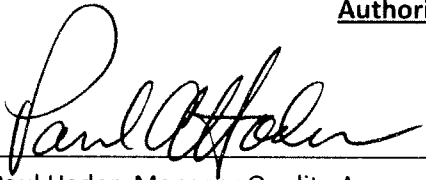
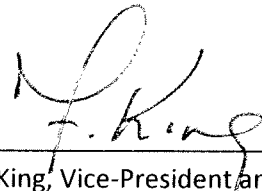
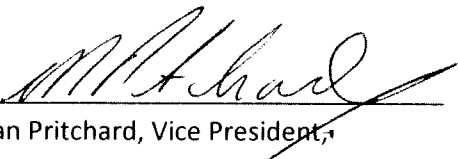
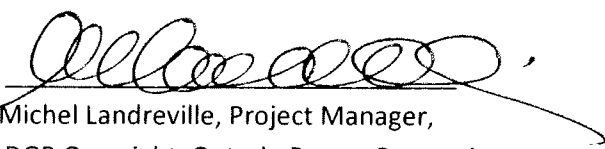


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NUCLEAR WASTE MANAGEMENT ORGANIZATION SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

**DESIGN AND CONSTRUCTION PHASE MANAGEMENT SYSTEM  
(OPG'S L&ILW DGR)**

<u>Authorization</u>	
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<b>Revision Summary</b>		
<b>Revision Number</b>	<b>Date</b>	<b>Description of Revisions</b>
R000	Feb. 18, 2011	Initial issue of the document.

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## 1. Introduction and Purpose

The Deep Geologic Repository (DGR) project for Ontario Power Generation's (OPG's) Low and Intermediate Level Waste (L&ILW) has been divided into four phases. The four phases are:

1. Regulatory Approvals Phase: Includes all activities required to obtain environmental assessment approval and a site preparation and construction licence.
2. Design and Construction Phase: Includes detailed design, site preparation, construction and commissioning as well as obtaining the operating licence.
3. Operations Phase: Includes preparing for operations, operations and obtaining the decommissioning licence.
4. Decommissioning Phase: Includes decommissioning and obtaining the abandonment licence.

OPG is the owner and licensee of the DGR throughout the entire lifecycle of the project. The operating model adopted for the project prior to starting DGR operations, provides the owner with management oversight of all activities to design, prepare the site, construct, commission, and ensure operational readiness of the repository. OPG, as owner, establishes the performance requirements. OPG, through its organization, performs project oversight to ensure that the project goals are achieved. The Nuclear Waste Management Organization (NWMO) has been contracted by OPG to manage the Regulatory Approvals Phase and Design and Construction Phase activities. The purpose of this document is to describe the organization and management system that will be applied to the Design and Construction (D&C) phase for the detailed design, construction, and commissioning for OPG's L&ILW DGR.

## 2. Project Management Approach

Organizational management structures have been established for the DGR project to ensure that responsibilities for performing activities are kept separate from the responsibilities for review and oversight. The internal allocation of functions, responsibilities and authorities are such that at any moment in time during the project, the health and safety of workers and general public, and the environment are protected, and all regulatory requirements are met in accordance with the applicable acts and regulations.

The NWMO has been contracted by OPG to conduct all activities associated with the design and construction of the DGR. Prior to the D&C phase, that is during the Regulatory Approvals phase, NWMO has been contracted to conduct all activities related to the environmental assessment and obtaining the site preparation and construction licence for the facility.

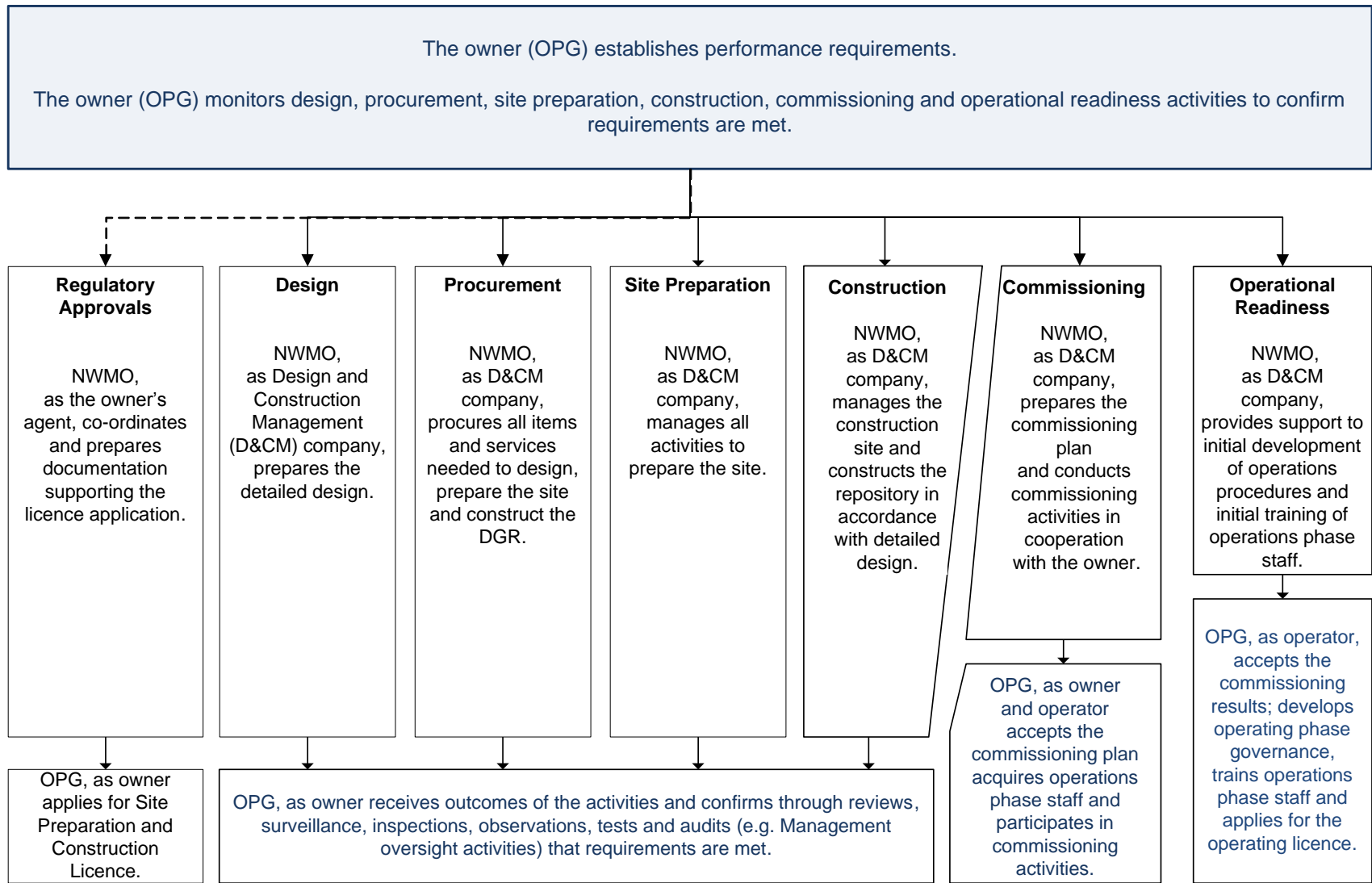
The NWMO responsibilities during the D&C phase, illustrated in Figure 1, are as follows:

- NWMO, as the Design and Construction Management (D&CM) company, performs the detailed design and ensures that the design is verified to ensure it meets all project requirements, regulatory requirements, applicable codes and standards;

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- NWMO, as the D&CM company, procures materials and services, prepares the site, and constructs the repository.
- NWMO, as the D&CM company, manages the construction site and constructs the repository in accordance with the detailed design.
- NWMO, as the D&CM company, prepares the commissioning plan and conducts the commissioning activities in cooperation with the facility owner operator. OPG, as owner, reviews and accepts the commissioning plan, participates in the commissioning activities along with NWMO staff, and accepts the commissioning results.
- Upon completion of commissioning and before the DGR facility is declared in-service, NWMO, as the D&CM company, provides support for the development of operational policies, procedures and standards and support for initial training of the operations phase staff.

