BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of PACIFICORP for a Certificate of Convenience and Necessity Authorizing Construction of the Currant Creek Power Project	)))))	Docket No. 03-035-29

REBUTTAL TESTIMONY OF RAND THURGOOD

FEBRUARY 11, 2004

Q. Please state your name.

A. My name is J. Rand Thurgood.

Q. Are you the same J. Rand Thurgood that submitted direct testimony in this proceeding?

A. Yes.

Q. What is the purpose of your rebuttal testimony?

A. In this testimony, I will address a number of positions and erroneous assertions put forth by Mr. Banasiewicz on behalf of Spring Canyon Energy LLC (Spring Canyon) and Mr. Falkenberg on behalf of the Committee of Consumer Services.

Q. Messrs. Banasiewicz and Falkenberg assert that the Company's Next Best Alternative (NBA) model has several incorrect or insufficient cost inputs. Do you agree?

A. No. As I discuss in greater detail in this testimony, there is no factual support for these assertions. In fact, many of the Company's cost inputs are conservative, and all were verified by Navigant in its July 22, 2003, Final NBA Report (NBA Report). Ironically, Mr. Banasiewicz asserts that the Spring Canyon project is virtually identical to the Currant Creek Project, therefore, under his logic, most of the cost savings he attributes to the Spring Canyon project would apply with equal force to the NBA.

Q. Mr. Banasiewicz claims that the NBA model uses an inappropriately low cost estimate for interconnecting to the transmission network. Is that accurate?

A. No. We used the estimate provided to Panda by PacifiCorp Transmission as a conservative estimate of the interconnection costs at the Mona Substation.

Q. Do you have any indication that your estimate was in fact conservative?

A. Yes. We recently received a new estimate for the Mona substation portion from PacifiCorp Transmission. It indicates that the cost is expected to be $5,500,000. This is well below the $7,000,000 amount used in the NBA. Other portions of the interconnection cost are also coming in lower than the estimates used in the NBA.

Q. Do you concur with Mr. Banasiewicz's statement that Spring Canyon could have met the June 2005 schedule had it been awarded a contract on October 1, 2003 to build either its bid number 135 or number 653 projects, both combined-cycle plants?

A. No. Mr. Banasiewicz proposes a 20-month schedule to build a green field combined-cycle plant. PacifiCorp asked three different major worldwide engineering/construction companies to provide their most optimistic schedules for bringing a combined-cycle plant on line after being given a full notice to proceed (FNTP). The shortest schedule proffered was 25 months. The 25 months would only start after execution of a contract to conduct the engineering and construction of the project that would enable an FNTP to be given (a contract that would take anywhere from several weeks to several months to complete). Mr. Falkenberg also apparently agrees that construction of a combined-cycle project was not feasible by the June 2005 date as implied in his direct testimony.

Q. Do you concur with Mr. Banasiewicz's assertion that "PacifiCorp is now realizing how risky and potentially unachievable it can be to obtain such permits" meaning air and water permits?

A. No, I do not. Mr. Banasiewicz's testimony would have the Commission believe that PacifiCorp does not expect to receive these permits. That is not the case. PacifiCorp has acquired all of the water necessary to operate the plant. The Utah Division of Water Rights issued a Memorandum Decision and Order on February 3, 2004, authorizing PacifiCorp to use the water for the Currant Creek Project. The Utah Division of Air Quality (UDAQ) has assured PacifiCorp that all is in order with respect to its Approval Order (more commonly known as an air permit) and that the "Intent to Approve" or ITA will soon be issued. This will start the 30-day public process after which PacifiCorp fully expects the Approval Order to be issued. Further, PacifiCorp has also requested from UDAQ that an Administrative Order be issued that would allow construction to take place until the Approval Order is issued. We expect to receive this order upon Commission approval of the Certificate of Convenience and Necessity.

