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1. GENERAL
Issue 1.2
Are OPG's economic and business planning assumptions that impact the nuclear facilities appropriate?

1.2-AMPCO-1

Ref: A2-2-1

a) Page 3: Please confirm the annual staff reductions over the past 5 years.

b) Page 4: Please provide the specific business areas and types of positions where critical skill shortages/gaps is being experienced by OPG.

c) Page 4: Please discuss the potential impacts in the test period of the new Ontario Nuclear Funds Agreement (ONFA) Reference Plan in 2017.

d) Given that OPG has filed a 5-year rate application with Payment Amounts for 2017 to 2021, please explain why OPG did not elect to prepare a five-year business plan.

e) Page 5: Please provide OPG's confidence level in the 2019-2021 projections by year.

f) Page 7: Please provide an update on the Province's concurrence on the 2016-2018 Business Plan.

g) Please provide the Terms of Reference for all studies filed in this application that are not already in evidence.

1.2-AMPCO-2

Ref: A2-2-1 Page 5

Preamble: The evidence states "OPG continues to employ leading practices in the business planning process, including top-down target setting for key resource envelopes such as OM&A, capital and headcount."

a) Please summarize what OPG believes to be leading practices in the business planning process.

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b) Please provide the specific top-down targets set for OM&A, capital and headcount over the test period.

c) Please explain any differences between headcount and FTEs.

1.2-AMPCO-3

Ref: A2-2-1 Page 1

Preamble: The evidence indicates that OPG's Business Plan supports Ontario's Climate Change initiatives.

a) Please provide the costs budgeted in this application (labour and non-labour) to address Ontario's Climate Change initiatives including Cap and Trade.

1.2-AMPCO-4

Ref: A2-2-1 Page 4

Preamble: The evidence indicates OPG has been challenged to find further cost reductions and efficiency gains.

a) Please confirm the key initiatives regarding productivity and efficiency improvements are found at pages 31, 35 and 37 of A2-2-1 Attachment 1.

1.2-AMPCO-5

Ref: A2-2-1 Attachment 1 Page 31

Preamble: At Page 31, OPG provides a list of six initiatives that are aimed at closing performance gaps in order to achieve targeted results for the Nuclear business unit.

a) Please provide further details on the design and status of Workforce Planning and Resourcing initiative and any documents provided to senior management and OPG's Board of Directors to approve this initiative.

b) Have any savings been identified over the test period as a result of implementing the six initiatives listed on Page 31? How have they reflected in the current application?

1.2-AMPCO-6

Ref: A2-2-1 Attachment 1 Page 35

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Preamble: At Page 35 OPG lists the following initiative for its Hydro-Thermal business:
Productivity Improvements: This initiative focuses on continued review of opportunities for efficiency gains from strategic initiatives, optimizing the productivity of maintenance staff, and focusing on the Attendance Support Program."

a) Does OPG have any similar or other productivity initiatives for its nuclear business?

1.2-AMPCO-7

Ref: A1-4-1 Page 2

a) Please provide a listing of all of the reports from the Audit and Risk Committee prepared that are relevant to the current application.

b) Please provide a status report on the recommendations from the Audit and Risk that are relevant to the current application.

c) Please provide the 2017 to 2021 workplan for the Audit and Risk Committee.

1.2-AMPCO-8

Ref: A1-4-1 Page 3

a) Please provide a listing of all of the reports from the Compensation, Leadership and Governance Committee that are relevant to the current application.

b) Please provide a status report on the recommendations from the Compensation, Leadership and Governance Committee that are relevant to the current application.

c) Please provide the 2017 to 2021 workplan for the Compensation, Leadership and Governance Committee.

1.2-AMPCO-9

Ref: A1-4-1 Page 3

a) Please provide a listing of all of the reports from the Darlington Refurbishment Committee that are relevant to the current application.

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b) Please provide a status report on the recommendations from the Darlington Refurbishment Committee.

c) Please provide the 2017 to 2021 workplan for the Darlington Refurbishment Committee.

1.2-AMPCO-10

Ref: Exhibit A2-1-1 Attachment 1 Page 10

Preamble: The evidence states "In the first quarter of 2014, the OSC approved an exemption which allows OPG to apply US GAAP up to January 1, 2019."

a) Please discuss OPG's strategy in 2019 and beyond regarding US GAAP versus IFRS and the impact on revenue requirement of any anticipated adjustments.

Issue 1.3
Is the overall increase in nuclear payment amounts including rate riders reasonable given the overall bill impact on customers?

1.3-AMPCO-11

Ref: A1-2-2 Page 1

a) Please provide OPG's Budgeted, Board Approved and Actual Nuclear Revenue Requirement for the years 2010 to 2015 and forecast for 2016.

1.3-AMPCO-12

Ref: I1-1-2 Page 1

Preamble: OPG provides the estimated monthly consumer bill impacts associated with the revenue requirement and OPG's deferral and variance account proposals.

a) Please provide the annualized bill impacts ($ and %) for a typical GS>50 kW and Large Use customer for the years 2017 to 202 and show the calculations.

2. RATE BASE
Issue 2.1
Are the amounts proposed for nuclear rate base (excluding those for the Darlington Refurbishment Program) appropriate?

2.1-AMPCO-13

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Ref: B1-1-1 Page 3 Chart 1

a) Please provide the budgeted, Board-Approved and actual in-service capital additions for each category in Chart 1 for the years 2010 to 2015.

2.1-AMPCO-14

Ref: B1-1-1 Table 2

a) Please provide the budget, Board approved and Actual rate base for the years 2010 to 2012.

3. CAPITAL STRUCTURE AND COST OF CAPITAL
Issue 3.1
Are OPG's proposed capital structure and rate of return on equity appropriate?

2.2-AMPCO-15

Ref: C1-2-1 Page 1 Chart 1

a) Please extend the table to include the years 2013 to 2016.

2.2-AMPCO-16

Ref: C1-1-1- Page 1

b) Please provide the annual impact on revenue requirement if the current capital structure is maintained.

4. CAPITAL PROJECTS
Issue 4.2
Are the proposed nuclear capital expenditures and/or financial commitments (excluding those for the Darlington Refurbishment Program) reasonable?

4.2-AMPCO-17

Ref: D2-1-3 Attachment 1 Page 2 Nuclear Business Case Summary Index

a) Please complete the attached excel spreadsheet prepared by AMPCO.

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4.2-AMPCO-18

Ref: D2-1-3 Table 1

a) Of the sixteen ongoing projects listed as Tier 1 projects in Table 1 from EB-2013-0321, please identify which projects were not classified as Tier 1 projects in EB-2013-0321 and indicate the Tier they were allocated to at that time.

4.2-AMPCO-19

Ref: D2-1-3 Table 1

a) For each of the projects in Table 1, please identify any projects where OPG did not utilize an Engineering, Procurement and Construction (EPC) contracting strategy.

4.2-AMPCO-20

Ref: D2-1-3 Table 1

a) Of the nineteen Tier 1 projects listed in Table 1 as new Tier 1 projects that have been approved for execution since EB-2013-0321, please provide a listing of all of the projects that have a total project estimate that has increased in this Business Case Summary (BCS) compared to the last BCS and include the variance. For example, for the Powerhouse Water ACU Replacements project (#31532, BCS Tab 18), the last BCS total project estimate was $9.693 million, whereas this BSC indicates a total project estimate of $20.045 million.

b) For some of the projects on Table 1, the Final In-service Date is shown as 2016 or earlier but in-service additions are shown in 2016 and beyond. Please explain by project. For example, for Project #31317, the in-service date is October 2013 and $0.8 million is recorded as an in-service addition in 2016.

c) For each of the projects that have been deferred, please provide the total project estimate, the total amount spent to date and the total amount to be deferred.

d) Line 19 Project #49285: For this completed project, please explain why the Total Project Cost reflects BCS amounts and not actual amounts.

e) Column (f) Final In-service date – please provide an update to the in-service dates.

4.2-AMPCO-21

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Ref: D2-1-3 Page 3

Preamble: The evidence indicates some projects have been deferred to address capital budget constraints. Specifically, the 2016 capital project portfolio budget is currently oversubscribed (i.e. the number of approved projects exceeds available funding). As a result, some projects have been deferred and a revised in-service date has not yet been determined.

a) Given the cost pressures resulting from the Darlington Refurbishment Program and Pickering Extended Operations, please discuss if any capital budget constraints or top-down targets were set for Nuclear Operations Capital.

4.2-AMPCO-22

Ref: D2-1-3 Page 8

Preamble: The evidence indicates that for six ongoing Tier 1 projects the total forecast project cost variances currently exceed 10%.

a) For each project, please confirm the variance is based on the Last BCS to This BCS and not an earlier estimate.

b) Please provide the total cost estimate variance for each project based on This BSC compared to the Definition Full Release Estimate.

4.2-AMPCO-23

Ref: D2-1-3

a) Please define removal costs.

b) Please explain how OPG estimate's removal costs? Is the methodology used consistent by project?

c) Please indicate the party responsible for removal. Does the party responsible vary by project?

