Project Life Cycle and Integration with Funding Agency Requirements

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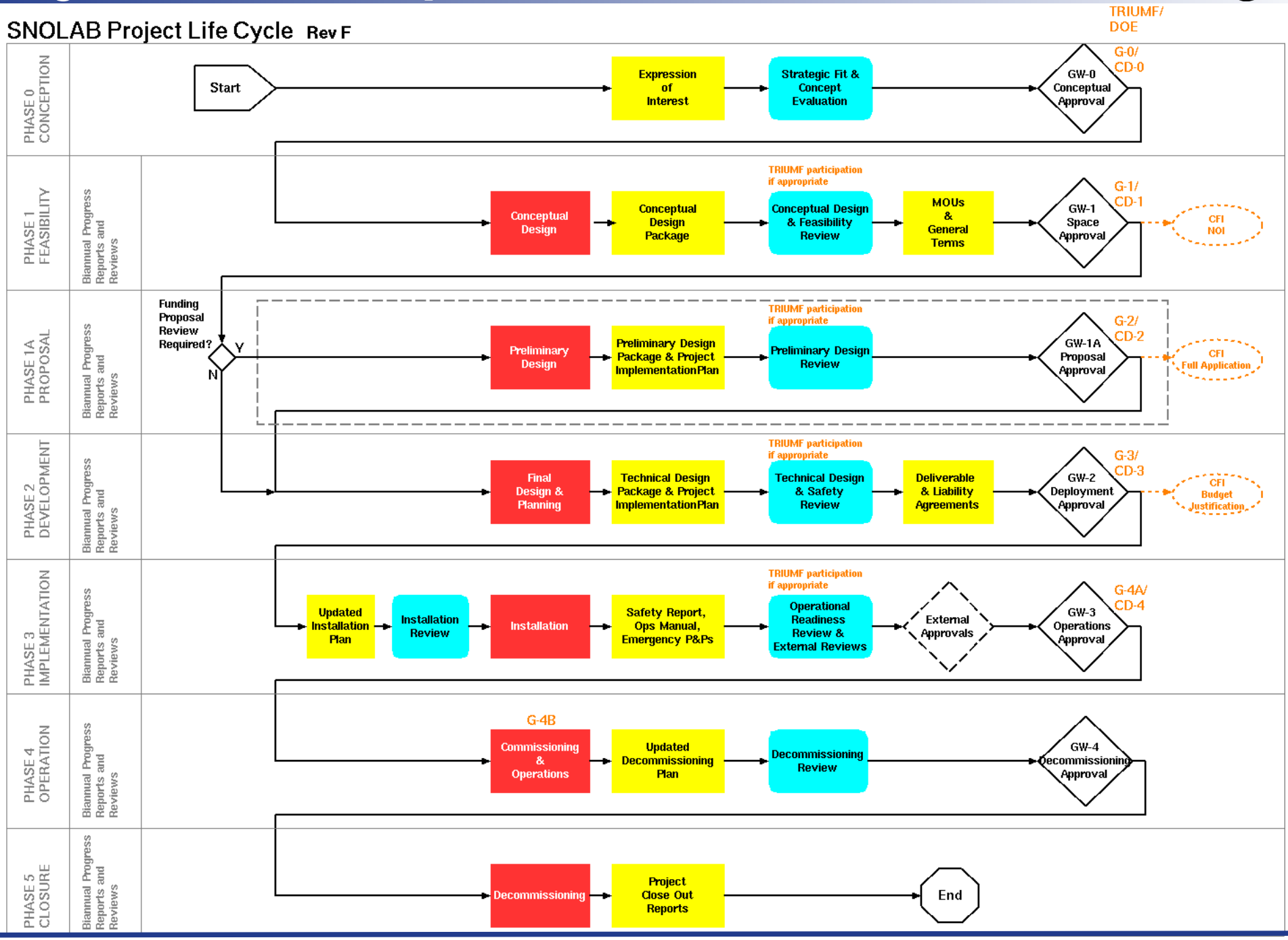
Formalizing Projects