Q. Do you agree with Mr. Banasiewicz's statement that PacifiCorp was forced to reduce the size of its air permit from 1000 MW to 500 MW?

A. No. PacifiCorp is only seeking approval to construct a 525 MW plant and it has elected to seek an air permit commensurate with the size of its proposed plant.

Q. Do you agree with Mr. Banasiewicz's statement that PacifiCorp uses an enormous amount of duct-firing far in excess of its air permit application and far in excess of industry standards?

A. No, definitely not. The approval order application filed by PacifiCorp requests a limit of 3500 hours per year of duct firing. The evaluation of the NBA against RFP bids correctly limited the duct-firing capability to 3500 hours after Round II

evaluations. Furthermore, there is no industry standard as to the extent duct-firing is used on a given facility. This is totally dependent upon the air permit limitations in force for the given facility and upon the extent to which the unit is dispatched. I also note that the duct-firing capacity of the proposed Currant Creek Project is roughly the same as that proposed by Spring Canyon in Bid No. 653, each being about 100 MW.

Q. Do you agree with Mr. Banasiewicz's testimony where the assertion is made that competitive market forces would eliminate any possibility that inefficient duct burners would fire greater than the 15% (1,300 hours/year) reported as an industry average by the EPA?

A. No. The frequency of duct-firing use in a combined cycle is determined by a number of factors. One is operability of the equipment. Numerous conversations with the vendor and engineer verify that there are no physical reasons why duct-firing could not be used continuously when the combined cycle is in operation. Environmental constraints are possible depending on the unique characteristics for each plant site. The dispatch decision, though, is largely based on the availability of alternative resources which can be dispatched at lower cost. For the Currant Creek situation, transmission and alternative resource constraints indicate dispatch levels almost equivalent to the available levels of duct-firing subject to environmental limitations. What the EPA has compiled as nationwide averages is essentially meaningless in the context of Currant Creek.

Q. Mr. Banasiewicz asserts that the availability assumptions for the NBA inappropriately rely on data derived from the Hermiston facility. Do you

believe the Hermiston data provides an inaccurate cost estimate for Currant Creek?

A. No. The Hermiston availability assumptions are reasonable. Spring Canyon asserts that using the Hermiston availability data for the four-year 1997-2000 time frame is inappropriate inasmuch as major overhauls are not performed in a four-year time frame. It is correct that a total overhaul period is longer than four years (typically six years), however, for the actual four year period in question, a long duration major overhaul was performed on one unit in addition to a hot gas path overhaul. In addition, two combustion inspections that typically would require 7 days or less to complete, were performed over a 14-day period since there was reduced need for power at that time. The net effect of these particular circumstances is that the historical Hermiston unavailability data for overhaul work is actually greater than would be expected over a "typical" six-year period which includes major overhauls. As an additional consideration, the Hermiston gas turbines are of an older vintage that require inspections more frequently than GE's current equipment. In conclusion, the Hermiston availability data for the 1997-2000 timeframe is reasonable.

Q. Do you concur with Spring Canyon's argument that the operating and maintenance costs for both Spring Canyon and the NBA need to be corrected?

A. Certainly not. Mr. Banasiewicz goes through an elaborate explanation to derive a revised O&M cost for Spring Canyon and the NBA. As outlined in Table 9 of his testimony, Mr. Banasiewicz arrives at a revised estimated O&M PVRR for Spring

Canyon of ($94.4) million for variable O&M and ($78.2) million for fixed O&M. (PVRR figures in parenthesis indicate costs.) As referenced by Mr. Banasiewicz's testimony, these costs must be considered together. Together these two O&M categories for Spring Canyon total ($172.6) million or a reduction of $47.9 million from the Spring Canyon original bid. Mr. Banasiewicz simultaneously modifies the NBA PVRR estimate of O&M, found in Table 10 of his testimony, from ($172.8) million to ($204.1) million or an increase of $31.3 million.

