

## ***QLI - Power Supply / Diagnostic Reports for 10-29 thru 11-04-01***

**Monday 10-29-01** **QLI: BLUE 4b-time.A** (Actual Time 03:10:32 +2504396)

QPA Faults none

QD Alarms (4b-qd1) B4QDQ9\_VT Tq-23

Postmortems show nothing unusual

DX Heaters not fired

Qdplots (PIC)

Quench Status NOT REAL

Reason same open voltage tap as Saturday (time 11:34) Blue quench link interlock originating from 4b-time.A, while sitting at injection. The 4b quench detector tripped before the link was pulled, but no problems were identified with the power supplies or the QPAs.

**Monday 10-29-01** **QLI: BLUE 10a-ps3.A** (Actual Time 06:17:48 +102882)

QPA Faults bi9-dhx-qp

QD Alarms (10a-qd1) B10QFQ4\_6VT Tq-24

Postmortems (PIC)

DX Heaters not fired

Qdplots

Quench Status **REAL QUENCH**

Reason Quench page indicates (2) magnet quenches, (10a-qd1) B10QFQ4\_6VT & (11b-qd1) B10DSA5\_A4VT Blue quench link interlock. We attempted to use the collimators to scrap away the unbunched blue beam. The blue beam debunched when Sequencer reached the autocog step. A blue quench link interlock occurred soon after, which was presumed **beam induced**. comment by...Nick L. -- An entire ring of debunched beam at flattop. No idea why this happened. No RF trips as far as we can tell and the gap volts appear normal. Now what do we do? If we try and abort the beam we'll surely QLI and possibly do bad things to cryo, but we have to get back down to injection somehow. We decide to use the scrapers aggressively and see if we can scrape all the beam away. It's a long shot, but it's all we've got. 06:44:45 comment by...Nick L. -- Well, we tried. We started to scrape a good bit of beam, but soon after loss-monitors pull the permit, the permit triggers the abort, the abort pulls the quench-link. Cryo reports higher temperatures in 10 o'clock, so now we wait.

**Monday 10-29-01** Beam Abort, **QLI: YELLOW ring 6b-ps1** (Actual Time 09:06:40 +2957976)

QPA Faults none

QD Alarms no negative Tq's

Postmortems

DX Heaters not fired

Qdplots

Quench Status NOT REAL

Reason Unexplained, possible another loose K-Lock connection.

**Monday 10-29-01** **QLI: BLUE 9b-ps1** (Actual Time 09:17:16 +2595104)

QPA Faults none

QD Alarms (9b-qd1) B8DSA4\_A3VT Tq-24 (also 1b-qd1 Tq-12)

Postmortems p.s. ramping down, nothing unusual

DX Heaters not fired

Qdplots N/A

Quench Status NOT REAL

Reason Operator error, Blue Quench Link interlock due to using the incorrect ramp slowfactor, when running the quench recovery procedure for yellow without bringing the setpoints to zero.

**Monday 10-29-01** Beam Abort, **QLI: YELLOW ring 6b-ps1** (Actual Time 10:07:08 +373559)

QPA Faults none

QD Alarms none displayed (RUNNING)

Postmortems N/A

DX Heaters not fired

Qdplots N/A

Quench Status NOT REAL

Reason Unexplained, possible looses K-Lock connection.

## ***QLI - Power Supply / Diagnostic Reports for 10-29 thru 11-04-01***

**Monday 10-29-01 QLI: BLUE 4b-time.B (Actual Time 10:30:20 +939919)**

QPA Faults none, blue and yel off

QD Alarms none showing (RUNNING)

Postmortems N/A

DX Heaters not fired

Qdplots N/A

Quench Status NOT REAL

Reason, the Power Supply Group has begun to troubleshoot a voltage tap problem in the 4 o'clock area.