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**Figure 1: NWMO Management Model for OPG's DGR L&ILW Prior to DGR Operations**

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### 3. Project Organization During the Design and Construction Phase

During the D&C phase, project activities are executed in two stages, design and then construction, with site preparation a subset of construction. The organizational management structure will evolve as the work progresses from the design stage through to the site preparation and construction stage. This evolving project organization is described in detail in Section 3.1.

#### 3.1. NWMO's Roles and Responsibilities

During the design stage, NWMO will plan, organize, direct and control the design and engineering work for the DGR Project. The NWMO's organization will consist of a DGR Project specific organization lead by a senior manager, who is appointed Project Manager with overall responsibility for the project. The Project Manager will have a project organization that will evolve as the work progresses from the design stage through the construction stage into commissioning.

During the construction stage the project organization will include qualified personnel providing on-site functions including construction management, project planning and control, procurement, health, safety, environment, engineering, commissioning and operations planning. The project organization will be supported by NWMO corporate functions including; human resources, general counsel, environment and permitting, quality assurance, geosciences, repository safety, licensing and information technology. The corporate organization maintains NWMO governance and provides guidance and project management oversight. The corporate organization also maintains expertise in specific areas such as geosciences by gathering information and evaluating external experience. The organizational structure is visually represented by the two charts provided in Appendix A.

The NWMO will manage the construction of the DGR facility including the procurement of the necessary materials and equipment. As constructor, the NWMO will hold the legal accountability for all health and safety matters for its employees and for all sub-contractors engaged during the D&C phase. During the construction stage, NWMO will assume the role and responsibilities of "Constructor" (OH&SA s.23) and "Employer" (OH&SA s.25 and s.26).

The detailed responsibilities for the various positions either as part of the project organization or supporting the project organization are described in Appendix C.

##### 3.1.1. Engineering Organization

The engineering organization will consist of a team of qualified engineers who have experience in the design of the types of facilities and equipment that will collectively form the DGR. The NWMO will prepare the design inputs such as the DGR Project Requirements and manage the engineering and design work to ensure that the design process is efficient and effective and that design output information accurately reflects the approved design. During the design stage engineers will be assigned to manage and oversee the design work which will be completed by contractors selected through a competitive bid process on the basis of their respective credentials, experience and expertise. During the construction stage the same team of engineers will review and accept the Construction Quality Assurance Plan, Human Factors Verification and Validation Plan and the Commissioning Management



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Plan. The engineering team will coordinate activities with the procurement, construction and commissioning organizations to ensure design requirements are achieved. The engineering team will also review and approve changes to the design that may be required to enable construction or enhance operations (e.g. improve safety or maintainability). The engineering organization will ensure that all design work will be completed in accordance with NWMO corporate and project specific governance.

Independent of the project engineers, an NWMO Design Authority, appointed by the NWMO President will oversee the design process to ensure that design engineering is completed in accordance with the NWMO governance and best engineering practice. The specific accountabilities of the design authority are described in Design Management, NWMO-PROC-EN-0001 (see Section 4.1.4.1), and in Appendix B.

### 3.1.2. Procurement Organization

The procurement organization will consist of corporate level and project level procurement functions. During the design stage the corporate procurement organization, lead by a Procurement Manager, provides purchasing services to the Project Manager. The Procurement Manager ensures that purchases are planned, requisitioning documents are prepared, quality and safety requirements are specified and the selection criteria are established for the evaluation of vendors in accordance with NWMO procurement governance. As the project proceeds towards construction, a project procurement organization will be established at the construction site. The on-site procurement organization will ensure procurement occurs in accordance with plan and will ensure through planned quality inspections that purchases of materials and equipment meets specifications. The on-site team will also directly and indirectly (e.g. via the construction and commissioning organizations) monitor vendor and contractor performance, verify quality of goods and services and document the results of these activities. At the corporate level the Procurement Manager will maintain procurement governance and provide guidance and oversight to the project procurement organization.

### 3.1.3. Project Controls Organization

Prior to the start of construction, the NWMO will establish a project planning, controls and management organization that will reside at the site and provide overall project direction, planning, coordination, and control. The project controls organization will include a planner and scheduler position who will maintain the detailed project schedule and report on progress. The project controls organization will also be responsible for management of project documents and records including construction quality assurance records.

### 3.1.4. Quality Assurance Organization

The construction quality assurance organization, lead by a qualified Quality Assurance Manager will report to the Project Manager. The quality assurance organization will monitor the quality of the work being performed and also independently audit the quality control and assurance activities that are completed by contractors working for the NWMO. The Quality Assurance Manager will work with the engineering and construction organizations to ensure construction activities are completed in accordance with the Construction Quality Assurance Plan.

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### 3.1.5. Construction Organization

Construction management will be lead by a Construction Manager and superintendents with direct responsibilities for civil and structural components (e.g. surface facilities), underground, site mechanical and site electrical and instrumentation construction and installation. The construction organization will complete construction work in accordance with the Construction Quality Assurance Plan and applicable construction permits and will work with the engineering organization to ensure the constructed facility meets all design requirements.

### 3.1.6. Commissioning Organization

The NWMO in cooperation with OPG will establish a commissioning organization lead by an experienced manager prior to the commencement of any commissioning activities. The commissioning manager will have responsibility to lead, plan and coordinate the commissioning organization and process. The commissioning organization will consist of a team of personnel including engineering, procurement, construction, contractor and OPG operations personnel lead by systems engineers with assigned responsibilities for underground, surface and shaft and hoist operations. The commissioning manager and commissioning team will develop the commissioning plan, obtain the necessary approval from the operations manager and then implement the plan. A key responsibility of the commissioning organization will be to ensure through testing that facilities and equipment operate as designed, accurate operating procedures are prepared and validated, and operations personnel are effectively trained and qualified to operate and maintain the repositories systems.

### 3.1.7. Operations (Turnover to Operations) Organization

The NWMO Project Manager in cooperation with the OPG Project Manager, DGR Oversight will, at an appropriate point during construction, establish an operations organization reporting to the NWMO Project Manager. An Operations Manager, assigned by OPG will lead the operations organization which will include system engineers and operations staff. The operations organization will work as a part of the commissioning team to facilitate a smooth transition from construction to operations. The operating organization will ensure the commissioning procedures are reviewed and accepted, participate in the commissioning activities, identify and monitor the transfers of responsibilities, accept responsibility for the transferred systems, become competent in the methods of operating the plant and participates in the preparation and submission of materials in support of the operating licence.

### 3.1.8. Health, Safety and Environment Organization

The project organization will include a health, safety and environment manager who leads an organization that both facilitates safe work planning as well as performs field monitoring and coaching on safe work practices. Similarly, the health, safety and environment organization will have an environmental officer that facilitates work planning, obtains necessary environmental permits and manages potential environmental harms that may arise during site preparation and construction. The health, safety and environment organization will be responsible to maintain the Health and Safety and the Environmental Management Plans and implement the plans by communicating the requirements, confirming qualifications (e.g. licenses and certifications) and delivering orientation training to employees and contractors.

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### 3.2. Contractors' Roles and Responsibilities

#### 3.2.1. Engineering Design Contractors' Roles and Responsibilities

Engineering design contractors employed by NWMO to complete the design engineering work will use an established quality management system, accepted by the NWMO, to control their work activities. In addition the selected organizations will establish project execution plans, engineering management plans and quality assurance plans for NWMO's acceptance to identify the specific organizational and management arrangements to manage the project work. For each contract the NWMO will have an appointed contract manager who will manage the contract and ensure that work is completed in accordance with plans and that project requirements are achieved.

