Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

FREEDOM OF INFORMATION ACT/PRIVACY PROGRAM

December 7, 2021

In reply refer to: FOIA #BPA-2022-00100-F

Larry Johnson
Law Office of Larry G. Johnson
8505 129th Ave SE
Newcastle, WA 98056-1757
Email: larry.ede@gmail.com
Phone: 425-890-4404

Dear Mr. Johnson,

This communication concerns your agency records request submitted to the Bonneville Power Administration (BPA), made via the Freedom of Information Act, 5 U.S.C. § 552 (FOIA). Your request was received on November 1, 2021, and formally acknowledged on November 24, 2021.

Original Request
"[Preamble and Background Information] A consulting firm in Massachusetts, Synapse, conducted within the last two or three years load flow studies (also known as power studies) to analyze a Puget Sound Energy (PSE) proposed project within King County, Washington, known as Energize Eastside. In a report about its conclusions drawn from those studies, Synapse claims to have discovered a Bulk Electric System (BES) vulnerability caused by a transmission line deficiency in King County, Washington. According to Synapse, this problem apparently has existed now from an indeterminate time into the present. Specifically, Synapse states in its report: "...our analysis shows that the current summer electric peak demand in King County has already triggered an operational need for the proposed transmission expansion to address system contingency scenarios and ensure the security of the Bulk Electric System.

[Records requested are] …any and all documents in [BPA's] possession, or to which [BPA has] ready access, that references or relates to any known security or other vulnerability problem(s) in the BES within King County, Washington, due to a transmission line deficiency. The time frame for this records request is from January 1, 2020, to the present. This request is satisfied if limited to notification(s) to or from [BPA] about any claimed, identified, or known security or other vulnerability problem in the BES within King County, Washington, due to a transmission line deficiency, and [BPA's] responses thereto. This request includes but is not limited to records [BPA has] … or [has] ready access, to or from the following entities: 1. Puget Sound Energy. 2. RC West (the Reliability Coordinator for the WECC region). 3. The Bonneville Power Administration. 4. Seattle City Light. 5. Northern Grid (successor to Columbia Grid)."

Request Clarification
On November 10, 2021, the agency requested additional clarification on your original request, specifically in regards to a proposed definition of a transmission line deficiency as, "an unexpected failure or outage of a system component." You replied: "The language in the Synapse report … discusses a Bulk Electric System vulnerability in King County caused by a transmission line deficiency in King County. I believe that [language] means that unless some new transmission line is built in King County, then under summer peak load conditions under two contingencies (N-2) the grid would go unstable. [Specifically, is BPA] aware of such a problem Bulk Electric System 'vulnerability' as I have defined in this paragraph? [Additionally, i]n direct response to your thinking that a transmission line deficiency is defined as 'an unexpected failure or outage of a system component'[.] [BPA's] definition is a definition of what a *contingency* is[;] a transmissions line *deficiency* means more transmission lines need to be built in order to avoid instability in the grid under *contingency* conditions."

Response
The agency's Transmission Operations Planning office gathered twelve pages of responsive records. These records contain the applicable ALL LINES IN SERVICE study results during the 2021 summer operating season and the 2020-2021 winter operating season (most current study results over the past year). The records indicate that BPA is currently setting limits to the identified limiting element and limiting contingency pair. This applies to the request for information regarding "transmission line deficiency." These records are being released in full with no redactions.

Fees
There are no fees associated with the processing of your FOIA request.

Certification
Pursuant to 10 C.F.R. § 1004.7(b)(2), I am the individual responsible for the information search and the release described above. Your FOIA request BPA-2022-00100-F is now closed with the responsive agency information provided.

Appeal
The adequacy of the search may be appealed within 90 calendar days from your receipt of this letter pursuant to 10 C.F.R. § 1004.8. Appeals should be addressed to:

Director, Office of Hearings and Appeals
HG-1, L'Enfant Plaza
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585-1615

The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. You may also submit your appeal by e-mail to OHA.filings@hq.doe.gov, including the phrase "Freedom of Information Appeal" in the subject line. (The Office of Hearings and Appeals prefers to receive appeals by email.) The appeal must contain all the elements required by 10 C.F.R. § 1004.8, including a copy of the determination letter. Thereafter, judicial review will be available to you in the Federal District Court either (1) in the district where you reside, (2) where you have your principal place of business, (3) where DOE's records are situated, or (4) in the District of Columbia.

