Controls SW Group Meeting

April 27, 2023

T. Summers

Safety!

DOE Accident Investigation Board report on High Voltage Electrical Shock Accident *

Long and detailed report, but worth the time to read and reflect.

https://internal.slac.stanford.edu/directors-office/sites/directors-office.internal.slac.stanford.edu/files/AIB Report April 2023.pdf

- Some of my high-level takeaways and how it relates to us (since we're not doing high voltage work):
  - Underscored the importance of thorough job planning, identifying risks, and making sure we understand how changing conditions can affect the work. Helped me recognize how our processes fit into a bigger picture.
  - Working to the test plan, especially for complex jobs involving multiple people or groups, or if your work could have effects beyond your immediate actions. This can be hard – since we often take pride in being able 'save the day' and make some inspired fix to a problem at hand – these heroic efforts are often applauded – this is why we have experts right?
  - Recognizing that you have the authority to Stop Work if you are concerned something isn't right, even if you aren't the expert in the room.
  - There are big, structural changes and improvements needed in how work is planned and executed here at SLAC, and this takes time to figure out.

- It might seem like a bit of overkill for software jobs – especially the small and benign ones – but this is how cultural shifts are made, where these methods and processes simply become part of how we do our jobs.

Safety!

Who to call in an emergency

Note SLAC's emergency number is x5555 – please put the full number in your phone – 650-926-5555.
Safety cards from the badging office have been updated to have the full phone number.

- This is the preferred emergency number - but of course call 911 if you can't remember!

- SLAC emergency/security will coordinate with 911 responders for the fastest response.

- Channel 4 on the radio also connects to SLAC emergency.

- **If you are involved in any situation, make sure to inform your supervisor right away. There may be mandatory reporting and required follow-up actions needed.**

State of the Accelerators

Simultaneously implementing corrective actions and preparation to start up accelerators

All machines are currently off while several major tasks are underway:

- Complete arc-flash re-labeling of breakers needed for operation – still a work in progress
  - Reminder to not operate any breaker with label older than March 2023.

- **LCW* restoration S10-S30 – now targeting S25/S26 next week 5/1-5/4, others sector pairs TBD.**
  - We currently have power off to ATCA/motion, not camac in S25/26 – recovery planned for the Friday

- **Cryoplant 1 recovery started this week and will take a month to reach stable 2K (more in a moment…)**
  - Follow along here! https://pswww.slac.stanford.edu/swdoc/ecs_dashboards/cryomodule.html

- **AD goal to recover SC gun as soon as possible to check health – targeting Monday May 8th**

- Detailed machine access schedule being maintained during this strange time:
  - https://slac.sharepoint.com/:x:/s/AOSD/aosd_maint/EfpVyvtO_5ZHimHRpyWoE3EBPfB9x5YwPFhBqHqawloxdg?e=S4p9pe

- ACR is staffed M-F 7am-5pm, SPEAR M-F 8am-4pm, otherwise call 650-926-2151 for on-call EOIC.

Controls Software Status

LAF* PAMM next week (Tuesday to Thursday)

- **Please submit jobs by tomorrow morning for the work planning meeting at 9am.**

Schedulers are committed to keeping a consistent PAMM schedule

- Please continue to add your jobs into the appropriate buckets.

- Benign software jobs continue to be handled on case-by-case basis.

08/01/2023	09/16/2023	All Accelerators	Downtime	August/September downtime (LCLS SC, FACET, LCLS Cu)
05/30/2023	06/01/2023	All Accelerators	PAMM	5/30-6/1 PAMM
05/16/2023	05/18/2023	All Accelerators	PAMM	5/16-5/18 PAMM
05/02/2023	05/04/2023	All Accelerators	PAMM	5/2-5/4 PAMM
04/24/2023	04/28/2023	All Accelerators	Downtime	Accelerator Work for 4/24-4/28. No access to Sectors 0-30 or BSY.

