



e-FILING REPORT COVER SHEET

Send completed Cover Sheet and the Report in an email addressed to: PUC.FilingCenter@state.or.us

REPORT NAME: Confidential Wind Availability Report

COMPANY NAME: Pacific Power

DOES REPORT CONTAIN CONFIDENTIAL INFORMATION? No Yes

If yes, please submit only the cover letter electronically. Submit confidential information as directed in OAR 860-001-0070 or the terms of an applicable protective order.

If known, please select designation: RE (Electric) RG (Gas) RW (Water) RO (Other)

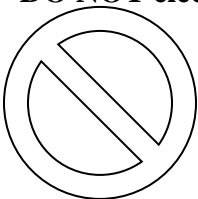
Report is required by: OAR
Statute
Order 10-414
Other

Is this report associated with a specific docket/case? No Yes

If yes, enter docket number: RE 57, UM 1355

List applicable Key Words for this report to facilitate electronic search:
Confidential Wind Availability Report

DO NOT electronically file with the PUC Filing Center:



- Annual Fee Statement form and payment remittance or
- OUS or RSPF Surcharge form or surcharge remittance or
- Any other Telecommunications Reporting or
- Any daily safety or safety incident reports or
- Accident reports required by ORS 654.715

Please file the above reports according to their individual instructions.

April 28, 2017

VIA ELECTRONIC FILING

Public Utility Commission of Oregon
201 High Street SE, Suite 100
Salem, OR 97301-3398

Attn: Filing Center

Re: RE 57—Confidential Wind Availability Report

PacifiCorp d/b/a Pacific Power submits for filing its confidential wind availability report for calendar year 2016. This report is provided in accordance with the stipulation in docket UM 1355, adopted by Order No. 10-414, in which the parties agreed that the report would be provided concurrent with the annual results of operations report.

This report is confidential and provided under the general protective order in this proceeding (Order No. 08-549).

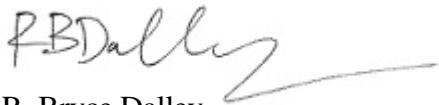
It is respectfully requested that all data requests regarding this matter be addressed to:

By E-mail (preferred): datarequest@pacificorp.com

By regular mail: Data Request Response Center
PacifiCorp
825 NE Multnomah, Suite 2000
Portland, OR 97232

For informal inquiries, please contact Natasha Siores, Manager, Regulatory Affairs, at (503) 813-6583.

Sincerely,



R. Bryce Dalley
Vice President, Regulation

Enclosures

cc: UM 1355 Service List

CERTIFICATE OF SERVICE

I certify that I served a true and correct copy of PacifiCorp's Confidential Wind Availability Report in Docket UM 1355 on the parties listed below via e-mail and/or overnight delivery in compliance with OAR 860-001-0180.

UM 1355

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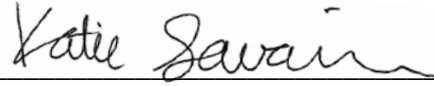
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Dated this 28th day of April 2017.

A handwritten signature in black ink that reads "Katie Savarin". The signature is written in a cursive style and is positioned above a horizontal line.

Katie Savarin
Coordinator, Regulatory Operations

Background

As briefly summarized below, there are many variables associated with calculating the availability of wind-powered generation resources (Wind Projects). Historically, there has been no industry standard definition of “availability.” As a result, availability calculations can and have been turbine manufacturer specific and/or the result of operation and maintenance (O&M) service contract negotiations. The North American Electric Reliability Corporation (NERC) is reviewing comments regarding the implementation of mandatory outage reporting beginning January 1, 2018, which may facilitate more standardized reporting of availability across the wind industry.

As further described below, PacifiCorp currently determines mechanical availability as the percentage of time a wind turbine generator is available to generate energy, notwithstanding external factors that do not result in the generation of energy (i.e., lack of wind or unavailability of electrical facilities external to the wind turbine). This is distinct from how availability is determined for thermal generating units.

Boundaries

As it relates to availability, Wind Projects are typically viewed as having the following three primary components that can affect availability: the wind turbine generator (WTG), the balance of plant (BOP) and the network transmission system (Grid). The WTG, BOP, and Grid are considered to connect to one another at points of electrical interface or “boundaries.”

The boundary between the WTG and the BOP is typically the connection of the power cables at the secondary side of the WTG padmount transformer (ground mounted outside the WTG) or at the first connection of the power cables inside the WTG. The boundary between the BOP and the Grid is usually defined as the point of interconnection (POI) with the network transmission system pursuant to a FERC pro-forma large generator interconnection agreement.