4.2-AMPCO-24

Ref: D2-1-3 Attachment 1 Tab 1 Page 4

a) With respect to the variance details, please explain why there was no amount for contingency included in the current approval and why now a contingency of $1.5 million (2.4%) is added.

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4.2-AMPCO-25

Ref: D2-1-3 Attachment 1

Preamble: Many of the Business Cases include "OPG Other" as a cost category.

a) Please provide a description of the nature of the costs captured under "OPG Other".

4.2-AMPCO-26

Ref: D2-1-1

a) Please provide a summary of OPG's key project management performance metrics and discuss performance trends over the past five years and forecast for the test period.

4.2-AMPCO-27

Ref: D2-1-3

a) Please provide the primary reasons for interest cost variances in the total project estimate.

b) Please provide the primary reasons for contingency cost variances in the total project estimate.

4.2-AMPCO-28

Ref: D2-1-2 Table 1

Please provide a breakdown of Operations Capital based on Projects $5 million to $20 million, Projects < $5 million, and Projects Unallocated showing budget and actuals for the years 2013 to 2016 and forecast for 2017 to 2019.

4.2-AMPCO-29

Ref 1: D2-1-1 Page 1

a) For the years 2013 to 2021, please provide a breakdown of the Nuclear Operations Capital Project Portfolio budget allocated to regulatory, system or unit reliability, system obsolescence or optimizing station generation.

Issue 4.3
Are the proposed nuclear capital expenditures and/or financial commitments for the Darlington Refurbishment Program reasonable?

4.3-AMPCO-30

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Ref: D2-2-1 Page 3, Chart 1 & D2-2-8 Page 7, Chart 3

Preamble: OPG provides a cost breakdown of the total Darlington Refurbishment Program (DRP) Release Quality Estimate (RQE) showing the Program components.

a) Please confirm that the RQE provides the baseline cost estimate for each major program component that OPG will compare all future costs to until 2026.

b) Please add a column to Chart 1 to reflect the component costs approved by OPG's Board of Directors in November 2013.

c) Based on OPG's review of other nuclear refurbishment projects and other megaprojects please compare OPG's Contingency of 16.4% of the RQE (excluding interest & escalation) to the Contingency % of these other projects.

d) Based on OPG's review of other nuclear refurbishment projects megaprojects, please compare OPG's Functional Costs of 21.3% of the RQE (excluding interest & escalation) to the % of Functional Costs of these other projects.

e) Please provide the original and current (revised) Safety Improvement Opportunities and Facilities & Infrastructure Projects budgets and show the % of costs for each that have been reclassified to date.

4.3-AMPCO-31

Ref: D2-2-1 Page 5

a) Please provide the OPG Functional Support % of in-service additions for Units 1, 3 and 4.

4.3-AMPCO-32

Ref: D2-2-1 Page 11

a) Please provide a copy of the Integrated Investment Plan (IIP).

4.3-AMPCO-33

Ref: Exhibit D2-2-2 Page 1

Preamble: DRP is a multi-phased program made up numerous individual projects of various sizes.

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a) Please provide the total number of individual projects for the DRP.

b) Please provide the number of individual projects under each of the five major work bundles.

c) Please confirm the total number of prime contractors working on the DRP.

d) Please provide a table that shows the number of projects managed under each prime contractor.

4.3-AMPCO-34

Ref: EB-2013-0321 D2-2-1

Preamble: In the last application, the following DRP Plans were filed as attachments in D2-2-1:

- Program Management Plans
- Refurbishment Program Structure and Summary Management Plan
- Refurbishment Program Scope Management Plan
- Program Cost Management Plan
- Program Schedule Management Plan
- Refurbishment Program Reporting Management Plan
- Darlington Refurbishment Risk Management Plan
- Refurbishment Program Communications Management Plan
- Refurbishment Program Staffing Management Plan
- Program Documentation and Project Closure Management Plan
- DNGS Refurbishment Management Plan – Refurbishment Engineering
- Program Assurance Plan for Darlington Nuclear Refurbishment
- Program Environmental Management Plan
- Program Management System Oversight Management Plan
- Program Site Implementation and Construction Management Plan
- Program Licensing Management Plan
- Nuclear Refurbishment Program Health and Safety Management Plan
- Program Contract Management Plan
- Program Return to Service Management Plan
- Darlington Refurbishment Supply Chain Management Plan

a) Please provide a listing of any additional key management plans that exist.

b) Please provide any updates to the above plans.

c) Please summarize the key changes by plan.

d) Please provide OPG's responsibility matrix for the project.

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4.3-AMPCO-35

Ref: Exhibit D2-2-2 Page 4 Figure 1 DRP Organizational Structure

a) Please provide the total cost for OPG's ten Functional Teams.

b) Please provide the total cost for OPG's five Dedicated Project Management Teams. Please confirm where these costs are captured in the DSP RQE.

c) For each of the Functional Teams under Program Management and Execution and Management and Support please provide the number of FTEs (Regular & Non-Regular) by key job categories for the years 2016 to 2021.

d) For each of OPG's Dedicated Project Management Teams for each of the five major work bundles (each with an OPG Project Director) please provide the total FTEs (Regular and Temporary) by key job categories for the years 2017 to 2021.

e) Please explain OPG's Resource Optimization Strategy and Plan for the DRP.

f) Please explain how OPG's Dedicated Project Teams work with the contractors who have their own support project staff including finance and other non dedicated support staff.

4.3-AMPCO-36

Ref: Exhibit D2-2-2 Page 5

Preamble: The evidence indicates that the project management teams are appropriately supported by Owner Support Services (AMEC NSS and Worley Parsons Canada), which provide engineering, project management, and functional support, and a Project Planning and Controls contractor (Faith and Gould), which provides project controls and contract management functional support.

a) Please explain how each of OPG's Dedicated Project Management Teams are supported by each of the above Owner Support Services and provide a breakdown of the costs of each service provided to each team.

b) Please explain how OPG manages any duplication of services between its teams and the Owner Support Services Teams (OSST). Is there any overlap between OSSTs? If so, please define.

4.3-AMPCO-37

Ref: Exhibit D2-2-2 Page 4

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Please complete the following Table for Unit 2.

OPG Functional Teams	**Payroll $**	**Non-Payroll $**
Engineering		
Nuclear Safety		
Planning and Control		
Managed System Oversight		
Contract Management		
Program Fees and Other Support		
Supply Chain		
Project Execution Support		
Work Control		
Operations and Maintenance		

4.3-AMPCO-38

Ref: Exhibit D2-2-2 Page 4

Please complete the following Table for Unit 2.

OPG Dedicated Project Management Teams	**Payroll $**	**Non-Payroll $**
Retube and Feeder Replacement		
Turbine Generator		
Defueling and Fuel Handling		
Steam Generator		
Balance of Plant		

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4.3-AMPCO-39

Ref: Exhibit D2-2-2 Attachment 2 Page 8

a) Please confirm which DRP Management Plans shown on Page 8 have not been filed in evidence.

4.3-AMPCO-40

Ref: D2-2-3 Page 4 Chart 2

a) For the RFR Work Bundle, please provide the contract value for each of the Target Price, Fixed Price and Cost + Mark-up contracts.

b) For each of the work bundle contractors shown in column 1, please provide a summary of the contractor's relevant past experience.

c) For each of the work bundle contractors and corresponding pricing models shown, please indicate which contracts include a contractor contingency.

d) For each of the work bundle contractors and corresponding pricing models with a contractor contingency, please provide the confidence levels that correspond to the contractor contingencies.

e) Please confirm the costs shown under Value of the Contract do not include any OPG costs.

f) For each contractor contract, please explain how OPG has assigned risks to the party that is best able to manage the risk and mitigate its impact on the DRP.

4.3-AMPCO-41

Ref: D2-2-3 Page 6 Figure 2

a) Please provide the $ values that correspond to the % shown for each pricing model.

4.3-AMPCO-42

Ref: D2-2-3 Page 10 Figure 3

a) For the Target Schedule, please confirm the neutral band represents 10%.

b) Please explain why there is no neutral band for less than the target schedule.

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4.3-AMPCO-43

Ref: Exhibit D2-2-3 Page 10 Chart 3

a) Please confirm the costs provided in Chart 3 do not include any OPG costs.

4.3-AMPCO-44

Ref: D2-2-3 Attachment 1 Page 2

Preamble: The Summary of EPC Contract for RFR with SNC/Aecon JV states that the contractor and OPG developed an execution phase plan that included a cost estimate, schedules and a risk register for the execution phase. The evidence states "The cost and schedule estimates developed by the contractor were subject to a P50 analysis and the P50 analysis was the basis for establishing the target cost and target schedule under the agreement".

a) Please provide the risk register.

b) Please explain why a P50 analysis was selected.

c) Were higher confidence levels tested? If yes, please provide the results. If not, why not?

d) Please explain how the contractor's fixed fee was calculated based on the target cost.

