

**Development of Proposed New
Section 502.17 of the ISO rules,
*Voice System Communications
Requirements* (“Section 502.17”)**

July 9, 2019

Calgary Place

Slow alarm:

- Stand by
- Listen to announcements

Fast alarm:

- Evacuate to muster point

Muster point:

- Courtyard at 5th Ave Place

BP Centre

Slow alarm:

- Stand by
- Listen to announcements

Fast alarm:

- Evacuate to muster point

Muster point *South*:

- Courtyard at 5th Ave Place

Muster point *West*:

- Courtyard by Chinese Cultural Center

SCC

When alarm sounds:

- Proceed to Guard House
- Wait for further instruction
(From your fire captain or fire department)



User Name: A-Guest

Password: @Great\$YYC

Time	Agenda Item
9:00-9:10	Consultation Session Overview and Introductions
9:10-9:15	ISO Rule Development Process Overview
9:15-9:30	Overview of Current and Proposed Changes to Voice System Communication Requirements
9:30-10:30	Proposed New Section 502.17 and Stakeholder Feedback Review
10:30-10:45	Coffee Break
10:45-11:55	Proposed New Section 502.17 and Stakeholder Feedback Review (continued)
11:55-12:00	Next Steps

Consultation Session Overview and Introductions

Consultation Session Overview

Stakeholder Expectations

- All stakeholders:
 - This is your session to ask questions and provide feedback so please actively participate
 - One speaker at a time
 - Introduce yourself by stating your name and company
 - Your positions are not binding, but provide your input in good faith so we can work together to address the issues
- In-person attendees:
 - Raise your hand to speak and use the microphone
- Webinar attendees:
 - Please submit questions or comments using the question button

