

*PUD No. 1 of Chelan County
Wenatchee, Washington*

*Slice SOI 200 - Capacity and
Energy Scheduling Limitations Instruction
Slice Contract Section 6*

Subject: Slice Capacity and Energy Scheduling Limitations

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This is a Slice Operational Instruction for Chelan PUD Slice Purchasers to ensure all Slice Purchasers full and fair access to energy and capacity associated with Chelan Slice. The following steps will be utilized to ensure that e-tagged capacity and energy is within limits on both a Preschedule and a Real-Time basis compliant with *Section 6* of the Slice Output Contract.

Slice E-Tag Limits (Preschedule and Real-Time):

Per Section 6 of the Slice Output contract, Slice Purchasers are allowed a limited number of export e-tags on both Preschedule and Real-Time. Please see your specific Slice Contract for e-tag limits. Slice Purchasers are allowed one import e-tag per hour on Real-Time for the purpose of paper-pond management only. Imports will be denied if paper pond is over maximum limit.

Slice Maximum Daily Limits for Net Schedules (Preschedule basis and prior to the hour of flow):

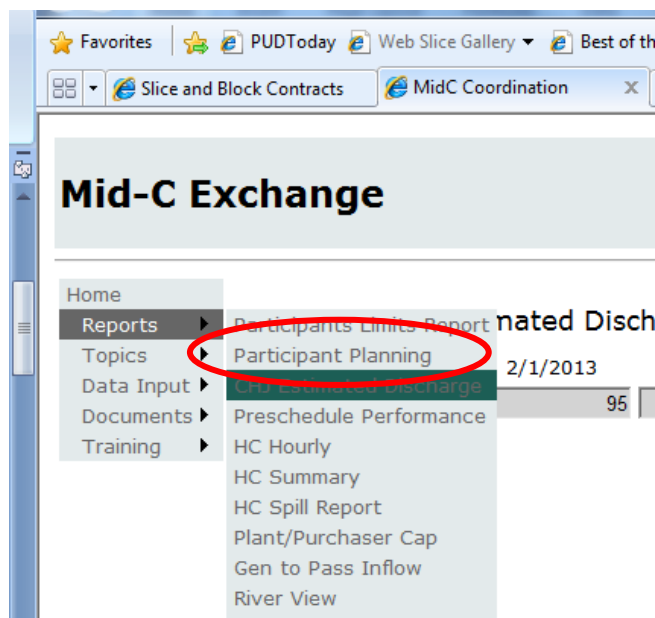
Log into the Mid-C Exchange tool and, under Reports, navigate to the *Reports/Participant Planning*.

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Select the appropriate date and entity acronym. The “Total Daily Inflow Estimate“ (MWh)” value can be found in the TOT column. This is the day-total inflow expected for the Slice Purchaser based on the Chief Joseph Project Discharge Estimate and other side flows.

Inflow Estimates	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOT
WEL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RRH	308	164	111	94	143	250	266	394	515	522	425	381	356	267	391	461	462	348	348	382	467	521	497	369	8442
RIS	149	140	135	133	154	153	145	157	144	160	158	173	178	158	155	164	169	196	179	171	171	195	191	0	3886
WAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	457	304	246	227	297	403	411	551	659	682	583	554	534	425	549	616	626	517	544	561	638	692	692	560	12328
ACTUAL NET	528	579	484	404	328	523	570	677	683	596	492	687	705	647	397	6	0	0	0	0	0	0	0	0	8306

The Maximum Daily Limit for Total Daily Net Schedules is 115% of the Total Daily Inflow Estimate. For example, using 818 MWh for the Total Daily Inflow Estimate, the maximum limit for the Total Daily Net

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Schedules is 15% higher (818 MWh x 115% = 940.7 MWh). Therefore, the Maximum Daily Limit is 940.7 MWh.

Actual Daily Net Schedules vs. Daily Limit	
Total Daily Net Schedules	672
Max. Allowable Daily Net Schedules	940.7
Exceed Allowable Daily Net Schedules	NO
Amount Over	0

Slice Minimum Generation Limit (Preschedule Basis):

In the Mid-C Exchange tool, under Reports, navigate to *Reports/Participants Limits Report*.

The Minimum Generation Limit is the greater of the hourly "Estimated Calculated Min Gen" and the hourly "Estimated Manual Min Gen".

Generation Requirements (MW/MWh)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Estimated Calculated Max Cap	163	163	163	163	163	163	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155	155	163	163
Estimated Calculated Min Gen	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5
Estimated Manual Min Gen	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

For example, the "Estimated Calculated Min Gen" for HE10 equals 4 MWh and the "Estimated Manual Min Gen" for HE10 equals 3 MWh. Therefore, the Minimum Generation Limit is the greater of these which is 4 MWh.

In the Slice Monitoring Tool, for the "Minimum Generation Limit":

1. All fractional MW will be rounded up to the nearest whole number.
2. For any day in the future, the "Minimum Generation Limit" is simply the forecasted Slice Purchaser minimum generation of the Chelan System. The Real-Time instantaneous values in the box at the top of the Tool can be viewed for comparison to the forecasted amounts.
3. For all completed hours in the current day and all previous days, the "Minimum Generation Limit" will be the actual hourly average "Minimum Generation Limit."