Each component can be viewed differently by the parties involved (WTG manufacturer, O&M service provider, and owner).

Time Allocations

Similar to the Boundaries discussion above, there are several categories of WTG time allocation. If the WTG is operating normally then the WTG manufacturer can have multiple variables in their SCADA system allocated to normal operation. Normal operation means the WTG is available to produce energy but not necessarily producing energy.

If a WTG is not available due to an environmental condition (i.e., high or low winds, low or high temperatures) then the SCADA system may have several variables allocated to unavailability due to environmental reasons.

If a WTG is not available due to the lack of power from the Grid then the SCADA system may have several variables allocated to unavailability due to loss of power.

If a WTG is not available due to a problem with the BOP then the SCADA system may have several variables allocated to unavailability due to BOP. The distinction due to unavailability associated with a BOP problem versus loss of power will require determination and manual input.

If a WTG is not available due to fault, repair, or scheduled maintenance of the WTG then the SCADA system will usually have several variables allocated to unavailability due to these service related issues.

While there are numerous ways to allocate turbine time, at its simplest, availability is calculated as follows:

$$\frac{\text{Survey Time (ST)} - \text{Lost Time (LT)}}{\text{Survey Time (ST)}} \quad \text{or} \quad 1 - \frac{\text{Lost Time (LT)}}{\text{Survey Time (ST)}}$$

Survey time is either a function of calendar time or a summation of some or all of the WTG time allocations. In addition, the time associated with instances when the WTGs are not communicating to the SCADA system (i.e., a fiber optic failure, loss of power or other communications related failure) may or may not be included as part of survey time or lost time. As a further example, some amount of time associated with scheduled WTG maintenance, untwist time, “turbine ok” status or startup time may or may not be included as part of lost time.

Wind Project availability calculations, while not standardized, are usually calculated either as the average of all of the individual WTG availabilities or as the summation of the individual WTG time related events. WTG manufacturers historically have not programmed their supervisory control and data acquisition (SCADA) systems to accommodate the number of time allocation variables that an owner or O&M service provider may desire. SCADA systems are WTG specific.

PacifiCorp Wind Projects

As summarized above, there are numerous ways to calculate availability, impacted by differing ways of considering the three boundaries and differing ways of accounting for turbine time. Definitions of these boundaries and time allocations can differ between turbine manufacturers and/or O&M service providers. The combinations of these variables result in availability calculations that can and do vary from Wind Project to Wind Project. For the context herein, the availability of a Wind Project is a function of time and has no relation to the energy production or the inherent volatility of energy production due to an intermittent and weather dependent fuel source.

PacifiCorp fully owns twelve Wind Projects and partially owns one Wind Project. Each Wind Project is monitored by its own individual SCADA with the exception of Seven Mile Hill II (which is combined with the SCADA system dedicated to Seven Mile Hill), McFadden Ridge I (which is combined with the SCADA system dedicated to High Plains), and Glenrock III (which is captured in the SCADA systems dedicated to the Glenrock and Rolling Hills projects). The individual availability calculations for each PacifiCorp Wind Project can be generally summarized as follows:

- **Glenrock, Glenrock III, Seven Mile Hill, Seven Mile Hill II, High Plains & McFadden Ridge I** – Survey time is defined as normal operation time plus loss of power time plus environmental time plus external stop time plus external energy curtailment time plus maintenance time plus customer stop time plus lost time. Lost time is defined as down time plus repair time.
- **Goodnoe Hills** – Survey time and lost time are based on 23 different groupings of SCADA variables.
- **Leaning Juniper I** – Survey time is defined as normal operation time plus loss of power time plus environmental time plus external stop time plus service time plus customer caused stop time plus lost time. Lost time is defined as outage time plus repair time.
- **Marengo & Marengo II** - Survey time is defined as normal operation time plus environmental time plus lost time. Lost time is defined as manufacturers down time.
- **Dunlap I** - Survey time is defined as normal operation time plus line out time plus environmental time plus external stop time plus external energy curtailment time plus customer stop time plus lost time. Lost time is defined as down time plus repair time plus availability adjustments plus maintenance time.
- **Foote Creek I** - Survey time is defined as the number of turbines times the number of days in the period times 24 hours per day. Lost time is defined as manufacturers down time which is defined as time electrical power was not generated due to scheduled and unscheduled service, maintenance and repairs of the wind turbine. This includes shutdown time due to breach of noise and environmental warranties.