

# APS Upgrade Update

Jim Kerby for the APSU Team  
July 24, 2019

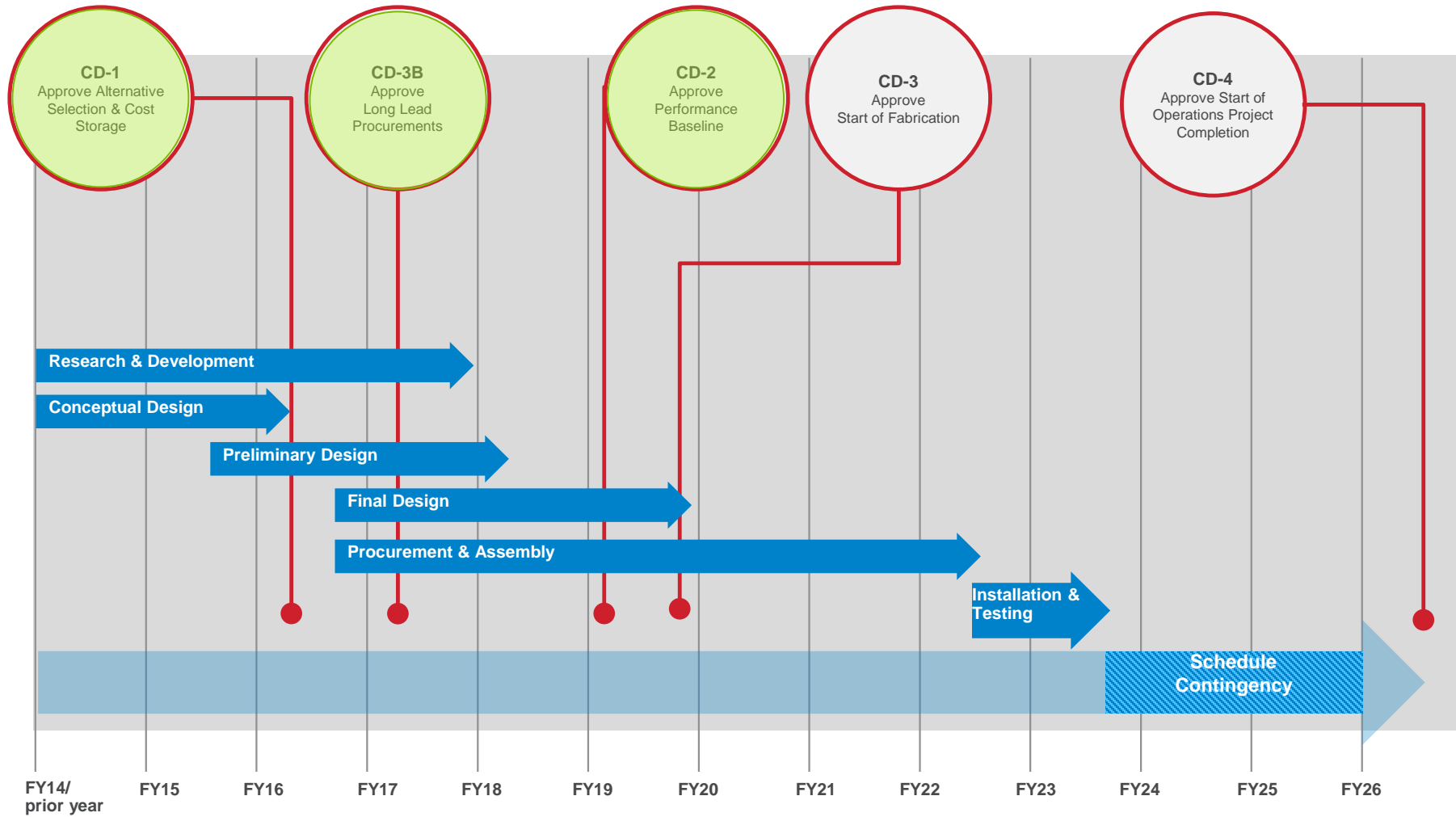


**DOE CD-3 Review of the Advanced Photon Source Upgrade Project**  
June 18-20, 2019

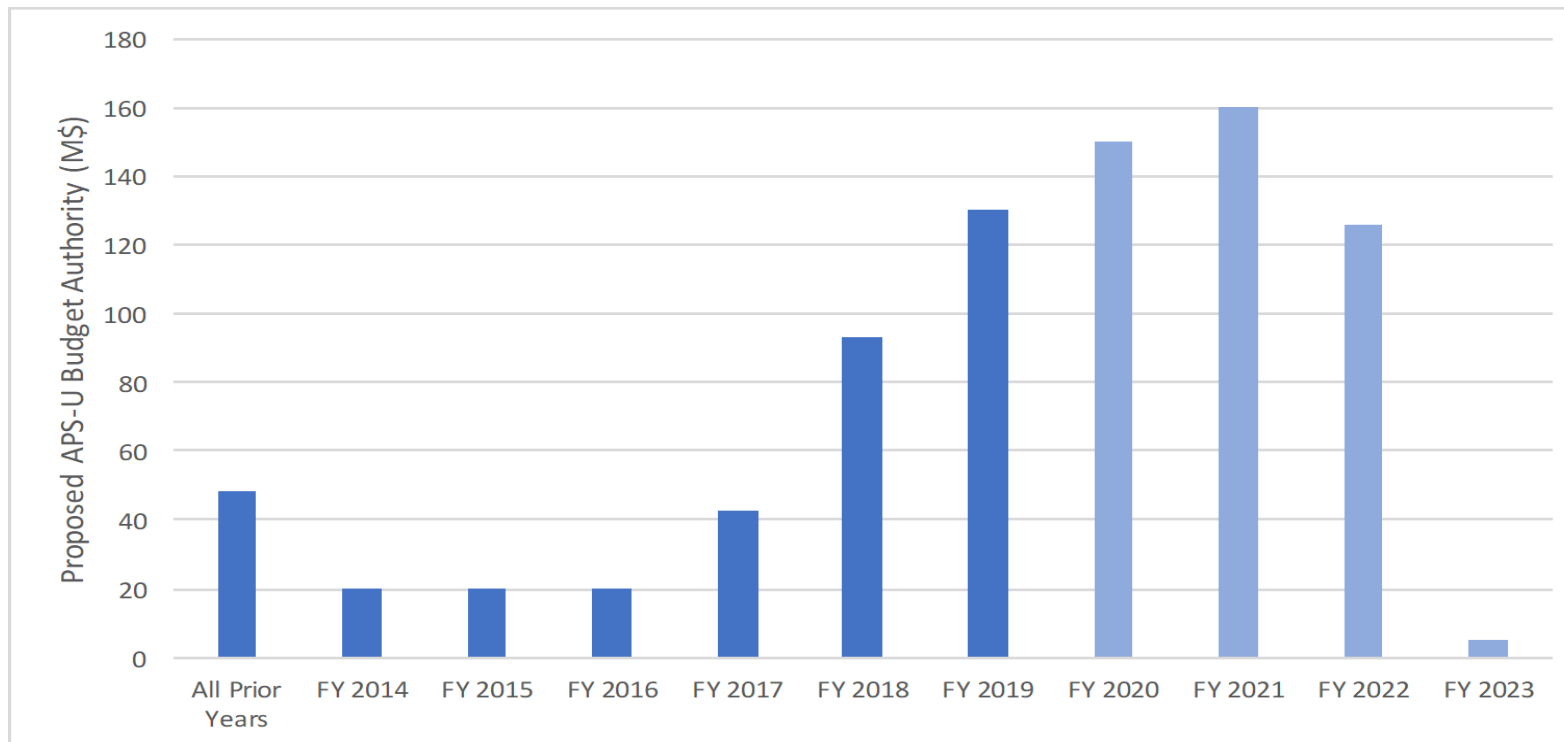


*Proceed to CD-3 Approval!*

# CD-3 Review June 18-20



# APS-U baseline funding profile



- FY17 – FY19 Funding came in at the high end of planning ranges; APS-U taking full advantage.
- FY20 President’s Budget included 150M. Project is well supported.
- \$49.0M of the \$89.5M of LLP funds are obligated; another \$15.2M are currently in the bid process; remainder of RFPs will be in process in next 2 months.
- The APS-U is well on it’s way- It’s critical to keep the momentum going!

