

APS/Users Monthly Operations Meeting

B. Stephenson
August 29, 2012

Agenda

- APS Update – Brian Stephenson
 - News
 - Safety
 - Science Highlights
 - Operations
 - Budget Outlook
 - Upcoming Activities
- APS Upgrade Update – Jim Kerby
- 7-BM is Open for Business, Officially! – Jin Wang



2012 Neutron X-ray Scattering School

August 12-24, 2012, at Argonne and Oak Ridge National Labs



- 63 graduate students from 51 universities and 1 industrial lab
- Received 29 lectures on x-ray/neutron scattering, optics, detectors, and specific techniques in mornings, did experiments in the afternoons
- Students performed experiments on 23 different APS beamlines with the help of ~50 CAT and APS staff
- Training future generation of users, $\geq 75\%$ of students continue to use facilities post-graduation.



Jim Murphy appointed to lead DOE/BES/SUF effective August 26

Degrees from Penn State, Wisconsin-Madison and Dartmouth

at NSLS from postdoc to Senior Scientist

Deputy Department Chairman overseeing Accelerators & Operations

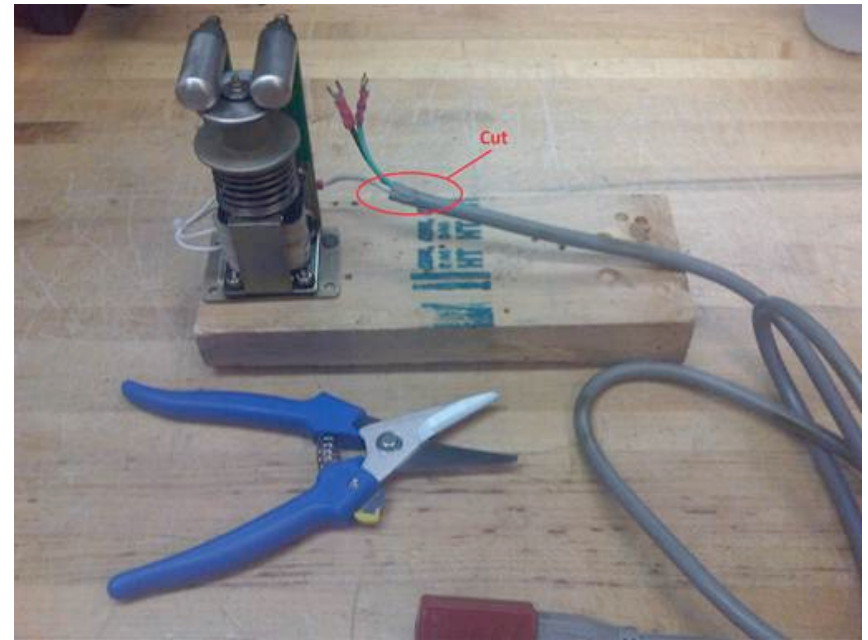
Led NSLS-II accelerator design team through CD-0

Research on physics of high brightness beams and free electron lasers, design of novel low momentum compaction storage rings, the understanding of coherent synchrotron radiation wakefields, and the physics of high gain free electron lasers

