SNOLAB	**Project Life Cycle Management**

Document Number: **SL-SCI-RES-60-001-P**		**Revision Number: 02**
Document Owner: Director of Research		
Reviewer:		
Name: Jeter Hall	**Signature: <approval on file>**	**Date: 2023-08-22**
Approval Authority: Director		
Name: Jodi Cooley	**Signature: <approval on file>**	**Date: 2023-08-22**

1.0 PURPOSE

This procedure establishes a framework for project milestones, reviews, and approval gateways throughout the lifespan of a Project hosted at SNOLAB. This framework provides clear oversight and transparency to projects and SNOLAB, and steering mechanisms to control project scope, change management, risk exposure, hazard management, strategic fit, and other aspects of the process.

2.0 SCOPE

This procedure is applied to all potential experiments (“New Opportunities”) and approved experiments (“Projects”) at SNOLAB. This procedure is not applicable to SNOLAB internally initiated projects such as facility infrastructure improvements.

3.0 DEFINITIONS

Project - is an Experiment approved by the SNOLAB Executive Director after consideration of a submitted *Expression of Interest Form*. Projects are usually initiated by organizations external to SNOLAB but may have SNOLAB scientists participating.

New Opportunity - is a potential Project under consideration for selection by SNOLAB.

Deferred Project - is a Project or New Opportunity that for any reason is suspended by its proponents by a *Letter of Deferral* addressed to the SNOLAB Executive Director. Deferred Projects do not submit progress reports and are not tracked by SNOLAB. All previously submitted documents are archived for future use.

Sub-Project - a Project that has sufficient complexity or that has distinct phases of upgrade in its science reach by the addition of new functionality may be divided into sub-projects. Each sub-project will follow its own Project Life Cycle.

Project Scope - describes the goals of the Project including its scientific and/or technical goals and includes a description of the basic processes that will be used to achieve those. The Project Scope will be described in the Project Charter.

Project Charter - is the document that describes the Project's intended purpose including the Project's Scope, the Project's scope limitations (things explicitly excluded from the Project's goals), SNOLAB deliverables, participating institutions, ownership of major assets and key Milestones for the Project. Changes in the Project Charter require joint agreement between the Project and SNOLAB.

Project Life Cycle - is the process for administering an approved Project at SNOLAB. It specifies the actions, reviews and approvals required for the Project to be brought to SNOLAB, operate and decommission.

Project Phase - within the Project Life Cycle, a Project will go through either six or seven phases defining the different stages of the Project's development and implementation.

Project Number - each New Opportunity will be assigned a unique Project Number which it will retain through the entire Project Life Cycle.

Gateway - to advance between Project Phases, a Project must pass a Gateway. Gateway approval is given by the SNOLAB Executive Director.

Project Risk - an event or outcome of a process that affects the Project's ability to meet its scientific objectives. A risk could affect scientific reach, cost or schedule. Project Risk explicitly excludes safety issues which are addressed separately as Hazards.

Hazard - a hazard is any situation, substance, activity, event, or environment that could potentially cause injury or ill health to people. Hazards are managed in accordance with the SNOLAB Hazard Management Policy and Procedure.

Conceptual/Preliminary/Technical Design - are progressively more advanced stages of design for a Project. The Conceptual Design will present a plan to achieve the scientific goals of the Project but may not have many of the engineering details worked out and may have multiple design options under consideration. Cost estimation based on the Conceptual Design will have large uncertainties associated with it. The Preliminary Design is more advanced than the Conceptual design with much of the

engineering at an advanced stage and the number of design options reduced. A cost estimate based on the Preliminary Design should have an uncertainty associated with it. For instance, the cost may be estimated to have a +50%/-20% uncertainty. The Technical Design should present the final design without options and with most or all of the engineering finalized. Shop drawings and vendor packages may be part of the Technical Design. The Project cost derived from the Technical Design should have small uncertainties with much of the costing based on vendor quotes.

Issues Log - a list of outstanding issues or actions that need to be resolved prior to approval such as Gateway Approval being given. This usually consists of recommendations from reviews but may include recommendations generated from external studies and assessments.

Experiment Advisory Committee (EAC) - is an international peer review committee that advises the SNOLAB Executive Director on the Science Program that is undertaken at SNOLAB.

4.0 RESPONSIBILITIES

SNOLAB Executive Director - is accountable and responsible for the overall direction and establishment of the Scientific Project Life Cycle Management System. The Executive Director is responsible for approval of all Project Gateways. The Executive Director approves use of SNOLAB resources and has final authority of all activities at SNOLAB.

SNOLAB Director of Research - is responsible for effective implementation of the Project Life Cycle. The Director of Research is responsible for the development of Projects from New Opportunity through to completion of Phase 2, Development and passing GW-2 Deployment Approval. The Director of Research is also responsible for assigning review chairpersons for all project reviews during these phases.

SNOLAB Director of Operations - is responsible for a Project after GW-2 in the Implementation, Operation and Closure Phases. The Director of Operations is also responsible for assigning review chairpersons for all project reviews during these phases.

SNOLAB PMO Manager - is responsible for the implementation of the Project Life Cycle. The PMO Manager assigns a Project Manager to each Project for administration of the Life Cycle process for that Project. The PMO Manager may act as Technical Coordinator for major Projects, responsible for the use of SNOLAB resources over the Life Cycle of the Project, and working with the Project Lead to ensure appropriate project management plans are in place.

