

RF Summary

- Fix Phase Detector-to-DSP data scramble
- More Voltage from Storage RF System
- Synchronized Ramps
- New Driver Amplifiers for Acceleration Cavities
- Precision Readbacks of Acceleration Voltage and Phase
- Operational Landau Cavities
- Improve Rebucketing with closed loop phase control
- Injection errors damping
- Coupled-bunch and bunch shape damping
 - *Second Priority*
- Discussion: Visitor from HERA wanted to know what DSP stood for.

Power Supplies

- Lots of Hardware plans (a few here):
 - hkps mods, QPA IGBT driver cards, QPA Controller Cards
 - Current regulator card relays, Loose K-Lock Connections Fix
 - High Precision Readbacks for dhx, dh0, qtrims and mains
- RHIC Power Supply Web Page
 - contains QLI analysis and p.s. trouble Log - please look at it.
 - <http://www.c-ad.bnl.gov/ceps/>
- Plot of P.S. Failure Hours, BNL Air Temperature, BNL Humidity on Y axis and Time on X-axis
 - Trend lines show failures go up as temp. & humidity go up
 - Trend lines show failures go down as temp. & humidity go down
 - **DO NOT RUN POWER SUPPLIES IN THE SUMMERTIME**

Cryogenic Systems

- DownTime
 - Cryo responsible for 100 hours of downtime
 - excellent considering system must run continuously
- Cryo System Upgrades
 - on site storage of entire liquid helium inventory
 - ability to maintain rings at 80k during shutdowns
- Weak Link
 - Turbo Expanders
 - Critical Process control upgrades are still required
- Discussion:
 - Will cryo PLC's still have to be reset during next run?
 - Yes, Occasionally

Quench Detection

- Maintenance to be Performed
 - existing quench detection chassis
 - voltage tap feedthroughs
- New Installs
 - Four New Quench Detection Chassis for Spin Rotators
- New Software
 - Develop new application to load different inductance tables
- Software Modifications
 - improve alarm messages, file descriptors
 - improve real quench test routines, and DX quench detection
- Discussion
 - Can we leave booster on during downramp? - yes
 - Can we go from Injection to Park faster? - yes

Controls

- Overall the RHIC Accelerator Controls Hardware is very Reliable
- Radiation is causing FEC, WFG and PLC Faults in the alcoves
- Legacy Controls Hardware are our main concerns
- Discussion:
 - Error checking has been added to wfg's
 - Concrete doors on certain alcoves was discussed
 - Estimates for buildings to replace alcoves was discussed
 - Are alcoves going to be safe?
 - Controls said their work list is too long

BPM

- BPM IFE Radiation Damage and Move to Alcoves
 - cable cost is higher than expected, about \$300k
 - IFE Failures are being correlated with BLM data - reduce move.
 - Investigating LHC plan of having power converter DSP's in tunnel and using 'error correction'
- TDR of all BPM Cryo cables has begun
 - checking for pin retraction
 - broken warm solder joints
- Discussion:
 - **WHAT WILL BE DONE ABOUT THE SEDATA CARDS?? NO CONCLUSION WAS DRAWN AT THE RETREAT AND THIS SOUNDS LIKE IT MUST BE RESOLVED. WHO WILL DO THIS?**
 - Moving the electronics to the alcoves will not solve the radiation problem because the radiation will just get worse

Vacuum

- **Fast Pressure Rise Occurred at Injection and ramping**
 - Most vacuum BPL interlocks were caused by Fast Pressure rises
 - Randomly occurred at baked and non-baked regions
 - Solid evidence of Beam Loss inducing Fast Pressure Rise
- **Slow Pressure Increase with Beam intensity**
 - Much less or none at baked sections
 - e-cloud and ion desorption
- **Hardware Plans**
 - Will bake about 24 of 55 warm vacuum sections
 - 30% of warm bore sections can't be baked easily or at all
 - Condition all TSP's to ride out Fast Pressure Rise
 - Install electron detectors and solenoids to study e-cloud
 - Change PLC Time Delay and increase set point levels?

