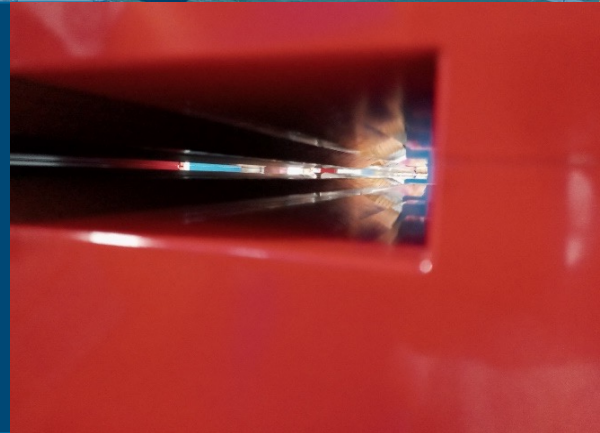




APS-U PROJECT UPDATE



Jim Kerby
APS Upgrade Project Manager
PSC All Hands Meeting
July 27, 2022



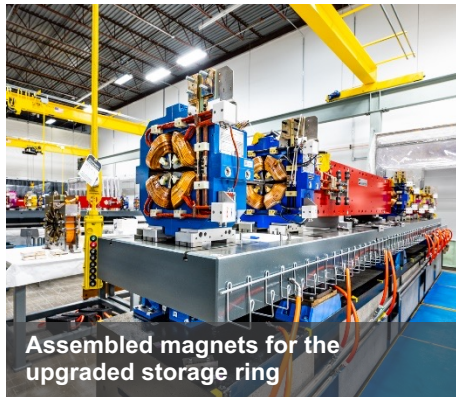

x500



\$815M



\$1.5B



Assembled magnets for the upgraded storage ring



First new beamline instrument up and running



New front-end systems to deliver x-ray beams to experiments

Long Beamline Building, which will house two of the nine feature beamlines



JULY 25, 2022



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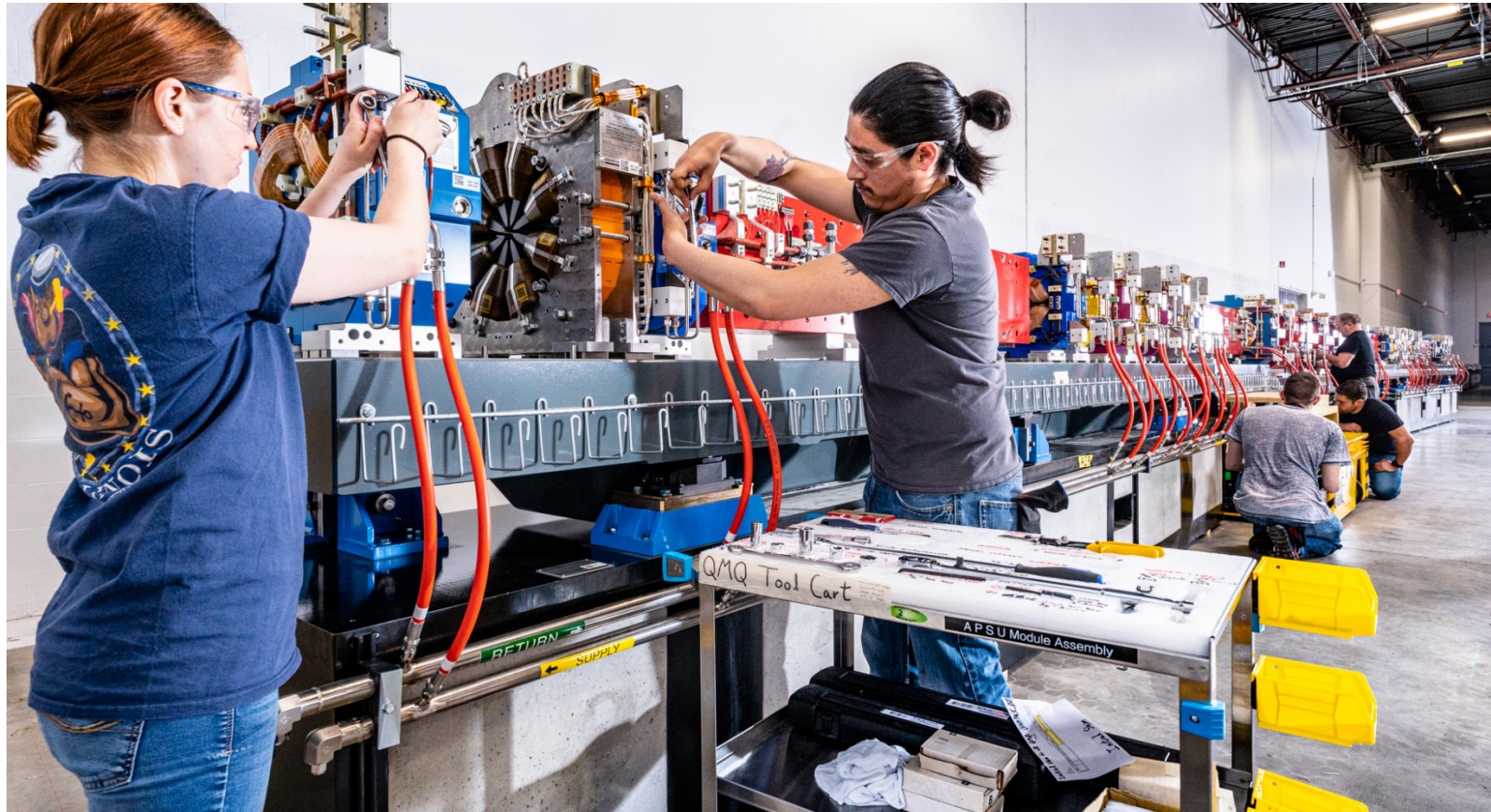
THANK YOU!



