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PROGRAM ASSURANCE PLAN FOR DARLINGTON NUCLEAR REFURBISHMENT

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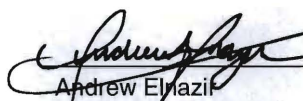
**Program Assurance Plan For Darlington
Nuclear Refurbishment**

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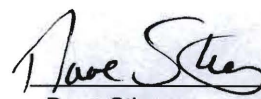
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Revision Summary

Revision Number	Date	Comments
R001	2013-05-07	Revised to reflect the four separate elements of Program Oversight and Assurance—Organizational Accountabilities, Program Oversight, Audit, and Self-Assessments.
R000	2013-03-28	Initial issue.

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Executive Summary

The goal of the Nuclear Refurbishment organization is to extend the life of the Darlington Nuclear Generation Station by 30 years using Engineering, Procurement, and Construction, (EPC) contractors to perform the majority of the refurbishment work. These selected EPC contractors deliver the contracted products and services using their own management systems and quality programs which are compliant with the Canadian Standards Association (CSA) N286-05 Management System Requirements for Nuclear Power Plants and other applicable codes, standards, and laws.

In order to provide OPG Management and its stakeholders with confidence that the refurbishment project will be completed successfully, on time and on budget while meeting the business objectives, an integrated set of assurance processes and tools will be put in place.

This plan details the role of each organization and the tools and processes they will use to provide this assurance. Assurance is comprised of five separate elements: Organizational Accountabilities, Internal Process Controls, Program Oversight, Audit, and Self Assessment.

A model called the "Nuclear Refurbishment Program Oversight and Assurance Framework" has been created to document the relationship and information flow between the Nuclear Refurbishment organization and the various corporate organizations along with the Government of Ontario that provide assurance functions.

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1.0 PURPOSE AND SCOPE

The goal of the Nuclear Refurbishment program is to extend the life of the Darlington Nuclear Generation Station (DNGS) by 30 years by refurbishing all four operating units using Engineering, Procurement, and Construction (EPC) contractors to perform the majority of the refurbishment work.

The purpose of this document is to clearly explain how assurance will be achieved in the Darlington Nuclear Refurbishment (NR) program. Assurance for the purpose of this document is defined as a set of tools, organizations, and processes that have been implemented to ensure that all business objectives of NR are achieved.

The scope of this document is for the Darlington NR Program only. Figure 1 below shows where this document fits within the overall NR program.

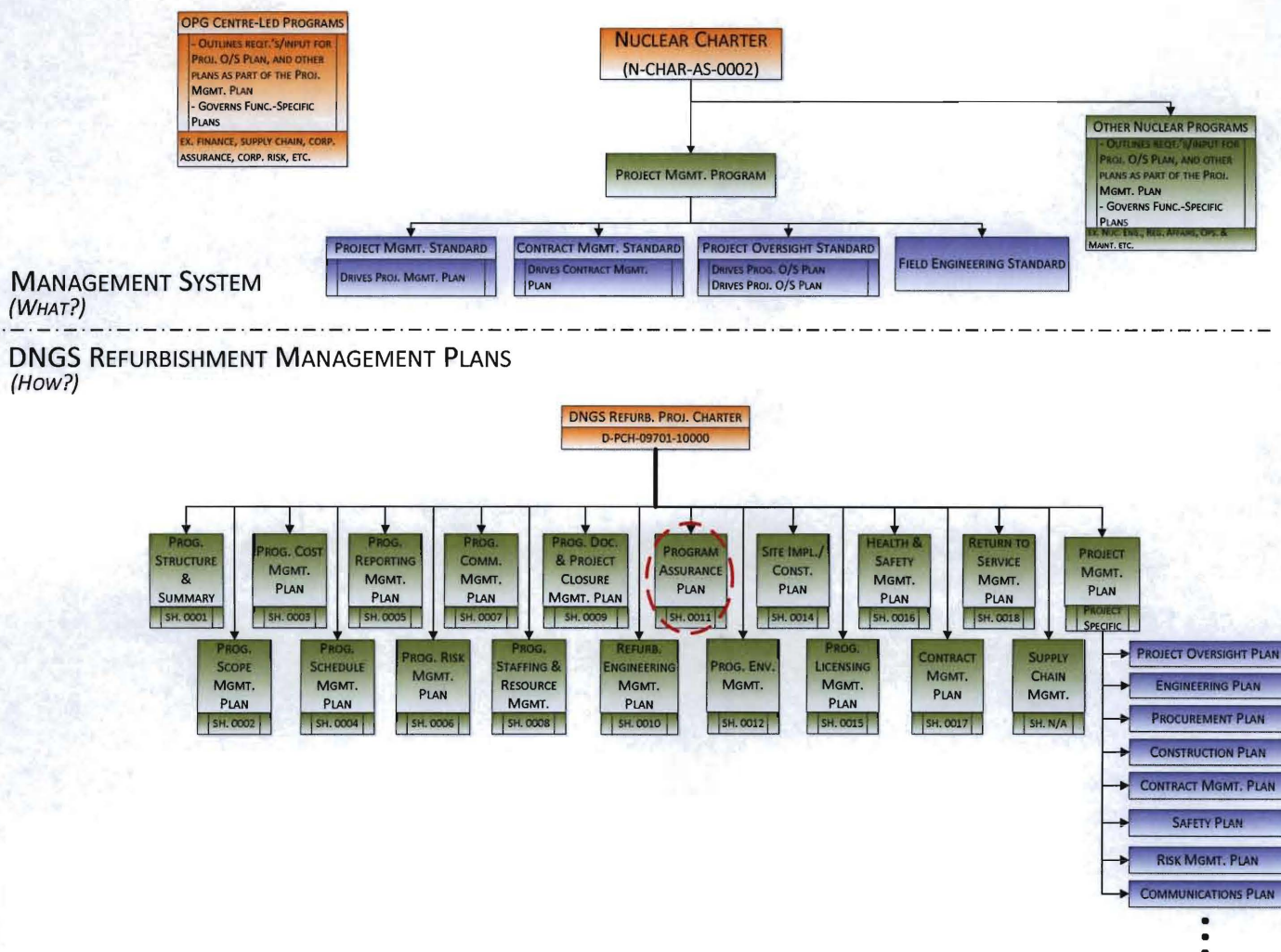


Figure 1 – Overall Management System

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The flow of information and the organizational hierarchy of oversight and assurance providers are captured in Figure 2 below. The details of the role of each of the oversight and assurance providers are available in Appendix A.

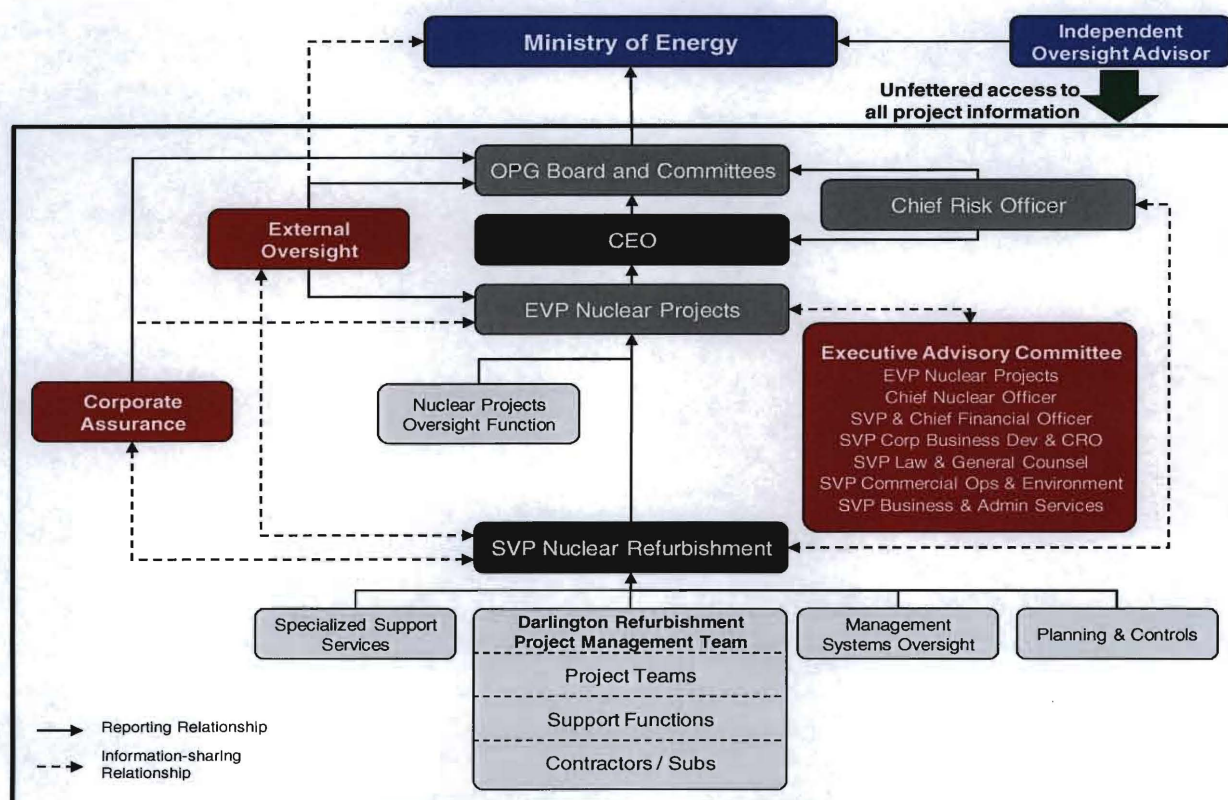


Figure 2 – Program Assurance Framework

2.0 NUCLEAR REFURBISHMENT PROGRAM ASSURANCE

NR Program Assurance is comprised of five separate elements: Organizational Accountabilities, Internal Process Controls, Program Oversight, Audit, and Self-Assessment. Each element plays an important role in providing assurance to the stakeholders that the project is being executed safely, on time, on budget and to the required quality.

Figure 3 illustrates the five elements of Program Assurance as outlined in this document. Please note that this document will be revised throughout the life of the NR Program in order to adapt to the changing needs of the NR Program.

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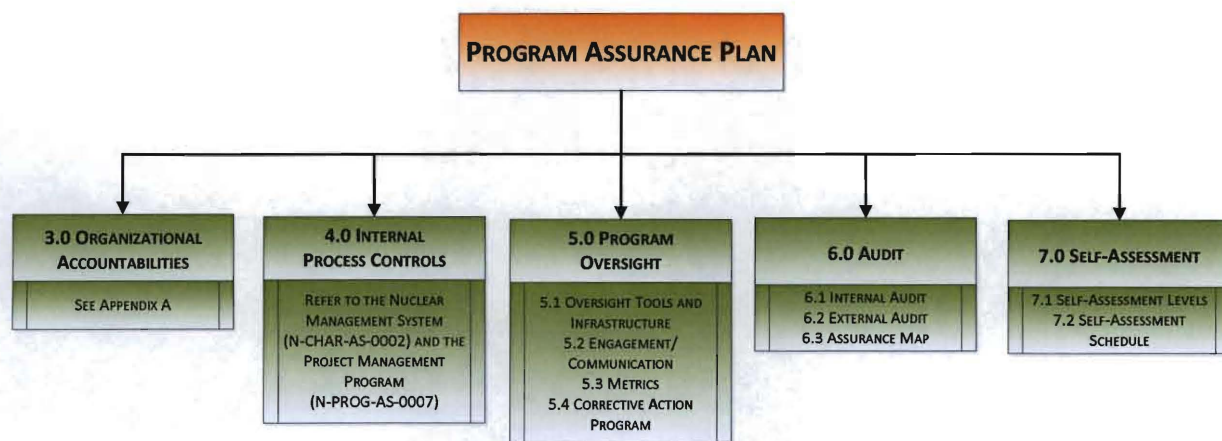


