

***RHIC QLI – Power Supply / Diagnostic Reports for (p⁺ Run 2001 - 2002)
January-21 thru January-24***

Monday, January 21, 2002:

One unsuccessful attempt was made to decelerate beam in RHIC with the PLL on. Another attempt was aborted when the permit link (12a-blm1) was pulled while ramping six bunches in Blue just at flattop. RHIC corrector power supply bi12-tv2 routinely is causing a range error alarm while ramping. This should be investigated tomorrow.

RHIC acceleration ramp started, ramp id down2 1011639608

Monday: Jan 21, 2002: Beam Abort, 2b-ps1, QLI in Blue ring, 2b-ps1 (Actual Time: 14:10:08 +2593931)

QPA Faults: Blue IR power supplies off indicating no faults.

QD Alarms: (2b-qd1) BIQFQ3_VT, Tq-24 (all others tripped indicating positive Tq values).

DX Heaters: None fired.

QdRealQuench: 12 out of 20 detectors fired, (2b-qd1) BIQFQ3_VT indicates real.

Postmortems: Many indicate current and voltage changes prior to T=0.

Qdplots: BDMC=1952.35amps, BQMC=1837.37amps.

Beam Loss Monitors: High rates around sector 2 and sector 3 near the dhx and dh0 magnets. (b1-lm3=4510rads/hr).

Quench Status: REAL

Reason: Due to beam loss during the deceleration ramp, however, it appears that the quench occurred 7.63sec before the ramp down. George Ganetis found that while MCR was setting up for the down ramp, they ramped the Main Quads string.

From the Physics Logs: -- 15:04:27 comment by...pc -- PLL horizontal lock was lost when prep moved tunes from actual to desired. qLoop then walked horizontal tune into the integer. GPM display of PLL and desired tunes had an odd glitch when this happened. PLL lock was strong. It is a puzzle that it did not track the move from actual to desired.

Tech Notes: N/A

Monday: Jan 21, 2002: QLI in Blue ring 12a-ps1.A, (Actual Time: 15:08:28 +1476438)

QPA Faults: Blue IR power supplies off, no faults shown.

QD Alarms: None tripped.

DX Heaters: None fired.

QdRealQuench: (11b-qd1) was in the pink, all others running.

Postmortems: Nothing unusual, BDMC=50amps (turn on).

Qdplots: N/A

Beam Loss Monitors: N/A

Quench Status: Not real.

Reason: Occurred during the recovery script program

From the Physics Logs: N/A

Tech Notes: A problem that we've seen before and when the script is run again, the problem clears. Could this be a possible glitch in the software pointing towards the 12a-ps1.A QLI during recovery?

RHIC QLI – Power Supply / Diagnostic Reports for (p[^] Run 2001 - 2002) January-21 thru January-24

Tuesday, January 22, 2002:

Beam Studies took place for most of the day.

Beam Abort 6b-ps1, dropped Yellow Quench

→ **Tuesday, January 22, 2002: QLI in Yellow ring, 6b-ps1 ring, (Actual Time: 10:32:04 +2547809)**

QPA Faults: Yellow IR power supplies off, no faults indicated.

QD Alarms: All detectors fired indicating positive Tq values.

DX Heaters: None fired.

QdRealQuench: System running.

Postmortems: Found nothing unusual.

Qdplots: YDMC=1952.35amps, YQMC=1840.86amps sitting at store energy.

Beam Loss Monitors: Beam dumps at sector 9 & 10 appear normal.

Quench Status: Not real.

Reason: Unexplained, possibly due to temperature changes in the control room area. (See the following Tech Notes below)

From the Physics Logs: -- comment by...Mei -- Well, the ac dipole was fired about 1min before the yellow quenched. The exact time stamp is 10:31:40 and the quench occurred at 10:32:04. No beam loss was seen within 10sec before the quench from the blm postmortem data. The betatron coherence due to the ac dipole is +/- 0.5mm in vertical and +/-0.3mm in horizontal. Due to the fact that the ac dipole excitation was before the quench, I think the quench was not caused by the ac dipole excitation. At **09:22:49** - MCR received a call from Ann Pham bldg. 1006B reporting that all doors and windows were open, possibly due to an AC problem. At request of MCR, windows and doors were closed and the existence of an AC problem confirmed. Repair work order is #EP38702.