The engineering design contractors will utilize an overall project organization with a project leader and clearly defined, roles, responsibilities and interfaces.

#### 3.2.2. Construction Contractors' Roles and Responsibilities

Construction contractors employed by NWMO to complete the various portions of the construction will work under the NWMO established system for construction management to control their work activities. In addition the selected organizations will be required to establish overall project execution plans and quality control plans for NWMO's acceptance to identify the specific arrangements to manage the work. For every contract the NWMO will have an appointed contract manager, supervisor or administrator who will manage the contract and ensure that construction work is completed in accordance with plans and that project requirements are achieved.

The contractors will utilize an overall project organization with a project supervisor and clearly defined, roles, responsibilities and interfaces. Contractors will also be expected to organize and manage their work to ensure the health and safety of their employees is protected and will be required to operate in full compliance with the DGR project Health and Safety Management Plan.

### 3.3. Organizational Interfaces

The NWMO will be responsible to coordinate and manage the interfaces with the project owner (OPG) and with the various contractors and vendors who will provide goods and services. The organizational interfaces are managed through the use of individuals who have clear authorities defined in either NWMO corporate or DGR Project governance or plans. For example, the superintendents for civil and structural, mechanical, electrical and instrumentation and geotechnical work (See Appendix A: Figure 1.), shall be responsible to ensure an effective interface exists between the engineering and construction teams.

### 3.4. Functional Interfaces

Functional interfaces exist between the NWMO corporate support functions and the DGR Project Management Team. The key functional interfaces include procurement, engineering design authority, geosciences, safety assessment, regulatory affairs, quality assurance and legal (General Counsel). Generally the functional groups provide specialized expertise to augment the knowledge and skills of the

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Project Management Team. The specific roles of corporate support functions will be defined in either NWMO corporate governance or project specific plans or procedures.

#### 4. NWMO Governance Applicable to the DGR Project

The NWMO DGR Project organization will manage the project using a combination of NWMO Corporate governance and DGR Project-specific governance. A listing of the NWMO Corporate governance and the Design and Construction project-specific plans and procedures is provided in the tables in section 8.

##### 4.1. NWMO Corporate Governance Applicable to the DGR Project

The NWMO is committed to developing, maintaining and continually improving a governance structure based on the organization's vision, mission and values that provides ongoing assurance that its work is of high quality. NWMO corporate governance is organized into management, business and support processes and is described in NWMO-PD-AD-0001, Governance Process Description. The Governance Process Description defines the NWMO's management system in an organized set of policies, procedures, standards and associated plans. The documents collectively communicate the organizations' structure, responsibilities, and expectations both in terms of policies and procedures and in terms of objectives and expected results. The statements of management commitment to adhere to requirements are expressed in approved policies pertaining to quality, health and safety, environment, aboriginal, human resources, transparency, and finance. NWMO governance also includes the organization's expectations for design management, safety assessment, regulatory affairs, procurement, community engagement and financial planning and accounting which apply to all aspects of NWMO's work on the L&ILW DGR project. A key component of the NWMO management system is the management review of the overall system. The management review is formally completed on an annual basis and evaluates the need for changes to the management system.

The NWMO President is responsible and accountable for the management system which defines and is used to control the organization's activities. Guiding principles are established and communicated in the organization's vision in a manner that safeguards people and respects the environment, now and in the future, and in the five fundamental values: integrity, excellence, engagement, accountability and transparency.

The NWMO has established in its governance the process for determining business objectives, plans to achieve the objectives and the required monitoring to ensure effectiveness. For work that the NWMO undertakes, a contractual agreement is negotiated and resource requirements are assigned along with the work schedule. A documented contract is formally established in order to confirm that the requirements are clearly understood. The contractual requirements are then included in the business objectives and plans. The NWMO has also defined, as part of its governance, the organizational structure including responsibilities of management positions and interfaces within the organization. The NWMO's management system has been externally certified as meeting the requirements of ISO 9001:2008 Quality Management Systems Requirements standard. The current management system has

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also been audited by OPG for compliance with the CSA N286-05 Management System Requirements for Nuclear Power Plants.

The documents described in this section cover the processes established to ensure the safe, efficient and effective long-term management of nuclear waste in full compliance with customer, community, stakeholders and regulatory requirements.

#### 4.1.1. Competency, Performance and Training Governance

The NWMO has established position descriptions that identify the minimum competency requirements in terms of education, training, skills and experience for each position. Personnel are selected and appointed to positions based on competency demonstrated through education, training, skills, experience and abilities. As part of business planning specific objectives, targets and measures are established for all of the work undertaken by the NWMO. Performance expectations for personnel are further defined in departmental work programs and individual performance contracts. Organizational and individual performance is evaluated against the established expectations in accordance with NWMO-POL-WM-0004, Performance Planning and Review Policy.

The NWMO requires that all personnel are suitably qualified for the work assigned to them and has established minimum training needs. Managers and supervisors are required, as part of the review of an individual's performance, to identify any additional training that maybe required to ensure the required competency is achieved and maintained. Training that is provided will be evaluated and verified as effective through appropriate examination, skills demonstration or supervisory assessments in accordance with NWMO-POL-WM-0003, Training and Development Policy.

#### 4.1.2. Health and Safety Governance

In undertaking construction of a DGR for L&ILW at the Bruce nuclear site, the NWMO is committed to carrying out these activities in a responsible manner that minimizes risk to employees, contractors, and the public. The NWMO will meet all applicable health and safety legislative and regulatory requirements, and is committed to working in compliance with the CAN/CSA Z1000-06 Occupational Health and Safety Management standard. The following documents form a part of the NWMO corporate governance for Health and Safety.

##### 4.1.2.1. Health and Safety Policy, NWMO-POL-WM-0002

The NWMO Health and Safety Policy describes the minimum requirements for the management of employee and public health and safety. The policy requires that managers assess and manage risks, design the work environment, plan work and execute work to protect workers and the public. The policy also commits the organization to continually improve health and safety performance.

##### 4.1.2.2. Health and Safety Risk Management

The NWMO Risk Management Procedure, NWMO-PROC-WM-0001, requires that the NWMO project managers identify, analyze, and evaluate all project risks including health and safety risks. Management

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is responsible to implement appropriate mitigating actions to ensure that risks including health and safety risks are either eliminated or effectively managed.

#### 4.1.2.3. Health and Safety Incident Reporting

The steps for reporting a health or safety incident or accident is included within the Nonconformance and Corrective and Preventative Action Procedure (see section 4.1.3.3.). The procedure also describes the steps for the development of corrective actions to prevent future occurrences.

#### 4.1.2.4. Emergency Response Standard, NWMO-STD-ES-0001

The Emergency Response Standard, which is applicable to all NWMO facilities and operations, describes the minimum requirements for emergency response plans and procedures. The emergency response standard includes requirements for identifying plausible emergency scenarios, defining appropriate responses to the scenarios, and establishing responsibilities, qualifications and capabilities including identifying required equipment and facilities. The standard will also define requirements for verification and evaluation of response readiness through exercises or drills.

#### 4.1.3. Quality Assurance Governance

The quality assurance program for the DGR project will be followed to ensure that the following objectives are met;

- The design for OPG's L&ILW DGR meets all L&ILW DGR project requirements,
- The design for OPG's L&ILW DGR is systematically evaluated to ensure it facilitates constructability, operability and maintainability.
- Critical DGR design components are verified by independent expert peer review and are found to be safe, reliable and robust.
- Changes to designs or specifications will be documented, reviewed, evaluated and approved prior to installation or construction.
- Constructed facilities and equipment installations fully meet all design requirements.

The following documents form the basis of NWMO governance for quality assurance.