- SNOLAB is formalizing the process for the requirements, review and approval of experiments ('Projects') coming to SNOLAB.
- The intent is to:
  - Improve communications between the SNOLAB and the Projects.
  - Make clear expectations and obligations of both the Projects and SNOLAB.
  - Provide guidance for Projects that are not familiar with complexities of deploying an experiment in an unusual environment.
- This process is called the *'Project Life Cycle'.*

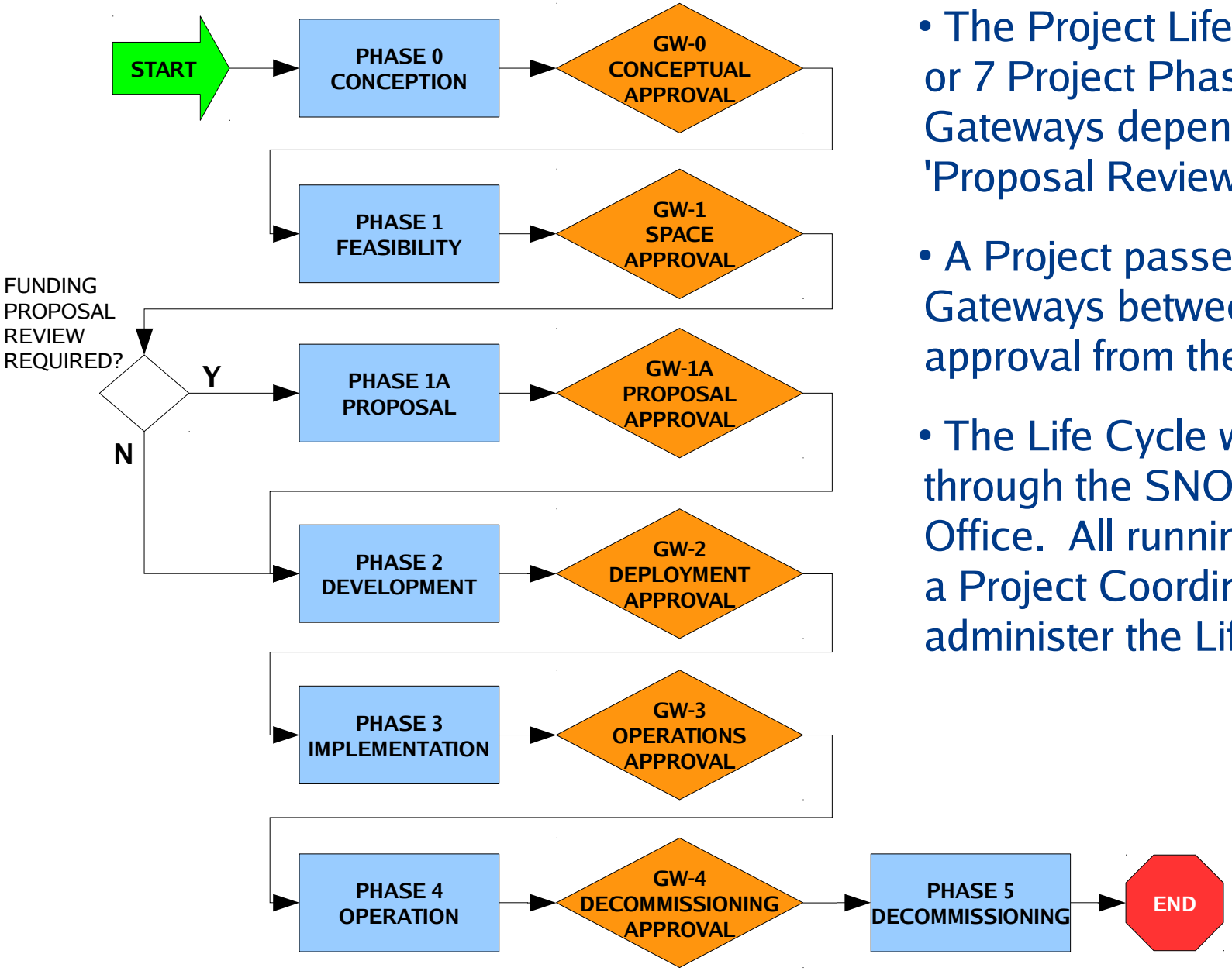
Funding Agency Requirements

- To align with the expectations of SNOLAB stake holders (funding agencies, Board) we are incorporating a step in the Project Life Cycle where, if required, a critical assessment is made of Projects. TRIUMF has already aligned their life cycle processes with these expectations.
- SNOLAB will assess the proposed Project's cost, schedule and resource allocation prior to providing a letter of support to funding agencies.
- This requirement has been incorporated into the new SNOLAB Project Life Cycle which we have aligned with both DOE and TRIUMF approval processes.
- We are also required by CFI to insert all running Projects at SNOLAB into the Life Cycle.

