AESO Discussion Paper – Short-Term Wind Integration
Stakeholder Comment Matrix

Section	Subsection	Stakeholder Response
4.0 Policy Coherence	**<u>Wind Integration Principles</u>** 1. Any potential suite of wind integration tools must ensure the safe and reliable operation of the system. 2. Market solutions are preferable to administrative solutions. 3. The energy market merit order is primarily a tool for balancing energy requirements on the system. 4. All generation should be treated fairly while recognizing their unique characteristics. 5. Ancillary services are a tool to protect the system from events that cannot be reasonably controlled. The draft principles are intended to outline a preliminary view on the interpretation of FEOC as it relates to the interaction between wind generation, the energy market and ancillary services. This relationship must be explored in order to develop a long-term wind integration plan that is grounded in policy and consistent with the current market design.	The AESO currently will not approve a generation facility if it cannot be reliably integrated to the grid; this principle should hold for wind facilities as well. Therefore ATCO Power would like to add the following principle: 6. Additional generation should not be approved if it cannot be reasonably accommodated by the Alberta Interconnected Electricity System (AEIS). Any approvals should be dependant on there being no additional risk of operational problems. ATCO Power is of the view that any addition of generation to the AEIS should be contingent on proper integration measures. The AESO should not prematurely approve new facilitates if the system cannot yet handle the variability.

6.0 Short-Term Integration Tools	**6.1 Energy Market Merit Order** Stakeholder feedback on using the EMMO to integrate wind generation is requested with the following key points: • At what point is over-dispatching the merit order for ramp rate unacceptable from a FEOC perspective? • If the need to over-dispatch EMMO can be anticipated prior to real-time, should tools such as incremental ancillary services and/or WPM be used in place of over dispatching EMMO? • In the long-term, should new ancillary services be developed that will reduce the instances of over dispatching EMMO for ramp rate both for wind and for other reasons?	ATCO Power does not consider the degree to which the EMMO vs. AS is used to manage ramp rate is necessarily a FEOC issue and feels that a range of potential outcomes could satisfy FEOC. We are nevertheless very interested in establishing a transparent procedure that governs how the EMMO and AS will be used especially in light of proposals to increase the volume of AS purchased and feel that developing a clear understanding of this is supportive of a FEOC market. We therefore encourage AESO to hold a wider discussion on the relationship between the EMMO and AS.
	6.2 Operating Reserve **<u>Regulating Reserve</u>** • Is it appropriate and FEOC to procure RR day-ahead when the wind forecast suggests they will be required to mitigate wind volatility? • How should the volume, if any, of incremental active regulating reserve be determined? o Based on the volume required to accommodate forecast wind energy? o Based on a tradeoff between the cost of incremental reserve and the value of lost wind production? o Based on the volume required to	Yes, additional regulating reserves should be procured based on the volume required to accommodate forecast wind energy. Any ramping events that exceed the capabilities of regulating reserve and the normal EMMO (without over dispatching) should be dealt with through WPM and contingency reserves. If larger volumes of regulating reserves are procured, the AESO should develop a clear and standardized methodology on when the system controllers should use the EMMO (without over dispatching) and when they should use reserves. If additional reserves are procured to manage wind, and wind generation is not as variable as forecast, the system controller should not use those reserves for any other purpose.

	reliably integrate wind without planning to rely on tools such as over dispatching the EMMO? • Should standby RR be activated in near-real time to manage the system over and above current RR levels? o Activating standby reserve would need to be done prior to an actual problem because moving reserve from standby to active make a situation worse as the unit activated alters its generation to provide the service. o Is it appropriate and FEOC to activate standby RR near real-time (T-2 or even T-30min) when the near real time wind forecast and system conditions suggest they will be required to mitigate wind volatility? • In the long-term, should regulating reserve be split into a load following product and an AGC product?	ATCO Power agrees that standby RR should be activated in near-real time.
	6.2 Operating Reserve **<u>Contingency Reserve</u>** • Should the AESO use mandatory active contingency reserve to manage unexpected decreases in wind generation if allowed by NWPP? • Should the AESO carry incremental active	Yes, AESO should use mandatory active contingency reserve to manage ramp down events. ATCO Power views a sudden decrease in wind generation as equivalent to a conventional station losing its fuel supply and tripping offline.

