Oct 1, 2012

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Ontario Energy Board
2300 Yonge St., 27th Floor
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Attn: Ms Kirsten Walli
Board Secretary

By electronic filing and e-mail

Dear Ms Walli:

Re: EB-2012-0340 OPG IRM Consult – SEP Submissions

Attached are the Society of Energy Professional's comments on this matter.

Sincerely,

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Before the Ontario Energy Board

In the matter of a Consultation regarding
Incentive Rate Making Options for
Ontario Power Generation's Prescribed Generation Assets

Comments on behalf of The Society of Energy Professionals

The Society of Energy Professionals has represented professional engineers, scientists, supervisors and other professionals at OPG and other Ontario Hydro successor companies since the energy sector was restructured in 1999. Prior to 1999, the Society represented professional employees and supervisors at Ontario Hydro.

The Society and OPG have been party to a number of collective agreements since 1999. The current collective agreement between the Society and OPG expires December 31, 2012. The Society currently represents more than 3000 professional employees and supervisors who are employed at OPG.

The present submission is structured in four parts: the first consisting of a recap of the background and history relevant to the issue in question; the second a general discussion of relevant considerations and limitations of regimes designed to improve efficiency in the Ontario context; the third consisting of some comments with respect to select recommendations made in the Power Advisory Report; and, the fourth consisting of some specific recommendations from the Society as to how the Board should proceed going forward.

Relevant History and Background

Between April 1, 2002 and April 1, 2005 OPG's generation assets bid into the market, subject to the Market Power Mitigation Agreement (MPMA). Under the MPMA, OPG was required to rebate the difference between the spot price and 3.8 cents/kWh to ratepayers. On April 1, 2005, Ontario Regulation 53/05 terminated the MMPA and established the "prescribed generation facilities" and set initial prices of $49.50/MWh OPG's nuclear generation facilities. O.R. 53/05 also set a price of $33.00/MWh for prescribed hydroelectric generation up to 1,900 MWh. OPG was to receive market price for all prescribed hydro generation in excess of 1,900 MWh.

The pricing regime established in O.R. 53/05 was intended as a transitional measure until the Board could establish a more appropriate and durable methodology for determining payment amounts. O.R. 53/05 empowered the Board with discretion with respect to "the form, methodology, assumptions and calculations used in making an order that determines payment amounts."

In August of 2005 a memorandum of agreement was struck between the Government of Ontario and OPG which set out eight mandates for OPG:

1. OPG's core mandate is electricity generation. It will operate its existing nuclear, hydroelectric, and fossil generating assets as efficiently and cost effectively as possible, within the legislative and regulatory framework of the Province of Ontario and the Government of Canada, in particular, the Canadian Nuclear Safety Commission. OPG will operate these assets in a manner that mitigates the Province's financial and operational risk.
2. OPG's key nuclear objective will be the reduction of the risk exposure to the Province arising from its investment in nuclear generating stations in general and, in particular, the refurbishment of older units. OPG will continue to operate with a high degree of vigilance with respect to nuclear safety.
3. OPG will seek continuous improvement in its nuclear generation business and internal services. OPG will benchmark its performance in these areas against CANDU nuclear plants worldwide as well as against the top quartile of private and publicly- owned nuclear electricity generators in North America. OPG's top operational priority will be to improve the operation of its existing nuclear fleet.
4. With respect to investment in new generation capacity, OPG's priority will be hydro- electric generation capacity. OPG will seek to expand, develop and/or improve its hydro- electric generation capacity. This will include expansion and redevelopment on its existing sites as well as the pursuit of new projects where feasible. These investments will be taken by OPG through partnerships or on its own, as appropriate.
5. OPG will not pursue investment in non-hydro-electric renewable generation projects unless specifically directed to do so by the Shareholder.
6. OPG will continue to operate its fossil fleet, including coal plants, according to normal commercial principles taking into account the Government's coal replacement policy and recognizing the role that fossil plants play in the Ontario electricity market, until government regulation and/or unanimous shareholder declarations require the closure of coal stations.
7. OPG will operate in Ontario in accordance with the highest corporate standards, including but not limited to the areas of corporate governance, social responsibility and corporate citizenship.
8. OPG will operate in Ontario in accordance with the highest corporate standards for environmental stewardship taking into account the Government's coal replacement policy.