Consultation Session Overview

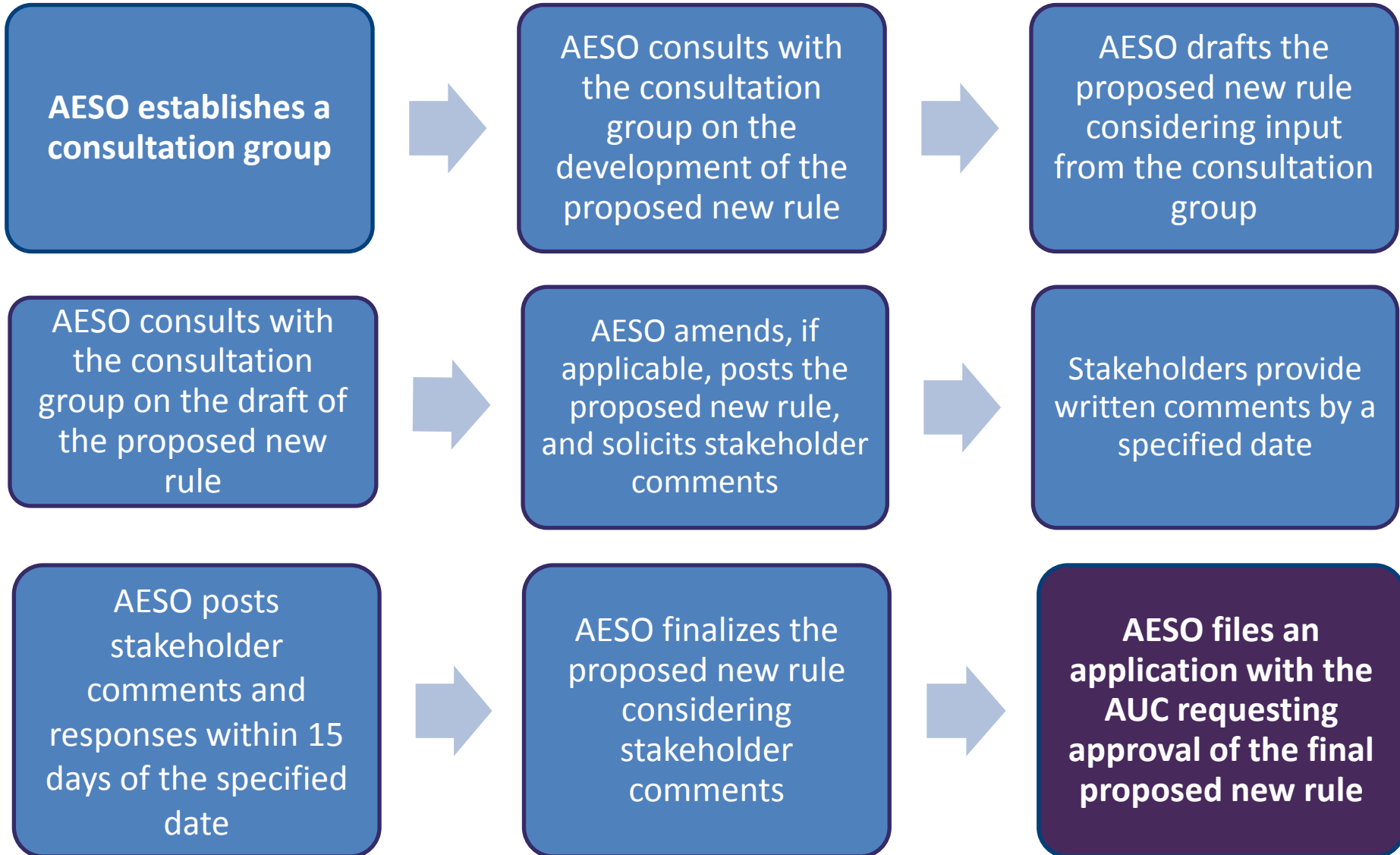
Meeting Minutes

- Session is recorded and will be used to assist in preparation of meeting minutes
 - Recording will be deleted after minutes are finalized
- Meeting minutes will be circulated for review and ultimately posted to AESO.CA
 - Company names will be incorporated where applicable
- Personal information is collected in accordance with section 33(c) of the *Freedom of Information and Protection of Privacy Act*
 - Questions or concerns can be directed to the Director, Information and Governance Services at 403-539-2528



Proposed New Section 502.17 ISO Rule Development Process

Current ISO Rule Development Process Overview





Voice System Communication Requirements Overview

Scope and Rationale of Proposed New Section 502.17

- Consolidates the voice communication requirements of Section 502.4 of the ISO rules, *Automated Dispatch and Messaging System and Voice Communication System Requirements*, and Alberta reliability standard COM-001, *Telecommunications*
- New and refined voice communication requirements
 - Control room and control centre voice requirements
 - ISO to market participant, and between market participants
 - Design and performance targets for voice communication
 - Extended power requirement for backup voice equipment
 - Restrictions on some backup system usage
- Changes made to ensure
 - Reliability and performance of critical voice services for AIES
 - Effective and independent backup voice communications
 - Preparedness during an extended power outage

Proposed New Section 502.17 and Stakeholder Feedback Review

- The AESO received feedback from: AltaLink Management Ltd. (“AML”), ATCO Electric Ltd. (“AE”), Suncor Energy Inc. (“Suncor”), TransAlta Corporation (“TransAlta”), ENMAX Power Corporation (“ENMAX”), and EPCOR Distribution and Transmission Inc. (“EPCOR”)
- The main topics of concern from Stakeholders were as follows:
 1. Utility orderwire definition
 2. Utility orderwire versus satellite
 3. Utility orderwire architecture
 4. Utility orderwire interoperability
 5. Extended power required for intermediate sites
 6. Availability – planned versus unplanned outages
 7. Utility orderwire responsibilities
 8. Utility orderwire operational Costs
 9. Utility orderwire implementation costs
 10. Extended time to comply

Stakeholder Concern 1

Utility Orderwire Definition

- AML, AE, and Suncor requested a definition for “orderwire”
- The AESO proposes to add a definition for “utility orderwire system” to an Information Document (“ID”)
- The proposed definition will include the following:
 - Leverages the utility telecommunication network infrastructure, including fibre, 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 fibre and tower access from 3rd party providers, where the active telecommunication equipment (router, radio, batteries, etc.) is controlled by the market participant
 - Can include redundant Private Branch Exchange (“PBX”) systems carrying utility orderwire and telecommunication services

Stakeholder Concern 2

Utility Orderwire Versus Satellite

- AML requested rationale for selection of utility orderwire over satellite network telephones for certain market participants:
 - Voice communications are critical to the operation and emergency preparedness of the Alberta interconnected electric system (“AIES”)
 - Utility orderwire system selected as the best backup given:
 - It is quick and effective dialing with dial tone
 - It has support for multiple lines and handsets
 - It has clear voice quality with no latency
 - In restoration event, field priority is utility controlled and aligned with restoration efforts
 - Known extended power capabilities and system alarming
 - Infrastructure specifically designed for power system operation

Stakeholder Concern 2

Utility Orderwire Versus Satellite

- Rationale for the selection of utility orderwire over satellite network telephones for certain market participants:
 - Satellite as a backup voice communication system has the following limitations:
 - Introduces voice latency challenge
 - Dial complexity (11+ digits)
 - No dial tone and connection delay (10-15 seconds)
 - Limited multiple line support
 - Multiple systems and multiple numbers
 - In major restoration events having too many users could inhibit the operator from calling out
 - Selection and restrictions in the proposed new Section 502.17 are done to ensure there is effective backup voice communications of key market participants in a blackout scenario