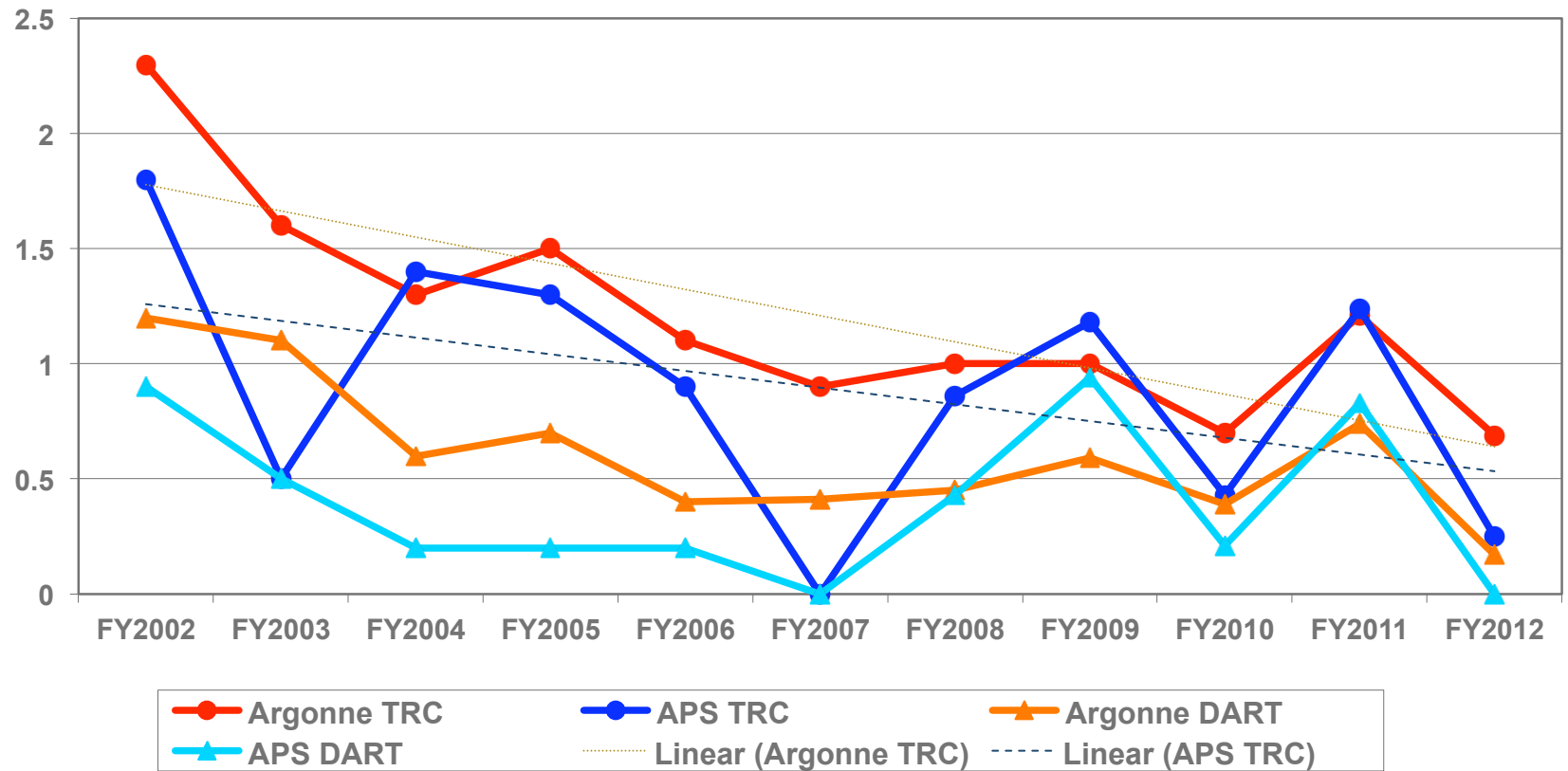


Recent APS Injury

- Employee preparing AC cable
- Had to remove additional outer insulation to free up inner wires
- Used new pair of specialty shears to slit insulation sheath along length
- Cut towards hand holding cable
- Shears cut quicker than expected and hit worker's right thumb
- Cut took seven stitches to close
- Always cut away from body & fingers



APS TRC & DART Rates (Estimated thru August 2012)



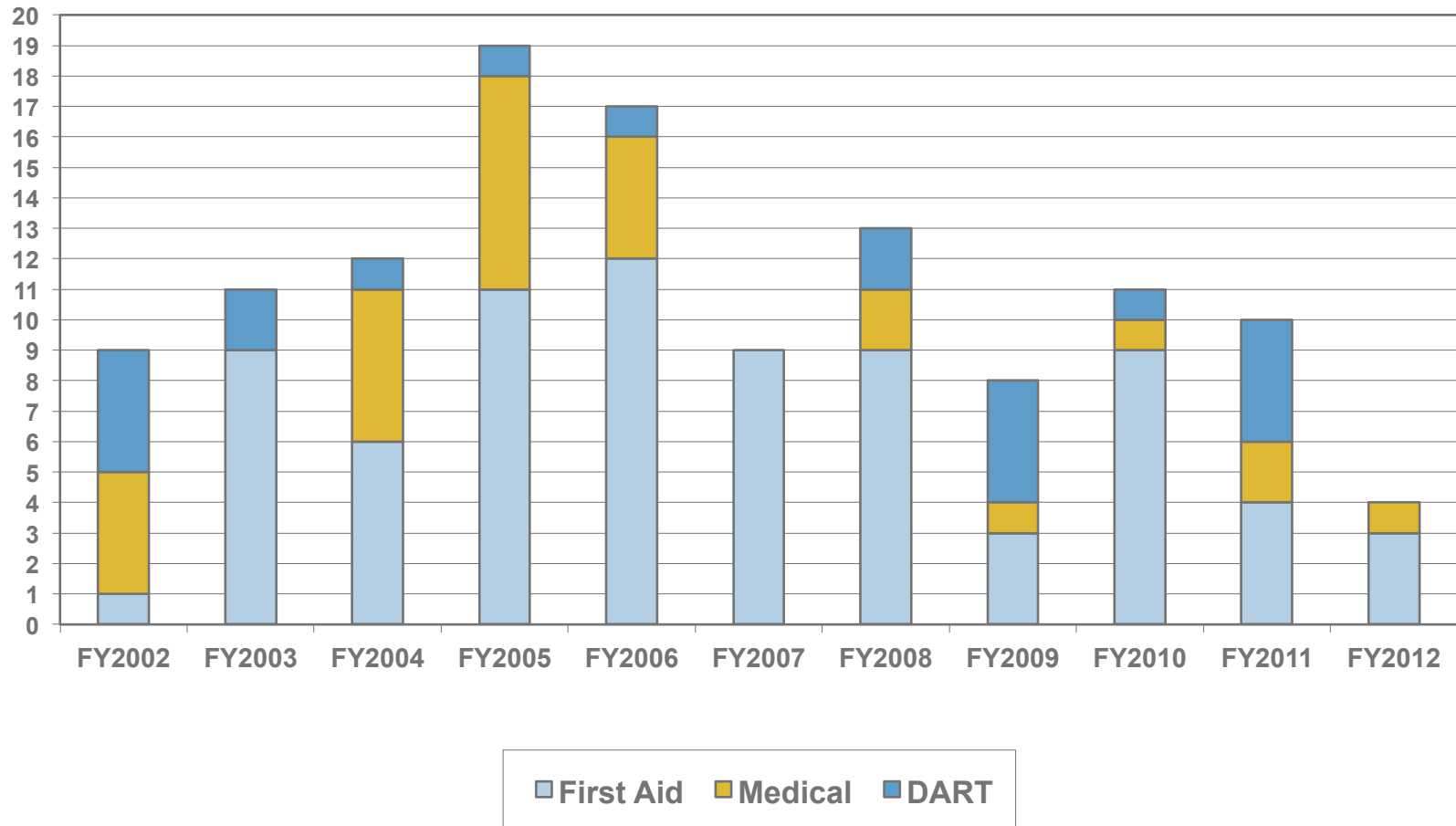
TRC = Total OSHA Recordable Case Rate per 200,000 Hours Worked

DART = Days Away, Restricted Duty, or Job Transfer Case Rate per 200,000 Hours Worked

FY2002-4 APS Divs. FY2005-8 SUF (APS Divs.+ IPNS) FY2009-12 PSC (APS Divs. Only)



APS - Total Injuries + Number in Each Category



FY2002-4 APS Divs.

