ONTARIO POWER GENERATION

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Ontario Power Generation

Standard

TITLE
PROJECT MANAGEMENT

AUTHORIZATION	
SINGLE POINT OF CONTACT:	Lindsay Greenland Director - Project Services, Enterprise Projects
DOCUMENT OWNER:	John Blazanin VP Project Management Office, Enterprise Projects

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PURPOSE AND SCOPE

This standard provides the criteria, expected behaviours and output requirements for the successful and timely execution of all projects in OPG. It describes the Project Management attributes and methodology required to manage projects throughout the project life cycle. The criteria, methodology and best practices described in this standard are applicable for all project management activities on all projects being executed within OPG irrespective of whether the project is executed by OPG staff or by external vendors through contractual agreements.
In addition, Appendix A provides specific project management regulatory requirements for projects being executed within our nuclear facilities.

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EXCEPTIONS

None.

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1.0 DIRECTION

1.1 Overview

Projects are initiated, funded, and executed by many different groups and organizations within OPG. The requirements for effective management of a project are dependent on the level of risk inherent to the project. Projects should be managed using a graded, risk based approach that properly matches project management processes with the degree of risk associated with the delivery of a project.

1.2 Project Management

Project Management is the discipline of planning, organizing, securing, and managing resources to bring about the successful completion of specific project goals and objectives. It is the application of a methodical and iterative approach for guiding a project through the projects life cycle. It incorporates tools and processes to plan, execute, monitor, and control project activities to ensure requirements are met.

Managing a project typically involves:

- Identifying and documenting project requirements, scope of work, and deliverables to satisfy the project needs and objectives including key constraints and assumptions.
- Providing graded, risk based oversight of the project, project team, supporting departments, contractors, and suppliers.
- Addressing the various needs, concerns, and expectations of stakeholders.
- Developing project plans, estimates and schedules.
- Developing project delivery, gate progression, funding and contracting strategies.
- Monitoring, reporting, communicating, and controlling project performance.
- Documenting and managing project risks and implementing recovery plans.
- Planning, managing and directing the project execution.
- Managing and controlling project changes and priorities.
- Incorporating operating experience and lessons learned.
- Balancing competing project constraints relating to the following:
    - Scope
    - Schedule
    - Cost/Budget
    - Resources
    - Risks
    - Value for money

1.2.1 The Project Manager has the overall accountability for project planning and delivery on behalf of the Project Sponsor. The required level of Project Management and controls are a function of the project scope, risk, complexity, duration, cost and project execution strategy.

1.2.2 All work performed during a project shall:

a) Maintain safety as the overriding priority.

b) Meet the specified quality requirements for the project.

c) Be executed by staff that are proficient for the type of work they are performing.

d) Be executed in phases. Progression from one phase to the next is approved at a phase-gate where project progress and performance is reviewed by management and validated to ensure project requirements and objectives are being satisfied, prior to proceeding through the gate and into the next phase.

e) Use as required, the corporate-level manuals, guides, instructions, forms and best practices for the specific project management area.

1.3 Scalability

While all elements of the Project Management Standard should be considered for all projects, not all projects require the full application of each element. The time, effort, degree of detail, and extent of application of some project management elements associated with fulfilling the requirements of this Standard should reflect the complexity (including risks) and cost of the project. All projects should be classified to a project level based on the project's complexity and anticipated cost at completion. Each project should be planned, executed, monitored and controlled, and closed out in accordance with scaled requirements associated with its project level. In some cases, certain aspects or phases of a project will be managed on behalf of OPG by an external contractor. Contractors will be expected to manage OPG projects with at least equivalent levels of rigor and discipline as OPG would apply.

1.4 Project Management Processes

The following key project management processes are based on industry standards, norms and best practices for project management, and should be adhered to when implementing project management at OPG:

- Phase-Gate Management
- Integration Management
- Integrated Change Control
- Scope Management
- Quality Management
- Schedule Management
- Cost Management
- Estimating
- Risk Management
- Communication & Stakeholder Management

These processes are only a subset of the full range of activities that may be performed in order

to manage a project. Plans for each of these processes should be summarized in a Project Management Plan (PMP). The following sections outline basic expectations for each process.

