ONTARIO POWER GENERATION

Internal Audit

Darlington Nuclear Refurbishment ("DNR") Engineering, Procurement and Construction ("EPC") Contractor Procurement Oversight Audit

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Report Rating: **Requires Improvement**

Distribution:

Dietmar Reiner
SVP Nuclear Projects

Michael Allen
SVP Nuclear Refurbishment

Sean Toohey
Project Director, Parts Integration

cc:	Jeffrey Lyash	President & CEO
	Ken Hartwick	SVP Finance, Strategy, Risk and Chief Financial Officer
	Glenn Jager	Chief Nuclear Officer
	Scott Martin	SVP Business and Administrative Services
	Stephun Cliver	Chief Supply Officer
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	Roy Martin	Project Director, Project Execution Programs Strategy
	Imtiaz Malek	Director Nuclear Safety Refurbishment
	Janice Ding	Director Internal Audit
	Mark Knutson	Director Nuclear Oversight

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1.0 EXECUTIVE SUMMARY

1.1 Report Rating and Summary of Findings

Report Rating: **Requires Improvement**

No.	Finding	Risk Type	Risk Rating[1]		
			High	Moderate	Low
1	[redacted] source surveillance tracking documentation is incomplete.	Operational	X		
2	Contractors had incomplete and inaccurate cost performance reporting.	Operational			X
Total			**1**		**1**

1.2 Background

The Darlington Nuclear Refurbishment ("DNR") project is currently nearing the end of the planning, engineering, and procurement phase with the refurbishment of the first unit (i.e., Unit 2 construction, installation and commissioning work) scheduled to begin in the fall of 2016.

To deliver the DNR project, OPG has tasked select contractors with planning, executing, and controlling the procurement of critical parts. OPG maintains oversight of these efforts as part of its due diligence in ensuring parts and materials are available on-time and according to OPG specifications.

In August 2015, Internal Audit ("IA") conducted an audit of the DNR Engineering, Procurement and Construction ("EPC") Contractor procurement oversight activities to assess the design of controls over the management of contractor procurement processes for materials, specifically long-lead materials. At the time of that audit, processes were relatively new, few parts and materials had been procured by the EPC Contractors, and therefore operating effectiveness of OPG oversight controls over EPC Contractor procurement activities could not be assessed. This review expanded upon the previous audit and also assessed the operating effectiveness of controls over select EPC Contractor procurement activities.

This is a risk-based audit identified in IA's program, selected given the significant profile of the DNR project and value of contractor procurement activities involved.

1.3 Objective & Scope

The objective of this audit was to independently assess the design and operating effectiveness of controls and processes related to procurement of materials to ensure timely delivery of materials that meet OPG quality standards and refurbishment requirements. To achieve the audit objective, we reviewed the processes and tested, on a sample basis, whether:

[1] Please refer to Appendix A for risk rating definitions

A. Procurement Planning Oversight

- Updates to materials procurement management plans were communicated to EPC Contractors to establish and agree upon expectations for procurement activities;
- Prime Contractors and applicable sub-contractors were qualified on OPG's Approved Supplier List ("ASL"), maintained their qualification status and were re-qualified on a timely basis (if necessary);
- Prime Contractors had quality management plans in place to ensure that all parts and materials procured, including those from sub-contractors, met relevant standards;
- Processes existed to facilitate the Prime Contractor's use of OPG preferred suppliers where applicable; and
- A framework existed with activity requirements and clear roles and accountabilities for the various OPG functions involved in contractor procurement oversight, from initiation to delivery.

B. OPG Oversight of Contractor Procurement Activities

- Project oversight plans were developed for each project bundle's procurement activities based on a risk based approach;
- The Procurement Tracking Tool ("PTT") was effectively used to monitor the procurement and logistics of parts and materials ('the right materials in the right place at the right time') and was accurate and complete;
- Quality Management Plans ("QMPs") / Inspection & Test Plans ("ITPs") were developed, indicated planned timelines for hold/witness points and/or Factory Acceptance Tests ("FAT"), and considered the potential for Counterfeit, Fraudulent, Suspect Items ("CFSI");
- Testing of parts and materials was performed based on the ITPs in a timely manner and prior to delivery and installation to ensure compatibility and quality;
- Documentation to evidence testing performed on parts and materials was retained;
- Parts and materials met OPG quality requirements, regulatory codes and standards, and were verified for CFSI;
- Where parts and materials did not meet OPG quality requirements, regulatory codes and/or standards or were determined to be CFSI, the quality issue(s) was/were documented, escalated in accordance with defined processes and remediated in a timely manner; and
- The Prime Contractor's (and sub-contractor's, through the Prime Contractor's monitoring activities) performance with respect to quality, timelines and budget was monitored and corrective action was taken as needed.