##### 4.1.3.1. Quality Policy, NWMO-PD-AD-0001

NWMO is committed to excellence and to satisfying the needs of our members, communities and stakeholders. The policy describes the organization's management approach to ensure the best knowledge, understanding and innovative thinking is used in analyses, public engagement and decision making. The policy identifies the use of quality plans, monitoring, and regular performance review to achieve continual improvement.

##### 4.1.3.2. Project Quality Plan

For each project undertaken by the NWMO a Project Quality Plan is prepared. The purpose of the project quality plan is to describe the quality objectives for the project, the roles and responsibilities of

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project personnel and the minimum requirements necessary to ensure the project quality objectives are achieved.

#### 4.1.3.3. Nonconformance and Corrective and Preventative Action, NWMO-PROC-QA-0001.

The Nonconformance and Corrective and Preventative Action Procedure defines nonconformance and includes the steps required for reporting a nonconformance, incident, deficiency, malfunction or failure. The procedure is used for the reporting of all types of incidents or deficiencies including health, safety, environment and security. The procedure also describes the steps for determining significance of the event as well as the development of remedial and corrective actions to prevent future occurrences. Nonconformance events are also monitored and analyzed for trends to ensure recurring nonconforming conditions are identified, documented, analyzed for cause and corrected to prevent recurrence.

#### 4.1.3.4. Internal Audit Procedure, NWMO-PROC-QA-0002.

The Internal Audit Procedure describes the use of independent audits which are conducted on a regular basis on behalf of senior management. The audits are completed to evaluate the effectiveness of processes within the organization to fulfill goals, strategies, plans and objectives. Audits and assessments are also used to determine adequacy of work performance, leadership, organization's culture, monitor process quality and identify opportunities for improvement. Audits of contractors are also performed to ensure that they are complying with their project quality plans and quality related governance.

#### 4.1.4. Engineering and Technical Governance

##### 4.1.4.1. Design Management Procedure, NWMO-PROC-EN-0001

The NWMO procedure describes the minimum requirements to ensure the design work is defined, controlled and appropriately verified in conformance with the design requirements of the CSA N286-05 Standard. The procedure describes the expectations for the design process including design planning, design inputs, design reviews, design outputs, design verification, design validation and control of design changes. The requirement for specific design reviews such as the constructability, operateability, maintainability and safety (COMS) and human factors assessment are also included in the procedure. This procedure is applicable to all NWMO engineering work and ensures that the designs for deep geologic repositories will be prepared in a systematic and reliable manner and that the designs will meet all specified requirements.

##### 4.1.4.2. Safety Assessment, NWMO-PROC-EN-0003

The Safety Assessment procedure establishes responsibilities and expectations for the performance of safety assessments in support of facility design and licensing. The procedure details the steps in safety assessment including planning, selection of events and criteria, data collection, conduct of assessment, documentation of results and safety assessment review.

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#### 4.1.4.3. Technical Computing Software Procedure, NWMO-PROC-EN-0002

This document describes the procedure for procuring, developing, controlling, using and retiring Technical Computing Software. Technical Computing Software is analytical, scientific, and design software and related software tools and datasets used by the NWMO for site characterization, design, environmental assessment and safety assessment of facilities for the long-term management of nuclear waste.

#### 4.1.4.4. Licensing Procedure, NWMO-PROC-RG-0002

The procedure describes the minimum requirements for preparing and applying for a licence for a nuclear facility. It requires the preparation of a detailed licensing plan that describes roles and responsibilities as well as resources and necessary sequence of activities.

#### 4.1.4.5. Regulatory Interface Procedure, NWMO-PROC-RG-0001

The Regulatory Interface Procedure describes the requirements for managing interfaces between the NWMO and the Canadian Nuclear Safety Commission. The procedure applies to all NWMO personnel and ensures that accountabilities are understood and that there is consistency in communications and completion of regulatory actions.

#### 4.1.5. Environment Governance

##### 4.1.5.1. Environment Policy, NWMO-POL-ES-0001

The policy describes the minimum requirements for environmental management for the NWMO. The policy applies to all NWMO work and requires the implementation of an environmental management system that is compliant with the ISO 14001:2000 Environmental Management System Standard.

##### 4.1.5.2. Environmental Incident, Spill or Accident

The steps required for reporting an environmental incident, spill, release or accident are included in the Nonconformance and Corrective and Preventative Action Procedure (see Section 4.1.3.3). The procedure also describes the steps for the development of corrective actions to prevent future environmental occurrences or accidents.

#### 4.1.6. Customer and Stakeholder Engagement and Communication Governance

The L&ILW DGR Design and Construction project will be compliant with the requirements of the NWMO policies and procedures pertaining to Customer and Stakeholder Engagement and Communication.

##### 4.1.6.1. Engagement and Dialogue Procedure, NWMO-PROC-RG-0003

The procedure sets out the minimum requirements for planning and executing NWMO's public engagement in terms of a five-step process. The procedure requires that a documented plan be prepared for each phase of a project and that adequate resources are allocated.



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#### 4.1.7. Procurement Governance

##### 4.1.7.1. Procurement, NWMO-PROC-FN-0006

The Procurement procedure describes the NWMO's controlled process for the purchasing of goods and services. The procedure requires the preparation of purchasing requirements, criteria for selection of vendors based on ability to supply acceptable products or services, confirmation of understanding of requirements, review and evaluation of proposals against requirements, issue of contract, monitoring of progress and final acceptance of the product or service including the plan for verification of the quality of purchases. Closeout evaluations are also required and documented for future use.

##### 4.1.7.2. Contract Standard – Consulting Services, NWMO-STD-FN-0002

This standard is applicable to all contractor and consulting services engaged by the NWMO. The standard specifies minimum contractual obligations pertaining to progress reports, right to audit, quality of deliverables, safety and environment and changes to work. Any exceptions to these terms will have to be reviewed by the Legal Department and approved in accordance with the Procurement Procedure (NWMO-PROC-FN-0006) on a case-by-case basis.

#### 4.1.8. Risk Management Governance

The NWMO Risk Management Procedure, NWMO-PROC-WM-0001 describes the minimum requirements for project risk management. In accordance with NWMO's Risk Management Procedure a DGR Design and Construction phase Risk Management Plan will be prepared. This plan will be regularly updated by the DGR D&C project team. Risk mitigation plans and activities will be identified and responsibilities for implementation will be clearly described.

#### 4.1.9. Documents and Records Management Governance

A managed system of controlled governing documents is used by the NWMO to provide guidance and direction for employees. The governance helps to ensure that the decisions and actions of individuals are aligned with the organizations goals and objectives. The requirements for control of preparation, review, approval, acceptance and management of documents and records pertaining to all NWMO work are described in the following governing documents.

##### 4.1.9.1. Standards for Controlled Documents, NWMO-STD-AD-0001

This standard describes the requirements for preparation and management of controlled documents that will be used within the NWMO. The standard ensures that controlled documents have a familiar and predictable format and are appropriately reviewed and approved prior to use by employees and contractors.

##### 4.1.9.2. Records Management, NWMO-PROC-AD-0002

This procedure describes the records management procedure implemented at the NWMO. The procedure includes all types of records including engineering drawings and quality assurance and quality control records.

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#### 4.2. NWMO DGR Project-Specific Governance

This document, Design and Construction Phase Management System, DGR-PD-00120-0001 describes the organizational management structure and the governance used to manage the DGR project. In order to manage the work, project-specific plans and procedures have or will be developed and implemented. The following project-specific governance will apply to the Design and Construction phase of the project.

##### 4.2.1. Engineering Project Management Governance

###### 4.2.1.1. Design/Engineering Management Plan

The NWMO procedure for Design Management, NWMO-PROC-EN-0001 describes the minimum requirements to ensure the design work is defined, controlled and appropriately verified. The Procedure requires the preparation of a Design or Engineering Management Plan. The Engineering Management Plans (EMP) for the DGR project will be prepared by the design responsible organizations in accordance with the Design Management requirements and they will describe the managed process that will be applied to the design of the facilities for which NWMO is responsible. The EMP will also define the roles and accountabilities of the design responsible organizations personnel, as well as NWMO personnel who will interact with the consultants or contractors, and the requirements to be met by a consultant's or contractor's design process.