Controls work that may impact you

- Sector power outages – but the details are fuzzy on timeline

- FACET controls environment upgrade wrapped up yesterday (still RHEL6) – keep an eye out for issues!

- Another one (of the 6) lcls archive appliance getting upgraded to RHEL7 sometime next week

Plan for Next Week

From Sharon's Wednesday Downtime Planning meeting

Dashboard: https://slac.sharepoint.com/sites/AD/committees/iwp/Pages/IWP-Dashboard-2022-2023-Downtime.aspx

Weekly slides: https://slac.sharepoint.com/:p:/r/sites/AD/committees/iwp/_layouts/15/Doc.aspx?sourcedoc=%7B0E25E64B-4DDE-40D3-A380-41DAEA665650%7D&file=DowntimePlanning_26Apr2023.pptx

April

Monday	Tuesday	Wednesday	Thursday	Friday	Sat/Sun
04/24/2023 • S20 LCW turn on	04/25/2023 • LINAC East PPS	04/26/2023 **Downtime Planning Mtg** • LINAC East PPS • Cryoplant – LINAC to 100K ⭐	04/27/2023 • LINAC Substation Maintenance – *Site Walkthrough by Electricians* • Cryoplant – LINAC to 100K • PEP Ring Road Closure – starting 4am	04/28/2023 • Cryoplant – LINAC to 100K • PEP Ring Road Closure	04/29 &04/30 • PEP Ring Road Closure – 04/29 completes 5pm

May

Monday	Tuesday	Wednesday	Thursday	Friday	Sat/Sun
05/01/2023 • Cryoplant – LINAC to 4K • LINAC Substation Maintenance – *K13 (S25&S26) Power Outage tentative*	05/02/2023 • PAMM • LINAC Substation Maintenance – *K13 (S25&S26) Power Outage tentative* • Cryoplant – LINAC to 4K	05/03/2023 **Downtime Planning Mtg** • PAMM • LINAC Substation Maintenance – *K13 (S25&S26) Power Outage tentative* • Cryoplant – LINAC to 4k	05/04/2023 • PAMM • Cryoplant – LINAC to 4K • LINAC Substation Maintenance – *K13 (S25&S26) Power Outage tentative*	05/05/2023 • Cryoplant –LINAC to 4K	05/06 &05/07 • Cryoplant – LINAC to 4K

Schedules in Development – subject to change

Disclaimer!
This schedule is a current best guess. (It's already changed since 11am Wed.)

All zones will generally be in No Access except for BTH and EBD-FEE, and during the PAMM areas needing access will be accommodated.

PPS and BCS testing is still ongoing.

Note PEP ring closure Thurs-Sat so no exiting through Alpine gate.

Update on Cryoplant (schedule from Eric Fauve)

CP1 recovery started

Best case scenario is:

- Initial 4K by May 8th
- Warm up and 'Fast Cool Down' which magically improves the performance so the RF cavities can be run at full field.
- 2K by mid-May.