Stakeholder Concern 3

Utility Orderwire Architecture

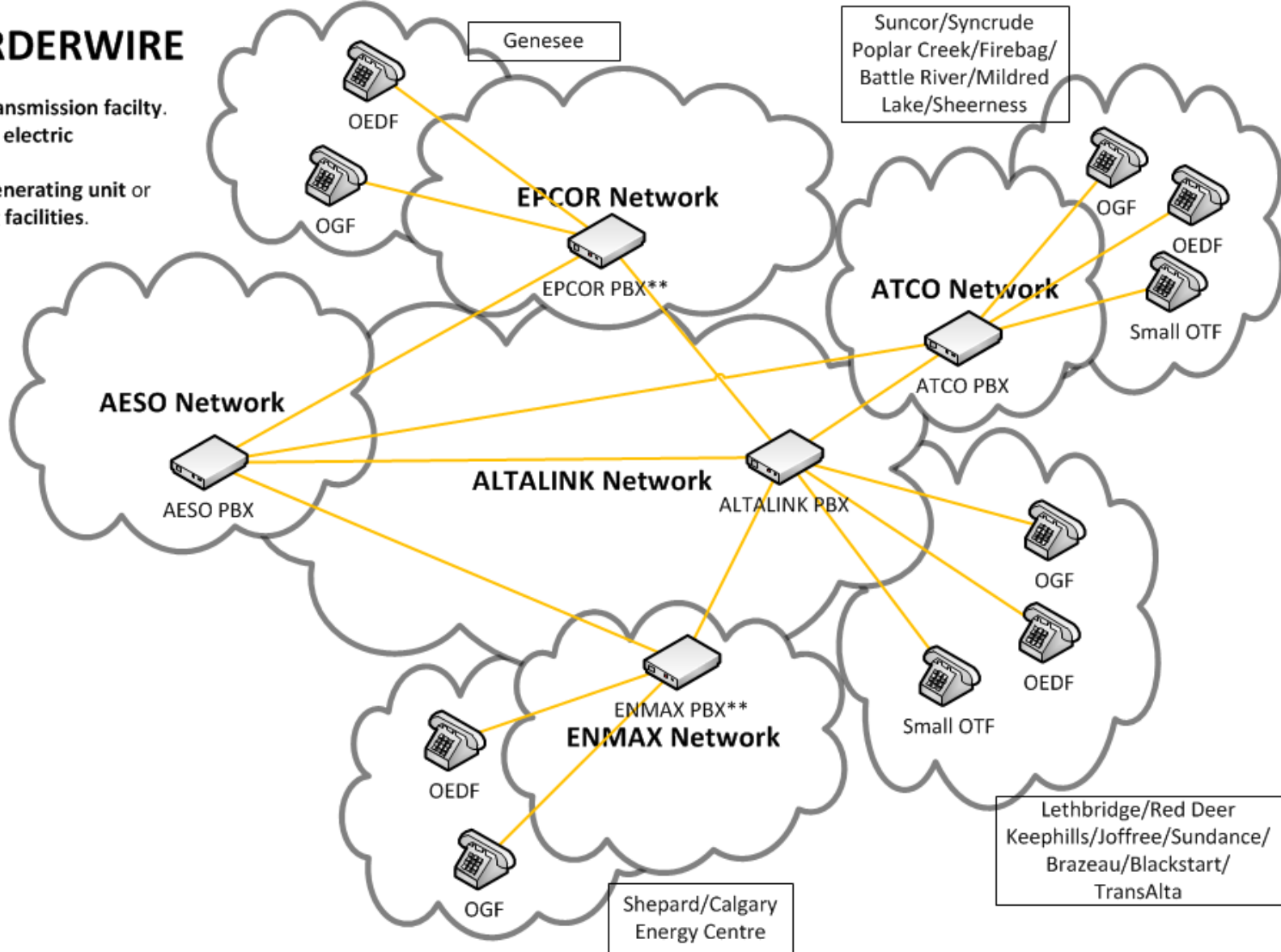
- AML and AE requested common understanding of the utility orderwire architecture:
 - Leverages the Utility Telecommunication Network
 - Core telecommunication infrastructure (microwave/fibre)
 - Carries critical power system services
 - Interconnect potential between most (or all) required parties
 - Several options evaluated by the AESO (next slides)
 - Same core telecommunication infrastructure regardless of option
 - Same physical interconnection points regardless of option
 - Primary difference is in the PBX and setup complexity
 - Considerations: reliability, complexity, troubleshooting, and cost

AESO's Preferred Orderwire Architecture Mesh Option



UTILITY ORDERWIRE

OTF – Operator of a transmission facility.
 OEDF – Operator of an electric distribution system.
 OGF – Operator of a generating unit or aggregated generating facilities.