Project Life Cycle

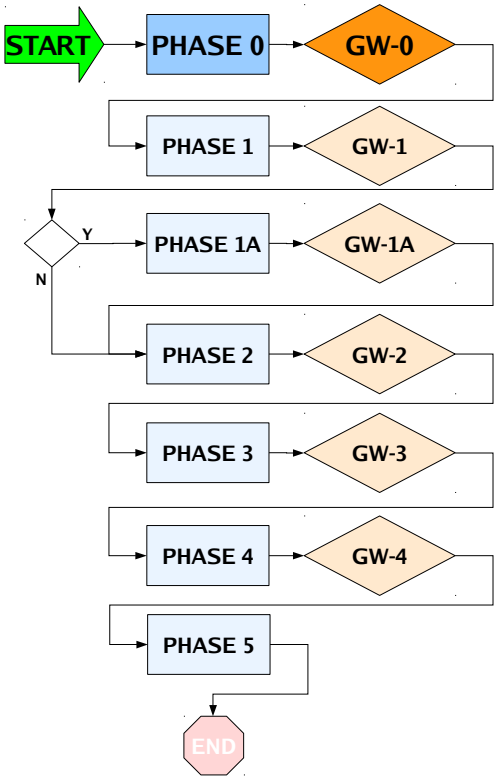


Project Life Cycle



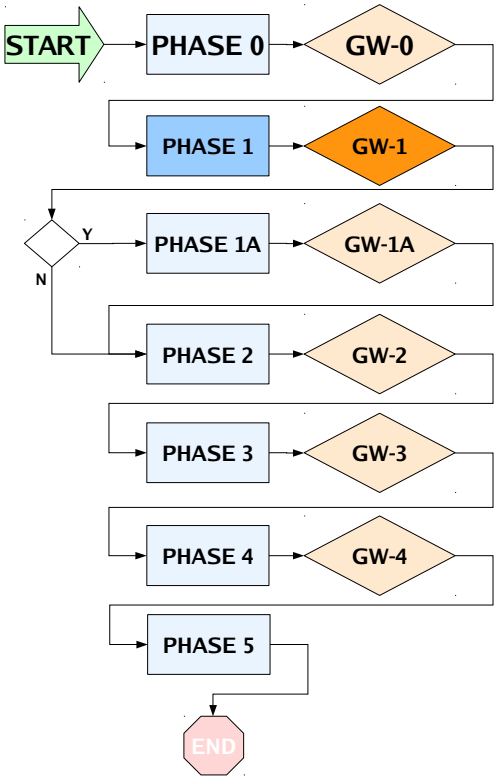
- The Project Life Cycle has either 6 or 7 Project Phases and 5 or 6 Gateways depending on whether a 'Proposal Review' is required.
- A Project passes through Gateways between Phases upon approval from the SNOLAB Director.
- The Life Cycle will be administered through the SNOLAB Projects Office. All running Projects will have a Project Coordinator assigned to administer the Life Cycle.

Phase 0



- **Phase 0: Conception**
  - 'New Opportunities' submit an Expression of Interest (EOI) detailing: scientific merit in the world context; description of the experiment; requirements from SNOLAB (space, services etc); hazards and risks; Collaboration demographics and funding status.
  - EOI is evaluated by the SNOLAB Experiment Advisory Committee (EAC) for scientific relevance and the SNOLAB Projects Office for Facility Impact.
- **Gateway 0: Conceptual Approval**
  - If approved, the New Opportunity becomes a 'Project', has a Project Coordinator assigned and is then tracked in the SNOLAB Project Life Cycle.