It is interesting that in manipulating the O&M values after having seen PacifiCorp's numbers Mr. Banasiewicz is able to come up with total O&M ($172.6) million, over a 20 year period, nearly identical to the NBA proposal ($172.8) million. As stated in Mr. Banasiewicz's testimony, the O&M costs for these projects should be similar since they are virtual duplicate concepts. We appreciate very much Mr. Banasiewicz confirming the validity of the O&M costs in the NBA.

Q. Do you agree with Spring Canyon's assertion that the NBA's variable O&M accrual to cover major maintenance is understated?

A. No. The NBA's estimate for the gas turbine maintenance costs were co-developed with General Electric (GE) in a similar manner to Exhibit F in Mr. Banasiewicz's testimony. Those costs were restated so that they could be used in a real-levelized fashion, but the basis for the costs were provided by GE. A review of the numbers provided by GE to PacifiCorp and the numbers in Exhibit F in Mr. Banasiewicz's testimony indicates that Currant Creek is using a

slightly higher level of maintenance costs over the same time period—$73,882,593 vs $71,308,293. The variable O&M costs in the NBA are sufficient for the Currant Creek project.

Q. Do you agree with Spring Canyon's assertion that the $0.10/MWh estimate for variable O&M for duct-firing is insufficient in the NBA and "will not even cover the additional cost of ammonia used by the SCR let alone additional maintenance on plant components especially the SCR"?

A. No. PacifiCorp is confident that the $0.10/MWh variable O&M for duct firing covers the cost of ammonia (NH3) and that the costs for maintenance of plant components is covered in the NBA proposal.

The quoted $0.10/MWh cost is the full cost of incremental ammonia used during the operation of the SCR during duct-firing operation. Looking at this issue in a straightforward way, the typical duct burner has a guaranteed NOx emissions rate of 0.06-0.08 lbs per MMBtu. Using the more conservative value of 0.08 lbs/MMBtu, a 500 MMBtu per hour duct burner will generate 40 lbs of NOx (as NO2). Assuming complete NOx removal, NH3 slip values are unchanged, and a typical stoichiometric ratio in the NOx reduction process (1 mole of NH3 consumed per mole of NOx (as NO2) reduced or 0.37 lbs of NH3 consumed for each lb of NOx reduced (as NO2)) then 14.8 lbs of additional NH3 will be required by each HRSG during duct firing. When the NBA was developed, 20% aqueous ammonia was quoted at $0.06 per pound or $0.30 per pound of NH3 equivalent. This equates to an hourly reagent cost of $4.44 for each 500 MMBtu/hour duct burner when fully fired. Each HRSG duct burner provides

approximately 52 MW of additional generation, equating to approximately $0.085/MWh, which is less than the $0.10/MWh value used in the NBA. It should be noted PacifiCorp is familiar with the operating costs of SCRs, as it operates eight SCR systems for the West Valley and Gadsby gas turbines.

In the NBA, PacifiCorp included $300,000 per year in fixed costs for duct-firing components, therefore the "additional wear on plant components" was included—it just was not considered to be a variable cost. Plant component maintenance, including SCR maintenance costs (excluding catalyst and major CT (combustion turbine) overhaul accruals), are included in fixed O&M. There is over $450,000, in addition to the $300,000 for the duct burners, allocated yearly to general plant maintenance activities in fixed O&M.

Q. Mr. Banasiewicz asserts that startup fuel is not in the variable O&M costs of the NBA and that the NBA variable O&M is underestimated by $1,856,000 per year. Please respond to these assertions.