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Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Minimum Generation Limit	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2
Net Schedule (Incl.CEA's)	35	35	35	35	35	35	42	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	35	35	0	
Under Min Gen	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y
Amount Under Min Gen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

The Mid-C Exchange tool and the Slice Monitoring Tool should yield approximately the same results.

Slice Minimum Generation Limit (Real-Time Basis):

In the Slice Monitoring Tool, for the “Minimum Generation Limit”:

1. All fractional MW will be rounded up to the nearest whole number.
2. The Real-Time instantaneous value is in the box at the top of the Tool labeled “Current Hour Min Generation Limit” (see below).
3. For all previous hours in the current day (located in the 24-hour grid) and all previous days, the “Minimum Generation Limit” will be the actual hourly average “Minimum Generation Limit”.
4. For the current hour and future hours in the current day and any day in future, the Minimum Generation Limit is simply the forecasted Slice Purchaser minimum generation of the Chelan System.

Status as of 10/10/2014 4:26:26 PM	
Current Hour Generation Request	16
Current Hour Interruptible Imports	10
Current Hour Max Generation Limit	40
Max Gen Limit After Reserve Req.	30
Current Hour Min Generation Limit	11

Slice Maximum Generation Limit (Preschedule Basis):

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In the Mid-C Exchange tool, under Reports, navigate to *Reports/Participants Limits Report*.
View the “Estimated Calculated Max Capacity” in MW per hour.

Generation Requirements (MW/MWh)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Estimated Calculated Max Cap	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52

In the above example, the Mid-C Exchange tool “Estimated Calculated Max Cap” is 52 MW. This is capacity and has not been reduced for the minimum required reserve obligation of 3% on generation plus a margin of 2%. The Maximum Generation Limit is calculated by dividing the “Estimated Calculated Max Cap” by 1.05 and then truncated down to the nearest whole number. In this example, the Maximum Generation Limit is calculated to be 52 MW/1.05 and then truncated down to the nearest whole number which equals 49 MW. Therefore, the Slice Purchaser shall not schedule more than 49 MW on an hour where the Mid-C Exchange tool “Estimated Calculated Max Cap” is 52 MW.

Chelan may curtail Preschedule e-tags in order to reduce the scheduled amount to at or below the Maximum Generation Limit. The 2% margin is to assure that a minimum of 3% reserves on generation are held even during in-hour fluctuations in capacity.

In the Slice Monitoring Tool, for the “Maximum Generation Limit”:

1. All fractional MW will be rounded down to the nearest whole number.
2. For all future days and any future hours in the current day, the “Maximum Generation Limit” will be derived using the forecasted Slice Purchaser capacity of the Chelan system / 1.05. The .05 represents the 5% Preschedule reserve requirement.

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Note: If you are over scheduled, the use of an interruptible/non-firm import is insufficient to remedy the situation because of the requirement to carry 100% reserves.

Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Maximum Generation Limit	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	0
Reserve Requirement Interruptible Imports - No Data Found																									
Max Gen After Reserve Requirement	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	0
Net Schedule (Incl.CEA's)	23	23	23	23	23	23	32	32	32	31	32	32	32	31	32	32	34	34	34	34	32	32	23	23	0
Over Scheduled	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Amount Over Scheduled	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The Mid-C Exchange tool and the Slice Monitoring Tool should yield approximately the same results.

Slice Maximum Generation Limit (Real-Time Basis):

1. All fractional MW will be rounded down to the nearest whole number.
2. The Real-Time instantaneous value is in the box at the top of the Tool labeled “Current Hour Max Generation Limit” (see below).
3. The current hour “Maximum Generation Limit” (located in the 24 hour grid) is derived by using the forecasted Slice Purchaser capacity of the Chelan system / 1.03. The .03 represents the 3% Real-Time reserve requirement. This value should not be used as the Real-Time capacity as it is generated from forecasted capacity rather than instantaneous capacity. Please use the instantaneous value from #2.
4. For all previous hours in the current day and all previous days, the “Maximum Generation Limit” will be the actual hourly average “Maximum Generation Limit”.

Status as of 10/10/2014 4:26:26 PM	
Current Hour Generation Request	16
Current Hour Interruptible Imports	10
Current Hour Max Generation Limit	40
Max Gen Limit After Reserve Req.	30
Current Hour Min Generation Limit	11

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Current Operating Hour alarming is set at 3% reserve requirement, not 5%.

Compliance:

If Chelan determines that the Slice Purchaser has schedules that are outside the maximum daily limits for net Preschedules or the Maximum Generation Limit on an hourly basis, Chelan may curtail schedules to get values inside the limits. In addition to these limits, the sum of the Slice Purchaser's export schedules/e-tags shall not be greater than the Slice Purchaser's Maximum Generation Limit. Warnings will not be given as this document serves as notice.



Approved by: _____

Janet Jaspers - Energy Planning & Trading Manager

Owner	Rev. Date	Ver.	Section / Item Number(s) Changed	Approved By
Fintz	10/24/12	0	Initial document	Jaspers
Fintz	12/13/12	1	Reserve requirement change to 5% contingency and 2% margin.	Jaspers
Fintz	1/29/13	2	General clean-up and consistency with SOI 35. Also to document usage of Slice Monitoring Tool in addition to Mid-C Exchange Tool.	Jaspers

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Fintz	1/31/2013	3	Change to reflect Mid C Exchange Tool addition of Total Daily Inflow Estimate.	Jaspers
Fintz	12/05/2014	4	To change reserve requirement % and update some graphics.	Jaspers