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To: Allan Kettles
Subject: Comments on the MOF

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March 30, 2009

SYNOPSIS

The objective of the MOF is to assist AESO in operating a fair and reliable interconnected grid. The premise of the MOF is that instabilities within the system are causing disruptive events on inter-tie lines. In an effort to mitigate these “bad neighbour” events, AESO is proposing to curtail wind output via rules-based MOF. This approach is unfair and raises numerous concerns, some of which are outlined below. In short, such events are caused by numerous features of the AIES and to single-out wind generation for unfair penalization is a contravention of AESO’s mandate. Wind industry must contribute to a reliable interconnected power system, but must do in an equitable manner. The concerns outlined below suggest that AESO has significant work to do before the provisions of the MOF are acceptable to industry and aligned with AESO mandate to operate a fair and reliable interconnected grid. These comments are to be viewed in conjunction with other stakeholder feedback.

CONCERNS

1. AESO has never demonstrated that wind ramping is historically and forecast to be solely responsible for variability challenges on the Alberta Interconnected Electricity System (AIES). This unfounded assumption, however, forms the basis for the MOF.
2. Industry has requested, but never received, a conclusive study from AESO that conclusively demonstrates that each of the past “bad neighbour” intertie infractions was caused by wind variability. It is likely that such a list of past events would show that the majority of grid instability events have been caused by (A) load spikes, (B) unplanned thermal unit outages, and (C) transmission line outages. Not wind variability.
3. AESO has never conducted a punitive study of coal units to similarly penalize coal generation for unplanned outages. The impact of such unplanned outages on grid stability has never been the focus of an exercise as significant as the MOF. Excerpts from Transalta’s 2008 Annual Report demonstrate that unplanned outages remain frequent:

- a. "... 2008 was not without challenges for us. Our key disappointment was the unexpected poor performance of our Alberta Thermal fleet. Our teams may have pushed the envelope one step too far in our efforts to find the sweet spot between reinvestment, short-term availability and long-term life cycles. The result was a higher number of unplanned outages than our historical average, and that made for very tough year for our Alberta Thermal teams." – page 3, message to Shareholders March 4, 2009
 - b. "Over the last five years, our average availability has been 88.1 per cent, which is below our corporate target of 90 to 92 per cent. This decrease in our average availability has been primarily impacted by the declines in availability in 2007 and 2008 due to higher than normal unplanned outages at our plants. A significant portion of these unplanned outages were a result of boiler leaks at our Alberta Thermal facilities." - page 23
 - c. TransAlta coal fired facilities account for 4,897 MW installed capacity on the AIES.
 - d. Such unplanned outages include the Oct 10, 2008 Gensee 3 failure, or the December 2008 unplanned outage of Sundance 4, or the 2005 Wabamun oil spill unplanned outage, or the February 6, 2008 unplanned outage at Battle River #4, etc.
 - e. The MOF presentation of March 24, 2009 states that "A 400 MW/hour in opposition to a typical load ramp will be a significant event". It is nothing if not ironic that the average coal facility in Alberta is 330 MW. But of course we all know that coal never has unplanned outage in "opposition to a typical load ramp".
4. Before any curtailment of wind is mandated by AESO, a study must be conducted to assess the impact on system reliability of (A) outdated transmission infrastructure, (B) unplanned thermal generation outages, and (C) intertie weakness on system reliability. In short, wind has been unfairly singled-out as representing the sole source of grid instability. This basis for the MOF is unfair and thus violates the AESO's mandate. It is known that Transmission Upgrades solve congestion directly. Operating rules only serve to delay meaningful action.
 5. The lack of dispatchable generation (hydro, gas peaking units, interties) account for Alberta's projected inability to manage variable load. Blaming this solely on non-dispatchable wind generation is UNFAIR. Coal generation is non-dispatchable. Load is non-dispatchable. Hydro is non-dispatchable. Costs of additional dispatchable generation must be borne by the entire industry. Billing "regulating reserves" as "the cost of variable wind" is misleading. The need for regulating reserves is only marginally attributable to wind at present or in forecast scenarios.
 6. After two years of study, involving 3 forecasting vendors and millions of dollars spent on Wind Forecasting, the ability to forecast wind power has improved dramatically. The MOF must provide comfort to industry that curtailment would only be necessary in events where EMMO, Regulating Reserves, Load/Supply Following Services, and Forecasting all FAILED. Although this is outlined in the MOF working papers, reassurance is required that curtailment is not to be used until no other alternative is available. The wind industry has been supportive of the forecasting pilot and cost forecasts are minimal relative to their forecast benefit to grid stability.

7. “In situations where the system cannot absorb all the forecasted or actual wind power generated, maintaining system security will call for wind power to be dispatched down, ramp rate limited or dispatched off” Such “situations” are not clearly understood by stakeholders.
8. New renewable generation cannot attract investment capital if the System Operator has the ability to “dispatch down, ramp rate limit or dispatch off” generation at will. If AESO is going to curtail wind output, it must provide an analysis of the scope of these anticipated curtailments. The AESO may use historical and any of its forecast generation/load scenarios as the basis. The analysis must clearly show, in respect of these curtailment events (see page 21 of MOF paper), the historical and anticipated:
 - a. DURATION (hours per event)
 - b. MAGNITUDE (MW curtailed per event)
 - c. FREQUENCY (events per year)
 - d. TIMING (seasonality & time of day of events)

This information is critical for quantifying the economic impact of proposed curtailment. (power sales per MW installed per year). This data has not been provided in a clear, concise manner to stakeholders. AESO reports on MOF have, to date, merely included EXAMPLES of events, with little meaningful quantitative analysis to assist stakeholders in understanding the impact and severity of such events, either forecasted or historical. Eg. Page 23 of the March 24, 2009 MOF Presentation merely mentions 234 ramp events but offers no indication of the period over which these were observed, their duration, magnitude or timing. The CanWEA response letter of April 5, 2007 clearly articulates the need for the above information to be quantified, though it is remains to be demonstrated by AESO. Other stakeholder comments asked similar questions.

9. Supply Surplus conditions mean that power supply exceeds demand (load). If wind provides a service to other generators by shutting down voluntarily, then it is to be compensated for this service. Perhaps those units unable to dispatch down safely (coal) could compensate wind for this anticipated service. The condition illustrated on pg 12 of the March 2009 MOF paper (a supply surplus event where supply exceeds demand) can indeed be handled by wind curtailment. In these scenarios, price should be at or near \$0 (reflecting supply exceeding demand) and curtailment is a service the wind industry can perform at relatively low cost to the system. As noted, AESO has not adequately demonstrated the duration, magnitude, frequency and timing of such events historically or on a forecast basis. Why would wind not be incentivized to provide this service to other generators unable to safely dispatch down (coal and cogeneration)? The MOF must address cost sharing in its “considerations for fairness”. It is encouraging that MOF states that “all supply facilities should participate in reducing MW generation during supply surplus conditions”.
10. MOF statements such as “the current size and composition of generation resources in Alberta (predominantly thermal and a large amount of cogeneration) in combination with the limited interconnection capability affect the capability of the system to accommodate wind power variability in the near term” demonstrate a narrow and misguided mindset. The system reliability issue is not solely caused by the variability of wind power generation. System reliability is a problem inherent in a fragile, unresponsive generation system fueled by non-dispatchable and unreliable coal-fired generation with limited

inertie capacity. The above statement says as much. The costs of mitigating this inherent instability must be borne by the sector as a whole in a proportional and fair manner. Wind generation (at 500 MW installed in a system with 5900 MW of coal) cannot reasonably be expected to bear 100% of the burden. This is UNFAIR and thus contrary to AESO mandate.

11. The AESO comment on page 13 that “Historical monthly or seasonal capacity factors therefore could be useful information for AESO system and market operations, system planning and resource adequacy assessments. In addition, market participants may find capacity factors useful” demonstrates AESO’s punitive attitude toward wind generation.
 - a. Perhaps market participants would be interested in similar data for thermal units and transmission lines, whose outages similarly cause grid instability. (see above)
 - b. Perhaps the AESO could provide this information from its metered volumes database in a more accessible manner, similar to SYGRATION’s analysis available from Ontario’s IESO.
 - a. Genesys, the computer model used for evaluation of power supply adequacy by the *Northwest Power and Conservation Council* identifies “forced (unplanned) outages of thermal and hydro generating units [as] a major source of uncertainty.”^[1]

^[1] <http://www.nwcouncil.org/GENESYS/tour.htm>