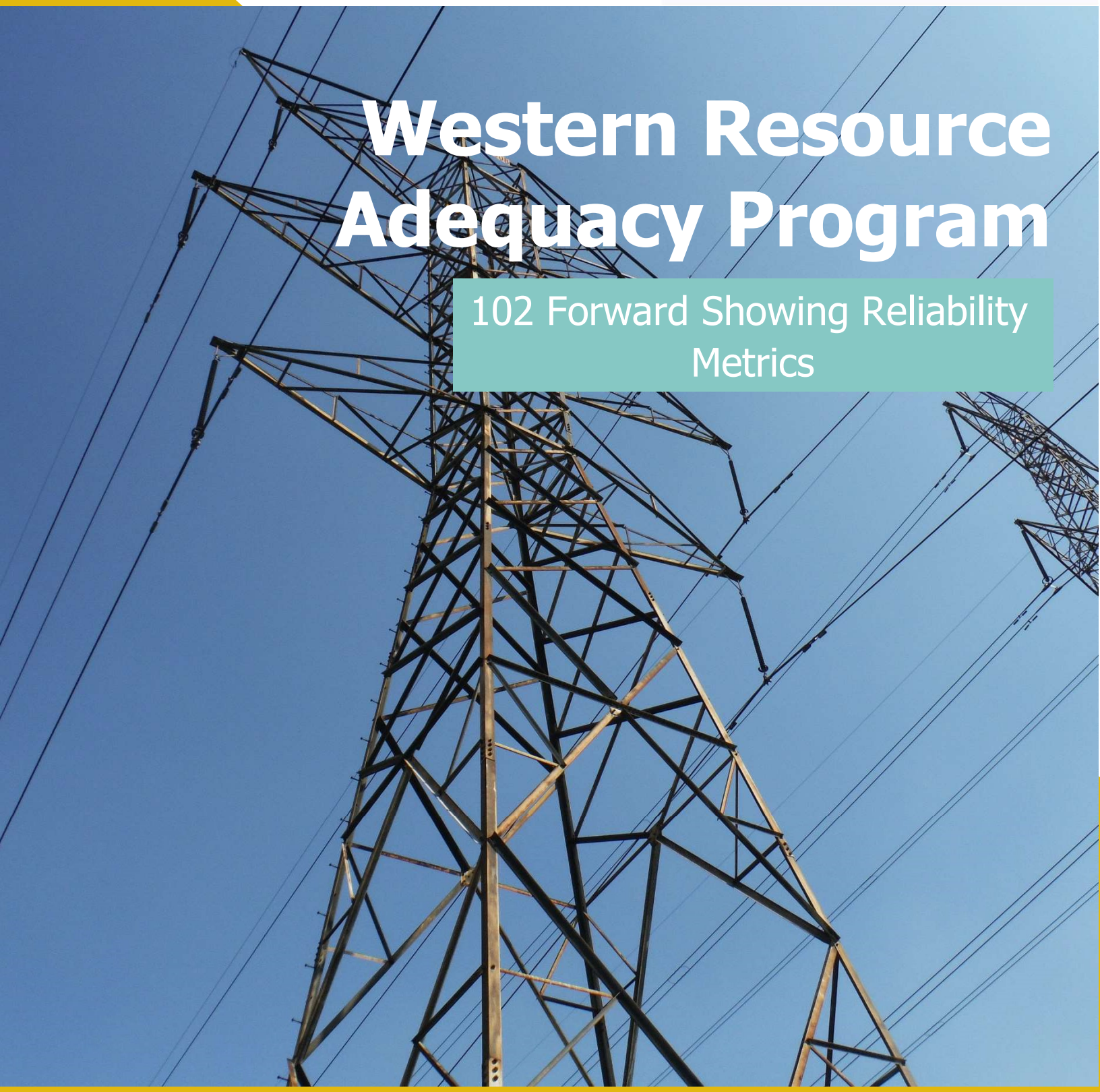
WESTERN POWERPOOL



Western Resource Adequacy Program

102 Forward Showing Reliability Metrics

100 – Forward Showing

Revision History

Manual Number	Version	Description	Revised By	Date
102	0.1	RAPC Glance Version	Michael O'Brien	1/18/2024
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102	0.4	RAPC Endorsement	Michael O'Brien	7/11/2024

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102 Reliability Metric Setting

1. Introduction

The Reliability Metric Setting Business Practice Manual (BPM 102) provides an overview of how the Program Operator will conduct the Loss of Load Expectation (LOLE) Study and set the Monthly FS Planning Reserve Margins (FSPRM~~s~~) to be approved by the Board. In addition to the guidance provided in this BPM, the Program Operator will provide scoping documents with additional technical details on the modeling approach prior to conducting the LOLE Study each year.

1.1 Intended Audience

BPM 102 is intended for WRAP Participants and other interested individuals or entities and will be particularly useful for individuals that are responsible for their Participant organization's Forward Showing Submittal or that need to ensure their organizations are submitting the required MW quantity of Qualifying Resources to meet the Forward Showing Capacity Requirement. BPM 102 will be most informative to individuals in Participant organizations that have an interest in the LOLE Study and the setting of FSPRMs. ~~Note that~~ Qualifying Capacity Contribution (QCC) methodologies - such as Effective Load Carrying Capability (ELCC) for variable energy resources (VER~~s~~) and unforced capacity (UCAP) for thermal resources - can be found in *BPM 105 Qualifying Resources*.

1.2 What You Will Find in This Manual

BPM 102 provides details, assumptions, methodologies, and procedures for conducting the LOLE Study and determining Monthly FSPRMs. This BPM explains how the Program Operator models ~~uncertainties~~ variations in load and ~~uncertainties~~ variations in generation, how numerous scenarios of variations in weather and variations in resource performance and outages are simulated from historic data, the Load and Resource Zones used in the LOLE Study simulations, the Subregions for which potentially differing FSPRM values are studied, how Contingency Reserves (CR) are accounted for, how the LOLE threshold is identified, how the simulations are conducted, and how FSPRMs are calculated.

1.3 Purpose

BPM 102 ~~will cover~~ details the components of the LOLE Study and how the Program Operator will determine the FSPRMs in the LOLE Study for the Binding Seasons.

1.4 Definitions

All capitalized terms that are not defined in BPM 102 have their meaning set forth in the Tariff. Any capitalized terms not found in the Tariff that are specific to BPM 102 are defined here, including by reference to another BPM where such term is defined.

Capability Test: As defined in *BPM 105 Qualifying Resources.*

Fuel Type: As defined in *BPM 105 Qualifying Resources.*

Historical Load Data: As defined in *BPM 101 Advance Assessment.*

LOLE Study: A probabilistic simulation of variations in load and ~~uncertainties~~ variations in generation to determine the amount of capacity needed for each Month of a Binding Season to meet the no more than a single event-day of loss of load in ten years reliability metric across a Binding Season. ~~for each Month of the Binding Seasons~~.

Net Generating Capability: As defined in *BPM 105 Qualifying Resources.*

~~**Peak Demand:** As defined in *BPM 101 Advance Assessment.*~~

Regional P50 Peak Load Forecast: Forecast based on total Participant load in the WRAP Region or total Participant Load in a Subregion depending on results being sought.

Study Scope Document: a document that defines the scope of an LOLE Study.

2. Background

The FSPRMs are the capacity margins above a Participant's monthly P50 Peak Load Forecast ~~requried~~required to meet the reliability metric of no more than a single event-day of loss of load in ten years ~~during the~~across a Binding Season~~s~~ (as calculated per Section 8). The total amount of monthly qualifying capacity needed to meet the reliability metric will be simulated in the LOLE Study using probabilistic analysis (see Section 7), taking into account variability in load (see Section 5) and ~~uncertainties~~ variation in generation (see Section 6) while maintaining Contingency Reserves (see Section 6.10).

The Tariff provides that the FSPRM determination employs:

i. a simulated resource stack using capacity accreditation principles consistent with those used for WRAP QCC determinations (see Section 6);

ii. an adjustment in the total WRAP-required QCC value as needed to meet a 1 event-day in 10 years LOLE across a Binding Season (see Section 8), and

iii. a standard that each Month will have at least 0.01 annual LOLE (i.e., 1 event-day in 100 years), while maintaining the overall event-day in 10 years LOLE across a Binding Season (see Section 8).

FSPRMs are determined for each Month of the Binding Season and for each Subregion (see Section 4.1) as well as the WRAP Region as a whole (see Section 4.1.1) in connection with the Advance Assessment. The timing and deadlines for data collection and study completion for the Advance Assessment can be found in *BPM 101 – Advance Assessment Timeline.* The LOLE Study will be defined by a Study Scope Document (see Section 3).

3. Study Scoping Process

The LOLE Study for each Binding Season that is the subject of a Forward Showing will be preceded by a Study Scope Document that will define the scope of work. The Study Scope Document will adhere to applicable Tariff requirements and the further guidance and implementing details described in this BPM 102. The Study Scope Document may also specify additional technical details as necessary to complete the applicable LOLE Study for the subject Binding Season. The Program Operator will provide the Board and RAPC a timely opportunity to review and comment upon the Study Scope Document prior to the Program Operator's commencement of the applicable LOLE Study and will highlight any notable changes in scope or methodology compared to prior LOLE Studies. In addition to other key study methodologies and assumptions, the Study Scope Document will identify the planning software or system modeling software to be utilized for the subject LOLE Study.

4. Load and Resource Zones

The WRAP Region will be modeled in each LOLE Study as divided among the separate load and resource zones ("LRZs") shown below in Figure 1, in order to consider weather variability across the WRAP Region and within Subregions. LRZs will be used primarily to distinguish weather modeling for loads and associated resources. To that end, the LOLE Study will not limit the import and export capabilities between LRZs when determining the FSPRMs for the WRAP Region or within Subregions. Changes to the LRZs shown in Figure 1 will be as noted in the Study Scope Document for the Binding Season to which such changes will apply.

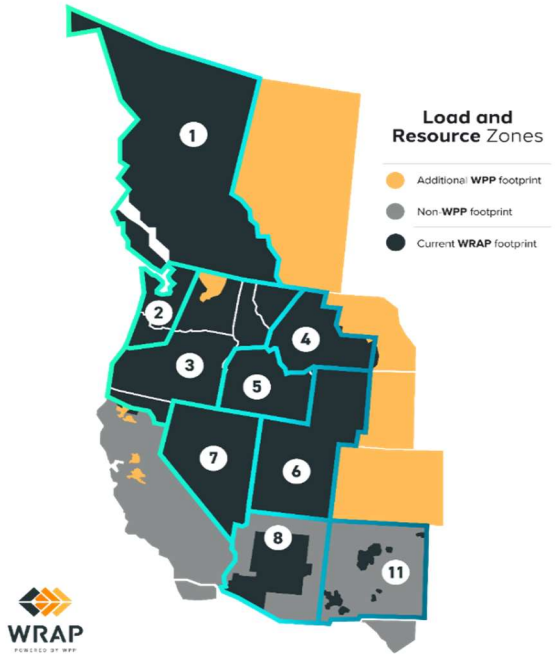

Figure 1 - WRAP Load and Resources Zones (LRZs)[1] as listed in Section 4.1

4.1 Subregions Used for Determination of Monthly FSPRMs

Two Subregions have been identified in the WRAP Region: the Northwest Subregion and the Southwest and East Subregion. LOLE Study simulations are conducted separately for each of the Subregions. Each Subregion is comprised of load and generation from within certain Balancing Authority Areas, and the boundaries of each Subregion are defined by the boundaries of the combined area of the component Balancing Authority Areas. The component Balancing Authority Areas for each Subregion are as follows:

- Northwest Subregion (Zones 1, 2, 3, 4)
    - Avista Corporation

[1] The WRAP Region is solely located within the United State of America, and any transactions required by the WRAP Operations Program associated with loads or resources located in Canada are effected inside the borders of the United States.

- BC Hydro and Power Authority[~~2~~1]
- Bonneville Power Authority
- Chelan County PUD #1
- Douglas County PUD #1
- Grant County PUD #2
- Northwestern Energy
- PacifiCorp West
- Portland General Electric
- Puget Sound Energy
- Seattle City and Light
- Tacoma Power

- Southwest and East Subregion (Zones 5, 6, 7, 8, 11)
  - Arizona Public Service
  - Basin Electric
  - Black Hills
  - Idaho Power Company
  - NV Energy
  - PacifiCorp East
  - Public Service Company of New Mexico
  - Salt River Project

Any load for which a Participant is responsible (that has not been excluded – see *BPM 103 Forward Showing Capacity Requirement*) that does not reside within one of the Balancing Authority Areas listed above will be added to one of the Subregions. A new Participant will be assigned by WPP to an appropriate Subregion (and thus modify the boundary thereof) subject to objection of the RAPC to such assignment, expressed by action of the RAPC.

~~[2] The WRAP Region is solely located within the United States of America, and any transactions required by the WRAP Operations Program associated with loads or resources located in Canada are effected inside the borders of the United States~~

4.1.1 WRAP Region Analysis

In addition to the Subregion analyses, WRAP Region FSPRMs will be determined by running LOLE Study simulation on the entire WRAP Region with unconstrained transmission (i.e., assuming no transmission constraints) between the Subregions.

5. Load Modeling in the LOLE Study

The FSPRMs are the capacity margins above a Participant's monthly P50 Peak Load Forecast ~~requried~~required to meet the reliability metric of no more than single event-day of loss of load in ten years ~~during the~~across a Binding Season~~s~~. The total amount of monthly qualifying capacity needed to meet the reliability metric will be simulated in the LOLE Study using probabilistic analysis (see the Study Scope Document for further details), taking into account variability in load (as well as ~~uncertainties~~ variations in generation – see Section 6). For each Winter Season and each Summer Season, the Program Operator will model the effects of weather ~~variablity~~variability by developing a minimum of forty historical weather years that reflect the impact of weather on load. To model the effects of weather variability on load, a load shape provided by Participants for recent years (e.g. five most recent years of Historical Load Data) will be combined with historical weather data to synthesize at least forty years of synthetic historical weather data. Relationships between weather observations and load will be developed based on the historical weather and Historical Load Data (see *BPM 101 Advance Assessment* and *BPM 103 FS Capacity Requirement*) from recent data sets. The historical weather data will consist of hourly temperature data from a representative selection of weather stations in each Subregion~~, indicative examples of which are shown in~~ . Weather data will be used from a back-up weather station ~~-~~if there are data quality issues for some periods in an initially selected station. ~~shows examples of this, providing a representative nearby back-up station for each of the four example stations shown for the Northwest Subregion.~~ The Study Scope document will identify when synthesized load shapes will be redetermined by the Program Operator; frequency of such updates will consider factors such as changes in load patterns, sharp increases in load due to large new customers, or changes in climate.

~~Zone~~	~~Weather Station # 1~~	~~Weather Station #2~~
~~NW Subregion~~	~~Kamloops, Canada~~ ~~Tacoma, WA~~	~~Penticton, Canada~~ ~~Seattle, WA~~ ~~Yakima, WA~~

	~~Kennewick, WA~~ ~~Helena, MT~~	~~Billings, MT~~
~~SW&E Subregion~~	~~Tonopah, NV~~ ~~Boise, ID~~ ~~Salt Lake City, UT~~ ~~Scottsdale, AZ~~ ~~Casper, WY~~	

Other inputs into historical weather will include an hour-of-week factor (in determining temperature-to-load comparisons for daylight hours versus darkness hours, as well as weekends versus Business Days) as well as temperature and average temperatures from the preceding 8, 24, and 48 hours. Different weather and load relationships will be built for the Winter Season and Summer Season. These weather and load relationships will be applied to the multiple years of weather data to develop synthetic load shapes for the study years. Equal probabilities will be given to each of the forty annual load shapes in the simulations.

6. Generator Modeling in the LOLE Study

The FSPRMs are the capacity margins above a Participant's monthly P50 Peak Load Forecast ~~requried~~required to meet the reliability metric of no more than a single event-day of loss of load in ten years ~~during the~~ across a Binding Season~~s~~. The LOLE Study will simulate the aggregated stack of Qualifying Resources provided to the Program Operator by ~~Particpants~~Participants in the Advance Assessment data collection, using the methodologies described below. In summary, the LOLE Study will model:

- the qualifying capacity of thermal resources based on Net Generating Capability (interchangeable with ICAP for thermal resources) taking into account equivalent forced outage rate-demand (EFORd) (see Section 6.1); note that ~~forced outage factor~~EFORd is different than the equivalent forced outage factor during C~~c~~apacity C~~c~~ritical H~~h~~ours (EFOFcch) used to determine thermal resource QCC ~~to meet the FS Capacity Requirement in the FS Submittal (see Section 6.1)~~(see Table 1).
- QCC values for Storage Hydro (see Section 6.2)
- Participants' wind Qualified Resources as a single wind resource per LRZ using historical and synthesized resource performance profiles (see Section 6.3)

- Participant~~'~~s' solar Qualified Resources as a single solar resource per LRZ based on solar profiles developed from weather data (see Section 6.4)
- Energy Storage Resources (ESRs) as dischargeable only when there is a lack of other Qualified Resources available to serve load (see Section 6.5)
- Participants' Run-of-River (ROR) Qualified Resources as a single ROR resource per LRZ, using historical and synthesized resource performance profiles (see Section 6.6)
- Demand Response (DR) with properties provided by Participants (see Section 6.7)
- Dispatchable and controllable behind-the-meter Qualified Resources as equivalent sized resources (see Section 6.8)
- Capacity transactions resulting in either a net import or net export from the WRAP Region as hourly generators in applicable LRZ (see Section 6.9)
- Contingency Reserves so as to maintain the required amounts (see Section 6.10).

The total amount of monthly qualifying capacity needed to meet the reliability metric will be simulated as a resource stack in the LOLE Study using probabilistic analysis, taking into account ~~uncertainties~~ variations in generation (as well as load – see Section 5). The monthly Qualifying Resource simulated capacities (in MWs) needed to meet the reliability metric each month will then be converted to unforced capacity (UCAP) values (see Section 8) to calculate the FSPRMs (as a percentage).

6.1 Thermal Generator Modeling

Thermal generators will be modeled in the LOLE Study at their Net Generating Capability value (as indicated by the Capability Test – see *BPM 105 Qualifying Resources*) while forced outages for each resource will be modeled in accordance with their EFORd when determining the amount of monthly qualifying capacity to meet the

reliability metric.[3] The Capability Test data will be provided by each Participant in its ~~annual data submittal~~FS Submittal as discussed in *BPM 105 Qualifying Resources and BPM 108 FS Submittal Process*~~, ,as described in *BPM 101 Advance Assessment*~~. All thermal resources will be modeled in the LOLE Study, unless information provided by the relevant Participant in the Advance Assessment Data Request indicates the resource will not be available in the study period, such as a retirement date, future in-service date, or similar reason.

Forced outage modeling for thermal resources will use annual EFORd values (based on the EFORd equation as defined by NERC GADS[4]), forced outage durations, and outage events sourced from NERC GADS (or equivalent) data provided by Participants. For thermal resources that do not submit such data, an average forced outage rate will be applied based on size, technology type, Fuel Type and resource age. At a minimum, the most recent five years of historical NERC GADS (or equivalent) data will be considered in the LOLE Study. The models will be updated every Year to reflect the latest outage rates.

~~In accordance with the Tariff~~, P~~p~~lanned outages for thermal resources will not be modeled in the LOLE study. All thermal resources will be modeled as available at any given hour if the Qualifying Resource is not on a forced outage.

6.2 Storage Hydro Qualifying Resources

The LOLE Study will model Storage Hydro Qualifying Resources utilizing the Monthly QCC values determined with the methodology described in *BPM 105 Qualifying Resources* for such resources. The methodology utilized to assess QCC values for Storage Hydro Qualifying Resources accounts for the availability of storage such that it is appropriate in the LOLE modeling to assume the facility can output the Monthly QCC value for each hour in the LOLE Study. No additional outage modeling will be applied to the Storage Hydro Qualifying Resources in the LOLE Study, since the QCC values consider historical outages.

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[3] Note: Resource EFORd is used in LOLE Study for determination of FSPRMs, and differs from the EFOF (Equivalent Forced Outage Factor) used for– the determination of QCC for thermal resources during C~~c~~apacity C~~c~~ritical H~~h~~ours (CCHs) – see *BPM 105 Qualifying Resources*.

[4] NERC, 2023 GADS Data Reporting Instructions, January 2023, Appendix F, p9, Section 25, available at; GADS_DRI_2023.pdf (nerc.com)

6.3 Wind Resources

Wind resources provided by Participants will be modeled together as a single wind resource per LRZ in the LOLE Study. Operational wind data (preferred and used when available) and synthesized wind data will be utilized for the analysis: recent historic wind resource performance is correlated to the corresponding peak load profiles so that synthesized wind performance data can be developed from similar load profiles in earlier years for use in the resource variability simulations. For example, actual historical resource performance profiles from a recent period (e.g., -2014-2020) are taken, and the load profiles for those days are matched with daily load profiles (+/-25 days) from older years (e.g., 1980-2014) that best align with the peak load profile of the day in question. Actual resource output will be used when available. The Program Operator will identify in the Study Scope Document whether synthesized wind shapes for years where historical data is insufficient or not available will be redetermined for the upcoming LOLE Study. Wind resources provided that have not gone through the above synthetization process will use wind operational and synthesized data that is similar (i.e. the same LRZ) as the resource being added.

6.4 Solar Resources

Solar resources provided by Participants will be modeled together as a single solar resource per LRZ in the LOLE Study. When operational solar data is unavailable, s~~S~~olar profiles for resources will be developed using irradiance and weather data that will be obtained for weather station sites for the years after 1998 from the National Renewable Energy Laboratory's (NREL) National Solar Radiation Database (NSRDB) Data Viewer. Data will be obtained from the NREL System Advisor Model (SAM) for each Year and site to generate 8,760 hourly profiles. Profiles from 1980-1998 will be selected by using daily profiles from the day that best matches the peak load out of all the days +/- 3 days of the source day of the 7-year period from 1998 to the most current year. The Program Operator will identify in the Study Scope whether synthesized ~~wind~~ solar shapes for years where historical data is insufficient or not available will be redetermined for the upcoming LOLE Study. Solar resources provided that have not gone through the above synthetization process will use previous solar operational and synthesized irradiance data that is similar (e.g. the same LRZ) as the resource being added.

6.5 Energy Storage Resources

~~Energy Storage Resources (~~ESRs~~)~~ will be modeled in the LOLE Study as energy limited devices that will charge and discharge in accordance with their equipment specifications. ESRs will be modeled to charge and discharge in a 'preserve reliability'

mode, meaning that they will only be discharged when there is a lack of other resources available to serve load. ESRs will be discharged prior to Demand Response (DR) programs. ESRs will not be restricted to charging from co-located resources or in a hybrid configuration unless specified by the Participant.

6.6 Run of River Qualifying Resources

~~Run-of-River (~~ROR~~)~~ Qualifying Resources provided by Participants will be modeled together as a single ROR per LRZ in the LOLE Study. Operational and synthesized ROR data will be utilized for the analysis. Recent historic ROR resource performance is correlated to the corresponding peak load profiles so that synthesized ROR resource performance data can be developed from similar load profiles in earlier years for use in the resource variability simulations. For example, actual historical ROR resource performance profiles from a recent period (e.g., 2014-2020) are taken, and the load profiles for those days are matched with daily load profiles (+/-25 days) from older years (e.g., 1980-2014) that best align with the peak load profile of the day in question. The Program Operator will identify in the Study Scope whether synthesized ~~wind~~ ROR shapes for years where historical data is insufficient or not available will be redetermined for the upcoming LOLE Study. ROR resources provided that have not gone through the above synthetization process will use previous ROR operational and synthesized river flow data that is similar (e.g. on the same river system) as the resource being added.

6.7 Demand Response Programs

The LOLE Study will include properties and values of DR programs provided by Participants. DR programs will be modeled as equivalent flexible resources with high fuel costs, such that these representative resources would be dispatched last in the LOLE Study to reflect DR operating scenarios. Forced outage rates will not be assigned to DR programs.

6.8 Behind-the-Meter Generation

Behind-the-meter generation reported by Participants as capacity resources that are controllable and dispatchable by the Participant will be modeled in the LOLE Study as generation (per the aggregation requirements in *BPM 105 Qualifying Resources*). These resources will be assigned parameters and forced outage information from equivalent-sized resources.

6.9 External Capacity Modeling

Any external capacity transactions ~~-~~that are supported by firm commitments in the Advance Assessment Data Request (see *BPM 101 Advance Assessment*) will be modeled as hourly generators in the applicable LRZ in the LOLE Study. External transactions include any firm capacity transactions from or obligations to non-participating entities external to the WRAP Region. If the transaction is a sale to a non-participating entity, it will be an export of capacity. If the transaction is a purchase from a non-participating entity, it will be modeled as an import of capacity; forced outage rates will not be assigned to these transactions.

6.10 Contingency Reserves Modeling

In accordance with standard BAL-002-WECC-3, Balancing Authorities (and Reserve Sharing Groups) and required to maintain a minimum ~~Contingency Reserves (~~CR~~)~~ amount that is equal to the greater of either:

i. the loss of the most severe single contingency or

ii. the sum of three percent (3%) of hourly integrated load and three percent (3%) of hourly integrated generation.

The LOLE Sstudy will ensure all ~~Contingency Reserves~~ CR amounts are maintained during tallied loss of load events. To ensure this, the LOLE Sstudy will assume an average six percent (6%) of the Regional P50 Peak Load Forecast CR requirement when determining the capacity requirements to maintain the one event-day in 10-year LOLE requirement.

