UNDERTAKING J21.1

Undertaking

To update Table 1 from J14.1 to the forecast OPG requests the OEB to rely on in setting rates and the associated rate base continuities.

Response

OPG does not propose to update its capital in-service forecast for the IR Term from the pre-filed evidence to reflect the impact of actual 2016 capital in-service amounts. Rather, OPG is requesting that the OEB approve nuclear rate base values for 2017-2021 as set out in Ex. A1-2-2, p. 1 (updated on March 8, 2017) and Ex. N2-1-1, p. 5 and detailed at Ex. N2-1-1, Table 1, line 4. These values represent OPG's forecasts in the pre-filed evidence based on OPG's 2016-2018 Business Plan, as updated for two material changes: 1) the removal of the 2017-2021 forecast Heavy Water Storage and Drum Handling Facility ("D2O Project") in service additions (Ex. N2-1-1); and (2) the inclusion of the projected year-end 2016 asset retirement cost adjustment arising from the 2017 ONFA Reference Plan update (Ex N1-1-1). Attachment 1 provides a set of supporting tables, including gross plant and accumulated depreciation and amortization expense continuities, for the proposed net plant rate base inclusive of the above updates. These tables correspond to pre-filed Ex. B3-1-1 Table 1, Ex. B3-3-1 Tables 1 and 2, and Ex. B3-4-1 Tables 1 and 2. No update is required to the pre-filed Nuclear Operations capital in-service table (Ex. D2-1-3 Table 4).

This undertaking follows an exchange with the OPG witnesses at Tr. Vol. 21, p. 3, line 14 to p. 8, line 5 regarding the impact of the actual 2016 capital in-service amount on the proposed nuclear rate base for the IR Term. As discussed during that exchange and further in Ex. J20.11, potential updating for actual 2016 in-service amounts would also require consideration of changes in the forecast in-service amounts over the full six-year period (2016-2021), including those due to project in-service dates moving across years.

To confirm the reasonableness of maintaining the proposed rate base values without an update in light of the 2016 actual in-service additions, in Attachment 2, OPG provides a current best-efforts view of 2017-2021 Nuclear Operations and Support Services capital in-service amounts (Att. 2, Tables 1 and 2) and corresponding net plant rate base values (Att. 2, Table 3), including the effect of 2016 actuals.[1,2] Attachment 2, Table 2

[1] As ratepayers are held whole with respect to variances in in-service timing and amount for the Darlington Refurbishment Program ("DRP") through the Capacity Refurbishment Variance Account, Attachment 2 continues to reflect DRP in-service amounts per the pre-filed evidence, adjusted for the removal of the 2017-2021 forecast in-service additions for the D2O Project.

corresponds to Ex. J14.1, Table 1. This view is based on the 2017-2019 Business Plan, adjusted to account for 2016 actuals and subsequent changes in timing of in-service amounts over the 2016-2021 period. The total Nuclear Operations and Support Services in-service amounts in this view are $2,009M over the 2016-2021 period (Att. 2, Table 1), substantially unchanged from the total of $2,008M reflected in the requested rate base (Ex. B1-1-1, Chart 1). On average, the resulting rate base values over the IR Term would be approximately $30M lower than requested, reflecting shifts in in-service timing. On the other hand, annual depreciation expense (excluding asset retirement costs) would be approximately $8M higher than requested, on average, reflecting changes in the anticipated project mix across the nuclear facilities. Attachment 2, Tables 4-7 provide supporting gross plant and accumulated depreciation and amortization continuities for this view.

In OPG's opinion, the current view of capital in-service amounts demonstrates that the requested nuclear rate base remains reasonable.

[2] This view also reflects the actual year-end 2016 asset retirement cost adjustment resulting from the 2017 ONFA Reference Plan update, and associated 2017-2021 annual depreciation expense impacts. The revenue requirement impacts of this adjustment are captured in Ex. J21.2.

UNDERTAKING J21.3

Undertaking

To explain $3.1B differential between the ARO liability and the ONFA segregated funds balance at the end of 2016, and if any significant amount of it is the discount rate, to provide the calculation.

