Stakeholder Comment Matrix for Additional Feedback

Period of Comment: July 25, 2019 through September 5, 2019 **Comments From:** ENMAX Energy Corporation (EEC), ENMAX Power Corporation (EPC) **Date [yyyy/mm/dd]:** September 3, 2019	**EEC:** **Contact:** **Pavel Petkov** **Phone:** 587-899-6667 **Email:** **ppetkov@enmax.com** **EPC:** **Contact:** Robert Rothstein **Phone:** 403-689-6507 **Email:** rrothsein@enmax.com

Instructions:

1. **Please fill out the section above as indicated.**
2. **Please refer back to the *Letter of Notice of Proposed New and Amended ISO Rule* under the "Attachments" section to view the actual draft of the proposed new Section 502.17.**
3. **Please refer to the *Stakeholder Comment Matrix for Additional Feedback Attachment ("Attachment")* for further information regarding AESO assumptions and instructions for completing the sections below.**
4. **Please respond to the questions below and provide your specific comments, proposed revisions, and reasons for your position underneath, if any. Blank boxes will be interpreted as favourable comments.**
5. **Please be advised that general comments do not give the AESO any specific issue to consider and address, and results in a general response.**

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	AESO's Preferred Orderwire Architecture ***Cost and Timeline to implement and operate the mesh option orderwire architecture.*** Please provide: (a) the implementation cost and implementation timeline; and (b) the operational cost; of the AESO's preferred orderwire architecture mesh option using the assumptions and architecture provided in the Attachment. Please include all assumptions used for the list of variables provided in the Attachment. Where possible, provide a breakdown of the cost and implementation timing by proposed new Section 502.17 requirements. If you are unable to provide the costs and timeline of complying with a proposed new Section 502.17 requirement, please state that requirement and why you are unable to provide the information at this time. Please list any issues related to budgetary cycles separately. ***Please indicate which type of stakeholder you are:*** ☒ ***Operator of a transmission facility*** ☒ ***Operator of a generating unit or operator of an aggregated generating facility with a maximum authorized real power ("MARP") of 5 MW or greater*** ☐ ***Other (please specify in the comments)***	The implementation cost and implementation timeline are listed below: **Please refer to ENMAX Orderwire - September 2019.vsdx for a visual representation of the orderwire design.** **EEC estimated implementation cost:** **Capital:** • SBC equipment & installation - $140,000 • SIP enabled phones - $570 • DMZ Switch Stack - $24,000 • Firewall - $20,000 • New Fiber - $100,000 **Total: $284,570** **EEC estimated operational cost:** **Annual OPEX:** • Fiber maintenance - $15,000 • .50 FTE technical resource - $50,000 • Telephone SBC Maintenance - $10,000 • Switch Maintenance - $5,000 • Firewall Maintenance - $5,000 **Total: $85,000** **EPC estimated implementation cost:** **Capital** • SBC equipment & installation - $140,000 • SIP enabled phones - $570 • DMZ Switch Stack - $24,000 • Firewall - $20,000 **Total: $184,570**

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		EPC estimated operational cost: **Annual OPEX:** • .50 FTE technical resource - $50,000 • Telephone SBC Maintenance - $10,000 • Switch Maintenance - $5,000 • Firewall Maintenance - $5,000 **Total: $70,000** **ENMAX Total:** **CAPEX $469,140** **OPEX: $155,000** Timeline: 12-20 months from effective date (aligning with budgetary cycles) • project execution 6-8 months • budget planning cycle 6-12 months (from rule effective date) Fully meshed solution: A physical fiber connection would need to be established between ENMAX and the AESO in addition to connecting to AltaLink. The capital costs can range between $100,000 to $500,000 dependent on connection endpoints and architecture decisions. Assumptions: • In order for the mesh option to be implemented, full physically redundant paths would be required at a substantially increased cost. • There is no fiber from an EPC substation to the AESO control centre. • Preliminary design has not been coordinated with AltaLink.

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		Stakeholders: EEC is an Operator of a generating unit. EPC is an Operator of a transmission facility.

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2	***Orderwire Architecture Options*** Which of the following orderwire architecture options do you support, if any: ☐ Mesh Option ☒ Operator of a Transmission Facility Hub Option ☐ AESO Hub Option ☐ Other (please provide details in the comments) The architecture for the first 3 options can be found in the Attachment. Please provide the rationale for your opinion or suggest an alternative option.	ENMAX supports the Operator of a Transmission Facility Hub Option as it does not require additional fiber to the AESO, reducing costs. This option does increase reliance on AltaLink as the connection hub for the EPC to AESO link.