Phase 1

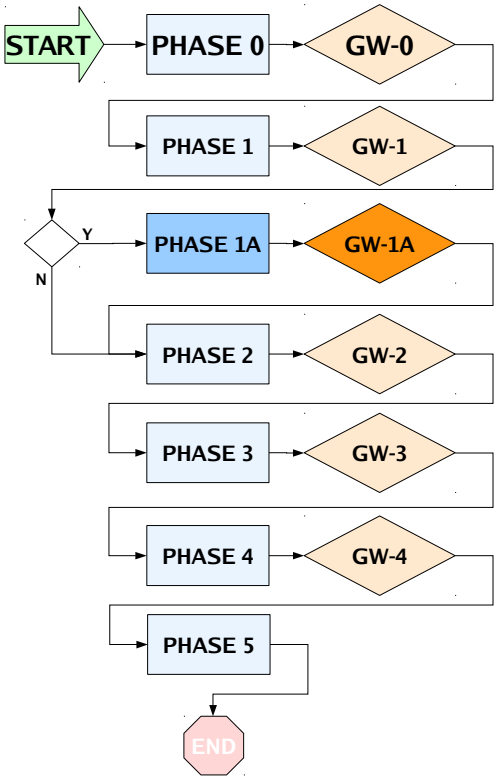


- **Phase 1: Feasibility**
  - Project develops conceptual design.
  - **Conceptual Design Review** to determine technical feasibility at SNOLAB that all hazards and risks have been identified and that there are feasible mitigation strategies. Schedule, resourcing, cost and funding are evaluated.
  - Project and Laboratory sign Memorandums of Understanding and Usage Agreements.
- **Gateway 1: Space Approval**
  - Space is reserved for the Project for a **fixed period** determined by the expected Project duration.

Space Approval

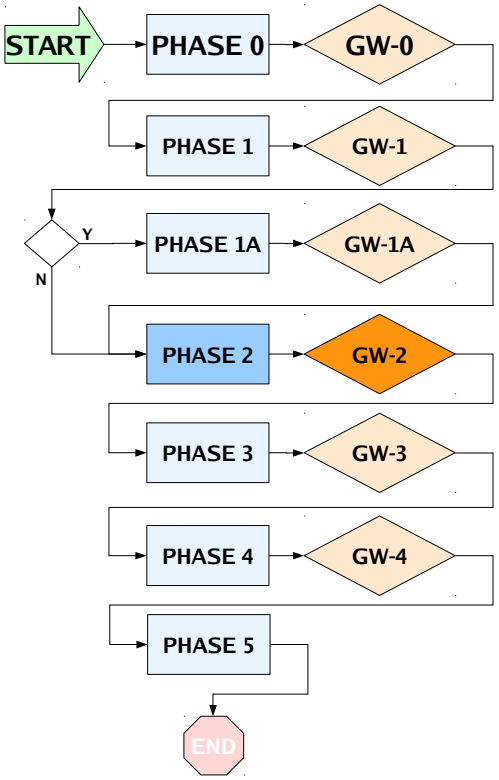
- Space approval is conditional on the Project's scope (scientific and/or R&D goals, projected duration).
- Space is approved for a fixed time frame consistent with the Project's projected schedule. It should be recognized that a Project may be sited in a space that will be required for another Project at a future date. Thus the time allocation may be firm with no possibility for extension.
- If funding is not fully secured, space approval may be conditional on receipt of funding in a timely fashion.
- If the Project's scope changes (e.g. descoping of scientific reach, enhancement of scientific reach, need for more time, etc), A Project Scope Change Request must be submitted for consideration and approval.
- The Director retains the right to withdraw space approval following appropriate consultation. Reasons could include: loss of scientific relevancy, violation of SNOLAB terms and conditions, Project extending too long.

Phase 1A



- **Phase 1A: Proposal**
  - May be required for Project cost/resource/schedule evaluation such as for input to a funding proposal.
  - Project design must be sufficiently advanced to predict the Project cost and associated uncertainties. Schedule must be resource loaded.
  - **Preliminary Design Review** that in addition to technical fit and hazard mitigation focuses on cost, resource allocation and schedule. **This review may take considerable time to complete.**
- **Gateway 1A: Proposal Approval**
  - This is a sign off that SNOLAB feels that within the uncertainties identified in the Preliminary Design that the Project can be constructed for the cost projected and on the time scale projected.
  - SNOLAB will normally require that this Gateway has been passed prior to providing a letter of support to funding agencies for a proposal.