4.3-AMPCO-45

Ref: D2-2-3 Attachment 1 Page 7

Preamble: The Summary of EPC Contract for RFR with SNC/Aecon JV indicates that a certain amount of typical rework is to be expected on a project of this nature.

a) Please explain the basis for a 3% rework.

b) Please provide the value of the allowance and show the calculation.

4.3-AMPCO-46

Ref: Exhibit D2-2-3 Attachment 1 Page 10

Preamble: The evidence states "The agreement requires that ownership of the physical tooling be transferred to OPG as such tooling is completed".

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a) Please confirm that all the tools have been manufactured and tested.

b) Please provide a listing of Major Tools and their projected useful life.

c) Please explain the role of SNC/AECON JV in the non-performance of the tools during the execution phase.

d) Please explain what role SNC/AECON JV has in the repairs of the tools during the execution phase.

e) Please explain the cost of disposal of the tools and where/by whom the disposal costs are to be borne.

f) Are the disposal costs included in the cost of the DRP?

4.3-AMPCO-47

Ref: D2-2-3 Attachment 1 Page 12

Preamble: The Summary of EPC Contract for RFR with SNC/Aecon JV states that the agreement permits OPG to suspend the work at any time.

a) Please provide examples of circumstances that would require OPG to suspend the work.

b) Please provide details of the circumstances that result in certain types of direct damages payable by OPG to the contractor.

4.3-AMPCO-48

Ref: D2-2-3 Attachment 3 Page 7

Preamble: The Summary of EPC Contract for Turbine Generators with SNC/Aecon JV indicates the agreement includes an allowance equal to 4% of the labour portion of the execution phase target cost for the first unit to be refurbished and 3% of the labour portion of the execution phase target cost for each subsequent unit for rework.

a) Please provide the $ value for the 3% and 4% rework.

b) Please explain why for this contract, a higher allowance for rework is agreed to for the first unit. For the RFR contract a 3% rework allowance was agreed to.

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4.3-AMPCO-49

Ref: D2-2-4 Page 2

a) Please provide the total spend to date.

4.3-AMPCO-50

Ref: D2-2-4 Page 3

Preamble: With respect to meeting key Definition Phase milestones, OPG indicates that regarding Scheduling, OPG developed an integrated Level 2 schedule for the Program and an integrated and resource-loaded Level 3 schedule for the Unit 2 preparation and Execution Phase.

a) Please explain what OPG means by resource-loaded.

4.3-AMPCO-51

Ref: D2-2-4 Page 3

a) Please confirm the party that undertook the independent assessment of the RQE.

b) Please provide the key updates that were made to the DRP Business Case Summary.

4.3-AMPCO-52

Ref: D2-2-4 Page 4 Chart 1 Key Lessons Learned

a) Please provide a summary of all of the reference documents that OPG reviewed.

b) For each of the past CANDU and other nuclear refurbishment projects reviewed, please provide the technical similarities and differences of these projects compared to the DRP and the key lessons learned by project.

c) Please provide the specific operating experience and lessons learned from each of the non-nuclear mega projects: Niagara Tunnel, Lower Mattagami River projects, London Olympics, Alberta Oil Sands, Toronto Union Station Redevelopment, and Heathrow Airport Terminal 5.

d) Please describe the benchmarking visits that OPG conducted.

e) Please describe the new benchmarking and collaborations that are planned.

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f) Please explain how the lessons learned discussed in b) and c) were incorporated into the DRP.

4.3-AMPCO-53

Ref: D2-2-4 Page 4 Chart 1

a) Please complete the following Table to compare the nuclear stations reviewed by OPG to DRP.

Nuclear Station	Total # Units	# of Units Refurb	# Full Time Staff	Annual MW	Start Date	Planned /Actual Duration	Planned /Actual Costs	Planned/Actual LUEC cents/kWh
DRP								

4.3-AMPCO-54

Ref: EB-2013-0321 D1-2-1 Att2 Project Execution Plan R03, The Niagara Tunnel Project, Project Execution Plan January 2013, Page

Preamble: Section 20.9 of the Project Execution Plan titled Project Completion Report states the following:

"The Project Completion Report will be prepared by the Project team under the direction of the OR Project Manager and will:

- analyse Project performance relative to the PEP
- identify problems in Project execution and their solutions
- record the Project history focusing on those things the Project team would do again or do differently on another similar project. This information would be of particular importance to OPG should the fourth tunnel ever be built, and may also prove useful as OPG pursues other generation projects.

The "Lessons Learned" part of the report will address, among other things, the following:

What contributed most to the success/failure of the Project?
What worked well? What did not work well?
What constraints limited our performance? How could those constraints be removed in future?
Where did we have problems? Should these have been foreseen? If so, what indicators were missed?
What innovations did we introduce on this Project? What were their impacts?

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What other things could we have done to improve Project performance and success?
Is the client (NPG) satisfied with the facility as delivered?
How effective was the Risk Management Plan in eleminating, avoiding, transferring, or mitigating risk events?

The OR Project Controls Manager will document all Project controls issues arising from the management of the Project, including cost, scope and schedule variances."

a) Please provide the Project Completion Report prepared by the Project team under the direction of the OR Project Manager.

b) Please discuss how the lessons learned have impacted the planning of the DRP.

c) Please provide the project control issues documented by the OR Project Controls Manager.

4.3-AMPCO-55

Ref: D2-2-2 Page 5

Preamble: The evidence states that "….all major contracts required to execute the DRP scope were awarded."

a) Please confirm all major contract agreements have been signed and approved by all parties.

b) Please explain if there have been any further amendments to these contracts to date.

4.3-AMPCO-56

Ref: D2-2-4 Page 2 Figure 1

a) Please provide the costs for F&IP and Refurb Support Facilities Projects separately.

4.3-AMPCO-57

Ref: D2-2-4 Page 6

Preamble: The evidence states "OPG has a high degree of confidence in its schedule for the RFR work bundle."

a) Please provide the confidence level on the reliability of the tooling.

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b) Please provide the percentage of customized tools. (i.e. tool not used in any other refurbishment.

c) Please provide the percentage of tools that are First of A Kind (FOAK).

d) Please list the tools that are FOAK and if they will be used in the actual refurbishment project or will be used in other building or processes, i.e. waste processing.

4.3-AMPCO-58

Ref: D2-2-5 Page 1

Preamble: The evidence indicates that the operating experience from each of the Pickering 'A' Return to Service project, the Pt. Lepreau refurbishment and various Bruce Power restart projects, where cost and schedule overruns were significantly driven by scope growth.

a) For each project, please provide the specific details of the cost and schedule overruns driven by scope growth/creep and explain how OPG has accounted for potential scope growth in the DRP.

4.3-AMPCO-59

Ref: D2-2-5 Page 1

Preamble: The evidence states "…having a detailed definition of scope enables OPG and its contractors to take the necessary steps to ensure completion of all corresponding engineering in advance of unit execution, and to secure necessary parts, tools, labour and craft resources to support the schedule."

a) Please confirm that within the Definition Phase all of the Unit 2 contractors have confirmed they have all the necessary labour, equipment, materials, tools, parts and craft resources to complete and support the schedules.

4.3-AMPCO-60

Ref: D2-2-5 Page 4

a) Please confirm the current scope of the DRP has not changed since June 1, 2015.

4.3-AMPCO-61

Ref: D2-2-5 Pages 4-5

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a) Of the 340 Scope Requests within the DRP Scope, 40% include engineering modifications. Please categorize the remaining Scope Requests.

b) Please provide the % of Scope Requests assigned to each of the five major work bundles.

c) Please provide the % of the 560 specific projects (when applied to the four units) that need to be completed directly for Unit 2.

4.3-AMPCO-62

Ref: D2-2-2 Page 5

a) Please explain the process OPG uses to determines which SIO and F&IP projects are part of the DRP.

4.3-AMPCO-63

Ref: D2-2-5 Pages 7-9

a) Please confirm the delivery of all tool sets by mid-2016.

b) If any tools have not been delivered, please provide a list of tools required and the scheduled delivery dates.

c) Please discuss the delivery schedule against plan of long lead materials including pressure tubes, calandria tubes, fuel channel end fitting assemblies, feeders and retube waste containers ordered for Unit 2.

d) Please confirm the date the Retube Waste Processing Building will be available and completed.

4.3-AMPCO-64

Ref: D2-2-6 Page 5

Preamble: The evidence states "OPG also evaluated risks and uncertainties for each segment of the schedule, and determined the amount of contingency required to deliver the Unit 2 refurbishment in consideration of the risks and uncertainties evaluated. This resulted in the production of a schedule that includes contingency for certain schedule risks that may be encountered during the execution of the refurbishment outages. Through probabilistic analysis, OPG expects to execute the Unit 2 refurbishment within this schedule. This high confidence schedule is the basis for Release Quality Estimate ("RQE"), which is the program level control budget. This schedule is also the schedule from which project success will be assessed."

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a) Please provide the risks and uncertainties for each segment of the schedule.

b) Please provide the amount of contingency for each schedule risk.

c) Please provide the Release Quality Estimate (RQE) document that OPG and its consultants relied upon in preparing the evidence.