SNOLAB Project Manager - is responsible for the administration of a Project's Life Cycle through all phases from Initiation through Closure. This includes, but is not limited to, liaising with each assigned active Project and maintaining all controlled documents from assigned active Projects. The SNOLAB Project Manager may also manage SNOLAB deliverables to the Project, if applicable. These duties could also be given to a SNOLAB Project Manager, Project Coordinator or Project Engineer depending on the size and complexity of the project and at the discretion of the PMO Manager.

Project Lead - is the person with overall responsibility for the Project. The Project Lead will be responsible for ensuring that all Project Personnel abide by the *General Terms and Conditions Applicable to Projects at SNOLAB* and that the Project follows its Quality Assurance Plan. The Project Lead is also the person designated by the Project to ensure that the Project's responsibilities in the Life Cycle process are met. In particular, the Project Lead or designate is responsible for the development, submission and control of all documents that the Project provides to SNOLAB as part of the Project Life Cycle.

Project Proponents - are members of the Project Collaboration.

5.0 REQUIREMENTS

A SNOLAB Project normally has the following six phases: *Initiation, Definition, Development, Implementation, Operation*, and *Closure*. Taken together, these phases represent the path a Project takes from start to finish and is referred to as the *Project Life Cycle*. In some cases, a seventh phase, *Proposal*, will be inserted between Definition and Development. The transition from one project phase to the next will be marked by *Gateways* that require the Executive Director's approval. Each Project Phase contains some or all of the following components:

- Development work by the Project and, where appropriate, SNOLAB;
- Submission of documentation by the Project to SNOLAB;
- Evaluation and/or Review of the submission by SNOLAB and in some instances external bodies;
- Development of agreements between the Project and SNOLAB; and when appropriate,
- SNOLAB approval for the Project to advance to the next phase.

The time spent in each phase is Project specific. Passage through the Gateways is not automatic. As an outcome of reviews, a Project may be required to revise its design or strengthen its documentation and resubmit to the review process. In some cases, a Project may be discontinued part way through the Life Cycle or may be deferred for reasons such as availability of funding or need for research and development. One possible reason for suspension or discontinuation is loss of scientific relevancy due to the Project not meeting its scientific objectives or by advances in the world community.

Appendix C shows the alignment between the SNOLAB Life Cycle gateway process and other gateway processes including that used at TRIUMF and the Critical Decision Process used by the US Department of Energy.

5.1. Process Scaling and Project Road Map

The Life Cycle detailed in this procedure applies to all externally initiated Projects at SNOLAB. However, depending on the level of risk associated with a Project, steps in this process can be consolidated or dispensed with. The risk will depend on the Project's importance, complexity, projected cost and safety concerns. The risk level of a Project (Low, Medium, and High) will be designated by the Executive Director. Projects with low or medium risk may have steps in the life cycle combined. Projects with high risk will undergo the full Life Cycle. Furthermore, Projects with high risk and complexity may be subdivided into sub-projects each of which shall undergo either the full Life Cycle or a consolidated Life Cycle. The level of risk will also dictate the depth of the documentation required of the Project and the rigorousness of its Quality Assurance programme.

The Project Scale will be assessed if the Project passes GW-0, *Initiation Approval*, and a *Project Road Map* will be created which details the requirements for the Project in each Life Cycle Phase including reviews and approvals. The Road Map will be administered by the SNOLAB Project Manager assigned to the Project.

5.2. Project Phases

The Project Life Cycle is shown as a flow chart in Appendix A. Appendix B contains a table of required submissions for the reviews in each Project Phase.

5.2.1. Phase 0: Initiation

Phase 0, *Initiation*, evaluates a New Opportunity for scientific merit consistent with SNOLAB's science mission and compatibility with the laboratory infrastructure including space, services and hazard mitigation. If the New Opportunity is deemed within SNOLAB's scientific mission and is appropriate for deployment at SNOLAB it is given GW-0, *Initiation Approval* and is designated a Project. The Project's Life Cycle will then be administered within the SNOLAB Project Life Cycle.

The New Opportunity submits an *Expression of Interest* (EOI) to the Director of Research. The PMO will assign the New Opportunity a unique *Project Number*. The EOI will describe the scientific objectives of the New Opportunity and will identify the anticipated requirements from SNOLAB including space and infrastructure. The EOI will also identify known safety hazards, outstanding technical issues, collaboration and funding status. The EOI will be evaluated independently by:

- The SNOLAB Experiment Advisory Committee (EAC) for scientific merit, strategic fit and execution readiness.

- The SNOLAB PMO to determine the impact on and compatibility with the facility and the host mining company operations if the New Opportunity were to be hosted at SNOLAB.

The EAC and PMO will submit their evaluations of the New Opportunity for consideration by the Executive Director who shall decide whether to accept the New Opportunity as a SNOLAB Project. If the New Opportunity is to be advanced, the Executive Director shall give *GW-0, Initiation Approval.* The New Opportunity will be designated a Project and advance to *Phase 1, Definition*, and will be assigned a *Project Manager* by the *PMO Manager.* The Project Manager will act as the primary contact between SNOLAB and the Project.

The Executive Director will designate the Project Risk and a Project Road Map will be created identifying subsequent reviews and approvals required by the Project. The Executive Director may also choose to allocate resources, such as design services, to the Project. **At this time, SNOLAB has not made any commitments of space to the Project.** If the New Opportunity is not given GW-0 approval, it might be encouraged to strengthen its case and resubmit at a future time.

