Stakeholder Consultation Session on the Development of the Proposed New Section 502.17 of the ISO rules, *Voice Communication System Requirements*

Minutes from Stakeholder Consultation Session on the Development of the Proposed New Section 502.17 of the ISO rules, *Voice Communication System Requirements* ("Section 502.17")

Location: AESO BP Location, Meeting Room 6006, 6th floor of the BP Centre located at 240 – 4th Ave SW Calgary, AB T2P 2H8
Date: July 9, 2019
Time: 9:00 a.m. to 11:30 p.m.

Attendees:

Company
Alberta Electric System Operator ("AESO")
AltaLink Management Ltd. ("AltaLink")
ATCO Electric Ltd. ("ATCO Electric")
ATCO Power ("ATCO Power")
Capital Power Corporation ("Capital Power")
Cenovus Energy Inc. ("Cenovus")
CNOOC International Ltd. ("CNOOC")
EPCOR Distribution & Transmission Inc. ("EDTI")
ENMAX Energy Corporation ("EEC")
ENMAX Power Corporation ("EPC")
Enel X North America, Inc. ("Enel X")
Suncor Energy Inc. ("Suncor")
TransAlta Corporation ("TransAlta")

Consultation Session Overview and Introductions

- The AESO welcomed stakeholders to the session, reviewed safety procedures, reviewed the agenda, and provided an overview of the consultation session.
- The AESO advised everyone that: the session is being recorded and that the positions and comments raised are not binding; personal information is collected in accordance to the *Freedom of Information and Protection of Privacy Act*; and minutes will be available on the AESO website for review.
- All attendees introduced themselves.

Rule Development Consultation Process Overview

- The AESO presented a brief history of the ISO rule development process, as it pertains to the proposed new Section 502.17. Noting that the Alberta Utilities Commission ("AUC") Rule 017, *Procedures and Process for Development of ISO Rules and Filing of ISO Rules with the Alberta Utilities Commission*, which came into effect August 2018, applies to all ISO rules that are in development.
- The AESO explained and reviewed its ISO rule development process.
- The AESO stated that the development of the proposed new Section 502.17 had started prior to AUC Rule 017 coming into effect and that the AESO had held working group meetings with industry

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stakeholders at the time. The AESO mentioned that the minutes of the working group meetings were posted on the AESO website.

- The AESO summarized what has happened to date under the AESO's new ISO rule development process. This has included inviting stakeholders to participate in the development of the proposed new Section 502.17, requesting feedback on the development of the proposed new Section 502.17, posting a draft of the proposed new Section 502.17 on the AESO website, and soliciting written stakeholder feedback on the draft ISO rule.
- The AESO noted that, in the written feedback, a few stakeholders requested a stakeholder session to discuss the concerns they had with the draft of the proposed new Section 502.17.
- The AESO explained that the consultation session was set up in response to that request and that the AESO would like to further discuss stakeholder concerns.

Voice Communication System Requirements Overview

- The AESO noted that the proposed new Section 502.17 is a consolidation of the voice communication requirements currently found in the existing Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements* ("Section 502.4") and related reliability standard COM-001, *Telecommunications*, ("COM-001") with new and refined voice communication requirements in the proposed new Section 502.17 to strengthen certain areas.
- Specifically, the AESO noted the following requirements: control room and control centre voice requirements; design and performance targets for voice communication; extended power requirement for backup voice equipment; and restrictions on some backup system usage. The AESO explained that these changes are being proposed to ensure reliability and performance of critical voice services for the Alberta interconnected electric system ("AIES"); effective and independent backup voice communications and preparedness during an extended power outage, while emphasizing that during a blackout, voice is definitely a critical system for the AESO as well as the AIES.
- The AESO encouraged stakeholders to provide feedback, and further explained that it did try to align the proposed new Section 502.17 requirements with existing operational practices and expectations.

Stakeholder Feedback Review

Stakeholder Concern 1 - Definition of "Utility Orderwire"

- The AESO reviewed stakeholders' request to include a "utility orderwire" definition; and its proposal to add a definition for "utility orderwire system" to an AESO Information Document ("ID"). The AESO noted that this proposed definition will include systems that: leverage the utility telecommunication network infrastructure, including fiber, microwave, routers and phone switches; 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; can include leased assets such as dark fiber and tower access from third party providers, where the active telecommunication equipment, including router, radio, and batteries, are controlled by the market participant; and can include a redundant Private Branch Exchange ("PBX") system carrying utility orderwire and commercial telecommunication services; and can have primary and backup voice on redundant PBX as the AESO will not consider that a single point of failure.
- The AESO noted that with respect to third party providers, as long as the market participant has control over the restoration of the equipment, the AESO is okay with including leased assets in the definition. The AESO further explained that the 2003 blackout brought recommendations that utilities use their own telecom equipment and to not overly depend on the publicly switched networks.
- ATCO had some concerns regarding its ability to deliver orderwire service with its current infrastructure. Specifically,
  - ATCO Electric commented that many of the PBXs are involved in delivering public switched telephone network ("PSTN") services, and as such cannot deliver orderwire service.
  - The AESO reiterated that the rule says that primary and backup can have no single common point of failure and that market participants are not expected to have separated PBXs for PSTN and

orderwire if it is a redundant system. Market participants can use their existing PBXs (as long as there are two).