G. Ganetis pushed crash button to fix open voltage tap, clearing problem.

**Monday 10-29-01 QLI: YELLOW 6b-ps1 (Actual Time 11:08:00 +2782534)**

QPA Faults none

QD Alarms no negative Tq's

Postmortems N/A

DX Heaters not fired

Qdplots N/A

Quench Status NOT REAL

Reason Techs working on the system, testing K-Lock connection.

W. Louie has begun to troubleshoot earlier Yellow QLI's in the 6 o'clock area.

1156: Setup off. Yellow Quench Link interlock starting from 2b-ps1. The Y9 Quench Protection Switch is reporting a UPS fault. 1200: W. Louie is going to 9 o'clock to check the QPA UPS.

1250: W. Louie reports that the Quench Links are up. The source of the Yellow Ring problems was not found.

**Monday 10-29-01 Beam Abort, QLI: YELLOW ring 2b-ps1 (Actual Time 11:56:12 +2106944)**

QPA Faults yo1-qd3-qp CROW

QD Alarms no negative Tq's

Postmortems show Iref for y2-q7-ps drop to zero before T=0

DX Heaters not fired

Qdplots N/A

Quench Status NOT REAL

Reason Able to reset, possible power supply problem – current reg card.

**Monday 10-29-01 QLI: YELLOW 2b-ps1 (Actual Time 14:51:32 +3639781)**

QPA Faults yo1-qd3-qp CROW

QD Alarms no negative Tq's

Postmortems show Iref for y2-q7-ps drop to zero before T=0

DX Heaters not fired

Qdplots N/A

Quench Status NOT REAL

Reason Yellow QLI during the hysteresis ramp. W. Louie informs MCR that y2-q7 mysteriously shut off. Power supply was found in standby therefore it was not the off push button on the control card. We changed the Fiber Optic card first but it may turn out to be the current regulator card, relays opening up. Tapped relays and seated card back into slot. Crowbar occurred because the current followed too fast. Remember the signal path comes through the fiber optic card first before it goes to the current regulator card. Reference will not be seen at the current regulator card until supply is on. NOTE: Found out later that the current regulator card did have a bad relay on it.

**Monday 10-29-01 Beam Abort, QLI: BLUE ring, 4b-time.B (Actual Time 16:57:08 +2386067)**

QPA Faults bi9-dhx-qp CROW

QD Alarms no neg Tq's

Postmortems blue main dipole has large oscillation between flattop and ramp.

DX Heaters not fired

Qdplots N/A

Quench Status NOT REAL

Reason Blue QLI on the way down to injection. Main PS switching between flattop and ramp, possible setpoint problem, will continue to investigating.

## ***QLI - Power Supply / Diagnostic Reports for 10-29 thru 11-04-01***

**Tuesday 10-30-01 QLI: BLUE ring, 4b-time.B (Actual Time 00:52:24 +1021651)**

QPA Faults b4-dhx-qp CROW

QD Alarms no neg Tq's

Postmortems blue main quad voltage appears to drop -3 sec prior to T=0

DX Heaters not fired

Qdplots N/A

Quench Status NOT REAL

Reason Blue quench link interlock. The post mortem plots show that the blue main dipole was switching between the flattop and ramp supplies. The Booster was single cycled during this time. -- Tue Oct 30 00:58:17 comment by...jak -- The QLI appears to be a problem with the blue main dipole again.

**Tuesday 10-30-01 Beam Abort, QLI: BLUE ring, 8b-ps1 (Actual Time 08:59:20 +431436)**

QPA Faults none

QD Alarms no neg Tq's

Postmortems show Iref for bi8-qi8-ps drop before T=0

DX Heaters not fired

Qdplots N/A

Quench Status NOT REAL

Reason **bi8-qi3** power supply went to the off state, post mortems showed that the Iref did drop before T=zero so the **current regulator card** was changed. Later back at the shop, Jim O. was able to confirm that the one in the supply did in fact have a bad relay; K2 (P.S. On).

