

# Weekly Report for 06/02/2014

## Highlights

- Served on SSRL DOE Triennial Review committee. (Kathy Harkay)

## APS Renewal and Upgrade

- Summarized MBA injection design. Presented results at the AOP group meeting. (Aimin Xiao)

## MCR Operations

### Storage Ring Operations

- Problem with SR SCR request files including non-existing blade PVs for the 35DI GRID boms. Fixed by regenerating said file. (Louis Emery)
- We had a severe problem with NaN values in setpoint feedforward during studies. Spent some time understanding this, and eventually fixed by rebooting a xray bpm ioc. (Louis Emery)
- Problem with elevated rms noise: removed S37B:P2:y from RTFB to reduce corrector error power. (Louis Emery)
- Analyzed a beam dump: probably due to a rf phase oscillation, since we see a triangular wave perturbation in x on all boms with fundamental frequency 360 Hz. (Louis Emery)
- Another beam dump. Could be a faulty BPLD (S31A:P1), so we'll wait and see. (Louis Emery)
- SCR investigations: From strange coupling occurring after a beam dump in operations, found a problem with having unintentionally left some QS4 on from some studies. Reconstructed the series of events and fixed the UBOP SCR file. (Louis Emery)
- Assisted the MCR with turning beam over to Users. (Karen Schroeder)
- Removed BPMs from orbit control which appeared to be affecting the orbit. (Karen Schroeder)
- Assisted MCR, both during the day and on off-shifts, with determining whether or not additional steps needed to be taken when a PEM did not behave as expected. (Karen Schroeder)
- Assisted MCR with recovery from beam losses (Karen Schroeder)
- Investigated beam losses to determine cause. Contacted SR manager if loss cause was not apparent. (Karen Schroeder)
- Measured the LHe pressure fall time when SCU0 main coil current is zero, both with and without beam. The fall times have increased by a factor of compared with last run, before the cryocoolers were serviced. The fall rate (main coil current zero) is 2.0 Torr/hr with 100 mA, 24 bunches and 7.6 Torr/hr with no beam. Prior to service, the rates were 3.1 Torr/hr and 8.6 Torr/hr, respectively. The 4-K cryocoolers have lost about 80 mW of capacity. (Kathy Harkay)
- Updated instruction for P1 offset measurement (Aimin Xiao)

### MCR Operations administrative/misc.

- Attended OPS Directorate for Flood and gave input on long-range schedule changes, steering request web page, etc. (Karen Schroeder)
- Generated Downtime report and presented, or gave to Flood to present, to OPS Directorate. (Karen Schroeder)
- Changed the 2014-2 run and 2014-3 on scheduling tool to reflect the shortened shutdown, modified

the files generated by Hammond so that they files could be posted on the web by the webmaster (Karen Schroeder)

- Updated the 2015-1 and 2015-2 schedule in the scheduling tool. (Karen Schroeder)
- Led daily 4 o'clock meetings in the MCR. (Karen Schroeder)
- Reviewed and approved non-RSS SR work requests, as well as a few RSS and non-SR requests when appropriate AOP personnel were unavailable. (Karen Schroeder)
- Reviewed and approved P.S. Swap-out Procedure. (Karen Schroeder)
- Reviewed other updated procedures for SR/F.C. duties and entered those appropriate into the Operator's Required reading (Karen Schroeder)

## APS Machine Studies

### Storage Ring Studies

- Analyzing some RTFB data from machine studies. Presented results to meeting. (Louis Emery)
- Attempted to do gap scans on 06/03 to restore X-ray bpms which were removed because the beamlines were steered. A problem with 24IDs prevented the scans from being completed. (Karen Schroeder)
- Successfully completed gap scans for both default A & B sets on 06/10 with Hahne and Sereno monitoring. Restored X-ray bpms to the orbit configuration if they were in spec after the steering. (Karen Schroeder)
- Assisted the MCR with non-beam studies when number of available personnel was limited. (Karen Schroeder)
- Assisted the MCR with recovery after accesses during machine studies. (Karen Schroeder)
- Updated the studies schedule with last minute changes. (Karen Schroeder)
- Completed ISM questionnaire (Karen Schroeder)
- Worked with B. Diery and M. Smith on debugging IEX control software and PS fault. (Aimin Xiao)

### ITS Studies

- Continued with PC Gun commissioning. (Jeff Dooling)
- Took quantum efficiency measurements; (Jeff Dooling)
- wrote script to calculate rms beam size from frame grabber data. (Jeff Dooling)
- Received instructions from S. Shoaf on how to use the built in functions found in the MAC-based frame grabbers (LFGs). (Jeff Dooling)
- Want to find which frame grabber is accurately reflecting beam size; the MV200 shows more in the wings but saturates earlier than the LFGs. (Jeff Dooling)