###### 4.2.1.2. Human Factors Engineering Plan

The Human Factors Engineering Plan (HFEP) identifies the scope, activities, deliverables and schedule for the human factors assessment of the design of the DGR. The HFEP will normally be incorporated into the Engineering Management Plans.

###### 4.2.1.3. Human Factors Verification and Validation Plan

The Human Factors Verification and Validation Plan (HFVVP) supports the HFEP and identifies the activities, deliverables and schedule of various verification and validation activities to be performed during construction and commissioning of DGR facility. The HFVVP will normally be incorporated into the Construction Management Plan and the Commissioning Management Plan.

##### 4.2.2. DGR Project Change Control, DGR-PROC-00740-1001

This procedure describes the management process for control of project change. It includes prompt identification of Project Change Notices (PCNs) and an approval process that results in appropriate review and authorized changes to scope, budget and/or schedule for the execution of the DGR project. Changes to design will be managed in accordance with NWMO Design Management, NWMO-PROC-EN-0001.

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#### 4.2.3. DGR Community Engagement Plan, DGR-PLAN-08510-0004

The DGR Community Engagement Plan will be prepared to ensure that appropriate communications and engagements with the communities surrounding the project site are planned and implemented. The plan will include preparation of materials as well as a schedule of activities to continue to build community awareness and understanding of the DGR Project, and build and strengthen relationships with key stakeholders and community leaders.

#### 4.2.4. DGR Project Document Management Control, DGR-PLAN-00121-1002

The NWMO procedure for records management (NWMO-PROC-AD-0002) and the NWMO standards for controlled documents (NWMO-STD-AD-0001) provide overall direction for the management of documents and records for the D&C Phase of the L&ILW DGR Project. A DGR project-specific Document Management Plan (DGR-PLAN-00121-1002) and associated instructions will be prepared for the purpose of day-to-day control of various DGR project documents. The plan will also include requirements for technical drawings numbering and equipment labeling systems. This plan will apply to all phases of the DGR project including detailed design, construction, and commissioning. It provides standard terminology, clear roles and responsibilities, and a detailed description of expectations of team members regarding document control for procedures, standards and instructions as well as explicit requirements for on-site records management and ultimate transfer of records into the NWMO records management system.

#### 4.2.5. Procurement and Contracts Governance

##### 4.2.5.1. Procurement and Contracts Management Plan, DGR-PLAN-00800-1001

A Procurement and Contracts Management Plan will be prepared for the DGR project. The plan will be compliant with the requirements of the NWMO Procurement Procedure and be available prior to the start of procurement of materials and equipment for the DGR. The plan will establish the detailed purchasing requirements to be followed for the project including defining specific roles and responsibilities, requisitioning and purchasing process, requirements for vendor pre-qualification, quality requirements, requirements for acceptance testing and inspection of materials and equipment. The plan will also describe requirements for contract monitoring, contract closeout evaluation and requirements for subcontractor control as well as records retention and maintenance.

#### 4.2.6. Training and Competency Governance

##### 4.2.6.1. Training Management Plan, DGR-PLAN-08920-1001

A Training Management Plan will be prepared for the DGR project. The plan will be consistent with the requirements of the NWMO human resources policies and with the principles of a systematic approach to training. The plan will include roles and responsibilities and minimum qualifications of individuals preparing training materials and delivering training. Training programs will be designed and developed based on an assessment of job requirements and appropriate training objectives and will be assessed and approved prior to implementation. Persons receiving training will be evaluated to ensure they have developed the necessary skills and knowledge required for job performance and provided feedback and

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remedial training if necessary. The Training Management Plan will include requirements for evaluation of training programs to ensure that training is effective and the overall plan remains effective.

#### 4.2.7. Construction Governance

##### 4.2.7.1. Construction Management Plan, DGR-PLAN-00180 -1001

The Construction Management Plan defines the responsibilities of the Construction Manager and construction management staff as well as the strategies and policies to manage the construction of the facilities at the DGR construction site. It is supported by project-specific procedures and standards, such as the Health and Safety Management Plan that also directs performance of the construction management activities. The Construction Management Plan describes the construction project and the facilities to be constructed as well as the processes that will be used to execute and complete the work and accomplish the construction objectives and requirements including schedule. The Construction Management Plan also includes the contingency plan and procedures to ensure a managed safe response to unplanned events such as flooding that could occur during construction. The contingency plan will be revised and tested as the construction proceeds through phases from surface construction to shaft sinking to underground development.

##### 4.2.7.2. Health and Safety Management Plan, DGR-PLAN-08962-1001

The Health and Safety Management Plan will be aligned with the NWMO Health and Safety Policies and be based on an assessment of health and safety risks. The Health and Safety Management Plan describes how all construction and commissioning activities will be conducted in a manner that ensures employee and contractor health and safety. The plan defines the standards to be achieved and the procedures to be followed by NWMO employees and contractors and the responsibilities of each within the project. The site emergency response plan will be included in the Health and Safety Management Plan and it will be updated as the work progresses. All personnel and contractors working on the L&ILW DGR site shall be given an orientation to the contents of this plan and shall be expected to comply with the health and safety policies, procedures, practices and standards established within the plan.

##### 4.2.7.3. Environment Management Plan, DGR-PLAN-07002-1001

The Environmental Management Plan will be aligned with the NWMO Environment Policy. The Environment Management Plan describes how all construction and commissioning activities will be conducted in a manner that ensures that pollution is minimized and the environment is protected from adverse impacts. The plan defines the standards to be achieved and the procedures to be followed by NWMO employees and contractors and the responsibilities of each within the project. The site spills and release response plan will be included in the Environment Management Plan. All personnel and contractors working on the L&ILW DGR site will be given an orientation to the contents of this plan and will be expected to comply with the environmental policies, procedures, practices and standards established within the plan.

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#### 4.2.7.4. Design and Construction Phase Project Quality Plan, DGR-PLAN-00120-0006

The Design and Construction Phase Project Quality Plan for OPG's DGR for L&ILW, describes the quality objectives for the project, the roles and responsibilities of project personnel and the minimum requirements necessary to ensure the project quality objectives are achieved. The document also describes the minimum requirements for construction contractor quality assurance plans. The document also describes the minimum requirements for monitoring and audit of quality assurance and quality control activities.

#### 4.2.7.5. Construction Quality Assurance Plan, DGR-PLAN-01916-1001

The Construction Quality Assurance Plan defines the sequence, schedule and various systematic actions that will be taken in the field by NWMO staff and contractors to provide assurance that the DGR facility is being constructed to meet the design specifications. In particular the Construction Quality Assurance Plan defines the requirements for performance of field tests and inspections to confirm the DGR facility is being built in accordance with the approved engineering drawings and specifications. The Construction Quality Assurance Plan receives authority from the D&C Phase Project Quality Plan for OPG's DGR for L&ILW (DGR-PLAN-00120-0006).

The Construction Quality Assurance Plan will define the following:

- Roles and responsibilities of personnel overseeing and executing the field quality assurance program;
- Qualification and training required by personnel executing various field quality assurance activities;
- Requirements for any work-specific quality management procedures that may be prepared by contractors performing construction work;
- Requirements for monitoring, testing, inspection and review activities that will be performed in the field to ensure that all goods and services are supplied and installed as per approved plans, drawings and/or specifications. (procedures for performing various monitoring, inspection and review activities will be documented in a Field Inspection Manual(s));
- Requirements for calibration or verification of measuring equipment against standards traceable to national or international measure standards;
- Requirements for notification in the event there are deficiencies in goods and services;
- Requirements for corrective action plans that would describe execution of corrective measures, and subsequent confirmation and reporting of results of corrective measures to an NWMO representative;
- Requirements for written reports that summarize monitoring, inspection and review activities performed in the field; and
- Requirements for the management of all quality assurance records arising from field inspections and tests.