Stakeholder Concern 2 - Utility Orderwire versus Satellite

- The AESO went through AltaLink's request for the AESO's rationale regarding the selection of utility orderwire over satellite network telephones for certain market participants, and explained that the AESO considers voice communication a critical service. The AESO explained that utility orderwire is selected as the best backup because it has: quick and effective dialing with dial tone; support for multiple lines and handsets; clear voice quality with no latency; in restoration event, field technician priority is utility controlled and aligned with restoration efforts; there are known extended power capabilities and system alarming; and infrastructure is specifically designed for power system operation.
- The AESO further explained that satellite as a backup is a decent backup; however, it has the following limitations: voice latency challenges; dial complexities with 11+ digits; no dial tone; connection delay of 10-15 seconds after dialing; limited multiple line support; multiple systems with multiple numbers; and in major restoration events, too many users could inhibit the hub operator, such as the AESO or a legal owner of transmission facilities ("TFO"), from calling out. The AESO noted that there are selections and restrictions in the proposed new Section 502.17 in order to ensure there is effective backup voice communication of all key market participants in a blackout scenario.
- There was a discussion about the AESO's statement that there is a need for the AESO to call out when a large number of market participants are trying to call into the AESO:
  - ATCO Electric wanted to understand the AESO's expectation.
  - The AESO explained that during a blackout, the AESO and TFOs are acting as coordinators, and generators have certain reporting accountabilities to both, so the AESO continues using satellite as a backup but it is limited to a certain subset of market participants, so there aren't too many users that might overload the system or make it a less effective backup. The AESO confirmed that in its current practice, satellite phones can be used on a wider basis; however, the restrictions applied don't affect a large number of users.
  - ATCO Electric clarified that its intention was to put this into the context of a functional requirement for the "orderwire system" and ATCO Electric's perception is that the AESO said something about it needing some kind of priority capability to dial out to generators, for example.
  - The AESO further explained using the example of restoration training which the AESO holds every year, there are hundreds of phone calls made an hour, and it comes down to balancing of generation and load, and there are different people working in different areas, there is lots of communication that happens very rapidly. The consequence of someone missing a direction or a market participant being slow or trying to respond is that the AESO may need to restart certain areas.
  - ATCO Electric further asked if the AESO has any intention of putting those kinds of things into some kind of a functional specification for the orderwire system.
  - The AESO noted that there isn't currently a plan to provide a functional specification, but will discuss the architecture later on in the presentation. In terms of specifics, the expectation is that the TFOs and utilities will work together and meet the requirement of the rule and use good utility practice.
  - ATCO Electric specified that it is not sure that the above expectation will cover the requirements identified by the AESO.

Stakeholder Concern 3 - Utility Orderwire Architecture

- The AESO explained that the stakeholders requested common understanding of the utility underwire architecture. The AESO presented the utility communication network as a core telecommunication infrastructure; it carries critical power system services; and has interconnect potential between most, or all, required parties – the AESO noted that it said "most" because the interconnection sites exist, but there are generators or smaller market participants that the AESO isn't certain on yet. The AESO then

presented the several options it evaluated, noting that the same core telecommunication infrastructure and physical interconnection points would be used regardless of option. The primary difference is in the PBX and setup complexity. The AESO noted the considerations to keep in mind when looking at these options are reliability, complexity, troubleshooting and cost.

- The AESO presented its preferred option as the Mesh Option through a comprehensive diagram, which has each major TFO with smaller transmission operators, distribution and generation connecting into their PBX and it is a mesh between the major TFOs and the AESO. The AESO noted that this option does have the most PBX complexity, especially for the AESO and AltaLink, but does have the best overall reliability with a division of different failures and impacts, so it has the lowest impact of both panned and forced outages. There is reasonable troubleshooting, and the highest cost option, but the increase cost would just be on the PBX and programming. The cost can be evaluated, but it is anticipated to be relatively small.
- There were clarifications questions and concerns regarding AESO's architecture options discussed:
  - AltaLink requested clarification on which pieces of the proposed architecture already exist.
  - The AESO explained that currently the AESO, AltaLink, and EDTI have a PBX, and it is aware that ATCO Electric is already installing one or has plans to do so. There are connections to most of the generators today that would meet the proposed new Section 502.17 requirements – not necessarily all the way to the AESO, but AltaLink already has a several voice connections today. ATCO Electric did have orderwire until the Multiprotocol Label Switching ("MPLS") came in; EDTI has a connection to the Genesee Generating Station over the AltaLink network. In terms of an interconnection today, AltaLink and the AESO are connected, but none of the other connections exist. Interconnection points do exist between major TFOs and the vast majority of the plants have that capability.
  - ATCO Electric requested clarification on the AESO's vision of the utility orderwire system and asked if it is a private ("voice over IP") VOIP system.
  - The AESO confirmed and explained that it does not necessarily have to be VOIP and that is not specified, but that makes the most sense as most systems are or are moving towards VOIP today.
  - AltaLink commented that today there is only one interconnection that ties PBX systems together, and it is difficult enough to keep that running even though they are identical systems. With the AESO's proposal to mesh together a larger number of disparate systems, people with different upgrade cycles, technology structures, budgets, with respect to the complexity of the system, an issue that may come up there is high complexity. Ultimately TFOs are electric utilities, not telephone companies or voice service operators; a system like this is orders of magnitude more complex than what they have today.
  - The AESO explained that AltaLink already operates the system today and that the AESO is ultimately concerned about reliability. It agrees there is complexity, but there is benefit to having this.
  - AltaLink expressed that the perceived cost and operational uplift will ultimately be more than what has been estimated so far.
  - The AESO understood the concern and noted it will talk about operational cost later in the presentation. The AESO also noted it would be interested in discussing this further and receiving specific feedback from stakeholders on costs.
- There were concerns and questions around compliance to the proposed new Section 502.17.
  - ATCO Electric mentioned that the proposed new Section 502.17 requires that market participants work together and that all market participants are compliant. ATCO Electric asked who was responsible for ensuring compliance; specifically would TFOs be responsible for initiating and ensuring that smaller market participants portion of the telecommunication connections are compliant with the proposed new Section 502.17 requirements. ATCO Electric also asked if there was another place in the proposed new Section 502.17, other than the Appendix, where market

