

PSC All-Hands Meeting January 25, 2023

Laurent Chapon
Associate Laboratory Director for Photon Sciences
APS Director



U.S. DEPARTMENT OF
ENERGY

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Advanced
Photon Source

AGENDA

Dava Keavney

Program Manager for X-ray Light Source and Neutron Scattering Facilities, DOE Office of Science

Introduction and remarks

Laurent Chapon

Safety, DEI, Budget, HR, Division Highlights

Jim Kerby

APS Upgrade update

Denny Mills

User survey, partnerships and celebrations

Laurent Chapon

New starters, awards

Safety, DEI, Budget, HR and Division Highlights

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George Crabtree

1944-2023

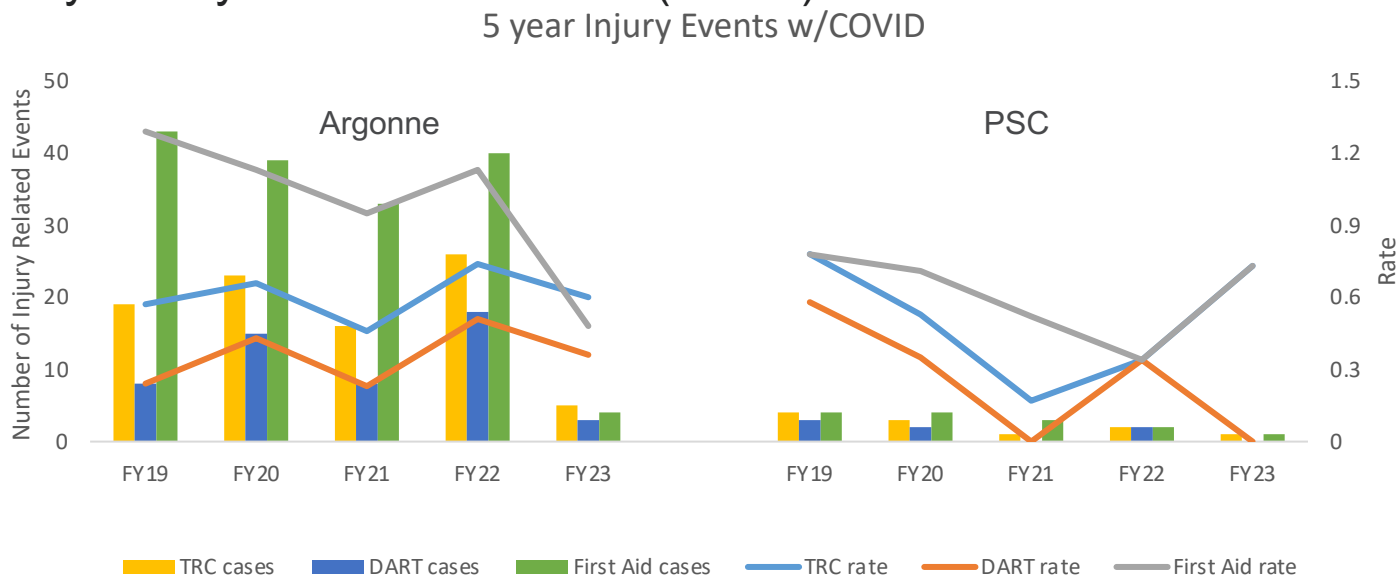


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SAFETY

Photon Sciences safety record for FY23 thru December

- 1 First Aid Injury
- 1 OSHA Recordable Cases (TRC)
- 0 Days Away or Restricted Time (DART)



SLAC ELECTRICAL ARC FLASH INJURY

Event Description

On Tuesday, December 27, 2022, three electricians at SLAC in California were involved in an electrical incident. The workers were preparing to do maintenance on 12 kV switchgear. They turned off the main breaker and three load-side breakers in the switchgear and disconnected them. To do a ZVV (Zero Voltage Verification), they opened the back panel of the switchgear. At some point, while attempting the ZVV, there was an arc flash.

The electrician in the switchgear was taken to a local hospital.

Key Take-Aways

Although the investigation is ongoing, there are some important preventative measures that are worth highlighting. All employees and contractors have the authority to stop or pause work if they believe there is a safety concern.

