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SNOLAB MEMORANDUM

To: COUPP-60 review chair and collaboration
From: Nigel Smith
Date: Thursday, 3 May 2012
RE: COUPP-60 review

The COUPP-60 collaboration has requested a review of their planned work within SNOLAB, to allow deployment of the COUPP-60 detector to commence this year. Accordingly, I would like to call a review team together to review the deployment and operational plans of the collaboration, addressing life safety, technical/engineering, hazard and risk analyses and sequencing of the deployment and subsequent operations. The review should cover all COUPP-60 systems within SNOLAB. It is anticipated that the review will be undertake in a single meeting, although subsequent reviews may be required should the chair and collaboration warrant this the most expedient way to deploy the detector. The charge for the review team is laid out below.

Relevant people to this charge:

SNOLAB Sponsor	Nigel Smith, Director, SNOLAB
SNOLAB Review Chair	Tom O'Malley, SNOLAB Project Engineer
COUPP-60 Sponsor	Andrew Sonnenschein, Fermilab/Chicago
COUPP-60 Project Manager	Eric Ramberg, Fermilab

Members of the review team:

- Tom O'Malley will chair the review meetings;
- The composition of the review teams is to be agreed between the review chair, the project sponsors and the SNOLAB Director, but may consist of both internal and external experts. The expertise of the review team needs to cover asphyxiation hazard, use of iodofluorocarbons, pressure/vacuum systems and water shielding;
- All SNOLAB managers should attend or provide input related to impact on their sphere of influence, with the impact on Vale to be determined directly or by the Facility Operations Group;
- The SNOLAB Safety Officer should attend and participate in all EH&S reviews;
- COUPP-60 collaboration members may attend as appropriate for the scope of each review, Andrew Sonnenschein to act as overall sponsor for the experiment during the review, with Eric Ramberg to act as COUPP-60 Project manager;
- Nigel Smith will attend ex-officio as SNOLAB Director;

Scope of the review:

- The scope of the review is the installation and commissioning of the COUPP-60 detector. This should include all phases of installation, including relocation of the COUPP-60 target from Fermilab, the construction of the shielding systems, iodofluorocarbon management, safety mechanisms and ancillary infrastructure.;
- Areas of interest that need to be covered by the completion of the review process includes:
    - Infrastructure physical design, construction and integrity;
    - Detector physical design, construction and integrity;
    - Shielding physical design, construction and integrity;
    - Safety of pressure and temperature control systems;
    - Safety of iodofluorocarbon handling / recovery systems and plant;
    - Safety and integrity of water systems and local plant;
    - Implications of calibration, DAQ and electronics systems.

Review process sequence

- Chair and collaboration to confirm sequence and scope of reviews (it is assumed that a single review will suffice for the COUPP-60 installation and commissioning, given the extensive surface testing at Fermilab);
- Collaboration to prepare and submit, to the chair, briefing packages for each review segment, as appropriate;
- Chair to determine appropriateness of review package and, assuming complete, to set review date and, in consultation with SNOLAB Director and collaboration, to determine appropriate constitution of the review team;
- Completion of the review, including initial feedback discussion with the collaboration;
- Creation of written review feedback, recommendation to the Director, SNOLAB, and generation of caveat list detailing any outstanding items that preclude deployment or commissioning;
- SNOLAB Director approval once recommendation received, against the caveat list;
- Chair empowered to sign off each phase as caveats closed out, leading to final commissioning;

Input will be provided by the COUPP-60 Collaboration in the form of a single, version controlled, briefing package or web archive and will consist, at a minimum, of:

- Risk and hazard identification, analysis and enumeration;
- Overall risk register showing intrinsic and residual enumerated risks, risk owner, mitigation strategies and actions (template available as an Excel file);
- Materials identification, hazard assessment and mitigation (MSDS);
- Life safety assessment and plans;
- Validation and justification of design and construction criteria;
- Drawings and specifications, with, where appropriate, Engineer of Record approval;
- Where appropriate, validation of compliance against Canadian regulatory standards, especially related to TSSA and ESA approval of equipment;
- Where appropriate, consultancy or other review reports and findings, with each recommendation identified and the collaboration action or response detailed;
- Expected resource and services requirement from SNOLAB;
- Expected resource and services requirement from Vale;
- Overall sequence of construction work, identifying the key milestones required prior to the following step;
- Overview of work plans and project implementation plan. These need not be fleshed out, but should provide enough information to allow general assessment of the expected task procedures;
- Definition of Document Control Process;
- Definition of Quality Management plan, including statement of response for situations where system parameters exceed stated bounds (e.g. pressure, stress)

Issues that need to be addressed during the review include:

- Capability and reliability of life safety systems;
- Inclusiveness and appropriateness of hazard analysis for use of materials and operations;
- Inclusiveness and appropriateness of risk analyses;
- Risks and hazards that should be addressed during the review should include, at a minimum:
    - Iodofluorocarbon handling and recovery;
    - asphyxiant/ODA hazard;
    - vacuum and pressure vessels;
    - calibration/radiation sources;
    - water shielding systems;
    - high voltage and DAQ;
    - physical hazards and risks, seismicity.
- Impact of systems integration sequence;
- Impact on the underground environment;
- Impact on SNOLAB systems;
- Impact on additional experimental systems;
- Impact on Vale operations.

The output from the review should be:

- A report to the Director, SNOLAB detailing findings of the review. This report should be broken down into the areas identified within the agenda, and detail if the systems as presented are deemed by the review team to be
    - Fit for purpose and ready to go
    - Fit for purpose, with caveats to be addressed
    - Not fit for purpose
- An overall assessment should be made of the sequencing and work plans for the various tasks in the reviewed programme, identifying if there are any issues related to the timing of operations
- An overall assessment should be made of the impact on other SNOLAB and Vale operations
- A complete caveat table should draw together the remaining issues that need to be resolved, in the view of the review team, by the collaboration. This should detail, in consultation with the experiment:
    - The caveat ‘task’
    - The owner of that task
    - The timescale for rectification
    - The impact of the caveat – ie does the caveat present a go/no-go decision point?

Timescale:

- Review to be held within 30 days of submission of the approved briefing package.
- Written report to the Director within 14 days of the conclusion of the meeting.