Questions about this communication may be directed to BPA FOIA Public Liaison Jason E. Taylor at 503-230-3537 or jetaylor@bpa.gov. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows:

Office of Government Information Services
National Archives and Records Administration
8601 Adelphi Road-OGIS
College Park, Maryland 20740-6001
E-mail: ogis@nara.gov
Phone: 202-741-5770
Toll-free: 1-877-684-6448
Fax: 202-741-5769

Thank you for your interest in the Bonneville Power Administration.

Sincerely,

Candice D. Palen
Freedom of Information/Privacy Act Officer

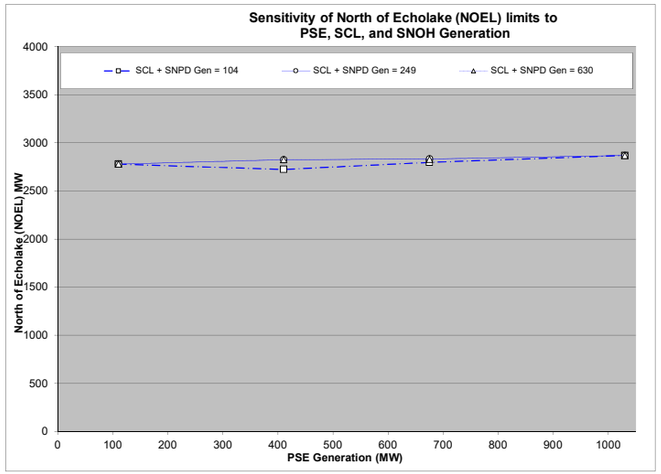
Attachment: Responsive records

None

Summer 2021
North of Echolake (NOEL) South-to-North (SN)
Heavy Loads
Outage: **21H**
Temp: **32F**

Average Puget Sound Net Area Load = 5149

	Gen Level PSE	Gen Level SCL/ SNOH	NOEL Path	Worst Contingency	Limiting Facility
G0	**110**	**104**	2779	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G1	**110**	**249**	2779	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G2	**110**	**630**	2779	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G3	**410**	**104**	2723	BFR_Monroe PCB 4526 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G4	**410**	**249**	2824	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G5	**410**	**630**	2826	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G6	**675**	**104**	2797	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G7	**675**	**249**	2834	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G8	**675**	**630**	2828	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G9	**1030**	**104**	2868	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G10	**1030**	**249**	2868	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G11	**1030**	**630**	2868	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]



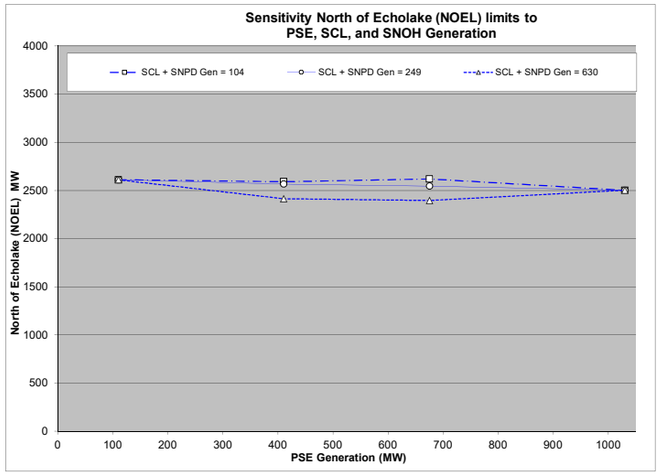
Gen #	PSE Gen	SCL Gen	Transfer Limit	Worst Contingency	Limiting Facility
G2	110	630	2779	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G5	**410**	**630**	2826	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G8	**675**	**630**	2828	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G11	1030	630	2868	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G1	**110**	**249**	2779	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G4	**410**	**249**	2824	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G7	**675**	**249**	2834	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G10	**1030**	**249**	2868	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G0	110	104	2779	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G3	**410**	**104**	2723	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G6	**675**	**104**	2797	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G9	1030	104	2868	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]