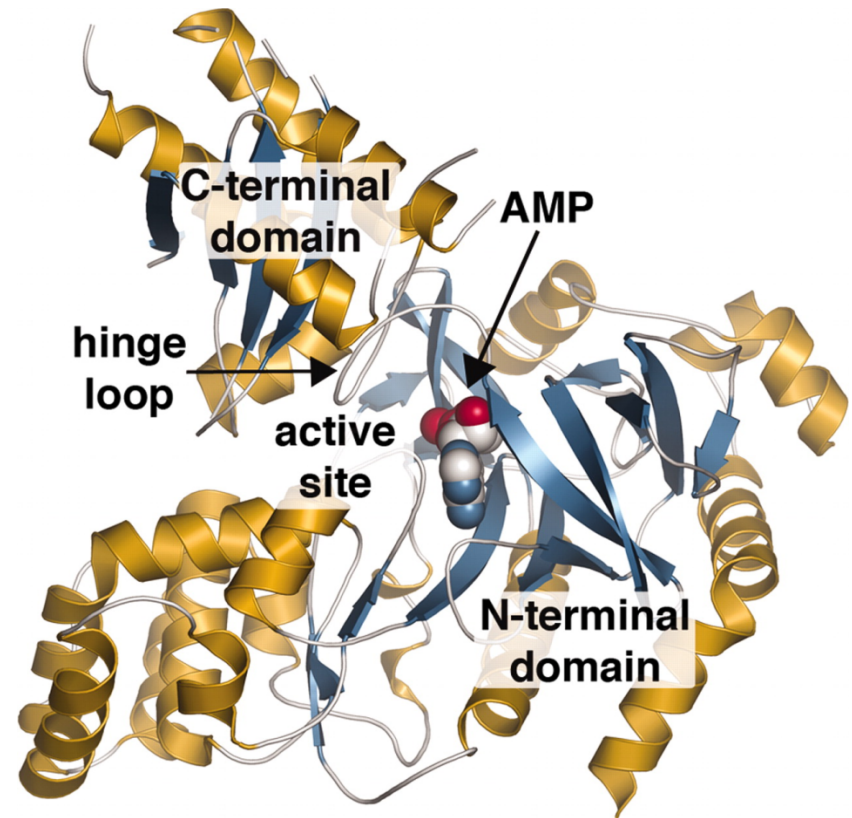
FY2005-8 SUF (APS Divs.+ IPNS)

FY2009-12 PSC (APS Divs. Only)



Plants' Rapid Response System Revealed

- A cross-Atlantic collaboration working the SBC-CAT 19-ID x-ray beamline at the U.S. Department of Energy Office of Science's Advanced Photon Source at Argonne National Laboratory and at the ESRF has revealed the workings of a switch that activates plant hormones, tags them for storage, or marks them for destruction
- The research is relevant not just to the design of herbicides but also to genetic modification of plants to suit more extreme growing conditions due to climate change



Ribbon diagram of overall structure of AtGH3 protein.
From C.S. Westfall et al., *Science* **336**, 1708 (2012).

C.S. Westfall, J. Herrmann, & J.M. Jez (Washington Univ.); C. Zubieta & U. Kapp (European Synchrotron Radiation Facility); M.H. Nanao (European Molecular Biology Laboratory & UJF-EMBL-CNRS)

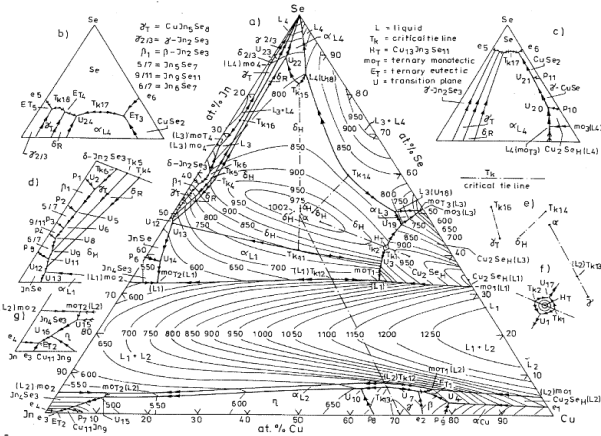
C.S. Westfall et al., [Science](https://doi.org/10.1126/science.1221863) **336**, 1708 (29 June 2012). DOI: 10.1126/science.1221863



DOW POWERHOUSE™ Solar Shingles: Reinventing the Roof

- In situ x-ray diffraction / differential scanning calorimetry studies by researchers from Dow Chemical using the DND-CAT beamlines at APS were used to investigate process / structure / property relationships in CuInGaSe materials (the active material in the first 'solar shingles').