As noted by Power Advisory, O.R. 53/05, in conjunction with the August 17, 2005 Memorandum of Agreement, represented first steps toward an IRM regime, a direction which was confirmed in the Board's findings in policy consultation EB-2006-0064.

Reconsidering efficiency and priorities

The Society believes that OPG and other publicly owned utilities should be incentivized and encouraged to pursue opportunities for greater efficiency. We do not, however, believe that efficiency should be the singular or over-riding goal of OPG, or the singular or over-riding criteria that the OEB used to evaluate OPG's performance. The Society notes with some concern a tendency for government, industry stakeholders and the Board itself to privilege ever greater efficiency and lower rates for consumers in their analysis of OPG's performance, often treating more fundamental concerns such as safety and reliability as second or third order concerns; givens which will take care of themselves.

The Board has defined efficiency as:

> "*Efficiency can be defined in a number of ways. The Board's key focus in this regard is to encourage productivity gains that are enduring and for the benefit of both the regulated company and the consumer. This means that regulated companies have incentives to manage costs while maintaining or improving their service levels."*

The Society takes no argument with the Board's chosen definition of efficiency, but we believe that efficiency gains must be realized within absolute limits of uncompromising safety and reliability. The common notion that there are always more efficiency gains to be found must, at some point, bump up against the fact that beyond a certain point, gains can only be achieved through compromises to safety and reliability. Moreover, we do not believe that the point at which efficiency gains erode these more fundamental considerations is obvious or easily determined, so we must err conservatively, on the side of caution.

Particularly concerning in this regard is the Board's heavy reliance on nuclear benchmarking studies in Cost of Service rate cases and how this would be transposed, and perhaps even magnified, in the context of an IRM process. The Society has in the past expressed serious misgivings about the appropriateness, utility and methodological soundness of the Scott Madden benchmarking study and other studies of its kind.

There are things that we want and expect from our public utilities, be it safety, reliability or quality of service that simply are not reflected in unit capability factors or forced loss rates. The relentless ratcheting of nuclear performance standards derived from comparator groups of dubious merit can only, at the end of the day, result in the creation of perverse incentives to cut or redistribute resources in ways that have a potentially negative impact on safety, reliability and service quality.

The Society found the recent presentation made by Mr. George Fitzpatrick of the Harbourfront Group to be extremely educative with respect to this problem. Mr. Fitzpatrick, in a presentation to stakeholders entitled *Analytical and Regulatory Issues Surrounding U.S. Nuclear Performance Standards (NPS)*, repeatedly made clear that with respect to nuclear operators, the overriding concern of U.S. State level regulators analogous to the OEB was not efficiency gains or consumer price reductions, but rather

safety, and that U.S. regulators had steered clear of automatic ratcheting performance standards in deference to the potentially negative effect that they might have on nuclear safety.

> "*…historically, at least in the history that I'm aware of, 1984 to present, the state regulatory commissions have focused on nuclear generation and they've focused always on safety.* ***[00:18:12]*** *Safety is of paramount concern. For state commissions it's the paramount concern, to all nuclear operators it's the paramount concern, senior management and all the utilities and holding companies that own these facilities. It's the paramount concern of the NRC, the Nuclear Regulatory Commission of the United States.* ***[00:18:32] There's a great deal of focus on safety beyond all else.***"
>
> *Historically, in the rate case situation in the US we've always looked at capacity factors, forced outages, refuelling outages, cost and durations, operation and maintenance costing, capital additions, not just historically but projections of those cost elements.* ***[00:19:36]*** *Basically, the point here is that they've been looked as part of a rate proceeding, we're looking at historical costs and pathways for the future, what do the future projections look like? Then basically, what happens is utility management, nuclear management goes in and makes these projections.*
>
> *Some of the work that I've done is looking at the projections that are made by nuclear clients and looking about how reasonable are they,* ***[00:20:00]*** *not from simple averages, which I'll talk about in a minute, but from model based averages, depending on the types of unit and a variety of other issues and modifiers that I'll go through later in the presentation.* ***The point here is that these are not the subject of automated regulation by and large. They're the subject of specific enquiries into cost and performance as part of a rate case setting.***
>
> ***[00:20:35] In July of 1991 the US Nuclear Regulatory Commission expressed concerns about nuclear performance standards and their impact, or potential impacts on safety. In their final policy statement on July 24 of '91 the following points were stressed. Certain forms of economic performance incentives may adversely affect the operation nuclear plants and the public health and safety. [00:21:03]"*** *(emphasis added)*