None

Summer 2021
North of Echolake (NOEL) South-to-North (SN)
Heavy Loads
Outage: 21H
Temp: 60F

Average Puget Sound Net Area Load = 4381

	Gen Level PSE	Gen Level SCL/ SNOH	NOEL Path	Worst Contingency	Limiting Facility
G0	**110**	**104**	2610	BFR_Monroe PCB 4526 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G1	**110**	**249**	2610	BFR_Monroe PCB 4526 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G2	**110**	**630**	2610	BFR_Monroe PCB 4526 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G3	**410**	**104**	2591	BFR_Monroe PCB 4522 Monroe-Echo Lake-SL	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G4	**410**	**249**	2567	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G5	**410**	**630**	2413	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G6	**675**	**104**	2619	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G7	**675**	**249**	2546	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G8	**675**	**630**	2396	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G9	**1030**	**104**	2501	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G10	**1030**	**249**	2501	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G11	**1030**	**630**	2501	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]



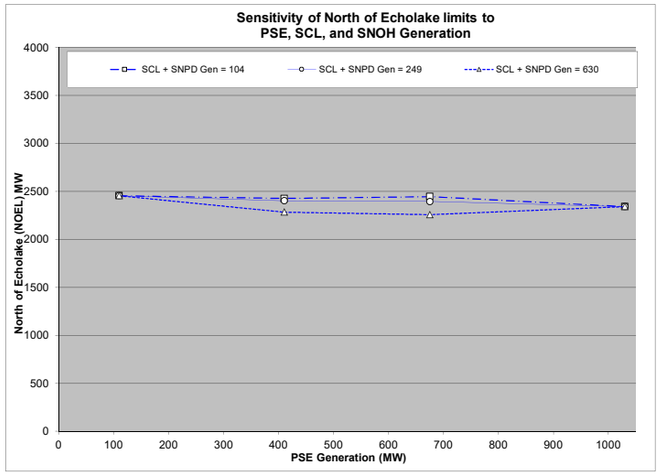
Gen #	PSE Gen	SCL Gen	Transfer Limit	Worst Contingency	Limiting Facility
G2	110	630	2610	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G5	**410**	**630**	2413	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G8	**675**	**630**	2396	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G11	1030	630	2501	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G1	**110**	**249**	2610	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G4	**410**	**249**	2567	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G7	**675**	**249**	2546	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G10	**1030**	**249**	2501	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G0	110	104	2610	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G3	**410**	**104**	2591	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G6	**675**	**104**	2619	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G9	1030	104	2501	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]

None

Summer 2021
North of Echolake (NOEL) South-to-North (SN)
Heavy Loads
Outage: **21H**
Temp: **86F**

Average Puget Sound Net Area Load = 4659

	Gen Level PSE	Gen Level SCL/ SNOH	NOEL Path	Worst Contingency	Limiting Facility
G0	**110**	**104**	2455	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G1	**110**	**249**	2455	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G2	**110**	**630**	2455	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G3	**410**	**104**	2426	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G4	**410**	**249**	2404	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G5	**410**	**630**	2285	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G6	**675**	**104**	2446	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G7	**675**	**249**	2395	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G8	**675**	**630**	2258	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G9	**1030**	**104**	2342	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G10	**1030**	**249**	2342	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G11	**1030**	**630**	2342	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]



Gen #	PSE Gen	SCL Gen	Transfer Limit	Worst Contingency	Limiting Facility
G2	110	630	2455	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G5	**410**	**630**	2285	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G8	**675**	**630**	2258	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G11	1030	630	2342	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G1	**110**	**249**	2455	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G4	**410**	**249**	2404	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G7	**675**	**249**	2395	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G10	**1030**	**249**	2342	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G0	110	104	2455	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G3	**410**	**104**	2426	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G6	**675**	**104**	2446	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G9	1030	104	2342	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]