Funding (BA) in Millions of Dollars (Then-year Dollars)												
	All Prior Years	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Total
OPC	8.5									5.0	5.0	18.5
TEC	40.0	20.0	20.0	20.0	42.5	93.0	130.0	150.0	159.8	121.2		796.5
Total	48.5	20.0	20.0	20.0	42.5	93.0	130.0	150.0	159.8	126.2	5.0	815.0

# OPA CD-3 Review Summary

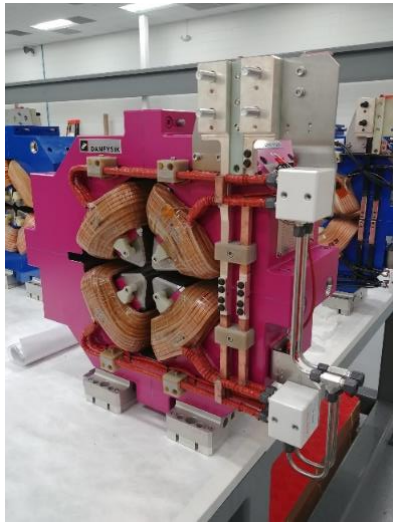
- Great Success! (Thanks to all!!)
- Energy Systems Acquisition Advisory Board (ESAAB) scheduled for tomorrow!
- Approval authorizes Argonne to execute the full scope of the APS Upgrade – we are moving beyond the Long Lead Procurement envelope previously set
- Full Steam Ahead!



24 July 2019 All Hands

# Recent Accelerator Progress

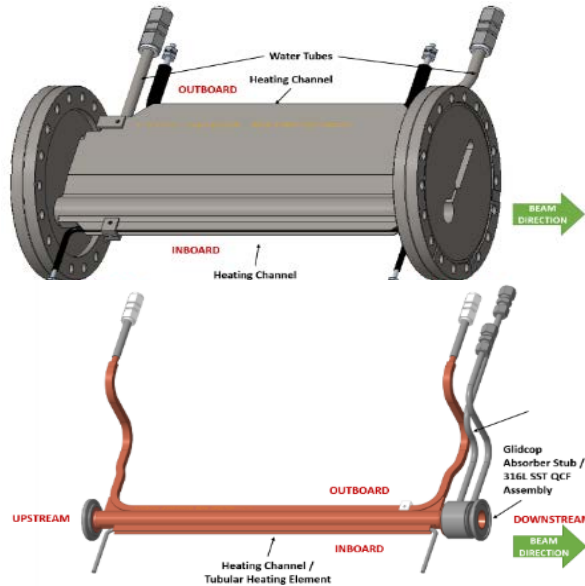
- Contracts for 1067 of 1321 storage ring magnets are awarded – remaining magnets (4 types) will undergo review in August
- 20.7m/sector of storage ring vacuum chambers are undergoing bid evaluation
- 2400 Unipolar and bipolar power supplies are under contract



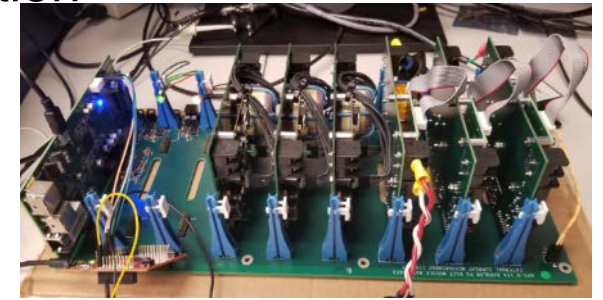
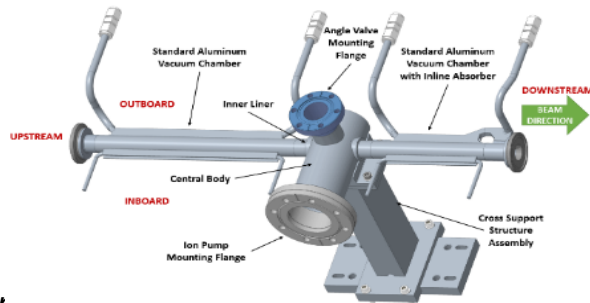
First article Q4 in Building 369



Completed bellows and cross support flange assembly after welding



Typical APS-U vacuum chambers undergoing bid evaluation, including stainless steel keyhole chambers (top), copper NEG-coated chambers (middle), and aluminum NEG-coated cross chambers (bottom).



