sup>st</sup> device tripped:** Normal

**QD-Alarms:** None listed.

**Postmortems:** Nothing unusual.

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

**Main Power Ring Power Status:** Working on recovering the system.

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045760316 indicates no real quenches.

**Technical Notes from the Running Logs:** b12-q6-ps not regulating properly, re-installed original current reg card, all okay now.

***Systems are returned to MCR for Science!***

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

### **Thursday, Feb. 20, 2003:**

**Quench Event:** Blue, 4b-time.B **Time of Event:** 23:02:48 (+) 2265069sec  
**Beam Permit Fail Time:** Tripped same time at 23:02:48 (+) 2265099sec  
**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** Normal, no faults indicated.  
**QDAlarms:** None listed.  
**Postmortems:** Nothing unusual.  
**Beam Loss Monitors (rads/hr):** N/A  
**Main Power Ring Power Status:** Blue main magnet power supplies looked clean as they were ramping down.  
**Qdplots:** N/A.  
**Quench Status:** 5min Delay File: QDLD.1045800170 indicates no real quenches.

**Technical Notes from the Running Logs:** Unexplained fault at this time.

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

**Quench Event:** Blue, 4b-time.B **Time of Event:** 00:35:08 (+) 110226sec  
**Beam Permit Fail Time:** Tripped same time at 00:35:08 (+) 110256sec  
**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** Normal, no faults indicated.  
**QD-Alarms:** None listed.  
**Postmortems:** Nothing unusual.  
**Beam Loss Monitors (rads/hr):** N/A  
**Main Power Ring Power Status:** Blue main magnet power supplies sitting clean at store energy.  
**Qdplots:** N/A.  
**Quench Status:** 5min Delay File: QDLD.1045805708 indicates no real quenches.

**Technical Notes from the Running Logs:** Unexplained 4b-time.B fault at this time. Bi5-qr9-ps indicated a Standby Error (AC Power, Standby, Remote, Quench, AC Phase). No action taken at this time as supply was able to reset.

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

**Quench Event:** Blue, 4b-time.B **Time of Event:** 06:13:12 (+) 2320234sec  
**Beam Permit Fail Time:** Tripped first at 06:01:28 (+) 2137860sec  
**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** Normal, no faults indicated.  
**QD-Alarms:** None listed.  
**Postmortems:** Nothing unusual.  
**Beam Loss Monitors (rads/hr):** N/A  
**Main Power Ring Power Status:** Running at store currents.  
**Qdplots:** N/A.  
**Quench Status:** 5min Delay File: QDLD.1045825994 indicates no real quenches.

**Technical Notes from the Running Logs:** Unexplained fault at this time.

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

**Quench Event:** Blue, 2b-ps1 **Time of Event:** 06:41:52 (+) 3062426sec  
**Beam Permit Fail Time:** Tripped at the same time 06:41:52 (+) 3062455sec  
**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** b2-dh0-qp, no faults indicated.  
**QDAlarms:** None listed.  
**Postmortems:** To low of currents to determine faults.  
**Beam Loss Monitors (rads/hr):** N/A  
**Main Power Ring Power Status:** Running at Park Current at the time, show nothing unusual  
**Qdplots:** N/A.  
**Quench Status:** 5min Delay File: QDLD.1045827715 indicates no real quenches.

**Technical Notes from the Running Logs:** Possible “D” Connectors on the front of the QPA or a loose AC connection. (Referenced to the previous quench event that occurred on Monday, January 27, 2003).