participants are classified. ATCO Electric also asked how impacted market participants would know that there were new ISO rule requirements.

  - The AESO noted that all market participants in Alberta have accountability to follow ISO rules. The AESO expects that when the TFOs look to comply with the ISO rules, they will look at which parties require connection and could initiate that conversation, noting that either party could initiate that conversation, but both are accountable for meeting all applicable ISO rules. The AESO explained that for new market participant a functional specification document is issued for its proposed facilities that list all applicable ISO rules, and that market participants: can choose options of how to meet the voice communication system requirements, this occurs well in advance of construction. The market participant will be responsible for the voice communication equipment required to connect its facility's voice communication equipment to the appropriate TFO voice communication system. Ideally, there is enough time to determine what is needed and that the voice communication system would not hold up the completion of the market participant's project.

- The AESO presented on its second option called *Operator of a Transmission Facility Hub,* which has AltaLink in the middle. The AESO explained that the option has reduced complexities for the AESO, it is the simplest from a troubleshooting perspective, and the links between entities are very clear. It does have larger outage impacts, a planned or forced outage on AltaLink's PBX would result in the AESO loosing visibility to all the other parties. Of the options considered, this one would be tied for the lowest cost.
- The AESO presented its third option called the *AESO Hub Option*, wherein the AESO is in the centre as opposed to AltaLink. This option is also tied for lowest cost, and it provides reduced complexity for AltaLink. If there is an outage on the AESO PBX, all the major transmission operators can't talk to each other. This includes AltaLink trying to talk to Genesee and Shepard given that it is not directly connected to AltaLink's network, but in a restoration event those would be key parties for AltaLink to talk to.
- There was a discussion on the impact of the *AESO Hub Option* on backup control centre requirements:
  - ATCO Electric asked if this infrastructure is also applicable to the backup control centre. And if there is a requirement for the backup control centres to talk to primary control centres.
  - The AESO responded "yes" to both questions and presented its last ruled out option called the *AESO Central Option*, where the AESO would act as the central point. The AESO explained that the central option has a huge point of failure, and there would also be anomalies like the Genesee Generation Station talking to EDTI through the AESO. There would be longer paths, reducing the reliability of the system, and it would be a troubleshooting nightmare. This option would be a challenge to troubleshoot because the TFOs are connected to the AESO, but the AESO is going over the TFOs' infrastructure, and the AESO does not have visibility to that infrastructure.
- The AESO explained that its preferred utility orderwire architecture option is the Mesh Option as it has the best overall reliability with failures having fewer impacts or outages having lower impacts. There is reasonable troubleshooting of network failures. There is increased cost for PBX interfaces and setup, but it is anticipated to be relatively small.
- There was a discussion around the effort the presented options placed on AltaLink and ATCO Electric:
  - AltaLink raised concerns regarding the difference between the options presented by the AESO and language in the draft of the proposed new Section 502.17. Specially, AltaLink explained that it was concerned with: the timelines for implementation of the rule requirements and that the options presented by the AESO have a heavy reliance on both AltaLink and ATCO Electric while the draft of the proposed new Section 502.17 suggests that the reliance is equal on all market participants – most market participants will be required to patch a few cables and attach a phone whereas the AltaLink will have to organize with 12-15 different market participants and coordinate implementation of the rule requirements. AltaLink asked if, given the uneven spread of reliance on AltaLink and ATCO Electric if a directive is more appropriate, to implement the requirement on existing facilities, than as an ISO rule requirement.