C. Pricing and Markups

- Oversight was in place to ensure OPG received optimal pricing for parts and materials; and
- Contractors adhered to pricing terms, including in relation to markups for goods and services.

This audit followed-up on action plans developed in response to the findings from the 2015 DNR EPC Contractor Procurement Oversight Audit. An audit of the vendor qualification process was completed in a separate audit in 2016.

The scope of this audit covered the DNR program's procurement activities and transactions on the Balance of Plant ("BoP") and Turbine Generator project bundles by Prime Contractors, [redacted] and [redacted], for the period from July 1, 2015 to June 30, 2016.

1.4 Conclusions

Positive Observations

- A risk-graded approach for supply chain oversight has been implemented by OPG. Critical parts and materials have been identified and included in an OPG oversight schedule. The Refurbishment Quality Management team is in the process of developing a risk-graded approach at the component level for all DNR Project Bundles; and

- Management has implemented a quarterly security access review process to ensure the PTT and applicable data is secure and protected. PTT data is also reconciled to bills of materials to help ensure completeness.

Findings & Recommendations

- [redacted] Master Source Surveillance Plan ("MSSP"), which includes information on Manufacturing Inspection and Test Plans ("MITPs"), has not been properly maintained. Various fields in the MSSP are blank and do not reflect the actual completion of MITPs. Management should continue working with [redacted] to ensure the MSSP is accurately updated and reported to OPG. Periodically, management should compare the MSSP with internal records (Master parts tracking files and the Critical Material Oversight Schedule) to verify that no MITPs are missing in the MSSP.

- [redacted] Management should continue working with these contractors to improve the detail and quality of cost performance reporting.

The findings noted in this report have been reviewed with Management, who has committed to specific action plans. Please refer to Section 2.0 for specific details of the above findings, along with the associated risk impact, recommendations and management action plans.

Change in OPG Oversight Practices with [redacted]

OPG's execution strategy for DNR has been to position OPG as an "oversight" organization, with its contractors responsible for planning, coordinating, integrating and ultimately executing the scope of work. The contracts entered into by OPG and its contractors reflect this execution strategy.

Due to issues encountered on the project, an executive decision was made for OPG to be more "hands-on" with [redacted] which was a significant change in the OPG execution strategy. As such, some of the following issues may become the responsibility of OPG:

- Low productivity;
- Rework due to planning issues; and
- Integration with other work.

OPG should consider if PO amendments are required to ensure revised accountabilities are accurately represented and the risks associated with applicable contracts are adequately mitigated through contract provisions in the event of disputes or claims. In addition, given OPG's increased "hands-on" role, OPG should have an understanding of incremental costs and consideration should be given as to whether [redacted] should be charged for the additional costs. It may be prudent to document these costs in the event of disputes or claims.

2.0 DETAILED AUDIT FINDINGS

Internal Audit identified the following findings and recommendations which have been risk rated based on the definitions outlined in Appendix A.

1. [redacted] source surveillance tracking documentation is incomplete.	**High**

The [redacted] MSSP, which was created and used by [redacted] to document and track the status of source surveillance activities including MITPs, is not being properly maintained. As at September 2016, various fields in the MSSP were incomplete and did not reflect the actual completion of MITP activities. For example:

- [redacted] Job# 15-5140 (OPG Project 73773, PO 619235) had MITPs completed and signed by both [redacted] and OPG (October 29, 2015 and November 4, 2015 respectively) but the completion of these activities was not noted in the MSSP;
- [redacted] Job# 14-5092 relating to the BoP Containment project has an MITP with an accepted and reviewed date by [redacted] as March 30, 2016 per their MSSP. However, the OPG project number is not listed on [redacted] plan; and
- For [redacted] Job# 15-5127 related to Adjuster Rods (OPG Project 73550, PO 617137), [redacted] indicated that the job required source surveillance. However, the MSSP lacked details regarding the source surveillance to be performed, the location of performance or potential OPG involvement. It should be noted that OPG has classified this component as a "critical material requiring oversight" (reference: Critical Material Oversight Schedule).

For each of the above examples, Internal Audit was provided with evidence of the MITP being completed or scheduled.

Additionally, OPG is considering implementing additional processes to facilitate the tracking of MITPs including:

- The addition of an "Oversight Required" attribute for individual parts in the Procurement Tracking Tool; and
- Increasing coordination efforts with Prime Contractors to improve cross-referencing between oversight schedules maintained by the Prime Contractors, OPG Project Management and OPG Supply Chain.

Potential Cause & Impact

Potential Causes:
[redacted] may not have understood OPG's expectations or were not focussing on administrative responsibilities.

Impacts:
Requisite source surveillance activities may not be performed if surveillance activities are improperly tracked.

Recommendation	Management Action Plan	Owner & Target Completion Date
1) Management should work directly with [redacted] to improve the quality and completeness of the MSSP. A due date for completion of the MSSP should be documented. [redacted] should be held accountable for meeting this due date. 2) OPG should continue implementing the Procurement Tracking Tool update and coordinating MITP tracking efforts.	Management will have [redacted] update their schedule, and will reconcile to OPG's tracking.	Sean Toohey, Project Director,Parts Integration January 27, 2017

2. Contractors had incomplete and inaccurate cost performance reporting.	**Low**

Contracts with [redacted] and [redacted] require that the contractors provide certain cost performance reporting. In our testing, we noted that cost performance reporting did not consistently include requisite or accurate information as required by the contracts. Specifically:

- [redacted] reporting has not included information on cost status, milestone reporting, and key performance indicators ("KPIs") since November of 2015; and
- The forecasted completion costs, as provided by [redacted] in cost performance reporting, is not consistently accurate. For example, OPG has noted on occasion that [redacted] reported Estimate at Completion ("EAC") metrics were lower than actual costs incurred.

The risk that OPG does not have accurate information on contractor cost performance is minimal as internal OPG performance reporting provides the Project Management team with sufficient information. Also, management had detected these omissions and errors and has re-communicated their expectations to the contractors.

Potential Cause & Impact

Potential Causes:

- Staff turnover at the contractors may have lead to reporting errors or omissions; and
- The contractors may not have fully understood OPG's expectations.

Impacts:

Contractors may not be fully aware of actual cost performance or milestones and may track inaccurate information that could lead to potential cost overruns.

Recommendation	Management Action Plan	Owner & Target Completion Date
Management should continue working with [redacted] to improve the detail and quality of cost performance reporting. If the contractors continue having cost performance reporting issues, OPG should consider imposing applicable penalties as per contractual terms.	Management has worked with [redacted] to improve the detail and quality of reporting to include the cost status, milestones and KPI's.	Complete

APPENDIX A – RISK RATING DEFINITIONS FOR AUDIT FINDINGS

Ratings are derived through professional judgment by the audit team and discussion with management. The ratings for individual control findings are outlined below.

Rating	Definition
High Risk	The finding presents a risk that could potentially have severe/major impact on financial sustainability (≥$5M), operational excellence, project excellence, safety, environment and reliability, reputation, regulatory relationship, or compliance with laws and regulations.
Moderate Risk	The finding presents a risk that could potentially have a moderate impact on financial sustainability ($500K to <$5M), operational excellence, project excellence, safety, environment and reliability, reputation, regulatory relationship, or compliance with laws and regulations. If not remediated, this risk could escalate to high risk.
Low Risk	The finding could potentially have a minor impact on financial sustainability (<$500K), operational excellence, project excellence, safety, environment and reliability, reputation, regulatory relationship, or compliance with laws and regulations. Recurring "low risk" findings may be elevated to medium risk status.

OVERALL REPORT RATING SCALE

An overall report rating has been assigned as an indication of the overall design, existence and effectiveness of the components of the internal control structure that was subject to the internal audit. The internal audit rating should be considered in conjunction with the definitions noted above.

- *Effective:* control and risk management practices provide reasonable assurance that business process objectives will be achieved and may include minor improvements and/or opportunities for improvement.
- *Generally Effective*: control and risk management practices require more than minor but less than significant improvements to provide reasonable assurance that business process objectives will be achieved.
- *Requires Improvement*: control and risk management practices require significant improvements in high risk and/or core areas to provide reasonable assurance that business process objectives will be achieved.
- *Not Effective:* control and risk management practices are not designed and/or are not operating effectively.