Examples of reasons to pause or stop work include:

1. improper PPE and clothing for the task
2. incorrect meter or incorrect tools
3. unsafe environmental or weather conditions
4. uncertainty of ZVV testing points

LAB WIDE SAFETY REFRESH

- **February 16th**
 - ANL All-Hands Meeting, 10 a.m.
- **Take an opportunity to refresh and refocus on working safely**
 - Reiterate important points/content from the Lab All-Hands
 - Important accomplishments over the past year
- **Focus on the change in work environment and practices as we begin the Upgrade project**



DEI STRATEGIC PLANNING



Include DEI in APS strategic plan



Ambition to have a more strategic document published, with a 5-year horizon.



BES supports facility directors in redefining the way we will approach strategic plans in the future.



Opportunity to think big and plan strategically for DEI activities.



FOCUS GROUPS



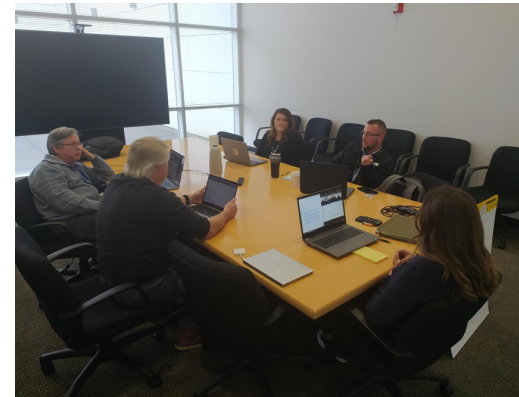
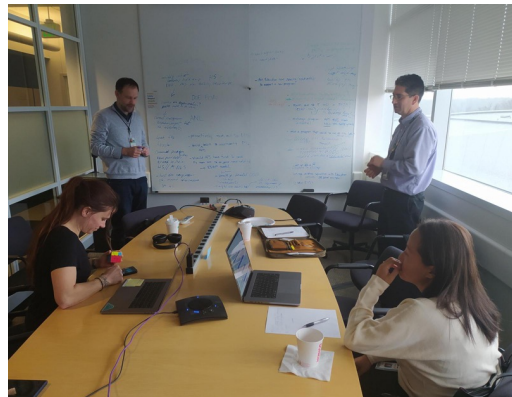
Psychological Safety: Increase real and perceived safety of “speaking up” & Improve communication about avenues available to resolve DEI issues



Diversity: Leverage ANL & DOE support for DEI activities and attract underrepresented minorities



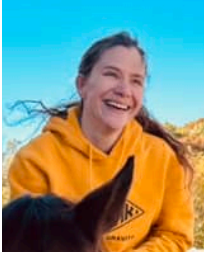
Hiring: Carefully calibrate descriptions in job postings to lower the barrier for application but not the actual requirements for jobs



Career development: Increase engagement with staff on promotion process to facilitate career progression & improve the communication of opportunities for prof. development

DEI COUNCIL MEMBERS

ALD



Fanny Rodolakis
Chair



Becky Sikes
Co-chair



Nathan Rogers



Tracy Thomas

XSD



John Freeland



Lisa Gades



Zou Finrock

AES



Chris Gorman



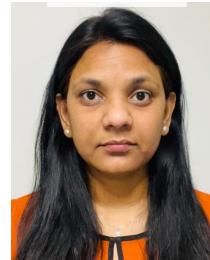
Luis Diaz



Ashley Wayman



Kathy Harkay



Sirisha Kallakuri

ASD



Elroy Chang

APS-U



Grace Avellar

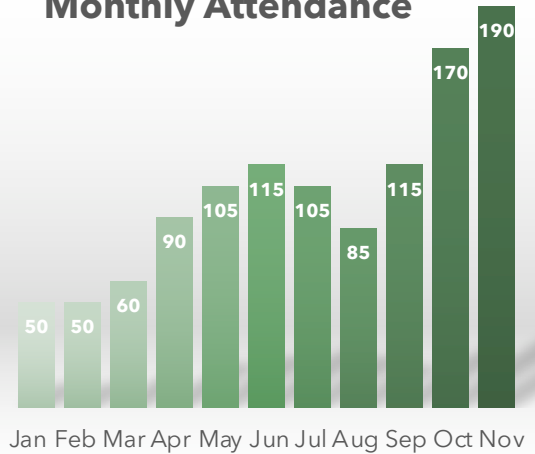


Katie Martin

THE VOICE OF PSC

Every 3rd Thursday of
the month @ 1PM

Monthly Attendance



March

Dr. Jessica Wade

British Physicist Creates Over 1,600
Wikipedia Pages for Women
Scientists and Scientists of Color