- The AESO stated that it believes that the voice communication system requirements included in the proposed new Section 502.17 are appropriate for a rule, but it can discuss these requirements further. The AESO notes that AltaLink currently operates a PBX and offers services to generators. The AESO noted that AltaLink and ATCO Electric are the largest TFOs, stating that, in terms of infrastructure, AltaLink and ATCO Electric operate a large portion of the transmission network. The AESO explained that it sees the voice communication system as a critical service for the operation of the power system, and since AltaLink and ATCO are larger, they apply for recovery of cost in their General Tariff Application ("GTA").
- AltaLink noted that their GTA still requires justification. It emphasized that the current wording of the rule doesn't specify there is a requirement for AltaLink and ATCO to step up and run this. AltaLink mentioned that both AltaLink and ATCO Electric both have done it to some degree, it is patchy, it is not control centre to control centre, but they have some phones throughout the province at the odd substation, but this is for all intents and purposes a capacity increase of their voice systems. There is more infrastructure involved and it is primarily an AltaLink and ATCO Electric effort as they have the most interconnections. So, in that sense, that is where AltaLink and ATCO Electric get concerned if there is a blanket 9-month implementation period, the cost will be vastly absorbed by these two TFOs, and the current rule does not make this a reality.
- The AESO noted it does not see a difference between voice communication system requirements and SCADA and teleprotection requirements, which AltaLink carries today. It further requested information from AltaLink on what it would take add a new generator project to AltaLink's system and to share this information.
- AltaLink explained that if the infrastructure is being put in place as part of a new project, then AltaLink's "point of presence" is at whatever the local substation is, and from there to a control centre depending on what a control centre looks like for that style of market participant. It would be a matter of them cabling it back, patching through and then adding a phone to a desk. AltaLink mentioned that for new projects it is relatively easy to implement the proposed new Section 502.17 requirements, but it is the initial build-out that is the much bigger effort. AltaLink also requested the AESO to describe who owns liability.
- The AESO noted that market participants are responsible for the assets they control and there are exception clauses in targets and availability, as the AESO does not expect to hold market participants liable for third parties. Further, the AESO noted it is no different than a main power line that TFOs connect to customers. There are obligations as a utility and the communication to the system is no different. As a transmission asset, the expectation would be good utility practice, but as far as detailed liability, that would need to be sorted out between market participants through any contracts there are in place with customers, or obligations throughout the *Electric Utilities Act*.
- AltaLink noted in that scenario, where this is a compliance program, in most market participants' case, if their cable goes down, the market participant will then go to AltaLink for answers. There isn't much accountability for market participants other than asking AltaLink to fix it, and the same goes for those connected to ATCO Electric. AltaLink reinforced that the way the rule is currently written, it has a lot of fine or unwritten print around expectations of AltaLink and ATCO Electric.
- The AESO noted that AltaLink and ATCO Electric have done a lot of work in their service offerings, setting expectations and troubleshooting protocols, and that goes for voice communication system, SCADA, and any other services they provide.
- AltaLink further noted that normally, for providing electricity they are covered under statutory protection, however under this rule they would not be unless it is directed. Further, AltaLink noted that the services they provide today are done under a "best effort" basis; however, the proposed new Section 502.17 have new requirements related to availability, backup generators, so it takes it to a different level of liability and responsibility.
- The AESO further explained that 99.9% of the infrastructure that will be required by the proposed new Section 502.17 is infrastructure that AltaLink and ATCO Electric already monitors and operates today. The AESO agrees that there is some more tracking and compliance of services,

but if a microwave radio goes down, AltaLink and ATCO Electric already have the field technicians and alarms to fix it on a priority basis.

- AltaLink explained that their current infrastructure itself is not much different than the infrastructure that would be required for the proposed new Section 502.17; however, the proposed new Section 502.17 requirements are not just related to infrastructure, the rule also requires TFOs to offer a new service. AltaLink currently does not have everything in place to provide this service, it is very patchy – best effort based. AltaLink then reiterated that the proposed new Section 502.17 as drafted doesn't drive these ideas to the end; it simply gives a blanket set of requirements that lets market participants roam free, whereas what is really being asked is for AltaLink and ATCO Electric to drive this to completion.
- ATCO Electric strongly disagreed with the comment made by the AESO that 99% of the infrastructure is already in place – as ATCO Electric does not have a PBX connection (it does have a voice system), however it does not have a backup control system that is capable of meeting this rule requirement, so there is more to a voice communication system than just radio, microwave and fiber – there is also the logistical set-up and initial uplift, as AltaLink stated. ATCO Electric asked the AESO to consider such costs as the initial uplift, as well as the ongoing maintenance and operation. With respect to the AESO's comment that it follows a best utility practice, ATCO Electric noted that it believes best utility practice is strongly different from a compliance rule and standard, and as we know, once requirements are put into a rule they becomes black and white – there is no longer any gray area, and it did not want to be in a position where it could not comply with a rule.

Stakeholder Concern 10 – Extended Time to Comply

- There was a discussion regarding stakeholder concerns related to the extended time to comply with the proposed new Section 502.17, so the AESO presented its "Stakeholder Concern 10". Specifically,
  - ATCO Electric further wanted to comment on the 9-month implementation timeline, and on the directive versus rule issue.
  - The AESO clarified that the 9-month implementation is calculated after the rule comes into effect. An effective date of the rule happens 3 quarters after the AUC approves the rule. The AESO illustrated an example – assuming the AUC approved the rule on January 1, 2020, the rule would become effective October 1, 2020, Operators of Transmission facilities would have until July 1, 2021 (19 months from AUC approval) to implement utility orderwire, and operators of generating facilities would have until February 1, 2022 (16 months from AUC approval) to implement utility orderwire. The AESO also noted that this timeline is still up for discussion.
  - ATCO Electric noted, that even so, ATCO Electric is already in their 2020-2021 GTA submission cycle, but do not have any of the costs for what they may need to implement in their GTA cycle, so other programs that have been developed may have to take a back seat to this in order to implement this.
  - The AESO responded that it has struggled because it has not received very specific information about how long it would take market participants to implement the rule requirements and how much it would cost. The AESO explained that it had received general concerns which it answered in generalized manner. The AESO clarified that the timeline suggested can change, and it is happy to reconsider based on specific feedback. Specifically, the AESO noted that if market participants need more time, then it has to understand how much time and if market participants think it will cost "more", the AESO needs them to give some sort of estimate and explanation as it has received little or no context with respect to cost.
- There was a discussion regarding the cost to comply.
  - The AESO explained that it was not sure what market participants meant when they said the proposed new Section 502.17 would be costly to implement – would it be $200,000, $2 million, or $20 million? The AESO encouraged market participants to include these specifics in their feedback because such information is helpful to the AESO in adjusting timelines.