Figure 3 – Map of Program Assurance Plan

3.0 ORGANIZATIONAL ACCOUNTABILITIES

The NR organization is comprised of Project and Function organizations. The organization design is based on a *Strong Matrix* principle where function staff will be assigned to the project teams to support the Project Managers (PMs) in achieving the project deliverables. The Nuclear Refurbishment Program will use EPC contractors to perform the majority of the work. The work performed by the EPC contractors will be overseen by the project teams. Figure 4 illustrates the matrix organization for the Nuclear Refurbishment Program.

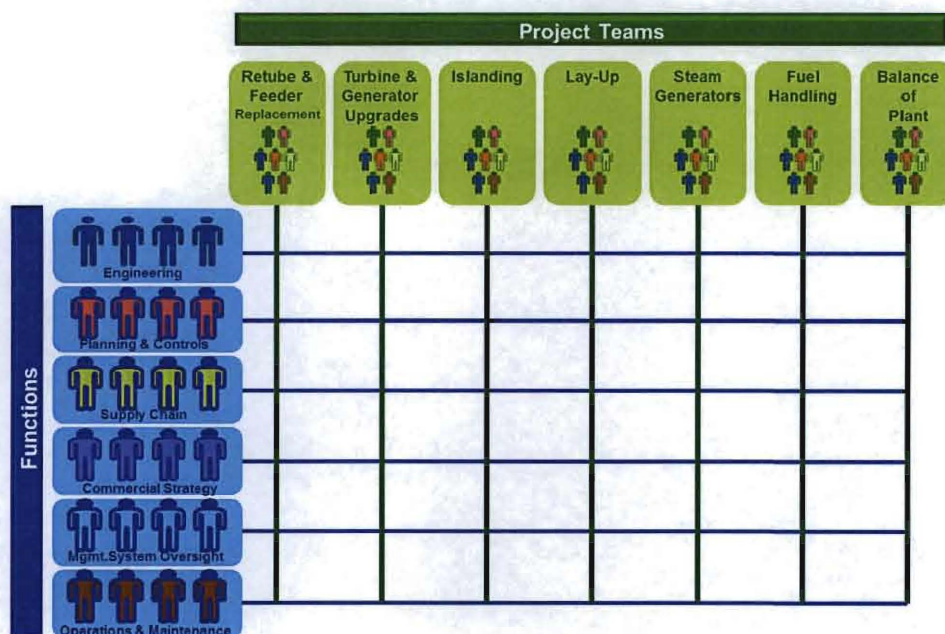


Figure 4 – Nuclear Refurbishment Matrix Organization Model

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Supplementing the core Project and Function Organizations of NR are various executive positions, committees, and supporting organizations. They provide audit services, executive oversight, and specialized support services. The details of the NR Strong Matrix organization are detailed in Appendix A.

4.0 INTERNAL PROCESS CONTROLS

Process controls ensure predictable, stable, and consistent levels of performance and results. Process controls and the corresponding performance measures have been defined for all aspects of the program (i.e. safety, quality, cost and schedule). These process controls are documented in corporate level governance and governance support documents, the Nuclear Management System (N-CHAR-AS-0002), Darlington Refurbishment Project Charter (D-PCH-09701-10000), Project Management Program (N-PROG-AS-0007), and project level instruction and guidance documents.

5.0 PROGRAM OVERSIGHT

As per INPO 11-007 Principles for Strong Governance and Oversight of Nuclear Power Organizations, Oversight is defined as *"...the verification that the standards, expectations, and goals established through governance of the organization are met...; [all employees] identify performance gaps for corrective action, monitor the effectiveness of corrective actions, and escalate issues to higher levels of line management when necessary. Oversight—through its fundamental elements of audit, evaluation, monitoring, inspection, and investigation—enhances organizational effectiveness, productivity, and integrity."*

The intent of Program Oversight for NR is to ensure consistent oversight across the entire program. All oversight and assurance providers shown on Figure 2 and detailed in Appendix A play a role in providing a level of Program Oversight. It is worth mentioning that the experience of individuals performing oversight is a critical component in the success of oversight. The following sections explain key requirements the NR Program will focus on to establish consistency across the program.

5.1 Oversight Tools and Infrastructure

5.1.1 Project Oversight Plan

The Project Oversight Plan (POP) is a *proactive* tool utilized by project teams to anticipate issues/risks and prompt mitigation/acceptance actions before they become realities. The guidance and requirements for preparing a POP are documented within the Nuclear Projects Oversight Guide (N-MAN-09701-10002).

5.1.2 Project Oversight Log

The Project Oversight Log is a tool documenting results of routine and/or strategic oversight activities executed by the project team. The guidance and requirements for

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preparing a Project Oversight Log are documented within the Nuclear Projects Oversight Guide.

5.1.3 Operating Experience (OPEX) and Lessons Learned

The OPEX and Lessons Learned Management process for the NR Program is described within N-MAN-00120-10001 Sheet RISK-06; this will be utilized to meet the intent of existing governance.

5.2 Engagement/Communication

Engagement and Communication are key elements to running a successful program; without them the NR Program runs a significant risk of misalignment. Engagement and communication are required between the following groups:

- the NR Program and the Darlington Nuclear Generating Station (DNGS) organization,
- the Refurbishment Project Executive Team (RPET) and the Projects,
- each of the Projects, and
- the Projects and the Functions.

5.2.1 NR Program–DNGS Interface

To capture regulatory (CNSC, MOE, MOL, OEB, etc.) actions and/or business decisions, as well as ensure alignment between the NR Program and DNGS, the following forums/processes have been established:

Darlington Refurbishment Program Status Meeting

The purpose of this forum is to:

- review program progress in terms of key milestones, overall costs, and earned value,
- identify, assign, and review risks or issues,
- identify, assign, and review outstanding actions that drive progress of the program, and
- foster communication between all stakeholders.

Refer to the terms of reference (N-PLAN-09701-10003) for additional detail.

Site Transition Oversight Committee (STOC) Meeting

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The purpose of this forum is to ensure that all departments across Darlington Nuclear (NR and DNGS) have a clear understanding of the specific deliverables to support readiness for the transition to refurbishment and back to station operations. Department Ownership Transfer Plans are presented and reviewed in this forum. Refer to the terms of reference available within the Darlington Refurbishment Operations & Maintenance SharePoint team site for additional detail.

Refurbishment Work Program Integration Meeting

The purpose of this meeting is to ensure the DNGS, NR Refurbishment, and Projects & Modifications organizations are integrated such that all three organizations are supporting each other in the requirements for refurbishment readiness. The team will use this forum to share information and align the organizations to ensure the station supports refurbishment activities and in turn refurbishment activities minimize impact to station.

Department Ownership Transfer Plans

Established to ensure that personnel in each department have a clear understanding of specific activities and responsibilities associated with the preparations for U2–U1–U3–U4 shut down, two units in operation and two units in refurbishment, restarting the Darlington units, post-refurbishment restart, and returning back the four units into operation.

The activities and responsibilities within the Transfer Plans include:

- support for unit turnover,
- development and/or revision of training materials and delivery of training,
- transition of work management processes,
- program, process, and procedure changes, and
- hiring and training additional personnel, as required, to support refurbishment and return to service.

The Transfer Plans also communicate management expectations for personnel performance, recent industry OPEX, overviews of unit changes and modifications, and schedules for upcoming activities. They are available within the Darlington Refurbishment Operations & Maintenance SharePoint team site.

Partnering Agreement

Established between the SVP NR and the SVP DNGS to:

- maintain a clear line of accountability for Nuclear Safety as defined in the PROL and in N-CHAR-AS-0002,

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- maintain a shared accountability for the success of the NR program between the SVP Nuclear Refurbishment and the SVP DNGS,
- minimize the complexity of the DNGS licensing process over the NR cycle,
- reduce the complexity of the unit return to service process while ensuring that the units are safe to restart following refurbishment, and
- reduce the costs and complexity of administrative functions and resource management.

5.2.2 RPET Team–Project Interface

Gate Review Board Meeting

Gate Review Board Meetings are held for each project associated with the Darlington Refurbishment program. For details on this forum refer to N-MAN-00120-10001-GRB Nuclear Projects – Gated Process.

Additionally, quarterly Scorecard Reviews are conducted with each of the NR Contractors.

5.2.3 Project–Project Interface

The objective of this forum is for each of the PMs to identify the following:

- Project-specific OPEX and Lessons Learned from each of the project teams
- Phase-specific OPEX and Lessons Learned from each of the project teams
- Contractor-specific OPEX and Lessons Learned from each of the project teams
- Upcoming required function resources

Although this meeting may or may not exist as of the Revision 1 issuance date of this document, it will be included as part of the change management plan associated with this revision.

5.2.4 Project–Function Interface

Integrated Project–Function Communication Meeting

The Integrated Project-Function Communication Meeting is a monthly internal NR management meeting. The purpose of this meeting is to conduct a detailed review of the NR Project and Function status with a focus on past period achievements, performance gaps, threats to deliverable success, and any support necessary to achieve success.

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The meeting is owned by the VP NR Execution and chaired by senior leaders from NR Execution on a rotational basis. Regular attendees include all Stratum IV and above NR staff, representatives from Nuclear Finance, Supply Chain, People & Culture, Public Affairs, Investment Planning, Darlington Site, and External Audit.

The standard agenda includes:

- a review of selected NR Program-level metrics,
- a high level status summary for all functions, and
- a detailed performance report for all NR project bundles.

Function Manager–Matrix Personnel Update Meeting

The objective of this forum is for Function Managers to provide Matrix Personnel across all projects with a unified understanding of new or revised function standards or requirements to be applied across all of the projects. This forum is also an opportunity for Matrix Personnel to share their OPEX and Lessons Learned with their function counterparts in other projects. This interface is in accordance with the OPG Business Model (OPG-POL-0033). Although this meeting does not exist as of the Revision 1 issuance date of this document, it will be included as part of the change management plan associated with this revision.

5.2.5 Project Team–EPC Contractor Interface

In order to ensure that all contract terms & conditions are exercised effectively and for OPG's best interests, all access to EPC contractor(s) must be endorsed by the associated PM. The project teams are the direct interface with their EPC contractor(s). Any input from a function to a project must be submitted to the project team via the function's matrixed representative for consideration and disposition.

5.3 Metrics

Performance monitoring and reporting are key components of the assurance model and process controls. Regular performance reviews and status meetings are held to ensure processes are implemented as designed, results are achieved as anticipated, and corrective actions are identified where results are not meeting expectations. Various performance reports are provided to all levels of the organization and the stakeholders to assist them in executing their oversight roles. They include:

- NR Schedule Reporting
 - NR Milestone Timelines
 - NR Milestone Reports
- Purchase Order Listing

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- MDR Reporting
 - MDR Work Curves: MDR Start and MDR Finish
 - MDR Blackout Chart
 - MDR Look Ahead for OPG Work
- Cost Reporting
 - NR Program Level
 - NR Bundle Level
 - NR Project Level
 - NR Function Level
- NR Program Report Card
- NR Engineering Report Card
- ECC Site Modification Report Card
- Contractor Scorecards

Currently, an initiative is in progress with the Planning and Controls Department to further develop guidance on metrics. Refer to the Project Controls manual (N-MAN-00120-10001-PC) for details.