For low-risk Projects, the Executive Director may choose to award GW-0

without EAC evaluation. A Project Road Map will still be created with all subsequent reviews and approvals identified.

5.2.2. Phase 1: Definition

In Phase 1, *Definition*, the Project develops its Conceptual Design and identifies, in detail, potential hazards and project risks. SNOLAB will review the conceptual design for feasibility of the Project at SNOLAB and for execution readiness. While the Project may not have final engineered solutions to the identified hazards, there must be a hazard management plan that is *in concept* achievable within the constraints of the laboratory. If the Project is deemed sufficiently mature, space for it at SNOLAB will be reserved for a period of time consistent with the Project's expected duration.

When appropriate, SNOLAB shall conduct a *Conceptual Design Review*. The submissions by the Project to this review will include the following documents:

- *Conceptual Design Report;*
- *Project Charter;*
- *Project Implementation Plan;*
- *Initial Budget and Basis of Cost;*
- *Initial Experiment Hazard Registry and Initial Experiment Hazard Management Plan; and*
- *Initial Risk Register and Initial Risk Management Plan.*

The Director of Research shall call a Review Committee to assess the Project's Conceptual Design. The review will assess the Project for technical readiness, compatibility with the existing SNOLAB infrastructure, safety, project execution readiness, financial viability, resourcing, schedule, and compliance with SNOLAB policies and procedures. In some cases, instead of a single all-encompassing review, a series of reviews may be held. The review(s) will identify any outstanding regulatory or laboratory requirements. The Review Committee shall generate a report with recommendations to the Executive Director and will advise the Director on the suitability of the Project to advance to *Phase 2, Development* (or in some instances *Phase*

1A, Proposal) and whether to reserve space for the Project at SNOLAB.

Also in Phase 1, the Project Proponent(s) will be required to agree to and abide by the *General Terms and Conditions Applicable to Projects at SNOLAB*. MOUs and agreements may be developed in parallel with the Conceptual Design Review process.

The Executive Director shall consider the recommendations from the Conceptual Design Review Committee and, provided the Terms and Conditions, Project Charter and other applicable agreements are in place, will decide whether the Project is given *GW-1 Space Approval*. If GW-1 approval is given, space within SNOLAB will be reserved for the Project for a length of time consistent with the projected Project duration. The Space Approval will be for the Project Scope described in the Project's Charter. As described in section 5.6, any changes in the Project Scope such as an upgrade to the Project, a change in goals of the Project or an increase in Project duration will require submission of a *Project Scope Change Request*. Such a request will be considered by and must be approved by the Executive Director. The Executive Director may also choose to allocate additional SNOLAB resources to the Project during this subsequent project phase.

5.2.3. Phase 1A: Proposal

Some Projects may be required to complete Phase 1A, *Proposa*l. These Projects will undergo a review of their anticipated cost and schedule. The output of this Review may be used as part of the submission to funding agencies. The decision of whether a Project must go through Phase 1A is made by the Executive Director.

To perform this review, the Project must typically be more advanced than in the Conceptual Design stage having fixed the major design elements and have a comprehensive Basis of Cost.

The Project will submit a Preliminary Design Package to SNOLAB which will include the following documents:

- *Preliminary Design Report;*
- *Updated Project Implementation Plan;*

- *Updated Experiment Hazard Registry and Updated Experiment Hazard Management Plan;*

- *Updated Project Risk Register and Updated Project Risk Management Plan;*

- *Updated Budget and Basis of Cost;*

SNOLAB will conduct a Preliminary Design Review which will include a detailed evaluation of the Project's technical completeness and the Project's costing, resources and schedule. The output of this review will be a report with recommendations to the Executive Director identifying any concerns. The Executive Director will take this report into consideration before deciding if the Project is given GW-1A, *Proposal Approval*. It should be noted that because of the nature of GW-1A, it is likely that the Preliminary Design Review Committee will have recommendations that need to be addressed prior to GW-1A approval. GW-1A approval will only be given if it is felt that the Project can achieve its goals within the projected budget and schedule.

5.2.4. Phase 2: Development

In Phase 2, *Development*, the Project completes the engineering design and finalizes the hazard mitigation. The Project refines the project planning with the submission of the *Project Implementation Plan* which along with the *Project Charter* is used as a baseline against which project performance may be monitored and controlled. At the successful completion of Phase 2 (passing GW-2), permission to deploy equipment and materials at the SNOLAB site is given.

SNOLAB performs a Technical Design Review to ensure that the Project remains fit for purpose, is compatible with the SNOLAB infrastructure and that the hazard management plan for the experiment has been successfully implemented. **At this point, approval has not yet been given to allow Project materials and equipment on the SNOLAB site.** While it is the Project's decision when to proceed with procurement and fabrication, it is recommended that GW-2 be completed prior to procurement in case issues are identified during the Technical Design Review that may necessitate a change in design.