4.3-AMPCO-65

Ref: D2-2-6 Attachment 1

Preamble: OPG provides the Refurbishment Outage Schedule for Unit 2.

a) Please provide the Refurbishment Outage Schedules for Units 1, 3 and 4.

b) Please explain OPG's resource strategy to meet the Schedule for Unit 2.

4.3-AMPCO-66

Ref: Exhibit D2-2-6 Attachment 1

a) Please complete the following table:

Unit #	Critical Path Start Date	Critical Path End Date	Duration Days	Duration Months
2				
3				
1				
4				
4 Units				

4.3-AMPCO-67

Ref: Exhibit D2-2-7

a) Please summarize OPG's operating experience from other refurbishments.

4.3-AMPCO-68

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Ref: Exhibit D2-2-7 Page 3

a) Please provide the contingency amount allocated to each of the three key contributors to contingency: cost estimating uncertainty, schedule estimating uncertainty and discrete risks.

b) Please provide the confidence levels for each key contributor.

4.3-AMPCO-69

Ref: Exhibit D2-2-7 Page 4

Preamble: The evidence indicates a comprehensive risk register including AACE estimate classifications for each project and detailed schedule logic was used to develop the contingency estimate.

a) Please provide the comprehensive risk register.

b) Please provide OPG's Risk Management Plan.

c) Please provide the top 10 contributors to cost risk.

d) Please provide the top 10 contributors to OPG-accountable delay risk.

e) Please provide the top 10 contributors to Contractor-accountable delay risk.

4.3-AMPCO-70

Ref: Exhibit D2-2-7 Page 5-6

Preamble: OPG indicates that its Monte Carlo simulation provides decision makers with a range of possible outcomes and the probabilities that those outcomes will occur to certain confidence levels.

a) Please provide the confidence levels tested and the contingency amounts at these confidence levels.

b) Were P10, P50 and P70 confidence levels tested? If not, please provide the total cost of the four units and the average cost per unit at low confidence (10%), medium confidence (50%), medium high confidence (70%) and high confidence (90%).

4.3-AMPCO-71

Ref: Exhibit D2-2-7 Page 6

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a) Please explain further what is meant by "Program contingency is derived from overarching Program risks managed at the executive level that could influence the overall Program's objectives, may require Program-wide response and may have a global impact on the Program".

b) Please provide a listing of the key Program risks managed at the executive level and the corresponding probability.

c) Please provide more details on the types of unforeseen changes to financial and other economic factors beyond those assumed in the Program.

4.3-AMPCO-72

Ref: Exhibit D2-2-7 Page 7 Chart 1

a) Please explain how OPG determined the contingency $ split between Project Contingency and Program Contingency.

b) Please explain how Program contingency amounts were determined for each project in Chart 1.

c) Please explain why Program contingencies are greater than Project contingencies for the following projects: RFR, Fuel Handling and Defueling and Project Execution and Operations and Maintenance.

d) For each of the projects in Chart 1 please provide the allocation between the three key contributors to contingency (cost estimating uncertainty, schedule estimating uncertainty and discrete risks) for both Project contingency and Program contingency.

e) Have other nuclear refurbishment projects reviewed by OPG included an unallocated program contingency amount under Program contingency? If yes, please provide project details and compare to OPG's proposal.

f) Please provide the total contingency amount held by the contractors, i.e. total amounts included in contracts, that are in addition to the $1.7 billion help by OPG.

4.3-AMPCO-73

Ref: Exhibit D2-2-7 Page 1

Preamble: The evidence indicates that contingency is not an extra amount that will not be spent if the project goes as planned, nor is it a tool to compensate for an underdeveloped project plan.

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a) Please explain the rationale for the $202 million in Unallocated Program Contingency.

b) How was the amount of $202 million determined?

c) What types of risks are covered under the Unallocated Program Contingency?

d) How will use of the $202 million in Unallocated Program Contingency be authorized and controlled?

4.3-AMPCO-74

Ref: D2-2-7 Page 8 Chart 2

Preamble: Of the total $1.7B of DRP contingency, $694.1M (40%) is attributed specifically to Unit 2.

a) Please provide the DRP contingency allocated to Units 1, 3 and 4 on the same basis as Chart 2.

b) Does the Monte Carlo analysis differentiate between Units?

c) If the contingency for Unit 2 is not used, please discuss how the funds will be treated and if any remaining contingency funds will be reallocated to other units.

d) Please provide the amount of Unallocated Program Contingency allocated to Unit 2.

4.3-AMPCO-75

Ref: D2-2-7 Page 8

Preamble: The evidence states "In allocating contingency to Unit 2, OPG assumed, based on industry experience, that the first unit will realize more risks then subsequent units…."

a) Please provide the specific industry experience OPG is relying on to support this statement and the 40% contingency allocation to Unit 2.

4.3-AMPCO-76

Ref: D2-2-7 Attachment 1 Page 2

Preamble: The evidence indicates KPMG reviewed the following OPG documents, in combination with the October 6th, 2015 interview of key OPG staff:

- RQE Contingency Development Plan, Dated 2015-06-04, NK38-Plan-09701-10006

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- RQE Contingency Development Report, Dated 2015-08-20, N-REP-09701-0556625
- Nuclear Project Risk Management, Dated 2015-03-30, N-MAN-00120-1000
- Nuclear Refurbishment Risk Management & Contingency Development Guide, Dated 2014-07-28, N-MAN-00120-1000
- Nuclear Projects Risk Management and Oversight (RMO) TOOL, N-GUID-09701-10123
- Presentation: "RQE Contingency Development", Dated 2015-06-24
- Integrated Contingency Estimate – Snapshot 3 (Final) dated September 30, 2015 – 'RQE Mgmt Summary – Contingency Snapshot 3.pdf'.

a) Please provide copies of any of the above documents not already provided in evidence.

4.3-AMPCO-77

Ref: D2-2-7 Page 9
Ref: H1-1-1 Page 13

Preamble: OPG proposes that the variance between actual costs and firm financial commitments and those forecast costs and firm financial commitments underpinning the 2017-2021 annual nuclear revenue requirement approved by the OEB in this proceeding be recorded in the Capacity Refurbishment Variance Account ("CRVA"). The nuclear revenue requirement includes DRP in-service additions. In the event of any unallocated contingency at the point of in-service, the favourable revenue requirement amount will be recorded in the CRVA and returned to ratepayers in a future test period.

a) Please confirm that the CRVA balance will be zero in the event the DRP is on budget and on time at the end of the test period. If this is not so, please describe the other factors that will apply.

b) Please report the amounts that would be recorded in the CRVA that would reflect the revenue requirement impact over the test period if the DRP in-service additions were 10% and 25% over budget. Please show your calculations.

c) Please report the amounts that would be recorded in the CRVA that would reflect the revenue requirement impact over the test period if the DRP in-service additions were 10% and 25% delayed over schedule. Please show your calculations.

4.3-AMPCO-78

Ref: Exhibit D2-2-8 Cost

a) Page 1: Please provide the document provided to OPG's Board of Director's in 2009 that details the $14 billion cost estimate for refurbishing all four units at Darlington.

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b) Page 2: Please provide a copy of AACE's Recommended Practice Nos. 17R-97 and 18R-97.

4.3-AMPCO-79

Ref: Exhibit D2-2-8 Page 6 Chart 3

a) Please provide the DRP RQE Breakdown in Chart 3 by Year.

b) Please provide the total contractor costs included in Chart 3.

c) Please provide a breakdown of Chart 3 categories based on total labour and non-labour costs.

d) For each of the major work bundles please provide a breakdown of contractor costs compared to OPG costs.

4.3-AMPCO-80

Ref: Exhibit D2-2-8 Page 6 Chart 3

Preamble: Under OPG Functions, Operations and Maintenance has a budget of $805 million, the largest component (34%) of the OPG Functions budget of $2,336 million.

a) Please provide a detailed breakdown of the Operations and Maintenance budget.

4.3-AMPCO-81

Ref: Exhibit D2-2-8 Page 6 Chart 4

e) Please provide Chart 4 for Units 1, 3 and 4.

4.3-AMPCO-82

Ref: Exhibit D2-2-8 Pages 11, 14 to 15, Charts 5 to 9

a) Please explain why the % of OPG Project Management Costs is not similar between the work bundles in Charts 6 to 8.

b) Please provide the OPG Project Management Costs included in the Balance of Plant Bundles Costs (Chart 9).

4.3-AMPCO-83

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Ref: Exhibit D2-2-8 Page 17 Figure 2

a) Please provide Figure 2 for Units 1, 3 and 4.

4.3-AMPCO-84

Ref: Exhibit D2-2-8

a) Please provide the average daily rate for the DRP for Unit 2 and show the calculation.

b) Please define overnight rate.

c) Please provide a description of the types of crews that will work on each of the major work bundles including size, composition, shift lengths, hours per week, days off per week, and how OPG optimizes its crew schedules.

d) Please estimate the amount of time each crew will actually be on the reactor face during their shift.

e) Please provide the estimated average cost per crew shift.

4.3-AMPCO-85

Ref: D2-2-8 Attachment 1

a) Please provide the original Darlington Refurbishment Business Case from 2013 (before Revision 1)

b) Please explain the significant changes in the Business Case approved in 2015 compared to the Business case approved 2013.

4.3-AMPCO-86

Ref: D2-2-8 Attachment 1 Page 31

Preamble: The evidence states “Resource Management/Bridging Between Units - Contingency is provided to retain critical trades and leadership resources between periods of specific resource demand. The risk is that due to the current un-lapped Unit 2 schedule, after the majority of the field work is complete on Unit 2, and prior to their requirement for Unit 3, key resources might leave OPG and not return to execute Unit 3. This could result in re-training of staff and reduced opportunity for performance improvement, as well as the potential loss of ‘project momentum’. OPG will mitigate this by assigning certain critical resources to Nuclear Project portfolio work, Fleet Unit Outage work, or Darlington ‘Life Extension’ works during this period. In the unlikely event where this is not possible, OPG has included $50M in the contingency estimate to retain these resources. This risk is the focus of

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continual effort in order to minimize the impact on the project.

a) Please confirm the $50 million contingency is allocated to Unit 2. If not, please provide the allocation of the $50 million contingency.

b) Please explain how the $50 million was calculated.

c) Please provide the amount of idle time to date for the DRP project.

d) Please discuss the amount spent to date to "retain resources".

e) Please discuss if this is retention strategy is a typical practice in other nuclear refurbishment projects.

4.3-AMPCO-87

Ref: D2-2-8 Attachment 2 Page 29

Preamble: Modus/Burns McDonnell states "The DR Team nonetheless has high confidence in the extent of the estimates it has prepared for RQE and are all-inclusive of what could reasonably be identified for staffing at this time. We believe that there is some risk that OPG will not meet its proposed plan in this area as the job functions and specific roles within the functional groups are not as defined as they could be. Additionally, the pace of the proposed ramp-up of the DR Team's staff over the next several months is very aggressive and will be very difficult to meet. In order to meet the plan, the DR Team would have to increase from 770 to just over 900 (17%) staff in less than 3 months. Moreover, the DR Team's projections for 2016 show a planned functional expenditure of $120M, excluding Operations & Maintenance and Engineering, which would equate to nearly 70% of the cost of these functions for the last 5+ years. The DR Team has been chronically under-spent during the Definition Phase, and missing these major ramp-up dates will further impact the accuracy of the team's staffing forecasts and potentially the status of preparatory work for breaker open.

a) How has OPG addressed the above concerns expressed by Modus/Burns McDonnell?

b) Please explain whether OPG was able to meet this plan staffing target or if OPG has put in place another viable option/plan.

c) Does OPG have experience in meeting staff increases of this magnitude in a short timeframe? Please explain and provide details.

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d) Please provide details of the proposed ramp-up and the make-up of the staff compliment.

e) Please explain why OPG has been chronically under-spent during the Definition Phase, and missing major ramp-up dates?

f) Please discuss the current impact on the accuracy of the team's staffing forecasts and potentially the status of preparatory work for breaker open.

g) Are all of the functional roles and responsibilities/accountabilities been assigned for this work? If not, why not?

h) How are these functional roles being integrated with other major work bundle contractors?

4.3-AMPCO-88

Ref: D2-2-8 Attachment 2 page 30

Preamble: Modus/Burns McDonnell states "The commitment from the NPET to further rationalize and organize the functions on the basis of a division of responsibility matrix ("DOR") has been held over to the Readiness to Execute phase. The DR Team committed to putting a DOR in place that defines each function's accountability and responsibility by early 1Q 2016, which in turn should result in optimizing the organization. This DOR is intended to also define roles and integration responsibilities between the DR Team, the contractors and the Station. Such an undertaking will certainly require some shake-out, which the team intends to do during the Readiness to Execute phase."

a) Please provide the current status of the commitment from the NPET to further rationalize and organize the functions on the basis of a division of responsibility matrix ("DOR")?

b) Please provide the latest version of the DOR.

4.3-AMPCO-89

Ref: D2-2-8 Attachment 2 page 30

Preamble: Modus/Burns McDonnell states "While the DR Team's goal for RQE was to identify the outer cost limit for the functions, BMcD/Modus is more concerned that the DR Team operate efficiently, have highly qualified and skilled resources, and actively manage the field work during the Execution Phase. One of the primary complaints from OPG's contractors is the company's track record of having too many

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decision-makers involved, particularly when problems arise. Thus, the risk to the Project's cost from a poorly defined functional team extend well beyond the cost of the team itself."

a) Please explain what BMcD/Modus is referring to in stating the company's track record of having too many decision-makers involved, particularly when problems arise.

b) Please explain how OPG has addressed the issue of having too many decision-makers involved.

c) As problems arise, please explain the difference in how they will be managed.

d) How has the DOR been integrated in the major work bundles to ensure an efficient process to resolve problems on a timely basis to ensure that work continues without jeopardizing schedules and costs?

4.3-AMPCO-90

Ref: Exhibit D2-2-8 Attachment 2 page 30

Preamble: Modus/Burns McDonnell states "In particular, the DR Team should sharpen its focus on commercial management of the contractors work in the field, which will entail a team effort between the commercial managers, project managers and field execution team. The DR Team intends to focus on these functions during the Readiness to Execute period, and their seamless integration will be essential to avoid claims and commercial disputes that can negatively impact work if allowed to fester.

The team has considerable work ahead to meet these goals, and we rate the current risk level in this area that the DR Team will not meet its plan as medium-high if the DR Team does not dedicate time and resources in this area in the short term."

a) Please describe OPG's plan for commercial management of the contractors work in the field?

4.3-AMPCO-91

Ref: D2-2-8 Attachment 2 Page 19

Preamble: In total, OPG is carrying $617M in contingency for RFR or RFR-related risks over and above the contingency that is built into the contract. With a remaining EPC contractor base cost for RFR of $2.33B (excluding contractor fees), this equates to 26%.

a) Please provide the contingency built into the RFR contract.

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4.3-AMPCO-92

Ref: D2-2-8 Attachment 4 Page 27

a) Please quantify the % of costs associated with the full time operation of Darlington that remains during the test period by year and show the calculation.

4.3-AMPCO-93

Ref: D2-2-9 Program Execution Page 3

a) Please explain the role of OPG's work control function group or project execution support group in terms of managing the contractor work force, tracking and recording working hours and all the allowable expenses incurred on the site and the proper approval for all costs by the contractor.

b) Has OPG put in place all the necessary processes to ensure a safe and controlled environment for the protection of non nuclear contractors who have never been exposed to the nuclear environment nor understand the nuclear safety protocols?

c) In the work processes between the contractors and OPG, is there a clear understanding/written procedures of who is to manage each of the activities/processes in the field work? If yes, please provide details.

d) Do OPG and the contractor have a written procedure on the resolution of problems that is understood by all parties, is robust enough to resolve the problems and actions can be documented and activities scheduled during the field work?

4.3-AMPCO-94

Ref: D2-2-9 Attachment 2 Page 4

a) How are contractors providing timely information on labour and expenses incurred to support the project planning and monitoring processes?

b) Have the problems experienced in this area by ES Fox on EPG3 been addressed? At whose cost?

4.3-AMPCO-95

Ref: D2-2-9 Attachment 2 Page 10

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a) Please explain why OPG is carrying contingency for schedule risk caused by AECON JV or any of the other major contractors.

4.3-AMPCO-96

Ref: D2-2-9 Page 6

Preamble: Given that OPG has expressed the principle that costs should be allocated where they are best controlled, please explain:

a) Why is OPG managing non-radiological waste instead of the contractor?

b) Please provide a table showing the amounts OPG has budgeted for each of radiological and non-radiological waste for each major contract.

4.3-AMPCO-97

Ref: D2-2-9 Page 6
Ref: D2-2-9, Attachment 2 Page 10

Preamble: "In total, OPG is carrying $616M in contingency for RFR or RFR-related risks over and above the contingency that is built into the contract."

a) Explain why OPG is carrying schedule risk for the contractor's performance?

4.3-AMPCO-98

Ref: D2-2-9 Attachment 2 Page 4 and 16

a) Given the performance of ES Fox on EPG3 referenced above, how can OPG ensure that contractors are capable of providing timely information flow to support project planning and execution? Please detail the extent to which OPG personnel are picking up the slack (and costs) for these shortfalls.

4.3-AMPCO-99

Ref: D2-2-11 Attachment 3 Page 64

a) Please provide any benchmarking material on construction or operations available from Bruce Power?