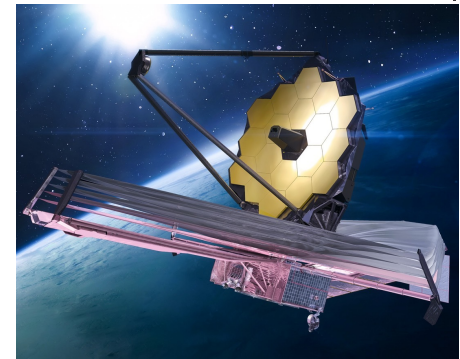
By Madeline Muzakki on October 19, 2022



April



Dr. Lou Strolger

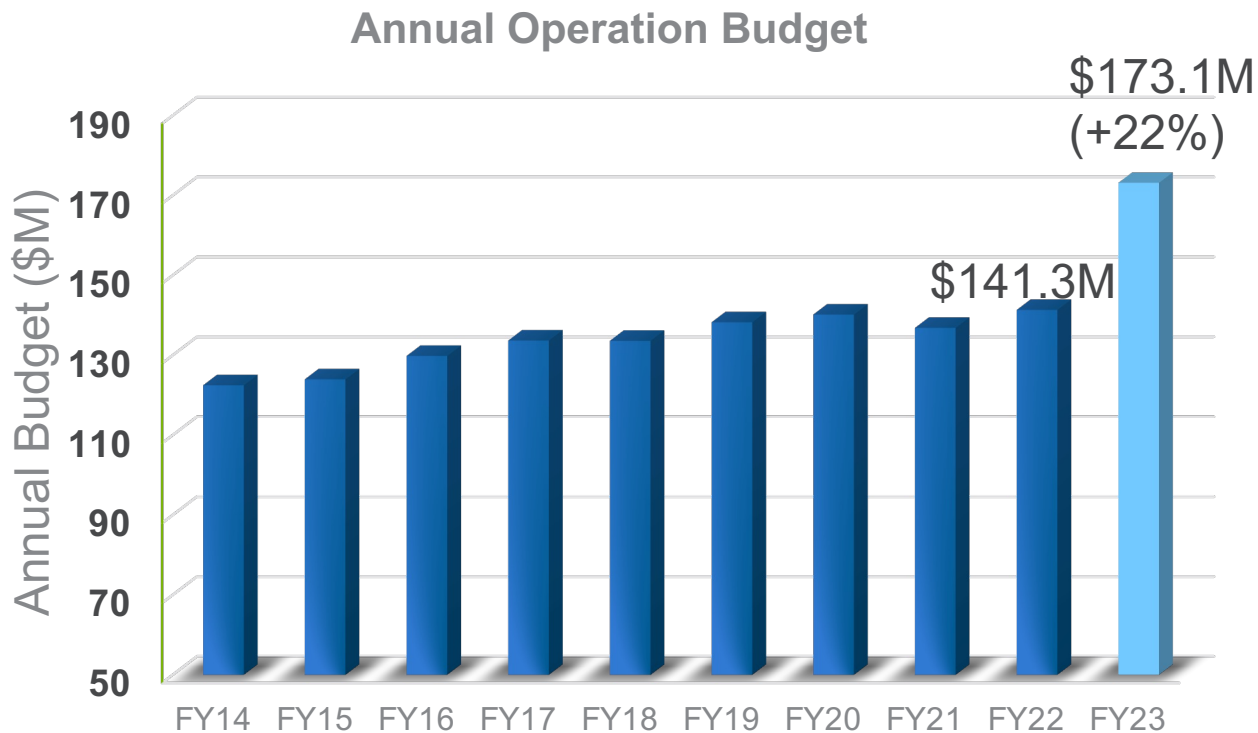


DEI – CONSULTATION

1. The DEI Committee will be seeking feedback from all employees on what HRS policies and procedures they would like more information on, this will include a prioritization of these items and a recommended approach to close the gaps in knowledge
2. The DEI Committee will be forming a diverse committee to gather recommendations on guidance on what it takes to receive an “Exceeds” in the Core Values and DEI assessments on the performance appraisal.