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3	***Stakeholder's Preferred Orderwire Architecture Option*** ***If you do not support the AESO's preferred mesh option, please provide the cost and timeline to implement and operate the orderwire architecture option you support.*** Please provide: (a) the implementation cost and implementation timeline; and (b) the operational cost; of the Orderwire architecture option. Please provide all assumptions used to determine the costs and timeline, including your assumptions for the list of variables provided in the Attachment. Where possible, provide a breakdown of the cost and implementation timing by proposed new Section 502.17 requirements. If you are unable to provide the costs and timeline of complying with a proposed new Section 502.17 requirement, please state that requirement and why you are unable to provide the information at this time. Please list any issues related to budgetary cycles separately. ***Please indicate which type of stakeholder you are:*** ☒ ***Operator of a transmission facility*** ☒ ***Operator of a generating unit or operator of an aggregated generating facility with a maximum authorized real power ("MARP") of 5 MW or greater*** ☐ ***Other (please specify in the comments)***	The mesh option requires full physically redundant paths at a substantially increased cost. There is no fiber currently from EPC substation to AESO network. **Transmission Facility Hub Option** Timeline: 12-20 months from effective date (aligning with budgetary cycles) • Project execution 6-8 months • Budget planning cycle 6-12 months (from rule effective date) Note that the proposed design has been confirmed with AltaLink. Yearly maintenance cost expected is ~$150,000 **Stakeholders:** EEC is an Operator of a generating unit. EPC is an Operator of a transmission facility.
4	***Availability Requirements*** Whether you agree with the availability targets set out in subsection 8, *Performance and Maintenance of Primary and Backup Voice Communication Systems*, of the proposed new Section 502.17. Please explain why or why not. If you do not agree, please provide suggested changes and the rationale for your suggestion.	EEC/EPC agree that the availability requirements are reasonable.

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5	***Extended Power Outage Requirements*** Whether you agree with the requirements for market participants during extended power outages of its facilities set out in subsection 9, *Extended Power Outage*, of the proposed new Section 502.17. Please explain why or why not. If you do not agree, please provide suggested changes and the rationale for your suggestion.	>36 hours is reasonable for facilities (EPC site 1 and site 2, ENMAX Shepard Energy Centre, Calgary Energy Centre) with diesel generators. >36 hours is reasonable for EPC Substations is reasonable as well.
6	***Operational Requirements*** Whether you agree that the proposed new Section 502.17 effectively captures the ongoing operational requirements of the proposed architecture. Please explain why or why not. If you do not agree, please provide suggested changes and the rationale for your suggestion.	ENMAX believes the proposed new Section 502.17 has the following limitation: • Dependability on AltaLink based on the proposed architecture
7	***Utility Orderwire Description*** Whether you agree with the AESO's description of "utility orderwire" as: (a) a service that is independent of external commercial telecommunication services such that continued operation, during an extended power outage, can be assured and restoration activities are internally controlled; (b) being able to leverage the existing utility telecommunication network infrastructure, including fibre, microwave, routers, and phone switches; and (c) including, if applicable, leased assets, such as dark fibre and tower access from 3rd party providers, where the active telecommunication equipment (router, radio, batteries, etc.) is controlled by the market participant.	ENMAX is in agreement with the suggested description of orderwire as described. However, please note that for (b), in order to build out the proposed solution in full, additional equipment needs to be procured as well as utilizing the existing utility infrastructure.

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8	***Other*** Please provide any other feedback or suggestions you have on the proposed new Section 502.17. Please provide the rationale for your suggestion.	ENMAX suggests exploring other satellite phone alternatives as they could potentially provide greater availability as a backup communication system. Despite the known voice delay and quality issues, Satellite phone still can serve as a low cost, highly available backup communication system.

<u>Information Document</u> - The AESO intends to develop an information document to accompany the proposed new Section 502.17. At a minimum, the AESO suggests that such an information document would contain descriptions of a utility orderwire and a control room for generators. Please provide your views on the type of content that should be included in an information document associated with the proposed new Section 502.17. Please provide the rationale for your suggestion.

Attachments: