



Western Resource Adequacy Program

RAPC Meeting

May 12, 2022 10-11:30am

| Participant | Name | Participant | Name |
|----------------|----------------------------------|--------------|----------------------------|
| APS | Brian Cole | NorthWestern | Joe Stimatz – joined 10:12 |
| Avangrid | Jeff Pritchard – joined at 10:22 | NV Energy | Lindsey Schlekeway |
| Avista | Scott Kinney | PacifiCorp | Mike Wilding |
| Basin Electric | Garrett Schilling | PGE | Dee Outama |
| Black Hills | Eric Scherr | Powerex | Mike Goodenough |
| BPA | Suzanne Cooper | PSE | Phil Haines |
| Calpine | Bill Goddard | SRP | Grant Smedley |
| Chelan | Shawn Smith | Seattle | Emeka Anyanwu |
| Clatskanie | Paul Dockery – joined 10:16 | Shell | Ian White |
| Douglas | Jeff Johnson | SnoPUD | Jeff Kallstrom |
| EWEB | | Tacoma | Ray Johson |
| Grant | Rich Flanigan | TEA | Ed Mount |
| Idaho | Camille Christen | TID | Pete Mensonides |

Objectives

1. Provide the RAPC with updates on project progress.
2. Seek RAPC input on progress and any administrative actions

Meeting Agenda

| Call to Order | |
|---------------|--|
| 10:00 | <ol style="list-style-type: none"> 1. Attendance 2. Agenda Overview <i>Motion to approve agenda</i> <i>Amendment discussion about alternate process for accrediting QCCs that do not report data to GADS</i> <i>Agenda approved as amended unanimously at 10:08</i> 3. Approve Minutes from last meeting <i>Minutes approved unanimously at 10:09</i> |
| PA/PO Report | |
| 10:09 | In-person meeting May 16-18 prep – COVID tests |



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|---------------------------|--|
| | Budget Report |
| | 1. PO Update <i>Discussion about data timing</i> |
| External Affairs | |
| 10:20 | No updates |
| Ongoing Business | |
| 10:22 | 2. Interim RA – excluding heat dome data <i>Update to work order approved unanimously (by Interim Program Participants) at 10:38</i> <i>Updated P99 spreadsheet will be sent out to Interim Program Participants</i> |
| | 3. FS Capacity Requirement – updated proposal <i>Updated proposal approved unanimously at 10:43</i> |
| New Business | |
| 10:43 | 4. Participation Proposal <i>Edits provided by BPA need to be discussed offline in further detail</i> |
| | 5. Accrediting UCAP/Thermal Resource (no GADs) <i>Discussion and commitment for PA/PO to develop short write up on topic for discussion at RAOC</i> |
| | 6. Binding Transition Proposal <i>Clarification that some of this will need to be included in the tariff</i> <i>Will be brought back for further discussion at the in-person meeting</i> |
| Upcoming | |
| 11:30 | Continued WRAP tariff review |
| Adjourned at 11:31 | |

Current 3A Participants: APS, Avangrid; Avista; Basin Electric*; Black Hills; BPA; Calpine; Chelan; Clatskanie*; Douglas; EWEB*; Grant*; Idaho Power; NorthWestern; NV Energy; PacifiCorp; PGE; Powerex; PSE; SRP; SCL; Shell; SnoPUD; Tacoma Power; TEA; TID

*opted out of OC/work group participation



Western Resource Adequacy Program

FS Capacity Requirement – Proposal

Prepared by FS Capacity Requirement Task Force:

| | |
|--|----------------------------------|
| Garrison Marr - Snohomish | Ruth Burris – PGE |
| Ed Mount - TEA | Zach Kanner - PAC |
| Ian White - Shell | Steve Belcoff, Erin Jensen – BPA |
| Mark Holman, Mike Goodenough, Dan O’Hearn - PWX | Bill Goddard - Calpine |
| Villamor Gamponia, Lorin Molander, Sachi Begur - PSE | Rebecca Sexton, Ryan Roy - WPP |
| Charles Hendrix, Alex Crawford – SPP | |

Background

The Phase 2B Detailed Design document describes RA Program Metrics including the Forward Showing (FS) capacity requirement and the Seasonal Planning Reserve Margin (PRM) calculation. Discussions during Phase 3A have led to changes to the 2B Detailed Design to accommodate the availability of capacity during the off-peak months of the binding season.

The result is that while a seasonal PRM will continue to be calculated, a Participant’s FS capacity requirement in the various months may be reduced in comparison to the Participant’s requirement in the Program peak month of the binding season. Any allowable reduction in capacity requirements in the off-peak months of the binding season will be verified to ensure compliance with the Program reliability metric of loss of load for 1 event-day in 10-year period for both the summer binding season and the winter binding season.

FS Capacity Requirement with inclusion of Monthly Capacity Reduction

FS Capacity Requirement(s) for the Peak Month (Peak Month FS Capacity Requirement)

To derive a Participant’s FS capacity requirement for the peak month, the maximum of the Participant forecasted monthly P50 load (of the binding season) is multiplied by 100% plus the PRM and is calculated using the following equation:

$$\begin{aligned} & \textit{Peak Month FS Capacity Requirement (Participant)} \\ & = \textit{Participant \{Peak month P50\}} * (100\% + \textit{seasonal PRM}) \end{aligned}$$

While the Seasonal PRM is calculated as:

$$\textit{Seasonal PRM (\%)} = \frac{\textit{QCC} - \textit{P50 Peak Month Load}}{\textit{P50 Peak Month Load}} * 100$$



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FS Capacity Requirement for Off-Peak Months of the Binding Season

The Seasonal PRM will be calibrated to account for months of the binding season that have a lower P50 peak load (“off-peak month”). For such months, a lower capacity requirement may be allowable. The lower capacity requirement will be determined through the Loss of Load Expectation Study for which the seasonal PRM is determined. For months that did not show a measurable probability of lost load in the initial study, the available monthly capacity in the LOLE study will be reduced by an amount for which a measurable amount of lost load probability can be determined for each month of the season. For these purposes, the value of 0.01 annual LOLE will be used.

Once the monthly capacity reduction has been calculated for each month such that all months of the binding season have at least a 0.01 annual LOLE probability, and it has been verified that the reliability metric of 0.1 LOLE across the season has been achieved, a separate PRM will be calculated for each month of the season. The equation for each month will be calculated using the equation below

$$PRM(monthly) (\%) = \frac{QCC(month) - P50 Load(month)}{P50 Load(month)} * 100$$

The FS capacity requirement for each month for each Participant will be equal to the Participant’s P50 monthly peak multiplied by 100% plus the monthly PRM.

$$\begin{aligned}
 \text{Monthly FS Capacity Requirement (Participant)} \\
 = \text{Participant \{monthly P50peak\}} * (100\% + PRM(month))
 \end{aligned}$$

Seasonal PRM and FS Capacity Requirement Calculation with Inclusion of Monthly Capacity Reduction

To calculate the Seasonal PRM with the inclusion of the monthly capacity reduction, loss of load expectation simulations will be performed to determine loss of load metrics. The capacity values, including the representation of the monthly capacity reduction, of the resources used in the simulations will be compiled into a ‘resource stack’ whose values will be determined based on the following procedures:

Resource stack for PRM calculation.

| Resource type | Conversion to UCAP |
|--------------------------------|---|
| Thermal Generation | The nameplate value of thermal generation capacity will be replaced with the qualifying capacity contribution (QCC) value of thermal generation. |
| Variable Energy Resource (VER) | The nameplate value of VER capacity will be replaced with the monthly capacity contribution from the VERs as determined through effective load carrying capability (ELCC) |
| Storage Hydro | Storage hydro values as modeled in the loss of load event (LOLE) study at their QCC values will be used in the PRM calculation. |



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FS Capacity Requirement – Proposal

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|--|---|
| Short-term storage/ hybrid resources/ DR | ICAP capacity (at the Program time duration requirement) is used for the calculation. |
| Monthly Capacity Reduction | Negative adjustment to the capacity of each month that did not produce a measurable risk of lost load in the preliminary simulations. |
| Pure Capacity adjustment to meet 1-in-10 LOLE | Adjustments to capacity to reach 1-in-10 metric for each binding season |

Once all capacity values have been set, LOLE simulation will be performed. If the LOLE value is less than the 1-in-10 metric, the inputs are adjusted to attain the required metric. Once the 1-in-10 metric is achieved, the capacity for each month will be calculated.

An *example* resource stack is shown below.

| Month | Nov | Dec | Jan | Feb | Mar |
|---|---------|---------|---------|---------|---------|
| Storage Hydro - QCC no planned outages | 39,878 | 40,729 | 42,271 | 40,983 | 44,033 |
| Total Thermal (UCAP) | 36,448 | 36,448 | 36,448 | 36,448 | 36,448 |
| VER ELCC Contribution | 6,000 | 5,000 | 5,500 | 6,500 | 8,000 |
| Other Resources | 400 | 400 | 400 | 400 | 400 |
| Total QCC | 82,726 | 82,577 | 84,619 | 84,331 | 88,881 |
| | | | | | |
| Monthly capacity reduction to achieve at least 0.01 annual LOLE | -3000 | 0 | 0 | 0 | -9000 |
| Resource Stack After Initial Adjustment | 79,726 | 82,577 | 84,619 | 84,331 | 79,881 |
| Perfect capacity to maintain 1-in10 LOLE | -10,000 | -10,000 | -10,000 | -10,000 | -10,000 |
| Total Capacity for PRM Calculation | 69,726 | 72,577 | 74,619 | 74,331 | 69,993 |
| P50 NCP Load | 60,853 | 65,124 | 65,316 | 63,391 | 58,859 |

The Seasonal PRM can now be calculated and expressed as a percentage of the P50 seasonal peak of the aggregated load across the RA Program footprint.

The Seasonal PRM can be represented by the following formula.



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$$\text{Seasonal PRM (\%)} = \frac{QCC - P50 \text{ Peak Month Load}}{P50 \text{ Peak Month Load}} * 100$$

The Seasonal PRM can then be calculated as

$$PRM (\%) = \frac{74,619 - 65,316}{65,316} * 100$$

$$PRM (\%) = 14.2\%$$

To determine capacity requirements in the off-peak months of the binding season, the monthly PRM values will be utilized. To calculate the monthly PRM, the reduced capacity for each month will be used in the PRM calculation with the Program monthly P50.

The monthly PRM for November can be represented by the following equation

$$PRM (\%)(Nov) = \frac{69,726 - 60,853}{60,853} * 100$$

$$PRM (\%)(Nov) = 14.5\%$$

Allocation of FS Capacity Requirement

The Program FS Capacity Requirement will be allocated separately to each Participant. To derive each Participant's FS capacity requirement for each month, a non-coincident peak method, as agreed upon in Phase 2B will continue to be employed. To calculate the Participant share of the capacity requirement, its peak monthly P50 load of the peak month will be multiplied by 100% plus the Seasonal PRM (Peak Month FS Capacity Requirement).

$$\text{Peak Month FS Capacity Requirement (Participant)} = \text{Participant \{Peak month P50\}} * (100\% + \text{seasonal PRM})$$

A participant that has a 2,000MW P50 peak load in the peak month of the season will have its FS Capacity Requirement calculated as

$$\text{Peak Month FS Capacity Requirement (Participant)} = 2000MW \{\text{Peak month P50}\} * (100\% + 14.2\%) = 2,284MW$$

To calculate the Participant share of the capacity requirement for each off-peak month, the Participant peak monthly P50 load will be multiplied by 100% plus the PRM for the given month.



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$$\text{Monthly FS Capacity Requirement (Participant)} = \text{Participant} \{ \text{monthly P50} \} * (\mathbf{100\% + \text{monthly PRM}})$$

A participant that has a 1,500MW P50 peak load in the month of November will have its FS Capacity Requirement calculated as

$$\text{Monthly FS Capacity Requirement (Participant)(Nov)} = \mathbf{1500MW} \{ \text{monthly P50} \} * (\mathbf{100\% + 14.5\%}) = \mathbf{1,717MW}$$

Calculation of Monthly P50

The P50 value utilized in the FS compliance metric will be calculated based on the program mandated methodology which is currently made up of the following key components (see approved [load forecasting methodology](#)):

1. A base monthly peak which is calculated as the median of that month's peak hourly load value for the last five years (net of historical additions and removals)
2. Adjusted for any known additions or removals of load in the forecast window
3. With a program developed growth factor applied

The LOLE modeling will be done 22+ months in advance of the of the FS. This introduces a potential difference in the load used for the study and the load used for the monthly FS compliance requirement. Because a monthly % PRM (as calculated through the study process) will be applied to the load the capacity available to the program will scale appropriately to account for these load differences.

Monthly PRM Considerations

The following are key aspects of the proposed monthly PRM:

1. The proposed methodology incorporates a monthly PRM that serves to inform capacity needs on the off-peak months of the binding season. The monthly PRM is not based on an arbitrary allocation of LOLE between months (e.g., same LOLE each month, minimize highest month, minimize all months), but rather on the need for capacity in the peak months to address higher capacity needs to address potential excessive load events.
2. The shaping factor prioritizes having capacity in months where the P95 might be very close to the seasonal peak P95 even if the P50 value is much lower, which helps address large magnitude loss of load events.
3. The monthly PRM is informed by the monthly QCC of individual resources and sends the correct signals such that resources get the appropriate credits in the months where they produce the most. The capacity requirement sends the appropriate signal to build / buy in the months where the capacity need is the highest and take planned outages and maintenance in the months where it is the lowest.
4. The allocation methodology appropriately allocates the capacity requirement to those participants contributing to the peak load.