When the Project is ready, it shall submit a Technical Design Package which

will include the following documents:

- *Technical Design Report;*
- *Master Equipment List;*
- *Updated Project Implementation Plan;*
- *Updated Experiment Hazard Registry and Experiment Hazard Management Plan;*
- *Updated Project Risk Register and Project Risk Management Plan;*
- *Updated Budget and Basis of Cost;*
- *Quality Assurance Plan;*
- *Initial Installation Plan;*
- *Initial Decommissioning Plan;*
- *Long Term Test Plan (if required); and*
- *Status report on the Issues Log*

The Director of Research, shall call a Technical Design and Safety Review to determine if the Technical Design:

- Is compatible with SNOLAB facilities;
- Has an Implementation Plan, an Installation Plan and necessary resource allocations to successfully implement the Project at SNOLAB.
- Meets all relevant regulatory requirements;
- Has successfully mitigated all previously identified and any newly identified hazards and risks;
- Has non-standard installation or operations tasks such as critical lifts or working with hazardous chemicals and if so that they will be specifically addressed as part of the Installation and/or Operations Readiness Reviews; and

- Requires external review and approval such as the SNOLAB insurance carrier or the mine operator.

The Technical Design Review Committee shall generate a report with recommendations to the Executive Director and will advise the Executive Director on the suitability of the Project to advance to *Phase 3, Implementation,* and whether installation of the Project on the SNOLAB site should be allowed to commence.

Also in Phase 2, there will be the development of:

- Usage Agreements between SNOLAB and the Project detailing the responsibilities for all aspects of the Project including ownership of materials and equipment and decommissioning;

- Deliverables Agreements between SNOLAB and the Project detailing what deliverables shall be provided by SNOLAB and the Project; and

- All necessary legal agreements for insurance by the Project and SNOLAB.

Collectively, these agreements shall set out the arrangements and obligations for construction, installation, maintenance and operation of the Project. These agreements may be developed in parallel with the Technical Design Review process.

The Executive Director shall consider the recommendations from the Technical Design Review Committee and, provided all required agreements are in place, will decide whether the Project is given *GW-2 Deployment Approval*. **From this point forward changes to the *Project Implementation Plan* can only be made by formal agreement through change management between the Project Lead and the Executive Director.**

If GW-2 approval is given, the Executive Director may choose to allocate additional resources such as installation and logistics support to the Project to assist it in the Installation Phase.

As of GW-2, the Project's Quality Assurance Plan goes into effect. Any substantive changes to the Project Implementation Plan, technical design or safety aspects of the Project will require joint approval between the Project and the appropriate SNOLAB counterpart.

5.2.5. Phase 3: Implementation

In Phase 3, *Implementation*, the Project brings materials and equipment to the SNOLAB site, undertakes construction or modification of civil works and infrastructure and installs the Project's equipment in preparation for operations. Although the Project has now passed GW-2, *Deployment Approval*, prior to the beginning of installation, SNOLAB shall review the updated Installation Plan. At the completion of installation SNOLAB shall conduct an Operations Readiness Review prior to any substantive operation of the Project including commissioning.

There could be considerable passage of time between the submission of the *Initial Installation Plan* in the Technical Design Review and beginning of Project installation. Therefore, **prior to any materials or equipment being installed at SNOLAB, an updated, current, *Installation Plan* must be submitted for review by SNOLAB.** This review will ensure that the Installation Plan is still relevant and that all planned installation related training and safety measures have been successfully implemented. A SNOLAB JHSC worker representative shall be part of the Installation Readiness Review. The Installation Review Committee will make recommendations to the Executive Director who will decide if installation work is approved. In some instances, there may be major activities during the installation that may require separate approval. For example, a critical lift.

At the completion of installation and prior to the beginning of operations (including commissioning) an Operations Readiness Review shall be held. The submissions by the Project for this review include the following documents:

- *As Built Drawings and Technical Manuals;*
- *Preliminary Operations Manuals;*
- *Operations Plan;*
- *Training Manuals and Records;*
- *Test Reports and Safety Certifications;*

- *Close out Report of Issues; and*
- *Quality Assurance Records;*

The Operations Readiness Review Committee shall determine if:

- All safety issues have been adequately addressed;
- All required training is in place; and
- The Project is following its Quality Assurance Plan.

A SNOLAB JHSC worker representative shall be part of the Operations Readiness Review. The Operations Readiness Review Committee shall generate a report with recommendations to the Executive Director and will advise the Executive Director on the suitability of the project to advance to *Phase 4, Operations.*

Some Projects may be identified as having sufficient risk associated with them that external approvals are required prior to operation. These approvals could be required from:

- The host mining company;
- SNOLAB's insurance brokers; or
- Government regulators;

If external approval is required, the Project shall prepare the appropriate information packages which will be submitted to SNOLAB which will be the primary contact with the external agencies giving approval. While it is encouraged to seek external approval as early in the Life Cycle as possible, it may not be possible until the Project's plans are well developed such as at the Operational Readiness Review stage.

In addition, an Area Hazard Assessment must be performed by the SNOLAB EHS Officer and any necessary changes made to the Area Hazard Class as detailed in the *Area and Experiment Hazard Class Procedure*. Training of Project and Laboratory Personnel may be required

prior to the start of the Project's operations.

The Executive Director shall consider the recommendations from the Operational Readiness Review Committee and, provided all issues have been closed, all required external approvals have been given and the necessary changes to the Area Hazard Class made and associated training completed, will decide whether the Project is given *GW-3 Operations Approval*.

As part of the output of GW-3, a *Project Operations Permit* shall be prepared and signed by:

- The SNOLAB Executive Director; and
- The Project Lead

The Operations Permit shall be valid for a fixed period of time and may include conditions and exclusions.