Se



In Cu

Research at APS (2007-2009)



Opening 2013

Will employ 1200 people by 2015



Phases, Kinetics,
Processing

Manufacturing

Solar power that isn't on
the roof, but IS the roof!

B. Landes, S. Rozeveld, B. Kern, B. Nichols,
and J. Gerbi (Dow Chemical Co.)

POWERHOUSE™
DOW SOLAR

Advanced Photon Source, Argonne National Laboratory

Record Machine Performance

Run 2011-3: MTBF 220 hours (7 faults), 99.6% available
Run 2012-1: MTBF 287 hours (6 faults), 99.7% available
Run 2012-2: MTBF 142 hours (12 faults), 98.9% available

Argonne Today



Daily Newsletter for Argonne Employees

March 1, 2012

SAFETY FOCAL POINT

PPE Road Show

INSIDE ARGONNE

- Community
- Cost Savings Ideas
- Event Calendar
- Freecycle@Work
- Green Lab Initiative
- Job Board
- Safety
- Travel

FOOD

- 213 Cafe
- 401 Grill
- Guest House



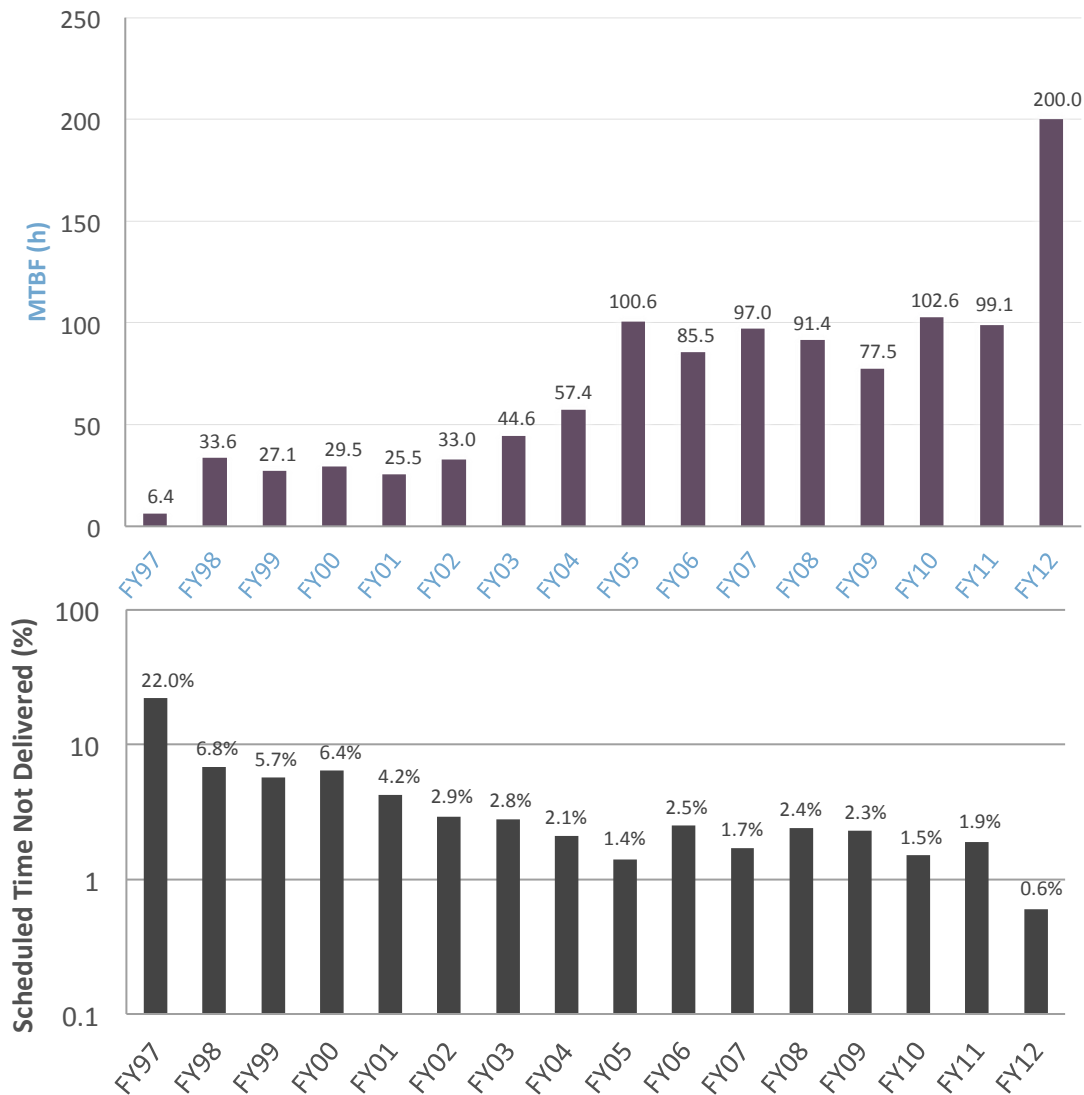
Record-setting run at APS

The recently completed user-beam run at Argonne's Advanced Photon Source set a new record for machine availability and reliability.