1.4.1 Phase-Gate Management

Key decision and control points ('gates') should be established at appropriate points during the project life cycle to control the projects progression through the phases. These control points enable a timely status review of the project's planning and performance to date, enabling the governing body to decide whether the project should progress to the next phase of the project. These check points should occur at the very early stages and throughout the project's life cycle until the project is completed and closed. This process will enable an informed assessment of progress and issues; validation of the business case; and ultimately lead to better decisions on future plans and investments.

1.4.2 Integration Management

Integration management is the main process through which the Project Manager ensures that all components of the project are adequately developed, coordinated, managed and aligned. It involves identifying, defining, combining, unifying and coordinating various activities and tasks of a project throughout the project life cycle. The effort and level of detail required to manage and integrate the project should be reflective of the projects complexity, cost and overall risk to the enterprise i.e. project scalability (refer to section 1.3 Scalability).

Project Integration Management includes initiating and planning the project, directing and managing the project work, monitoring and controlling the project work, and closing out the project. The process also involves the managing of interdependencies among the project management knowledge areas, and coordination and alignment of project teams, processes, systems, and interfaces through the use of a standardized Work Breakdown Structure (WBS) (See section 1.4.4 Scope Management).

In addition to the other project management processes outlined in section 1.4, project resource management and procurement management should also be planned and managed using the Project Management Plan (PMP). .

a) Human resource management – This process is used to ensure adequate internal staff and external resources are assigned to and used effectively on the project. Selection of a proficient Project Manager (PM) with the necessary combination of formal project management training and experience, management and team leadership skills, and adequate technical knowledge of the project subject matter commensurate to the project's complexity and cost, is critical for project success. Also, the composition of a project team should be based on the size and complexity of the project, the contracting strategy, have the right balance of technical and management skills, and have appropriate representation of key stakeholders.

   Roles, responsibilities and accountabilities of the project team should be established early in the planning phase(s), and these should be reviewed and updated as necessary throughout the project, including whenever there is a change of key project personnel or at the start of each project phase or sub-phase. While OPG may use consultants, contractors and suppliers in various contractual arrangements, it is important to note that the OPG PM is always responsible for the effective functioning of the overall team, as well as for establishing, maintaining and aligning clear and distinct accountabilities for the OPG project

team and key contractors.

b) Procurement and contract management - Procurement of services and materials for projects should be carried out in accordance with OPG- PROC-0058, Procurement Activities, and OPG-PROC-0060, Requisitioning Services. Supply Chain and other critical stakeholders, such as Law Division, should be engaged early in the procurement process to ensure that there is agreement on procurement, sourcing, and contracting strategies and responsibilities. Contracts for services should be planned and managed in accordance with OPG-PROG-0038, Contract Management Program.

1.4.3 Integrated Change Control

The objective of integrated change control is to ensure that each change to scope, schedule or cost proposed during a project is adequately defined, reviewed, and approved before implementation. The key benefit of this process is that it allows for documented changes within the project to be considered in an integrated manner with the project objectives and plans, while addressing overall project risk.

Integrated change control is the process of ensuring that all changes to project scope, cost and schedule “project performance baselines” are controlled and documented; that contingency funds allocation is managed; and that the nature and cause of changes are documented, analyzed, approved and implemented to minimize the impact to cost schedule and scope.

Refer to section 1.5.7 Change Control for further requirements relating to Change Control.

1.4.4 Scope Management

The objective of scope management is to ensure, consistent with the Project Charter, that the project includes all the work required, and only the work required, to complete the project successfully. Scope management includes planning, defining, verifying, documenting, obtaining approval for, and controlling a project scope of work.

To adequately define the project scope, the project team should sub-divide the project into smaller more manageable components by establishing a Work Breakdown Structure (WBS) that defines “work packages” in sufficient detail to:

- Clearly identify intermediate and final deliverables and their completion criteria.
- Provide a basis for accurate cost, time, and resource estimates.
- Establish a baseline for performance measurement and control.
- Facilitate clear responsibility assignments.

A scope change control process is required to manage the approved scope of work and any changes to it. Refer to section 1.5.7 Change Control for further requirements relating to scope change(s).

1.4.5 Quality Management

Quality management processes are required to control human performance, engineering, work planning, materials and field-related engineering and execution work, in order to meet the

requirements of the project. A Quality Plan is intended to help ensure that the agreed requirements for the deliverables of the project can be met. An assessment of the need for formal quality planning for the project and how any Quality Plans will be developed and documented should be made in conjunction with key stakeholders and the project team.