Tech Notes: Looking at the temperature logs for 1006 in the control room area where the electronics chassis are located during the time frame of the quenches, there was a huge drop from 97deg F to 52deg F for the first QLI. After about two hours, the temperature rose from 52 deg F to 77deg F before leveling off steady around 72 deg F. This is when the second QLI occurred. Out by the power supplies, the temperature fluctuation was only around 8 degrees during this time. Therefore, if this unexplained trip is caused by temperature, the problem may be located within the control room area.

Beam Abort, 6b-ps1 dropped Yellow Quench

→ **Tuesday, January 22, 2002: QLI in Yellow ring, 6b-ps1 (Actual Time: 12:01:12 +2763533)**

QPA Faults: Yellow IR power supplies off, no faults indicated.

QD Alarms: All detectors fired indicating positive Tq values.

DX Heaters: None fired.

QdRealQuench: 12 out of 20 detectors fired with no indications.

Postmortems: Found nothing unusual.

Qdplots: YDMC=1952.36amps, YQMC=1841.08amps sitting at store energy.

Beam Loss Monitors: N/A, no beam.

Quench Status: Not real.

Reason: Unexplained, possibly due to temperature changes in the control room area of building 1006.

From the Physics Logs: comment by...fp -- quench in yellow at store again, with no beam. Called George to help figuring this one out. - George tells us to try once more - if we quench again in the same location they'll have to work on it. [fp](#)

Tech Notes: (see 6b-ps1 quench Tech Notes above)

RHIC QLI – Power Supply / Diagnostic Reports for (p⁺ Run 2001 - 2002) January-21 thru January-24

RHIC acceleration ramp started, ramp id down2_1011740461 Beam Abort, 1b-ps1 dropped Blue Quench

Tuesday, January 22, 2002: QLI in Blue ring, 1b-ps1 (Actual Time: 18:02:56 +2482335)

QPA Faults: (1b-qd1) B12DSA4_A3VT Tq-24 and (3b-qd1) B2DSA4_A3VT Tq-12 all others tripped indicating positive Tq values.

QD Alarms: N/A

DX Heaters: None fired.

QdRealQuench: 12 out of 20 detectors fired with no indications.

Postmortems: 1004b indicate a problem with the b-dipole main.

Qdplots: BDMC=1952.35amps sitting at store energy.

Beam Loss Monitors: Nothing unusual.

Quench Status: Not real.

Reason: Blue main dipole power supply, glitch.

From the Physics Logs: comment by...pc -- PLL was locked but qLoop did not close. We have not seen this failure mode before. Perhaps a step was skipped in the sequencer? Desired tune line went to actual then moved to desired, but quads did not work to move the tune. comment by...fp vp dt am jvz -- quench at the beginning of the down ramp - (?) - this looks like the end of down ramping

Tech Notes: George Ganetis notes as the down ramp begun, a large voltage spike on the main dipole power supply shows switching back and forth between ramp and flat top current.

Wednesday: Jan 23, 2002:

Wednesday, January 23, 2002: QLI in Yellow ring, 10a-ps3.B (Actual Time: 05:37:04 +1788069)

QPA Faults: All Yellow IR power supplies off with no fault indications.

QD Alarms: All fired indicating positive Tq values.

DX Heaters: None fired.

QdRealQuench: N/A

Postmortems: Show nothing unusual.

Qdplots: YDMC=473.45amps, YQMC=449.88amps sitting at Injection current.

Beam Loss Monitors: N/A

Quench Status: Not real.

Reason: Y10DQPSW (6KASW Quench Switch PLC failed).

From the Physics Logs: The Y9 quench protection switch appears to be the culprit, as it does not indicate the expected 'no quench link' status on the pet page. Support reported that none of the indication lights are lit on the supply.

Tech Notes: W. Louie diagnosed that the quench protection switch problem was caused by a PLC problem. C. Theisen was contacted to reload the software. In the end, a new PLC was installed that had the proper software loaded.

Suncraft Power Supply Fault:

14:52:18 - MCR called and complained about **yo9-tq6-ps** not performing as it should. Snapshot photos indicated that there was a possible problem with the current regulator card relays as the Iref would drop out then suddenly appear. One good photo showed that the relay was definitely the cause. Don swapped the card and Jim tested it back at the shop and immediately found the K1 Relay was faulty.