[Read more »](#)



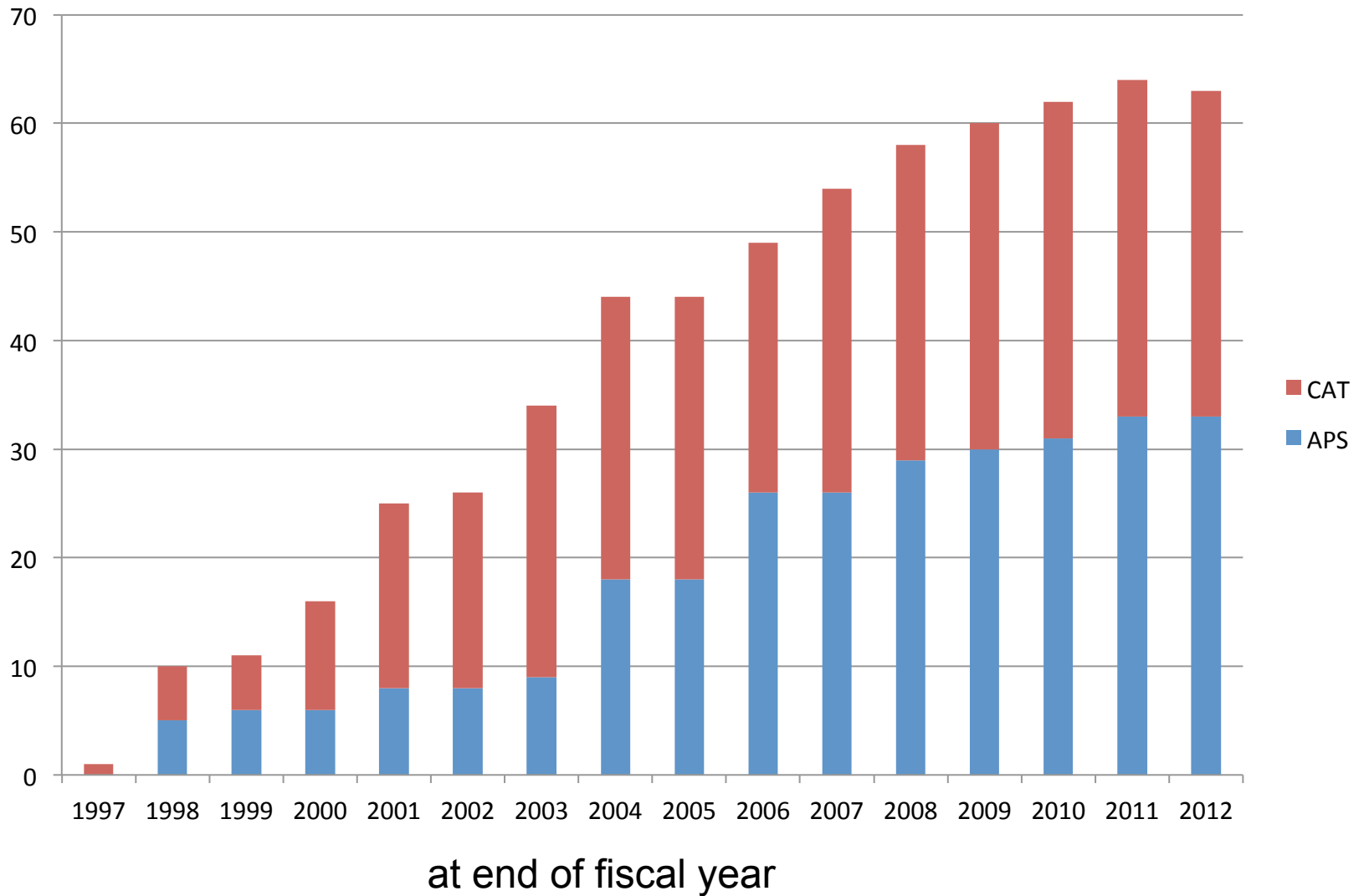
Trends: Accelerator Performance



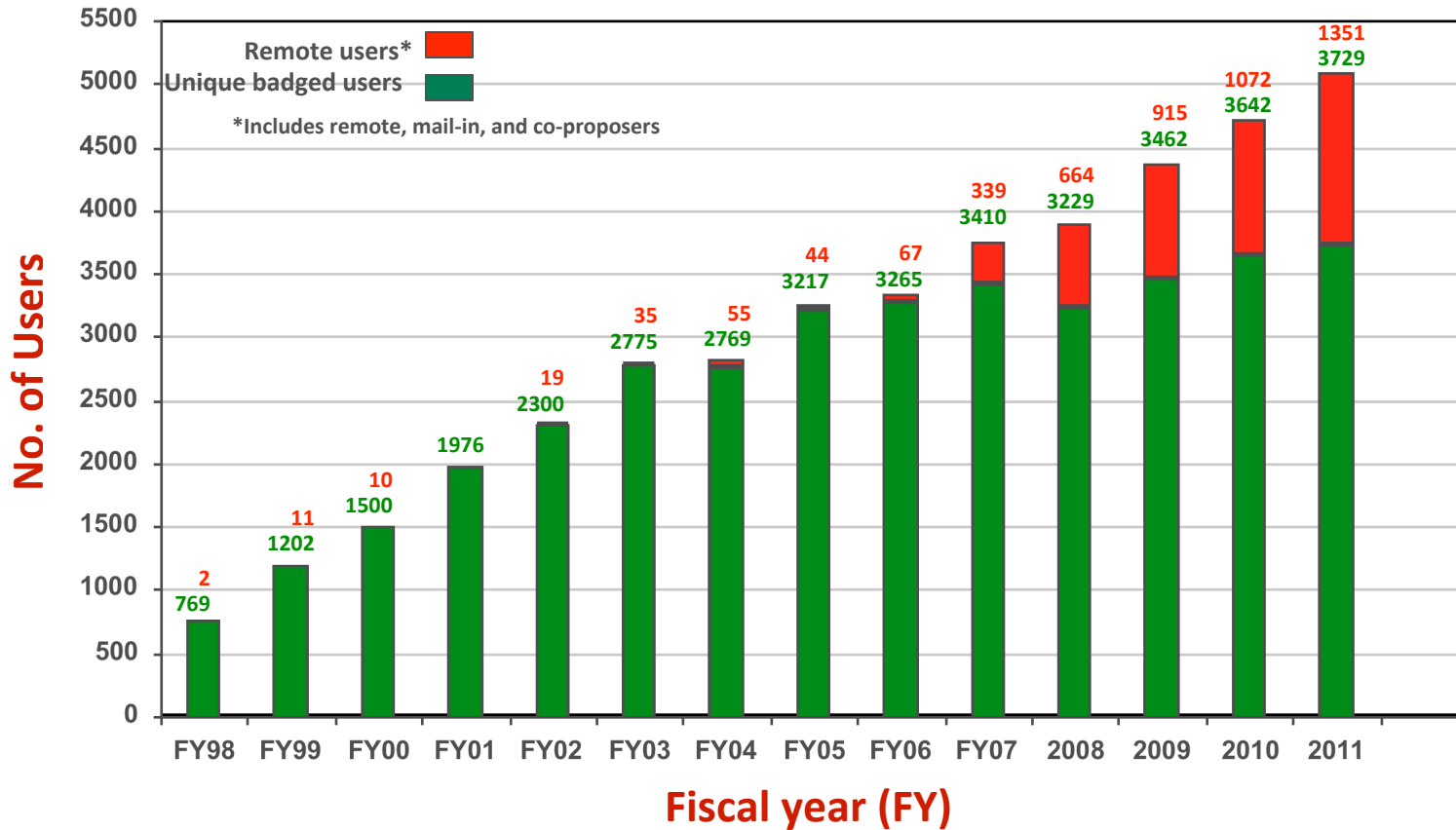
- Outstanding FY12 performance:
- Mean Time Between Faults: 200 hrs (25 in 5000 hrs)
- Scheduled Time Not Delivered: 0.6% (30 hrs)



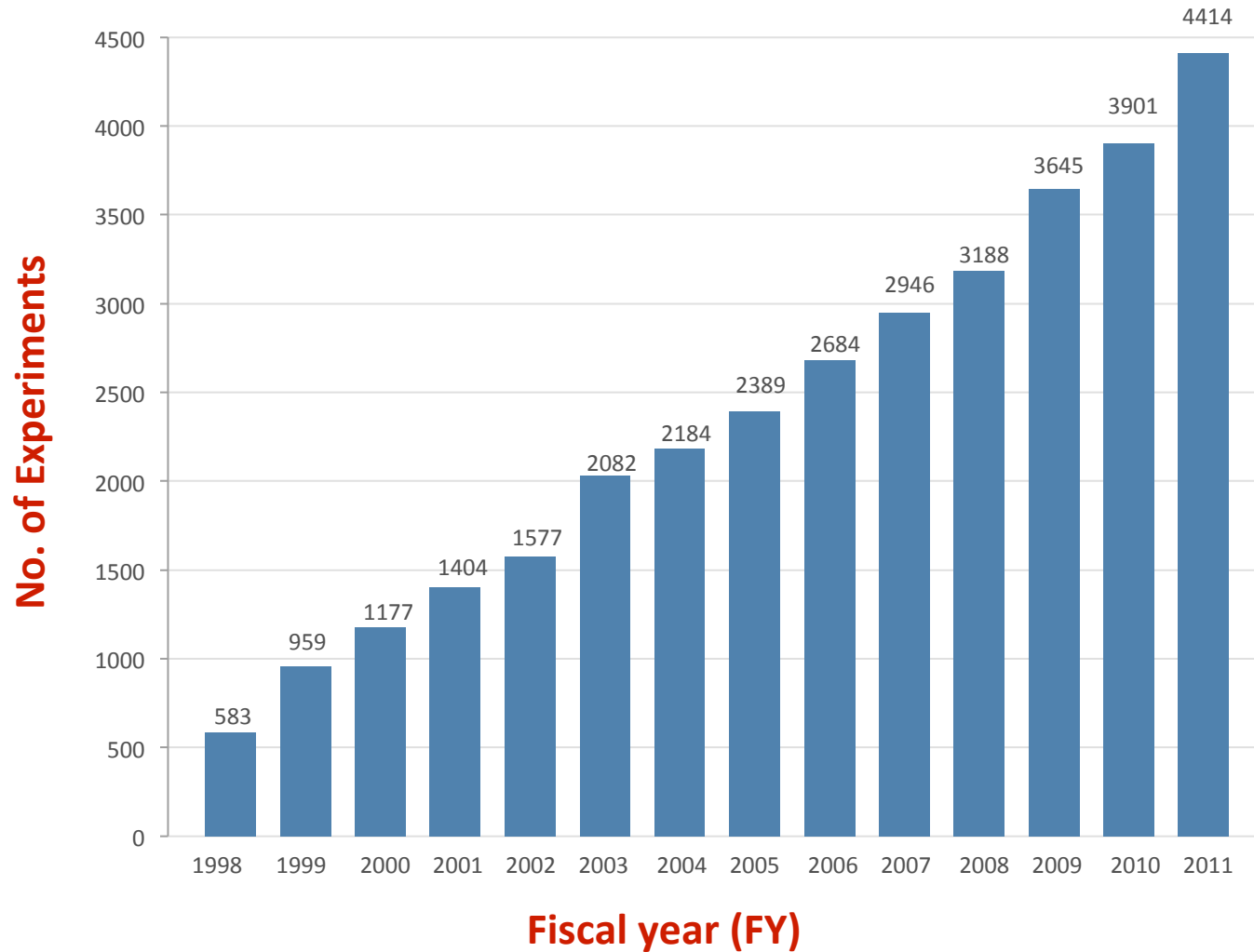
Trends: Operating Beamlines



Trends: Users (on-site and remote)



