

APS OPERATIONS AND COVID PROTOCOL + AES DIVISION INPUT



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PSC All Hands Meeting
January 26, 2022

APS OPERATIONS HIGHLIGHTS



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Argonne National Laboratory is a
U.S. Department of Energy laboratory
managed by UChicago Argonne, LLC.

January 26, 2022, PSC All Hands Meeting

APS OPERATIONS UPDATE

APS General Operations with COVID protocol

- The APS accelerator complex operating at high reliability
 - 2021-3 run ended at 97.97%; Feb 1 user run start
 - Final 8 weeks of run **averaged** ~99.5% reliability with 3 of those weeks achieving 100% uptime

APS remains in a state of **limited operations and maximum telework** status

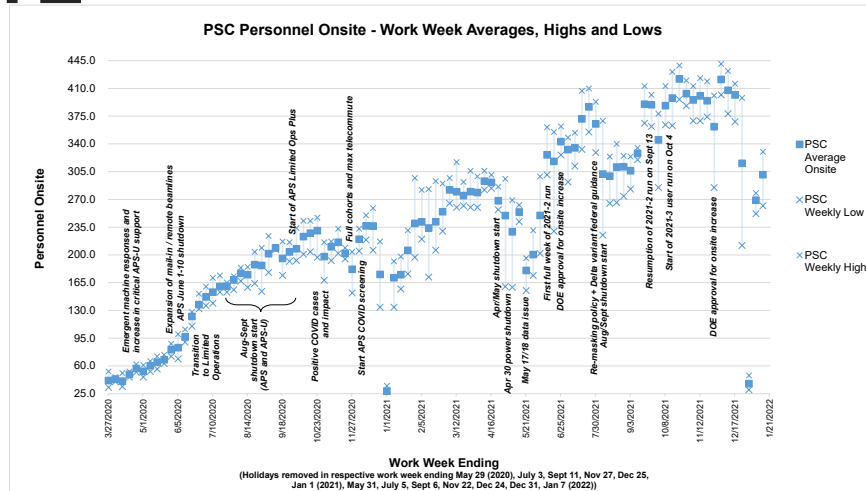
Face coverings required, regardless of vaccination status; **KN-95 masks due into Central Stores soon**

SHIELD screening test increased enrollment due to Omicron transmissibility; PSC, including CAT staff, contractors and others, constitute about 1/3 of total Argonne enrollment

- First week results: **3.5% test positivity; 22 out of 41 positives were asymptomatic cases**
- Staffing impacts in technical work groups, **successfully navigated** to date by resource managers

Instant Trace proximity badge program **significantly expanded**, now with over 700 proximity badges in use at PSC, including CAT staff, contractors and others

- Proximity badges assigned to general users** hosted onsite at XSD and CAT beamlines



APS regularly has 400+ staff and limited users onsite during a run period

QUARANTINE AND ISOLATION GUIDANCE

Report all close contacts and positive results to the COVID-19 Question Line at 630-252-2555.

January 10, 2022

	Fully Vaccinated AND Boosted	Fully Vaccinated in the last six months <i>(or two months for J&J)</i> AND Not Boosted	Fully Vaccinated more than six months ago <i>(or two months for J&J)</i> AND Not Boosted	Unvaccinated
Exposed to someone with COVID-19	QUARANTINE <ul style="list-style-type: none"> Wear a face covering around others for ten days. Test on day five, if possible. If you develop symptoms, get a test and stay home. 		<ul style="list-style-type: none"> Stay home for five days and wear a face covering around others for five additional days. Test on day five, if possible. If you cannot quarantine, you must wear a face covering for 10 days. 	
Tested positive for COVID-19	ISOLATE <ul style="list-style-type: none"> Stay home for a minimum of five days and until your symptoms are resolving and you have no fever. Wear a face covering around others for five additional days. 			

Find more at www.cdc.gov/coronavirus/2019-ncov/your-health/quarantine-isolation.html.

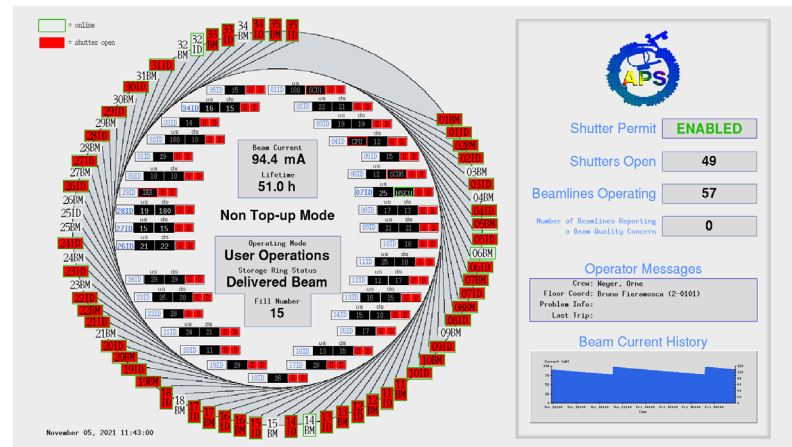
APS OPERATIONS UPDATE

■ APS User Program:

- Vast majority of beamlines remain enabled for scientific programs
 - Mail-in/remote experiments remain encouraged
 - Onsite users capped at 2 onsite users per experiment
 - Have made exceptions where a larger team is required and can be safely accommodated
- Onsite users must be listed as such on approved ESAFs and required to show proof of vaccination or unvaccinated with exemption and proof of testing enrollment
- Expansion of proximity badge to general users onsite

■ Argonne General Information:

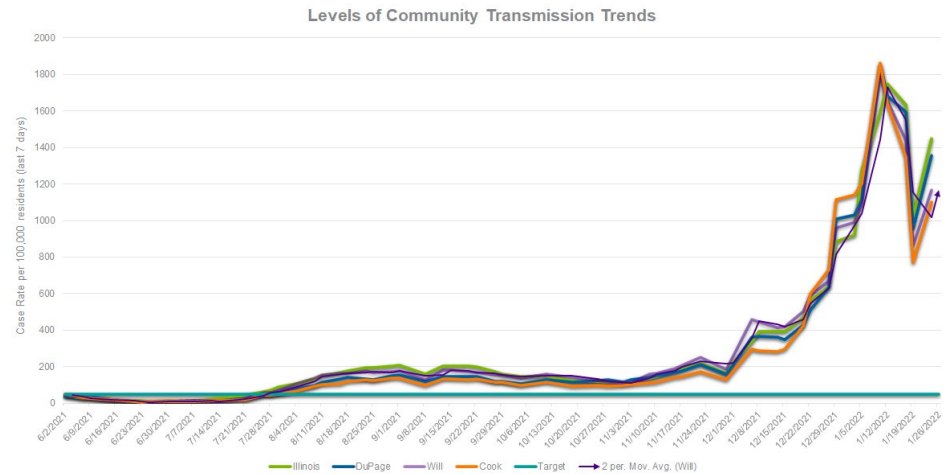
- Argonne site remains in limited operations and maximum telework status per the DOE Workplace Safety Plan and Argonne Safety Plan
- Argonne onsite totals capped at 2,250 personnel daily average (inclusive of employees, contingent workers, users, contractors, deliveries)
- Numerous business and facility restrictions in place: Travel, limited support facilities



APS Operations dashboard on Nov 5, 2021 (324 singlets non top-up operation since Nov 2)

ARGONNE SITE RE-ENTRY

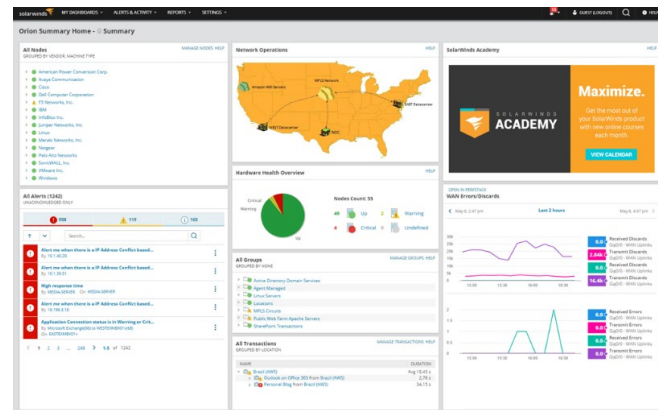
- Re-entry plans submitted to DOE previously – remain under review
 - Remains subject to community transmission metrics or alternative metric
- If approved by DOE, the following will be triggered:
 - Returns local decision making to Argonne with commensurate DOE-ASO oversight
 - Minimum 30-day notice to employees of re-entry timeline; re-entry orientation training
 - Numerous preparatory activities initiated ahead of population return, e.g., enhanced cleaning
 - Hybrid work elections formalized; onsite population caps eased or removed outright
 - Business policies reinstated including expanded travel and event/hosting guidance
 - Support facilities/services re-opened (Guest House, fitness center, Bright Horizons expanded capacity) or start phase-in (food service)



CDC COVID County View Data – Levels of Transmission as of Jan 23 2022 for DuPage, Will, Cook Counties

SOLARWINDS VULNERABILITY

- SolarWinds provides IT services in support of managing core network services and configurations: 300,000 customers including several government and Fortune 500 companies
- Nation State-led compromise of SolarWinds – malicious code added to customer software updates available from March–June 2020
- Alert of SolarWinds incident provided by DOE on Sunday, December 13, 2020
- Argonne has five installations of SolarWinds – three APS installations ran a vulnerable version from April – Sept 2020
- Argonne conducted immediate analysis of provided indicators of compromise – **no indication** of compromise at Argonne identified; as a proactive measure, the three systems were taken offline, to be replaced upon direction of DOE and DHS
- Since this initial incident, Argonne BIS, Cyber, and APS IT responded to numerous DHS/DOE data calls
- Plan to build new SolarWinds instances approved by DOE and Argonne Cyber in late May 2021
- Rebuild followed strict plan framework; Phase 0 (install/build and test) completed in late Oct 2021
 - **Phase 1 (move to production) authorization received Jan 17 2022 from Cyber and ASO; Forecasting an in-service date of Jan. 31**