Interface Scenario I0

32F	Trans Lim	Limiting Element	Limiting CTG	% OTDF	Pre-Trans Est	Limit Used	ATC Mon: MW flow Puget Sound Area Net Load (207)	Iteratively Found	ATC Mon: MW flow North of Echo Lake (3480)
_G1	3231.15	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.21	-497.67	-496.6	5171.87	FULL	2778.91
_G3	3247.67	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.21	-491.41	-494.53	5127.21	FULL	2723.05
_G4	3578.86	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.21	-498.36	-496.13	5164.12	FULL	2823.68
_G5	3904.01	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.5	-2500.7	-2524.02	5105.47	FULL	2825.83
_G6	3655.54	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.19	-497.31	-496.32	5154.85	FULL	2796.99
_G7	3874.33	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.2	-496.9	-495.69	5175.52	FULL	2833.89
_G8	4168.53	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.56	-2534.39	-2524.53	5110.11	FULL	2828.07
_G10	4272.21	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.15	-495.92	-498.01	5181.04	FULL	2868.09

60F	Trans Lim	Limiting Element	Limiting CTG	% OTDF	Pre-Trans Est	Limit Used	ATC Mon: MW flow Puget Sound Area Net Load (207)	Iteratively Found	ATC Mon: MW flow North of Echo Lake (3480)
_G1	3377.35	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.14	-466.2	-464.93	4434.68	FULL	2610.1
_G3	3465.52	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.13	-463.78	-465.82	4398.47	FULL	2590.55
_G4	3596.51	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.41	-2315.04	-2322.58	4395.81	FULL	2566.65
_G5	3594.34	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.41	-2311.38	-2323.56	4315.39	FULL	2413.41
_G6	3805.21	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.5	-2326.49	-2320.85	4400.79	FULL	2619.12
_G7	3792.3	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.5	-2318.88	-2328.62	4395.81	FULL	2545.7
_G8	3811.04	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.5	-2324.25	-2330.84	4312.16	FULL	2395.53
_G10	4026.1	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.54	-2337.18	-2332.14	4393.7	FULL	2501.2

86F	Trans Lim	Limiting Element	Limiting CTG	% OTDF	Pre-Trans Est	Limit Used	ATC Mon: MW flow Puget Sound Area Net Load (207)	Iteratively Found	ATC Mon: MW flow North of Echo Lake (3480)
_G1	2916.56	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.32	-2070.52	-2082.17	4708.88	FULL	2454.63
_G3	2992.3	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.14	-427.37	-425.8	4673.36	FULL	2426.28
_G4	3088.23	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.35	-2124.98	-2128.98	4674.74	FULL	2403.57
_G5	3162.13	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.35	-2168.51	-2157.25	4595.47	FULL	2285.14
_G6	3285.74	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-9.14	-427.92	-426.11	4681.81	FULL	2445.86
_G7	3316.84	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.37	-2154.14	-2144.2	4676.99	FULL	2395.22
_G8	3356.61	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.37	-2168.58	-2159.05	4592.69	FULL	2257.87
_G10	3532.68	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.37	-2108.72	-2099.83	4671.39	FULL	2341.91

North of Echolake (NOEL) South-to-North (SN)				Heavy Loads			21H	None					
PSE Gen		**110**	**110**	**110**	**410**	**410**	**410**	**675**	**675**	**675**	**1030**	**1030**	**1030**
SCL + SNPD Gen	**LOAD**	**104**	**249**	**630**	**104**	**249**	**630**	**104**	**249**	**630**	**104**	**249**	**630**
32F	5149	2779	2779	2779	2723	2824	2826	2797	2834	2828	2868	2868	2868
60F	4381	2610	2610	2610	2591	2567	2413	2619	2546	2396	2501	2501	2501
86F	4659	2455	2455	2455	2426	2404	2285	2446	2395	2258	2342	2342	2342
		G0	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11

Limiting Element **Limiting CTG**

Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 5	**BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230kV Bank 1**
Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT	**BFR_Monroe PCB 4522 Monroe-Echo Lake-SnoKing 1 500kV AND Monroe 500kV Capacitor Group 3**

Limiting Element	Limiting CTG
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A

	32F	60F	86F
_G1	2778.91	2610.10	2454.63
_G3	2723.05	2590.55	2426.28
_G4	2823.68	2566.65	2403.57
_G5	2825.83	2413.41	2285.14
_G6	2796.99	2619.12	2445.86
_G7	2833.89	2545.70	2395.22
_G8	2828.07	2395.53	2257.87
_G10	2868.09	2501.20	2341.91