BUT... there is a problem with the insulating vacuum so they will pause to leak check during the cooldown.
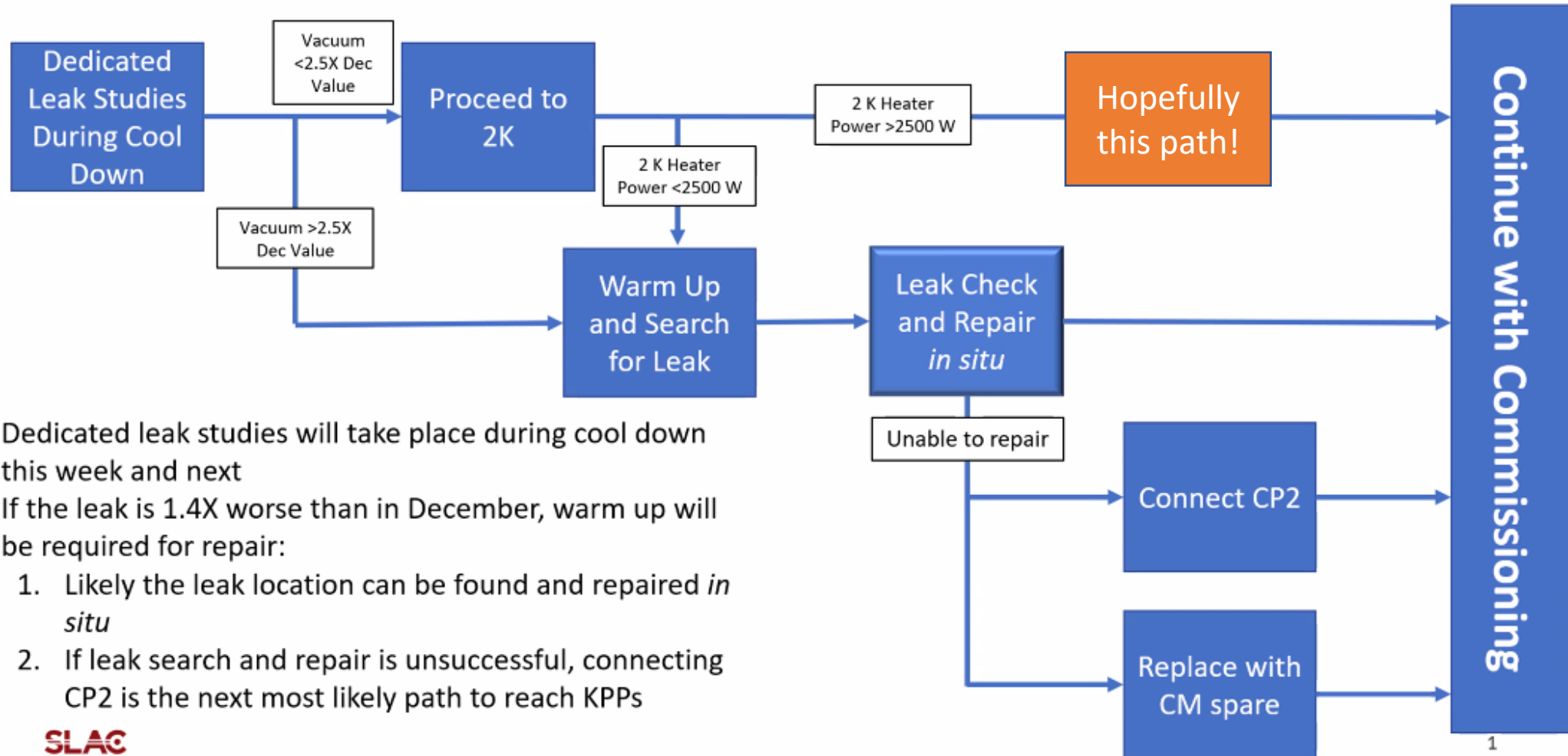
- The poor vacuum means it takes more LHe capacity to keep the module cold at full RF power than the Cryoplant can provide.
  (Likely can't achieve KPPs*)

