CURTAILMENT OF TRANSMISSION AND ENERGY

In this Section:

1.0 OVERVIEW

Curtailment of Ttransmission ~~service~~ Service occurs when an emergency or other unforeseen condition and/or commercial activity threatens to impair or degrade the reliability of the transmission system. Curtailments will be made on a non-discriminatory basis to relieve the constraint.

An Economic Interruption of Ttransmission Sservice occurs, up until the end of Real Time scheduling (see ~~Section 10 of~~ BC Hydro's OATT Business Practice on *Submitting Energy Schedules*), when:

1. a valid, higher class ~~t~~Transmission ~~r~~Reservation interrupts a lower-class ~~t~~Transmission ~~r~~Reservation; or
2. a Non-Firm Ttransmission R~~r~~eservation is purchased from unused capacity of Firm ~~transmission~~ Transmission Service and the Firm ~~transmission~~ Transmission Service owner schedules on their rights.

~~2.~~

BC Hydro reserves the right to interrupt Transmission Services~~,~~ in whole or in part. For ~~E~~example: Firm Point-to-Point (PTP) ~~t~~Transmission ~~s~~Service can interrupt Network Economy Transmission ~~s~~Service, Non-Firm Transmission ~~s~~Service and Secondary Transmission ~~s~~Service. BC Hydro does not charge for the ~~t~~Transmission ~~r~~Reservation if an economic interruption occurs.

These Business Practices provide clarification of the rules, standards and practices used by BC Hydro to implement its Open Access Transmission Tariff (OATT)~~OATT~~. While the terms of BC Hydro's OATT and these Business Practices govern, the Transmission ~~c~~Customers should also refer to the NAESB WEQ Business Standards and WECC Regional Criteria, which BC Hydro has followed in most, but not all respects. BC Hydro also complies with the Mandatory Reliability Standards adopted by the BCUC.

2.0 SCHEDULING LIMIT (SL)

The SL of a path is the primary determinant on whether ~~or not~~ curtailment to transmission is required. The formula to determine SL is as follows:

$SL = TTC – TRM_u$

Where TTC is the Total Transfer Capability and TRM_u is the Transmission Reliability Margin Unreleased. Refer to BC Hydro's OATT Business Practice on *TTC/ATC* for further information. ~~Counterflow is energy scheduled and flowing on the opposite path.~~

An infringement ~~upon SL can~~ occurs when the amount of energy scheduled on a path is greater than the SL. ~~for a path and cannot be accommodated while including counterflow energy. Total energy scheduled > SL + counterflow = infringement upon SL~~

3.0 CURTAILMENT PRIORITY - TRANSMISSION

At xx:40 if there is an infringement upon SL for the next scheduling hour or if there is a condition that degrades the reliability of the transmission system and causes an infringement upon SL, BC Hydro will proceed with alleviating the infringement by issuing a Reliability Limit to the appropriate Ttransmission Rreservations. This may also lead to the curtailment of energy schedules.

NAESB e-Tag 1.8 Functional Specification defines Reliability Limit as the highest MW level at which a transaction should be permitted to run based on system reliability considerations. This limit is typically used to indicate curtailments.

BC Hydro will assign Rreliability Llimits based on ~~transmission~~ Transmission ~~service~~ Service priority. All ~~non~~Non-~~F~~firm ~~–~~ Ttransmission R~~r~~eservations including Network Economy Service (Type 2) will be assigned Reliability Limits before any ~~f~~Firm ~~t~~Transmission ~~r~~Reservations. Reliability Limits will be assigned until the infringement upon SL is resolved.

Within each priority group, the Reliability Limit will be assigned ~~according to P~~pro-rata. ~~as applicable – refer to Section 3.1 below.~~ If a Reliability Limit is assigned to a ~~transmission~~ Transmission ~~reservation~~Reservation, the Transmission Customer can select the Impacted MW link on the ~~CONFIRMED TSR~~Transmission Reservation on OASIS to review the details.

~~3.1~~ Transmission Service Curtailment Priority by priority groups is as follows:

Transmission Service Priority Group

- ~~Secondary PTP: Pro-rata~~
- ~~Non-Firm and Network Economy (Type 2): Pro-rata~~
- ~~Network Economy (Type 1) and Conditional Firm (Conditional Period): Pro-rata~~
- ~~Firm and Conditional Firm (Non Conditional Period): Pro-rata~~

- Secondary PTP
- Non-Firm and Network Economy (Type 2)
- Network Economy (Type 1) and Conditional Firm (Conditional Period)
- Firm and Conditional Firm (Non Conditional Period)

First to Curtail (Lowest Priority)
↓
Last to Curtail (Highest Priority)

4.0 CURTAILMENT PRIORITY - ENERGY

e-Tags with the Reliability Limit issued on transmission will be curtailed Last-In-First-Out (LIFO) according to the Product code and cut priority set by the PSE (Purchasing-Selling Entity) on each e-Tag. For e-Tags with no assigned PSE cut priority order or for e-Tags of like assigned PSE priority order, BC Hydro will curtail by LIFO.

Refer to BC Hydro's OATT Business Practice on *Submitting Energy Schedules* for Energy Product Codes and PSE assigned Cut_Priority order for e-Tags.

BC Hydro will prioritize e-Tags as follows when curtailment is required:

Interruptible / Recallable (G-NF)
Normal / Uninterruptible (G-F, G-FC, G-FP, G-F1, G-EX)
Reserves / Capacity (C-SP, C-NS, C-RE)
Dynamic (NSPIN, REPL, INC, DEC, SPIN, REGUP, REGDN)

~~Lowest Priority~~First to Curtail (Lowest Priority)
↓
~~Highest~~ Last to Curtail (Highest Priority)~~Priority~~

For example:

~~TSR~~ ARef 1 is 100 MW with the following e-Tags scheduled against the ~~TSR~~Transmission Reservation:

e-Tag 1 (G-NF) is for 25 MW
e-Tag 2 (G-F) is for 25 MW; "Cut_Priority" = 1
e-Tag 3 (G-F) is for 25 MW; "Cut_Priority" = 2
e-Tag 4 (G-F) is Dynamic

At xx:40, a Reliability Limit is set to ~~TSR~~ ARef 1 for 55 MW and curtailment of energy schedules is required. BC Hydro will curtail the e-Tags as follows (based on the priorities discussed above):

e-Tag 1 is curtailed for 25 MW
e-Tag 3 is curtailed for 20 MW

~~If energy curtailment(s) results in an infringement upon SL on the Counterflow path, BC Hydro will assign a Reliability Limit to the appropriate transmission on the Counterflow path.~~ BC Hydro will assign the Reliability Limit in accordance with the transmission curtailment priority defined in Section 3 above.

If BC Hydro, as the ~~l~~Load ~~Control~~ control ~~Area~~ area or ~~Generating~~ generating ~~Control~~ control ~~Area~~ area curtails energy, it will send out a Reliability Adjustment (Curtailment) e-Tag pursuant to industry rules.

5.0 CURTAILMENT PROCESS

At xx:40, BC Hydro ~~will~~ recalls all unscheduled Network Economy Service (Type 1 and 2 ~~priority~~). BC Hydro ~~will~~ then determines if an infringement upon SL exists for each path for the next scheduling hour.

If there is no infringement upon the SL, then a Reliability Limit is not required for ~~transmission~~ Transmission ~~reservations~~Reservations (i.e. no curtailment occurs).

If there is an infringement upon the SL, then the following ~~will occur~~steps occur:

1. BC Hydro ~~will~~ assigns Reliability Limits on ~~transmission~~ Transmission ~~reservations~~ Reservations according to the priority defined in Section 3 ~~above~~.
2. Within each transmission priority group, BC Hydro assigns Reliability Limits ~~will be assigned~~ to ~~transmission~~ Transmission ~~r~~Reservations according to Pro-rata as applicable ~~– refer to Section 3.1 above~~ per Section 3.0 until the infringement upon SL is resolved.~~.~~

~~3. Reliability Limits will be assigned until the infringement upon SL is resolved.~~

~~4.~~3. If total energy scheduled exceeds the SL, BC Hydro will curtail e-Tags to the Reliability Limits assigned to the ~~t~~Transmission ~~r~~Reservation(s) per Section 4.0. ~~Curtailment of eTags will be performed according to the Product Code and PSE defined Cut_Priority (noted in Section 4 above) within each transmission reservation.~~

~~5.~~4. If the total of the curtailed energy is below the SL, BC Hydro ~~will~~ re-allocates, on a pro-rata basis, the unscheduled capacity of ~~t~~Transmission ~~r~~Reservation(s) to energy schedules that were to be curtailed~~.~~; ~~T~~therefore allowing the sum of ~~total~~ MW on the impacted energy schedules to equal the SL limit-, and in some instances, e-Tags to be above the Reliability Limit of the ~~t~~transmission.

Example:

- SL = TTC – TRM_u = 100 MW
- Energy schedules = 280 MW ~~and Counterflow = 0 MW~~
- Transmission ~~r~~Reservations total 500 MW for this path
- Reliability Limits are assigned to ~~t~~Transmission ~~r~~Reservations so that the total capacity of the T~~t~~ransmission ~~r~~Reservations equals the SL. (Step 1 and Step 2)
- ~~■~~

~~TSR~~ Transmission Reservation Priority (per Section 3 above)	Original Capacity	Curtailment
	Transmission (MW)	Transmission Reliability

		Limit (MW)
~~TSR~~ ARef 8 – Non-Firm	25	0
ARef ~~TSR~~ 4 – Network Type 2	50	0
ARef ~~TSR~~ 1 – Non-Firm	50	0
ARef ~~TSR~~ 2 – Firm	50	13
ARef ~~TSR~~ 3 – Firm	150	40
ARef ~~TSR~~ 5 – Firm	25	7
ARef ~~TSR~~ 6 – Firm	100	27
ARef ~~TSR~~ 7 - Firm	50	13
TOTAL	500	100

- Energy Schedules total 280 MW and therefore exceeds SL. (If total energy schedules had been equal to or below 100 MW, no e-Tags would need to be curtailed).
- ~~E~~e-Tags with Reliability Limits assigned to ~~transmission~~ Transmission Reservations will be curtailed to the Reliability Limit.
- However, the new energy schedules total is 93 MW, which is below the SL of 100 MW (Step 3).
- ARef ~~TSR~~ 6 has unscheduled capacity (7 MW). The 7 MW is reallocated on a pro-rata basis to the e-Tags that were curtailed. This results in the final curtailment to the e-Tags (Step 4).

~~TSR~~ Transmission Reservation Priority (per Section 3 above)	Transmission Reliability Limit (MW) (Steps 1 and 2)	Original Energy (MW) in Curtailment Priority	~~Projected~~ Initial Energy Curtailed To Reliability Limit (MW) (Step 3)	Final Energy Curtailed To SL (MW) (Step 4)
ARef ~~TSR~~ 8 – Non-Firm	0	e-Tag 1 = 25	0	0
ARef ~~TSR~~ 4 – Network Type 2	0	e-Tag 2 = 50	0	0
ARef ~~TSR~~ 1 – Non-Firm	0	e-Tag 4 = 20 e-Tag 3 = 25	0	0
ARef ~~TSR~~ 2 – Firm	13	e-Tag 11 = 20 e-Tag 5 = 20	e-Tag 11 = 0 e-Tag 5 = 13	e-Tag 11 = 0 e-Tag 5 = 14
ARef ~~TSR~~ 3 – Firm	40	e-Tag 6 = 50	e-Tag 6 = 40	e-Tag 6 = 44
ARef ~~TSR~~ 5 – Firm	7	e-Tag 7 = 10 e-Tag 8 = 10 (same priority)	e-Tag 7 = 0 e-Tag 8 = 7	e-Tag 7 = 0 e-Tag 8 = 8
ARef ~~TSR~~ 6 – Firm	27	e-Tag 9 = 20	e-Tag 9 = 20	e-Tag 9 = 20
ARef ~~TSR~~ 7 - Firm	13	e-Tag 10 = 35	e-Tag 10 = 13	e-Tag 10 = 14
TOTAL	100	280	93	100

5.1 Current Hour Curtailments

Following an energy curtailment, BC Hydro will confirm the new Net Scheduled Interchange with the adjacent Balancing Authorities.

If an energy schedule is curtailed across the hour (current hour to next hour) and/or days, the integrated energy value will be calculated for both hours.

> Example: A 100 MW schedule for HE 24 and HE 01 the next day is curtailed effective time 23:59 with ramp duration of 20 minutes. The integrated energy values will be calculated for both HE 24 and HE 01.

Transmission Customer notification of all energy curtailments will be made available electronically using e-Tag information.

6.0 CURTAILMENT OF LOSSES

If BC Hydro curtails a Transmission Customer's Losses e-Tag, the Transmission Customer will not be assessed with a "strike" pursuant to Section 15.7 of BC Hydro's OATT. BC Hydro will financially settle with the Transmission Customer for the Losses for that scheduling hour. Refer to BC Hydro's OATT Business Practice on *Ancillary Services* for information on Real Power Losses.

7.0 RELOADS

7.1 Reloads by BC Hydro

BC Hydro will reload e-Tags where an e-Tag has been curtailed in error by BC Hydro. If the approved reload causes an infringement upon SL, BC Hydro will issue Reliability Limits to Ttransmission ~~reservations~~ Reservations and curtail energy according to this Business Practice to relieve the SL.

In the case where e-Tags have been curtailed in the scheduling hour due to a real time reduction of TTC-, BC Hydro will reload the curtailed e-Tags should an increase in TTC be made available. ~~Etags~~ e-Tags will not be reloaded, where reloads would cause an SL infringement.

7.2 Reloads by Other Balancing Authorities

In the scheduling hour, BC Hydro will approve all e-Tags reloaded by other Balancing Authorities unless the transmission allocated to the e-Tag is fully utilized or the reload causes an infringement upon the SL.

Document Change History

Issue	Reason for Issue	Date
5	Updated Language	September XX, 2022
4	Corrected typo.	April 25, 2019
3	Updated procedures to implement non-firm curtailment methodology	October 25, 2016
2	Corrected typo.	August 8, 2012
1	Updated procedures to implement new curtailment methodology. Previously Business Practice 12.	November 1, 2010

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