Overview and some definitions talk

1. Vadim said if we don't change anything in the machine and you turn it on again, it does reproduce.
2. John Morris asked the question "Do we ever turn the machine back on and have it reproduce or does it never reproduce?"
3. Mike Brennan says reproducibility does not equal reliability.
4. Angelika said there would be no volunteers for the reliability czar.
5. Dan said there should be a reliability czar and one thing he should do is calculate MTBF. Dan said he is ashamed and would never buy a SunCraft product.
6. Don Barton asks if we need a reference magnet.
7. Guryn (ppTopp Experiment) said even if nothing changes the machine does not come back.
8. Waldo said the machine does not need a reference magnet if you don't change anything.
9. Visitor from HERA says you need reference magnet even if nothing changes.
10. Dan says we need reference magnets.
11. Mike Brennan says reference magnet need not be in series with other magnets in main ring.
12. Phil Pile wants to know what the reference magnet buys you

Reliability of Tune/Chromaticity Orbit talk

1. Visitor from Hera asks “Is there no control of the tunes?” “Do the tunes drift?”. He said they use human feedback at HERA for the tunes.
2. Todd and Waldo said the working PLL would help with this problem.
3. Pete Cameron said the tunes drift at Injection.
4. Todd said it would be nice to have reference magnets because of the persistent current problem but it is not a killer.
5. Dan said there is 2 units of chromaticity change 0.4A to 0.5A but I don’t remember what he was referring to.
6. Angelika says it would be nice to have Luminosity feedback.
7. The Hear Visitor said that RHIC has slow tools to adjust orbits.
8. Thomas said RHIC has 4 IR’s vs 2 in HERA.
9. Waldo said we need real knobs.
10. Todd said we don’t adjust the steering that much but the chromaticity is much worse. The blue and yellow set tunes are very different, not the chromaticity.
11. Fulvia said we could not count on the ramps.
12. Dan asked if we will ever understand the difference between the measured and the model. Dan said that Johannes has some bugs because the first year we hit the correct tunes to the 3rd digit. The second year the tunes were off by 2 units.
13. Todd said the persistent currents at injection are a problem.
14. The visitor from HEAR said that at HERA they were able to calculate the chromaticity from the reference magnets
15. Waldo said the proton ramp was better because they kept everything constant.
16. Waldo said the sextupole magnets are being run at too low a current.
17. Dan said we should have control of the experimenters magnets.

Reliability of Schedule talk

1. Fulvia said we were supposed to have 12hrs/week of machine studies originally.
2. Angelika showed what the machine efficiency was.
3. Guryn (ppTopp Experiment) says the downramp belongs to machine development.
4. Angelika's "LAST RUN" slide said, we had too many meetings, daily changes of schedule too much, expectations were not realistic, we did not know experiment strategy in advance, much more, good slide.
5. Bill Christie (STAR) did not know what machine physicists wanted to know but now he does so he will write a plan.
6. Representative of Phoenix (I think he was from Phoenix) said they were not hiding anything from machine physicists.
7. Phil Pile said we make weekly plans now and don't do it well.
8. Phil Pile said the voting scheme may be changed. Tom Kirk may get involved.
9. Waldo said when the 9AM meeting would be over the plan would change right away.
10. Phil Pile said we had daily meetings due to hardware failures. He also said the guy in control of the shift would do his own thing and forget about the plan.
11. We lacked direct contact between the experiments and machine physicists.
12. Fulvia said the weekly schedules are a good idea but we need another meeting for the machine physics and beam experiments.
13. Phil Pile wants to keep Wednesday meeting to decide physics.

Correlations in FY01 Statistics

1. More physics after machine studies occurred.
2. Todd, we can reach 40% mark.
3. Longer maintenance the less time to restore program.
4. Weekends – failure times are longer because you need to call people in.
5. Thomas said we have a good operations crew since more physics got doen with operations crew than the physicists
6. Mike Brennan said there are less trouble reports generated for RHIC than the injectors.
7. Tony (from phoenix?) sai we should look at context switching vs non context switching.
8. Carl said that the setup time was a long time.

RF talk

The visitor from HERA wanted to know what “DSP” stood for

Power Supplies talk

Waldo wanted to know if the power supply group forgot anything.

Cryo talk

1. Cryo attributed for 100Hrs of total downtime, this does not include the insulating vacuum problems.
2. Paul Sampson wanted to know if the cryo PLC's will still have to be reset during the next run.
3. Gerry Bunce wanted to know if we could keep re-cooler on to keep us cold between runs instead of keeping the compressor on?. Tony said it was not meant for that purpose but this could be looked into.
4. George Ganetis wanted to know if the I/O racks around the dump system had problems and Tony said yes.

Quench Detection talk

1. We must get the status of the UPS's to the controls system. This will tell us if they failed.
2. There is a problem with crosstalk between the q89 (or tq) power supplies 4-20mA readback with the dhx power supplies 4-20mA readback, this must be looked at.
3. Thomas asked if we could turn the booster ON during the downramp or up ramp, I am not sure which he asked about.
4. Don Barton asked if new ceramic insulators would last longer, George said he is putting a new design in.
5. Paul Sampson asked about k-locks. Georeg said we are putting a conductive paste on them and Wing is looking at putting a filter on them to make them less sensitive.
6. Mike Brennan asked if we could go from Injection down to park faster. George said yes.
7. Dan wanted George to tell him how to split up sextupoles.
8. Visitor from HERA asked if we ever had spontaneous quenches and George said NO.
9. Angelika asked if she could get information on when dirty dumps caused quenches. She should look at web page.
10. Mei Bai and George discussed BLM's and whether they helped determining what caused a quench. George said when the BLM's were enabled they helped but there was a problem sometimes when they did not work if a single bunch quenched a snake magnet

Controls talk

1. Mike Brennan asked a question about wfg problems and AL said he added error checking to wfg's.
2. Waldo had a question about radiation detected by chipmunks controls group was using. Brian showed some slides about this and Jon Sandberg said they were looking into putting concrete doors on alcoves.
3. John Morris asked if the alcoves are going to be safe.
4. Jon Sandberg said they are getting estimates for putting buildings on top of the tunnel to replace the alcoves.
5. Dan said the controls people will have more work coming up with the solenoid p.s.'s.
6. Don Barton said his list is too long already.

BPM talk

1. Waldo said the BPM cables are inside the cold mass so the guys working in the tunnel now have to be careful not to damage them.
2. Rob Michnoff asked if we should move BPM stuff to alcoves.
3. Waldo said if we don't solve radiation problem the alcoves will just get worse.
4. Dan said the intensity must go up by 2 times.
5. Dana asked if we have identified the machine components sector 3 causing problems – the answer was no.
6. Al Marusic said the FEC's have had a high failure rate due to the SEDATA cards. He said the SEDATA cards should not be used in the control system!!!!
7. Dan said the way the Instrumentation group deals with the SEDATA card problem is that a guy lives with the pager on and he gets a call whenever there is a problem and then he fixes it.
8. Mike Brennan asked what the cost of fixing the SEDATA cards was, Pete said that this was unknown now.
9. Larry asked about the reliability of the BPM FEC's.
10. IF ANYTHING COMES OUT OF THIS RETREAT WE SHOULD DETERMINE WHAT TO DO ABOUT THE SEDATA CARDS!!!!

Vacuum talk

1. Dan asked if they could change vacuum data so there is no longer a 10 second delay. Roger Lee said only if it goes into the MADDC's
2. Dan asked if the solenoids were being installed at 12:00 and 2:00, Dick said yes

Reliability of Machine Physics talk

1. Steve made a matrix. Top row had Closed orbit, Tune, Coupling and Chromaticity. The first column had typical, required ramp, required transition, and required store. He assigned colors to each cell in the matrix. The colors represented what needed work. He asked the audience if they agreed. It seemed like chromaticity needed the most work.
2. Waldo said that longitudinal emittance was not on the matrix.
3. Steve Tepikian said for the store to be reliable these things in the matrix must be reliable.
4. Dan said the variations in tune during the Gold run were due to the Gamma-T. Christoph said it was not that much.
5. Herman said the qloop was not needed at SPS. LEP did not need it and then they found out later on they did.