The Quality Plan should:

a) Define what quality program is to be used in the project's quality plan.

b) Include the methods that will be used to measure the project actual performance against the defined quality requirements.

c) Demonstrate the following elements where applicable:

- Quality planning to determine the type and frequency of internal and external quality standards and monitoring required for project success.
- Quality Assurance to plan a systematic pattern of means and actions designed to provide confidence that items or services will meet specified requirements and perform satisfactorily in-service. These include quality systems, instructions, training, qualifications and checklists.
- Quality Control processes to ensure that specified requirements are met through monitoring, inspections, testing, examinations or verifications. This includes the documentation of non-conformances and corrective actions.

A Quality Plan may be developed for an entire project, or for one or more phases or aspects of a project e.g. engineering, procurement, execution phase, etc. If separate Engineering, Procurement and Construction Plans are prepared to supplement an overall PMP, quality planning may be addressed within those documents, and there may be no need for an additional Quality Plan.

Work must be planned and executed to meet all stated project requirements including quality while maintaining design, safety and performance objectives. Field-related engineering activities must also meet the project quality requirements and expectations.

Technical support and quality service activities must ensure that the following objectives are met:

a) Inspection, examination and test activities are performed and documented in accordance with approved plans, and design and commissioning requirements.

b) Measuring and test equipment required during execution is calibrated and controlled.

c) Changes are controlled and the results communicated and documented.

d) Non-conformances are identified, dispositioned and documented.

All records management requirements must be satisfied, especially those relating to Quality Assurance and Quality Control records.

1.4.6 Schedule Management

The objective of schedule management is to ensure that the project can be completed within the committed timeframe. It is also the main planning and monitoring tool used to communicate

the execution of project deliverables.

Schedule management should include:

a) Identification of key activities including their start and finish date, duration and resources.

b) Sequencing logical interrelationship of activities and milestones.

c) Identification and optimization of the critical path

d) Regular monitoring and updating to track performance, including earned value processes where appropriate, and initiate corrective action for schedule threats.

e) Planning and strategizing to identify and manage priorities, opportunities, and threats.

f) Management of float in the schedule.

Every project should have a schedule developed to the level of detail necessary for proper planning, monitoring and control of the work. The schedule should be aligned with the WBS, and, should utilize standard activity structures and milestone codes where applicable.

Schedule development should be done with the participation of and input from the full project team. In particular, the activity duration or effort estimates should be provided by those who will be responsible for carrying out the related activities. These estimates should be validated by comparison against similar activities or estimating databases. Before being finalized, the completed schedule should be reviewed by the project team members and, if necessary, their managers to validate the sequence and duration of activities and to confirm the availability of resources at the required times.

In no case should a project schedule be arbitrarily compressed to meet a target completion date. If all realistic strategies for shortening the schedule have been evaluated and not found to be feasible, or the risks associated with shortening the schedule are considered unacceptable, the Project Sponsor and/or decision-maker must be advised that the target completion date is unachievable.

The completed schedule forms part of, or is directly referenced in, the PMP. The Project Sponsor shall approve the key or major schedule milestones and in-service date(s) as part of the approval of the PMP. Any subsequent changes to these must also be approved by the Project Sponsor through the use of the project change management process.

1.4.7 Cost Management

Cost management includes the process of determining budgeted cost of labour, materials, equipment and other resources, required for the execution of a project, then assessing and managing the actual cost of deliverables against the budget baseline. The budget or cost baseline should be aligned with the resource loaded project schedule. Cost management should include:

a) Establishment of the budget or cost baseline and cash flow with consideration of the project schedule.

b) Monitoring the status and trend of cost performance.

c) Implementing corrective actions as required.

d) Managing the use of contingency funding required for managing project risks.

e) Forecasting future budget requirements.

f) Managing required budget changes.

g) Ensuring that all approved changes are reflected accurately in the cost baseline.

h) Preventing incorrect, inappropriate, or unauthorized changes from being included in the cost baseline.

i) Informing appropriate stakeholders of authorized changes.

The following should be used to ensure that projects are completed within the approved funding envelope:

- Cost Estimating – developing an estimate of the quantities and costs of the resources needed to complete project activities to establish the budget or cost baseline (see section 1.4.8).
- Cost Budgeting – allocating the overall cost estimate to individual work packages and timeframes in alignment with the project schedule, where appropriate.
- Cost Control – monitoring the status and trend of cost performance and controlling changes to the project budget.
- Forecasting – determining the cost to complete for the remaining project activities and deliverables, and developing the Estimate At Completion (EAC) for the project. Periodically re-estimating the monthly spend plan, year-end total costs and EAC including in-service amounts for capital projects.
- Contingency Management – controlling the allocation of contingency funds to in-scope work, to mitigate the consequences of risk events. Periodically re-assess remaining project risks and contingency requirements as part of the forecasting process.

It is the responsibility of the Project Manager to ensure that cost management processes are defined, implemented and used by project team members.

1.4.8 Estimating

Cost estimating is the process of determining the total cost of labour, materials, equipment, professional fees, and other resources, required for the execution of a project or part of a project. A quality cost estimate leads to a more precise project schedule and budget which forms the basis for project planning, decisions, value and performance. Estimates are also used to evaluate changes, alternatives, and what-if scenarios to assist in decision making.

Cost estimating is a key component of the Project Cost Management, Project Schedule Management and Project Phase-Gate Management process. The key benefit of the cost estimating process is that it determines the monetary resources required for the project. The process is generally applied during each phase of the project life cycle as the project scope is defined, modified, and refined.

The Project Sponsor is accountable for having estimates prepared at the required level of project definition on both a Project Life Cycle and annual basis. Prior to Execution, the Project Manager is accountable for having estimates updated to reflect the latest status and expected

cost performance of the project.

1.4.9 Risk Management

Risk management includes identifying, analyzing, planning for and responding to uncertain events that could affect project outcomes. Risk management activities should start as early as feasible in the Project Life Cycle, since early identification can often result in elimination or cost-effective mitigation of potential risk events that may be more difficult to manage if discovered later in the project. Both threats and opportunities are included within project risk management.

The Project Manager should ensure that project risk management is executed thoroughly to reduce the likelihood of unexpected issues occurring and adversely impacting the project and stakeholders.

Risk Management should include:

- Identification, documentation, and analysis of project risks.
- Defining proper risk response strategy through mitigation, acceptance, transfer, avoidance, and monitoring of risks through preventive action planning and execution.
- Determining the cost and schedule contingency required for residual risks impact through contingency/ risk modeling and adequacy review.
- Developing risk contingency plans to deal with residual risks that may materialize.
- Monitoring and controlling risks, and contingency management throughout the Project Life Cycle and also in accordance with the Cost Management activities.

Risk management processes should be applied regularly in each phase of the project.

1.4.10 Communication and Stakeholder Management

The Project Manager shall ensure that proper and effective communication and stakeholder management practices are used throughout the Project Life Cycle. This is to ensure that all project team members, stakeholders, contractors and suppliers, are properly engaged, understand the deliverables, and are working with the required and most recent information.

The communication requirements include:

a) Maintaining alignment between team members and stakeholders.

b) Timely distribution and control of information, documentation and changes.

c) Communicating targets and expectations.

d) Regular project team planning and progress meetings.

e) Informing stakeholders of project progress, risks and changes.

f) Expediting support and issue resolution.

g) Reporting on project performance.

Project reports communicate project progress, results, issues or problems, and forecast outcomes to the Project Sponsor, Senior Management, project team members and stakeholders. Information in project reports is also used to identify a need for corrective or

preventive action to ensure that the project objectives are met. The reporting process should include:

- Progress Reporting – describing what the project team has accomplished.
- Variance Reporting – identifying and analyzing variances from the approved baselines and performance indexes or measures.
- Forecasting – predicting future project status and progress.

The Project Manager is responsible for establishing the necessary reporting processes and formats to meet the needs of various participants and stakeholders. The Project Manager will utilize the standardized project reporting in place for the enterprise and business unit.

1.5 Project Controls

Project Controls are developed and implemented to support planning and monitoring of project performance in order to identify whether or not work is being executed per plan, as well as to provide early detection of potential issues and risks.

Project controls involves planning, tracking, reviewing, and regulating the progress to meet the performance objectives of the project.

If performance issues, trends or risks are discovered during project execution, they should be investigated, understood and mitigated to maintain the baseline. The key is to detect such issues as early as possible, understand the potential impacts, and take appropriate steps to mitigate, as part of risk mitigation. Mitigation includes preventative and/or corrective actions to minimize the impact on the deliverables at risk.