APS OPERATIONS – FY23 BUDGET



OPERATIONS BUDGET FOR LIGHT SOURCES

Thanks for the exceptional teamwork

- Staff /partners/users consistently delivering high impact science, new technology and operational excellence
- Exceptional support and engagement from BES to build out years budget bottom-up
- Lab directors and government relation staff working together to drive change for light sources
- Very active engagement, and excellent tours/VIP visits to showcase the importance of APS in the research ecosystem.



MOVING FORWARD

1) Increase staffing levels to support beamline operation at APS-U and existing beamlines that have not operated at full capacity

*This is essential to **attract and retain talent**, remain at the cutting edge of innovation in collaboration with our user community, and successfully address the **big data and sample environment/automation** challenges at fourth generation synchrotron facilities.*

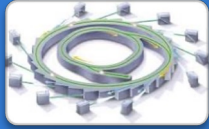
2) Replacement of the **obsolete high-power radiofrequency** (RF) klystrons with solid-state RF amplifiers for the APS Booster synchrotron and Storage Ring, **deferred maintenance at APS.**

3) Include a level of capital expenditure in our baseline budget to support a rolling program of upgrades to maintain an internationally competitive beamline portfolio

4) Financial support for **DEIA activities** commensurate with our ambitions

EXCHANGE OF STAFF PROGRAM

A rolling yearly visitor program that encourages long duration visits (1 to 6 months) of PSC staff at various host institutions



Working collaboratively at other BES U.S. light sources, neutron sources or nano centers

MSIs

Create new partnerships with MSI and HBCUs (primarily non r1 MSIs), including educating communities on synchrotron enabled science and technology



Working at international light sources with the aim of improving bilateral collaborations (US-Germany, US-UK, US-Sesame....)



Working at a collaborator academic institution on existing science and technology projects, or as a learning experience in a priority area identified as part of the annual personal development plan

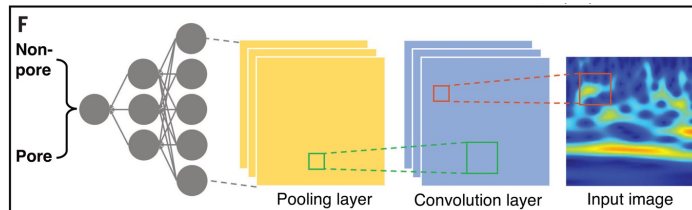
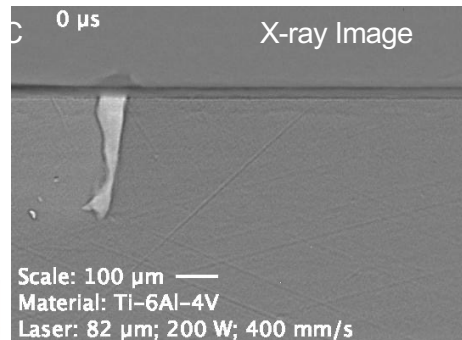
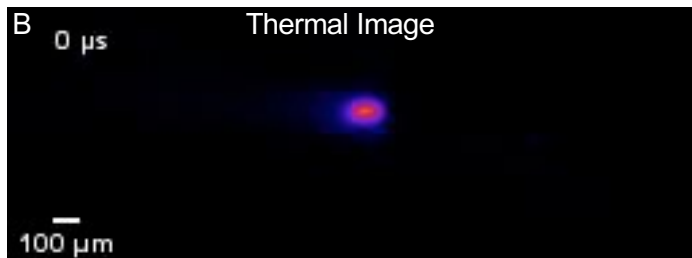
Please contact your DD or senior leader for more details