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

### **Friday, Feb. 21, 2003:**      *Maintenance Period - Main Magnet Power Supplies*

**Quench Event:** Blue, 4b-time.B      **Time of Event:** 13:02:48 (+) 54274sec

**Beam Permit Fail Time:** Down already at 08:59:12 (+) 3784600 in preparations for maintenance.

**Quench Status:** 5min Delay File: QDLD.1045850568 indicates no real quenches listed.

**Quench Event:** Yellow, 4b-time.B      **Time of Event:** 13:02:48 (+) 3867274sec

**Beam Permit Fail Time:** Down already at 08:59:12 (+) 3784600 in preparations for maintenance.

**Quench Status:** 5min Delay File: QDLD.1045850571 indicates no real quenches listed.

**Technical Notes from the Running Logs:** Crash Button was pushed on both mains for maintenance repairs.

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

**Quench Event:** Blue, 4b-time.B      **Time of Event:** 23:26:48 (+) 1208139sec

**Beam Permit Fail Time:** Tripped at the same time 23:26:48 (+) 1208169sec

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated.

**QDAlarms:** None listed.

**Postmortems:**

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

**Main Power Ring Power Status:**

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045888009 indicates no real quenches.

**Technical Notes from the Running Logs:** Unexplained trip.

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

**Quench Event:** Blue, 4b-time.B      **Time of Event:** 02:05:04 (+) 2783888sec

**Beam Permit Fail Time:** Tripped at the same time 02:05:04 (+) 2783888sec

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated.

**QDAlarms:** None listed.

**Postmortems:**

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

**Main Power Ring Power Status:**

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045897506 indicates no real quenches.

**Technical Notes from the Running Logs:** Unexplained trip. 02:08:29: comment by TJS, JPJ... Spontaneous QLI -- no beam activity was taking place at this time and there were no substantial losses. Looks like another main problem since it comes from 4b-time.B. We'll recover and do one more blue ramp for the night, then attempt to leave beam in for experiments to do background studies as necessary -- but the backgrounds look reasonable with only deuteron beam in the machine.

***RHIC Physics Run 2002 – 2003, Daily Quench Events  
for the month of February 2003***

**Saturday, Feb. 22, 2003:**

**Quench Event:** Blue, 4b-time.B **Time of Event:** 04:44:25 (+) 1718272sec

**Beam Permit Fail Time:** Tripped at the same time 04:44:25 (+) 1718302sec

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated.

**QDAlarms:** None listed.

**Postmortems:**

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

**Main Power Ring Power Status:**

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045907065 indicates no real quenches.

**Technical Notes from the Running Logs:** Unexplained trip. 09:05:06 Every thing is back on. We are performing a hysteresis ramp. Carl is in and looking at the data from last night.

**Saturday, Feb. 22, 2003:**

**Quench Event:** Blue, 4b-time.B **Time of Event:** 12:54:20 (+) 5567sec

**Beam Permit Fail Time:** Tripped at the same time 12:54:20 (+) 5597sec

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated.

**QDAlarms:** None listed.

**Postmortems:**

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

**Main Power Ring Power Status:**

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045936460 indicates no real quenches.

**Technical Notes from the Running Logs:** 13:14:43 C. Schulteiss and G. Ganetis have determined that the latest blue main dipole trip was caused by an air flow fault. They have requested that F. Orsatti be contacted, in order to change the offending filter. G. Ganetis also reported issues with the PLC code for the blue main dipole supply. J. Piacentino was contacted.

**Saturday, Feb. 22, 2003:**

**Quench Event:** Yellow, 4b-time.B **Time of Event:** 17:52:32 (+) 362833sec

**Beam Permit Fail Time:** Tripped at the same time 17:52:32 (+) 362833sec

**Quench Status:** 5min Delay File: QDLD.1045954352 indicates no real quenches listed.

**Quench Event:** Blue, 4b-time.B **Time of Event:** 17:58:00 (+) 687253sec

**Beam Permit Fail Time:** Tripped, due to yellow at 17:52:32 (+) 362833sec

**Quench Status:** 5min Delay File: QDLD.10458954680 indicates no real quenches listed.

**Technical Notes from the Running Logs:** Both Blue and Yellow Mains were powered down for Software changes.

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

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

**Quench Event:** Blue, 4b-time.B **Time of Event:** 22:14:44 (+) 2664375sec

**Beam Permit Fail Time:** Tripped at the same time 22:14:44 (+) 2664405sec

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated.

