

Information Document

Determination of Rate STS, Rate DTS and Metering Levels for a Distribution Facility Owner

No. 2018-019T



Information Documents are not authoritative. Information Documents are for information purposes only and are intended to provide guidance. In the event of any discrepancy between an Information Document and any Authoritative Document(s)¹ in effect, the Authoritative Document(s) governs.

1 Purpose

This Information Document relates to the following Authoritative Document:

- Rate DTS of the ISO tariff, *Demand Transmission Service* (“Rate DTS”); and
- Rate STS of the ISO tariff, *Supply Transmission Service* (“Rate STS”).

The purpose of this Information Document is to provide information regarding the point of supply (“POS”) and point of delivery (“POD”) at which the AESO applies Rate STS and Rate DTS, respectively.

2 Background

The AESO has determined that additional clarity should be provided in regards to the appropriate contract capacity for Rate STS and Rate DTS for a distribution facility owner (“DFO”) at a substation, in light of an increase in distribution-connected generation, and the increasing number of system access service requests (“SASRs”) being received by the AESO from DFOs requesting system access service under Rate STS.

Rate STS currently applies to system access service at the point of supply, meaning that electricity flowing onto the transmission system is to be calculated and measured at the demarcation point between the transmission system and the applicable electric distribution system. The AESO considers the 25 kV distribution feeders exiting the substation to be transmission facilities, as defined in the *Electric Utilities Act*. As such, the AESO considers the demarcation point between the transmission system and an electric distribution system to be the 25 kV feeders exiting the substation.²

In the AESO’s view, there have been inaccurate assessments of contract capacity and metering levels for system access service under Rate DTS and Rate STS at substations due to the totalizing of system access service under Rate DTS and Rate STS at the 138 kV bus level or the high side of the transformer, instead of at the 25 kV feeder level.

Inaccurate contract capacity and metering levels for system access service under Rate DTS and Rate STS impact generating unit owner’s contribution (“GUOC”) payments, DTS billing determinants and substation fraction calculations. Substation fraction calculations are used in determining the allocation of connection costs as either demand or supply related, the appropriate DTS investment levels, and in calculating the monthly POD charge.

Therefore, the AESO is providing further clarity regarding how system access service for Rate STS and Rate DTS and metering levels should be calculated and measured, to ensure that: (i) the ISO tariff is applied correctly and consistently; and (ii) there is fair and consistent treatment between transmission and distribution-connected generation.

The AESO’s practice, outlined in section 3 below, is intended to ensure the following:

- Consistent and fair treatment between transmission and distribution-connected generation. Generally, whether generation connects to the transmission system or the electric distribution system, the impact on and the benefits received from the transmission system are the same.

¹ “Authoritative Documents” is the general name given by the AESO to categories of documents made by the AESO under the authority of the *Electric Utilities Act* and regulations, and that contain binding legal requirements for either market participants or the AESO, or both. AESO Authoritative Documents include: the ISO rules, the Alberta reliability standards, and the ISO tariff.

² Relevant provisions from the ISO tariff and *Electric Utilities Act* can be found in Appendix 2.

Similarly, the AESO considers that there should be no economic advantage that can be achieved by a generator that connects to the transmission system versus the electric distribution system, or vice versa. For example, a distribution-connected generator should not receive distribution derived transmission credits (resulting from totalizing Rate DTS and Rate STS), lower GUOC payments, or avoid a transmission remedial action scheme ("RAS") by virtue of it being connected to the electric distribution system. Any inconsistent tariff treatment between transmission and distribution-connected generators may lead to "tariff shopping" by generators in some circumstances.

- POD transmission facilities and costs, which historically have generally been utilized or incurred for load connections, can be reviewed such that the substation fraction (i.e., substation split between generation and load) at each POD is properly calculated to determine the impact on AESO investment and monthly POD charges.
- Contract capacity under Rate STS and Rate DTS, as well as the GUOC (which is based on the contract capacity for system access service under Rate STS), are reflective of the flow of electric energy onto or out of the transmission system (i.e., these flows are not totalized).
- For large additions of distributed-connected generation, the AESO requires feeder-level information for forecasting and planning purposes.