KPPs = Key Performance Parameters, proof the machine can do its job!
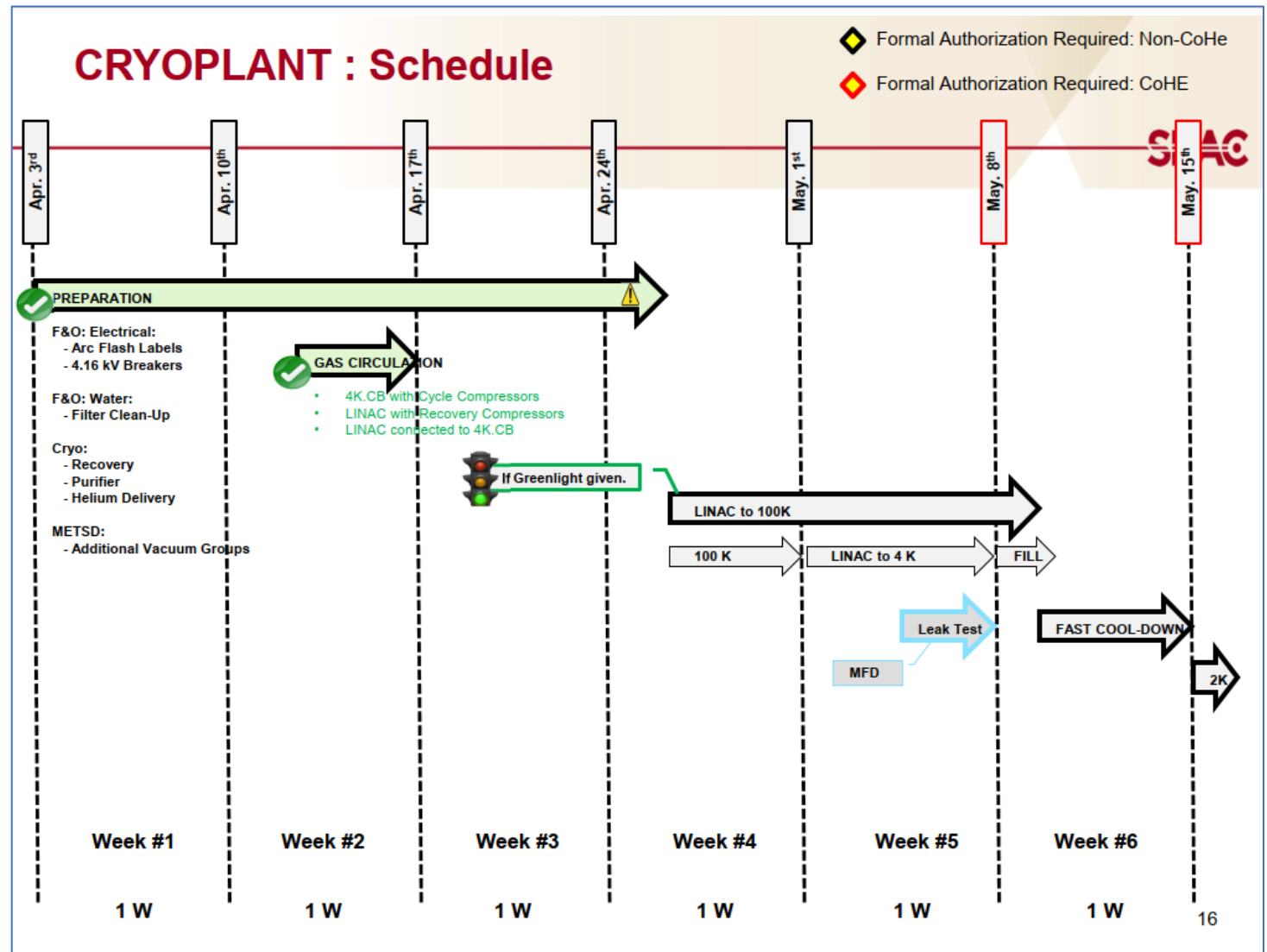
Update on Cryoplant (slide from Dan G. at 4:15 meeting)

Repair Scenarios

Details on 3 Scenarios on following slides

Dedicated Leak Studies During Cool Down

Vacuum <2.5X Dec Value

Proceed to 2K

Vacuum >2.5X Dec Value

2 K Heater Power >2500 W

2 K Heater Power <2500 W

Hopefully this path!

Warm Up and Search for Leak

Leak Check and Repair *in situ*

Unable to repair

Connect CP2

Replace with CM spare

Continue with Commissioning

1. Dedicated leak studies will take place during cool down this week and next
2. If the leak is 1.4X worse than in December, warm up will be required for repair:
   1. Likely the leak location can be found and repaired *in situ*
   2. If leak search and repair is unsuccessful, connecting CP2 is the next most likely path to reach KPPs

Update on Cryoplant (slide from Dan G. at 4:15 meeting)