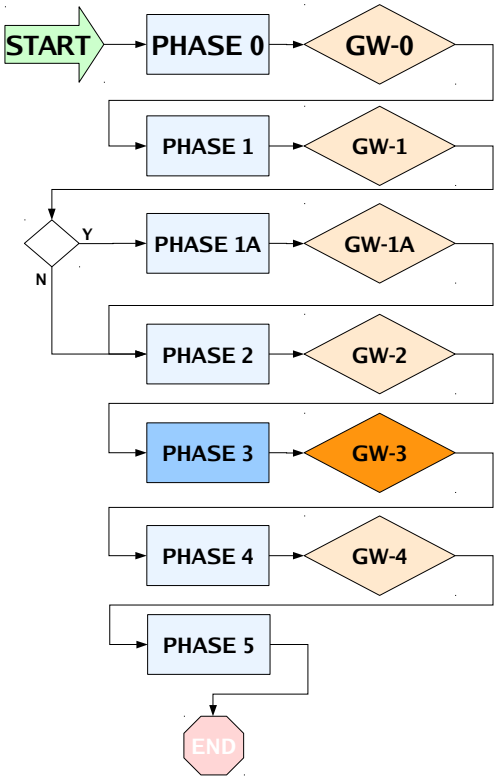
Phase 2



- **Phase 2: Development**
  - Project finalizes design. Prepares procurement and fabrication packages.
  - **Technical Design Review** of final design to ensure that it is still technically compatible with SNOLAB (e.g. still fits underground) and that all Hazards have been fully mitigated either through engineering, procedures or both.
  - Formal agreements between Project and SNOLAB for deliverables. Liability agreements and insurance (construction, personnel).
- **Gateway 2: Deployment Approval**
  - Project proceeds with fabrication and procurement.
  - Materials brought to SNOLAB for installation.

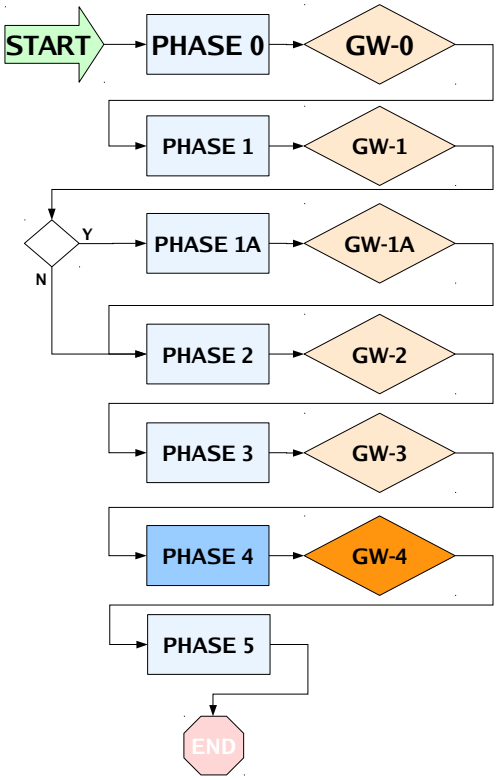
Note: It is strongly recommended that GW-2 approval is given before the Project begins fabrication/procurement.