**Tuesday 10-30-01 Beam Abort, QLI: BLUE ring, 10a-ps3.B (Actual Time 12:07:20 +3549698)**

QPA Faults B9DQPSW (Over current, open contactor, remote on)

QD Alarms no neg Tq's

Postmortems (PIC)

DX Heaters not fired

Qdplots (PIC)

Quench Status NOT REAL

Reason and Repair **B9DQPSW** fault Wing, and Company are inspecting a QPA switch at 10 o'clock which had an overcurrent fault, causing the last Blue QLI. We changed the **IM3-SCR Driver firing board** inside (the 2amp fuse was blown) as per Wing. Also checked the buss connections to the precision resistor that are attached to the SCR heat sinks and then ran the unit up. All looks good.

**Tuesday 10-30-01 QLI: BLUE ring 4b-time.B (Actual Time 13:34:36 +222428)**

QPA Faults none listed

QD Alarms none listed (RUNNING)

Postmortems N/A

DX Heaters did not fire

Qdplots N/A

Quench Status NOT REAL

Reason work being done on the main system.

**Tuesday 10-30-01 QLI: BLUE ring, 11b-ps1 (Actual Time 16:57:16 +1091014)**

QPA Faults b12-dhx-qp CROW

QD Alarms (11b-qi1) B10DSA5\_A4VT Tq-24 and (1b-qi1) B12DSA5\_A4VT Tq-12

DX Heaters did not fire

Postmortems show blue main dipole p.s. oscillate before T=0

Qdplots show no indications of -Tq's above dropped before T=0

Quench Status NOT REAL

Reason was the blue main dipole p.s. glitched, wrong ramp used and caused qd to trip

## ***QLI - Power Supply / Diagnostic Reports for 10-29 thru 11-04-01***

**Tuesday 10-30-01** QLI: YELLOW ring, 9b-ps1 (Actual Time 17:31:28 +3585830)

QPA Faults bi9-dhx-qp CROW

QD Alarms (9b-qd1) Y8DSA4\_A3VT Tq-24

DX Heaters did not fire

Postmortems show nothing unusual

Qdplots indicate that a wrong slow factor was used on the down ramp

Quench Status NOT REAL

Reason operator error, used the wrong slow factor and wrong ramp rate.

**Wednesday 10-31-01** QLI: BLUE 3b-ps1 (Actual Time 12:38:24 +2865357)

QPA Faults b4-dhx-qp CROW

QD Alarms (3b-qd1) B3DSA3\_A2VT Tq-24

DX Heaters did not fire

Postmortems show nothing unusual

Qdplots indicate that the Vtap went neg approx. -0.08 before T=0

QdRealQuench indicates (3b-qd1) B3DSA3\_A2VT

Quench Status **REAL QUENCH**

Reason Beam Induced, possible RF system, Cryo Control Room reports that the temperature spike occurred in the sector 2 & 3 triplets

14:25:55-Lots of troubles at prep time - RF loops did not turn on. So we decide to reinject after a new SetupInjection. At this point, problems with **yi10-qgt**. (comment by...fp -- qgt's checked by johannes, one revived (thanks jvz)

14:29:12 FEC's 10a-ps1, 9a-ps1, and 11b-ps1 required reboots (soft or normal reset) after a real quench occurred today. Two of this group had suspended tasks, and one did not have a corresponding alarm on ADT. The Yellow Ring could not be ramped down, due to WFG errors. The 9C Momentum PLC also faulted at the same time and was reset.

\*\*\* MCR Log reported that the RHIC gamma-tr power supply **bi8-qgt** tripped during the ramp down from flattop. It was turned back on remotely. (No time mentioned)

15:21:59 comment by...Johannes -- Ramp from yesterday 10:12 showed a large spike in the b2-dhx/0-ps

17:23:32 comment by...fp -- store went up - **bi1-th21** went off and there is an effect on lifetime - trying to get it back now.... -- unfortunately is bi1-th21 is not coming up.....Vadim will try and compensate for it.