**QDAlarms:** None listed.

**Postmortems:**

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

**Main Power Ring Power Status:**

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1045970086 indicates no real quenches.

**Technical Notes from the Running Logs:** 22:27:46 MCR called Carl Schultheiss. He's investigating from home.

22:38:46 Carl reports that the problem is the same airflow fault that appeared earlier today. C. Schultheiss and F. Orsatti came in tonight to diagnose the cause of Blue Main Dipole Flattop power supply airflow faults. The airflow for the power supply was found to be consistent with the other RHIC MMPS's. As a temporary fix, they have jumped out the airflow fault. During the next maintenance period, the differential air vane switch for the power supply will be replaced. Carl or G. Ganetis should be contacted if the MCR receives a mainpmctrl.slat.b-dmain SCR overtemp alarm. **NOTE:** This was discussed to be the problem to the Unexplained Trips (Ref to earlier trips)

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

**Quench Event:** Yellow, 12a.ps1-A **Time of Event:** 12:28:28 (+) 997117sec

**Beam Permit Fail Time:** Tripped at the same time 12:28:28 (+) 997146sec

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated, yi11-qd2 tripped 8<sup>th</sup> in the sequence.

**QDAlarms:** (12a-qd2) Y11QFQ2\_VT, Int. 1, Tq= -24.

**Postmortems:** yi11-qd2-ps begins to oscillate -0.04sec before T=zero. Current pulses from (pos) +62amps through zero then down to (neg.) -150amps. Voltage rises then follows oscillating at -0.025sec and seems to be out of phase with the current.

**Beam Loss Monitors (rads/hr):** Appeared to be a good beam abort

**Main Power Ring Power Status:** Running at store energy of YDMC=5043amps, YQMC=4608amps.

**Qdplots:** N/A.

**Quench Status:** (Real), 5min Delay File: QDLD.1046021308 indicates real quench at the following:

(12a-qd2) Y11QFQ2\_VT (Note: George reports that this is not a real magnet quench)

**Technical Notes from the Running Logs:** 12:36:31: comment by TJS... According to QED, this could have been a 12 o'clock Q2 (Yellow Quenched [ Y11QFQ2\_VT Int 1 ] @ 02/23/2003 12:28:55 [rhicMode: BDUYAU1] Tq = -24 | Tq=-24 ). Libby is contacting Cryo. No DX heaters fired. 13:13:30: comment by TJS... Cryo looked pretty clean. We are back and prepping for another ramp. 14:59:28: comment by ganetis... This yellow quench link trip was caused by 12a-qd2 quench detector. The quench detector tripped because of a p.s. problem in yi11-qd2-ps. There were no real quenches. Also no DX heaters would have fired because they are only in the blue ring.

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

**Quench Event:** Yellow, 12a.ps1-A **Time of Event:** 23:36:36 (+) 3431429sec

**Beam Permit Fail Time:** Tripped at the same time 23:36:36 (+) 3431429sec

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated, yi11-qd2 tripped 7<sup>th</sup> in the sequence.

**QDAlarms:** (12a-qd2) Y11QFQ2\_VT, Int. 1, Tq= -24.

**Postmortems:** yi11-qd2-ps Starts oscillating prior to the trip, (Ref to Yellow, 12a.ps1-A at 12:28:28 (+) 997117sec.)

**Beam Loss Monitors (rads/hr):** Appeared to be a good beam abort

**Main Power Ring Power Status:**

**Qdplots:** N/A.

**Quench Status:** (Real), 5min Delay File: QDLD.1046061399 indicates real quench at the following:

(12a-qd2) Y11QFQ2\_VT (Note: George reports that this is not a real magnet quench)

**Technical Notes from the Running Logs:** Mon Feb 24 00:03:57: comment by Don... It looks like yi11-qd2-ps caused this QLI. This same p.s. caused a QLI on 2/22 at 12:28 also. I could have CAS try swapping the current regulator card out but I am not sure if that will fix the problem because the setpoint looks clean on the Postmortems.