Description:	**None**
Season/Year:	**Summer 2021**
Direction:	**North of Echolake (NOEL) South-to-North (SN)**
Case Loads:	**Heavy Loads**
Outage:	**21H**
Power World:	**21**
Study Person:	**Dan Pool, David Chis, Daniel Kuraspediani**
Source:	**21HS_SNH_NOEL**

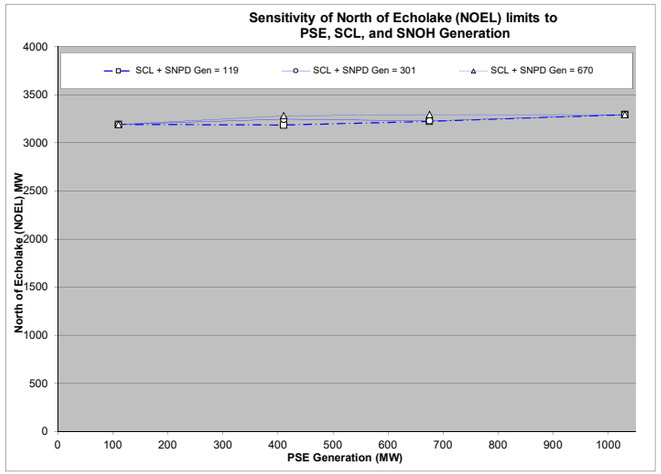
*Note: The presence of a "red" box indicates a further examination in Powerworld is required

ALIS

WINTER 2021
North of Echolake (NOEL) South-to-North (SN)
Heavy Loads
Outage: **21H**
Temp: **25F**

Average Puget Sound Net Area Load = 6813

	Gen Level PSE	Gen Level SCL/ SNOH	NOEL Path	Worst Contingency	Limiting Facility
G0	110	119	3190	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G1	110	301	3190	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G2	110	670	3190	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G3	410	119	3185	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G4	410	301	3245	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G5	410	670	3280	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G6	675	119	3222	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G7	675	301	3228	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G8	675	670	3293	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G9	1030	119	3292	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G10	1030	301	3292	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G11	1030	670	3292	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]



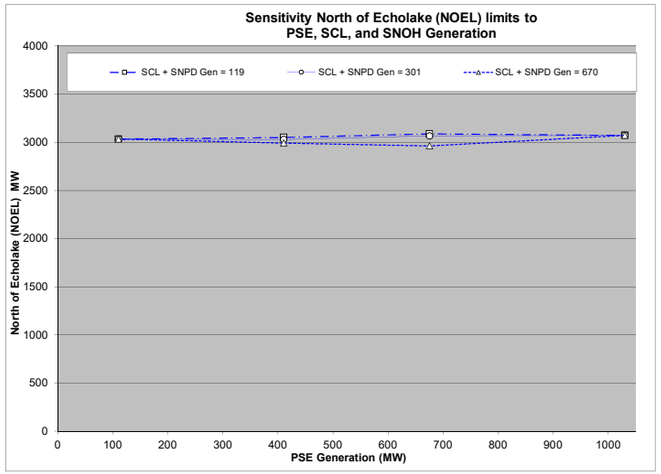
Gen #	PSE Gen	SCL Gen	Transfer Limit	Worst Contingency	Limiting Facility
G2	110	670	3190	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G5	**410**	**670**	3280	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G8	**675**	**670**	3293	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G11	1030	670	3292	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G1	**110**	**301**	3190	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G4	**410**	**301**	3245	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G7	**675**	**301**	3228	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G10	**1030**	**301**	3292	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G0	110	119	3190	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G3	**410**	**119**	3185	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G6	**675**	**119**	3222	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G9	1030	119	3292	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]

ALIS

WINTER 2021
North of Echolake (NOEL) South-to-North (SN)
Heavy Loads
Outage: **21H**
Temp: **45F**