Mr. Fitzpatrick went on to identify certain practices that had been identified, in particular, by the NRC as being potentially corrosive of safe operation: use of sharp thresholds; short time interval measurements; lack of "null zones"; and reliance on SALP (Systematic Assessment of Licensee Performance) scores.

> *"They did not want that hindsight analysis to be the basis upon penalties basically, because when you find something that was wrong with the design*

basis, or find something you could be doing better, they did not want that to become an issue for safety."

"The key points made in the final policy statement from my perspective, and I think it's pretty clear if you read the statement, is that safety is paramount. There is nothing that should be done to compromise safety. ***They also said that they thought that nuclear performance standards could lead to some unintended activity or actions.****" (emphasis added)*

With respect to the validity of nuclear performance benchmarking in particular, Mr. Fitzpatrick made a number of observations that are highly germaine to the current discussion, and should perhaps give pause for reflection upon the weight placed on the Scott Madden study in the most recent OPG Cost of Service rate decision EB-2010-0008. In particular, Mr. Fitzpatrick identified a number of variables, all of which have been shown to be statistically significant factors in nuclear performance. Variations in these factors greatly impair unit performance comparability and compromise the validity of benchmarking of the sort performed by Scott Madden:

"Now, the following two slides - ***this slide and the next one I really included them to demonstrate that nuclear plants are different; nuclear units are different from each other. [00:33:00]*** *They're not different in terms of one operates at 10%, one operates at 80%; they're different in terms of how you set... you can't go with industry averages because the newer plants are going to run better. They run better; that's the way it is.*

So what happens is you have to adjust for things like maturing operating age, where are you? Where are you in your lifecycle? Immature operating age - now less of a problem right now because we don't have any plants in the years one to six of their operation. ***[00:33:32]*** *That was a problem in the old days. Cooling water type has changed - it used to be that fresh water plants outperformed salt water plants - not so anymore. Salt water plants outperform fresh water plants because of water chemistry, and the differences in what's in the fresh water and where it's been taken from and things of that nature.*

Cooling tower types have an impact, whether it's natural draft or mechanical draft cooling towers. The containment type - we model that as well. ***[00:34:00]*** *We see statistically significant differences as with reactor system type - it all has to do with maintenance and forced outages.*

If you go onto steam generators we've seen a number of utilities go through steam generator replacement. The initial steam generator type will depend upon on how well it operates through what I call the midlife. And then once you replace the steam generator you expect to see a bump up in capacity factor, but of late we've seen issues where that has not occurred.

> ***[00:34:36]*** *Reactor vessel head replacement - that again is the bump up to capacity factor. The commercial operating date of the unit - the older the vintage, the lower the performance all else equal. And finally fleet versus non-fleet - I think you need to consider this because what I consider a fleet unit in the US is a unit of similar type that's owned by the same operating company or holding company because they have the advantage of learning from each other.*
>
> ***[00:35:08]*** *They have online databases, they're constantly processing information, and plus, all their mid cycle outages and refuelling outages are planned by a central group of folks that move around, and you're constantly going from one to another, they know how to work on the units that they own. So that's a big component* ***when you have units such as Candu with Pickering A, Pickering B and Darlington, that's not a fleet in my opinion so I just want to make that clear. [00:35:35]*** *You may not be getting that because there are different vintage types and I've not analysed that at this point."*

If there are two main takeaway points from Mr. Fitzpatrick's presentation, they are as follows:

1. The use of automatic ratcheting nuclear performance standards by regional electricity regulatory authorities in the United States has been discouraged, if not altogether abandoned, because of the potentially deleterious impact that perverse efficiency incentives might have on nuclear safety. Instead, regulators work closely with nuclear operators to optimize the performance of individual nuclear units, and where appropriate fleets, based on the very particular design, age and lifecycle stage of those units or fleets.
2. Crude and indiscriminate benchmarking of the sort imposed on OPG through the August 17, 2005 Memorandum of Agreement (benchmarking vs. all CANDU units worldwide and vs. top-quartile North American nuclear units) is of highly dubious validity. Informed averages, based on a "significant robust database" (which in all likelihood does not exist for Darlington or Pickering), or model-based "most likely performance" estimators are better statistical measurement methods.

Comments on Power Advisory Recommendations

> *"This assessment will consider the prospect that specific IRM options will result in more efficient operations and contribute to the OEB's goals of protecting consumer interests in electricity pricing and promoting economic efficiency."*
>
> *Incentive Regulation Options for Ontario Power Generation's Prescribed Generation Assets* - Power Advisory LLC., April 20, 2012

Without unnecessarily rehashing the foregoing discussion on efficiency and priorities, the Society would like to point out that while Power Advisory references *Ontario Energy Board Act*, Statutes of Ontario, Ch. 15, Schedule B, 1(1)1., 2. in setting out the scope of it's assessment, it does so selectively. What Power Advisory chooses to not attend to is at least as instructive as what they do choose to attend to, and the Society believes the Board should give equal consideration to those charges in the Act that are not cited:

1. *(1) The Board, in carrying out its responsibilities under this or any other Act in relation to electricity, shall be guided by the following objectives:*
1. To protect the interests of consumers with respect to prices ***and the adequacy, reliability and quality of electricity service.***
2. To promote economic efficiency and cost effectiveness in the generation, transmission, distribution, sale and demand management of electricity ***and to facilitate the maintenance of a financially viable electricity industry.***

Similarly, a reading of Power Advisory's evaluation criteria and outcome goals for OPG IRM options, casts doubt upon the soundness of the framework in which the recommendations were developed, placing safety and reliability as fourth order priorities as it does:

Evaluation Criteria For OPG IRM Options: Outcome Goals

1) Promote Efficiency
2) Contribute to Lower Electricity Bills
3) Preserve OPG's Financial Integrity
4) Preserve the Reliability and Safety of OPG's Facilities
5) Preserve the Value of OPG's Facilities for Future Use
6) Ensure Accountability and Transparency
7) Preclude Unintended Consequences
8) Ease and Cost of Implementation

Recommendations – Nuclear Operations

Recommendation #1: Establish the cast-off prices based on the cost-of-service, reflecting a modest increase in the Unit Capability Factor (UCF) of the Pickering units.

In the November 30, 2006 Board Report, "*A Regulatory Methodology for Setting Payment Amounts for the Prescribed Generation Assets of Ontario Power Generation, Inc.",* (pg 11), the Board stated: "*The Board will implement an incentive regulation formula when it is satisfied that the base payment provides a robust starting point for that formula."*

While the Society acknowledges that the Board has conducted two very lengthy and thorough cost-of-service proceedings with OPG, we believe there should be significant question as to whether they have arrived at a base payment that "provides a robust starting point for that formula" for two reasons. In the first instance, in both rate cases, the Society is of the opinion that inappropriate weight was placed on the importance of

nuclear performance benchmarking. In the second instance, given scheduled refurbishments and a planned new build, in the decade between 2015 and 2025, OPG will enter into a period of continuous change and flux for which there is no precedence in the company's history, even if one were to look back through the entire history of nuclear operations of OPG's predecessor company Ontario Hydro, let alone over the previous two test periods. The Society is of the opinion that nothing in the period covered by the first two rate cases provides an appropriate baseline or cast-off point for evaluating performance in the coming years.

Recommendation #3: Adopt price determination method Option N2, with OM&A and other cost efficiencies and increased production reflected in the calculation of prices in years 2 through the end of the IRM term (assumed to be at least four years in total).

Recommendation #4: Consider an additional incremental targeted incentive(s) directed toward continuous improvements in UCF and Forced Loss Rates (FLRs) at the Pickering and Darlington plants, considered as separate plants and thus potentially resulting in a reward for progress made in one plant being partially offset by a penalty for a degradation of performance at the other plant.

Here again, Power Advisory's own words are highly instructive:

> *"Power Advisory acknowledges that these recommendations represent a departure from past practices either in Ontario or elsewhere, and particularly with respect to the recommendation to implement a target revenue requirement under Option N2 that incorporates cost and production efficiencies in years 2 through the end of the IRM term. These recommendations attempt to reflect the unique role of OPG's assets and its position with the Province of Ontario as its sole shareholder."*

There is a reason for this, of course, and it is well established earlier in this submission. This approach is precisely what the Society is cautioning against, and it is precisely the approach that Mr. Fitzpatrick informed stakeholders had been purposefully eschewed in the United States.

The OEB should not be implementing performance standards for nuclear operations based on the unique importance of OPG's nuclear generation assets or the ownership structure of those assets. Rather it should be seeking efficiencies based on the unique characteristics of the nuclear units whose performance it seeks to optimize.

Recommendations – Hydroelectric Operations

While the Society does have concerns to a greater or lesser extent with respect to the implementation of an IRM regime for any of OPG's operations, we do acknowledge that if it is appropriate anywhere, it *may* be appropriate in the context of OPG's current

hydroelectric operations. The Society believes that OPG's proposal to file a re-basing application in 2013 with a 2014-2015 test period, followed by an IRM application in 2015 with the goal of moving to IRM set rates by 2016 is a reasonable one.

Recommendation #1: *Establish a traditional price cap mechanism (Option H5) with a modest "x-factor" that encourages cost efficiencies without threatening the continued future availability of OPG's prescribed hydroelectric facilities;*

Recommendation #2: *Retain the HIM (Option H1), with incentive payments that are proportionate to the benefits that are reflected in customer bills, thus retaining the existing sharing above a capped amount approach; and*

Recommendation #3: *Continue the practice of after-the-fact reviews of OPG's performance during SBG conditions, making adjustments to a variance account if it determines that OPG could have reasonably taken actions to mitigate the impact of SBG conditions.*

The Society does have some concerns with respect to option H5, the traditional price-cap approach, and leans more toward London Economics suggested "H7" approach of a price cap combined with an embedded productivity target over the revenue requirement. As well, our conditional support for an IRM mechanism for hydroelectric hinges on the completion of additional work to develop the specific details and parameter values for X-factors, z-factors, off-ramps, etc… Primarily though, we are of the belief that given appropriate studies and research and a robust process of stakeholder consultation during the development of an IRM regime for hydroelectric, it may be possible to implement such a regime appropriately in the timelines currently proposed.

Summary

In summation, the Society strongly opposes the implementation of an IRM mechanism for OPG's nuclear operations. While OPG appears willing to entertain the Power Advisory recommendation that an IRM regime based on a price cap mechanism with future price based on target achievement may be appropriate following the completion of Pickering decommissioning and Darlington refurbishments, the Society is of the opinion that this will likely never be an appropriate or responsible approach to rate setting.

Instead, the Society encourages a fundamental rethink of the way in which efficiency is framed and a recognition that at the margins the single-minded pursuit of ever greater efficiencies can lead to unintended negative consequences with respect to safety and reliability.

In particular, and in light of the evidence presented by Mr. Fitzpatrick of the Harbourfront Group, the Society encourages a serious reconsideration of the use of nuclear benchmarking studies in the setting of efficiency incentives for the purpose of ratemaking.

Although the August 17, 2005 Memorandum of Agreement requires that OPG benchmark its against CANDU nuclear plants worldwide as well as against the top quartile of private and publicly- owned nuclear electricity generators in North America remains in place, there is no requirement that such benchmarking should continue to receive the decision making weight it has in recent OEB proceedings. Indeed, the OEB might take the opportunity to engage the government in a dialogue with respect to the serious limitations and potential pitfalls of the methodology it has prescribed.