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

**Quench Event:** Yellow, 12a.ps1-A **Time of Event:** 02:14:32 (+) 3996820sec

**Beam Permit Fail Time:** Tripped at the same time 02:14:32 (+) 3996849sec

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated, yi11-qd2 tripped 4<sup>th</sup> in the sequence.

**QDAlarms:** (12a-qd2) Y11QFQ2\_VT, Int. 1, Tq= -24.

**Postmortems:** yi11-qd2-ps Starts oscillating prior to the trip, (Ref to Yellow, 12a.ps1-A at 12:28:28 (+) 997117sec.)

**Beam Loss Monitors (rads/hr):** Appeared to be a good beam abort

**Main Power Ring Power Status:**

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1046070875 indicates no real quenches.

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

02:14:00: QLI in Yellow at store; it appears yi11-qd2 is the cause. CAS will swap out its current regulator card, as suggested by D. Bruno via the RHIC machine log.

### **Monday, Feb. 24, 2003:**

**Quench Event:** Blue, 2b-ps1 **Time of Event:** 17:01:40 (+) 593151sec

**Beam Permit Fail Time:** Tripped first at 16:48:12 (+) 84690 = {13min 28sec sooner}

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated.

**QDAlarms:** (3b-qd1) B3DSA3\_A2VT, Int. 100, Tq= -24

**Postmortems:** Supplies ramping down.

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

**Main Power Ring Power Status:** Ramping down from Injection to Park Current.

**Qdplots:** Indicate the ramp down starting at -2.27 amps per sec at -19.88sec then the ramp rate accelerates to -8.24amps/sec at -9.99sec. Continues to accelerate to -11.21 amps/sec at -5.06sec prior to the trip.

**Quench Status:** 5min Delay File: QDLD.1046124100 indicates no real quenches.

### **Monday, Feb. 24, 2003:**

**Quench Event:** Yellow, 4b.time.A **Time of Event:** 17:01:40 (+) 27032914sec

**Beam Permit Fail Time:** Tripped first at 16:48:12 (+) 84704 = {13min 28sec sooner}

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated.

**QDAlarms:** (4b-qd2) Y3DRD0\_D0, Int. 100, Tq= -22

**Postmortems:** Supplies ramping down.

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

**Main Power Ring Power Status:** Ramping down from Injection to Park Current.

**Qdplots:** Indicate ramping down at 12.36 amps per sec prior to -3.1699sec at 259.048amps. Then, the ramp rate changes to -18.44amps per sec after -3.1699sec.

**Quench Status:** 5min Delay File: QDLD.1046124102 indicates no real quenches.

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

23:37:51: comment by ganetis... Both the blue and yellow quench link trips were caused by quench detectors. The quench detector tripped because a wrong slow factor was used to ramp injection to park. I thought ramps were done through the sequencer?

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### **Monday, Feb. 24, 2003:**

**Quench Event:** Blue, 3b-ps1 **Time of Event:** 22:36:40 (+) 1954681sec

**Beam Permit Fail Time:** Tripped first at 22:20:20 (+) 3966656 = {16min 20sec sooner)

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated.

**QDAlarms:** (3b-qd1) B3DSA3\_A2VT, Int. 100, Tq= -24

**Postmortems:** Supplies ramping down.

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

**Main Power Ring Power Status:** Ramping down from Injection to Park Current.

**Qdplots:** Indicate a down ramp change at the time of -3.184sec. Ramp of -12.979amps/sec becomes -7.865amps/sec at the -3.184sec mark then accelerates to -19.44amps/sec.

**Quench Status:** 5min Delay File: QDLD.1046144201 indicates no real quenches.

### **Monday, Feb. 24, 2003:**

**Quench Event:** Yellow, 4b.time.A **Time of Event:** 22:36:44 (+) 1206982sec

**Beam Permit Fail Time:** Tripped first at 22:20:20 (+) 3966668 = {16min 20sec sooner)

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated.