(Looked at it on Snapshot 17:11:53 and saw the Iref spiked positive (irefCurrentRangeError), Snapshot later at 18:42:49 shows spike in neg direction, probably tried to turn it on with setpoint not at zero)

**Thursday 11-01-01** Beam Abort, QLI: BLUE Ring 10a-ps3.A (Actual Time 06:52:08 +1513323)

QPA Faults bi9-dhx-qp CROW

QD Alarms (10a-qd1) B10QFQ4\_6VT Tq-24

DX Heaters did not fire

Postmortems bo10-qd3-ps shows error signal -4.25 at T=0, several others show error signal rise slightly

Qdplots indicate Vtap dropped approx. -0.1533 before T=0

QdRealQuench indicated B10QFQ4\_6VT

Quench Status **REAL QUENCH**

Reason occurred when the beam was dumped. Cryo reported a slightly elevated temperature in the 10 o'clock region. (comment by...jak -- they tried to clean the abort gap)

11:10 **Main Magnet P.S.**, C. Schultheiss is loading **software** with magnets at zero.

12:40 An attempt to bring up the RHIC MMPS's with new quench-preventive software was unsuccessful. Carl will reload the old setup.

## ***QLI - Power Supply / Diagnostic Reports for 10-29 thru 11-04-01***

**Thursday 11-01-01** Beam Abort, **QLI: BLUE Ring 4b-time.B** (Actual Time 22:29:00 +1364250)

QPA Faults b4-dhx-qp CROW

QD Alarms no negative Tq's

DX Heaters did not fire

QdRealQuench none listed

Postmortems show down ramping and oscillations on the main blue main dipole p.s.

Qdplots N/A

Quench Status NOT REAL

Reason occurred on down ramp, suspect possible software/controls related. We've seen this before and Carl will investigate.

**Friday 11-02-01**

**bi1-th8 and yo4-tq6** tripped after rebucketing causing an early end to the store.

**18:15:44** the **bi1-th21 corrector** (which caused the large loss in Blue when tripped) was compensated everywhere on the ramp. Do not bring this PS on until it is repaired. NOTE: This is on the schedule to be replaced on the next maintenance day

**23:21:48** comment by...jak -- The yellow took a dive after rebucketing. The **yo1-sxd** was off during rebucketing (this was noticed afterwards.) The sextupole was turned on, which helped reduce the dive and Nick is making chromaticity changes.

**Saturday 11-03-01** Beam Abort, **QLI: BLUE Ring 4b-time.B** (Actual Time 05:36:08 +1003855)

QPA Faults b4-dhx-qp CROW

QD Alarms no negative Tq's

DX Heaters did not fire, set state for 4b is all yellowed out?

QdRealQuench none listed

Postmortems show wrong dates for the mains and several others, (1969).

Qdplots N/A

Quench Status NOT REAL

Reason: comment by...jak -- I am unable to view the post mortem data. The PMViewer says that "no post mortem data successfully displayed." I believe that this QLI is due to the **blue mains switching** between the flattop and ramp supplies. The bmmps was accidentally left on at this time.

### **Sextupole Power Supplies**

**06:34:20** comment by...MCR -- While chromaticity changes were being made, sextupoles starting tripping off at flattop: yo1-sxd, bo11-sxd, bi9-sxd, yi11-sxd, yo9-sxd. The slow factor was set at 10 during this time. W. MacKay, T. Roser and D. Trbojevic have joined the party. Dejan finds that the sextupoles are not behaving properly at flattop, causing this morning's problems. W. Louie is looking into it and reports that he will have to reload the inductance table for the sextupoles to accommodate the changes in ramp22. This reload will pull the quench link, so we are ramping down to zero. We had already ramped down to injection, so a hysteresis ramp will be necessary.