***RHIC QLI – Power Supply / Diagnostic Reports for (p⁺ Run 2001 - 2002)
January-21 thru January-24***

Thursday, January 24, 2002:

RHIC Polarized Protons pp2pp special run

Cryogenics Problem, Snake Magnets Sector 3C:

(From the MCR Logs)

0750: Setup off. The Cryo Control Room reports that the RHIC 3 o'clock snake lead flows are showing high temperatures outside of the safe range. RHIC was ramping to top energy at the time. The main RHIC power supplies are ramping back to injection while the snakes are ramping to zero. Three of the four turrets showed elevated temperatures, as high as 168 degrees Kelvin.

0810: The MCR contacted D. Bruno, G. Ganetis, S. Seberg, and G. McIntyre about the problem at the snakes.

0830: A Ring access will be made at 4GE2 to assess the problem with the 3 o'clock snakes.

0930: The 4z1 sweep was lost when a gate entrant exited the Ring without a release. The sector has been placed on Restricted Access for installation of mechanical switches to control the snake heaters. The original controller had suffered radiation damage.

(From the Physics Logs)

11:14:36- As George Ganetis and Tony Nicoletti agreed we can fix the cryo CONTROLLER problem after the shutdown. They are coming out of the tunnel now, and we are ready to check the snakes and after that inject!!!! [dejan](#)

Friday, January 25, 2002:

05:30 Physics run is over. Measuring polarization. P⁺ source personnel are still using the beam for measurements.

06:00 RHIC beam is dumped. BLIP is off.

06:03:02- Beam Abort, 2b-ps1 dropped Blue Quench [Sequencer](#)

06:03:04- **Quench Link Interlock in Blue ring, 2b-ps1** dropped first [Sequencer](#)
(Actual Time: 06:02:56 +2822296) No faults, power supplies at zero currents.

06:06:09- **Quench Link Interlock in Yellow ring, 10a-ps3.A** dropped first [Sequencer](#)
(Actual Time: 06:06:08 +3486967) No faults, power supplies at zero currents.

07:38:24 -The Snake Magnets in Alcove 3C, while running at operating currents, were put into the "OFF STATE" condition by Operations before being run down to zero currents.

Permit.3C-ps1 Snake Link Failure (Time: 07:38:24)

Friday, January 25, 2002:

Blue Snake bo3-snk7-2.3-ps (Snapshot Data Time: 07:38:24)

Snap Shot: Indicate that the power supply tripped to the OFF state.

Current Settings: BMDC = 0amps, Snake Magnet Current = 324.79amps.

Qdplots: Verify that the supply went to the off state at operating current.

Beam Loss Monitors: N/A

Quench Status: **REAL MAGNET QUENCH**

Reason: Operator Error, Power supply was given the OFF command while running at operating currents before being run down to zero amps.

Blue Snake bo3-snk7-1.4-ps (Snapshot Data Time: 07:38:24)

Snap Shot: Indicate that the power supply tripped to the OFF state.

Current Settings: Snake Magnet Current = 99.78amps.

Qdplots: Verify that the supply went to the off state at operating current.

Quench Status: **REAL MAGNET QUENCH**

Reason: Operator Error, see above.

Tech Notes: Snake Magnets were given the OFF command before running them down to zero currents for the end of the RHIC 2002 Polarized Proton Run.

***RHIC QLI – Power Supply / Diagnostic Reports for (p⁺ Run 2001 - 2002)
January-21 thru January-24***

Permit.3C-ps1) Snake Link Failure (Time: 07:38:26)

Friday, January 25, 2002:

→ **Yellow Snake yi3-snk7-2.3-ps (Snapshot Data Time: 07:38:26)**

Snap Shot: Indicate that the power supply tripped to the OFF state.

Current Settings: YMDC = 0amps, Snake Magnet Current = 325.58amps.

Qdplots: Verify that the supply went to the off state at operating current.

Beam Loss Monitors: N/A

Quench Status: REAL MAGNET QUENCH

Reason: Operator Error, Power supply was given the OFF command while running at operating currents before being run down to zero amps.

→ **Yellow Snake yi3-snk7-1.4-ps (Snapshot Data Time: 07:38:26)**

Snap Shot: Indicate that the power supply tripped to the OFF state.

Current Settings: Snake Magnet Current = 99.67amps.

Qdplots: Verify that the supply went to the off state at operating current.

Quench Status: REAL MAGNET QUENCH

Reason: Operator Error, see above.

Tech Notes: Snake Magnets were given the OFF command before running them down to zero currents for the end of the RHIC 2002 Polarized Proton Run.

End of the RHIC 2002 Polarized Proton Run !!!

Look forward to hearing about Great Discoveries from the Experimenters!