Average Puget Sound Net Area Load = 5753

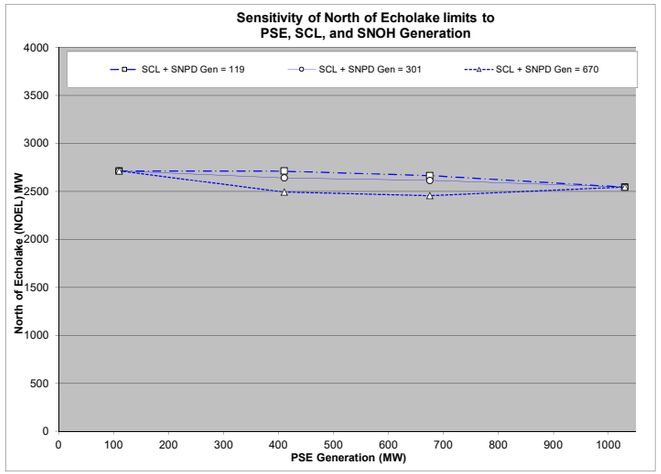
	Gen Level PSE	Gen Level SCL/ SNOH	NOEL Path	Worst Contingency	Limiting Facility
G0	110	119	3032	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G1	110	301	3032	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G2	110	670	3032	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G3	410	119	3049	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G4	410	301	3028	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G5	410	670	2992	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G6	675	119	3087	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G7	675	301	3067	BFR_Monroe PCB 4526 Monroe-Echo Lake-S	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G8	675	670	2962	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G9	1030	119	3072	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G10	1030	301	3072	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G11	1030	670	3072	BFR_Custer PCB 4268 Monroe-Custer 1 500k	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]



Gen #	PSE Gen	SCL Gen	Transfer Limit	Worst Contingency	Limiting Facility
G2	110	670	3032	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G5	**410**	**670**	2992	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G8	**675**	**670**	2962	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G11	1030	670	3072	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G1	**110**	**301**	3032	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G4	**410**	**301**	3028	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G7	**675**	**301**	3067	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G10	**1030**	**301**	3072	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G0	110	119	3032	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G3	**410**	**119**	3049	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G6	**675**	**119**	3087	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]
G9	1030	119	3072	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]

ALIS

WINTER 2021
North of Echolake (NOEL) South-to-North (SN)
Heavy Loads
Outage: 21H
Temp: 70F



Average Puget Sound Net Area Load = 4450

	Gen Level PSE	Gen Level SCL/ SNOH	NOEL Path	Worst Contingency	Limiting Facility
G0	**110**	**119**	2714	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G1	**110**	**301**	2714	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G2	**110**	**670**	2714	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G3	**410**	**119**	2711	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G4	**410**	**301**	2641	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G5	**410**	**670**	2493	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G6	**675**	**119**	2664	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G7	**675**	**301**	2616	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G8	**675**	**670**	2456	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G9	**1030**	**119**	2545	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G10	**1030**	**301**	2545	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G11	**1030**	**670**	2545	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]

Gen #	PSE Gen	SCL Gen	Transfer Limit	Worst Contingency	Limiting Facility
G2	110	670	2714	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G5	**410**	**670**	2493	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G8	**675**	**670**	2456	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G11	1030	670	2545	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G1	**110**	**301**	2714	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G4	**410**	**301**	2641	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G7	**675**	**301**	2616	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G10	**1030**	**301**	2545	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G0	110	119	2714	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G3	**410**	**119**	2711	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G6	**675**	**119**	2664	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]
G9	1030	119	2545	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]

Interface Scenario I0

25F	Trans Lim	Limiting Element	Limiting CTG	% OTDF	Pre-Trans Est	Limit Used	ATC Mon: MW flow Puget Sound Area Net Load (207)	Iteratively Found	ATC Mon: MW flow North of Echo Lake (3480)
_G1	2708.48	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.33	-505.8	-505.68	6836.31	FULL	3190.23
_G3	2865.09	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.33	-506.48	-505.47	6810.02	FULL	3184.69
_G4	3128.93	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.33	-507.43	-506.56	6820.55	FULL	3244.92
_G5	3577.49	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.27	-525.7	-525.72	6778.77	FULL	3280.37
_G6	3219.93	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.33	-507.06	-507.15	6816.53	FULL	3222.16
_G7	3380.98	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.33	-503.68	-505.1	6818.72	FULL	3228.11
_G8	3886.92	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.27	-524.66	-524.72	6784.6	FULL	3293.3
_G10	3884.26	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.32	-507.29	-506.12	6835.32	FULL	3292.12