Response

Chart 1 below reconciles the noted 2016 year-end $3.1B difference between OPG's nuclear asset retirement obligation ("ARO") balance of $19.1B determined in accordance with US GAAP and the Ontario Nuclear Funds Agreement ("ONFA") Decommissioning Segregated Fund and Used Fuel Segregated Fund (collectively "segregated funds") fully funded balance of $16.0B, as reflected in the company's 2016 audited consolidated financial statements.

As shown below, the difference in the discount rate used to calculate the nuclear ARO and the ONFA funding requirement accounts for approximately $2.2B of the $3.1B differential. The other two notable differences, discussed below, are nuclear liability expenditures that are not funded under the ONFA but included in the ARO, and the inclusion of future waste costs in the ONFA funding that are not recorded in the ARO until such wastes are produced. The calculation of the discount rate difference is provided in Attachment 1.

Chart 1
Reconciliation of 2016 Year-End ARO and ONFA Segregated Funds Balances

Line	Description	Billion $
1	2016 year-end ARO balance	19.1
2	Liability for internally funded expenditures (i.e. not ONFA eligible)	(2.2)
3	ONFA funded portion of ARO balance	16.9
4	Discount rate difference	(2.2)
5	ONFA funding for future wastes not yet generated, which are not included in current ARO balance in accordance with US GAAP	1.0
6	Other	0.3
7	2016 year-end ONFA segregated funds balance	16.0

Internally Funded Expenditures

As noted at Ex. C2-1-2, p. 9, lines 7-10 and discussed by Mr. Mauti at Tr. Vol. 21, p. 75, line 7 to p. 79, line 2, the costs for used fuel management and L&ILW storage costs incurred during the stations' operating lives are not funded under the ONFA and cannot be drawn from the segregated funds. As these costs, referred to as internally funded, are part of OPG's legal obligation for nuclear waste, they are included in the ARO and are funded from OPG's operating cash flow. Therefore, these costs, which account for approximately $2.2B of the $19.1B of the 2016 year-end ARO balance, are not included in the ONFA segregated funds balance.

Discount Rate

OPG is required to use different discount rates to determine the ARO in accordance with US GAAP and the funding requirement in accordance with the ONFA. As discussed below, the ONFA discount rate is currently 5.15% while the ARO weighted average discount rate is approximately 4.95%.[1] Once internally funded costs are excluded, the discount rate difference accounts for approximately $2.2B of the difference between the ARO balance and the ONFA segregated fund balance at the end of 2016, as calculated in Attachment 1. OPG has no discretion with respect to the use of these discount rates.

The initial value and each subsequent revision to the ARO are known as tranches. As noted at Ex. C2-1-1, p. 4, lines 21-26 and Ex. C2-1-2, p. 7, lines 26-28, in accordance with US GAAP, each tranche is calculated using a discount rate determined at the time of the revision and is not revalued for subsequent changes in the discount rate. As discussed in Ex. L-8.2-1 Staff-207, each upward revision in the amount of undiscounted estimated cash flows underlying the ARO is required to be calculated using a credit-adjusted risk-free rate determined as of the date the revision. As discussed in Ex. N1-1-1, p. 16, lines 11-18, downward revisions in the amount of undiscounted estimated cash flows are required to be calculated using the weighted average discount rate of the existing tranches. Following the year-end 2016 adjustment, OPG's nuclear ARO consists of seven tranches, each with its own discount rate, as shown in Attachment 1. The estimated weighted average discount rate of the seven tranches is approximately 4.95%.

The discount rate used to determine the ONFA funding requirement is determined in accordance with the ONFA, at the time of each approved ONFA reference plan. As explained by Mr. Mauti at Tr. Vol. 21, p. 77, line 3 to p. 77, line 12 and Tr. Vol. 21, p. 149, line 22 to p. 150, line 1, the ONFA discount rate is calculated as 3.25% real rate of return prescribed by the ONFA plus the long-term change in the Ontario consumer price index. The resulting rate stands at 5.15% per the current approved ONFA reference plan and establishes the long-term target rate of return on the ONFA segregated funds.