Leak Detection and Repair

Most likely scenario
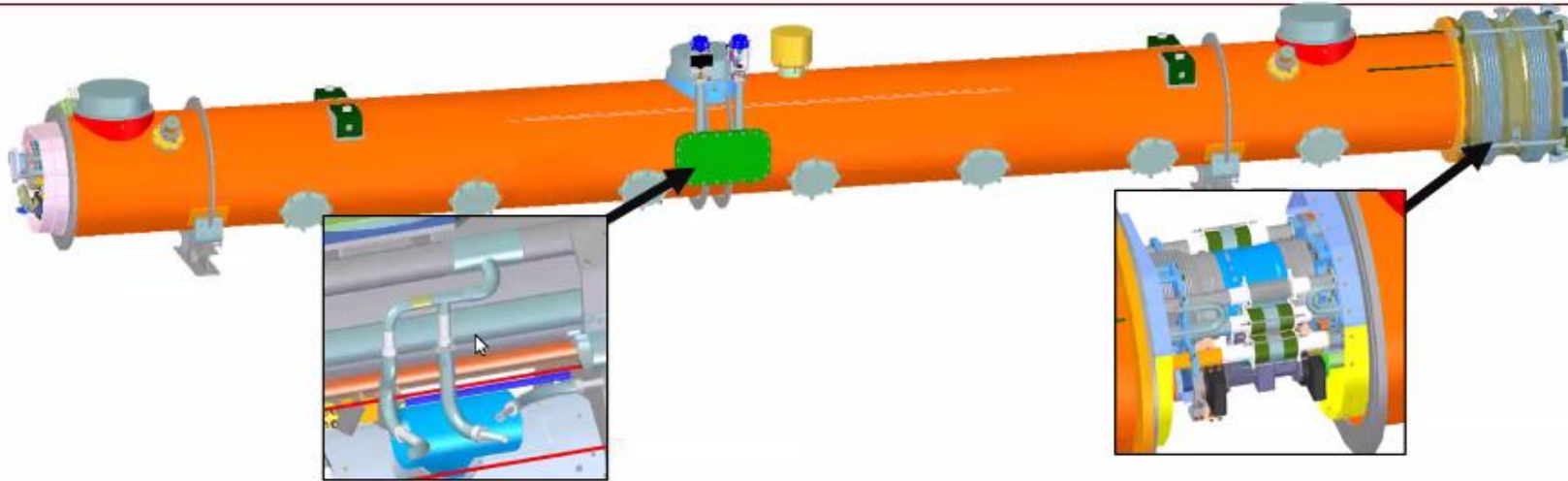
- Leak is theorized to be from "Line A" – 4.5 K helium supply
- Based on calculations, the leak is expected to be large enough to find at room temperature with standard leak testing techniques
- **Dedicated studies during cool down** this week and next week will aid in narrowing down the specific CM to investigate
- Vast majority of Line A is a straight pipe with only a few connections:
    - Connection to the CD and JT valves in the center of the CM
    - Welded to a bellows in the CM interconnects
- Both of these locations are accessible on the installed CMs
- **Estimated down time: 3 months** (1 month warmup, 1.5 months leak test and repair, .5 months cool down)

SLAC

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Other Reminders and Things

- Chris Myers will be starting in my team on Monday!

- The North Access/Bypass Road middle section is closed due to a big sink hole, fix date TBD.

- PEP road will be closed Thursday – Saturday (no access to Alpine Gate).

- If you have any issues, reminders, requests, or did-you-knows to include in this meeting send them to me!

Special Presentation

Yekta Yazar - Design and plans for a new archive viewer in PyDM

The JAVA Archive Viewer, currently used at SLAC to retrieve historical data from the archivers, is aging and no longer being maintained. A new PyDM application is being designed as a replacement. The proposed design will focus first on a functional replacement of the JAVA version, intended to be released quickly. A planned second version will include more complex post-processing and support for new EPIC7 datatypes. This presentation will demonstrate a graphical UI mockup and describe the current plan and draft requirements.

Comments, feedback, and suggestion on the design and name is encouraged!

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