- ATCO Electric noted that providing more information to the AESO is a fair request. It alluded to AltaLink's comment about responsibility not being evenly spread across the TFOs and said that the proposed new Section 502.17 is vague and TFOs don't have enough information to come up with an exact cost. For example, the infrastructure where a backup generator is applied would determine the scope. Without clearly understanding exactly where the equipment goes and what type of service is being provided, expected level of reliability and operation and support, it is very challenging for the TFOs to come up with costs.
- AltaLink echoed ATCO Electric's comments regarding the larger TFOs being required to quarterback this process, the TFOs need to negotiate contracts and demark points with every one of the market participants that they connect with. AltaLink explained that it is very difficult to get a general cost estimate because they have no idea how cooperative market participants will be, if they are just going to throw it back to the TFO because they are larger, and this needs to be negotiated with every single market participant. So the TFOs ability to cost estimate at this time is true napkin math at best. Until they have something to put behind a project, it will be difficult to have an estimate. Further, AltaLink's GTA is through 2021, most of the costs will be in the implementation period, and these have not been accounted for in their GTA.
- EEC asked if the AESO can provide its estimate of what it thinks putting together the M*esh Network* option will cost as this information may help market participants in their initial guidance.
- The AESO confirmed it can share its estimate as it has identified the market participants that would need to be connected, and it has done a rough analysis. The AESO stated that for TFOs and market participants, the AESO expects this implementation to cost under $1 million.
- ATCO Electric responded with the fact that implementing the proposed new Section 502.17 requirements at its backup control centre would cost over $700,000 alone. To that, add the backup generator requirement at every site.
- The AESO noted that the rule will clarify there is no backup generator requirement at every site.
- AltaLink provided its initial estimate was around $150,000 per interconnection, which would roughly total upwards of $2 million and noted this estimate should be taken with a heavy dose of salt because it is napkin math. AltaLink mentioned that as soon as there is talk of infrastructure being added into the field, the numbers go up to 6 figures per site, and that is not including the significant cost of the head-end. AltaLink also noted that meshing the system alone, without adding the interconnections, would be pushing against AESO's under $1 million estimate. AltaLink further clarified that not knowing who the market participants are and not knowing what is needed as a last-mile connection makes it difficult to come up with accurate numbers at this point. AltaLink stated that knowing that the Mesh Option is AESO's preferred option does give the TFOs a small place to start estimating.
- The AESO noted its expectation is, much like a connection project, market participants are responsible for reaching the edge of their network.
- AltaLink asked how the AESO expects to communicate this to market participants as AltaLink does not think they are aware of this requirement today.
- The AESO noted this is how all other services are provided, and that it received feedback from some already. It also noted that if this expectation and demarcation point is not clear in the rule or ID, the AESO will try addressing that.
- AltaLink noted that project costs may arise where existing folks are connecting through TELUS PBX to AltaLink. AltaLink asked how the AESO creates a project to put the last mile connection because this cannot be done using the existing infrastructure.
- The AESO explained that there are not that many new participants for AltaLink that will have this as a new requirement – Keephills, Sundance, Brazeau, Blackstart, and Lethbridge all are fine.
- AltaLink noted it was fine with receiving a list of market participants, who are affected by this, but in reference to Lethbridge, it currently has the connection optical fiber, but it does not currently have a

voice connect. AltaLink required clarification on exactly which market participants will be obligated under this rule to comply apart from the major participants.

- The AESO responded that it is limited to non-radial TFOs, and generators over 300 MW, and some that AESO has not provided in their presentation because they expect to be eligible for a variance. For example, Elk River Power is technically a TFO.
- EEC noted that it sounds like there is a discrepancy between what the AESO believes this will cost versus the market participants. EEC asked at what point does the cost outweigh the benefits of orderwire versus satellite, and if the AESO has a number in mind of what would be too much.
- The AESO confirmed it has not done the work to define that specific number, but from the reliability perspective and preparedness for a blackout emergency, having an effective backup especially for critical assets and safety is crucial. It has yet to see any specific numbers, but will address this issue once it receives more specifics from market participants.
- ATCO Electric asked if it is the AESO's expectation that the utility orderwire system will only serve generators at or above 300 MW.
- The AESO noted that it left this open such that smaller participants can connect if they so choose - similarly to how SCADA can be used today. However, it has only made it a requirement for the generators at or above 300 MW. The AESO has not discounted the smaller generators, but there is a cost for them to change, so the AESO is not sure how many market participants would be interested in having a utility orderwire system. The AESO stated that this is something that can further be analyzed.
- ATCO Electric noted that applicable rules for SCADA or teleprotection do not specify the architecture of the network that delivers them, rather the end availability that has to be achieved. It asked if it would be appropriate to have the same type of requirement for orderwire. ATCO Electric also inquired whether it should be left in the hands of the TFOs to determine what architecture is required to meet the availability.
- The AESO replied that the proposed new Section 502.17 itself does not specify architecture, however you can replace SCADA with PBX and it is essentially the same. The AESO noted it is merely presenting proposals and encourages TFOs to come up with their own architecture.