HR UPDATES

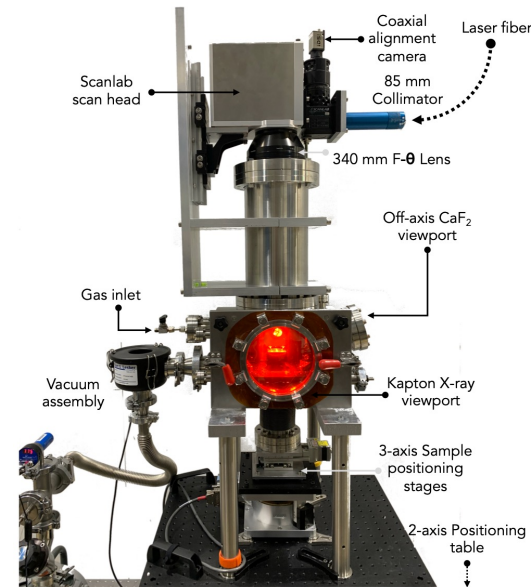
- **Effective immediately there is a revised Impact Argonne Awards process for PSC**
 - Do not submit the nomination in Workday until it has been approved
- **Mentors and Volunteers are needed for 2023 Introduce a Girl to Engineering Day**
 - [Register](#) by February 8th
- **Argonne's Employee Assistance Program expands on-site counseling hours**
 - Argonne's [Employee Assistance Program](#) (EAP), now offers on-site counselor appointments on Tuesdays and Thursdays. Licensed social workers are available for employees from 8 a.m. to 4 p.m. on those days
 - Contact the Perspectives call center at 800-456-6327
- **New enhancements to the bereavement leave to include pregnancy, fertility, adoption losses**
 - For absences due to the death of any covered family member, benefits-eligible employees receive three days of paid leave, and up to 10 days of unpaid leave
 - Please see [LMS-PROC-170: Bereavement Leave](#) for details
- **Ombuds offering classes on communication**
 - More information available on MyArgonne

MACHINE LEARNING-AIDED REAL-TIME DETECTION OF KEYHOLE PORE GENERATION IN LASER POWDER BED FUSION

In-situ high-speed imaging 32-ID, Ex-situ tomography 2-BM



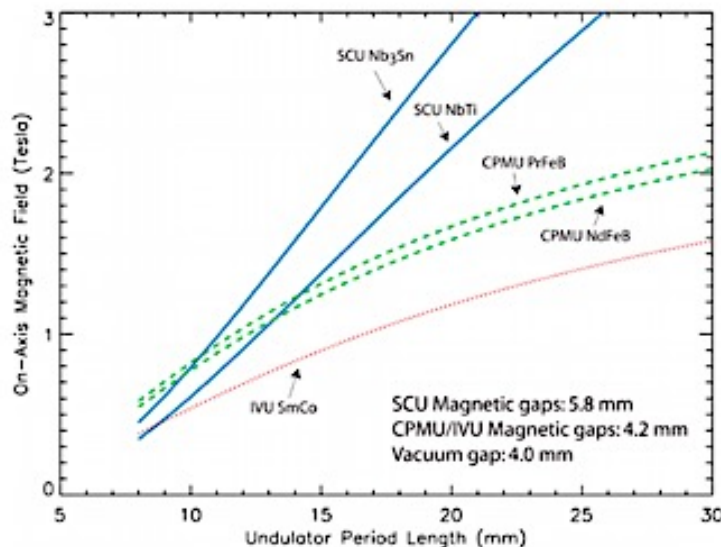
Zhongshu Ren, et. al. Science **379**, 89 (6 January 2023).



SUPERCONDUCTING UNDULATOR TECHNOLOGY

APS is on the Verge of another step forward in SCU, with the delivery of a Nb₃Sn SCU with potential 20-25% field enhancement

- Existing SCUs use the well-established NbTi wire
- Nb₃Sn wire has higher current capabilities
- However, the material is more brittle and difficult to handle, requiring high temperature treatment
- In 2018, DOE-BES funded a development effort to demonstrate Nb₃Sn in an SCU. Working together with Fermilab (heat treatment) and Berkeley Lab (quench protection), we have built the world's first Nb₃Sn SCU for use in an accelerator and are about to demonstrate in the APS.



Calculated on-axis magnetic fields of two cryogenic permanent magnet undulators (CPMUs), two superconducting undulators (SCUs) and on in-vacuum undulator (IVU) for a vacuum gap of 4.0 mm for period length from 8 mm to 30 mm.

E. Moog, et.al. ANL/APS/LS-348, 2017.

NB₃SN SCU IS INSTALLED IN SECTOR 1 AND READY FOR COMMISSIONING

- Efim Gluskin serves as the PI for this project and Ibrahim Kesgin as the Technical Lead.
- The minimal goal is to demonstrate that Nb₃Sn SCUs can survive a real beam radiation environment. The "stretch" goal is to show the brightness improvement expected with higher field.
- The SCU team has worked very hard to install this device for a beam test since it's the last chance to do so before the APS dark time.
- Thank you to the beamline users for supporting this effort.