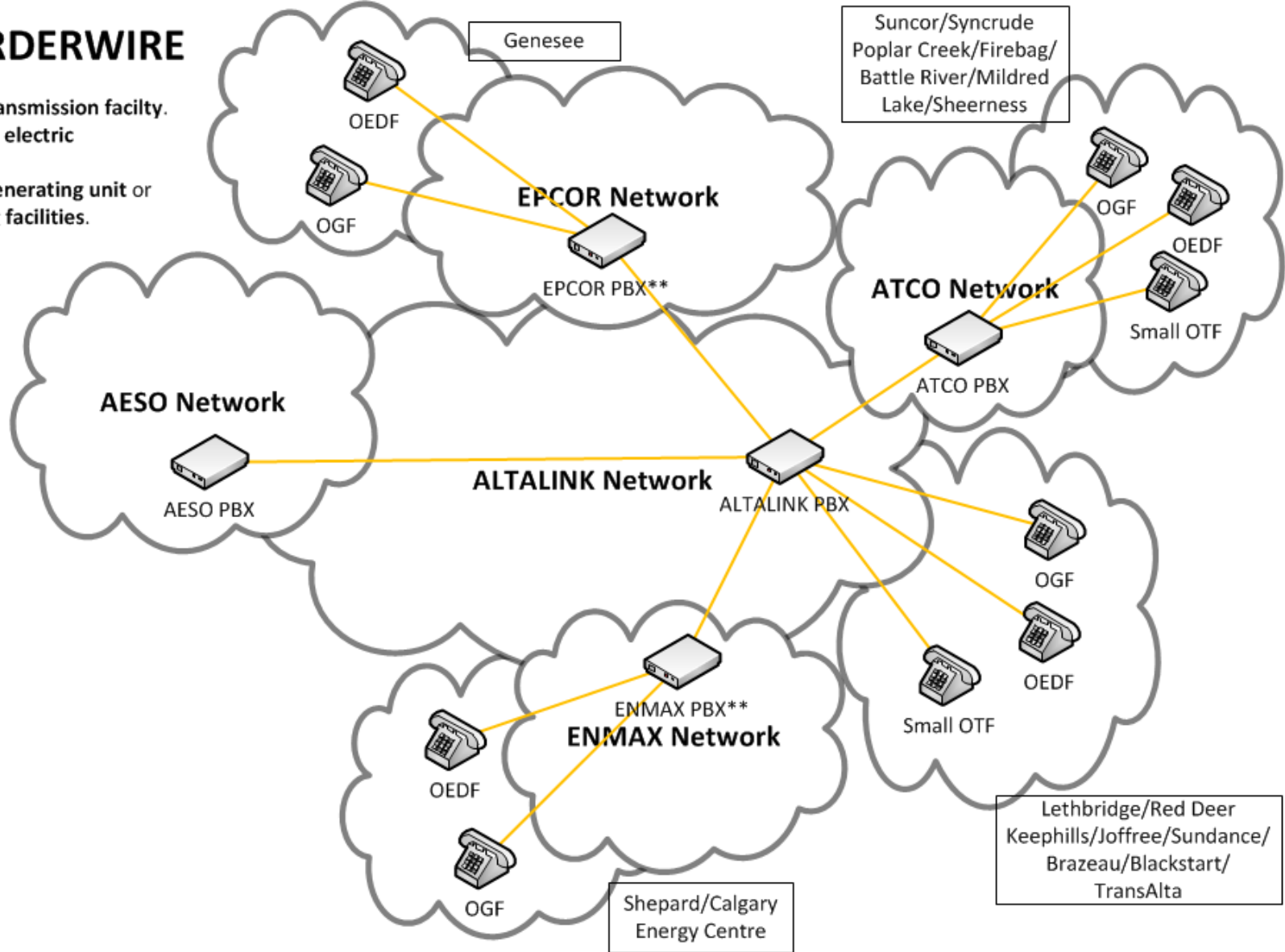


Other Considered Orderwire Architecture Operator of a Transmission Facility Hub Option



