

Weekly Report for 06/22/2015

APS Renewal and Upgrade

- Continued MBA stability simulations for the "newest" vacuum design at various chromaticities. (Ryan Lindberg)
- Attended injector working group meeting. (Jeff Dooling)
- Fixed a bug inside elegant floor coordinates calculation. (Aimin Xiao)
- Started shot-to-shot injection simulation with HHC and mismatched injection beam. (Aimin Xiao)
- Prepared presentation for CD1 director review. (Aimin Xiao)

MCR Operations

Storage Ring Operations

- Assisted MCR with turning beam over to Users after studies. (Karen Schroeder)
- Investigated beam motion/orbit errors reported by MCR and removed/replaced BPMs. (Karen Schroeder)
- Discussed with Louis and Karen on how to reset CPU and IEX hardware to limit the possibility of dumping the stored beam. Conclusion: increase RTFB trip limits. Stop topup running. (Aimin Xiao)

Linac Operations

- In the last two weeks of operation, Linac klystron (L2) appears to be producing more noise than its adjoining rf system. This was noted during beam transport when L1:P1 and L2:P1 - P4 bpm's started dropping out. As a result the control-laws for linac steering and beam phase could not be used. We were forced to increase the vmin level for bpm operation. (Stan Pasky)
- Informed the rf group on 6/29 that L2 is producing higher than normal levels of noise in the klystron gallery thus interfering with linac diagnostic indications. (Stan Pasky)
- On July 3rd, L2:MO1 tripped on HV Supply Ovid. Operator switched to our backup klystron L3 until repairs could be made. Repairs were delayed until July 6th that resulted in replacing a solid state PFN switch. The original switch was found to have carbon tracks on wire insulation which indicated arcing. (Stan Pasky)

MCR Operations administrative/misc.

- Attended weekly OPS Directorate meeting, produced downtime reports for the same. (Karen Schroeder)
- As it stands we have many Predictive Analytics tools that are in use for our injectors, for example - Acquire Linac Waveform tool under OAG... Operators collect data once a day for Linac Integrated Current Monitors, Forward and Reflected RF Wave Forms on our rfguns and RFGun Kicker One and Two waveforms. We also sensitize our alarm handlers to inform use of any changes from the norm. With that said - any detected change in the waveforms, temperature or flows, RM&D's are written to the appropriate support group. If the detected change is a result of ageing or a possible faulty component(s). This can be addressed during Machine or Injector Studies Periods rather than waiting for the equipment fail which could result in down time to our Users. (Stan Pasky)
- Point in case - L2:WS1 water station has been producing low flow alarms for the last two weeks, it should be noted that this alarm is well above the actual trip point. An actual trip would have disabled LLRF for RF system two until repairs could be completed. This issue with L2:WS1 will be addressed during the Injector Studies Period thus avoiding possible down time. (Stan Pasky)

APS Machine Studies

Storage Ring Studies

- Produced non-beam when Flood was on vacation and beam-related portion of the machine studies schedule. Updated as necessary. (Karen Schroeder)
- Performed gap scans for to update ID gap feedforward tables. (Karen Schroeder)
- Conducted abort kicker radiation study with K. Harkay and J. Vacca. (Jeff Dooling)
- Performed orbit switch from 24 to Hybrid. (Aimin Xiao)
- Reviewed BPM offset measurement result. (Aimin Xiao)

APS Machine Research and Development

Storage Ring Research and Development

- Found some inconsistencies and unphysical wakefields when reviewing the APS impedance model - specifically some transverse (quadrupolar) wakefields. Begun re-doing the wakefield calculations using the method I use for the MBA to make further comparisons to experiment. (Ryan Lindberg)

Linac Research and Development

- Analyzed laser diode data collected in May at Fermilab. (Jeff Dooling)
- Found that the variation in slope efficiency for two separate power measurements can be explained by the difference in distance between diode and meter for the two data sets. (Jeff Dooling)
- The result means that replacing the present diode set with spares is unnecessary. (Jeff Dooling)

APS Machine Software

AOP Applications Software

- Updated PVmonitor with a button to silence it for 15 minutes. (Robert Soliday)
- Updated sddsEditNew to increase the file limit that causes the popup warning. Also put parameters and columns into a paned window so that the parameter pane can be expanded to view more parameters at one time. Also renamed it to sddsedit. (Robert Soliday)
- Updated OAGAnalogCheck, OAGMBSCheck and OAGLBSCheck to include all the PC1 power supplies. (Robert Soliday)
- Updated various Tcl scripts to use the ttk widget set. This was done to give them a more modern look and make them better match the desktop theme. These scripts include DataLoggerViewer, sddsedit, SaveCompareRestore, SearchDataLoggers, CheckDataLoggers, ReviewAlarmLog, and mpsDumpReview. (Robert Soliday)

Storage Ring

- Updated APSCalibrateDCPS by adding support for canted undulators, trim supplies and A:QS4 supplies. (Robert Soliday)
- Updated the SR-DCPS by adding the QS4 category. (Robert Soliday)
- Updated mpsDumpReview because an empty dumpRecord.snap.gz file caused the program to

crash instead of giving a useful error message. (Robert Soliday)

- Updated APSMpSRUpDownDoubleSector so that when setting the vertical canted undulator power supplies to 0, it uses the SFB PVs. (Robert Soliday)
- Updated mpsDumpReview by changing the RF scope data plots based on Tim Berenc's suggestions. (Robert Soliday)
- Updated SRSetDefaultLattice to fix a problem that could occur if the default file link is missing. (Robert Soliday)
- Updated APSMpSRUpDownDoubleSector so that the skew quads are degaussed instead of just turned on and set to the final value. (Robert Soliday)
- Updated SR-DCPS.tcl so that the skew quads can be configured from this script for degaussing. (Robert Soliday)
- Updated makeSBPMReqFile to include the GRID-XBPM PVs. (Robert Soliday)
- Updated SiteSpecificSCR.tcl script to add the SRXrayBPMWaveform system. (Robert Soliday)