**QDAlarms:** (4b-qd2) Y3DRD0\_D0, Int. 100, Tq= -22

**Postmortems:** Supplies ramping down.

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

**Main Power Ring Power Status:** Ramping down from Injection to Park Current.

**Qdplots:** N/A

**Quench Status:** 5min Delay File: QDLD.1046124102 indicates no real quenches.

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

**22:41:55:** comment by TJS... User error: The sequencer has been giving us errors on the IPM for the down ramp, so Brian (*MCR: 22:37:00: QLI in both rings. I hit here2park in Wfgman when the sequencer hung at injection during the down ramp cycle*) clicked 'here to park' with the wrong slow factor instead of going through the sequencer.

### **Tuesday, Feb. 25, 2003:**

**Quench Event:** Yellow, 12a-ps1.A **Time of Event:** 01:25:36 (+) 115302sec

**Beam Permit Fail Time:** Tripped same time at 01:25:36 (+) 115331sec

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** No faults indicated, yi11-qd2 listed 7<sup>th</sup> in the sequence.

**QDAlarms:** (12a-qd2) Y11QFQ2\_VT, Int. 1, Tq= -24

**Postmortems:** Shows yi11-qd2-ps beginning to oscillate -0.03sec before T=zero. This has occurred before (Ref to Sunday, Feb 23, 2003).

**Beam Loss Monitors (rads/hr):** No data stored for availability for the sectors in question.

**Main Power Ring Power Status:** Running at store energy; YDMC=5043amps, YQMC=4608amps.

**Qdplots:** Indicates Y11QFQ2\_VT Integrator drop sharply passing through Int 1 before T=zero.

**Quench Status:** (**Real**), 5min Delay File: QDLD.1046154336 indicates a real quench at the following:

(12a-qd2) Y11QFQ2\_VT (**Note: George reports that this is not a real magnet quench**)

**Technical Notes from the Running Logs:** **02:39:10:** comment by Don... CAS is swapping out yi11-qd2-ps.

## ***RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003***

### **Wednesday, Feb. 26, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 06:10:44 (+) 2545007sec

**Beam Permit Fail Time:** Tripped first at 06:10:44 (+) 2453200sec

**Timing Resolver, 1<sup>st</sup> device tripped / OPA Cntrl:** No faults indicated.

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

**Postmortems:** yo8-qf2 running at 11.69amps at -0.075sec before T=zero, indicates current rise while voltage drops (beam induced quench) yo8- qd3 and qd1 also show these signs that a quench took place.

**Beam Loss Monitors (rads/hr):** g8-lm1=2151, high loss near the qf2 magnet.

**Main Power Ring Power Status:** Running at store energy; YDMC=5043amps, YQMC=4608amps.

**Qdplots:** Indicates Y8QFQ2\_VT Integrator and V tap going negative passing through Int 1 before T=zero.

**Quench Status:** (**Real**), 5min Delay File: QDLD.1046257846 indicates a real quench at the following:  
(8b-qd2) Y8QFQ2\_VT