4.3-AMPCO-100

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Ref: D2-2-11 Attachment 3 Page 70 Footnote 86

a) Please provide the Memorandum of Understanding on Collaboration during Ontario's Refurbishment Period Between Bruce Power LP (Bruce Power) and Ontario Power Generation (OPG), November 12, 2015

4.3-AMPCO-101

Ref: D2-2-11 Attachment 1

a) Page 5: Concentric indicates it did not independently verify the appropriateness, sufficiency or correctness of the Program schedules, cost estimates, or scope. Please confirm the third party that undertook this verification.

b) Page 6: Please provide OPG's benchmarking analysis of its Program against other CANDU refurbishments such as those at the Wolsong nuclear plant in South Korea, the Bruce nuclear plant in Ontario, and the Pt. Lapreau nuclear plan t in New Brunswick.

4.3-AMPCO-102

Ref: D2-2-11 Attachment 3, Page 7

Preamble: Dr. Patricia D. Galloway provides testimony on the DRP.

a) Page 6: Please provide OPG's evidence reference for DRP being a FAOK.

b) Page 7: Please provide the matrix organization for the DRP.

c) Page 8: Please provide the available cost data from other refurbishment projects.

d) Page 9: Please provide documentation of the lessons learned from other refurbishment projects, other nuclear projects, and other megaprojects and megaprograms.

e) Page 10: Please describe the infrastructure for metrics and integrated reporting plans.

f) Page 41: Please provide OPG's Project Oversight Standard.

g) Page 42: Please provide the risks and mitigation plans for FOAK/FIAW risks.

h) Please provide Dr. Galloway's assessment of the key challenges in executing the DRP successfully.

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4.3-AMPCO-103

Ref: D2-2-11, Attachment 3, Page 27
Ref: D2-2-7, Page 6

Preamble: OPG and its experts claim that OPG's DRP project planning process is world class. In describing world-class project planning, Dr. Galloway describes "Management Reserve" as, "Unlike contingency, which covers identified, but not yet realized risks, management reserves are intended to address unforeseeable emergencies that cannot be effectively managed using contingency as they are such [sic] magnitude and rarity that they go beyond project-specific risks." OPG further states, "For a project of the size and duration of the DRP, there are a number of low probability high consequence events that could impact the Program and that are outside of the contingency determined for the Program." By its definition, Management Reserve covers items outside the scope of this hearing; however, it is within the scope of this hearing to determine if OPG has implemented its planning strategy appropriately, and to determine the magnitude of potential risks to the DRP. Therefore, given that OPG states that these risks exist, and given that world-class project planning includes Management Reserve, please:

a) Confirm that Management Reserve has not been included in the DRP estimates. If it has, please explain where and what risks it covers.

b) Confirm that OPG has calculated a Management Reserve estimate.

c) Report the magnitude of the Management Reserve calculated and list the risks it is intended to address.

d) If OPG has not prepared a Management Reserve estimate, explain why it has not in the context of its claims to have followed world-class procedures in project planning.

Issue 4.5
Are the proposed test period in-service additions for the Darlington Refurbishment Program appropriate?

4.5-AMPCO-104

Ref: D2-2-10 Page 2

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Preamble: The evidence states that to the extent there have been unit-specific engineering costs incurred during the Definition Phase that are not related to Unit 2, such costs are not included in the amounts coming into service in Unit 2 in 2020.

a) Please provide the engineering costs for each unit.

b) Are there any other costs in addition to engineering costs during the Definition Phase that are not related to Unit 2? If yes, please provide details.

4.5-AMPCO-105

Ref: D2-2-10 Page 9

Preamble: OPG indicates that it has reviewed the cost classification of DRP projects that resulted in reclassification of certain projects from DRP to the Nuclear Operations Portfolio and certain OM&A costs to Nuclear Operations.

a) Please discuss the criteria OPG used to classify projects within and outside of the DRP.

b) How has the reclassification analysis of DRP projects changed since EB-2013-0321?

c) By year, please provide a complete reconciliation of all of the DRP reclassified costs (capital and OM&A) including a description of the costs and where they have been reclassified to.

4.5-AMPCO-106

Ref: D2-2-10 Page 17

a) With respect to the Heavy Water Storage and Drum Handling Facility (Project number 31555), please provide the amount paid to the initial contractor and provide the start and end dates of the contract.

b) Please advise if OPG paid a penalty in the termination of the contract for default.

c) Please provide the amount of the contract to SNC/AECON to complete the project.

d) Please advise if OPG paid a premium to have SNC/AECON complete the project.

e) Please confirm when the contract to SNC/AECON was awarded.

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4.5-AMPCO-107

Ref: D2-2-10 Page 22

Preamble: OPG provides a variance analysis comparing actual versus in-service amounts for the years 2013 to 2015.

a) Please advise of the lessons learned in analyzing the variances and how the lessons have been applied to the DRP.

Issue 5.1
Is the proposed nuclear production forecast appropriate?

5.1-AMPCO-108

Ref: A1-4-1 Page 2

a) Please provide the total generation (TWH) from OPG's regulated facilities for the years 2010 to 2015 and forecast for 2016.

6. OPERATING COSTS
Issue 6.1
Is the test period Operations, Maintenance and Administration budget for the nuclear facilities (excluding that for the Darlington Refurbishment Program) appropriate?

6.1-AMPCO-109

Ref: F2-2-1 Table 1 Nuclear Base OM&A

a) Please provide the number of FTEs allocated to each of the Stations and Support functions shown on the basis of regular and non-regular staff for the years 2013 to 2021.

b) Please provide the labour and overtime separately for each of the Stations and Support functions on the basis of regular and non-regular staff for the years 2013 to 2021.

6.1-AMPCO-110

Ref: F2-2-2 Page 7

a) Under Projects and Modifications, please explain why internal staff supported the outage work rather than using previously planned external contractors.

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b) Please explain how contractor costs compare to internal costs for the same scope of work.

6.1-AMPCO-111

Ref: F2-3-1 Table 1 Nuclear Project OM&A

a) Please provide the number of FTEs allocated to each of the project categories shown for regular and non-regular staff for the years 2013 to 2021.

b) Please provide the labour and overtime costs separately for regular and non-regular staff for the years 2013 to 2021.

6.1-AMPCO-112

Ref: F2-4-1 Table 1 Nuclear Outage OM&A

a) Please provide the number of FTEs allocated to each of the Nuclear Stations and the Nuclear Support Division categories for regular and non-regular staff for the years 2013 to 2021.

b) Please provide the labour and overtime costs separately allocated to each of the Stations and Support functions shown for regular and non-regular staff for the years 2013 to 2021.

6.1-AMPCO-113

Ref: F2-4-1 Table 2 Nuclear Outage OM&A

a) Please recast the Table to provide the labour and overtime costs separately for regular and non-regular staff for the years 2013 to 2021.

6.1-AMPCO-114

Ref: F2-6-1

a) Please provide the forecast and actual purchases by vendor for the years 2013 to 2015.

b) Please provide the OM&A Purchased Services Nuclear Operations forecast for 2016 to 2021.

6.1-AMPCO-115

Ref: F3-3-2

c) Please provide the forecast and actual purchases by vendor for the years 2013 to 2015.

d) Please provide the OM& Purchased Services Support Services forecast for 2016 to 2021.

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Issue 6.3
Is the forecast of nuclear fuel costs appropriate?

6.3-AMPCO-116

Ref: F2-5-1

a) Please provide a table that shows the costs of processing uranium into fuel bundles for the years 2010 to 2015, 2016 budget and plan 2017 to 2021.

6.3-AMPCO-117

Ref: F2-5-2 Page 1

a) Please explain the increase in the Total Fuel Bundle cost per MWh from 2015 to 2016.

6.3-AMPCO-118

Ref: F2-5-1 Table 1

a) Please provide a table that sets out Board Approved versus Actuals for the years 2013 to 2015.

b) Please explain the variance for the years 2014 and 2015.

Issue 6.4
Is the test period Operations, Maintenance and Administration budget for the Darlington Refurbishment Program appropriate?

6.4-AMPCO-119

Ref: F2-7-1 Page 1

Preamble: For 2015, the OM&A cost variance is $16.7 million.

a) Please provide a breakdown of this amount due to: cost classification changes for the Operations trainee program from DRP to Nuclear Operations; transfer of facilities and infrastructure demolition projects and removal activities to Nuclear Operations portfolio; and unutilized contingency for potential Definition Phase costs that are not eligible for capitalization.

6.4-AMPCO-120

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Ref: F2-7-1 Page 1
Ref: F2-7-1 Table 1

Preamble: OPG indicates that OPG has budgeted DRP OM&A expenditures of $126.9 million: $41.5 million in 2017, $13.8 million in 2018, $3.5 million in 2019, $48.4 million in 2020 and $19.7 million in 2021.

a) Please provide further details on the nature of OPG's OM&A costs related to Retube and Feeder Replacements and Other Refurbishment Projects, by year.

b) Please provide the number of regular and non-regular FTEs for the years 2013 to 2021.

c) Please provide the labour costs for the years 2013 to 2021 for regular and non-regular FTEs.

d) Please provide the overtime by year for the years 2013 to 2016 for regular and non-regular staff.

e) Please provide the removal costs by year.

f) Please provide the L&ILW costs by year.

g) Please explain if the removal costs are related to work undertaken by a contractor. If yes, please explain why these costs are not part of the Contractor's contract.