Example of SolarWinds Orion dashboard for network management

AES DIVISION HIGHLIGHTS



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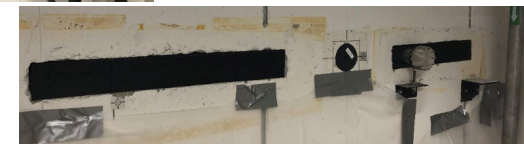
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DESIGN & DRAFTING

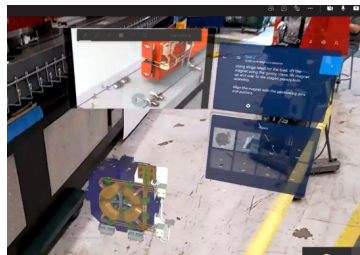
- Novel use of 3D printed containers to hold lead shot shielding
 - Developed by Geoff Pile, installed by Glenn Moonier
- Addition of new larger capacity printer in the Additive Manufacturing Lab
 - Stratasys F770
 - Build envelope of 1000 x 610 x 610 mm (39.4 x 24 x 24 in.)
- Virtual tour/augmented reality investigation
 - Matterport - Virtual Tours/Digital Twin – Data Tags
 - Virtual installation instructions/maintenance instructions
 - Microsoft HoloLens Headset – guide development



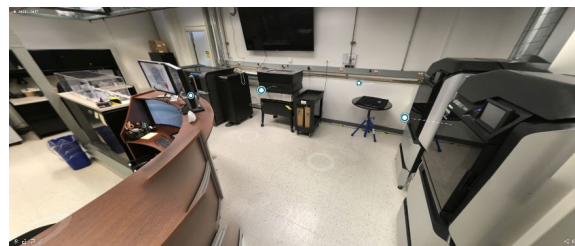
Matterport data tags



Lead shot shielding containers



Microsoft guides



Matterport Digital Twin

AES SHUTDOWN HIGHLIGHTS

- Replaced L4 water skid in the linac gallery; the second installation in upgrading five-total skids
- Replaced 6 of 12 control valve actuators on the linac gallery, linac tunnel, and PAR process water system
- Assisted RF Group with Canon coupler replacement in booster RF cavity 2
- Completed 4 Front End Equipment Protection System (FEEPS) upgrades
 - **Remaining 2 FEEPS upgrades (with exception of 35-BM and 38-AM FE) will be completed in April/May 2022 shutdown, the culmination of a 3+ year effort in upgrading 55 FEEPS**



Above right: New L4 water skid

Above left: New control valve actuator

Left: Obsolete control valve actuators

PSS AND ACIS UPGRADES

▪ Personnel Safety System (PSS)

- Second installation of the GEN4 PSS was completed at 25-ID, installed in Oct 2021 and commissioned and validated in early Nov 2021
- All beamlines will eventually be upgraded to this PSS generation design during or after the APS-U dark period

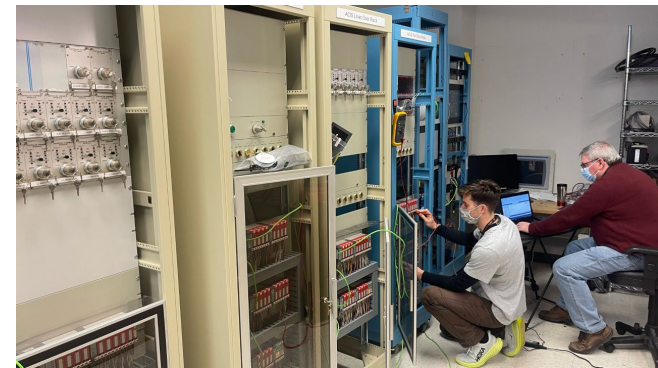
▪ Access Control Interlock System (ACIS)

- ACIS Upgrade Project
 - Linac/PAR ACIS-U hardware and software modules are connected; integrated testing is in process to verify many interconnections in internal rack/panels, some software modules and network interfaces
- ACIS for Linac Extension Area (LEA)
 - Field wiring was connected in October 2021; validation testing was completed during the January 2022 shutdown



Above: 25-ID PSS controls and cabinets installed

Below: ACIS-U module connections and integrated testing



EFFORT TO PLUG COOLING CHANNELS

- A total of 78 front-end (FE) components, many in operation 20+ years, contain Lee plugs that are used to seal cooling channels
 - These components contain 638 Lee plugs in total
- Over the last 3 years, 7.7% of these FE components have developed leaks through the Lee plugs
- Most of these components will be scrapped at the dark time
- To reduce downtime risk, several different options were tested for plugging and sealing the cooling channels
 - Copper Stick 2-part epoxy putty selected for application
- During the recent maintenance shutdown, all accessible FE components containing Lee plugs were plugged and sealed using Copper Stick
- There were 2 components located in the first optics enclosures at sectors 3 and 4 that were inaccessible due to installed shielding