7. LOLE Study

Once the capacity contributions of the components of the resource stack have been determined (see Section 6) the LOLE Study simulation will be performed for the Subregions and WRAP Region to determine the capacity needed each Month to meet the reliability metric.

The probabilistic LOLE Study will model load variability (i.e., one of the forty (or more) synthetic load shapes) for all hours of the Year and random forced outages for Qualifying Resources in the WRAP Region and Subregions during each hour of the study. The LOLE Study will count loss of load events (insufficient Qualified Resource capacity to meet load) during all hours of the Binding Season against the reliability metric of the no more than one event-day in ten-year LOLE across a Binding Season. Loss of load events that occur during hours outside of the Binding Season will not be considered.

If an LOLE Study simulation has excess capacity in a Binding Season, pure negative capacity (with no outage rate) will be added in all hours of the applicable Binding Season until the WRAP Region or any Subregion arrive at the no more than one event-day in ten years across a Binding Season reliability threshold. If an LOLE Study simulation has insufficient capacity in a Binding Season, pure positive capacity (with no outage rate) will be added in all hours of the applicable Binding Season until the WRAP Region or any Subregion reaches the no more than one event-day in ten years across a Binding Season reliability threshold. In addition, to ensure the amount of qualifying capacity is not leading to excessively low LOLEs, pure capacity will be adjusted to ensure that all Months of the applicable Binding Season have at least 0.01 day per Year LOLE in that given Month, while at the same time ensuring the LOLE for the entire Binding Season does not exceed 0.1 day per Year LOLE.

Once the reliability metric is achieved, the capacity requirement (as represented by the resource stack and pure capacity) for each Month of the Binding Season (by Subregions and WRAP Region) is converted to UCAP for calculation of the FSPRMs (see Section 8).

8. FSPRMs Calculations

The monthly capacity values of the resource stack that result from the LOLE Study simulation (see Section 7) will be replaced with UCAP values as indicated in Table 1. The intent of the UCAP approach is to represent Qualified Resources with respect to their availability.

Table 1 - Resource capacity value to calculate UCAP FSPRMs

Resource type	Conversion to UCAP Values
Thermal Generation	The Net Generating Capability will be replaced by QCC values calculated by the Program Operator using the thermal QCC methodology (see *BPM 105*)
Wind, Solar and ESR	Values for wind, solar, and ESR resources will be determined by using an ELCC analysis (see *BPM 105*). The capacity values attributed to wind and~~,~~ solar resources ~~,~~ and ESRs ~~resources~~ will be consistent with the QCC values assigned to such resources in the QCC analysis (see *BPM 105*).

Storage Hydro	QCC values submitted by the Participants calculated using the Storage Hydro QCC methodology (see *BPM 105*).
Run-of-River Hydro	QCC values calculated by the Program Operator using the ROR QCC methodology (see *BPM 105*).
Demand Response	No conversion needed. Modeled maximum monthly capacity of all programs submitted by the Participants.
Pure Capacity adjustment to meet reliability metric	No conversion needed.

After the monthly capacity values of a resource stack are converted into UCAP values, the FSPRMs will be calculated separately for each Month of the Binding Seasons based on the Regional P50 Peak Load Forecast for each Month (Month also refers to a partial calendar month that is part of a Binding Season) as follows:

$$FSPRM\ (\%) = \frac{UCAP_{1-in-10} - \textbf{Regional}\ P50\ Load\ Forecast}{\textbf{Regional}\ P50\ Load\ Forecast} * 100$$

Where:

FSPRM(%) is the FSRPM for a specified Month in a Binding Season

$UCAP_{1\text{-}in\text{-}10}$ is the UCAP required to meet the reliability metric for a specified Month in a Binding Season

Regional P50 Peak Load Forecast is the ~~non-coincident~~ P50 Peak Load Fforecast for the specified Month ~~(see *BPM 103 Forward Showing Capacity Requirements* for more information about Participants' P50 loads).~~

Regional P50 Peak Load Forecasts used in the above FSPRMs equation are distinct from Participant P50 Peak Load Forecasts used in the calculation of Participant FS Capacity Requirements in *BPM 103 FS Capacity Requirement*. However, it should be noted that while Regional P50 Peak Load Forecasts are calculated using the same methodologies as Participant P50 Peak Load Forecasts the former use a Load Growth Factor specific to the LOLE Study (see *BPM 103 FS Capacity Requirement*).