Exh. DCG-13
Dockets UE-170485/UG-170486
Witness: David C. Gomez

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **AVISTA CORPORATION d/b/a AVISTA UTILITIES,** **Respondent.**	**DOCKETS UE-170485 and UG-170486 (*Consolidated*)**

EXHIBIT TO
TESTIMONY OF

David C. Gomez

STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION

Avista's Response to Staff DR No. 200

October 27, 2017

AVISTA CORP.
RESPONSE TO REQUEST FOR INFORMATION

JURISDICTION:	WASHINGTON	DATE PREPARED:	09/18/2017
CASE NO:	UE-170485 & UG-170486	WITNESS:	Clint Kalich
REQUESTER:	UTC Staff - Gomez	RESPONDER:	James Gall
TYPE:	Data Request	DEPT:	Energy Resources
REQUEST NO.:	Staff 200	TELEPHONE:	(509) 495-2189
		EMAIL:	James.gall@avistacorp.com

REQUEST:

Referring to the values in the Resource Table in the AURORA model project file used in this case and the AURORA project files from the last two General Rate Cases:

a. Please explain how Avista arrived at the forced outage values in Table 1 below. Provide all analysis, workpapers, formulae and any other materials and documents which Avista relied on to calculate these values.[1]
b. Explain why Boulder Park values were updated and not the other Peaker Plants.
c. Explain why the over $2.0 million in capital costs Avista expended in the Peaking Generation Business Case from 2012-2016 included in Mr. Kinney's Exhibit SJK-4, Pages 64 to 66, has not resulted in a decrease in forced outage rates for peaker plants.[2]
d. Explain why most wind, solar and geothermal resource forced outage rate values in the model refer to separate time-series sub hourly tables instead of individual forced outage values.
e. In the separate time-series sub hourly tables used to calculate forced outage values, identify which column and values apply to the resources listed in the Resource Table. Describe how the forced outage values are calculated in the study using a time-series sub hourly table.[3]
f. Explain the presence and source of generic forced outage values in the Resource Tables of in this rate case and in UE-150204.[4] Explain why these values remain unchanged.

RESPONSE:

Please see Avista's **CONFIDENTIAL** response to data request Staff_DR_200C. Please note that Avista's response to Staff_DR_200C is **Confidential per Protective Order in UTC Dockets UE-170485 and UG-170486**.

[1] Mr. Kalich's workpapers supporting his thermal resource settings in AURORA for forced outages relies on a 5-year rolling average for Coyote Springs 2, Lancaster and Kettle Falls and 6-years for Colstrip. No such workpapers appear to exist for the resources listed in the table.
[2] In Docket No. UE-100749, Mr. Kalich's Exhibit No. CGK-1T, page 24, Table 4 – Equivalent Forced Outage Rates (EFOR) of Avista Thermal and Gas Plants show values for Northeast and Rathdrum identical to values in Table 1 above. Boulder Park EFORs appear to have worsened since then.
[3] For example, Palouse Wind refers to a table titled; SH_Avista|Palouse|2017 which contains 70 columns with values for hours 1-23 for the year 2017. Referring to the last column; Palouse, the forced outage value for hour 1 on January 1, 2017 would be equal to (105.3 MW * (1-45.2/100)) = 47.5956.
[4] For example, Wattenberg Field CG 1 is reported to have in both this case and UE-150204, a forced outage factor of 21.14 percent.

a) The Boulder Park forced outage rate was calculated using data in the "station service.xlsx" spreadsheet provided in working papers with this case. We did not retain the specific calculations, but have re-created the work arriving at 13.65 percent, see Staff_DR_200C Confidential Attachment A.

b) The Northeast and Rathdrum plant forced outage rates of 5 percent are an assumption used for these plants since the 2005 rate case. Limited operations of the plants does not give a good sample size to base forced outages rates upon, and so we use the same rate as in our energy position report.

The 5 percent forced outage rates for Northeast and Rathdrum are much lower than data reported by NERC's GADS database attached as Staff_DR_200C Confidential Attachment B, which can also be found at the web address below. In other words, the output, and value to customers, of these plants in the rate case is higher than they would be if the higher GADS rates were used.

http://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx

In this file NERC averages forced outage rates for similar technologies, in this case they find the forced outage rates for Gas Turbines at an EFORd rate of 8.4 percent for above 49 MW (i.e. Rathdrum). For 20 plus MW Jet Engines, the technology for Northeast, the rate is 8.4 percent. Reciprocating Engines, the technology of Boulder Park, is not tracked by GADS in this report.

The Company for this case chose to update Boulder Park's forced outage rate to a 5-year actual, lowering its rate from 15.00 percent. Similar to Northeast and Rathdrum, this lower forced outage rate benefits customers in the case by making the plant more available then it would be with a higher forced outage rate.

c) Capital projects frequently are not always intended to improve a plant's reliability. Instead, capital deployed may retain reliability, improve plant capability, improve or restore plant efficiency, and/or or comply with regulatory requirements. Below is a list of peaking plant projects not directly impacting plant reliability:

a. replace equipment obsolescence such as replacing an outdated control system,
b. adding mandatory environmental requirements such as adding emission monitoring equipment,
c. Replacing station batteries, so the facilities can maintain its reliability,
d. Add fast start systems at Rathdrum to allow the unit to start faster to provide 10 minute reserve products,
e. Replacing blade sections based on OEM recommendations so the units prior to forced outages take place.

d) In AURORA, forced outage rates for variable generating resources like wind and solar are used to reflect the expected hourly generation shape of these resources. It is common practice with AURORA to use the forced outage column to represent the hourly shape of these resources by an hourly de-rate to the capacity, as there is no other way to properly model hourly profiles for renewables. For geothermal resources, an annual vector is used to represent efficiency changes in the projects as well production levels depreciate over time.

e) Within the resource table, the column "forced outage" shows the resources that use the sub hourly data. This is found by searching for the "SH_" in the beginning of the text string. The column used in the corresponding sub hourly table is found by the work between the "| |", for example "|NW|". These values are calculated by using regional wind and solar data. For example the solar data is calculated from a study by the NPCC using NREL data, and the wind data is calculated using NREL data by Avista.

It is important to recall that, because of the methodology used to match AURORA prices to the forward markets, these datasets do not materially affect power supply costs in this case. The only wind resource Avista controls using the sub hourly table is Palouse Wind. In this case the data used is based on the 12x24 estimated delivery provided by the developer of the project and is in the sub hourly table "Palouse". As explained above, wind output is input into AURORA using forced outage rates.

f) The forced outages rates used in this case and prior cases are derived from NERC's GADS data or from the default AURORA database. The forced outage rates for regional resources are unchanged from the prior case because this information was not updated. Avista periodically updates this data with new GADS data, but these estimates generally do not change much year to year and are not always updated each year. Because the data in question is for non-Avista resources, it has no impact on the results of this case; electricity market prices are trued up to forward prices.