Future Waste Volume

The ARO balance represents the present value of the obligation for nuclear facilities decommissioning and interim storage and long-term management of nuclear wastes generated to date (in this case, to the end of 2016). As noted at Ex. C2-1-1, p. 4, lines

[1] The difference between the ARO discount rate and the ONFA discount rate were explored in previous OPG proceedings (for example, see EB-2012-0002 Ex. L-1-7 SEC-12).

6-12 and Ex. C2-1-2, p. 7, lines 8-12, these are referred to as committed costs and comprise the ARO liability in accordance with US GAAP.[2] Committed costs exclude incremental variable costs associated with future wastes not yet generated. The ONFA funding requirement accounts for the same obligation as the ARO, plus the estimated cost of the long-term management of future nuclear wastes forecast over the remaining life of OPG-owned nuclear generating stations, in line with assumptions in the approved ONFA reference plan. The inclusion of future waste volume accounts for approximately $1B of the 2016 year-end ONFA segregated fund balance.

[2] As discussed in Ex. C2-1-1, sections 3.2.2 and 3.2.3 and Ex. C2-1-2, p. 8, lines 3-7, additional wastes generated over time give rise to incremental committed costs, which are recorded as increases to the ARO at that time. These costs are referred to variable used fuel and low and intermediate level waste management expenses, the forecasts for which are included in the 2017-2021 proposed revenue requirement as period costs, as they were in previous OPG payment amount proceedings.

CALCULATION OF DISCOUNT RATE DIFFERENCE BETWEEN ARO LIABILITY AND ONFA SEGREGATED FUNDS

ARO Tranche #	Initial ARO and Subsequent ARO Adjustments	ARO Undiscounted Cost Flows (Excluding Internally Funded Expenditures) ($M)	GAAP ARO Discount Rate	GAAP ARO Present Value ($M)	ONFA Discount Rate	Hypothetical ARO Present Value @ ONFA Discount Rate ($M)	Discount Rate Impact ($M)
		(A)	(B)	(C)	(D)	(E)	(F) = (C) less (E)
1	Initial Recognition	56,858	5.75%	12,937	5.15%	14,491	(1,554)
2	Year-End 2006 – 2007 ONFA Reference Plan	120,750	4.60%	1,795	5.15%	1,063	732
3	Beginning of 2010 – Darlington Refurbishment Decision	29,972	4.80%	392	5.15%	241	151
4	Year-End 2011 – 2012 ONFA Reference Plan (Step 1)	(624)	3.43%	(90)	5.15%	200	(290)
5	Year-End 2012 – 2012 ONFA Reference Plan (Step 2) *(incl. Pickering extension)*	17,236	3.50%	852	5.15%	72	780
6	Year-End 2015 – 2015 Bruce Refurbursement Announcement	93,096	3.21%	2,660	5.15%	216	2,444
7	Year-End 2016 – 2017 ONFA Reference Plan	(21,943)	4.95%	(1,629)	5.15%	(1,562)	(67)
	Total			**16,918**		**14,721**	**2,197**

NOTES

a) The undiscounted cost flows in Column A exclude all internally funded expenditures as these programs are not part of the ONFA funding requirement. Cost flows associated with variable expenses accrued as additional wastes are generated are recorded in the latest ARO tranche in place at the time the variables expenses are incurred. Undiscounted cost flows in Column A represent projected expenditures over approximately the next 170 years.

b) Each tranche represents a revision in the amount of undiscounted estimated cost flows underlying the ARO, in accordance with generally accepted accounting principles (GAAP).

c) As required by GAAP, upward revisions in the amount of undiscounted estimated cost flows (including for internally funded programs) are discounted using the credited-adjusted risk-free rate determined as of the date the revision is recognized, while downward revisions are discounted by the weighed average discount rate of the existing tranche. Although the ONFA-funded year-end 2011 ARO adjustment cost flows decreased, the overall undiscounted cost flows, including internally funded programs, increased. As such, a then-current credited-adjusted risk-free rate was used to discount the incremental cost flows. For the year-end 2016 ARO adjustment, the overall undiscounted cost flows, including internally funded programs, decreased. As such, the weighted average rate of the existing tranches was used to discount the cash flow decrement (as noted in Ex. N1-1-1, p. 16, lines 11-18).

d) To derive Column E, Column A cost flows are discounted by the ONFA discount rate in Column D.