5.4 Corrective Action Program

As per Section 5.11 of the Canadian Standards Association (CSA) N286-05 standard, designs, documents, tools, materials, parts, processes, services, and practices that do not meet requirements shall be identified and recorded as problems. This standard also emphasizes the importance of not only using a Corrective Action Process (CAP) but to assess its effectiveness. Since EPC contractors supporting the NR Program must meet the requirements outlined in CSA N286-05, they too must be held to this standard. OPG and each of its EPC contractors are operating in a partnership. Hence, there are requirements to address adverse conditions that trigger the use of OPG's CAP Program versus leveraging the EPC contractors' CAP Program. For example, if one of OPG's processes were to fail, the onus is on OPG to use its CAP Program to resolve the issue versus a circumstance where an EPC contractor's process were to fail thereby resulting in the use of the EPC contractor's CAP Program.

5.4.1 Use of OPG's CAP Program

Within the NR Program the requirement is that the CAP procedure, N-PROC-RA-0022, will be used by OPG staff to document day-to-day issues and breakthrough quality

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issues. The CAP will explore where a failure has occurred and how to improve the associated process. The corrective actions may be used to modify a specific project's POP or, if common to all projects, all POPs.

To provide additional context, the following are examples of adverse conditions that will lead to the use of OPG's CAP Program:

- an adverse trend or reoccurrence observed by OPG through oversight activities – the threshold of reporting will depend on the consequence(s) of the adverse event(s) that may arise or the consequence(s) of the reoccurrence(s) on all business drivers (e.g. quality, safety, cost, schedule, environment, regulatory commitments)
- an adverse condition against two or more contractors identified through Program Oversight
- an adverse condition may apply to other equipment or activities beyond the specific occurrence where it may have a greater impact
- an adverse condition that directly impacts the ability to safely operate and/or maintain the equipment or the plant
- an adverse condition that represents an actual or potential operability concern, or that represents a condition reportable under the Power Reactor Operating License (PROL)

For the first two examples above, the category and significance level of an SCR will be based on assessed risk(s) and consequence(s) of the adverse condition(s) and/or reoccurrences. The corrective actions may be tracked through other established processes/protocols with the contractors (e.g. project management processes, contract management processes, oversight processes etc.), outside of the SCR process.

For the last three examples above, the expectation is that OPG will initiate and evaluate (if applicable) SCR's in its own CAP Program. OPG will need to follow-up and document completion of all corrective actions within its SCR system.

Project teams, as documented in their POPs, will provide both routine and strategic oversight of the contractors' CAP Programs to ensure their programs are designed and operating effectively. Examples of areas assessed include, but are not limited to, the following:

- a documented process exists and is implemented for a) identifying, reporting, evaluating, and analyzing adverse conditions, and b) designing, prioritizing, and implementing timely corrective actions to prevent reoccurrence
- staff understand the CAP Program and are adequately trained to execute their intended roles within the program

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- results are communicated across the contractor's organization, as applicable

The results of oversight activities may lead to the use of OPG's CAP Program. Results of OPG's CAP Program may then progress to:

- escalation within both the contractor and OPG leadership teams,
- a joint review of corrective action plans between the OPG Project Manager and his/her counterpart in the contractor's organization, or higher depending on the significance of the issue, and/or
- a Non-conformance and Corrective Action Request (NCAR) through Supply Chain.

5.4.2 Use of Contractor's CAP Program

For all NR Projects within the NR Program each of the respective contractors will be mandated to follow their own internal CAP Programs to document adverse conditions and monitor trends. As each contractor will have their own CAP method for satisfying the requirements of CSA N286-05, the associated NR project team must ensure they have a full understanding of the process and infrastructure utilized by their contractor(s). The NR project team must, on a weekly basis, review the Corrective Action reports produced by their contractor to ensure appropriate actions are taken to address adverse conditions. The NR project team must hold their contractor(s) accountable to use their CAP Program intelligently to meet the intent of the CSA N286-05 requirements within Section 5.11.

For circumstances where the contractors' adverse conditions are reported within OPG's CAP Program (for Significance Level 1 and 2 issues), OPG may request the contractor representative(s) attend the OPG Corrective Action Review Board (CARB) to present the corrective actions and/or effectiveness reviews. This request will be made by the OPG CARB Chair to the corresponding OPG Project Manager

Non-conformances, except those coming under the purview of OPG's NCAR process, and in-process adverse conditions related to quality, cost, and schedule for the work planned and executed under the contractors' management systems will be managed through respective contractors' corrective action or non-conformance programs. Corrective actions will not be generated within OPG's CAP Program for these types of adverse conditions.

Upon notifying the relevant NR PM, OPG Supply Chain will conduct ASL audits to ensure contractors are adhering to their Management Systems. If NCARs are initiated, the contractor will be asked to assemble a formal corrective action plan to address the deficiencies and submit a response to OPG. A series of NCARs may result in a formal audit of the contractor's processes. The process by which NCARs will be applied is detailed within N-GUID-01935-10004.

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6.0 AUDIT

Audit is a process used to independently assess the effectiveness of governance, management systems and controls in achieving business objectives. Audits can be conducted by OPG corporate groups (internal) or external entities. Internal audit plans and scope are based on business unit or function objectives and the assessment of risks to achieving those objectives. Audit facilitation and coordination will be executed by the Darlington Refurbishment Management System Oversight (MSO) team.

6.1 Internal Audit

Internal audits are those completed by OPG Assurance which includes two divisions, Internal Audit (IA) and Nuclear Oversight (NO). Please refer to Appendix A for details on the roles of IA and NO.