Corporate Costs
Issue 6.6
Are the test period human resource related costs for the nuclear facilities (including wages, salaries, payments under contractual work arrangements, benefits, incentive payments, overtime, FTEs and pension costs, etc.) appropriate?

6.6-AMPCO-121

Ref: A1-5-1 Page 1

a) For each of the Executive positions (level 2) in the Corporate Organizational Chart, please map the number of total nuclear FTEs under each position.

6.6-AMPCO-122

Ref: F4-3-1

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a) Please provide a chart that plots both year end staffing levels and corresponding year end labour costs for the years 2013 to 2021.

b) Please provide the wage increase assumptions in the application for each remaining year in the test period when the current PWU and SEP collective agreements have expired.

c) Please discuss if OPG negotiated any cost and productivity offsets to the wage increases in the PWU or SEP collective agreements.

d) Please discuss if either the current PWU or SEP collective agreements include the use of thresholds to establish amounts or types of work that can be contracted.

e) Please discuss any provisions in the PWU or SEP collective agreements regarding contracting out.

f) Please discuss if a No Layoff Clause is included in the PWU or SEP collective agreements.

g) Please discuss how the DRP or Pickering Extended Operations impact any aspects of the collective agreements.

6.6-AMPCO-123

Ref: F4-3-1 Page 3

a) For the years 2017 to 2021, please provide the percentage of nuclear revenue requirement that is attributable to compensation costs including overtime.

6.6-AMPCO-124

Ref: F4-3-1 Page 3

Preamble: The evidence indicates at the end of 2015, OPG had 9,247 regular employees. Of this approximately 7,294 employees worked directly in or supported nuclear facilities.

a) Please provide the total number of OPG employees including regular and non-regular employees at the end of 2015.

6.6-AMPCO-125

Ref: F4-3-1 Page 4

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a) Please provide Figure 2 based on staff supporting regulated facilities including both regular and non-regular staff.

b) Are the types of positions shown in Figure 2 similar for the years 2016 to 2021 or would OPG make any adjustments to the types of positions over the test period.

c) Based on the response to part (b), please provide a table that shows the number of FTEs by "type of position" for the years 2016 to 2021 split between regular and non-regular staff.

6.6-AMPCO-126

Ref: F4-3-1 Page 5

a) Please provide a Table that shows the number of nuclear employees eligible for retirement for the years 2013 to 2021 and the number of actual retirements for the years 2013 to 2016.

6.6-AMPCO-127

Ref: EB-2013-0321 Exhibit A4 Tab 1 Schedule 1 Page 6

Preamble: The Chart on Page 6 shows the hiring and staff levels for OPG as a whole including Darlington Refurbishment and New Build.

a) Please reproduce the Table for the years 2007 to 2016 (YTD) for nuclear only.

b) Please provide the new hires for New Build for the years 2013 to 2021.

6.6-AMPCO-128

Ref: F4-3-1 Page 5

a) Please provide details on OPG's internal staff redeployment strategy for the years 2017 to 2021.

6.6-AMPCO-129

Ref: F4-3-1 Page 5

Preamble: OPG indicates that by managing staff reductions through retirements and putting in place vacancy controls, OPG was able to reduce its regular headcount by nearly 2,700 positions between 2011 and 2015…"

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a) Please explain OPG's vacancy controls.

b) Please confirm the date the vacancy controls became effective.

c) Please provide the number of nuclear vacancies in June and December for the years 2013 to 2015 and June and Year to Date for 2016.

d) Please provide the forecast number of nuclear vacancies for the years 2017 to 2021 built into the application.

6.6-AMPCO-130

Ref: F4-3-1 Page 6

a) Of the increase in over 600 FTEs in 2016, please provide a breakdown of the major areas in the company these FTEs have been allocated.

6.6-AMPCO-131

Ref: F4-3-1 Page 7

Preamble: Figure 4 shows temporary FTEs.

a) Please define temporary.

b) Please explain how temporary FTES compare to non-regular FTEs?

6.6-AMPCO-132

Ref: F4-3-1 Page 7

Preamble: The evidence indicates a new category of employees called "Term Employees" exists.

a) Please provide the forecast number of Term Employees for the years 2016 to 2021 split between Darlington and Pickering.

b) Please provide the budget for the years 2016 to 2021 for Term Employees.

c) Are Term Employee numbers included in the Non-Regular staffing numbers and costs?

d) What specific benefits are Term Employees entitled to?

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6.6-AMPCO-133

Ref: F4-3-1 Page 11

Preamble: The evidence indicates that salary compression exists across OPG with approximately 250 managers currently earning less than the staff they supervise, making it difficult to attract qualified represented staff into Management positions.

a) Please provide the reasons why staff are making more than their supervisors?

b) Please provide the total number of OPG staff in the years 2013 to 2016 earning more than $50,000 a year in overtime.

6.6-AMPCO-134

Ref: F4-3-1 Page 12

a) Please provide the savings amount and how it was determined based on the number of management headcount reductions in the categories of executive, senior management, and management.

6.6-AMPCO-135

Ref: F4-3-1 Page 13

a) Please provide the range of premiums paid for overtime.

b) Please explain the reasons for the higher overtime amounts in 2013 and 2015.

c) Please provide the budgeted overtime for the years 2013 to 2016 in terms of $ and hours.

d) Please explain any variances greater than 10%, comparing overtime budget to actuals for the years 2013 to 2016.

e) Please provide the forecast of overtime hours for the years 2017 to 2021.

f) Please provide the percentage of overtime paid at double time for the years 2013 to 2015 and the assumptions for 2016 to 2021.

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g) Please provide the percentage of overtime paid at more than double time for the years 2013 to 2015 and the assumptions for 2016 to 2021.

h) Please provide the budget and actual overtime amounts for the DRP to date.

i) Please provide the forecast overtime budget for the DRP for the years 2017 to 2021.

j) For the PWU skilled trades, please discuss the types of work shifts, the hours in a work week and the number of hours worked before an employee is eligible for overtime. Please discuss when and how different overtime rates are applied.

k) For the PWU clerical, semi-skilled trades and general trades, please discuss the type of work shifts, the hours in a work week and number of hours worked before an employee is eligible for overtime. Please discuss when and how different overtime rates are applied.

l) Please provide contractor overtime amounts (budgeted and actual) for the years 2010 to 2016 and forecast for 2017 to 2021.

m) Please provide any recent changes to OPG's work shifts, overtime policies and management of overtime in order to minimize overtime of its employees and contractors.

6.6-AMPCO-136

Ref: F4-3-1 Page 14

a) Please identify any significant changes OPG has made to its employee non-pension benefits plan since EB-2013-0321.

6.6-AMPCO-137

Ref: F4-3-1 Page 20

a) Please confirm how Society represented employees in the General Industry segment compare to market.

6.6-AMPCO-138

Ref: F4-3-1 Page 22

a) Please explain why OPG and Bruce Power no longer share a common salary structure for PWU represented positions.

6.6-AMPCO-139

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Ref: F4-3-1 Attachment 1

a) Please provide Attachment 1 on the basis of Executive, Senior Management, Management, Non-Union, Union and show the allocation between Regular and Non-Regular staff.

6.6-AMPCO-140

Ref: F2-1-1 Table 3

a) Please provide Table 3 on the basis of Executive, Senior Management, Management, Union, Non-Union and show the allocation between Regular and Non-Regular staff including a complete breakdown of the categories of non-regular staff.

b) Please provide an electronic version of Table 3.

6.6-AMPCO-141

Ref: F2-1-1 Table 3

a) Please complete the following table:

Group	**2013 Actual $**	**2014 Actual $**	**2015 Actual $**	**2016 Budget $**	**2017 Plan $**	**2018 Plan $**	**2019 Plan $**	**2020 Plan $**	**2021 Plan $**
Nuclear Operations									
Regular Staff									
Non-Regular Staff									
Sub-Total									
Darlington Refurbishment									
Regular Staff									
Non-Regular Staff									
Sub-Total									
TOTAL									

6.6-AMPCO-142

Ref: F4-3-1 Attachment 2

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a) Page 3: 78% of OPG incumbents are in roles covered by this benchmark review. How does this % compare to previous OPG benchmarking studies?
b) Page 3: Please provide the number of total OPG incumbents and total # OPG incumbents benchmarked to the job family. Slide 9

c) Page 8: Please explain why benefits (current benefits & pension & OPEB) and overtime costs are not shown as compensation elements?

d) Page 9: Please map each job family to the Utility Segment, Nuclear Authorized Segment and General Industry.

e) Page 3, 9: Please map the number of PWU, SEP and Management incumbents to each job family on Page 9.

f) Page 11: Please confirm current benefits & pension & OPEB and overtime costs were not included in the compensation analysis.

g) Page 27: OPG's pension and benefits % of salary is above the 50th percentile of the market for the PWU, Society and Management Groups. Please provide the revenue requirement impact if the pension and benefits % of salary was at Market P50 for PWU, Society and Management.

