

# PSANI Curtailment Calculator

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## Customer Presentation



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## What is the PSANI Curtailment Calculator?

- ▶ Automates BPA's previous PSANI procedure and calculations
- ▶ Enables Dispatchers to analyze conditions in the Puget Sound Area (PSA) and on the Northern Intertie (NI) using S>N OTC, real-time schedule netting and curtailment "what-if" scenarios
- ▶ Calculates and executes pro-rata curtailments for the PSA and NI
- ▶ Bases calculations on system conditions captured in a snapshot in time

## Benefits of the Tool

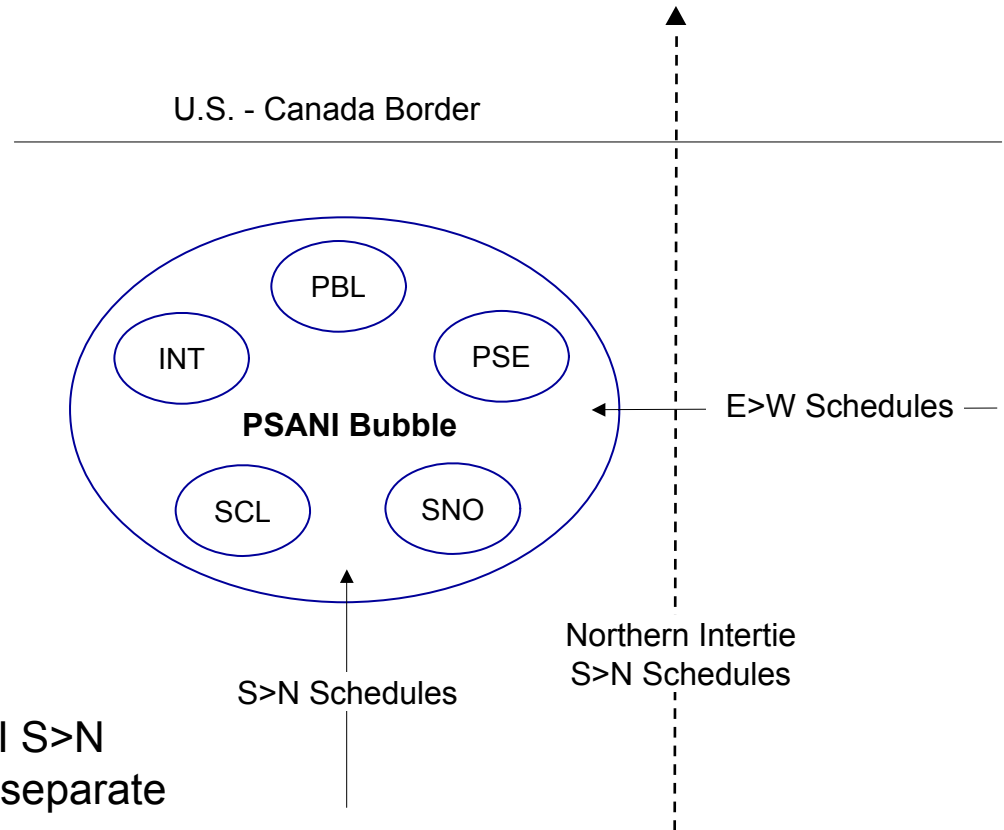
- ▶ Displays OTC and scheduling data in one location to enable quick and accurate verification of PSANI conditions
- ▶ Enables BPA to automatically execute PSANI curtailments by 35 minutes after the hour for the next scheduling hour
- ▶ Provides details for every tag associated with the curtailment
- ▶ Attaches curtailment record number, affected load zone, and reason to all PSANI tags
- ▶ Maintains an exportable history of PSANI advisories and curtailments

## PSANI Entities

▶ Customers impacted by a PSANI curtailment are:

- ✓ Puget Sound Energy Inc.
- ✓ Seattle City Light
- ✓ Snohomish PUD
- ✓ Alcoa - Intalco
- ✓ PBL NT
  - City of Blaine
  - Town of Sumas
  - Tanner Electric Corp
  - Orcas Power & Light

▶ The PSANI curtailment includes NI S>N schedules. The NI is treated as a separate entity for this curtailment calculation.