U.S. DEPARTMENT OF
ENERGY

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1ST SECTOR ASSEMBLY IN BLDG. 981



U.S. DEPARTMENT OF
ENERGY

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BLDG. 981 – 100,000+ SQ FT OF UPGRADE!



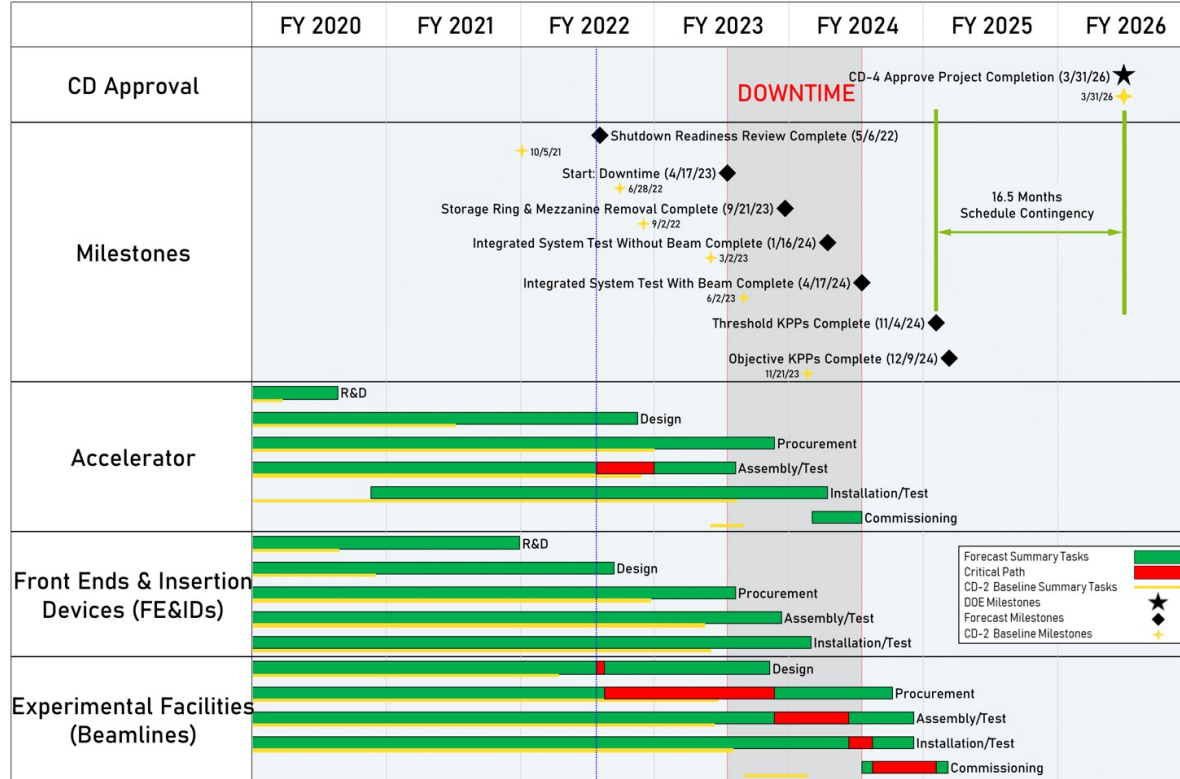
CURRENT STATUS AND SCHEDULE

68% complete by cost

- Cumulative performance - 3% over cost and 5% behind schedule
- FY22 – 9% over cost and 11% behind schedule