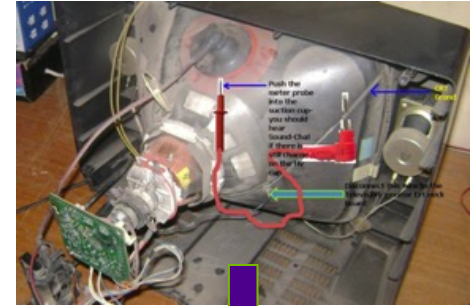


Ibrahim Kesgin and Matt Kasa next to the newly installed Nb₃Sn SCU

FROM TUBES TO TRANSISTORS: UPGRADING THE STORAGE RING RF SYSTEM TO SOLID-STATE

A critical need to maintain operation beyond the APS Upgrade

- The original APS RF system is based on MW-class klystrons that no longer are being produced; all modern telecom systems are based on solid-state amplifiers.
- This development is similar to what other storage rings have done. **For APS the challenge is the 2 MW RF power requirement.**
- Plan to convert the APS storage ring RF system to solid-state amplifiers. The new budget authority makes the delivery of this program a reality.



FIRST 200 KW SSA PROTOTYPE REACHES FULL POWER AND MEETS ALL ACCEPTANCE!

Kudos to project leaders Ali Nassiri and Doug Horan and the entire RF group.



Combiner cavity



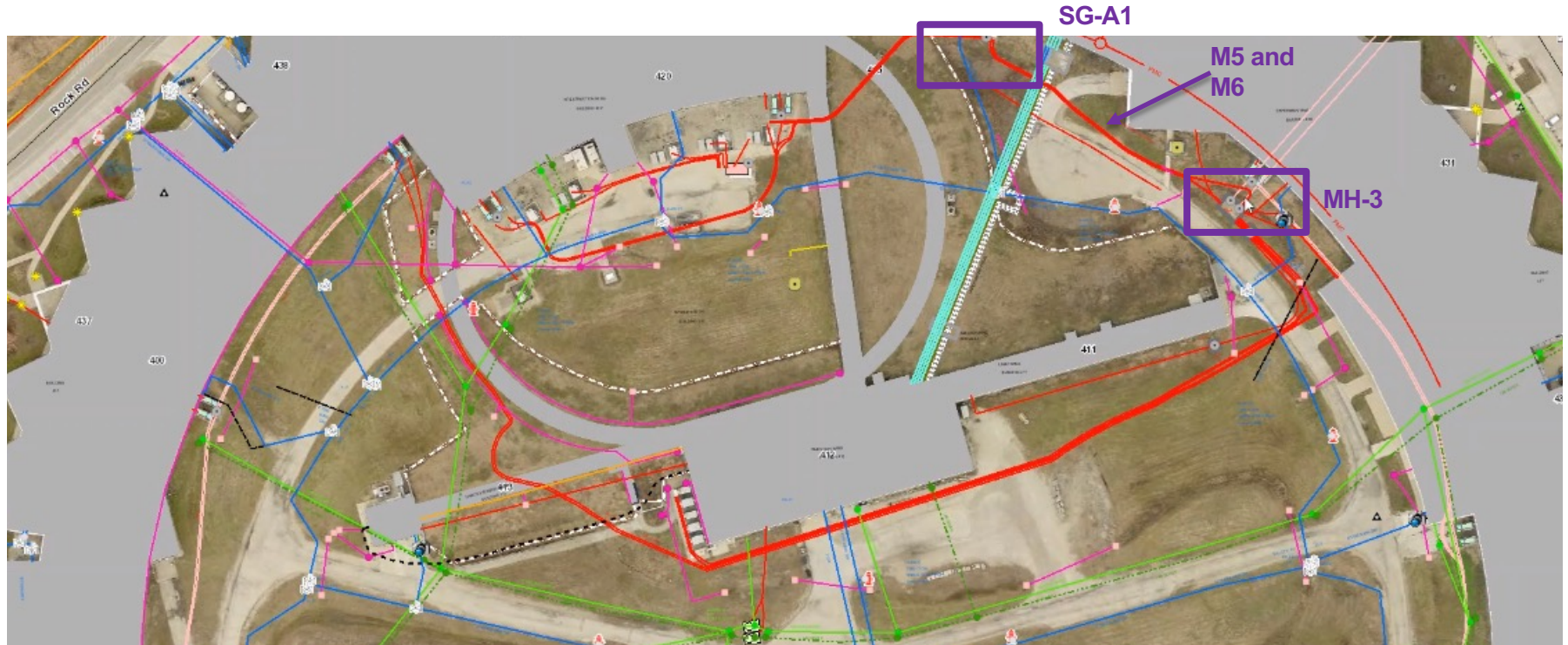
Amplifier racks

Plan is to begin procurement of production system in spring 2023 with first units arriving after APS-U commissioning. System will be completed by 2027.