The following can be utilized for this purpose:

- *Project Management Plans* and Gate Submissions
- Reports and metrics
- Progress meetings
- Documents
- Quality assurance and control plans
- Change requests
- Risk reviews

1.5.1 Cost Controls

The Project Manager is accountable for ensuring that regular cost monitoring and control processes are defined, implemented and diligently used by project team members and contractors. Active cost monitoring and controlling activities typically includes:

- Using standard project reporting to monitor cost performance. The key function of cost monitoring is to determine any variance between the actual costs and the plan in order to flag any areas for concern.
- Regular monitoring to provide early detection of potential and actual cost overruns, under spending, incorrect estimates, accounting errors, and cash flow

trends. Monitoring frequency will depend on the phase of the project. For example, more frequent monitoring may be necessary during crucial work execution periods such as outages, high-profile or critical projects.

- Reporting and communicating the cost trending analysis, cost performance results and any corrective actions to the project team, sponsors and stakeholders.
- Ensuring proper project cost or control accounts are setup in OPG project management systems.
- Developing sufficient cost detail including in-service amounts and their timing for capital funded projects to allow for effective monitoring of project cost performance. The costs, the WBS, and the cost or control accounts must be aligned in order to have a direct comparison to assist in detecting any issues.
- Ensuring planned value (or budget) is accurately allocated to and actual cost is collected in the cost or control accounts to support measurement of cost performance.
- Ensuring accruals are properly identified and captured in the actual costs.
- Identifying incorrect, inappropriate, or unauthorized charges and implementing corrective actions to rectify.
- Performing cost trend analysis and forecasting the Estimate At Completion (EAC) and cash flows. Forecasting is performed to assess if the EAC is still within the approved budget.

This assessment is used to initiate any corrective action and recovery plans required to mitigate and resolve identified project cost issues. If warranted, change requests shall be initiated.

Projects often encounter changing conditions and issues as they are executed. The cost impacts of these changing conditions on the project budget and cash flow must be evaluated to support the project in managing the issues. If warranted, change requests shall be initiated.

1.5.2 Schedule Controls

The project schedule shows what activities are to be done, who will undertake them, and when they will be done in relation to other activities.

The current project schedule is updated, reported and communicated on a regular basis to show activity progress, overall progress, and actual milestone achievement dates.

Comparison of the current schedule to the baseline provides the schedule variance and metrics that are used to flag and identify areas of concern and risks. These areas of concern must be understood and if necessary corrective actions implemented so that projects are completed within the committed time frame and approved budget. Updated schedule data can also be used for forecasting cost and time at completion and will identify whether or not the project is on track to meet its commitments.

In addition to reflecting the current status of the project, the update process allows for the detection and correction of possible errors (or incorrect assumptions) embedded in the schedule.

Important deliverables that are at risk of being missed must be resolved with the accountable individual and/or department to minimize cost and schedule impacts to the project. If an issue

is not resolved, it should be escalated quickly within the organization to communicate impacts and obtain support to resolve the issue.

Schedule baseline changes must be implemented through a controlled and documented process. The process prescribes when changes are allowed and the level of approval required. It is important to maintain the previous history of the project schedule either in the revised baseline, or as an archived copy.

Schedule baseline change processes should allow for activity changes that do not affect the overall project schedule and committed milestone dates. These can include changing activity descriptions, adding additional detail to facilitate tracking completion of certain deliverables or insignificant activity logic changes.

1.5.3 Key Performance Indicators

Key Performance Indicators are performance metrics established to assist in demonstrating performance achievements in safety, quality, scope, cost and schedule. The intent of monitoring these metrics is to identify performance gaps or trends early, allowing for timely implementation of recovery plans and corrective actions in order to maintain the project plan or at least minimize the impacts. It will also identify when initiation of change requests may be required.

Areas addressed by Key Performance Indicators typically include:

a) Safety – nuclear safety, conventional safety, radiological protection, and environmental compliance;

b) Quality – human performance (e.g. rework), equipment or materials (e.g. failed inspections), and installation (e.g. defects);

c) Scope (e.g. number of scope changes, design change revisions);

d) Schedule – life-to-date and projected “at-completion” milestone adherence, Schedule Variance (SV) for critical path and non-critical path activities;

e) Cost – life-to-date and projected “at-completion” performance, contingency and management reserve drawdown (if applicable), Cost Variance (CV) for critical path and non-critical path activities;

f) Value for Money using Earned Value Management (e.g. Schedule Performance Index, SPI and Cost Performance Index, CPI, Cost-Schedule Index, CSI);

g) In-service amounts – measurement of actual in-service amounts versus planned in-service amounts.