Injectors

- Added PG1 specific mode switch machine procedures. (Robert Soliday)
- Updated APSMpBRFTurnOn.tcl by increasing the pause time when checking the injection power. (Robert Soliday)
- Updated PG1_ModeSwitch.tcl by adding a missing step at the end of the switch to normal mode for beamline conditioning. (Robert Soliday)
- Added the APSMpBPSTurnOffPulsedSupplies machine procedure. (Robert Soliday)
- Updated various machine procedures after testing the PCGUN startup procedure. (Robert Soliday)
- Updated APSMpPARTurnOn.tcl by adding a step to reset the fault status on the power control. (Robert Soliday)
- Updated LMOCS_TurnOn.tcl because L1 now has a 500W RF amp. (Robert Soliday)

General

- Updated wfm2sdds to add Textronix WFM version 3 support. Also added support for all possible WFM data types. (Robert Soliday)
- Added APSTmpDir Tcl procedure, which will return the native path for the temp directory on all operating systems. This was particularly a problem on Windows. (Robert Soliday)
- Updated the APSSaveDialog procedure to use the tk_getSaveFile widget. (Robert Soliday)
- Updated APSSendEMail to fix a problem on linux. (Robert Soliday)
- Updated APSSstandardSetup to load our ca, os and sdds packages directly instead of using the package require command. This speeds up starting new applications. (Robert Soliday)
- Updated collectFPGABpmHistory to cleanup all the files in the temp directory. (Robert Soliday)

- Updated sddsmatrixop by adding support for the Intel MKL library. (Robert Soliday)
- Fixed a bug in sddsbreak when using -rowlimit=<num>,overlap=<num> (Robert Soliday)
- Fixed a bug in sddstranspose when copying the parameters from the input file. (Robert Soliday)
- Fixed a bug in sdds2dinterpolate when using the -vertex or -npoints options. (Robert Soliday)
- Updated APSMultipleChoice to limit the question prompt to 2000 characters. (Robert Soliday)
- Added the 19ID data logger. (Robert Soliday)
- Wrote tdms2sdds to convert National Instruments TDMS files to SDDS. (Robert Soliday)
- Fixed sddsplot bug when using the files qualifier with the -stagger option. (Robert Soliday)

IOC/EPICS/Controls/Linux/Solaris/Linux Clusters/Data Loggers/Simulation software

- Updated PSSGlobalWatchdog fault descriptions. (Robert Soliday)
- Fixed DataLoggerViewer when locating old converted data logger data for PVs that started with lowercase letters. Added filters for User Operations mode and for ASD Studies mode. (Robert Soliday)
- Updated various data loggers. (Robert Soliday)
- Added cronjob to create SCU1 auto saved plots. (Robert Soliday)
- Updated checkDataLoggers so that it doesn't flag the SRDCPS 100Hz data loggers during maintenance. (Robert Soliday)
- Fixed sddsglitchlogger problem starting a new page after calling SDDS_ReconnectFile. (Robert Soliday)
- Updated DataLoggerViewer by adding the ability to export the data as comma separated values. (Robert Soliday)
- Updated PSSGlobalWatchdog so that EPS faults and warnings pause for an hour if they repeat too often. (Robert Soliday)
- Installed new lustre nodes on the linux cluster and added a second head node. (Robert Soliday)
- Created new SCU1 data logger. (Robert Soliday)
- Fixed cppatch on linux cluster because of changes after head node upgrade. (Robert Soliday)
- Created the MM1 data logger. (Robert Soliday)
- Updated DataLoggerViewer by adding the ability to save the current plot setup as a custom plot similar to a preset plot. (Robert Soliday)
- Updated elegantRingAnalysis to convert /head2/home and /head/home paths to /home. This was causing problems on the linux cluster. (Robert Soliday)

Publications, papers and report

- Posted some old work on noise in seeded FELs as a technical note so that it can be properly

referenced. (Ryan Lindberg)

- The article co-authored with K. Harkay and Y. Ivanyushenkov entitled, "Fast Beam Loss Diagnostic to Quantify Charge Deposition in APS Superconducting Undulators" was published in the ICFA Beam Dynamics Newsletter, <http://www-bd.fnal.gov/icfabd/Newsletter66.pdf> (Jeff Dooling)

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

- Reviewed a paper for Optics Express. (Ryan Lindberg)

Miscellaneous

- Corrected Frausto's Storage-Ring written qualification test and discussed same with him. (Karen Schroeder)
- Coordinated correcting a problem with the statistics which had been reported by the P.S. Group. Later made changes to file used by cron job to switch the Desired Mode PV from User Operations to Machine Studies since Flood was on vacation. (Karen Schroeder)
- Helped David Pavel (Univ of Guanajuato, Mexico) with installing elegant on OSX. (Robert Soliday)
- Wrote Blues Queue Android app. (Robert Soliday)
- Helped Ender Akdogan (Ankara Univ, Turkey) with Elegant on Windows. (Robert Soliday)
- Updated APS Status Android app. (Robert Soliday)
- On Annual Leave Wednesday through Friday. (Jeff Dooling)
- Produced the Injector Studies Schedule for July 7th - July 21st... (Stan Pasky)
- Took 1.5 days vacation off. (Aimin Xiao)