

# EAC – SEF Operations Division Update

Richard Ford  
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# Topics

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- PMP (Vale summer shutdown 2024)
- Under-taking review of UG fire protection
- Completed update of SNOLAB Structural Design Seismicity Requirements
- Liquid Nitrogen
- Compressed air
- Power
- Chilled Water
- Windy Drift

# PMP Summer 2024

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- The Vale PMP (Preventative Maintenance Program) is a summer “mine shutdown” period for significant maintenance on main major infrastructure (shaft, cage, ventilation, water, compressed air, ...) requiring a prolonged shutdown. Historically this shutdown has ranged from a week to several months, with 4 – 6 weeks being typical. Access to underground is usually severely constrained during the PMP, requiring that construction activities are essentially stopped, and that operating experiments and plants must be capable of robust and reliable remote and automated operations.
- Reminder that the 2023 PMP was originally planned to be very long ~4 months, but in the end was reduced to 2 months (5-weeks no access) due to cancelation of shaft work. Our “fear” was that the 2024 PMP would be long to complete the work cancelled from the 2023 PMP. However, as of now, the Creighton mine manager has informed me that the 2024 PMP will be 6 weeks.
- I do not yet have any information about UG access during these 6 weeks, and at this point I would say the 6-week projected 6-week PMP is very much subject to change.

# UG Fire Protection Consultants Review

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- Fire risk and protection requirements for experiments are determined within the lifecycle process.
- Contract with a fire hazard protection engineering consultancy to review area-based fire risk with UG SNOLAB and protection options.
- Also consulted with Mine Rescue.
- One expected outcome is to retire or reconfigure current standpipe/hose-reel system to use clean domestic water.
- Another potential is to use CAFs (mobile foam units) as recommended by Mine Rescue
- Also, expect to have improved guidance to projects on fire protection requirements and options.

# Structural Design Seismicity Update

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- Ground control consultants ITASCA have updated their 2009 report on mining-induced seismic activity risk and design requirements for SNOLAB.
- This was prompted by the severe design challenges using the current spectral response function, while in reality knowing that the real risk is reduced due to current mining activity being much deeper within Creighton mine (~8600 feet) compared to 2009. Also there is now much more data available from increased instrumentation.
- New report is issued, and we have a new “design event” time-series scaled velocity spectrum.
- A new pseudo-acceleration spectrum (PAS) has been calculated from the time-series event for use in conventional structural design.
- The new PAS has much reduced Pas compared to the previous, and within the envelope applicable to structures and structural frames it is now more similar to local-region earthquake parameters, which is simplifying conventional structural analyses. There are still higher accelerations at higher frequencies, typical for rock bursts, that experiment designs need to take into account, but these are still more manageable than previous.
- SNOLAB also now has a structural engineer on staff with expertise in seismicity analysis.

# Liquid and Gas Nitrogen

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- GN2, connected to supply the DEAP3600 main LN2 dewar, is now performing well following the installation of the compressed air booster pump.
- The LN2 generator plant:
  - Working well following fix of early failures (valves and pump seal) – reliability improved
  - Working with the vendor to enable remote start of the compressor.
  - Providing relief to logistics, as capacity of ~350 L/day meets most lab requirements, and saves a rail car per day.
  - R&D in progress to address the argon separation issue.



# Compressed Air

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- Over the last several months there have been several incidents of low compressed air pressure due to Vale supply (problem for AHUs, SNO+ plants, CUTE).
- During this time SNOLAB's back-up CA has been out of service and is being replaced with a larger capacity system.
- The new CA plant is now delivered and underground and installed with all piping and electrical completed. Remaining work on controls connections to the BAS is underway now, and the unit should be operating within 2 – 3 weeks,

# Power

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- Last 6 months (Aug'23 – Jan'24) had 7 power outages. Generators turned on for all outages, however on one event (Dec'23) the lab was without power for 25 minutes, due to tripped breaker on 18 cct (caused by Vale ground fault in the deep, and improper breaker coordination).
- The new MPC remote-operated breakers are now delivered and underground, and installation will begin over the next months. Final tie-ins however will require two extended power outages (without generator backup) which must be coordinated with Vale and the experiments).
- A comprehensive electrical power study will be undertaken this year to examine options to improve power reliability and continuity, and to address power quality issues (THD)



# Chilled Water

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- We have been working on upgrades for the last year:
  - Intended to improve performance – increased temperature stability
  - Intended to improve efficiency – get more capacity out of existing system as well as save power
  - Allow better visibility of the lab heat balance for planning purposes
- Over past 6-months there have been several “soft” chiller outages (reduced capacity) due to compressors failures, and VFD and controller failures.
- A project is planned (proposed to POG) to build an electrical room enclosure to reduce electrical and controller failures.
- A comprehensive chiller study is currently being scoped to help guide long term planning to extend life or replace chillers, and options for increased future capacity.



# Windy Drift



# Windy Drift Condemned (1)

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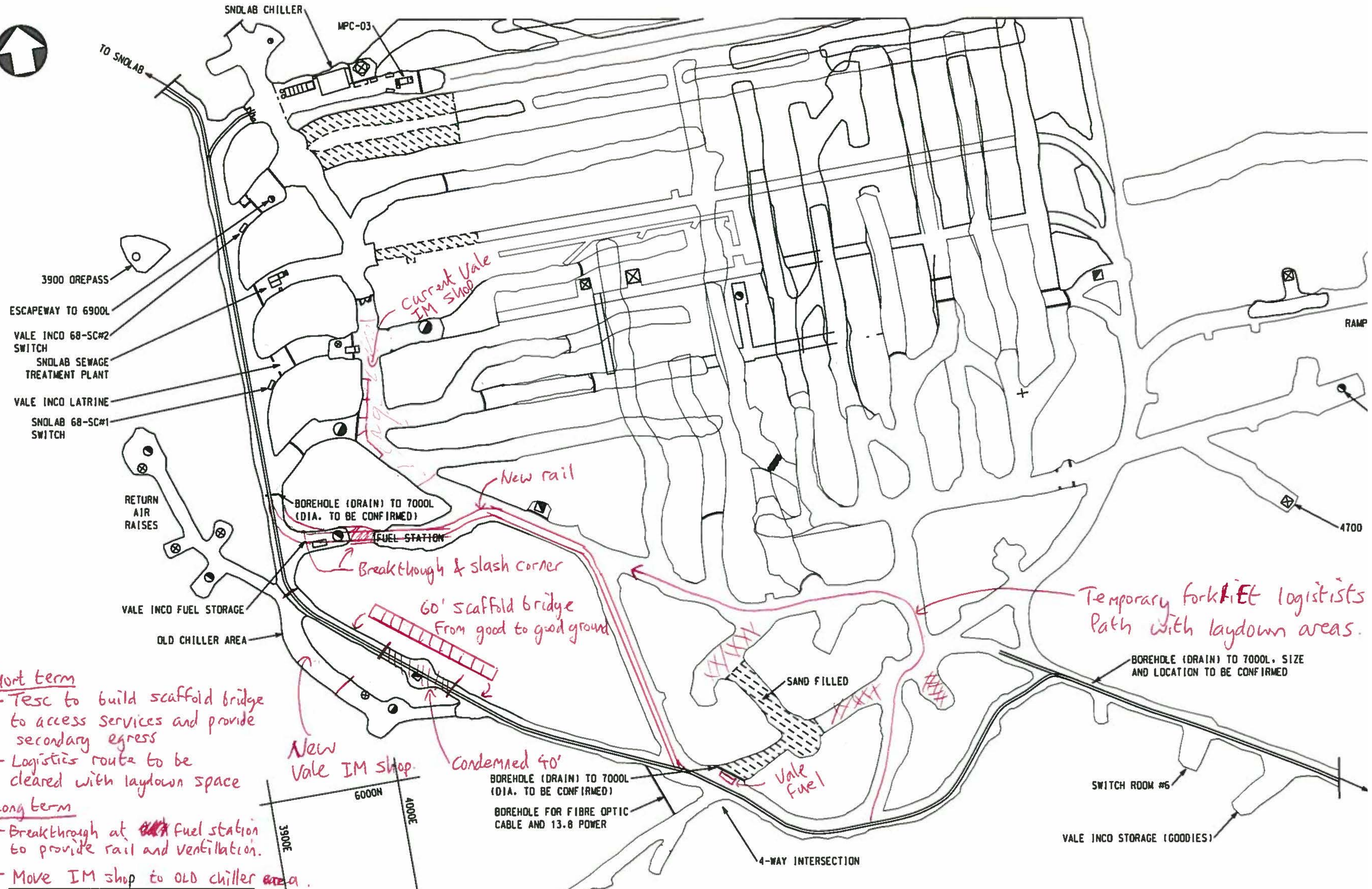
- As reported at previous meetings, the windy drift has been out of service for almost a year now, with original plans to repair some ground control problems. Logistics and personnel have been using the bypass drift through the Vale IM shop, which does not have rail link.
- During rehabilitation work the contractor discovered voids behind drift walls. Work was stopped, and area temporarily barricaded as unsafe.
- Subsequent probe drilling found evidence of large void and fractured rock behind wall and below level ground. Thought that the finger chute to the old 402 ore pass has caved-in.
- Vale has now condemned the drift as unsafe and likely unreparable. Further probe drilling is planned from the opposite side to better define size and shape of void. This is unlikely to change that the drift is unreparable, but will help refine the zone of bad-ground and risk of ground collapse.

## Windy Drift Condemned (2)

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- Vale is working with contractor to build a scaffold bridge over the bad ground. This would allow drift to be used as secondary emergency egress, and the scaffold to access utilities.
- In case of water pipe break before the scaffold is installed, there is a plan for how a temporary pipe could be laid, and the materials are ready.
- Vale is working with the logistics supervisor to tidy up and re-grade bypass through the IM shop in order to help the current temporary forklift route easier to unload and navigate.
- There are long term plans for re-routing the utilities and services, and for blasting a breakthrough drift to reestablish rail link, and to re-locate the Vale IM shop.





- short term
- Tesc to build scaffold bridge to access services and provide secondary egress
  - Logistics route to be cleared with laydown space
- Long term
- Breakthrough at ~~fuel~~ fuel station to provide rail and ventilation.
  - Move IM shop to old chiller area.



# End - Questions