**Cause:** \*\*\* MCR was changing the power supply setpoints too fast tripping the quench detectors. They know they're not supposed to do that and therefore Wing really didn't have to re-tune but it didn't hurt in doing so.

**Saturday 11-03-01** Beam Abort, **QLI: BLUE Ring 1b-ps1** (Actual Time 11:14:56 +1432171)

QPA Faults none

QD Alarms no negative Tq's, all RUNNING

DX Heaters did not fire, set state for 4b is all yellowed out?

QdRealQuench none listed

Postmortems N/A

Qdplots N/A

Quench Status NOT REAL

Reason, while at zero current Wing reloaded the inductance table for the sextupoles.

## ***QLI - Power Supply / Diagnostic Reports for 10-29 thru 11-04-01***

**Saturday 11-03-01** QLI: YELLOW 10a-ps3.A (Actual Time 11:14:56 +1443929)

QPA Faults none

QD Alarms no negative Tq's, all RUNNING

DX Heaters did not fire, set state for 4b is all yellowed out?

QdRealQuench none listed

Postmortems N/A

Qdplots N/A

Quench Status NOT REAL

Reason, while at zero current Wing reloaded the inductance table for the sextupoles.

14:25 - yo9-th4 and yo9-tv5 sat at 1 amp through the last ramp. Suspecting rad damage we did an AC reset to 9c-ps2. There were no range errors on alarm display for the supplies during the ramp.

**Saturday 11-03-01** Beam Abort, QLI: BLUE 4b-time.b (Actual Time 15:01:48 +1952756)

QPA Faults b4-dhx-qp CROW

QD Alarms no negative Tq's

DX Heaters did not fire, set state for 4b is all yellowed out?

QdRealQuench none listed

Postmortems show several whit the date 1969, others nothing unusual

Qdplots N/A

Quench Status NOT REAL

Reason Stones ran on gpm but the mains never moved. A down sequence was inadvertently issued sending the mains to park, so we need a hysteresis ramp. 15:00: Blue QLI at 4b-time.B. We used the Hysteresis Down sequence which does not single cycle the BMMPs.

15:18:40 comment by...dejan -- Dipole correctors in the yellow ring at the 9 o'clock alcove did not follow the ramp in the last two attempts.

**Sunday 11-04-01** Beam Abort, QLI: BLUE 10a-ps3.A (Actual Time 04:13:32 +1222936)

QPA Faults bi9-qp9-qf9 FAN

QD Alarms no negative Tq's

DX Heaters did not fire, set state for 4b is all yellowed out?

QdRealQuench none listed

Postmortems N/A

Qdplots N/A

Quench Status NOT REAL

Reason **FAN FAULT bi9-qp9-qf9** while ramping to flattop. Air vane was found by CAS to be touching the heat sink avoiding it to clear.

**Sunday 11-04-01** Beam Abort, QLI: BLUE 10a-ps3.A (Actual Time 04:53:36 +520629)

QPA Faults bo10-qp8-qf8 FAN

QD Alarms no negative Tq's

DX Heaters did not fire, set state for 4b is all yellowed out?

QdRealQuench none listed

Postmortems N/A

Qdplots N/A

Quench Status NOT REAL

Reason, comment by...Nick L. -- This is not a real quench, just a result of bringing up the link and then resetting it.

05:25 -- Performing a RHIC hysteresis ramp.

05:30 -- Blue and yellow quench link interlocks before reaching flattop.