6.6-AMPCO-143

Ref: 2015 Annual Report of the Office of the Auditor General of Ontario

a) Chapter 4, Page 630: Please provide the outcome of any relocation policy changes incorporated in the SEP collective agreement.

b) Chapter 4, Page 631: Please provide an update on OPG's enhanced contractor payment controls to avoid the risk of overpayment.

c) Chapter 4, Page 631: Please explain how shift schedules are structured to minimize overtime.

d) Chapter 4, Page 631: Please confirm that employees who are regular daytime employees are no longer getting overtime as a result of being placed on schedules different from their normal working hours.

e) Chapter 4, Page 631: Please discuss if OPG has imposed overtime limits on any additional staff in 2015 and 2016 and provide the corresponding overtime reductions.

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f) Chapter 4, Page 631: Are the imposed overtime limits for I&M technicians still in place?

g) Chapter 4, Page 632: Please provide the outcome of any changes to sick leave provisions incorporated into the SEP collective agreement.

h) Chapter 7, Page 725): The Standing Committee on Public Accounts made eight additional recommendations to the Auditor General's 2013 OPG Human Resources Audit. Please provide the status of all outstanding recommendation.

6.6-AMPCO-144

Ref: 2013 Annual Report of the Office of the Auditor General of Ontario

a) Chapter 3, Page 176, Figure 11: Sick Leave Plans at OPG are compared to the Ontario Public Service. Please provide any updates to OPG's data.

b) Please discuss if OPG internally compares its Benefit Plans to the Ontario Public Service Plan.

6.6-AMPCO-145

a) Please provide a summary OPG's key Human Resource metrics and discuss performance trends over the past five years and forecast for the test period.

8. NUCLEAR WASTE MANAGEMENT AND DECOMMISSIONING LIABILITIES
Issue 8.1
Is the revenue requirement methodology for recovering nuclear liabilities in relation to nuclear waste management and decommissioning costs appropriate? If not, what alternative methodology should be considered?

8.1-AMPCO-146

Ref: C2-1-1 Page 5, Footnote 1

Preamble: The evidence states "The ONFA between OPG and the Province of Ontario sets out OPG's obligations for funding the long-term programs of the nuclear liabilities, through contributions to two segregated funds, the Decommissioning Segregated Fund ("Decommissioning Fund") and the Used Fuel Segregated Fund ("Used Fuel Fund") (collectively, "segregated funds"). In accordance with the ONFA, the Decommissioning Segregated Fund is established to pay for costs associated with the Decommissioning program, the L&ILW Disposal program, certain costs of the Used Fuel Storage program incurred after the stations are shut down, and the costs of the L&ILW storage program incurred after

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the stations are shut down. The Used Fuel Segregated Fund funds the costs of the Used Fuel Disposal program and certain costs of the Used Fuel Storage program after the stations are shut down."

a) Please provide any documentation defining how OPG's funding contributions are to be determined. Do the calculations vary depending on the funding position of the segregated funds? If so, define the specific calculations required under each scenario and provide any documents (including without limitation regulations, statutes, MOUs) that proscribe these calculations. Please highlight the specific references that proscribe these calculations.

b) Provide the calculations at the station level used to determine the funding levels for each year 2016-2021.

8.1-AMPCO-147

Ref: C2-1-1

Preamble: The evidence discusses amounts recorded in OPG's financial statements as due to or due from the Province in accordance with generally accepted accounting principles.

a) Please provide the amounts recorded in OPG's financial statements as due to or due from the Province for the years 2013 to 2015 and forecast for 2016 to 2021.

b) Please confirm the first year that OPG recorded an amount due to province in its financial statements.

c) Please provide the regulations, rules, guidelines or any other relevant documents with specific references that govern when and how amounts due to or due from the Province are managed.

8.1-AMPCO-148

Ref: C2-1-1 Page 6

a) Please indicate when the used fuel bundles exceeded the 2.23 million used fuel bundle threshold.

b) Please provide the current number of used fuel bundles.

8.1-AMPCO-149

Ref: C2-1-1 Page 7

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Preamble: The evidence states "As at December 31, 2015, the Decommissioning Fund was overfunded at less than 120 per cent.

a) Please provide the current funding position of the fund.

Issue 8.2
Is the revenue requirement impact of the nuclear liabilities appropriately determined?

8.2-AMPCO-150

Ref: C2-1-1 Table 1

Preamble: The total revenue requirement impact of OPG's nuclear liabilities (Prescribed Facilities and Bruce) are $454.3 million in 2017, $450.1 million in 2018, $439.1 million in 2019, $506 in 2020 and $444 million in 2021.

a) Please provide any relevant documents (including without limitation regulations, statutes, MOUs) and highlight the specific references that proscribe the circumstances under which OPG must pay the province any amounts from the segregated funds.

b) Please provide any relevant documents (including without limitation regulations, statutes, MOUs) and highlight the specific references that proscribe the calculation of the amounts OPG must pay the province from the segregated funds under the circumstances defined in a).

c) Provide a table showing the amounts to be paid to the province from the segregated funds each year 2016-2021 and show the supporting calculations.

d) Please provide the revenue requirement impact if the amounts calculated as due to the province are retained by OPG.

9. DEFERRAL AND VARIANCE ACCOUNTS
Issue 9.1
Is the nature or type of costs recorded in the deferral and variance accounts appropriate?

9.1-AMPCO-151

a) Please provide a list of the accounts that currently do not attract interest.

10.REPORTING AND RECORD KEEPING REQUIREMENTS
Issue 10.3

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Is the monitoring and reporting of performance proposed by OPG for the nuclear facilities appropriate?

10.3-AMPCO-152

Ref: A1-3-2 Page 37

a) Please provide the targets OPG has set for its Human Performance, Outage Performance, Equipment Reliability and Parts Improvement initiatives.

10.3-AMPCO-153

Ref: A1-3-2 Page 42, Chart 12

a) Please provide the annual targets for the years 2016 to 2021 for each nuclear performance measure.

Issue 10.4
Is the proposed reporting for the Darlington Refurbishment Program appropriate?

10.4-AMPCO-154

Ref: D2-2-9 Page 9

a) Does OPG plan on reporting on reporting specifically on the status of the interest and contingency costs as part of the cost reporting?

10.4-AMPCO-155

Ref: 2-2-9, page 5, Section 4.0
D2-2-9, Attachment 2 Page 17

Preamble: Given that OPG has already had to reallocate $290mm in costs from DRP to OM&A, please explain how OPG will ensure that:

a) OM&A costs are properly allocated between DRP and normal operations.

b) OM&A costs are properly recorded in real time; and

c) These allocations and reports will be auditable.

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Issue 11.3
Is OPG's approach to incentive rate-setting for establishing the nuclear payment amounts appropriate?

11.3-AMPCO-156

Ref: A1-3-2 Page 33 Chart 10

a) Please recast Table 10 based on a production-weighted average stretch factor that sets the Darlington Stretch factor at 0.15%.

Issue 11.5
Is OPG's proposed mid-term review appropriate?

11.5-AMPCO-157

Ref: A1-3-1 Page 8

Preamble: OPG indicates that given the long term of this application and the uncertainty associated with nuclear production, OPG believes that it will be necessary to review OPG's production forecast and consequential fuel costs at the mid-point of the five-year period covered by this application. OPG also proposes to clear December 31, 2018 balances in deferral and variances accounts in conjunction with the mid-term production review.

a) Please identify other costs in the application that have a significant risk of deviations from forecast increasing in the second half of the application.

11.METHODOLOGIES FOR SETTING PAYMENT AMOUNTS

Issue 11.6
Is OPG's proposal for smoothing nuclear payment amounts consistent with O. Reg. 53/05 and appropriate?

11.6-AMPCO-158

Ref: A1-3-3 Page 8 Chart 3
Ref: Nuclear Rate Smoothing Presentation September 23, 2016, Slides 5 and 9
Ref: A1-3-3 Page 10 Chart 4

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Preamble: OPG proposes that annual nuclear base payment amounts reflect a constant 11 per cent per year increase during the 2017 to 2021 test period resulting in deferred revenue requirement.

At Reference 1, OPG provides a summary of outcomes related to smoothing alternatives.

At Reference 2, Slide 9 of the presentation shows a Nuclear Payment Amount Rate Smoothing at 11% compared to a Customer Rate Impact Smoothing of 0.7% bill impact.

a) Please confirm the smoothing alternatives at Reference 1 reflect five nuclear payment amount rate smoothing proposals based on a range of 8%-12% annual increases and a customer bill impact smoothing proposal is not included.

b) Please reproduce slide 5 of the presentation to include the customer impact smoothed rate line for an annual increase of 0.7%.

c) Please reproduce slide 6 of the presentation to reflect the mechanics of a rate smoothing proposal based on the customer impact smoothed rate of 0.7% annually.

d) Please reproduce Chart 4 at A1-3-3 Page 10 to show the deferred revenue requirement under the customer impact smoothing at 0.7% and 1.5% annually.

e) Please confirm the customer smoothing proposal does not increase the risk of a credit rating downgrade.