In some instances, a Project may choose, or be required, to have a staged approach to operations such as going through a commissioning phase. In this case the Operations Readiness Review may be broken into segments with conditional Operations Approval given to each phase with the Operations Permit reflecting these restrictions. For example, a commissioning phase of a process system may limit the amount of process material allowed underground.

5.2.6. Phase 4: Operation

In Phase 4, *Operation*, the Project conducts its planned research program. The Project continues to be subject to SNOLAB requirements as defined in the *General Terms and Conditions Applicable to Projects at SNOLAB* and in the MOUs and agreements signed between the Project and SNOLAB. During the course of operations, the Project may decide that it requires more time than was originally allocated and/or it may wish to undergo modifications or upgrades. As described in section 5.6, this constitutes a change in Project Scope and a formal request must be submitted to SNOLAB for consideration and approval.

At the completion of its scientific program, the Project shall submit an updated Decommissioning Plan for review. The Decommissioning Plan shall be reviewed and approved by SNOLAB, and if warranted, be subject to

review by committee.

Upon receipt of an approved Decommissioning Plan the Executive Director shall decide whether the Project is given *GW-4 Decommissioning Approval*. The Executive Director may decide to allocate SNOLAB resources to assist with decommissioning.

5.2.7. Phase 5: Closure

During Phase 5, *Closure*, the Project shall be decommissioned. Assets shall be disposed of as per the MOUs and Agreements. Oversight of the Project through the bi-annual reviews will continue in the Closure phase both to ensure timely decommissioning and to ensure that scientific objectives including publications are met. The Project shall complete a *Project Close Out Report* and the Project and SNOLAB will jointly complete a *Project Close Out Memorandum* confirming that all assets have been disposed of and all essential and contractual responsibilities have been retired.

5.3. Reviews

There are a number of reviews required over the Life Cycle of the Project. The Review Committees are typically drawn from SNOLAB Management, the Design Office, PMO, Scientific Support Group or the Research Group. Some reviews will draw on the entire management team while others might only draw on a subset (for example an Installation Review). In some cases, external expertise will be brought in to augment the onsite technical capabilities. Reviews such as the Operations Readiness Review are mandated by legislation to have Joint Health and Safety Committee worker representation.

Some Projects may undergo a parallel review process initiated by member laboratory or funding agency. Where the review requirements are similar to those of SNOLAB, a joint review may be held or representatives from one institution may sit on a review held by another. For instance, an external institution may send representatives to sit on a SNOLAB chaired review or SNOLAB may send representatives to sit on a review chaired by an external institution. As well, if requested, a recognized agency or institution of the Project may request that an observer attend a SNOLAB review.

Nominally there are up to six reviews required in the Project Life Cycle (Conceptual, Preliminary, Technical, Installation, Operations and Decommissioning). In some instances, for low-risk Projects some of these

reviews may be merged. For complex Projects and Projects that have staged deployment there may be additional reviews or related activities such as HAZOPS. The review requirements for a given Project will be detailed in the Project Road Map.

Reviews are called by the Executive Director and managed by the appropriate Director. The Director appoints a Chair (usually from within SNOLAB Management) and generates the review charge. Once called, the administration of the Review is the responsibility of the assigned Project Manager who works with the Review Chair and the Project Lead.
The Chair decides on the format of the Review (e.g., in person vs teleconference, surface vs underground, duration) and acts as a gate keeper to ensure that the documentation submitted by the Project meets the requirements of the Review.

The Charge for the Review will detail the expected submissions by the Project. Some Projects may commission studies and assessments of aspects of the Project by bodies external to the Project or SNOLAB. If such assessments contain information or recommendations that affect the science goals of the Project or Project safety, they must be part of the submission for the Review – even if not explicitly requested as part of the Review Charge. An example of a Project sponsored external report is a fire hazard assessment by a consultant.

It is not expected that the EAC will normally participate in reviews. However, the EAC may recommend that particular topics be addressed in a review or suggest particular conditions be placed on the Project before full approval is granted, or recommend that the EAC review certain aspects of the Project Implementation Plan.

All submissions for the Review will be in electronic form and will be archived by SNOLAB. The output of the Review will be in the form of a report to the Executive Director and will be in the format of findings, comments and recommendations. In some instances, the Review Committee may group its recommendations by phases of the Project (particularly if the Project is undergoing a staged approach to deployment).

The Review report shall be submitted to the Executive Director by the Director who, once the report is approved by the Executive Director, shall transmit it to the Project Proponents. The Proponents will be given a time frame in which to look at the report, ask questions about report recommendations and indicate if they accept the report recommendations and what actions will be taken to address them. If necessary, the Director shall work with the Proponents and the Review Chair to resolve contested points in a timely fashion. If consensus

cannot be found, disputed points shall be resolved by the Executive Director.

All recommendations from all reviews will be compiled and their status monitored by the Project Manager in an Issues Log. The Issues Log will also contain any recommendations from external assessments and reports sponsored by the Project. Recommendations are usually closed by the Chair of the Review Committee which generated them. The Project must submit a written justification for closing issues along with supporting documentation. It is unusual for a Project to be permitted to begin operations before all applicable recommendations are closed out.

5.4. External Approvals

Depending on the size and unconventionality of risks associated with a Project, it may be necessary to seek approval from external stakeholders such as the host mining company or SNOLAB's insurance carrier. Ministry or regulator approval may be required for some systems (such as pressure vessels) or when unconventional hazards are involved. In such cases the Project will be responsible for preparing the necessary submissions but SNOLAB will act as the point of contact with the external body.