A key aspect of the construction quality assurance program during DGR site preparation and construction will be field test quality control. Field test quality control means all those planned testing activities that will be performed to acquire data that is representative, and of known precision and accuracy. Field test quality control data will be used to confirm that materials (e.g. backfill, concrete, rock bolts) are installed during construction of the DGR facility in accordance with design specifications.

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The Construction Quality Assurance Plan will describe the use of a Field Quality Inspection Manual (DGR-MAN-01916-0002) which will provide detailed requirements for various in-the-field quality control activities.

#### 4.2.8. Commissioning Governance

##### 4.2.8.1. Commissioning Overview

Commissioning is the process of verifying, in new construction, that all the subsystems (e.g. HVAC, plumbing, electrical, fire/life safety, wastewater, communications and security) achieve the project requirements as intended by the facility owner and as designed by the facility engineers. The initial commissioning team leader will be involved from project initiation through one year of occupancy.

The following governance applies to the commissioning aspects of the Design and Construction phase of the DGR project.

##### 4.2.8.2. Commissioning Management Plan, DGR-PLAN-00920-1001

The Commissioning Management Plan defines the commissioning process with detailed activities and schedule for the commissioning of the DGR. The Commissioning Management Plan will also describe the detailed operational acceptance requirements and the scope of work with the various commissioning services that the commissioning manager and the related parties have to comply with. The acceptance specifications will refer to drawings, schedules and the relevant parts of codes, manuals, guides and standards. The requirements for vendor participation are also included along with the arrangements for interface with the facility's operating manager and organization.

##### 4.2.8.3. Commissioning Change Control Procedure, DGR-PROC-00920-1001

The Commissioning Change Control Procedure describes the process by which change can be made to the design or operation of the DGR facility during the commissioning stage. No change will be implemented unless the change is determined to be necessary (e.g. a flaw that renders equipment or process inoperable or endangers health or safety) and the change receives independent review and approval by the design organization, design verification and appropriate validation testing during commissioning.

#### 5. Audit and Management Review

Audits of the DGR D&C phase project activities and Management System elements will be conducted on a regular basis to provide assurance to the project management team, the NWMO executive, and OPG that plans and procedures are being effectively implemented.

Audits of contractors work-specific quality plans and supporting management systems will also be completed to provide assurance that work is being conducted in compliance with requirements. Audits

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of contractor construction quality assurance plans and procedures will be completed to determine compliance and assess effectiveness.

Overall effectiveness of the DGR D&C Management System will also be reviewed and assessed as part of the annual NWMO Management Review conducted by NWMO's senior management.

#### 6. Availability of NWMO Governance and DGR Project Specific Governance

All NWMO Corporate governance applicable to the DGR project is currently available. The following table (Table 8.1) lists the NWMO Corporate governance referred to in this document.

**Table 8.1 Applicable NWMO Corporate Governance**

Document	Availability
<b>Competency, Performance and Training</b>	
Performance Planning and Review Policy, NWMO-POL-WM-0004	Current
Training and Development Policy, NWMO-POL-WM-0003	Current
<b>Health and Safety</b>	
Health and Safety Policy, NWMO-POL-WM-0002	Current
Emergency Response Standard, NWMO-STD-WM-0002	Current
<b>Quality Assurance</b>	
Quality Policy, NWMO-PD-AD-0001	Current
Nonconformance and Corrective and Preventative Action, NWMO-PROC-QA-0001	Current
Internal Audit Procedure, NWMO-PROC-QA-0002	Current
<b>Engineering and Technical</b>	
Design Management Procedure, NWMO-PROC-EN-0001	Current
Safety Assessment, NWMO-PROC-EN-0003	Current
Technical Computing Software Procedure, NWMO-PROC-EN-0002	Current
Licensing Procedure, NWMO-PROC-RG-0002	Current
Regulatory Interface Procedure, NWMO-PROC-RG-0001	Current
<b>Environment</b>	
Environment Policy, NWMO-POL-ES-0002	Current
<b>Customer Stakeholder Engagement and Communication</b>	
Engagement and Dialogue Procedure, NWMO-PROC-RG-0003	Current
<b>Procurement</b>	
Procurement, NWMO-PROC-FN-0006	Current
Contract Standard – Consulting Services, NWMO-STD-FN-0002	Current
<b>Risk Management</b>	
Risk Management (Projects) Procedure, NWMO-PROC-WM-0001	Current
<b>Documents and Records Management</b>	
Standards for Controlled Documents. NWMO-STD-AD-0001	Current
Records Management, NWMO-PROC-AD-0002	Current

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The following table (Table 8.2) lists the NWMO DGR project specific governance planned for the D&C phase and the date by when each document is expected to be available.

**Table 8.2 NWMO DGR-Specific Governance**

Document	Availability
<b>Organization and Management</b>	
Design and Construction Phase Management System, DGR-PD-EN-0001	Current
Design and Construction Phase Project Quality Plan, DGR-PLAN-00120-0006	Current
<b>Engineering</b>	
Engineering Management Plans (contractors)	Mar, 2011
Human Factors Engineering Plan	Current
Human Factors Verification and Validation Plan	Sep, 2012
DGR Project Change Control, DGR-PROC-00740-1001	Mar, 2011
DGR Project Document Management Control, DGR-PLAN-00121-1002	Mar, 2011
<b>Community</b>	
DGR Community Engagement Plan, DGR-PLAN-08510-0004	Mar, 2011
<b>Procurement and Contracts</b>	
Procurement and Contracts Management Plan, DGR-PLAN-00800-1001	Sep, 2012
<b>Training and Competency</b>	
Training Management Plan, DGR-PLAN-08920-1001	Sep, 2012
<b>Construction</b>	
Construction Management Plan, DGR-PLAN-00180 -1001	Sep, 2012
Health, Safety and Environment Management Plan, DGR-PLAN-08960 -1001	Mar, 2011
Environment Management Plan, DGR-PLAN-07002-1001	Mar, 2012
Construction Quality Assurance Plan, DGR-PLAN-01916-1001	Dec, 2012
Field Quality Inspection Manual, DGR-MAN-01916-1002	Dec, 2012
<b>Commissioning</b>	
Commissioning Management Plan, DGR-PLAN-00920-1001	Nov, 2012
Commissioning Change Control Procedure, DGR-PROC-00920-1001	Nov, 2012