Phase 3



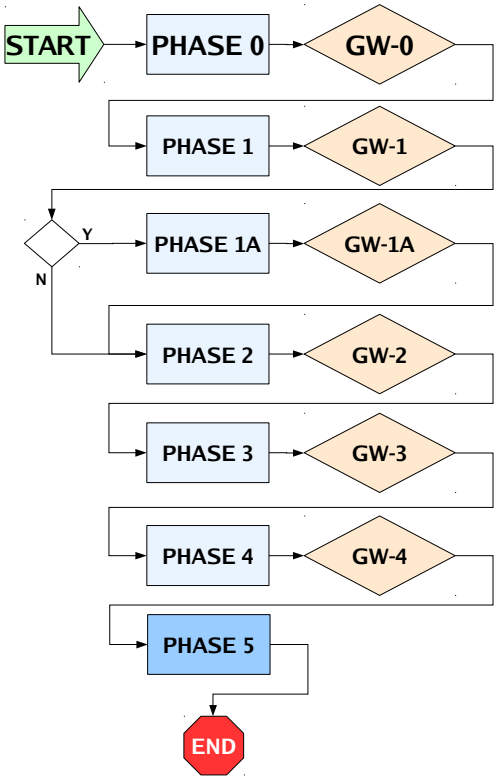
- **Phase 3: Implementation**
  - Prior to actual installation, an **Installation Review** is held to ensure that the Project's installation plan, training, logistics are current.
  - Project Installation at SNOLAB.
  - **Operational Readiness Review** prior to operations (including commissioning).
  - External Approvals if necessary (e.g. Host mine company, insurance broker).
- **Gateway 3: Operations Approval**

Phase 4



- **Phase 4: Operation**
  - Project commissions and enters operations.
  - Near end of operations the Project submits an updated Decommissioning Plan (initial plan submitted for Technical Design Review).
  - **Decommissioning Review** to ensure safe decommissioning, proper disposal of assets and proper disposal of hazardous materials.
- **Gateway 4: Decommissioning Approval**

Phase 5



- **Phase 5: Closure**
  - The Project decommissions, disposes of assets and returns space used to the state agreed upon in the usage agreements.
  - The Project writes a Close Out Report.
  - The Project and SNOLAB sign a memo agreeing that all obligations have been properly dealt with.

Project Road Map

- Once past GW-0, Conceptual Approval, a *Project Road Map* will be created.
- The Road Map will show all the expected process related activities for the Project including reviews and approvals and the nominal submissions required for them.

Process Scaling and Segmenting

- **Scaling:** The full Life Cycle has a significant burden and is intended for Projects with high risk associated with them. High risk includes: significant safety issues, technical complexity and risk, long durations, etc. The risk level will be designated by the SNOLAB Director in consultation with the EAC and Projects Office.
  - This is in tension with SNOLAB's proven ability to deploy 'small' Projects rapidly.
  - For projects with low or medium risk, steps in the Life Cycle may be streamlined with phases and Gateways combined. The consolidation will be reflected in the Project Road Map.
- **Segmenting:** Conversely, for high risk or complex projects there may be components of the Project that are more advanced than others and it may be desirable to break the Project into Sub-Projects, each of which is given its own Life Cycle.