Stakeholder Concern 4 - Utility Orderwire Interoperability

- The AESO explained that there is a concern that if the AESO allows flexibility, market participants will have different systems; however, from its perspective there is no specific technology or vendor mandated to allow market participants flexibility. The AESO noted that there is a preference for packet-based exchange given scalability with PBXs and interconnects and that there are open standards that the AESO expects most equipment to support. The AESO suggested that in other cases it could always go back to legacy connectors which most systems would be able to connect. As for supporting legacy phones, there are converters for the four-wire or two-wire to connect to a packet system. The AESO's expectation is that reasonable effort is made to accommodate equipment, but upgrade to compatible phones may be required in some instances. The expectation for smaller TFOs and DFOs and generators is not a PBX to PBX connection, but just a phone on their desk which is much simpler and less complex than PBX to PBX communication. The AESO does recognize this as a challenge, but feels that there are ways of doing it, stating that while it does have complexity, the system will also be very effective and meet the AIES's needs.

Stakeholder Concern 5 – Extended Power Required for Intermediate Sites

- The AESO noted that it is proposing to update subsection 9(2) of its draft of the proposed new Section 502.17 to clarify that the requirement applies to equipment located within the control centre, which 9(1) specifies. The AESO noted that the proposed new Section 502.17 does not apply to all the substations. The expectation today is that intermediate sites have a minimum of 8 hours of battery backup, which is the understood good electric utility practice in Alberta and also consistent with the proposed requirement for the proposed new Section 502.11 of the ISO rules, *Substation Technical and Operating Requirements* ("Section 502.11").

- The AESO noted that there are longer hour requirements on the control centres, and this is for all backup systems, is longer because they are the central hub and more critical. The expectation for intermediate sites is less because they have alarming and there is control over the restoration and prioritization, so TFOs will know what intermediate sites batteries may fail or could be failing. The AESO noted that there are also a number of sites that do have backup generators today, which are alarmed and monitored. For the utility orderwire system, it is a network that TFOs have visibility of, and have direct control of where to send technicians if you know that a failure could happen. The AESO also noted that the proposed new Section 502.11 will cover substations, and telecommunication sites are a topic for a future communications rule.
- There was a discussion with ATCO Electric regarding specific utility orderwire connections.
  - ATCO Electric wanted clarification that if they have a utility orderwire connection to a Syncrude or Suncor control room, the effective holdover requirement for the orderwire connection to either of them is 8 hours.
  - The AESO confirmed that is the expectation. With 48 hours at the control centres the AESO wanted to ensure that the communication hubs have solid backup power and expect control centres already have backup power today, the requirement is for battery backup and generation (total fuel not required onsite), which should allow them to meet this requirement.
  - ATCO Electric noted it is struggling with the logic of how the proposed new Section 502.17 deals with the utility orderwire and asked why the requirement for the end points would be different than the intermediate sites.
  - The AESO stated that it understood, and noted that this topic can be given more thought. It further noted that 8 hours is not specified in the rule, it is just an expectation based on good utility practice. The AESO explained that only requirement for TFOs in the rule is 48 hours for control centres.
  - ATCO Electric requested clarification regarding the logic of battery requirements for the control centre versus the intermediate sites. Specifically ATCO Electric mentioned that since battery backup since control systems need 36 hours of battery backup while intermediate sites only 8 hours, in a blackout, after 8 hours the system won't work.
  - The AESO explained the numbers started off a bit different. Given the cost, the AESO doesn't want to apply 36 hours to all substations and intermediate sites although experience has shown that substations usually last longer and they have alarming and notifications that allow the TFOs to dispatch resources to the sites that are potentially going to lose power.

Stakeholder Concern 6 – Planned vs. Unplanned Outages

- The AESO explained that availability requirements are for *unplanned* voice communication system outages. The AESO is proposing that the definition of "availability" for the proposed new Section 502.17 follow the WECC guidelines, which is for just unplanned outages. It noted that in previous versions of the rule requirement it used "mean time to repair" as defined, but decided to use "availability" in order to give market participants flexibility in how they design and operate their systems.
- There were questions around alignment with SCADA requirements. Specifically,
  - AltaLink questioned if the AESO would consider aligning the 99.5% with SCADA instead of having it as a new number, because a lot of their circuits for non-TPR based connections are designed around SCADA requirements today, so this would bump that up and drive more cost.
  - The AESO noted it will consider this. One of the goals is to try to align implementation with current operational practices and to have things be fixed at the same level as existing services. The AESO then proceeded to present a rule visualization diagram, and noted that clarification around system availability. The expectation for any of the links is the lowest requirement of the two end points. The AESO gave the example of a TFO connection to a small generator using the TFO orderwire system, the availability target that the TFO would be required to meet is the lowest availability – 95%.
- There were questions around the value of backup power requirements.

- The AESO explained that its requirement for the backup power is related to the equipment that market participants have in their control room or control centre.
- ATCO Electric further noted that the backup voice communication is not the same as the primary voice communication and SCADA, which are used in real time to monitor and operate equipment. It noted that it is unsure that implementing a backup voice system requirement similar to SCADA adds value and is the most beneficial for the ratepayer since the control centre is only part of that communication system and without the rest of the network, market participants can't communicate elsewhere.

- There was a discussion around AltaLink's MPLS system and its availability. Specifically,
  - The AESO also noted that when the MPLS system went in, the availability was far higher than the numbers discussed today, and asked what is driving this.
  - AltaLink explained that the MPLS equipment itself is very solid, but what is being discussed here is the total physical links, so, for example if radio is being used, the path of the radio will add to the numbers. Fiber would easily clear requirements, but over some of the lower-capacity radios and less redundant services, they are designed in theory to meet SCADA requirements.
  - The AESO noted that the market participants with lower capacity will have lower requirements.
  - AltaLink further explained that sometimes they do not have voice at the same level of service as teleprotection relay (TPR).