UTILITY ORDERWIRE

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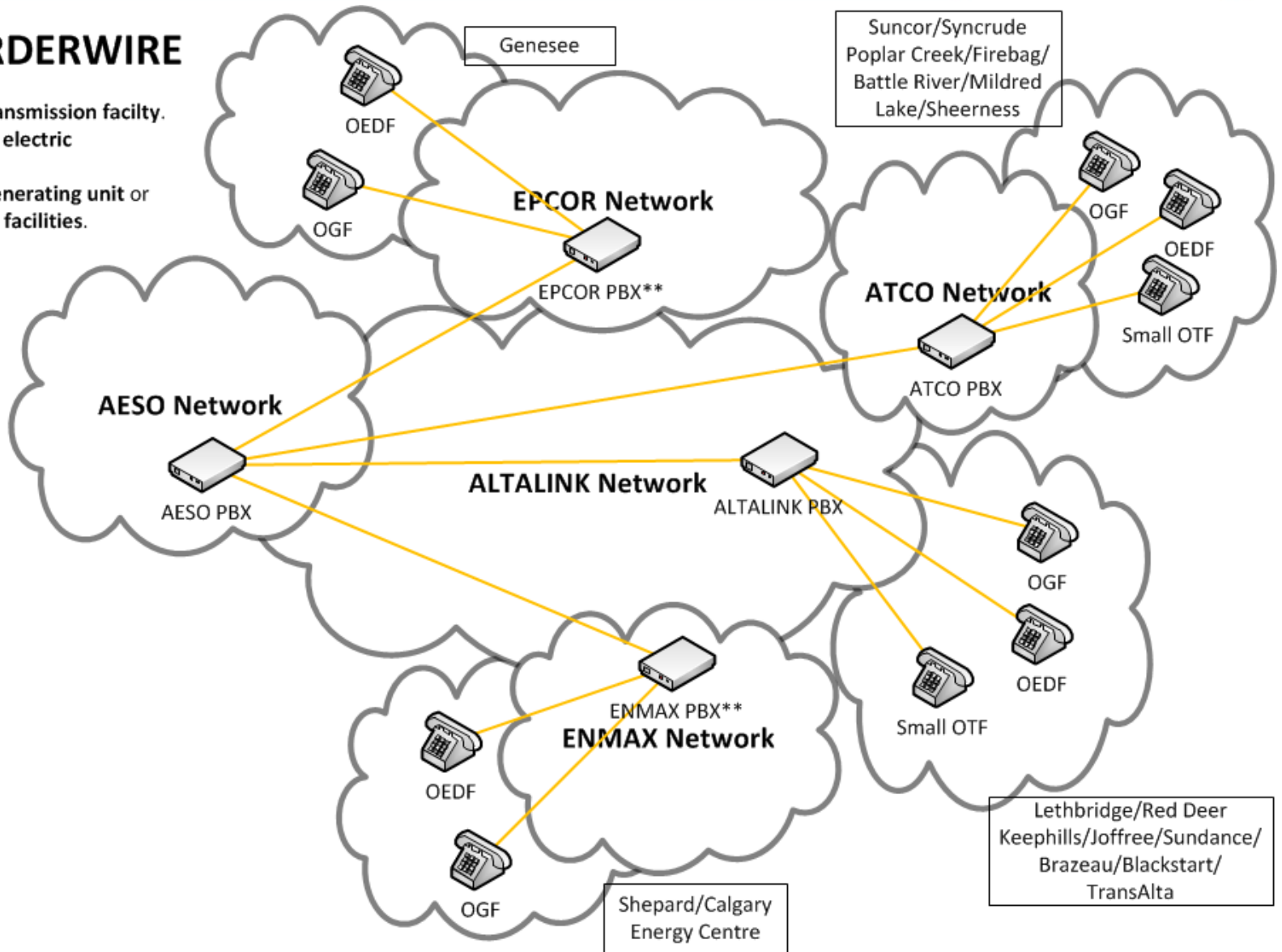


Other Considered Orderwire Architecture

AESO Hub Option

UTILITY ORDERWIRE

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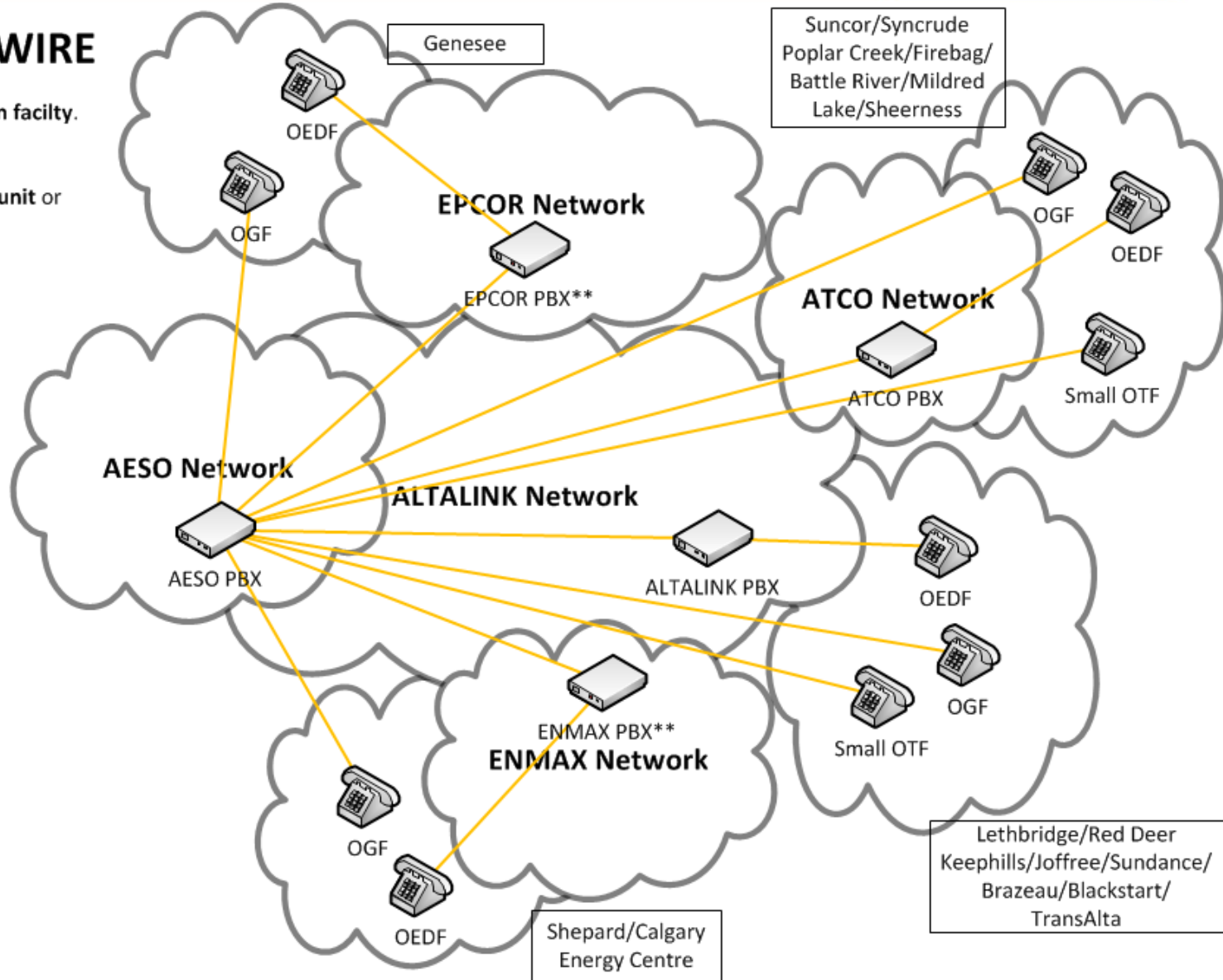
Ruled Out Orderwire Architecture