6.2 External Audit

External audits will be conducted by External Oversight Organizations secured to assist the Executive Vice President (EVP) Nuclear Projects and the Nuclear Oversight Committee (NOC) in fulfilling their mandate by providing independent assessments on the performance of the NR Program. The scope of the external audits may include:

- reviewing and monitoring the definition, development and risk management of the NR Program,
- monitoring the progress of the NR Program against cost, schedule, financing, risk and other targets,
- reviewing execution performance of the NR Program, and/or
- review of relevant NR Program project management documentation.

The frequency of reviews will be determined by the EVP Nuclear Projects and NOC.

6.3 Assurance Map

To increase coordination and reliance among the assurance providers and to eliminate or reduce the need for multiple audits or assessments on the same scope, an assurance map has been developed. This map displays a matrix of audit or evaluation type activities versus the responsible organization or group.

The Corporate Assurance Line of Business (LOB) is accountable to develop and maintain this assurance map of the Darlington Refurbishment Program to coordinate activities of the various assurance providers. The assurance map is available within the Darlington Refurbishment Management System Oversight SharePoint team site.

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7.0 SELF-ASSESSMENT

Self-assessments place an increased emphasis on individual accountability and robust management systems. Self-assessments and benchmarking evaluations are examples of management performance improvement tools. They provide a structured method to compare performance with management expectations, industry standards of excellence, and regulatory requirements to identify areas needing improvement.

7.1 Self-Assessment Levels

There are three different types of self-assessment levels that may be used in order from most to least effort/rigour (for additional information, refer to N-PROC-RA-0097):

7.1.1 Divisional Level Self-Assessment

- Identified by the Management Sponsor and planned prior to the beginning of the year
- Conducted by a multi-person team with membership external to the area being assessed
- Carried out by a Team Leader who has attended Self-Assessment Orientation Training (TIMS PEL 66084). Directors may approve a training exemption in TIMS for team leaders who have the necessary expertise
- Evaluated by the Management Sponsor for quality using the Quality Review tab of the self-assessment

7.1.2 Departmental Level Self-Assessment

- Planned prior to the beginning of the year
- Conducted by a multi-person team
- Evaluated for quality using the Quality Review tab of the self-assessment

7.1.3 Snapshot Self-Assessment

- Has no special requirements

In NR, it is anticipated that the majority of Self-assessments conducted will be at the Snapshot level. All employees in NR are encouraged to plan and execute Self-assessments so that the organization as a whole is driving improvements.

7.2 Self-Assessment Schedule

On an annual basis NR will develop and publish a Divisional Level Self-assessment and Benchmarking schedule. It is the accountability of the MSO department to develop

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and publish the Self-assessment schedule in accordance to N-PROC-RA-0097, Self Assessment and Benchmarking.

The annual self assessment schedule is developed taking into consideration the NR Assurance Map, Audit schedules, and NR senior management areas of interest. Self assessments examine key processes, areas of perceived weakness, and processes where future audits will be undertaken. Performance gaps or improvement opportunities will be identified and corrective actions will be undertaken to eliminate the performance gaps.

The results of the self assessments are documented in the Self-assessment database with corrective actions documented in Station Condition Records (SCR) or Management Actions. Self assessment results are monitored and reviewed at the monthly NR Corrective Action Review Board (CARB) meeting.

8.0 ABBREVIATIONS

This manual contains many abbreviations and a list of all used abbreviations has been provided to assist the reader:

ARC	Audit/Risk Committee of the Board of Directors
ASL	Approved Suppliers List
CARB	Corrective Action Review Board
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
DNGS	Darlington Nuclear Generating Station
EAC	Executive Advisory Committee
EPC	Engineering, Procurement, and Construction
ERM	Enterprise Risk Management
EVP	Executive Vice President
GRB	Gate Review Board
IA	Internal Audit
IOA	Independent Oversight Advisor
LOB	Line of Business
MOE	Ministry of Energy
MOL	Ministry of Labour
MSO	Management System Oversight
NCAR	Non-conformance and Corrective Action Report
NO	Nuclear Oversight
NOC	Nuclear Oversight Committee of the Board of Directors
NR	Nuclear Refurbishment
OEB	Ontario Energy Board
OPEX	Operating Experience
OPG	Ontario Power Generation
PM	Project Manager
POP	Project Oversight Plans
PROL	Power Reactor Operating License

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RPET	Refurbishment Project Executive Team
RQE	Release Quality Estimate
SCR	Station Condition Record
SVP	Senior Vice President

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Appendix A: ORGANIZATIONAL ACCOUNTABILITIES

A.1.1 Nuclear Refurbishment Project Teams

There are seven Nuclear Refurbishment Projects within the program. They are:

- (1) Retube and Feeder Replacement
- (2) Turbine and Generator Upgrades
- (3) Islanding
- (4) Lay-up and Services
- (5) Steam Generators
- (6) Fuel Handling
- (7) Balance of Plant

Each project is led by a Project Manager or Director and is assisted by additional project staff. The Project Manager is accountable for the planning and execution of their project. The Project Managers are accountable to ensure that the EPC contractor(s) delivers the contracted products and services to the quality specified, on time and on budget. Project Management Plans detail how the Project Managers will manage their project. Part of the Project Management Plan includes the Project Oversight Plan (POP) detailing how oversight of the EPC contractor(s) will be planned, scheduled, executed, measured and reviewed. Standards for the Oversight plans are documented in N-STD-AS-0030, Nuclear Projects Oversight Standard and in N-MAN-09701-10002, Nuclear Projects Oversight Guide.

The Project Managers will request from the function organizations additional or specialized resources required to plan and execute their oversight activities.

A.1.2 Nuclear Refurbishment Functions

There are six Nuclear Refurbishment Functions within the program. They are:

- (1) Engineering
- (2) Planning and Controls
- (3) Supply Chain
- (4) Commercial Development
- (5) Management System Oversight

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(6) Operations and Maintenance

Functions are led by a Director or Vice President. Functions set standards for projects and provide function support for the execution of the project. Function Organizations shall collaborate with the Project Teams in the development of the POP as documented in N-MAN-09701-10002, Nuclear Projects Oversight Guide, and where required provide specialized or additional resources to execute the oversight activities. The oversight results, performance metrics, station condition records, (SCR) and trends may be reviewed to determine if there is an unidentified risk or opportunity surfacing across the projects. This may result in changes to the POPs.

In addition to oversight Function Directors are responsible for:

- Fulfilling Project Managers' resource requests by assigning required staff with the right skill-sets
- Forecasting resource demands and remedying gaps appropriately (e.g., hiring more people, negotiating with Project Managers to sequence demand)
- Establishing and enforcing project-wide safety and QA standards
- Establishing project-wide technical standards in their areas of accountability

A.1.3 EPC Contractors

EPC contractors will be executing the majority of the work on the Nuclear Refurbishment Program. Before a contractor is eligible to execute on a Nuclear Refurbishment work package through a Request for Proposal (RFP), they must be qualified by OPG Supply Chain Quality Services under the Establishing and Maintaining Ontario Power Generation Nuclear Approved Suppliers List (ASL) process. The ASL process is governed by N-PROC-MM-0010. This process ensures that the contractor meets the requirements outlined in the Canadian Standards Association standard N286-05, Management system requirements for nuclear power plants, which is necessary to perform work in OPG Nuclear stations.

EPC contractors use their own quality program and manage quality to all applicable standards. In addition they supervise project management, engineering and field staff to achieve cost, schedule and quality deliverables. Finally they prepare, monitor project metrics and take corrective actions as required.

EPC contractors will use sub-contractors in the execution of some of their work. For Nuclear Refurbishment, it has been contractually set up that the sub-contractors will work under the EPC Contractors quality program.

A.1.4 Specialized Support Contracts

The concept of Specialized Support Contracts is to provide Nuclear Refurbishment with project management, project controls, scheduling, estimating, risk management, and technical support services.

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Currently, Nuclear Refurbishment has Specialized Support Contracts with the following contractors:

- Faithful and Gould
- AMEC/NSS
- Worley-Parsons

A.1.5 Management System Oversight

Management System Oversight is a Nuclear Refurbishment function. Its main role is to ensure that the management system is in place and working effectively for the Darlington Refurbishment project. Specific accountabilities include:

- Monitoring effectiveness of the Darlington Refurbishment Program and associated projects, and providing feedback to the Program owner and Project Managers, respectively
- Providing support and assistance to project staff who are performing oversight activities of EPC Contractors
- Maintaining the Program Oversight Plan to ensure consistent oversight across the entire program
- Coordinating External Oversight reviews and evaluations
- Managing the Corrective Action Program for Nuclear Refurbishment
- Coordinating the development and providing support for the execution of the Divisional Level Self-assessment schedule

A.1.6 Planning and Controls

Planning and Controls is a function within Nuclear Refurbishment. Its role is to ensure financial controls, project schedules, risk management and project reporting processes are developed and functioning within Nuclear Refurbishment. The elements of Project Controls are specified under the Project Management Standard, N-STD-AS-0028.

Planning and Controls staff will be assigned to the project teams supporting cost, schedule and risk management. In addition a centralized group will provide internal program and project reporting. This reporting will be used to manage the program and projects as well as provide information to the executives and committees described in Figure 2. Specific accountabilities include:

- Establishing and maintaining estimating, scheduling, budgeting, cost management, forecasting, document control, risk management and performance reporting processes

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- Managing the risk management program
- Issuing monthly program/project status reports including key metrics, cost and schedule performance, forecasts, and risk assessments
- Overseeing program/project baselines, change order reporting, and contingency status

A.1.7 Senior Vice President (SVP) Nuclear Refurbishment

As the leader of Nuclear Refurbishment Program, the SVP has overall oversight of the program with support from the Nuclear Refurbishment Project Management Team, Project Controls, (metrics and reporting), and Management System Oversight. The SVP uses reports and updates from the Project Management Team and findings from Internal Audit, Nuclear Oversight, and the Chief Risk Officer to manage the Nuclear Refurbishment Program. The SVP is accountable for the following:

- Planning, directing, and providing vision and leadership for all aspects of the Nuclear Refurbishment organization. These include producing a Release Quality Estimate (RQE) and schedule for the refurbishment project(s) and ultimately delivering a successful implementation of approved projects.
- Establishing performance standards for Nuclear Refurbishment activities and functions.

A.1.8 Executive Vice President (EVP) Nuclear Projects

The Executive Vice President, Nuclear Projects, provides direction and oversight to the entire Nuclear Projects organization. Specific accountabilities include:

- Planning and setting strategic direction for Nuclear Refurbishment and resources assigned to the Nuclear Projects division in accordance with the approved business plan, producing targeted performance and results in a safe, reliable, and cost-effective manner
- Implementing policies, charters, programs, procedures, and standards that ensure activities are performed in accordance with applicable regulations, codes and standards, and to accepted professional standards
- Initiating and recommending actions to ensure nuclear project schedules are optimally planned to provide the best value to the corporation
- Establishing project goals and priorities for work programs and associated resources
- Establishing appropriate management systems, including documentation, self identification of problems, and development of reasonable and achievable corrective actions to meet due diligence requirements

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- Maintain and enhance relationships with local public and regulatory agencies

A.1.9 Executive Advisory Committee (EAC)

The EAC uses program updates from the EVP, SVP, and Project Management Team to advise and support the EVP Nuclear Projects. The terms of reference of this committee is documented in Darlington Refurbishment Executive Oversight Meeting - Terms of Reference, N-PLAN-09701-10002.

The core objective is to communicate the status of the Darlington Refurbishment Program and to ensure alignment of objectives between the project team and its stakeholders. Additional objectives in support of achieving the Darlington Refurbishment Program Objectives include:

- Communicating project and program level updates
- Sharing information, and when required, seek advice
- Confirming stakeholder support for deliverables required by the project, i.e. project financing
- Providing a forum for healthy challenges between stakeholders and the project teams

A.1.10 External Oversight

External Oversight is an independent external organization secured to assist the EVP Nuclear Projects and the Nuclear Oversight Committee (NOC) of the Board of Directors in fulfilling their mandate by providing independent assessments on the performance of the Darlington Refurbishment Program. Initially the assessments will be completed semi-annually with results reported to the EVP Nuclear Projects and the NOC.

The scope of the external evaluations may include:

- Reviewing and monitoring the definition, development and risk management of the Refurbishment Program
- Monitoring the progress of the Refurbishment Program against cost, schedule, financing, risk, safety and other targets
- Reviewing execution performance of the Refurbishment Program
- Review of relevant Refurbishment Program project management documentation

A.1.11 Corporate assurance

Corporate Assurance is a centre led organization consisting of two divisions: Internal Audit (IA) and Nuclear Oversight (NO). The scope of their activities includes the

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evaluation of the effectiveness and efficiency of OPG's governance, risk management and control processes. Internal Audit produces an annual audit plan that is approved by the Audit and Risk Committee of the Board of Directors.

Nuclear Oversight scope includes assessments of programs under the Nuclear Management System, N-CHAR-AS-0002, as per N-PROG-RA-0010, Independent Assessment. A 3-year rolling audit schedule is produced to align audit activities with station activities or evolutions to confirm the continuing effectiveness of the management system. Oversight processes and reviews performed by the Supply Chain quality function and the external Nuclear Safety Review Board are also covered within this program.

A.1.11.1 Internal Audit

The IA organization reports through the Finance line of business. OPG internal audits are identified though the Integrated Annual Audit Plan for OPG that is approved by the Audit and Risk Committee (ARC) of the Board of Directors.

IA assists the Board in fulfilling its strategic oversight responsibilities by providing the ARC with independent, objective assurance and consulting activities designed to add value and improve the organization's operations. IA helps OPG accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of the organization's risk management, control, and governance processes.

A.1.11.2 Nuclear Oversight

Nuclear Oversight conducts audits on Nuclear Refurbishment processes and products and is governed by N-PROG-RA-0010, Independent Assessment. NO provides independent insight on areas of performance strength and opportunities for improvement to line management, assuring that there is factual and objective reporting of current performance.

The Independent Assessment Program, N-PROG-RA-0010, ensures the management system under N-CHAR-AS-0002, Nuclear Management System, is reviewed with sufficient frequency to confirm its continuing effectiveness. This program provides independent assessment processes to perform comprehensive and critical evaluations of activities affecting Ontario Power Generation Nuclear facilities, including Nuclear Waste Management facilities.

N-PROC-RA-0048, Conducting Audits establishes the methodology and requirements for planning, scheduling, staffing, preparing, performing, reporting and follow-up of audits and surveillances performed by NO. Additional direction and guidance on specific tasks for the conduct of independent audits and surveillances is also provided in N-GUID-01070-10001, Nuclear Oversight Audit Handbook

NO Audits provide assurance that the OPG Nuclear Management System is implemented effectively across Nuclear Refurbishment by ensuring audits and

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assessments are conducted for all phases of the program including Project Definition, Preliminary Planning, Detailed Planning, Execution and Project Closeout.

A.1.12 Chief Risk Officer (CRO)

The OPG Board approved Corporate Risk Management Policy holds the Chief Risk Officer accountable for independently overseeing risk management and mitigation programs within OPG.

The Enterprise Risk Management (ERM) group is accountable for performing oversight on behalf of the CRO. For OPG's destiny projects, ERM will focus on project risks which could significantly impact the achievement of corporate objectives.

A.1.13 Chief Executive Officer (CEO)

The Chief Executive of OPG has overall responsibility for corporate performance. The CEO provides executive direction to the Nuclear Refurbishment Program in the context of business oversight. The CEO uses reports from the EVP Nuclear Projects on program status, audit reports from Internal Audit/Nuclear Oversight and External Oversight groups and risk reports from the Chief Risk Officer to assist in executing his oversight accountabilities.

A.1.14 OPG Board and Committees

The Board of Directors and Committees of OPG have an advisory and decision role in the operations of OPG business. The Board of Directors use the following information to provide direction to the Nuclear Refurbishment Program:

- Reports from the CEO and EVP Nuclear Projects on project status
- Risk reports from the Chief Risk Officer
- Audit and Nuclear Oversight reports
- External Oversight reports

A.1.15 Independent Oversight Advisor

This person(s) is an independent advisor to the Minister of Energy. They will have full access to the Nuclear Refurbishment Program.

The purpose of the Independent Oversight Advisor (IOA) is to advise the Minister of Energy on the effectiveness of execution of the Refurbishment Program with respect to risks associated with the Refurbishment Program budget and schedule. In order to effectively execute this Scope of Services, OPG will provide the IOA access to information related to the Refurbishment Program. The IOA may also be provided with certain information by, or on behalf of, the Ministry of Energy during the conduct of his or her advisory duties.

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The IOA will fulfill this mandate by providing independent assessments on the performance of the Refurbishment Program by:

- reviewing and monitoring the definition, development and risk management of the Refurbishment Program,
- monitoring progress of Refurbishment Program against targets, including cost, schedule, financing and risk, and
- reviewing execution performance of the Refurbishment Program.

A.1.16 Ministry of Energy/Government of Ontario

OPG's sole shareholder is the Government of Ontario. The shareholder will expect the Nuclear Refurbishment Program to run on time, on budget and with high quality and safety performance. The shareholder will use reports from the CEO and EVP Nuclear Projects on project status, including External Oversight reports and access to External Oversight firms. In addition, they will employ an independent advisor with full access to the Nuclear Refurbishment Program.