APS 13.2KV POWER SHUTDOWN JAN. 3-13

Repair faulted cable (M6) from manhole 3 (MH-3) to switchgear A-1

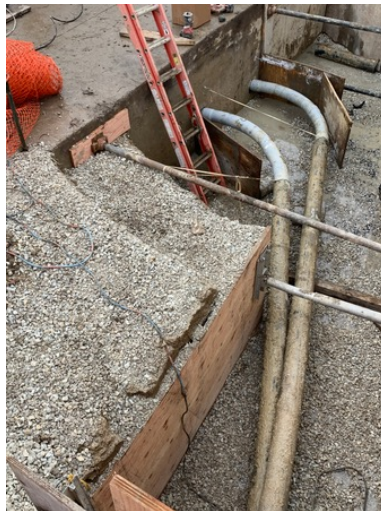


APS 13.2KV POWER SHUTDOWN JAN. 3-13

Repair faulted cable (M6) from manhole 3 (MH-3) to switchgear A-1

Included in the planned repair:

- Replace M6
- Identification and labeling of all cables in MH-3
- Install two sump pumps
- Cable testing



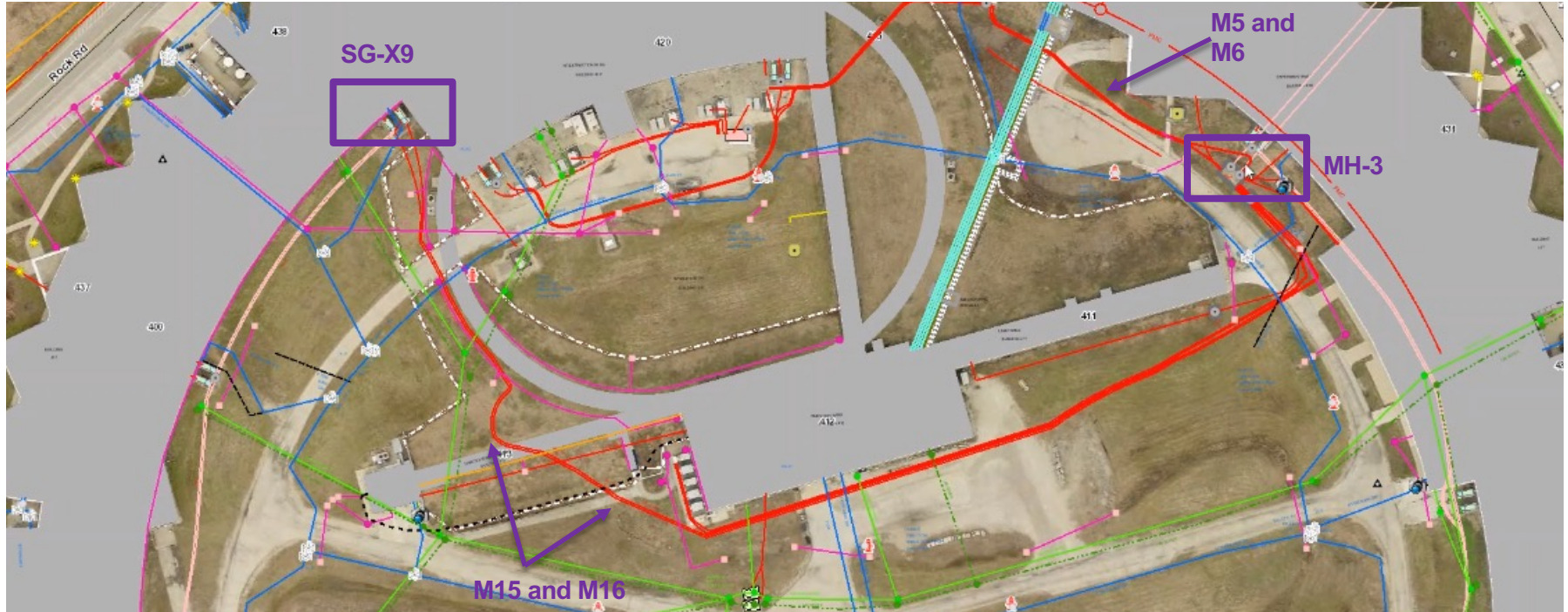
MH-3 buried conduit



M-6 in MH-3 and cable labeling

APS 13.2KV POWER SHUTDOWN JAN. 3-13

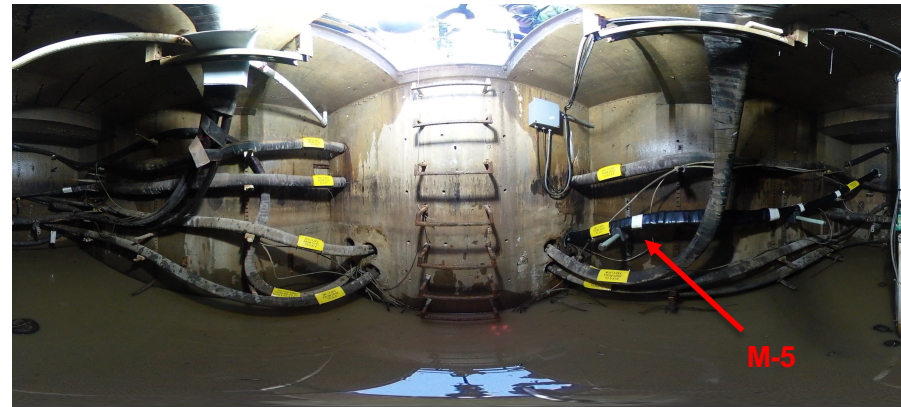
Scope expansion: M5 replacement, M16 splice repair, cable testing



APS 13.2KV POWER SHUTDOWN JAN 3-13

Scope expansion: M5 replacement, M16 splice repair, cable testing

- M6's adjacent cable (M5) did not pass test – replaced
- M16 did not pass testing – splice replaced
- M16's adjacent cable (M15) passed testing, will monitor.



Awards and New Starters

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IMPACT ARGONNE AWARD RECIPIENTS