AESO Central Option



UTILITY ORDERWIRE

OTF – Operator of a transmission facility.
 OEDF – Operator of an electric distribution system.
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Stakeholder Concern 3

Utility Orderwire Architecture

- A common understanding of the utility orderwire architecture:
 - AESO's preferred utility orderwire architecture option is the Mesh Option
 - Best overall reliability with division of failure impacts
 - Lowest impact of planned and forced outages
 - Reasonable troubleshooting of network failures
 - Increased cost (in PBX interfaces and setup) anticipated to be relatively small



Stakeholder Concern 4

Utility Orderwire Interoperability

- AML and AE expressed concerns about interoperability and technology:
 - No specific technology or vendor is mandated by the AESO to allow flexibility
 - Preference for packet-based exchange given scalability with PBXs and interconnects
 - Interoperability specifics will depend on the systems involved
 - Open standard protocols available on most equipment
 - Time Division Multiplexing (“TDM”) exchange a possibility for challenging cases
 - Analog telephone adapters (“ATA”) for legacy phones/connections
 - Reasonable effort to accommodate equipment but upgrade to compatible phones in some instances

Stakeholder Concern 5

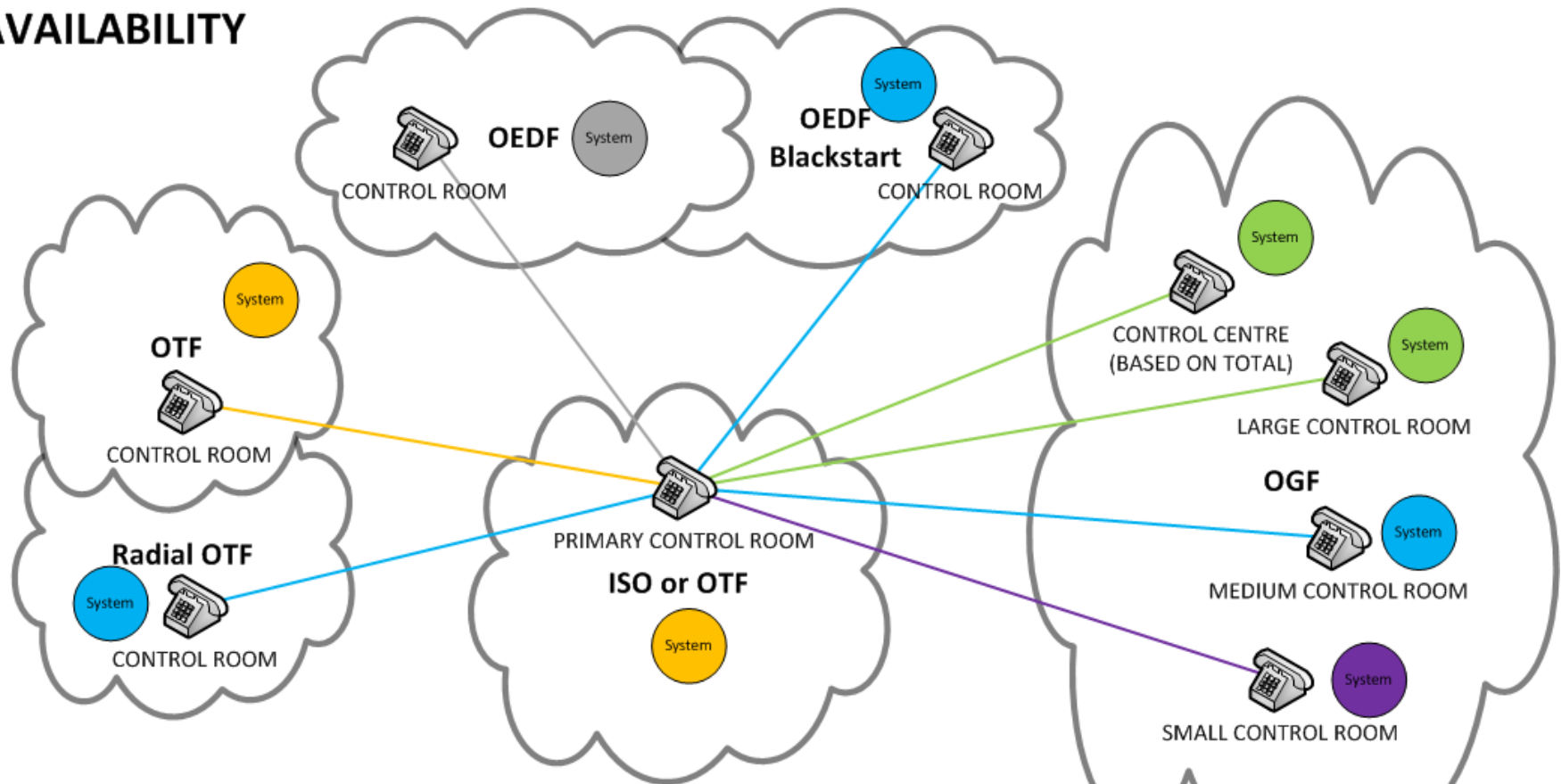
Extended Power Required For Intermediate Sites