A. PacifiCorp does not consider startup fuel to be a variable O&M cost. For the NBA, startup fuel was not included in the variable O&M costs because we consider these costs to be inconsequential relative to the cost of the total fuel consumed. We consider Spring Canyon's estimate of $1,856,000 as the cost of startup fuel to be significantly overstated. The current definition for a startup is the period between the time of the start and the time the unit is at minimum sustainable load. For a gas turbine during a warm or hot start, this occurs relatively soon after the gas turbine is synchronized. This process takes approximately 12-14 minutes and requires approximately 60-67 MMBtu per gas

turbine per start, depending on whether it is a hot or warm start. Under the assumption that the average fuel for a start is 63 MMBtu per gas turbine with 300 starts per year, and a fuel cost $5.50 per MMBtu, then the annual cost for startup fuel would be $208,000 for a 2x1 facility. This is just 11% of Spring Canyon's estimate. Using Spring Canyon's assumption of $5.50 per MMBtu, the annual fuel cost of the facility would be somewhere in the range of $100 million to $130 million. The annual startup fuel cost of $208,000 is inconsequential.

Q. Do you concur with Spring Canyon's assertion that a generation value for the NBA should have been 417 MW at 60F instead of 420 MW?

A. No. The predicted value from Stone & Webster's Thermoflex run was 419 MW. The regression model that was used to establish the values at different temperatures predicted 420 MW for 60F.

It should be pointed out that Stone & Webster has designed and built 2x1 combined-cycle plants with air-cooled condensers, most notably the Apex Project, which is almost identical to the Currant Creek Project in design. It is our opinion Stone & Webster is closer to the details on this particular project than Mr. Banasiewicz and his engineering firm. In addition, Mr. Banasiewicz fails to provide the assumptions used to come up with the 417 MW.

Further, the results of performance prediction models are influenced by certain factors, including: how well the model predicts the performance of the gas turbines (inasmuch as the original equipment manufacturers (OEMs) periodically modify the performance of their currently offered equipment), the assumed efficiency of the steam turbine, the back pressure, and the assumptions regarding

the plant's auxiliary loads, especially the air cooled condenser, one of the largest auxiliary loads in the plant.

PacifiCorp is confident that at 60F, the Currant Creek Project will be able to generate at least 420 MW in the combined cycle mode without duct firing.

Q. Spring Canyon asserts that $167 per fired hour must be accrued for SCR replacement and that the NBA has no cost for SCR catalyst replacement. Is that correct?

A. Absolutely not. Spring Canyon states that $167 per fired hour must be accrued for SCR replacement. This is not a realistic value. For the NBA, PacifiCorp estimated the cost for catalyst replacement at $500,000 per heat recovery steam generator (HRSG) for every 32,000 fired hours of operation. This is equivalent to $31.25 per fired hour, the value used in the NBA. Currently, it should be noted that the $31.25 value appears to be conservative. PacifiCorp has received a quote for catalyst replacement for 2 HRSGs that indicates replacement catalyst can be procured for less than the $1,000,000 estimate used in the NBA. Furthermore, the NBA assumes a cost of $31.25 per fired hour to be accrued for SCR catalyst replacement. PacifiCorp negotiated a catalyst life for its HRSGs is excess of 25,000 fired hours. The supplier indicated that the guaranteed life could be extended to 40,000 hours for a cost less than $100,000. In conclusion, Spring Canyon's estimate of the SCR replacement costs PacifiCorp should have used in its NBA evaluation is completely inaccurate. The value PacifiCorp used in its NBA is both conservative and reasonable.

Q. Do you agree with Spring Canyon's assertion that the NBA includes an "inappropriately low" cost of equipment?

A. Unequivocally not. As Spring Canyon quotes from the NBA Report, "the prices quoted in the Stone & Webster report were based on original equipment manufacturers' (OEM) prices for new equipment." For the NBA, PacifiCorp adjusted CT costs to reflect the secondary market. As Spring Canyon observes, PacifiCorp has not purchased from the secondary market but has contracted with the OEM. Spring Canyon goes on to say that they have requested PacifiCorp to confirm the exact amount of "this error." However, there is no "error." The total of the contracted quotes for all the major Company-furnished equipment used to develop the NBA is completely within budget.