**Technical Notes from the Running Logs:** Beam induced.

### **Wednesday, Feb. 26, 2003:**

**Quench Event:** Yellow, 8b-ps1 **Time of Event:** 06:52:44 (+) 813923sec

**Beam Permit Fail Time:** Tripped the same time at 06:52:44 (+) 813954sec

**Timing Resolver, 1<sup>st</sup> device tripped / OPA Cntrl:** y08-qd1-qp, No faults indicated.

**QDAlarms:** None listed

**Postmortems:** Too low of values to determine.

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

**Main Power Ring Power Status:** N/A.

**Qdplots:** N/A.

**Quench Status:** 5min Delay File: QDLD.1046260364 indicates no real quenches.

**Technical Notes from the Running Logs:** Possible fault with the yo8-qd1-qp during the Quench Recovery TAPE.

### **Wednesday, Feb. 26, 2003: *Maintenance Period - Main Magnet Power Supplies***

**Quench Event:** Blue, 4b-time.A **Time of Event:** 09:24:20 (+) 2226892sec

**Beam Permit Fail Time:** Down already at 09:05:44 in preparations for maintenance.

**Timing Resolver, 1<sup>st</sup> device tripped / OPA Cntrl:** No faults indicated, b-qtrim-qp

**Quench Status:** 5min Delay File: QDLD.1046269462 indicates no real quenches listed.

**Quench Event:** Yellow, 4b-time.A **Time of Event:** 09:24:28 (+) 3217508sec

**Beam Permit Fail Time:** Down already at 09:05:44 in preparations for maintenance.

**Timing Resolver, 1<sup>st</sup> device tripped / OPA Cntrl:** No faults indicated, y-qtrim-qp

**Quench Status:** 5min Delay File: QDLD.1046269471 indicates no real quenches listed.

**Technical Notes from the Running Logs:** b-qtrim and y-qtrim were turned to the OFF state in preparation for the maintenance day agenda.

## *RHIC Physics Run 2002 – 2003, Daily Quench Events for the month of February 2003*

### **Friday, Feb. 28, 2003:**

**Quench Event:** Blue, 3b-ps1 **Time of Event:** 11:13:28 +3677505

**Beam Permit Fail Time:** Tripped second at 11:13:28 +3677537

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** N/A

**QDAlarms:** (3b-qd1) B2DSA4\_A3VT, Int. 5, Tq= -24

**Postmortems:** 1004B indicated that the Blue dipole main power supply began to oscillate during the switch over from flat top to ramp current while ramping down from store energy starting at approximately -0.24sec and stopping at -0.15sec.

**Beam Loss Monitors (rads/hr):** Beam was dumped at 11:10:25 appearing as a normal condition.

**Main Power Ring Power Status:** Running at store energy BMDC=3700amps, BQMC=3966amps and starting a down ramp.

**Qdplots:** Shows no indications of a magnet quench or that of a wrong ramp rate.

**Quench Status:** 5min Delay File: QDLLD.1046448811 indicates no real quenches.

**Technical Notes from the Running Logs:** 11:54:19: comment by ganetis... The blue quench link trip was caused by 3b-qd1 quench detector. The quench detector tripped because of a blue main dipole voltage oscillations. These large oscillation happened when the current was switching from flattop to ramp power modules.

### **Friday, Feb. 28, 2003:**

**Quench Event:** Blue, 3b-ps1 **Time of Event:** 15:42:44 (+2997450)

**Beam Permit Fail Time:** Tripped second at 15:42:44 (+2997481)

**Timing Resolver, 1<sup>st</sup> device tripped / QPA Cntrl:** Blue quench detector, No faults indicated.

**QDAlarms:** (6b-qd1) B5QFQ2\_VT, Int. 1, Tq= -24

**Postmortems:** Indicate that voltage and current changes identifying quenches near bi5-qd2 and qf3.

**Beam Loss Monitors (rads/hr):** high loss at g5-lm1 of 965.30 (b5q2 magnet).

**Main Power Ring Power Status:** Running at store energy BMDC=3700amps, BQMC=3966amps.

**Qdplots:** Indicates B5QFQ2\_VT Integrator and Raw voltage tap both going negative (Int. of 10, .25volts?)

**Quench Status:** **(Real)**, 5min Delay File: QDLLD.1046464966 indicates a real quench at the following:  
(6b-qd1) B5QFQ2\_VT

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

15:45:00: Blue QLI during steering. 6b-qd1 pulled the link; there were 110 high intensity bunches in the machine at the time.

15:48:32: comment by vp... After the orbit correction done the coupling increased. To decouple the family 1 was reduced from -0.0004 to -0.00015.

15:50:01: comment by vp... While scanning family 2 the Blue quenched. It was (by accident) to large change in the skew family requested.

23:51:00: comment by ganetis... The blue quench link trip was caused by 6b-qd1 quench detector. The quench detector tripped because of a real quench in B5QFQ2\_VT. The beam permit tripped after the quench detector tripped. There was high beam loss in this location. Are the BLM trip levels set correctly? There was a real magnet quench at b5q2.