- AML and AE requested clarification on the extended power needs of intermediate sites:
 - AESO is proposing to update subsection 9(2) to clarify that the requirement applies to equipment located within the control centre.
 - Expectation that intermediate sites have a minimum of 8 hours battery backup
 - Understood good electric utility practice in Alberta
 - Consistent with proposed requirement for the proposed new Section 502.11 of the ISO rules, *Substation Technical and Operating Requirements*
 - Monitoring of intermediate sites to enable restoration as needed

- AE requested clarification of availability for planned and unplanned outages:
 - The availability requirement is for unplanned voice communication system outages
 - The proposed definition of availability for the proposed new Section 502.17 will follow the WECC guidelines: *Communication System Performance Guide for Electric Protection Systems and Guidelines for the Design of Critical Communications Circuits.*
 - Mean time to repair and mean time before failure are selected by the market participant to meet the availability requirement

Rule Visualization

AVAILABILITY



- 99% / 99.5%
- 98% / 99.5%
- 97% / 99%
- 95% / 95%
- Undefined

OTF – Operator of a transmission facility.
OEDF – Operator of an electric distribution system.
OGF – Operator of a generating unit or aggregated generating facilities.

Stakeholder Concern 7

Utility Orderwire Responsibility

- AML requested better understanding of market participants responsibilities for utility orderwire:
 - Transmission operators will carry and support the voice services of other downstream market participants
 - Market participants responsible for infrastructure and equipment reaching upstream market participants
 - Market participants responsible for the infrastructure and equipment they operate in their facilities
 - Joint use agreements and service agreements are handled between market participants

Stakeholder Concern 8

Utility Orderwire Operational Costs

- AML requested discussion of associated operational costs:
 - Voice is a critical service required for the safe and reliable operation of the AIES
 - No different than other critical services (e.g., TPR, SCADA)
 - Transmission operators recover operational costs in their general tariff application (“GTA”)
 - Service fees are not charged for carrying services required for the operation of the AIES
- Operational impact to transmission operators:
 - Majority of the core infrastructure and PBXs are already operationally covered. Increased PBX usage.
 - Target for rule to align with existing practices which consider the criticality of the impacted facilities

- AML and AE requested discussion of implementation costs:
 - No system project or direction letter planned from the AESO at this time
 - Market participants responsible for reaching upstream market participants
 - Major transmission operators responsible for preparing PBXs and commissioning services
 - Cost of the utility orderwire changes estimated at <\$1M

Stakeholder Concern 10

Extended Time To Comply

- AML and AE requested clarification of utility orderwire time to comply:
 - Feedback received suggested 2 years to implement
 - Effective date of the rule suggested 3 quarters (9+ months) after AUC approval
 - Subsection 3(1) of proposed new Section 502.17 states that operators of transmission facilities “take up to 9 months from the effective date”
 - Subsection 3(2) of proposed new Section 502.17 states that operators of generating facilities “take up to 15 months from the effective date”
- Example timeline:
 - Assuming AUC approval January 1, 2020
 - Rule becomes effective October 1, 2020 (10 months)
 - Utility orderwire – operators of transmission facilities - July 1, 2021 (19 months from AUC approval)
 - Utility orderwire – operators of generating facilities - February 1, 2022 (25 months from AUC approval)