The Company chose to pursue the purchase of the CTs directly from the OEMs after examining the secondary market in some depth and evaluating the additional cost and risk factors associated with these highly critical pieces of equipment and the need to maintain schedule. Even though the Company purchased the CTs from the OEM, the inference should not be made that the negotiated price to be paid for the CTs was not influenced by the secondary market. The Company's price for the CTs was slightly higher than the NBA estimate, but was substantially lower than Stone & Webster's estimate for new CTs. Further, the additional cost paid for the CTs over the secondary market price used in developing the NBA has been compensated by lower negotiated costs for the other major Company-furnished equipment. The net effect is that the

total cost for all major Company-furnished equipment is within the amount used in the NBA.

Q. Do you agree with Mr. Falkenberg's assertion that the economic basis for the Currant Creek Project was inaccurate?

A. As Mr. Falkenberg pointed out, the $117 million PVRR did not reflect an appropriate comparison because the model run used to generate this number did not reflect the removal of the CO_2 tax impact on market prices. What Mr. Falkenberg fails to point out is that this model run (with the carbon tax not applied to the NBA) was not used to evaluate the NBA against all other RFP bids. The comparison evaluations correctly used only the model run where both the market prices and CO_2 taxes were applied together. Mr. Klein provides more detailed testimony on the evaluation models.

Q. Mr. Falkenberg asserts that the staged construction of the project, increases costs to ratepayers. Does this assertion paint a full picture for the Commission?

A. No. While the staged construction of the project will marginally increase the capital costs of the project by less than 1.5% of the total expected capital costs, the staged construction also ensures that there will be a reliable resource available for the summer load of 2005 and therefore avoids at least part of the need to rely on the market to supply power during the most expensive hours of the day, if such power is even available and if sufficient transmission even exists. Mr. Tallman explains in greater detail the issues in filling PacifiCorp's load and resource gap

during the summer of 2005 without Currant Creek. There is no other cost/effective alternative, as Mr. Falkenberg's testimony would have you believe.

Q. Mr. Falkenberg implies that the assumption of 100% availability for Currant Creek in July and August of 2005 is too optimistic in light of PacifiCorp's experience at Gadsby and West Valley in their initial months of operation. Do you agree with this observation?

A. No. The construction schedule of the NBA, assuming the certificate is granted by February 23, 2004, anticipates first firing of the CTs in late April. Commercial operation is expected by the end of June for the two CTs in simple cycle mode. This schedule therefore allows two months of startup and testing on these CTs before the months of July and August. Conversely, in addition to the differences in technology, equipment and contractors, the units at Gadsby and West Valley, because of schedule, were forced to undergo initial testing and startup during July and August. Startup and testing at Currant Creek will be complete before the months of July and August and availabilities during these critical months are expected to be near 100%.

Q. Mr. Falkenberg asserts that "PPW has a poor track record of estimating the O&M costs for its own projects. For example, the actual labor costs at West Valley Plant have exceeded estimates by more than 100% according to CCS 4.16." Is this assertion accurate?

A. No. It is true that the manpower estimates for West Valley were underestimated in 2001, but when the overall estimates for the Gadsby gas turbines were folded into the West Valley estimates, the combination of costs were much closer to

actuals. Gadsby and West Valley gas turbines do share management and O&M personnel, and the operating configuration at West Valley (five LM-6000 simple cycle machines) is not a common plant configuration in the industry. Overall, PacifiCorp is a very experienced operator of power generating facilities. PacifiCorp operates over 6,890 MWs of fossil fuel generating capacity. In establishing the operating labor estimates for Currant Creek, we used our experience with Hermiston operating costs as well as the experience of the CT vendor and General Electric. A 2x1 CCCT is a common configuration in today's power generation industry. PacifiCorp is confident in the operating cost assumptions for the Currant Creek project NBA.

Q. Does this conclude your rebuttal testimony?

A. Yes.