5.5. Project Oversight

5.5.1. Bi-Annual Reporting

Any New Opportunity after GW-0 becomes an approved Project and is subsequently monitored in the Project Life Cycle. Bi-annual progress reports against timelines, cost, risk and stakeholder plans are required and will be assessed by SNOLAB Experiment Advisory Committee and the Research Director (along with the PMO). The EAC will make findings, comments and recommendations to the Executive Director. The Project will be required to formally respond in writing to any Project specific recommendations within a timescale specified by the Executive Director. The EAC report will also be shared with SNOLAB governance including the Board and its committees.
When assessing a Project’s submission, the EAC, if appropriate, may request additional expertise outside the committee.

5.5.2. Ad Hoc Reporting

In addition to the semi-annual reports, SNOLAB may also require additional information and reporting from the Project to fulfill other requirements such

as reports to SNOLAB's funding agencies. These requirements will be met by the Project in a timely fashion. SNOLAB may also request from the Project, information intended to be made public during the course of SNOLAB activities. This could include slides for presentations, publicity photographs etc.

At the Executive Director's discretion, additional reporting structures may be put in place to ensure there is timely communications between SNOLAB and the Project. For example, fortnightly meetings between the Project and SNOLAB may be instituted.

5.5.3. Auditing

SNOLAB reserves the right to audit the Project. Particularly in Phases 2 through 5 when the Project is active at the SNOLAB site. Auditing may include:

- Verification of compliance with the Project's Quality Assurance Plan;
- Verification of compliance with the Project's Training program; and
- Verification that the Project's Safety Program remains effective.

5.6. Change in Project Scope

The Project Scope describes the goals of the Project, be they scientific or technical and describes what processes will be used to achieve those goals. An example would be a Project searching for Dark Matter using a particular target material and expecting to operate for a particular period of time. The Project Scope will be detailed in the Project Charter as part of the Phase 1 submissions. The space and time allocation to the Project will be conditional on the Scope. If the Project wishes to change the Scope (e.g., change of target material, change of scientific reach, change of run duration), a *Project Scope Change Request* must be made. Such a request will be considered and must be approved by the Executive Director. If a change in scope is approved, the Project must update its Project Charter accordingly.

5.7. Confidentiality

5.7.1. Submissions by the Project

Submissions to SNOLAB by a Project have a restricted audience. Within

SNOLAB these documents will be made available to groups and individuals as needed. These documents are always shared with the SNOLAB governance including the Board and its committees. In addition, SNOLAB will make these documents available to the following entities if requested by them:

- SNOLAB funding agencies;
- Recognized institutions and agencies of the Project as defined in the Project Charter and Bi-annual progress reports; and
- Project Collaboration Board members.

5.7.2. Outputs of the Life Cycle Process

Outputs from the Life Cycle process such as MOUs and agreements are usually shared with the appropriate Proponents of the Project. Examples where there may be restricted distribution might be legal agreements between SNOLAB and a university – in such a case it may only be available to SNOLAB stake holders and the relevant Project Proponent. Some of the outputs from the SNOLAB Life Cycle process are in the form of reports to the Executive Director (such as from the EAC or review committees). These will usually be shared with the Project.

5.7.3. Public Visibility

While SNOLAB will not make information from an Expression Of Interest publicly available, once a Project is past GW-0, SNOLAB will make available:

- The Project's name, number and scientific field (dark matter, neutrinoless double beta decay, etc);
- When past GW-1, the time and space within the laboratory allocated to the Project;
- At which point in the Project Life Cycle the Project is (which phase the Project is in and which Gateways it has passed); and
- A high-level schedule for the Project describing major project activities and their expected start times and durations.

6.0 RECORDS

- Project Road Map
- Review Reports
- Gateway Approval Letters
- MOUs and Agreements
- Project Operations Permit

7.0 SUPPORTING DOCUMENTS

- General Terms and Conditions Applicable to Projects at SNOLAB
- SNOLAB Experiment Programme Oversight and Quality
- Area and Experiment Hazard Assessment Procedure
- SNOLAB Experiment Advisory Committee Terms of Reference
- Project Review Committee Terms of Reference
- SNOLAB Expression of Interest Template
- Project Operations Permit Template
- Project Bi-Annual Report Template
- Master Equipment Register Template