## 7. References

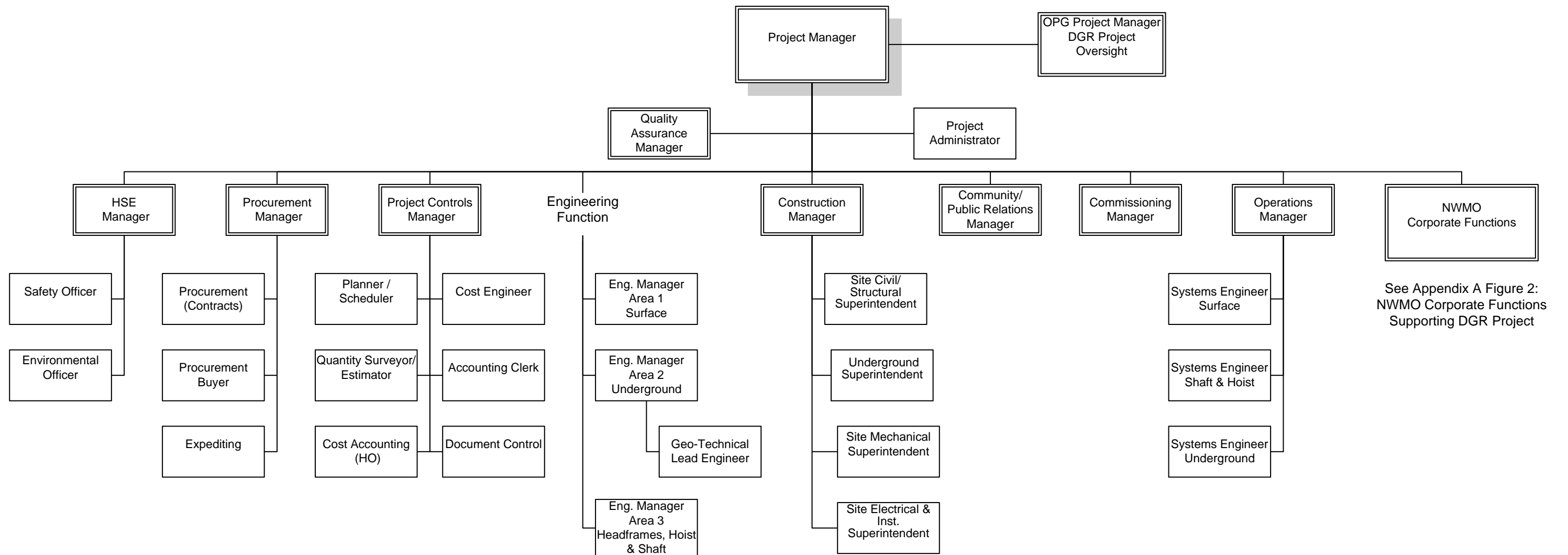
Management System Requirements for Nuclear Power Plants, CSA N286-05, February 2005.  
Management of Low and Intermediate-level Radioactive Waste, CSA N292.3-08, March 2008.  
Quality Management System Standard Requirements, ISO 9001:2008, November 2008  
Occupational Health and Safety Management, CAN/CSA Z1000-06, March 2006.  
Environmental Management Systems – Requirements with guidance for use, ISO 14001:2004, November 2004

## 8. Appendices



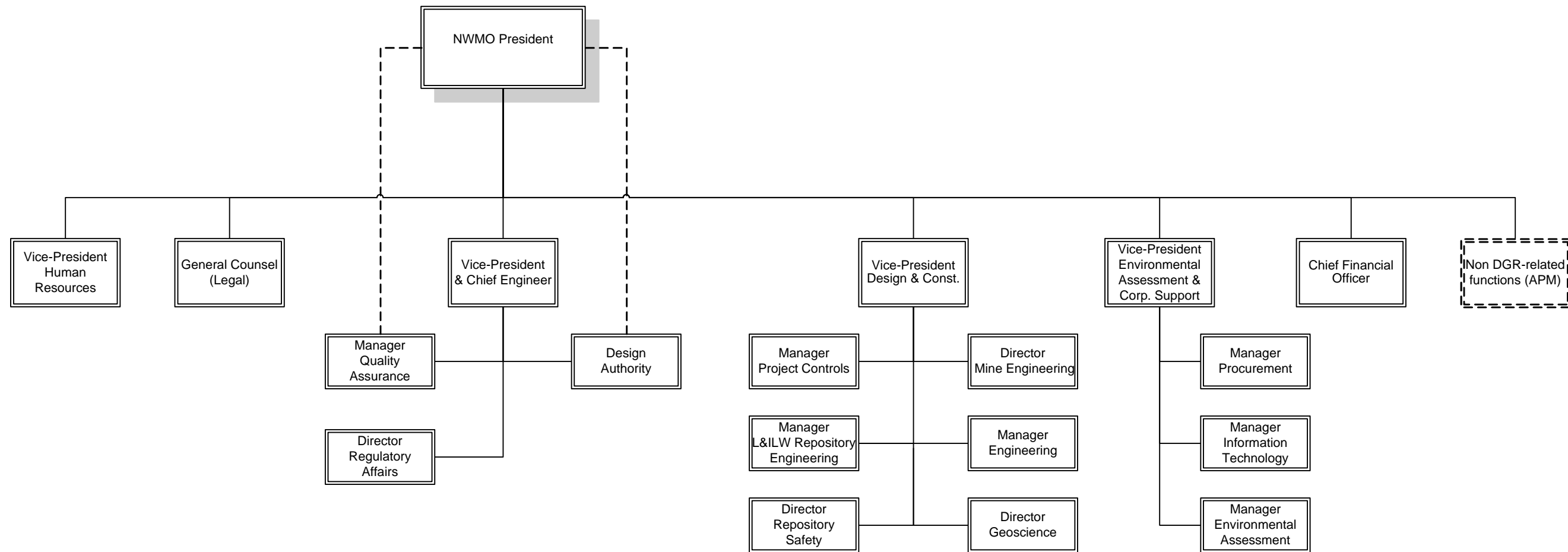
APPENDIX A: Figure 1.

## L&ILW DGR Design and Construction Project Organization – Construction



APPENDIX A: Figure 2.

## NWMO Corporate Functions Supporting DGR Project



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## **APPENDIX B: Roles and Responsibilities during the Design and Construction Phase**

### **1. NWMO's DGR-Related Roles and Responsibilities**

#### **1.1. President, Nuclear Waste Management Organization**

The President, Nuclear Waste Management Organization has the following responsibilities:

- Overall accountability for the successful completion of work on the DGR Project and for meeting cost, schedule and quality expectations established for this project. The responsibility and accountability for project planning and execution is delegated to the Project Manager.
- Monitoring the overall performance of the DGR Project management team including health, safety and environment performance.

#### **1.2. DGR Design and Construction Project Manager**

The DGR Design and Construction (D&C) Project Manager has the following responsibilities:

- Accountable for project planning, execution and monitoring including responsibilities for managing schedule, scope, cost and quality in order to achieve project expectations.
- Approves the Design and Construction Phase Management System and is the single point of contact for communication with OPG, the owner of the DGR.
- Accountable for construction planning, construction execution including health, safety and environment.
- Accountable for commissioning including validation of all designed systems.
- Establishes the project quality requirements in consultation with the Manager, Quality Assurance, and approves Contractor work-specific Quality Plans.

#### **1.3. Vice-President Design and Construction**

The Vice-President Design and Construction has the following responsibilities:

- Establishes and maintains a design and construction organization for deep geologic repository projects.
- Accountable for NWMO repository design engineering and construction engineering.
- Accountable for NWMO repository design and construction quality assurance.
- Maintains awareness of international experience and developments in nuclear waste repositories and incorporates appropriate lessons learned.

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#### **1.4. Vice-President and Chief Engineer**

The Vice-President and Chief Engineer has the following responsibilities:

- Plans and provides quality assurance oversight services for the DGR Project
- Plans and provides Design Authority oversight services for the DGR Project
- Plans and provides Regulatory Affairs services for the DGR Project.

#### **1.5. Vice-President Environmental Assessment and Corporate Support**

The Vice-President Environmental Assessment and Corporate Support has the following responsibilities:

- Plans and facilitates implementation of the Environmental Monitoring Program.
- Plans and implements public communication activities and maintains a positive relationship with the local municipalities and aboriginal communities.
- Plans and implements the procurement program for the D&C design stage.
- Provides guidance and oversight of the project procurement during construction.

#### **1.6. Design Authority**

The Design Authority has the following responsibilities:

- Authorizes use of the design responsible organization's (DRO's) engineering management plan or plans for the DGR Project.
- Initiates periodic audits of DRO's design work program to confirm that they are conducting work in compliance with their Engineering Management Plan.
- Authorized use of design outputs following receipt of recommendation from the Project Manager.
- Authorizes use of the system used to establish and maintain a complete documented knowledge base that defines the design.
- Authorizes the use of planned activities, referred to as the commissioning plan, to confirm that the "as built" matches the approved design.