3 Determination of Rate STS and Rate DTS and metering levels for a DFO

The following practice will be applied by the AESO on a go-forward basis:

- A DFO contract for system access service under Rate STS will be based on the sum of the feeder flows into the 25 kV bus (i.e., the generation flows onto the transmission system).
- A DFO contract for system access service under Rate DTS will be based on the coincident sum of the feeder flows out of the 25 kV bus (i.e., the demand flows out of the transmission system).
 - The demand (under Rate DTS) and supply (under Rate STS) will be corrected so that demand and supply flows are not totalized at the POD (or transformer) level. The contract for system access service under Rate DTS and Rate STS and metering will be based on the flows at the feeder level. This will allow for correct contract capacity and metering levels for the purposes of correctly calculating and collecting the GUOC, customer contributions decisions ("CCD's"), assessing POD charges, and assessing bulk/regional charges.
- The AESO will complete planning studies for a SASR submitted by a DFO requesting system access service under Rate STS where the inflow onto the transmission system is greater than 5 MW. For purposes of any RAS requirements, a distribution-connected generator will be treated the same as a transmission-connected generator.

4 Implementation

The practice outlined in section 3 above will be implemented as follows (and is further summarized in Appendix 1).

4.1 Metering/STS/DTS

System access service under Rate STS and Rate DTS will not be totalized at a POD level.

A single contract for system access service under Rate DTS may cover all flows on feeders out of the substation, and a single contract for system access service under Rate STS may cover all flows on feeders into the substation, unless the DFO requests individual or multiple contracts at the feeder level.

New distribution-connected generation projects will be studied at minimum feeder load levels to determine expected maximum generation feeder flows onto the transmission system such that an appropriate contract capacity for system access service under Rate STS is established.

Most DFOs have appropriate metering installed at the feeder level such that the above may be implemented. However, where this is not the case, the AESO will consider an appropriate solution on a case-by-case basis.

All new measurement point definition records ("MPDRs") are designed to reflect the above metering configurations (i.e., metering at the feeder level). Appendix 3 provides a general depiction of how the metering configuration will be applied.

4.2 GUOC

The AESO will continue to calculate GUOC for a DFO based on the contract capacity for system access service under Rate STS. However, if the contract capacity for system access service under Rate STS changes solely as a result of this new practice (i.e., no actual new incremental generation is being added), no additional GUOC amounts would be assessed. For example, an incremental generation addition from 10 MW to 12 MW (and corresponding contract capacity increase for system access service under Rate STS from 10 to 12 MW) would result in an incremental GUOC payment based on 2 MW. Whereas, in the case where the contract capacity for system access service under Rate STS increases from 10 MW to 12 MW due to the summing of only the feeders serving generation (i.e., no new generation is added on the distribution system), no additional GUOC amounts would be assessed.

4.3 Substation fraction

In general, the substation fraction will only be adjusted to reflect the incremental contract capacity changes for system access service under Rate STS or Rate DTS due to a new SASR. For example, a contract capacity change that is the result of this new practice (i.e., no new SASR), consistent with the above, will not result in a new substation fraction calculation being applied.

4.4 DTS Billing and Construction Contribution Decision (CCD) investment levels

The adjustment of the substation fraction for a POD and POS may result in the adjustment of investment levels and monthly DTS billing. Generally, the addition of system access service under Rate STS to an existing substation may result in a reduction in the AESO investment level and a corresponding reduction in monthly DTS billing charges. Sample calculations are provided in Appendix 4 below.

In cases where the contract capacity for system access service under Rate STS increases at a POD (as a result of a contract capacity change or new contract) and there has been investment at the POD in the last 20 years, the eligible investment is reduced accordingly and the DFO will be required to refund part of the previously calculated investment.

5 The 2018 comprehensive ISO tariff application

In its 2018 comprehensive ISO tariff application, the AESO has proposed revisions to the ISO tariff to explicitly incorporate and address the practice described above.³ However, it is the AESO's view that the existing ISO tariff already supports the adoption of the practice.

Additionally, the AESO has proposed in its 2018 comprehensive ISO tariff application that:

- GUOC be paid by the legal owner of a distribution-connected generator (rather than the DFO) and based on the maximum capability of that generator (i.e., GUOC would no longer be based on the DFO contract capacity for system access service under Rate STS); and
- DFOs be required to provide additional, detailed information with regards to distribution-connected generator that is connected to each distribution feeder.

³ Alberta Utilities Commission Proceeding 22942, Exhibits X0002.01 and X0014.01.

Revision History

Posting Date	Description
2018-05-03	Initial release

Appendix 1: Implementation Plan

	Timing	MPDR	Contract capacity DTS/STS	GUOC	Substation Fractions (SF)
Current Substation Configuration	Status Quo Today	Existing MPDRs were on substation or transformer basis.	<ul style="list-style-type: none"> DTS/STS totalized at the POD (substation level) or transformer level; one or multiple STS per substation, and STS contract may not be reflective of energy flow on to the transmission system as it is totalized with DTS. 	<ul style="list-style-type: none"> GUOC based on STS contract capacity, and GUOC paid by DFO. 	<ul style="list-style-type: none"> Based on contract capacity for STS and DTS.
Active SASR	SASR received prior to 2018/05/15 As per AESO's project list: <ul style="list-style-type: none"> If the project changes its ISD greater than 1 year from the ISD then the project will be considered a "New SASR" for DTS/STS contract and metering purposes. If the project changes its size or location, then the project will be considered a "New SASR" for DTS/STS contract and metering purposes. 	The AESO is continuing to evaluate this aspect of the practice.	<ul style="list-style-type: none"> DTS/STS totalized on a transformer basis; one or multiple STS per substation; and STS contract may not be reflective of energy flow on to the transmission system as it is totalized with DTS. 	<ul style="list-style-type: none"> GUOC based on STS contract level; GUOC paid by DFO; and If there is an existing STS at the POD, GUOC will only be paid on the incremental generation added. 	<ul style="list-style-type: none"> DTS Monthly POD Charge and Customer Contribution (CCD) based on incremental contract capacity for DTS and STS.
New SASR (new practice, outlined in section 3 above, is applicable)	SASR received on or after 2018/05/15	All new or Revised MPDRs will be on feeder basis, adjustments may be required for sites with existing STS.	<ul style="list-style-type: none"> One or multiple separate DTS/STS per substation STS separately totalized on feeder basis; and DTS separately totalized on feeder basis. 	<ul style="list-style-type: none"> GUOC based on STS contract level; GUOC paid by DFO; and If there is an existing STS at the POD, GUOC will only be paid on the incremental generation added. 	<ul style="list-style-type: none"> DTS Monthly Connection Charge and Customer Contribution (CCD) based on incremental contract capacity for DTS and STS.

Appendix 2: Relevant Excerpts from the ISO Tariff and the Electric Utilities Act

ISO Tariff

The relevant provision from Rate STS of the ISO Tariff includes:

Applicability

1(1) Rate STS applies to **system access service** provided at a **point of supply** to:

- (d) the **legal owner** of an **electric distribution system** where a **generating unit** or an **aggregated generating facility** connected to the **electric distribution system** results in electricity flowing into the **transmission system**; or

Electric Utilities Act

The relevant definitions from the *Electric Utilities Act* include:

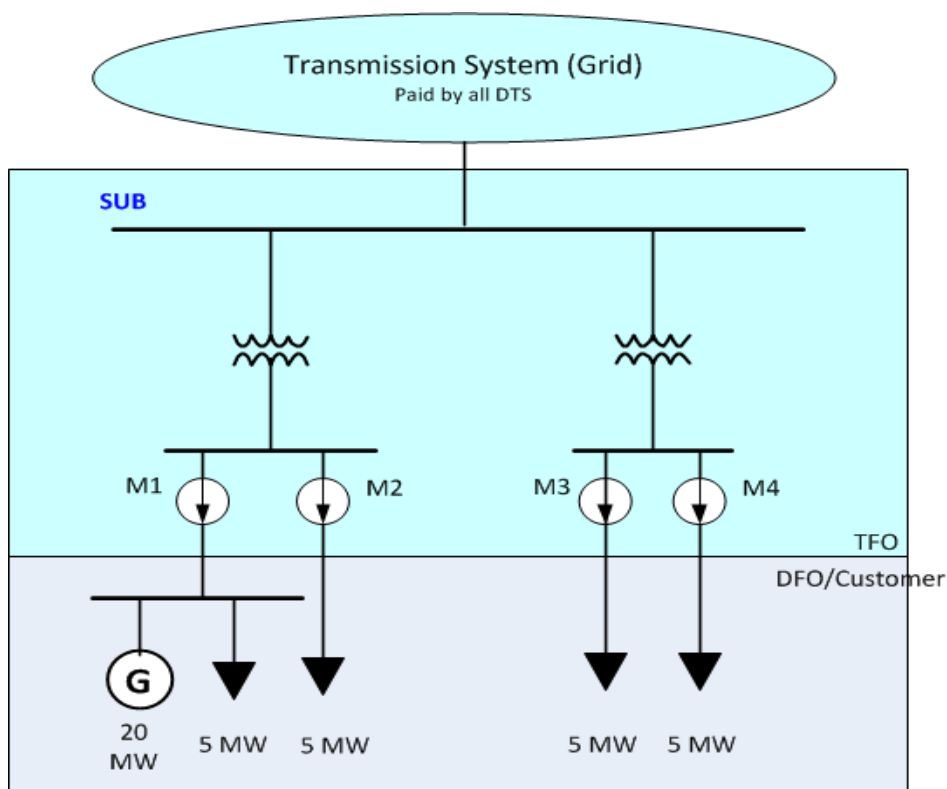
1(1)(m) “electric distribution system” means the plant, works, equipment, systems and services necessary to distribute electricity in a service area, but does not include a generating unit or a transmission facility.