8.0 REFERENCES

N/A

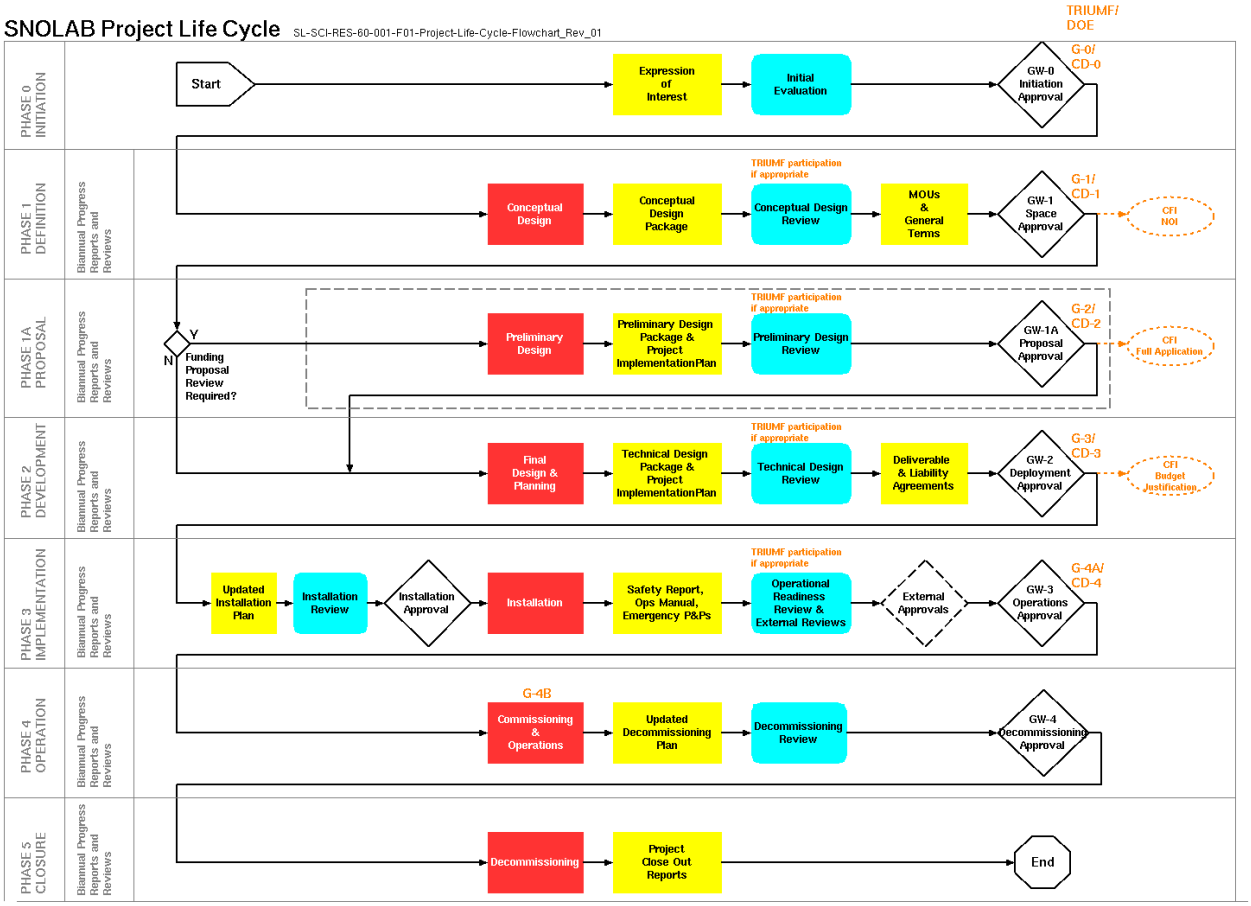
9.0 REVISION HISTORY

ORIGINATING DATE: 2015-09-02

REV NO.	EFFECTIVE DATE (YYYY-MM-DD)	AUTHOR	SUMMARY OF CHANGE
00	2015-09-08	Fraser Duncan	Initial Issue.
01	2015-12-07	Fraser Duncan	Changed names of Phase 0 and Phase 1 and updated documentation requirements.
02	2023-08-22	Jeter Hall	Updated titles and roles of the SNOLAB staff. Realigned some details to current practice.

Appendices

A. Project Life Cycle Flow Chart



B. Project Submissions

The following table lists the major submissions that the Project must provide during each Phase. Not included in the table are joint agreements, reports and MOUs between the Project and SNOLAB. Additional documents may be specified in the Project Road Map.

It is recognized that a Project may have to prepare submissions for other bodies such as funding agencies and participating institutions and that those submissions may take a different format that what is required for the SNOLAB process. In that case there is the potential of repetition or conflicting document structure. Provided all the required components of the documents listed below are provided at the appropriate project Phase, SNOLAB will work with the Project to accommodate differing document structures.

Phase 0 Initiation	
Expression of Interest (EOI)	The Expression of Interest shall describe the Project's: • goals and merits, • physical description and function, • requirements from SNOLAB for resources and infrastructure, • status of R&D and funding, and • collaboration demographics in sufficient detail to allow an assessment of the scientific veracity of the Project and the potential impact on the SNOLAB facility.
Phase 1 Definition	
Conceptual Design Report	The present concept for the Project detailing: • Science reach and science requirement including background goals, shielding and cleanliness requirements; • Space and infrastructure requirements; • Descriptions of apparatus; • Logistics; • Outstanding Research and Development. Where design decisions have not been made, alternate concepts with their associated infrastructure requirements should be presented.
Project Charter	• Scope & Limitations • Participating Institutions • Collaboration Board • Ownership of Major Assets • Key Milestones