## Real-time PSANI Conditions

- ▶ A PSANI Advisory is initiated when BPA NI S>N OTC is expected to be less than the maximum firm commitment for the next scheduling hour
- ▶ A PSANI Curtailment is executed when BPA NI S>N OTC is less than the maximum firm commitment and estimated net schedules for the next scheduling hour
- ▶ If NI S>N OTC is exceeded in hour, BPA will curtail BC schedules at the border as an in hour curtailment
- ▶ If there is a S>N reduction on the NI due to a problem on BC's system, BC will take the full reduction on NI schedules flowing S>N. BPA will not impose a PSANI curtailment
- ▶ PSANI does not implement the return of the Canadian Entitlement; it implements curtailments according to the Treaty

## Timing of the Curtailment

- ▶ As system conditions allow, the PSANI curtailment will be executed at 35 minutes after the hour for the next scheduling hour. For example:

<b>Time of Unforeseen Outage</b>	<b>Cut Northern Intertie</b>	<b>Execute PSANI</b>
10:15	HE 11	by 10:35 for HE 12
10:45	HE 11 & 12	by 11:35 for HE 13

## Summary of the PSANI Process

- ▶ Dispatch analyzes system conditions, determines the need for an Advisory, and saves Advisory data
- ▶ Dispatch calls Scheduling to inform them a PSANI Advisory has been initiated for the next scheduling hour
- ▶ Scheduling calls customers to inform them of the initiation of the Advisory
- ▶ Scheduling calls Powerex for the projected net total of schedules not yet submitted for the next scheduling hour and enters the value into the system
- ▶ The system calculates schedule and curtailment information
- ▶ Scheduling confirms the final curtailment amount with Dispatch
- ▶ Scheduling executes the curtailment at 35 past the hour

## How are Curtailments Calculated?

For the Requested Curtailment amount

- ▶ Retrieve all NI S>N tags and tags flowing into the Puget Sound Area in a S>N and E>W direction
- ▶ Group tags by Priority Code: Secondary Non-Firm Hourly (1-NS), Primary Non-Firm Hourly (2-NH), Non-Firm NT (6-NN), Firm (7-F)
- ▶ Apply a Load Factor (based on the Dispatcher selected Load Zone) to each tag to determine its MW Available to Cut
- ▶ If the MW Available to Cut total of Secondary Non-Firm Hourly tags meets the Requested Curtailment amount, apply pro-rata calculations to 1-NS tags
- ▶ If the total MW Available to Cut value of Secondary Non-Firm Hourly tags does not meet the Requested Curtailment amount
  - ✓ Cut all 1-NS tags based on their MW Available to Cut
  - ✓ Calculate the remaining curtailment amount
  - ✓ If the total MW Available to Cut value of 1-NS and 2-NH tags meets the Requested Curtailment amount, apply pro-rata calculations to 2-NH tags
- ▶ If the total MW Available to Cut value of 1-NS and 2-NH tags does not meet the Requested Curtailment amount, repeat the process for Non-Firm NT tags then Firm tags

**Load Factors**

Entity	Zone 1	Zones 1&2	Zones 1, 2 & 3
PSE	0.150	0.155	0.500
SCL	0.000	0.432	1.000
SNO	0.150	0.650	1.000
A-IN	1.000	1.000	1.000
PBL NT Blaine Sumas Tanner Orcus	1.000	1.000	1.000
NI	1.000	1.000	1.000

## How are Curtailments Calculated? (cont.)

In this example,

- ▶ The requested curtailment amount is 700 MWs for Load Zone 1, 2 & 3
- ▶ Total available MWs of 1-NS tags do not satisfy the requested amount
- ▶ Take the remainder of the cut from 2-NH tags applying pro-rata calculations

Requested Curtailment = 700					
1-NS Tags	Entity	Tag Begin MW	Load Factor	MW Avail to Cut	Calculated Cut
Tag A	PSE	50	0.5	25	25
Tag B	PSE	70	0.5	35	35
Tag C	SNO	90	1	90	90
Tag D	NI	135	1	135	135
<b>Total</b>				<b>285</b>	<b>285</b>
Requested Curtailment - Calculated Cut 1-NS Tags = <b>Unsatisfied Curtailment</b> <b>700 - 285 = 415</b>					