Bipolar power supply external measurement system under test



Initial trial fit and check of the bunch lengthening system helium circuit

# Recent Front Ends, ID, and Experimental Systems Progress

- Beneficial Occupancy of 28-ID enclosures completed in June
- The 1<sup>st</sup> batch of pole, magnets and monokeeper for the 2.8cm planar undulators will arrive from the vendors this week
- The new superconducting undulator magnetic measurement system is undergoing benchmarking with an existing 2.3cm planar undulator
- Glidcop masks were inspected, and surface finish concerns promptly successfully addressed. A vendor visit will occur in late June.



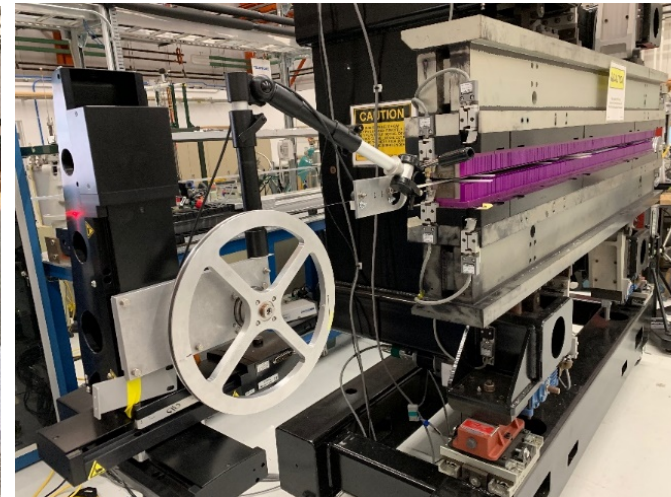
28-ID-B viewed from upstream



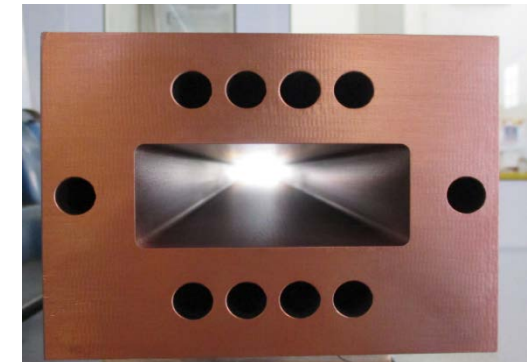
First batch of poles for the 2.8cm period undulator after machining and prior to heat treatment



First article 28mm period undulator monokeeper with super strongback undergoing final inspection prior to delivery at the vendor

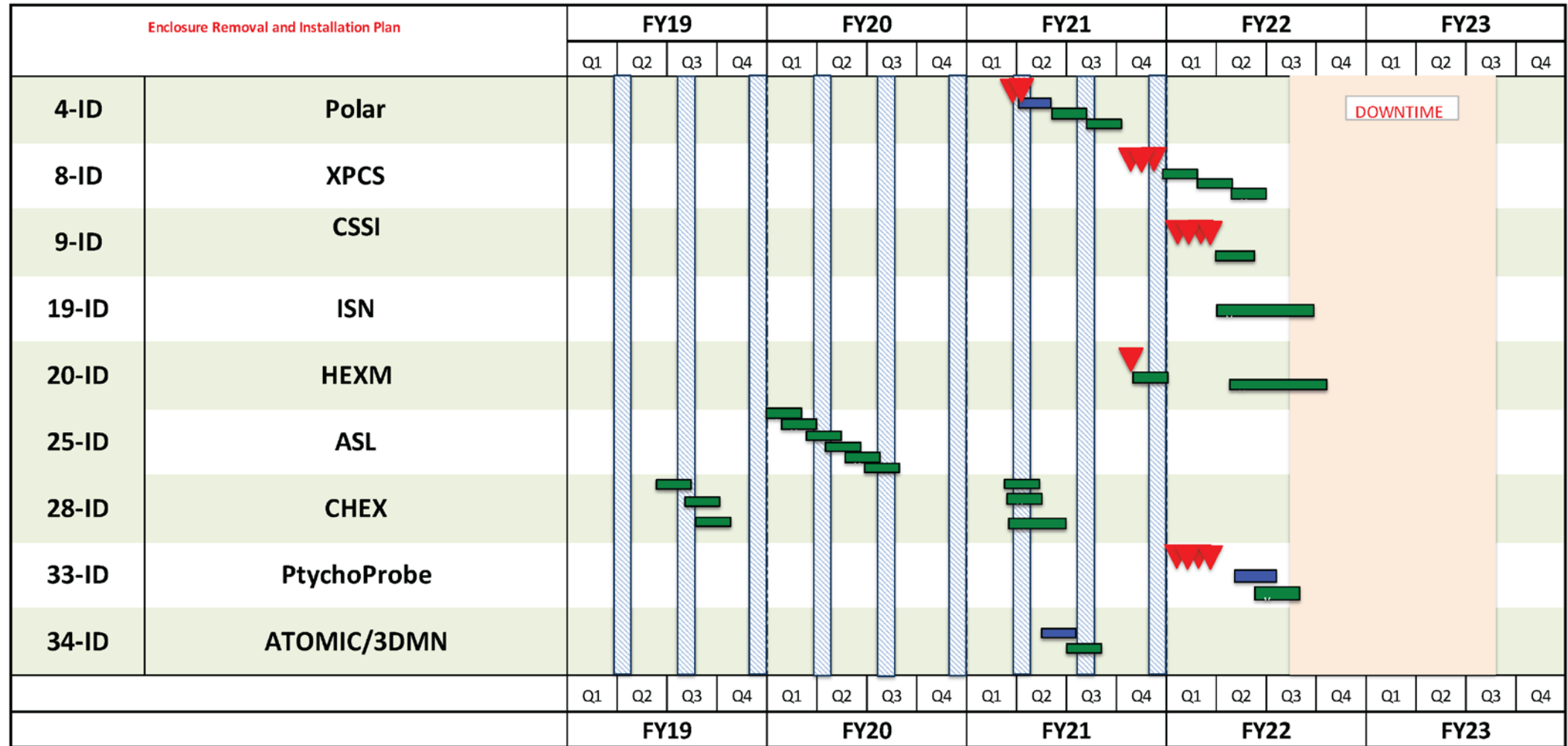


New SCU magnetic measurement system being benchmarked with planar 2.3cm period undulator.  
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Glidcop bodies for the high heat load front end masks after polishing of the inner surface.

# Notional Enclosure Installation Schedule



SR Maintenance period



New Build



Modifications



Teardown

# The (Exciting) Year Ahead

The challenge now is to build on the momentum we have

- ~2/3rds of cost of the APSU are industrial contracts...we need to finish designs and obligate funds to keep the Project on track → we will continue to work with our design processes and procurement practices (and teams)
- In addition...equipment is showing up! We have over 150 storage ring magnets here on site! Again, we'll build on the tools (eTraveler, Component Data Base) and teams to keep this on track.

On the accelerator, we shift effort to Zone F; and focus on advancing the feedback and controls systems

For IDs/Front Ends 1<sup>st</sup> articles of planar and SCU devices will come to fruition

For Experimental systems, the Final Design of the Long Beamline Building will be completed (groundbreaking next year!) and we will push for contracts on all enclosures and equipment where possible...while developing the instrument designs



# Summary

- It's been a haul...but we got what we asked for! And the APS-U contribution to the renewed facility APS will be in 2025 is on it's way!
- Your support, and the support of the Laboratory as a whole, the program, and the community, has been critical
- We will continue to advance the APS-U...completing designs...pushing procurements...and looking for ways to improve how we do things

With Operations, the Upgrade will keep the APS at the forefront of science for years to come...we look forward to seeing the fruits of our labors!

## ...and a note on safety

- The recent ORPS reports on the back of the weekly safety sheet reflect a lot of ‘scope creep’ or complacency across the national labs
- What is familiar to us, or what once seemed like a good idea...might not be any longer!
- PLEASE...take a moment to have a questioning attitude...look at things with fresh eyes...and listen to others



We always want you (all) to come to work...work smart and hard...and go home safely! And we'll see you the next day too!

# APS Colloquium August 7!

The Advanced Photon Source Upgrade Storage Ring

Glenn Decker

APS-U Associate Project Manager