	contingency reserve to insure against decreases in wind generation? o This reserve could be tailored for specific hours when wind is forecast to ramp down and load forecast to ramp up, for example. o The alternative is likely to fully dispatch EMMO for ramp rate requirements when wind energy unexpectedly declines. o This is consistent with the use of contingency reserve to replace lost generation from other resources.	Yes, AESO should carry incremental active contingency reserve to manage ramp down events that exceed the capability of the regular EMMO.
	• Should standby contingency reserve be activated in near-real time to manage the system, i.e. the system would carry more than the minimum active contingency reserve in some hours to manage wind variability? o Reserve would need to be activated prior to an actual problem. o The accuracy of the wind forecast inside T - 2 or even T - 30 minutes will determine the likelihood of activating standby reserve only when required.	ATCO Power agrees that standby contingency reserves should be activated in near-real time.
	• Should unexpected decreases in wind generation be treated equivalently to other generation contingencies, i.e. the system carries sufficient contingency reserve to manage unexpected loss of generation?	Yes, ATCO Power views unexpected decreases in wind generation to be equal to other generation contingencies; they should therefore be treated the same.

	6.3 Wind Power Management • Under what conditions is it appropriate to use WPM? o In advance of conditions that might place the system at risk? For example, if wind is at a high level and expected to ramp down concurrently with the morning load ramp up, should WPM be used proactively or should a solution such as activating standby contingency reserve be used? o When the wind ramp is not forecast? This implies the AESO purchase sufficient ancillary services to accommodate forecast ramps. o When the wind ramps up more rapidly than the EMMO can accommodate without over dispatching? This allows wind production to increase only as fast as the EMMO can ramp down and implies that incremental ancillary services will not be purchased to accommodate potential wind ramp up events. o Under supply surplus conditions? • Should the AESO establish a WPM market solution or is pro-rata appropriate? o How would a WPM market interact with the solution for supply surplus and/or congestion management?	ATCO Power does not support using WPM proactively to manage possible ramp down events. In these cases standby contingency reserves should be used. Sufficient ancillary services should be purchased to accommodate any forecast ramp events. ATCO Power supports the use of WPM for ramp up events that exceed what the EMMO can accommodate without over dispatching. This solution treats wind as any other generator. A market solution for WPM is too complex. ATCO Power supports pro-rata as a simple and fair solution.

	○ Would participation be limited to wind facilities and how would costs be allocated? • In the long-term, should the AESO develop an ancillary service that accommodates wind ramps up by reducing production from in merit generators and/or wind facilities themselves? ○ Is this an appropriate cost for load to bear since wind can manage this operational challenge through a WPM protocol?	Any ancillary service developed specifically to accommodate wind ramps should be borne by wind generators not load.
	6.4 Wind Power Forecast • Should the system be able to accommodate forecast wind generation? ○ Purchase sufficient reserve to accommodate forecast wind generation. ○ The alternative is to rely on more WPM and /or over dispatching EMMO. • Should the wind power forecast for individual facilities (or the aggregate wind forecast) resemble a must offer must comply obligation in the long-term? ○ If the forecast creates obligations for wind facilities, does it also create obligations for the system to absorb the forecast without using WPM?	Yes, the system should be able to accommodate forecast wind generation. Sufficient reserves should be purchased to accommodate any ramp down events and WPM should be used to manage ramp up events that cannot be handled by the regular EMMO. ATCO Power does not support must offer must comply obligations for wind generators.

	6.5 Summary of Integration Options **Short-Term Requirements** • Determine the volume, mix and procurement strategy for incremental ancillary services as wind capacity increases • Develop a process to implement WPM • Develop guidelines on the use of WPM in real time or near real time	
	6.5 Summary of Integration Options **Potential Long-Term Direction** 1. Mitigate wind power primarily through the use of centrally procured ancillary services o Minimal use of WPM o No must offer must comply obligation for wind o A ramping service would be developed 2. Mixed solution o WPM used to mitigate wind ramp up events o Reserve to mitigate wind ramp down events o A ramping service may be developed o Could entail a form of must offer must comply obligation for wind generators particularly to control ramp ups	ATCO Power supports Option #2 as a long term direction with the exception of must offer must comply obligations. It would be appropriate to use WPM to mitigate ramp up events and reserves to manage ramp down events.

	3. Create similar obligations for wind generators as exist for other generators o Wind power forecast could be part of a must offer must comply obligation o Could require wind to be firm at T – 2 o Wind firming service developed either by the market or by AESO	