For monitoring to be effective, any performance gaps or variances identified need to be investigated and understood. Analysis should be performed on an ongoing and routine basis to determine the causes of temporary and permanent variances and trends. The results of the analysis should be documented in project reports.

If performance is not meeting expectations, analysis should be conducted to determine trends and to ensure appropriate corrective actions(s) are being undertaken to prevent recurrence. Also, if contributing factors have already been identified as part of the Risk Management Plan, their respective mitigation plan must be implemented. Those factors which have not yet been identified will be addressed through change control process and a general contingency plan.

Frequency of Key Performance Indicator reporting will depend on the requirement of the project

phase and the frequency of data updates. For example, actual cost information is available weekly or monthly whereas schedule progress updates may be performed more frequently depending on the nature and phase of the project.

1.5.4 Earned Value Management

Earned Value Management (EVM) is a method used to objectively measure project cost and schedule performance relative to the project baseline. EVM metrics can assist in identifying performance issues that need further investigation and potentially a recovery plan if the baseline plan is to be maintained or the impacts minimized. It is also an effective tool for prioritizing work and resources.

Two important Key Performance Indicators are used in EVM – Schedule Performance Index (SPI) and Cost Performance Index (CPI). Generally speaking, an index value less than 1.0 indicates performance below baseline targets:

- CPI less than 1.0 indicates a potential for cost overrun because the actual cost of the activity or project exceeds the earned value for that activity or project.
- SPI less than 1.0 indicates the activity or project is behind schedule.

A CPI or SPI greater than 1.0 indicates the project or activity is performing better than planned. Generally this is desirable however, it may be an indicator that estimates were too conservative or actual costs are not being allocated correctly. It may also represent an opportunity to re-prioritize resources to other project areas which may be underperforming.

Both CPI and SPI, to be effective, are based on “earning” the plan, i.e. progress or % complete against the schedule or non-schedule activities. Where EVM is used, project teams should pre-determine earning rules, or “rules of credit” to objectively assess progress. The use of commodity tracking (units installed) or deliverables achieved are better predictors of progress than a subjective % complete.

The project team should monitor and analyze CPI and SPI and the trends. The goal is to understand the causes and potential impacts of activities under or over performing.

Investigation may uncover errors (e.g. accounting) or risks that can be corrected early to prevent larger effects to the project. Corrective action and recovery plans are often required to restore the project plan or at least reduce the impacts.

1.5.5 Forecasting

Forecasting is performed by analyzing the work performed against the work planned, identifying trends, analysing remaining work and determining the impact of performance on the estimated cost and schedule going forward.

Forecasting cost shall take into consideration the committed costs, capital in-service amounts, contingency utilization and remaining risks/ contingency requirements, the actual execution efficiency for the work performed and the planned efficiency for the remaining work.

Similarly, schedule forecasting is required to predict the completion dates of activities and milestones.

The Project Manager is accountable for having the forecast updated as necessary to reflect the latest status and expected performance of the project. Effective forecasting can be achieved

when experience and objective judgement are applied together with consideration of risks and the usage of quantitative forecasting techniques, such as Earned Value.

1.5.6 Contingency Monitoring and Control

The project organization shall have a process to establish and manage Contingency and/ or Management Reserve. This process shall define and document the authority of approval required to the Contingency and/ or Management Reserve, and the impact on project or program baselines. The adequacy of the Contingency and/ or Management Reserve and the need to drawdown, should be identified through periodic risk monitoring and forecasting.

The owner(s) of the Contingency and Management Reserve shall ensure that the Contingency and/ or Management Reserve usage is monitored closely to determine if sufficient funds remain available to address future known and unknown risks. Control and monitoring of Contingency and/ or Management Reserve includes understanding the reason for the allocation, the amount required, the total value authorized, and the amount of Contingency and/ or Management Reserve funds remaining available.

Contingency is normally managed at the Project level, whereas Management Reserve will be managed at the program or portfolio level.

On larger projects quantitative risk assessment techniques should be used to determine the adequacy of the Contingency and/ or Management Reserve at the beginning of a project and periodically as the project progresses through a gate and/or as part of periodic forecasting activities.

1.5.7 Change Control

Change Control is the process of reviewing all change requests, approving changes and managing changes to the deliverables, documents and the baseline scope, costs, and schedule. Change Control is implemented to maintain the integrity of the baseline and control scope and cost creep.