1(1)(ccc) “transmission system” means all transmission facilities in Alberta that are part of the interconnected electric system.

1(1)(bbb) “transmission facility” means an arrangement of conductors and transformation equipment that transmits electricity from the high voltage terminal of the generation transformer to the low voltage terminal of the step down transformer operating phase to phase at a nominal high voltage level of more than 25 000 volts to a nominal low voltage level of 25 000 volts or less, and includes

- (i) transmission lines energized in excess of 25000 volts,
 - (ii) insulating and supporting structures,
 - (iii) substations, transformers and switchgear,
 - (iv) operational, telecommunication and control devices,
 - (v) all property of any kind used for the purpose of, or in connection with, the operation of the transmission facility, including all equipment in a substation used to transmit electric energy from
 - (A) the low voltage terminal,
 - to
 - (B) electric distribution system lines that exit the substation and are energized at 25 000 volts or less,
 - and
 - (vi) connections with electric systems in jurisdictions bordering Alberta,
- but does not include a generating unit or an electric distribution system.

Appendix 3: Metering Configuration



Rate STS:

The new formula for distribution generation flow will be as follows:

$$\text{MPXSTS} = \{G1\}(-M1) + \{G2\}(-M2) + \{G3\}(-M3) + \{G4\}(-M4)$$

- If $M1 < 0$, $\{G1\} = 1$; Otherwise, $\{G1\} = 0$
- If $M2 < 0$, $\{G2\} = 1$; Otherwise, $\{G2\} = 0$
- If $M3 < 0$, $\{G3\} = 1$; Otherwise, $\{G3\} = 0$
- If $M4 < 0$, $\{G4\} = 1$; Otherwise, $\{G4\} = 0$

Rate DTS:

The new formula for load will be as follows:

$$\text{MPXDTS} = \{L1\}(M1) + \{L2\}(M2) + \{L3\}(M3) + \{L4\}(M4)$$

- If $M1 > 0$, $\{L1\} = 1$; Otherwise, $\{L1\} = 0$
- If $M2 > 0$, $\{L2\} = 1$; Otherwise, $\{L2\} = 0$
- If $M3 > 0$, $\{L3\} = 1$; Otherwise, $\{L3\} = 0$
- If $M4 > 0$, $\{L4\} = 1$; Otherwise, $\{L4\} = 0$

Appendix 4: Sample calculation of investment level and monthly DTS billing

Examples:	No Rate STS	Addition of Rate STS	Notes
Example 1 - Addition of 30 MW Rate STS			
<u>Contribution/Investment</u>			
Project cost	\$ 7,390,016	\$ 7,390,016	
Less for replaced transformer (RCN)	\$ (1,400,000)	\$ (1,400,000)	
Participant-related costs	\$ 5,990,016	\$ 5,990,016	
DTS (MW)	39.3	39.3	
STS (MW)	-	30.0	30 MW STS added
Load Factor	93%	93%	
Investment	\$ 2,340,800	\$ 1,559,250	
Construction Contribution Required	\$ 3,649,216	\$ 4,430,766	\$ 781,550 Additional contribution required when STS added (i.e investment level is reduced)
<u>Monthly DTS Bill</u>			
DTS Bill (per month)	\$ 503,000	\$ 483,754	\$ (230,952) Annual reduction with STS added
			3 Year simple pay back
Example 2 - Addition of 10 MW STS			
<u>Contribution/Investment</u>			
Project cost	\$ 7,390,016	\$ 7,390,016	
Less for replaced transformer (RCN)	\$ (1,400,000)	\$ (1,400,000)	
Participant-related costs	\$ 5,990,016	\$ 5,990,016	
DTS (MW)	39.3	39.3	
STS (MW)	-	10.0	10 MW STS added
Load Factor	93%	93%	
Investment	\$ 2,340,800	\$ 1,964,560	
Construction Contribution Required	\$ 3,649,216	\$ 4,025,456	\$ 376,240 Additional contribution required when STS added (i.e investment level is reduced)
<u>Monthly DTS Bill</u>			
DTS Bill (per month)	\$ 503,000	\$ 495,538	\$ (89,546) Annual reduction with STS added
			4 Year simple pay back