Stakeholder Concern 7 – Utility Orderwire Responsibility

- The AESO explained the expectation is that the transmission operators will carry and support the voice services of other downstream market participants; market participants are responsible for infrastructure and equipment reaching upstream market participants and TFOs, as well as infrastructure and equipment they operate in their facilities; and joint use agreements and service agreements are handled between market participants. The AESO noted this is like any other service operating today.

Stakeholder Concern 8 – Utility Orderwire Operational Costs

- The AESO noted this topic was discussed earlier in the meeting, but outlined that TFOs recover operational costs in their GTA; and service fees are not charged for carrying services required for the operation of the AIES. With respect to service fees, the AESO explained that there is an AUC decision that makes this clear, and from the AESO's perspective, the utility telecom network is a transmission asset, so it is already paid for and it exists for the purpose of operating the system. The AESO further explained that operational impact to transmission operators would result in increased PBX usage, but the majority of the core infrastructure are already operationally covered.

Stakeholder Concern 9 – Utility Orderwire Implementation Costs

- The AESO explained that at this time there is no plan for a system project or direction, but the AESO is willing to discuss once it has more information from market participants.
- There was a discussion with AltaLink regarding its concern of having the requirements in a rule rather than a direction letter:
  - AltaLink requested a comment from the AESO with respect to its preference of having this as a rule as opposed to a direction letter/directive given the comments around budgetary cycles which affect the two major TFOs, AltaLink and ATCO Electric.
  - The AESO stated it prefers to have a rule because it ensures visibility especially for new market participants entering the market. In terms of timeline, the AESO considers this a way to address cost, by allowing market participants more time to prepare. The AESO also explained that components of the proposed new Section 502.17 are already in a rule, there is already momentum in terms of putting everything into a rule. Further, the AESO's approach is that requirements that are consistent and applicable across the industry normally go into a rule, versus more specific and individualized scenarios for which a directive is more appropriate. The AESO believes that concepts, like compliance and monitoring, belong in a rule. The AESO explained that in terms of

implementation costs, this will be treated the same as any other new rule being implemented that costs money – the costs are allocated on a rolling basis. The AESO noted that certainly there is an initial budgeting challenge with respect to startup costs, but on an ongoing basis this will be standard operation costs. The AESO further explained that it will request estimates from market participants in order for the AESO to make a more informed decision.

  - AltaLink reinforced its preference to have this as a directive as opposed to a rule because the orderwire is a net-new requirement, COM-001 and 002 today do not specifically call out orderwire for those services, and the existing COM-001 and 002, did not as formally put AltaLink, ATCO Electric, and potentially some others in a position of being a real service provider. AltaLink explained that for them this is a capacity increase, a new service and a new service provider model that it would adopt.
  - The AESO explained that COM-001 is not very prescriptive on what is needed other than "adequate communication" between parties, and the existing Section 502.4 is more prescriptive, and one of the backup options for the market participants is utility orderwire. It does not have an availability target, but is an existing backup voice option.
  - AltaLink clarified that the existing Section 502.4 does not have mandated orderwire.
  - The AESO confirmed it is not mandated. The existing Section 502.4 does not have a greater than 300 MW category, and it is not restricting satellite for people lower than 50 MW.
  - AltaLink also questioned if costs should be part of the Rate STS, *Supply Transmission Service*, charges instead of Rate DTS, *Demand Transmission Service*.
- There were clarifying questions regarding the AESO's view of operational ability.
  - ATCO Electric wanted clarification on what operational abilities the AESO would like this system to have for them. It noted the AESO mentioned a requirement for non-blocking ability to call generators at-will in high traffic scenarios. It noted that these kind of issues need to be specified before the estimating can begin. All different scenarios must be thought through as they need to be engineered into the system.
  - The AESO explained that specifying how many lines TFOs should have is beyond the scope of the rule of what the AESO can prescribe, it should really be up to the TFOs to explore how many lines they need and how big an interconnection pipe is when they are designing. The AESO noted it is interested to hear back how market participants propose this should be specified in a rule. This can be clarified in the ID as part of the "utility orderwire" definition.
- There was a question regarding grandfathering:
  - EEC asked if the AESO had considered any grandfathering strategies.
  - The AESO noted it considered grandfathering the rule early on, but from a reliability perspective, especially when it comes to the large generators and the interconnection of the TFOs, it was important to have a very effective backup. Therefore, the AESO made the decision not do have a grandfathering clause.

Final Questions, Thoughts, Comments

- The AESO asked attendees if they had any final questions, thoughts, or comments. The following comments were provided:
  - AltaLink noted it agrees with the objective of the proposed new Section 502.17, which is a highly available emergency voice network, however it is concerned about what they would have to do to make it a reality. AltaLink also reiterated that the way the proposed new Section 502.17 is written, each market participant could only assume responsibility for their own compliance. AltaLink asked why, as far as supporting a grander system goes, would AltaLink take on the operational compliance burden when it is not explicitly required of it to do so. AltaLink stated that it believes there is a lot of risk that the voice communication system will not come to fruition the way that everyone would like it to if it comes down to voluntarily accepting compliance and operational risk and uplift.