#### **1.7. Chief Financial Officer**

The Chief Financial Officer has the following responsibilities:

- Provides, maintains and monitors systems of internal control regarding expenditures.

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- Provides guidance and oversight of the DGR project cost tracking and reporting.

### **1.8. General Counsel and Corporate Secretary**

The General Counsel and Corporate Secretary has the following responsibilities:

- Provides legal support to the DGR D&C Project Manager.
- Assists the D&C Project Manager prepare and negotiate the terms and conditions of contracts with service providers.

### **1.9. Vice President Human Resources**

The Vice President Human Resources has the following responsibilities:

- Provides human resources and labour relations support to the DGR D&C Project Manager.
- Provides oversight of the DGR Project regarding human resources.

### **1.10. Manager, Quality Assurance**

The Manager, Quality Assurance reports to the Vice President and Chief Engineer and has the following responsibilities pertaining to the DGR D&C phase of the project:

- Prepares the Project Quality Plan (PQP) for use during the D&C phase.
- Advises the Vice-President Design and Construction, and the Department Managers, regarding the implementation of the D&C PQP during the project.
- Assesses compliance with the D&C Project Quality Plan.
- Reviews information about each consultant's or contractor's overall quality management system and provides recommendations to the responsible Vice-President or Manager regarding the adequacy of the system.
- Reviews each consultant's or contractor's work-specific Quality Plan and provides recommendations to the DGR D&C Project Manager, Vice Presidents and Department Managers regarding the adequacy of the Quality Plan.

### **1.11. Engineering Area Manager**

Each Engineering Area Manager has the following responsibilities:

- Directs all work activities related to the design and engineering pertaining to the respective assigned area of responsibility (e.g. surface facilities, shaft and hoist, repository (underground) facility) of the L&ILW DGR.
- Reviews the D&C PQP for use on the DGR Project.

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- Reviews consultant/contractor work-specific Quality Plans related to the design and engineering of their engineering area and recommends them for approval by the DGR D&C Project Manager.
- Monitors the contracted work to ensure deliverables meet contractual requirements including quality requirements.

#### **1.12. Director, Repository Safety**

The Director, Repository Safety has the following responsibilities:

- Directs all work activities related to safety assessment in support of the design for the DGR facility.
- Reviews consultant/contractor work-specific Quality Plans related to safety assessment and recommends them for approval to the DGR D&C Project Manager.
- Monitors the contracted safety assessment work to ensure deliverables meet contractual requirements including quality requirements.

#### **1.13. Director, Repository Geoscience**

The Director, Geoscience has the following responsibilities:

- Directs all work activities related to geoscientific site characterization and geoscientific verification activities in support of design engineering and safety assessment.
- Reviews consultant/contractor work-specific Quality Plans related to geoscientific work program and recommends them for approval to the DGR D&C Project Manager.
- Monitors the contracted geoscientific work to ensure deliverables meet contractual requirements including quality requirements.

#### **1.14. Manager, Environmental Assessment**

The Manager, Environmental Assessment has the following responsibilities:

- Directs all work activities related to environmental monitoring.
- Directs all work activities related to obtaining required permits including certificates of approval.
- Reviews consultant/contractor work-specific Quality Plans related to environmental monitoring and recommends them for approval to the DGR D&C Project Manager.
- Monitors the contracted environmental monitoring work to ensure deliverables meet contractual requirements including quality requirements.

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### **1.15. Director, Regulatory Affairs**

The Director, Regulatory Affairs has the following responsibilities:

- Conducts regulatory interface on the DGR Project with the Canadian Nuclear Safety Commission (CNSC) and for communications with OPG on licensing matters.
- Coordinates preparation of all CNSC correspondence on the Project, for submission by the NWMO D&C Project Manager.

### **1.16. Manager Procurement**

The Manager Procurement has the following responsibilities:

- Prepares, maintains and communicates the requirements of the Procurement Procedure.
- Ensures that procurement activities are managed in accordance with NWMO's governance including the OAR.
- Ensures that procurement functions and transactions are conducted in a fair, honest, ethical and responsible business manner.
- Provides guidance and oversight of the project procurement during construction.

### **1.17. Project Controls Manager**

The Manager, Project Controls has the following responsibilities:

- Prepares, maintains and communicates the project execution plan and master schedule.
- Provides project planning and control support to the DGR D&C Project Manager.
- Provides project document and records management support to the DGR D&C Project Manager and the DGR Project organization.

### **1.18. Project Procurement Manager**

The Project Procurement Manager has the following responsibilities:

- Prepares, maintains and communicates the project Procurement and Contracts Management Plan.
- Prequalifies vendors, providing goods and services to the project, based on requirements including qualifications, certifications, quality, technical capability and relevant experience.

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- Ensures requirements for acceptance testing and inspection of materials and equipment are established and inspections and/or testing are completed.
- Establishes and ensures requirements for contract monitoring and closeout are completed.
- Retains and maintains records of purchases including associated documentation.

### **1.19. Construction Manager**

The Construction Manager has the following responsibilities:

- Prepares and maintains the construction plan and schedule.
- Prepares progress reports, construction schedules, construction forecasts, cost reports, estimates of monthly cash requirements, estimates for contract progress payments, and such other data as may be required.
- Coordinates with engineering area managers to ensure construction and installation is completed in accordance with design requirements, specifications, codes and standards.
- Works with the Project Quality Assurance Manager to ensure the requirements of the Field Quality Assurance Plan are achieved.

### **1.20. Project Quality Assurance Manager**

The Project Quality Assurance Manager has the following responsibilities:

- Prepares and maintains the Construction Quality Assurance Plan.
- Prepares and maintains the Field Quality Inspection Manual.
- Reviews inspection and test results to confirm that the acceptance criteria have been satisfied.
- Provides quality oversight of construction activities to ensure requirements of the Construction Quality Assurance Plan are achieved.
- Monitors the work of contractors to ensure that quality assurance and control activities are completed as required.



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### **1.21. Commissioning Manager**

The Commissioning Manager has the following responsibilities:

- In cooperation with the Operations Manager prepares and maintains the commissioning plan and schedule.
- Establishes the commissioning team in accordance with the commissioning plan.
- Prepares, progress reports, commissioning schedules, and prepares commissioning records including all necessary inspection and test results as required by the commissioning plan.

### **1.22. Health, Safety and Environment Manager**

The Health, Safety and Environment Manager has the following responsibilities:

- Prepares and maintains the Health and Safety Management and Environment Management Plans.
- Provides DGR Project construction site orientation training to DGR Project contractors
- Monitors work activities and reports on health, safety and environmental performance to the Project Manager and NWMO President.
- Investigates incidents and accidents and prepares recommendations for preventative actions.
- Provides monitoring and oversight of construction activities to ensure requirements of the Health and Safety Management and Environment Management Plans are achieved.

### **1.23. Community/ Public Relations Manager**

The Community/ Public Relations Manager has the following responsibilities:

- Prepares and maintains the Community Communications/ Engagement Plan for the DGR D&C Project.
- Executes the community communications and engagement activities to support the design and construction of the DGR project.
- Build, maintain and strengthen relationships with key stakeholders in the government, the media and the local communities.
- Ensure OPG is kept fully informed of communication plans and progress in keeping with the communication protocol between OPG and NWMO.

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#### **1.24. Operations Manager**

The Operations Manager has the following responsibilities:

- In cooperation with the Commissioning Manager reviews and accepts the commissioning plan and schedule.
- Establishes the operations team in accordance with the operations readiness plan.
- Prepares, required operations policies, procedures and standards.
- Develops the operations team capability through training and operational readiness activities including participating in the commissioning activities.

#### **1.25. Manager Information Technology**

The Manager Information Technology has the following responsibilities:

- Prepares and maintains the NWMO Information Technology Management Standard.
- Provides advice and guidance to the Project Manager regarding use of Information Technology.