Change Control process includes the following change management activities:

a) Reviewing, analyzing impacts and approving change requests proactively and promptly.

b) Managing and communicating the approved changes.

c) Incorporating approved changes into project documents.

d) Reviewing, approving and implementing all recommended corrective and preventive actions.

e) Coordinating changes across the entire portfolio or program.

f) Documenting the complete impact of change requests.

Specific criteria will be used to provide guidance on when a Change Request is required, when a change to baseline will be allowed, and what levels of approval are required.

Generally, Change Requests are required when the proposed changes have material impacts on the baseline.

Not all change requests will result in a baseline revision. Change requests used to obtain and

document approval to change a commitment, such as a project milestone, or to deal with productivity, performance, or estimating issues, may not result in a revision to the cost or schedule baseline. When a re-baseline is not warranted, the impacts of change requests will be documented and variance to baseline monitored.

1.6 Document and Records Management

Established procedures for managing the creation, review, approval, issue, and revision of project documents should be followed. Procedures for document management shall be in accordance with OPG-PROG-0001, Information Management and local document management requirements. A critical requirement is to ensure that project team members, suppliers, and contractors are all working to the most current, approved versions of project documents.

Project records should have appropriate file numbers, retention periods and security classifications assigned. To provide traceability for lessons learned and Post Implementation Review (PIR) purposes, copies of all approved revisions to key project documents throughout the life cycle should also be retained as part of the project records.

2.0 ROLES AND ACCOUNTABILITIES

The key responsibilities and accountabilities of participants in the project management process are outlined below. These are not exhaustive, and more comprehensive descriptions can be found in the various project management process guidance.

2.1 Project Management Office

Sets project management information requirements to ensure all project information tracking can be rolled up at the business plan, budget, and project portfolio views in a manner that facilitates proper oversight, intervention and corrective action.

2.2 Project Sponsor

a) Initiates the project and prepares the Identification documentation for the Front End Planning phases.

b) Identifies all project stakeholders who are expected to remain active and visible throughout the project.

c) Communicates overall project status, progress and forecasted outcome to Senior Management.

d) Approves significant scope changes and contingency drawdowns within signing authority or obtains approval from the appropriate higher approval authority if required.

e) Verifies that the approved scope of work has been completed.

f) Ensures that the delivered project meets the business objectives within the approved cost and schedule constraints.

g) Develops the PIR plan, ensures a PIR is conducted and results are reported to Finance, reports PIR results within the Business Unit and ensures significant lessons learned are

shared within the organization.

2.3 Project Manager

a) Role is assigned by the Project Executing Organization for delivery of the project.

b) Ensures that the necessary project management processes are implemented effectively and efficiently on all projects for which he/she is accountable.

c) Identifies stakeholder requirements and incorporates them into the project objectives.

d) Prepares, and submits for approval, a PMP that meets the quality expectations and standards prescribed in this Standard.

e) Ensures that staff and contractors involved in project teams are appropriately trained and qualified.

f) Ensures that the approved scope of work is delivered within the schedule and budget.

g) Approves changes and contingency drawdowns within signing authority or obtains approval from the appropriate higher approval authority if required.

h) Ensures that the project is properly closed out within the required timeframe.

2.4 Project Stakeholders

a) Accountable to the Project Manager to provide quality input to the project.

b) Ensure the project is supported as needed within their own organization, meeting the requirements of the project schedule.

c) Supports prudent decision making as needed by the project manager.

d) Ensure only the right minimum credible scope is identified from their respective organization.

3.0 DEFINITIONS AND ACRONYMS

3.1 Definitions

Project Controls – A process that encompasses the resources, procedures, and tools for the planning, monitoring, and controlling of all phases of the capital project lifecycle. This includes estimating, cost and schedule management, risk management, change management, earned value progressing, and forecasting.

Project Management Plan (PMP) – A formal, approved, written document that establishes the scope, cost and schedule baselines for managing the execution of the project, measuring and controlling progress, monitoring performance, and managing change.

Work Breakdown Structure (WBS) – A deliverable-oriented hierarchy of project elements which organizes and defines the scope of the project. Each descending level represents an increasingly detailed definition of a project component. The lowest level in the WBS is usually referred to as a “work package”. The level to which the work is broken down should be appropriate to both the project and the project Phase. The WBS defines the level of project

elements which will be individually described/specified, estimated, monitored, reported upon, and controlled by the project team.

3.2 Abbreviations and Acronyms

PIR	Post Implementation Review
PMP	Project Management Plan
WBS	Work Breakdown Structure

4.0 BASES, RECORDS AND REFERENCES

4.1 Bases

None.

4.2 Records

The project records table can be found in OPG-MAN-00120-0017, Communication and Stakeholder Management.

4.3 References

4.3.1 Performance References

OPG-PROC-0056, Post Implementation Review

OPG-PROC-0058, Procurement Activities

OPG-PROG-0001, Information Management

OPG-PROG-0006, Investment Management

OPG-PROG-0009, Items and Services Management

OPG-PROG-0038, Contract Management

OPG-PROG-0039, Project Management

OPG-STD-0076, Developing and Documenting Business Cases

OPG-STD-0153, Contract Management

OPG-PROC-0019, Records and Document Management

OPG-MAN-00120-0017, Project Communication and Stakeholder Management

Refer to Enterprise Project Management website for any references to OPG manuals or guides.

4.3.2 Developmental References

Project Management Institute (PMI) - Project Management Body of Knowledge 5th Edition (PMBOK Guide)

FIN-PROC-0030, Property, Plant and Equipment

LP-PJ-01, Project Management Program

N-CHAR-AS-0002, Nuclear Management System

N-PROG-AS-0007, Project Management

OPG-POL-0001, Health and Safety Policy

OPG-POL-0004, Enterprise Risk Management Policy

OPG-POL-0021, Environmental Policy

OPG-POL-0033, OPG Business Model

OPG-PROG-0004, Enterprise Risk Management

OPG-PROG-0006, Investment Management

OPG-PROG-0010, Health and Safety Management System

OPG-STD-0017, Organizational Authority Register

OPG-STD-0030, Classification, Protection and Release of Information

5.0 REVISION SUMMARY

This is a **non-intent** revision.

- Added reference to OPG-MAN-00120-0017 in section 4.2, Records. DCR # 148974
- Added Sub-clauses to Appendix A, Regulatory Requirements Matrix – Nuclear as per DCR # 143735
- Revised section 1.4 (Project Management Processes) and its sub-sections in order to align this standard with the current project management processes outlined in the governance support documents.

Appendix A: Regulatory Requirements Matrix – Nuclear

The following table lists the regulatory requirements for nuclear facilities that relate to project management that must be met through the implementation of this standard.

Item #	Reference	Requirement
1	CSA N286-12, Sub-clause 7.7.1	General: The process for constructing structures, systems and components shall be established and controlled using generally accepted construction and project management practices, in accordance with the design documents referenced in Clause 7.3.6 using approved items.
2	CSA N286-12, Sub-clause 7.7.2(a), 7.7.2 (b), 7.7.2(c), 7.7.2(d) and 7.7.2(e)	Prerequisites: Conditions to be met prior to Construction.
3	CSA N286-12, Sub-clause 7.7.3(a), 7.7.3(b), 7.7.3(c), 7.7.3(d), 7.7.3(e), 7.7.3(f), 7.7.3(g), 7.7.3(h), 7.7.3(i), 7.7.3(j), 7.7.3(k)	Activities: Construction activities shall be controlled in accordance with drawings, specifications, and work documentation.
4	CSA N286-12, Sub-clause 7.7.4(a), 7.7.4(b), 7.7.4(c), 7.7.4(d), 7.7.4(e), 7.7.4(f)	Documents shall be available prior to and during construction.
5	CSA N286-12, Sub-clause 7.8.2(c)	Commissioning: Construction completion assurance has been completed in accordance with Clause 7.11.1 for the structure, system, or component.
6	CSA N286-12, Sub-clause 7.8.4.1	Structures, systems and components shall be commissioned in accordance with written specification and work documentation prepared prior to commissioning.
7	CSA N286-12, Sub-clause 7.11.2(b)	Turnover: Boundaries between structures, systems, and components shall be clearly identified in the field and on documents.
8	CSA N286-12, Sub-clause 9.6	Construction: The process for constructing structures, systems, and components shall be established and controlled using generally accepted for construction and project management practices, in accordance with the design documents referenced by Clause 9.3.5 using approved items.
9	CSA N286-12, Sub-clause 9.7.1	General: The process for commissioning structures, systems, and components shall be established and controlled to confirm that they meet design requirements prior to placing them in service using generally accepted commissioning and project management practices.
10	CSA N286-12, Sub-clause 9.8	Turnover.