## ***QLI - Power Supply / Diagnostic Reports for 10-29 thru 11-04-01***

**Sunday 11-04-01** Beam Abort, **QLI: YELLOW 8b-ps1** (Actual Time 05:30:20 +52295)

Reason (see above and below for reason)

**Sunday 11-04-01** **QLI: BLUE 10a-ps3.A** (Actual Time 05:30:20 +156663)

QPA Faults none

QD Alarms (10a-qd1) B9DRDX\_VT Tq-22

DX Heaters FIRED, 10a-ps3.A2 & 10a-ps3.B2

QdRealQuench (10a-qd1) B9DRDX\_VT

Postmortems shows bi9-dhx-ps Iref spike -0.042sec before T=zero

Qdplots B9DRDX\_VT (RAW) goes to -0.033 before T=zero

Quench Status **REAL QUENCH**

Reason, (MCR comments): when we recovered the QLI, we tried to inject for the hysteresis ramp. We were unable to get more than a few turns. PHOBOS indicated seeing radiation spikes. Although we found the inability to inject very odd (especially for yellow, since it made it through the ramp) we decided to do a hysteresis ramp (to take this out of the equation.) When we were near flattop, both blue and yellow quenched. Cryo reported seeing some heat waves. The bi9-dhx supply was the source of the quench. The current reference was at zero until 0.044 seconds before the link was pulled. At this point, the reference jumped to 1000 A, back to zero, to 1400 A, back to zero, etc. The supply responded with voltage and current spiking. Don Bruno was contacted. He is investigating from home. Having the bi9-dhx at zero current would also explain the problem with injecting. [jak](#)

**Sunday 11-04-01** Beam Abort, **QLI: YELLOW 8b-ps1** (Actual Time 08:11:36 +1841399)

QPA Faults none

QD Alarms (8b-qd2) Y7QDQ8\_VT Tq-23

DX Heaters did not fire

QdRealQuench none listed

Postmortems shows power supplies ramping up

Qdplots

Quench Status not Real

Reason due to new ramp and the quench detectors being too sensitive.

C. Schultheiss loads new software for the RHIC mains this shift. The Booster MMPS can be pulsed during the down ramp.

**Sunday 11-04-01** **QLI: BLUE 10a-ps1** (Actual Time 08:47:44 +312625)

QPA Faults bi9-qf9-qp FAN & yi10-qf9-qp FAN

QD Alarms none listed, all RUNNING

DX Heaters did not fire

QdRealQuench none listed

Postmortems N/A

Qdplots N/A

Quench Status not Real

Reason **FAN FAULT bi9-qf9-qp**, Tom N. used a qpa control test box to exercise the fan switches several dozen times to clean the contacts on the switch.

**Sunday 11-04-01** Beam Abort, **QLI: BLUE 10a-ps1** (Actual Time 11:48:28 +387938)

QPA Faults none

QD Alarms none (Running)

DX Heaters did not fire

QdRealQuench none listed

Postmortems N/A

Qdplots N/A

Quench Status not Real

Reason bo10-qf6 standby error state when ramping to injection, replaced the CURRENT REG CARD.

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NOTE: current regulator card was good, possibly p.s. went to off state but not sure. P.S. turned off at 12:06 on high error tripping quench link at 12:48. Two separate problems, 1) tripped on error and 2) lost AC power completely, will continue to investigate.

**Sunday 11-04-01** Beam Abort, **QLI: YELLOW 8b-ps1** (Actual Time 12:44:40 +3514260)

QPA Faults none

QD Alarms (8b-qd2) Y7QDQ8\_VT Tq-23

DX Heaters did not fire

QdRealQuench none listed

Postmortems ramping, yi7-tq6-ps spikes on input m(Y1), did not trip.

Qdplots N/A

Quench Status not Real

Reason new ramp and quench detector re-tuning.

**Sunday 11-04-01** Beam Abort, **QLI: YELLOW 8b-ps1** (Actual Time 14:44:40 +1840036)

QPA Faults none

QD Alarms (8b-qd2) Y7QDQ8\_VT Tq-23

DX Heaters did not fire

QdRealQuench none listed

Postmortems N/A

Qdplots N/A

Quench Status not Real, Reason George has found that the currents in the 8 o'clock region for the 1m beta\* ramp are changing so rapidly that the quench protection system interprets the data as a problem. He has decreased the sensitivity of two of the channels as a temporary fix to allow us to try and run.