Project Monitoring

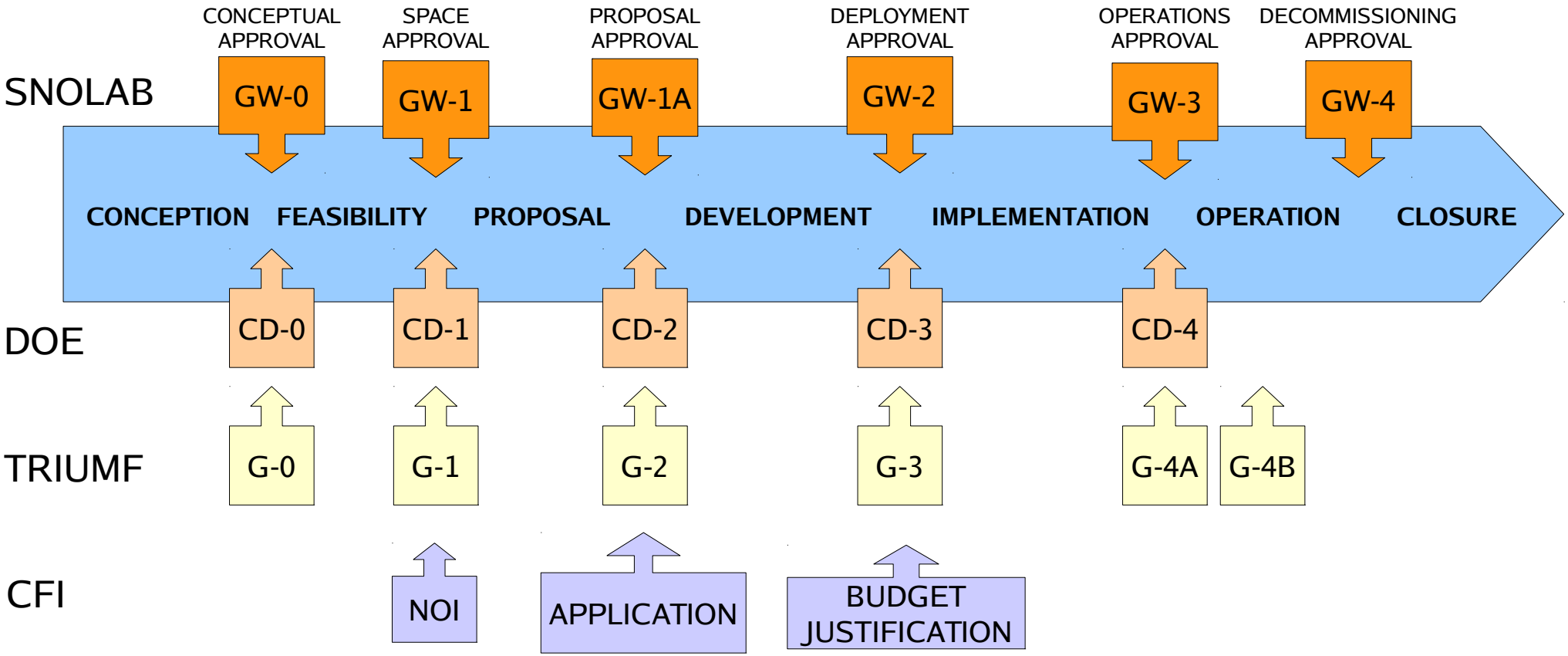
- **Bi-annual Reporting:** All Projects past GW-0 will be required to submit progress reports twice per year. These will be reviewed by the SNOLAB Experiment Advisory Committee.
- **Auditing:** SNOLAB may audit Projects for compliance against their Quality Assurance Plan and Safety Programmes.

Confidentiality

- Submissions to and outputs from SNOLAB throughout the Life Cycle process will be confidential and have a restricted distribution which includes:
  - SNOLAB Governance (Board and its Committees);
  - SNOLAB funding agencies;
  - The Project's Management Board;
  - Recognized Project institutions and agencies.
- The status and high level schedule of Projects will be publicly visible after GW-0 (Conceptual Approval). Status will show what phase the Project is in and what Gateways it has passed. Schedule will show start times and durations of high level activities such as installation, commissioning, operations.

Alignment with Other Processes

- The SNOLAB Life cycle aligns with other institution and agency processes including the US Department of Energy, TRIUMF, CFI.
- A key difference is that many other processes end at the beginning of operation of the Project while the SNOLAB process continues through decommissioning.



Process Coordination

- If a Project is being controlled by a process external to SNOLAB (i.e. DOE, TRIUMF), there may be similar documentation and review requirements to the SNOLAB Life Cycle Process.
- In such cases, SNOLAB will work with the other bodies to minimize duplication of effort and where possible combine documentation and reviews.

Project Status

	GW-0	Phase 1	GW-1	Phase 1A	GW-1A	Phase 2	GW-2	Phase 3	GW-3	Phase 4	GW-4	Phase 5	
Project	Conceptual Approval	Feasibility	Space Approval	Proposal	Proposal Approval	Development	Deployment Approval	Implementation	Operations Approval	Operation	Decommissioning Approval	Closure	End
PUPS													
COUPP-4													
PICASSO													
DEAP-1													
HALO										Running			
DAMIC										Running			
PICO-60										Running			
PICO-2L										Running			
SNO+													
SNO+ Te													
DEAP-3600													
MiniCLEAN													
SuperCDMS													
LU-Genomics													
NEWS													
DMTPC													
Ge-1T													
nEXO													

In Progress
Runing
To Be Done
Not yet required
Defered

Summary

- SNOLAB has adopted a Project Life Cycle to better administer experiments. It is intended to:
  - Minimize confusion about expectations from Projects.
  - Provide transparency to the review/approval process.
- The Life Cycle is consistent with other processes and integrates anticipated requirements from stakeholders.
- The process will be applied to all currently running Projects and all future Projects.

End