Unsatisfied Curtailment = 415							
2-NH Tags	Entity	Tag Begin MW	Load Factor	MW Avail to Cut	Pro-Rata	Pro-Rata Curtailment	Calculated Cut
Tag E	SCL	300	1	300	23.08%	96	96
Tag F	PSE	400	0.5	200	15.38%	64	64
Tag G	SNO	200	1	200	15.38%	64	64
Tag H	NI	600	1	600	46.15%	192	192
<b>Total</b>				<b>1300</b>		<b>416</b>	<b>416</b>
$MW\ Avail\ to\ Cut = Tag\ Begin\ MW \times Load\ Factor$ <b>For Tag F: <math>400 \times 0.5 = 200</math></b>							
$Pro-Rata = MW\ Avail\ to\ Cut\ (each\ tag) / Total\ MW\ Avail\ to\ Cut$ <b>For Tag F: <math>200 / 1300 = 15.38\%</math></b>							
$Pro-Rata\ Curtailment = Pro-Rata \times Unsatisfied\ Curtailment\ Amount$ <b>For Tag F: <math>15.38\% \times 415 = 64</math></b>							
$Calculated\ Cut = Take\ the\ lesser\ of\ MW\ Avail\ to\ Cut\ and\ Pro-Rata\ Curtailment$ <b>For Tag F: 64</b>							
<b>Total Calculated Cut = Calculated Cut 1-NS Tags + Calculated Cut 2-NH Tags</b> <b>701 = 285 + 416</b>							

## Finding PSANI Information on the Tag

Look for the tag Reason or Comment field in your scheduling software. The Reason field for a PSANI tag will show:

- ▶ PSANI ID, the BPA record number associated with the curtailment. Use this ID to identify the curtailment with BPA Scheduling.

- ▶ Load Zone where the curtailment occurs

- ▶ Curtailment reason

The curtailment cannot be executed without this information

https://tagdemo.bpa.oatiwebtms.com - Request Approval Details - Microsoft Internet Explorer

Status of Curtailment Request for Tag **BPAT\_BPATPSHMBC2\_BPAT**

GCA	PSE	Tag Code	LCA	Authority	Creation Time	Submission Time	Approval Time
BPAT	BPAT	PSHMBC2	BPAT	Internal	2007-09-24 13:47	2007-09-24 14:45	2007-09-24 14:51

Request Status

Company	Role	Agent/Approval	Delivery State	Approval Rights	Approval State	Approval Type	Entity Approval Time	Reason/Error
<a href="#">AESO</a>	SCA	Internal	Delivered	No	N/A			
<a href="#">BCTC</a>	SCA	Internal	Delivered	No	N/A			
<a href="#">NWT</a>	SCA	Internal	Delivered	No	N/A			
<a href="#">AESO</a>	TP	Internal	Delivered	No	N/A			
<a href="#">BCTC</a>	TP	Internal	Delivered	No	N/A			
<a href="#">BPAT</a>	TP	Internal	Delivered	No	N/A			
<a href="#">NWT</a>	TP	Internal	Delivered	No	N/A			
<a href="#">BPAP01</a>	GPE, LSE, TX Cust	Internal	Delivered	No	N/A			
<a href="#">BPAT</a>	Tag Author	Internal	Delivered	No	N/A			
<a href="#">EPCR24</a>	PSE, TX Cust	Internal	Delivered	No	N/A			
<a href="#">PNSC</a>	SC	Internal	Pending	No	N/A			
<a href="#">BPAT</a>	GCA, LCA, SCA, Author	Internal	Delivered	Yes	APPROVED	Active	2007-09-24 14:45:21	

Approval Status History

Req ID	Request	Company	Type	Origin	Action	Action Time (PDT)	User	Reason/Comment
1	Curtailment	BPAT	CA	INT	CREATE	2007-09-24 14:45:20	WD:OATI	PSANI ID 156 ZONE 1 Line Outage
1	Curtailment	BPAT	CA	INT	APPROVE	2007-09-24 14:45:21	WD:OATI	
1	Curtailment				IMPLEMENTED	2007-09-24 14:45:21		

Refresh View Tag View Tag Status View XML Log Help Close

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## Submitting PSANI Tags

- ▶ Although NERC tag specifications allow it, do not submit tags with two Allocation Profiles on the same Transmission Segment. This is considered a “stacked” tag.
- ▶ The chance of a stacked tag is less than 1%, however, if a curtailment is required, Firm may be cut before Non-Firm
- ▶ Instead, submit tags for each Allocation Profile separately
- ▶ Do not adjust tags during a PSANI Advisory

## BPA Contacts

- ▶ Vicki Pederson 360-418-2725
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