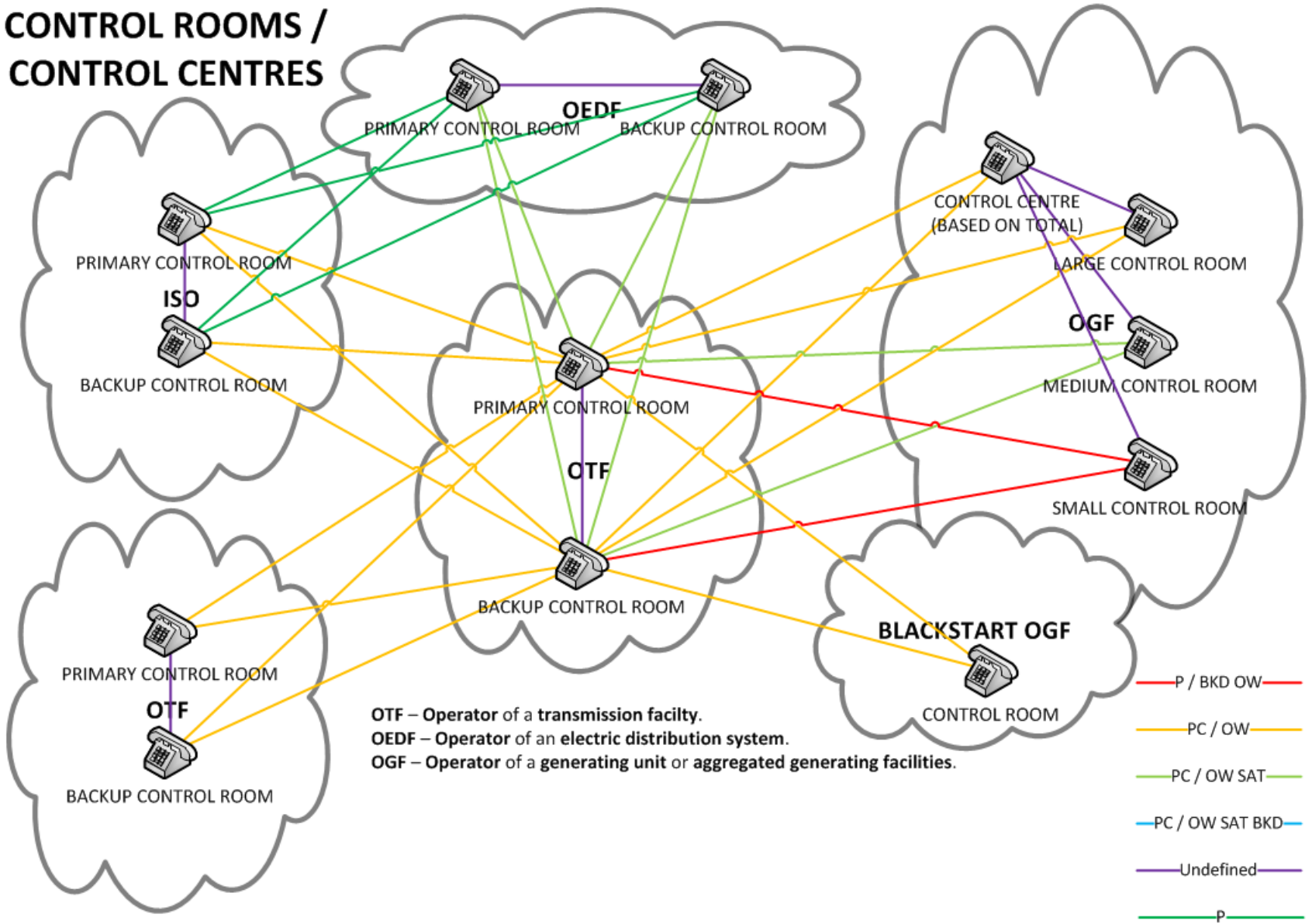


Next Steps

Thank you

Rule Visualization

CONTROL ROOMS / CONTROL CENTRES



- Meaning of Control Room for Generators
 - For the purposes of the proposed new Section 502.17, a control room is a location where an operator has direct control over a generating unit or facility
 - For direct control, the control room 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
 - A control room is a designated area for controlling the generating unit or facility that would be actively manned and controlling during any of the following conditions:
 - normal operating condition
 - maintenance condition
 - emergency operating condition

- Wind or Solar Aggregated Generating Facilities Without a Control Room
 - An operator of a wind or solar aggregated generating facility that does not have a control room located at the aggregated generating facility is not required to meet the voice communication requirements of the proposed new Section 502.17 at that aggregated generating facility
 - A control centre for these aggregated generating facilities still must meet the requirements of the proposed new Section 502.7