Trends: Experiments



APS FTE History: Increasing Operations Efficiency

5-year increases:

Ops FTEs: 8%

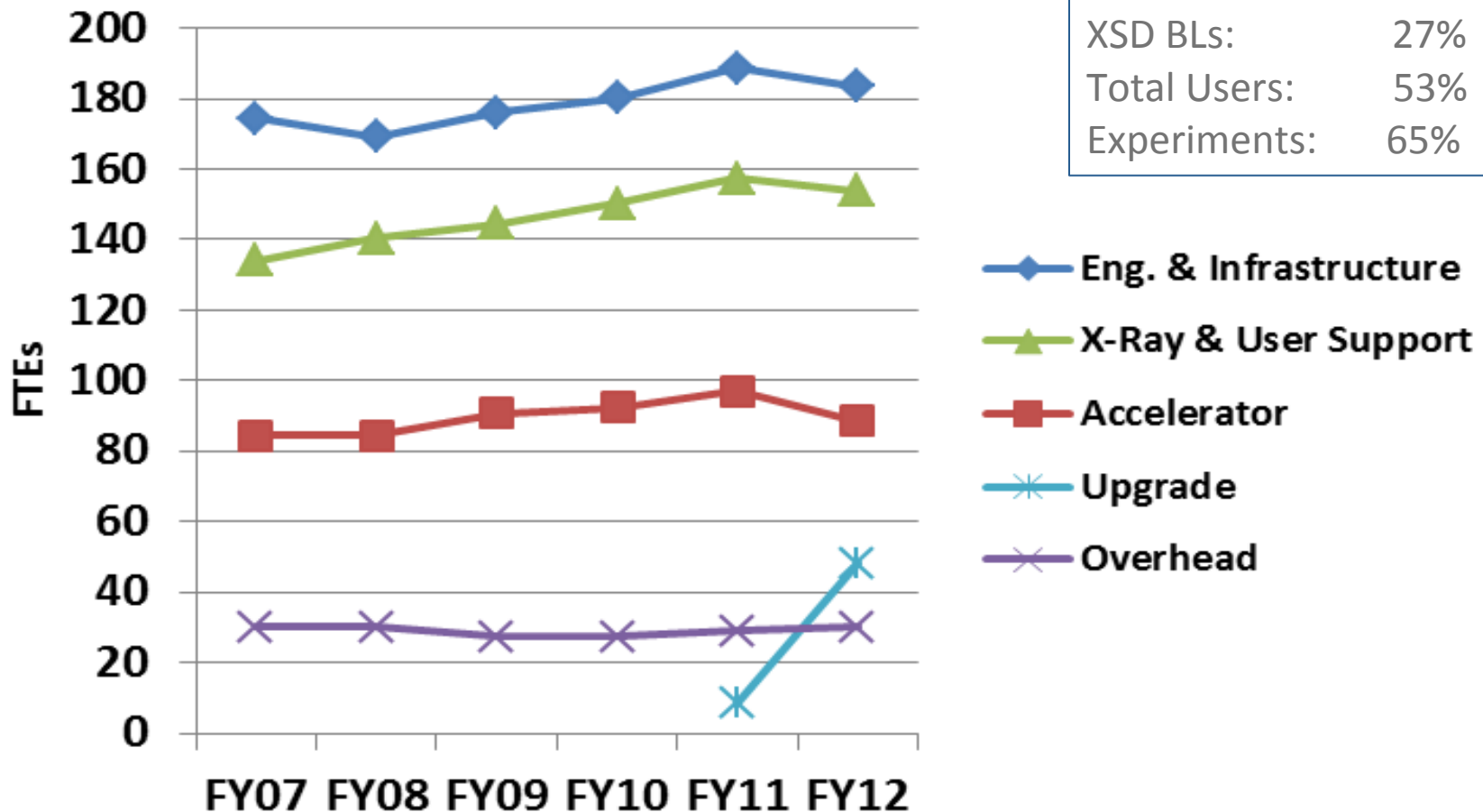
XSD FTEs: 15%

Total BLs: 17%

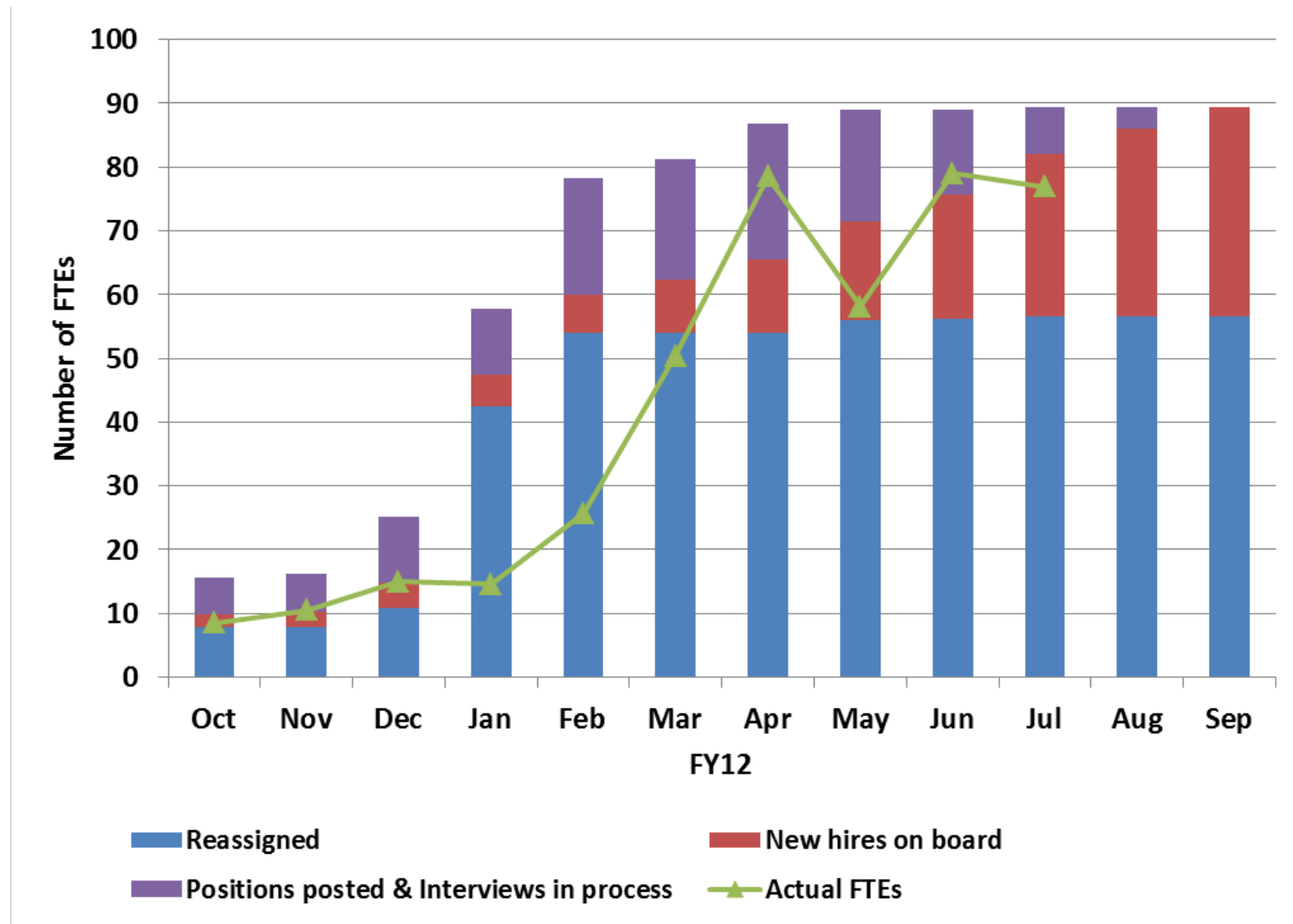
XSD BLs: 27%

Total Users: 53%

Experiments: 65%



APS Upgrade Staffing: A Major Transition in FY12



FY13 Budget Information To Date

\$M	FY10	FY11	FY12	FY13 President	FY13 House	FY13 Senate
DOE Office of Science	4904	4843	4889	4992	4801	4909
Basic Energy Sciences	1637	1678	1694	1800	1657	1712
Facility Ops	-	-	731	810	777	781
APS Ops	125.9	129.7	123.0	134.8	-	-
APS Upgrade	1.0	7.5	20.0	20.0	20.0	20.0



FY13 Budget: Language in Bills

President: BES continues support for the operations of its suite of scientific user facilities ... In FY2013, increases are requested **to operate facilities at near optimum levels**. The upgrade of the APS is continued, ...

House: The recommendation includes \$776,568,000 for facility operations, \$46,000,000 above fiscal year 2012 and \$33,426,000 below the request. The increase above fiscal year 2012 is for preliminary operations of the NSLS-II as it completes construction and **to increase operating time of other Basic Energy Sciences facilities to near-optimal levels**.

Senate: Of the remaining funds for BES, ... \$908,725,000, which is \$49,698,000 above fiscal year 2012 enacted levels, is **to increase operating times to near optimum levels of world-class scientific user facilities**.



Plans to Accommodate Users During NSLS-I to -II Transition

- Reduction in capacity expected at NSLS for several years beginning FY14
- APS, SSRL, and ALS are developing plans to provide capacity during the transition between NSLS-I and NSLS-II
- APS can already accommodate more users in some automated techniques
- We can quickly and economically increase capacity for scattering, spectroscopy, topography, high P, etc. at several existing bending-magnet beamlines by adding staff and/or equipment



The Argonne Exemplary Student Research Program

- During 2011-2012 school year the Exemplary Student Research Program spearheaded by the Argonne Education Division brought three teams of high school students and teachers to Argonne
- Working with resident users and staff scientists from the U.S. Department of Energy Office of Science's Advanced Photon Source and Electron Microscopy Center the students gained hands-on experience in seeing a research project through from idea to reality
- The program is being greatly expanded for 2013 providing a greater number of student teams with access to more APS user facilities



Neuqua Valley High School students at GSECARS beamline 13-ID-E at the APS (top) and preparing samples under the guidance of GSECARS staff scientist Matt Newville.