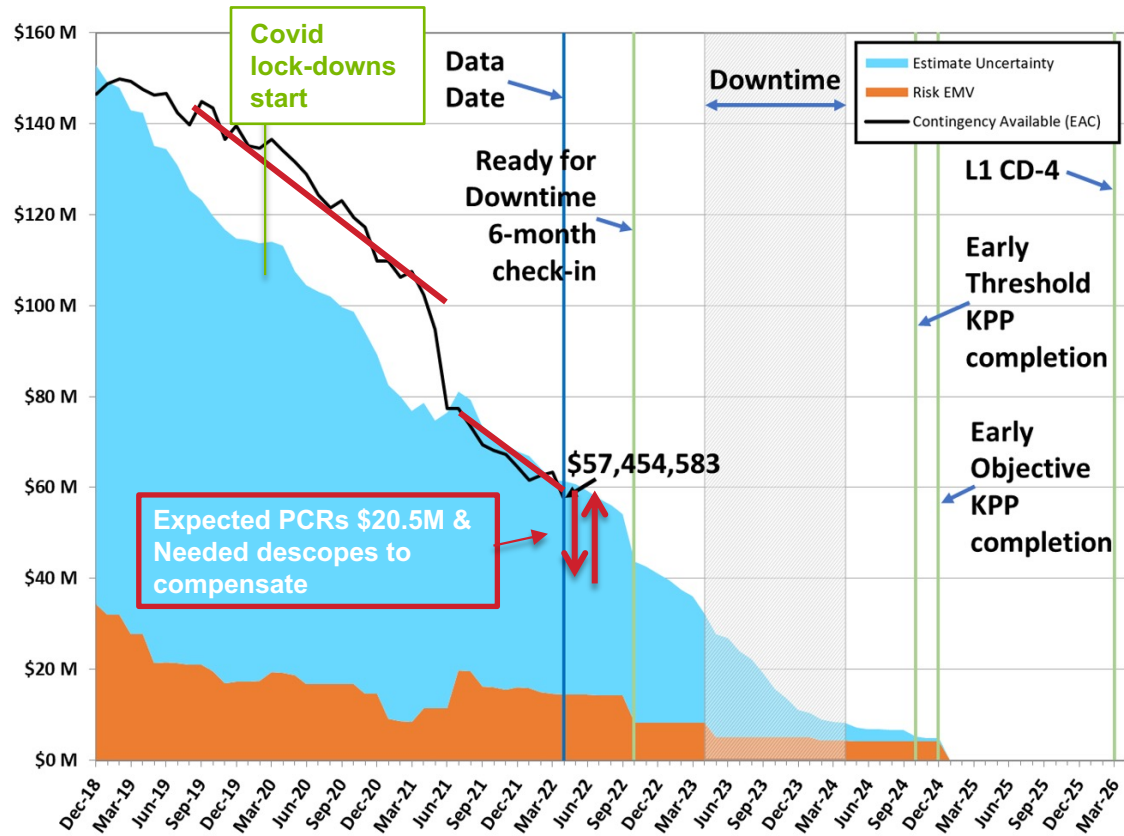
COVID and supply chain impacts continue; our staff are visiting vendors regularly to understand their issues and help solve them
Accelerator component delivery, acceptance and assembly drive the shutdown

- Readiness Review in August...path to April 2023 shutdown and the 1-year duration



CONTINGENCY ESTIMATES

- Amount of contingency available (black line) is less than expected for projects at this point of completion, and lower than remaining “risk” uncertainty indicates we need (blue shade)
- Contingency burn rate (red lines) show “normal” rates with drops for COVID/supply chain disruptions
- Project has just done bottoms-up analysis of labor and M&S to complete project that will increase costs by +\$20.5M (project change requests PCRs)
- This must be balanced by a similar descope amount



DESCOPE METHODOLOGY

- **Preserve items that ensure delivery of Threshold KPPs** ← REQUIRED
- **Any descope shall not limit the ultimate capabilities of the facility**
 - Minimal cancellation of existing contracts
- **Accelerator descopes**
 - Preserving beam stability is a priority
 - Some flexibility between Day 1 operating modes & necessary diagnostics
- **Scientific descopes (front ends, insertion devices, and beamlines)**
 - Photon delivery is REQUIRED
 - Maximize science return on investment for feature beamlines and enhancements
 - Feature beamlines prioritized in inverse order of ranking from original external review
 - Preserves most capabilities on 7 of 9 feature beamlines & beam delivery components on remaining 2
 - Enhancements also prioritized considering original external review
 - Prioritize enhancements that leverage outside partner investments

PROPOSED DESCOPE LIST

Rank	Accelerator Items	Descoped cost
1	Booster High Power Coupler	\$350k (already done)
2	Fast Orbit Feedback	\$200k + \$100k labor
3	Mechanical Motion Sensing System	\$200k + \$519k labor
4	38 AM Beam Size Monitor	\$500k + \$400k labor
	To Go Total:	\$900k + \$1019k labor

Rank	Front Ends and Insertion Devices	Descoped cost
1	Superconducting Undulators (2)	\$200k + \$1,800 labor (already done)
	To Go Total:	\$0

Rank	Experimental Systems Items	Descoped cost
1	Environmental control rooms ASL, CSSI, CHEX, & Polar.	\$898k
2	Enhancements for 1-ID, 2-ID, 6-ID, 7-ID, 25-ID, 30-ID, & 32-ID beamlines (optics and instrumentation)	\$4,872k + \$428k labor
3	HEXM feature beamline instrument for 20-ID-D	\$934k + \$100k labor
4	PTYCHO feature beamline multilayer monochromator	\$409k + \$50k labor
5	3DMN feature beamline instrument and detectors	\$4,059k + \$600k labor
6	Atomic feature beamline instrument, detectors, and optics	\$5,909k + \$795k labor
	To Go Total:	\$17,081k + \$1,973k labor

Grand Total: \$17,981K M&S and \$2,992K Labor

\$20,973k ←

PATH FORWARD

Descoped items will not be lost, but completion of some items will be delayed

- Argonne and PSC management are both committed to ensuring we find mechanisms to realize the descoped items
 - i.e., Major Item of Equipment funds
- ESAC mtg. in August charged with confirming methodology and our choices

The whole team is working to deliver the current scope on time and budget while ensuring a smooth transition back to operations

- Hitting cost targets and avoiding delays will improve the contingency situation
- Should economic conditions change, or contingency improve, we will recover scope

SUMMARY

- We all are focused on delivery of the project to KPPs within budget and schedule
- Use of scope to maintain project contingency status to ensure delivery and meet the KPPs is required at this time
- Though some items have been descoped from the project, PSC and Argonne are committed to completion for each
- Upcoming Reviews
 - Shutdown Preparedness Review: August 16-17-18
 - Experimental Systems Advisory Committee (ESAC): August 17 and 24
 - Machine Advisory Committee (MAC): October 2022
 - Accelerator Readiness Review Status Update: September 2022
 - Director's Review: September/October 2022
 - DOE Status Review: November 2022

COMMUNICATIONS

Bookmark for the latest news and information

APS Upgrade web page on the APS website

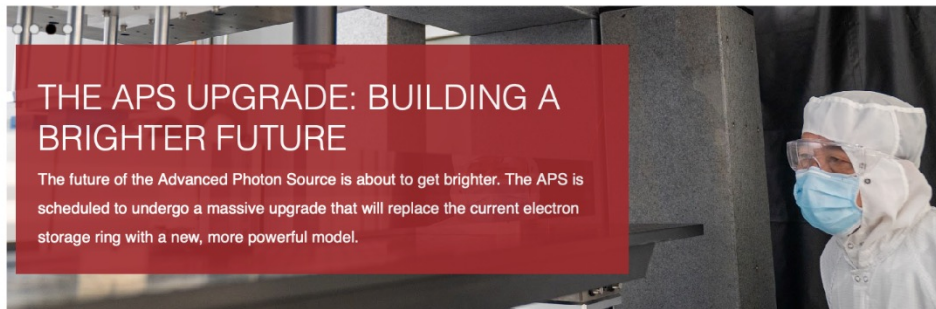
- <https://www.aps.anl.gov/APS-Upgrade>

APS Upgrade web page on the Argonne website

- <https://www.anl.gov/aps-upgrade>

263 days to the shutdown!

The **Advanced Photon Source**
a U.S. Department of Energy Office of Science User Facility



APS Upgrade Home

About the APS Upgrade

FAQ

New Storage Ring

Feature Beamlines

Videos

People of the APS Upgrade

INSTALLATION PERIOD CURRENTLY SCHEDULED TO BEGIN APRIL 17, 2023

The APS Upgrade storage ring installation period, during which the APS will pause operations for one year, is currently scheduled to begin on April 17, 2023. The APS will operate throughout 2022 and will schedule an operations run early in 2023, though the exact schedule has not been determined. The upgraded APS will return to operations after the 12-month installation and commissioning period, though initial operations will be at reduced current and availability as the machine is tuned up. Regular updates will be provided on this website.



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