Extraordinary Effort

- Claybourne White
- Kevin Peterson, Junjing Deng, Si Chen, Evan Maxey, Fabricio Marin



25+ YEARS SERVICE AWARDS

25 years

Jorg Maser
Michael Hahne
Jin Wang

30 years

Gregory Banks
Guy Harris
Mark Martens
Linda Shoudis

35 years

Dennis Mills

40 years

Kenneth Volin

AWARDS AND RECOGNITIONS



Stefan Vogt selected for DOE Oppenheimer Science and Energy Leadership Program



Ken Belcher, Mike Edelen and George Doktorczyk received Board of Governors awards for Outstanding Safety Performance

NEW STARTERS



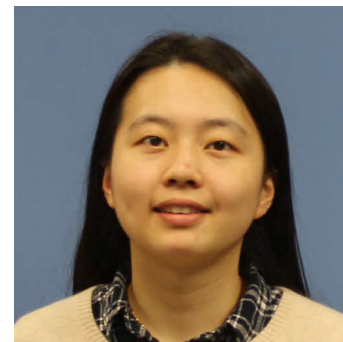
Davide Bianculli



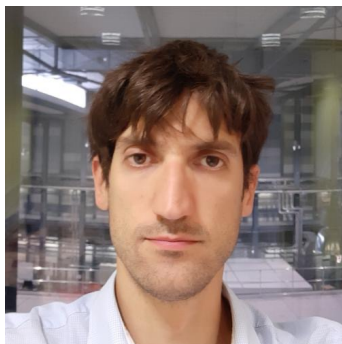
Paul Bednarski



Shea Stewart



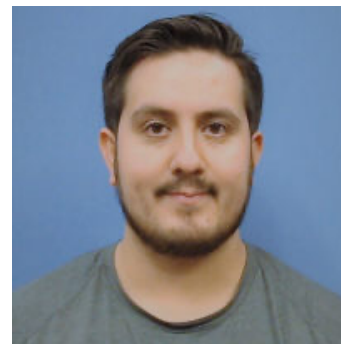
Xiaoyang Liu



Alberto Mittone



Savannah Novencido



Frankie Hernandez



Questions?



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Please do not hesitate to reach out
Always welcoming feedback!
Ichapon@anl.gov



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