45F	Trans Lim	Limiting Element	Limiting CTG	% OTDF	Pre-Trans Est	Limit Used	ATC Mon: MW flow Puget Sound Area Net Load (207)	Iteratively Found	ATC Mon: MW flow North of Echo Lake (3480)
_G1	3121.49	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.36	-481.06	-482.64	5788.47	FULL	3032.4
_G3	3320.61	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.35	-484.74	-483.21	5765.3	FULL	3049.16
_G4	3428.5	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.35	-478.92	-480.2	5763.53	FULL	3028.34
_G5	3722.01	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-50.21	-2362.19	-2354.7	5697.35	FULL	2991.61
_G6	3670.79	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.35	-485.2	-483.68	5772.61	FULL	3086.84
_G7	3788.17	Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT 1 [230.00 - 230.00 kV]	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND	-8.34	-483.47	-481.53	5774.98	FULL	3067.07
_G8	3932.98	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.91	-2356	-2366.35	5691.45	FULL	2961.58
_G10	4148.33	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.89	-2369.04	-2376.09	5772.37	FULL	3071.51

70F	Trans Lim	Limiting Element	Limiting CTG	% OTDF	Pre-Trans Est	Limit Used	ATC Mon: MW flow Puget Sound Area Net Load (207)	Iteratively Found	ATC Mon: MW flow North of Echo Lake (3480)
_G1	3325.05	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.98	-2194.06	-2201.78	4511.78	FULL	2713.82
_G3	3465.43	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.96	-2188.54	-2194.23	4486.01	FULL	2711.25
_G4	3458.04	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.96	-2185.43	-2193.55	4467.78	FULL	2641.49
_G5	3502.2	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.96	-2195.79	-2204.8	4375.12	FULL	2492.78
_G6	3643.51	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.96	-2182.42	-2187.75	4477.23	FULL	2664.29
_G7	3691.47	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.96	-2200.6	-2204.35	4462.39	FULL	2616.18
_G8	3693.06	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.96	-2198.38	-2204.17	4367.58	FULL	2455.71
_G10	3895.84	Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 500.00 kV]	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/23	-49.92	-2201.99	-2190.54	4449.25	FULL	2544.91

21HW_SNH_NOEL

North of Echolake (NOEL) South-to-North (SN)				Heavy Loads			21H	ALIS					
PSE Gen		110	110	110	410	410	410	675	675	675	1030	1030	1030
SCL + SNPD Gen	LOAD	119	301	670	119	301	670	119	301	670	119	301	670
25F	6813	3190	3190	3190	3185	3245	3280	3222	3228	3293	3292	3292	3292
45F	5753	3032	3032	3032	3049	3028	2992	3087	3067	2962	3072	3072	3072
70F	4450	2714	2714	2714	2711	2641	2493	2664	2616	2456	2545	2545	2545
		G0	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11

Limiting Element	Limiting CTG
Line CUSTER (40323) TO MONROE (40749) CKT 2 [500.00 - 5	BFR_Custer PCB 4268 Monroe-Custer 1 500kV AND Custer 500/230kV Bank 1
Line SNOKING_S3 (41008) TO MAP_SK3_CIO2 (410081) CKT	BFR_Monroe PCB 4526 Monroe-Echo Lake-SnoKing 1 500kV AND Monroe 500kV Capacitor Group 2
Limiting Element	Limiting CTG
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A

	25F	45F	70F
_G1	3190.23	3032.40	2713.82
_G3	3184.69	3049.16	2711.25
_G4	3244.92	3028.34	2641.49
_G5	3280.37	2991.61	2492.78
_G6	3222.16	3086.84	2664.29
_G7	3228.11	3067.07	2616.18
_G8	3293.30	2961.58	2455.71
_G10	3292.12	3071.51	2544.91

Description:	**ALIS**
Season/Year:	**WINTER 2021**
Direction:	**North of Echolake (NOEL) South-to-North (SN)**
Case Loads:	**Heavy Loads**
Outage:	**21H**
Power World:	**21**
Study Person:	**Dan Pool, Daniel Kuraspediani, David Chis**
Source:	**21HW_SNH_NOEL**

*Note: The presence of a "red" box indicates a further examination in Powerworld is required