- The AESO noted that if the rule does not specifically call out the TFOs to provide the service in the manner that it should, it would be helpful to receive feedback on what should be added to the rule to meet the objective of the rule. The AESO noted that if it ends up with a "crisp" rule, it will help market participants justify their obligation to provide this service, and that the service and compliance are not optional.
- AltaLink noted that it is clearer now that the expectation is that downstream market participants will be responsible for the last mile infrastructure back to the TFO's point of presence, but they may not be aware of that responsibility or it may not be as clear right now.
- The AESO specified that when it is requesting feedback, even being able to identify the elements of the rule that may be missing, even if the AESO decides to go with a direction letter, that information will be helpful in their determination, as that information would still need to be included

- There was a discussion around the future of the proposed new Section 502.17.
  - AltaLink asked whether the requirements that pertain to greater 300 MW in the proposed new Section 502.17, would always be limited to this level, stating that TFOs would probably not get less connected over time, they most likely will grow. AltaLink stated that it is another reason the foundation for the proposed new Section 502.17 should be strong now.
  - The AESO noted it does not see this changing in the next 10-15 years, unless the big generators disappear and we get our generation from the smaller market participants, then the criteria may have to be reconsidered.
  - AltaLink also noted that AltaLink and ATCO Electric will be providing a service and from a liability perspective, their companies will need to be protected. Further, it noted that it would prefer a minimum number of PBX interconnects as they are difficult to maintain, complex and onerous, so it would be reasonable for it, as it is already connected to the AESO, to connect to ATCO, but not go beyond that since there are operational challenges.
  - The AESO noted that it considered EDTI and ENMAX not needing PBXs as they could get passed through. The idea is to implement this in the most cost-effective way for the ratepayer. The final architecture will be determined through further discussions between the TFOs and the ISO.

Additional Clarifications

- There was a discussion around the use of PBX connections and a request for further clarity on the meaning of Control Room for Generators. Specifically:
  - AltaLink expanded on limiting the PBX connections and provided examples of different connections, which would simplify the architecture, complexities and maintenance. It further requested clarification on what control centres mean for smaller market participants.
  - The AESO presented its meaning of control room for generators, which it plans to include in the ID, which was as follows: it is a location where an operator has direct control over a generating unit or facility; must be local to the generating unit or facility and should not depend on external commercial communications to operate and control the generating unit or facility; and is a designated area for controlling the generating unit or facility that would be actively manned and controlled during any of normal operating, maintenance, and emergency operating conditions. The AESO further stated that control centres have to meet the requirement of the total generation *excluding* wind. For instance, Pincher Creek, or TransAlta's wind farm (which has greater than 300 MW of wind) would not need orderwire because they are wind based. The AESO further explained this with a rule visualization diagram.
  - ATCO Electric noted it is unsure that the total MW from the ATCO Power control centre is more than 1000 MW, and not local ad asked how it would be classified.
  - The AESO explained that there are local control rooms and remote control centres, so if a market participant is managing a bunch of generation remotely, then the requirement is based on the total amount of generation the market participant is controlling at the control centre. The AESO further explained that if the market participant has 24-hour staff on-site, that will not be included even though the control room may be providing some dispatch or support.

- AltaLink requested further information on the idea for the backup control centres. For TransAlta, the emergency operations centre ("EOC") is not connected by utility owned infrastructure, so if they are controlling generation from that backup control centre, the expectation would be that there is orderwire, so that is an example of new infrastructure.
- The AESO noted that for the stated example, the market participant could look at applying for a variance.

- There was a discussion around rule compliance:
  - AltaLink wanted to know if there is a risk that the downstream market participant would say that paying for the last mile infrastructure is not their responsibility since it is being pushed as a "for the greater good" of the transmission. AltaLink asked if market participants have a mechanism to push back on complying with the proposed new Section 502.17 requirements.
  - The AESO explained that if requirements are in an ISO rule, market participants are *required* to comply and there is no grandfathering clause. Further explaining that market participants have an opportunity to provide feedback during consultation, but all market participants must comply with ISO rules once they are approved by the Commission.

Wrap Up and Next Steps

- The AESO noted that it will put together a list of questions and ask that market participants to provide comments. Specifically with respect to: implementation time; cost; added clarity in the rule; backup voice communication requirements; and demarcation line regarding responsibilities.
- The AESO explained that once feedback is received, it will review the feedback, and make changes to the proposed new Section 502.17, where appropriate.
- There was a discussion about next steps and whether or not there would be another stakeholder session:
  - The AESO stated that, if after receiving stakeholder feedback, it felt more discussion was needed, another consultation session would be held.
  - AltaLink and ATCO Electric agreed that another stakeholder session would be helpful.
  - The AESO also noted that if the written feedback was clear and no questions remained, it would move forward with posting the next draft of the proposed new Section 502.17, and would request formal written feedback on the formal draft of the rule.
  - The AESO reiterated that it is not ruling out another stakeholder session, however, encouraged stakeholders not to rely on that when providing comments, as there may not be one.
- ATCO Electric questioned if smaller market participants were aware of this session, and if they have a big enough telecom group to address these issues.
- The AESO explained their process of posting these notices of stakeholder sessions on their website, and it is assumed that all market participants, including the owner of generating facilities ("GFOs") are reviewing the notices.
- The AESO also noted it will provide a draft of the minutes to attendees for comments, finalize them, and post the final minutes to the AESO website. It also stated that it will post the presentation.