## APS Machine Research and Development

### Storage Ring Research and Development

- Gave monthly progress report on skew quadrupole to R. Torres. (Louis Emery)
- Discussed with Sereno RTFB correction. Learned from Sereno the corrector weighting formulation due to Carwardine. However, I don't think that weighting correctors will improve orbit correction. We resolved how best to implement this in sddspseudoinverse. Specified how to collect scalar PVs with MBA R&D DAQ system. (Louis Emery)
- Reviewed windowing for FFT to explain the bulge in SR dipole corrector PSD near DC that others took. (Louis Emery)
- Recollected the suite of impedance coupling measurements from the early 90s to Borland. (Louis Emery)
- Worked with M. Smith on IEX future control develop plan. (Aimin Xiao)
- Prepare IEX run at 400 eV@circular mode. Calculated lh/lv based on the magnet measurement results. Generate temp IEX correction table. (Aimin Xiao)

## Other Research and Development

- Electron cloud R&D: Found a paper by Padmore et al in which measured total photoemission yield is compared with theory by Fraser. A practical formula was found (for same theory) in another paper by Tremsin and Siegmund. Applied the theory to L. Boon's measurements and it gives reasonable agreement. Most importantly, it gives a QE that drops towards zero for angles less than 3 deg, which is very promising. Suggested that L. Boon apply these fits to her data and generate an effective QE for the entire data set for the aluminum chambers. (Kathy Harkay)

## APS Machine Software

### AOP Applications Software

- We had a severe problem with NaN values either in EPICS or in data files, which prevented studies in RTFB, and risking operations the following day. I wrote some debugging and printout statements in sddscontrollaw to help determine which EPICS PVs had the apparent problem. Shang eventually cleaned up the modifications later. (Louis Emery)

### Storage Ring

- changed gap full scan subdirectory to gapScanFull, and brief scan subdirectory to gapScanBrief for both daily and archive directory. (Hairong Shang)
- updated the usage message of getxytunes. (Hairong Shang)
- continue tested tune and HOM measurement with MXA with CY, the tune measurement with MXA-VSA worked fine as long as VSA works. But MXA setup for HOM seemed not correcty, the resolution was too low, Kathy wants higher resolution as in VSA. CY was investigating it. (Hairong Shang)
- added option for taking SA waveform data of MXA (when measTune is set to zero) to getVXATraceData. (Hairong Shang)
- ID35 blades PVs no longer exist, this caused the gap scan scripts and pem bumped. Therefore updated makeGapScanMonitorFile to ID35 xray bpm blades pvs, updated the gap scan monitor files. And removed ID35 from feedback forward table. (Hairong Shang)

### Injectors

- made dl/I and dl buttons in BRampControlAutoCorrection work for IRamp. -- However, the dl/I for

SD IRamp did not look correct which was too big, but the RMS value was good (very small) -- debugged and found that SD-I in the reference file is different from SD current waveform, was not updated when SD current waveform was updated. -- fixed the problem after updated SD-I in the reference file. (Hairong Shang)

## General

- added "ASDOPS workspace setup" to Miscellaneous menu in OAGapps application and OAGapps gnome menu. (Hairong Shang)
- worked with CY on how to generate chirp signal with MXA -- wrote matlab code to read I/Q data from SDDS file and write them into mat file which can be directly loaded into MXA scope analyzer. Helped CY generated chirp drive signal. (Hairong Shang)

## Meetings, workshops, conferences, committees, LMS related, and reviews

- Attended shutdown planning close-out meeting for the April/May shutdown. (Karen Schroeder)
- Attended planning meeting for the SR accesses during the 6/17 maintenance period. (Karen Schroeder)
- Served on SSRL DOE Triennial Review committee. (Kathy Harkay)
- Participated in ASRC meeting of the ATLAS facility in Physics Bldg. 203. (Jeff Dooling)
- Physics does many of their own critical lifts without involving riggers. (Jeff Dooling)
- Attended AWA Outreach phone-in using ReadTalk, discussing possible uses for the AWA. R. Fiorito (UMD) has post-doc working on a quad-scan measurement technique that includes space charge. (Jeff Dooling)

## Safety and Required Training

- Entered answers (some probably "wrong") to ISM questionnaire. (Louis Emery)
- Took ESH700 radiological worker training. (Louis Emery)
- Successfully completed the following on-line training classes: Incident Command System (ICS) and Area Emergency Supervisor (Karen Schroeder)

## Miscellaneous

- Read references on Landau damping for inclusion in Borland's JSR paper. (Louis Emery)
- Gave tour of MCR and how OAG does things in MCR to Stuart Henderson of APS-U. (Louis Emery)
- As usual, prepared machine study schedule for next week. (Aimin Xiao)
- Read Piwinski's and Huang's paper on IBS effects. Found out 2 errors inside Huang's paper. (Aimin Xiao)
- Continue the PRSTAB paper review. (Aimin Xiao)
- took two training courses. (Hairong Shang)