Project Implementation Plan	The Project Implementation Plan will contain: • Project Management Structure • Project Oversight • Organizational Chart • Roles and Responsibilities • Engineering Responsibilities • Work Breakdown Structure • Resource Plan • Schedule • Milestones • Priorities
Initial Budget and Basis of Cost	Initial Budget and Basis of Cost for the Project
Initial Hazard Register and Experiment Hazard Management Plan	The Hazard Register shall identify all hazards organizing them by class in a matrix which shows intrinsic and reduced hazard. The Hazard Management plan shall describe the hazards and the plans for mitigating them. A template is provided for the Hazard Registry.
Initial Project Risk Register and Project Risk Management Plan	Identification of all Project Risks that threaten the scientific impact, timeliness, cost, etc of the Project. The Register will be in matrix form. A template is provided for the Risk Register. The Project Risk Management Plan shall identify plans to mitigate the Project Risks. The plan may identify R&D to retire technical risks, expansion of the collaboration to retire personnel risks etc.
Phase 1A Proposal	
Preliminary Design Report	Further advanced design report. Engineering should be advanced on many aspects of the project. Where design decisions have not been made, the advantages/disadvantages and cost of the alternatives should be well developed. The design is sufficiently advanced that the uncertainty in the cost derived from the design can be estimated.
Updated Project Implementation Plan	Update of the Project Implementation Plan submitted in Phase 1
Updated Experiment Hazard Register and Experiment Hazard Management Plan	Updated Experiment Hazard Register Updated Experiment Hazard Management Plan
Updated Project Risk Register and Project Risk Management Plan	Updated Project Risk Register Updated Project Risk Management Plan
Updated Budget and Basis of Cost	Updated Budget and Basis of Cost
Phase 2 Development	
Technical Design Report	All major design decisions should have been made and the Technical Design Report should describe the final design of the Project. Complete or near complete drawings and equipment specifications.

Master Equipment List	A list of all major pieces of equipment identifying size/shape, power requirements, regulatory requirements. Template provided.
Updated Project Implementation Plan	Update of the Project Implementation Plan submitted in Phase 1 or Phase 1A
Updated Experiment Hazard Register and Experiment Hazard Management Plan	Updated Experiment Hazard Register Updated Experiment Hazard Management Plan
Updated Project Risk Register and Project Risk Management Plan	Updated Project Risk Register Updated Project Risk Management Plan
Updated Budget and Basis of Cost	Updated Budget and Basis of Cost
Quality Assurance Plan	The Quality Assurance Plan shall include: • Document and Drawing Change Control; • Safety Issue reporting including reporting to SNOLAB • Non-conformance Reporting and Correction including communications with SNOLAB; • Records management; and • Change Management including SNOLAB.
Initial Installation Plan	An initial plan for installing the Project at SNOLAB including: • Planned work schedule and required shifts; • Training requirements for workers; and • Requested SNOLAB resources (installation, logistics, operators).
Initial Decommissioning Plan	An initial plan for decommissioning of the Project including: • How Project assets are dispersed; • Logistics for removal of materials and assets from the SNOLAB site; • What materials and assets are proposed to be left at Site; and • Hazardous waste disposal plan.
Long Term Test Plan	Some Projects might identify the need for long term testing of critical components. If so, a Long Term Test Plan must be provided which includes: • What components are to be tested; • How the tests will be conducted; • What records will be kept; • What the response is in the event of an unsatisfactory test result.
Status Report on Issues Log	A status report on the issues including recommendations from past reviews, studies etc.

Phase 3: Implementation	
Updated Installation Plan	Updated Installation Plan that is consistent with final Project design and procured systems. Includes: • Training requirements and records for workers; • Underground access requirements (shift and numbers of personnel); • Logistics requirements from SNOLAB.
As Built Drawings and technical manuals specification	As built engineering drawings including P&IDs. Technical manuals and specifications of equipment.
Initial Operations Manual(s)	Initial Operations Manual including: • Emergency Response Procedures; • Identification of major procedures; and • Maintenance/Testing plan for systems that require regular maintenance and/or periodic testing such as may be required for regulatory certification.
Operations Plan	• Run Plan (planned activities and expected durations); • Planned surface and underground shifts including numbers of personnel expected; and • Anticipated draw on SNOLAB resources during operations.
Training Manuals and Records	• Training requirements for operators; • Records of personnel trained and authorized.
Test Reports and Safety Certifications	Test reports and Safety Certifications for life safety related equipment.
Close out Report of Issues	A close out report for all issues including recommendations from past reviews along with supporting documentation.
Quality Assurance Records	Records demonstrating that the Project's Quality Assurance Plan has been implemented and is being followed.
Phase 4: Operation	
Updated Decommissioning Plan	At end of operations an Updated Decommissioning Plan that includes: • Planned dispersement of Project assets including assets to be left at site; • Underground access requirements for decommissioning (shifts, and number of personnel); • Logistics requirements from SNOLAB; • Hazardous waste disposal plan.
Phase 5: Closure	
Project Close Out Report	The Close Out Report shall include: • Confirmation of disposal of assets; • Plans for publications and science output after close out.

C. Alignment with Other Gateway Processes

The following table shows the alignment between the SNOLAB Life Cycle Gateway Process and other gateway processes.

SNOLAB Phase		SNOLAB Gateway	TRIUMF Gateway	DOE Gateway	Anticipated Requirements for CFI
Initiation					
		GW-0 Initiation Approval	G-0	CD-0 Approve Mission Need	
Definition					
		GW-1 Space Approval	G-1	CD-1 Approve Preliminary Baseline Range	Notice of Intent
Proposal					
		GW-1A Proposal Approval	G-2	CD-2 Approve Performance Baseline	Full Application
Development					
		GW-2 Deployment Approval	G-3	CD-3 Approve Start of Construction	Budget Justification
Implementation					
		GW-3 Operations Approval	G-4A	CD-4 Approve Start of Operations	
Operation	**Commissioning**				
			G-4B		
	Operations				
		GW-4 Decommissioning Approval			
Closure					