DAVID J. MEYER
VICE PRESIDENT, CHIEF COUNSEL FOR REGULATORY
AND GOVERNMENTAL AFFAIRS
AVISTA CORPORATION
P.O. BOX 3727
1411 EAST MISSION AVENUE
SPOKANE, WASHINGTON 99220-3727
TELEPHONE: (509) 495-4316
FACSIMILE: (509) 495-8851

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

THOMPSON RIVER CO-GEN, LLC a Colorado Company, COMPLAINANT, vs. AVISTA CORPORATION dba AVISTA UTILITIES, a Washington Corporation, RESPONDENT.	)	CASE NO. AVU-E-05-7 DIRECT TESTIMONY OF THOMAS C. DEMPSEY

FOR AVISTA CORPORATION

I. INTRODUCTION

Q. Please state your name, employer and business address.

A. My name is Thomas C. Dempsey. I am employed as Manager, Thermal Engineering, by Avista Corporation and my business address is 1411 East Mission Avenue, Spokane, Washington.

Q. Please state your educational background and professional experience.

A. I graduated from the University of Texas at Austin in August 1993, with a Bachelor of Science in Mechanical Engineering, with a major in thermal/fluid systems, of which power plant design and analysis is a component. I have taken numerous training courses during the course of my career, including Thermoflex® software training. Thermoflex® is an industry standard power plant design and performance modeling software package sold by Thermoflow, Inc.

In December of 1993, I accepted a position in Houston Lighting & Power's Performance Analysis group. My responsibilities in that position included performance testing of various types of generating units, including natural gas-fired Rankine cycle units, natural gas-fired combustion turbines, and coal-fired facilities. Testing of those facility types encompassed performance efficiency and emissions testing and tuning activities.

I joined Washington Water Power (now Avista) in December of 1996 as a Production Engineer in the Generation Engineering group. My job responsibilities included management of engineering projects for the Company's hydro and thermal facilities as well as performance testing for Avista's wood-fired facility in Kettle Falls, Washington. In that role

I also had responsibility for development of the preliminary conceptual design for Avista's Kettle Falls Generating Station combined-cycle project.

I received my Professional Engineering license in January, 1998. In 2001, I was promoted to the position of Combustion Turbine Specialist, which included responsibilities for supervision of operation and maintenance for Avista's Northeast and Rathdrum natural gas-fired combustion turbine facilities and the Boulder Park Generating Station, a natural gas-fired reciprocating engine plant. In 2004, I became Manager of Thermal Engineering which, in addition to the operations and maintenance responsibilities described above, added responsibilities for engineering supervision for all of Avista's thermal generating facilities (Kettle Falls Generating Station, Rathdrum Combustion Turbine, Northeast Combustion Turbine, Coyote Springs 2, Boulder Park Generating Station), with the exception of Colstrip.

Q. What is the scope of your testimony in this proceeding?

A. I will further explain the basis for the Company's determination that the net output capacity of the TRC project is greater than 10 aMW even with the new environmental permitting requirements. My testimony will explain the relationship between boiler heat input and steam output levels and the amount of generation net output. I will provide an overview of TRC's emissions test results for NOx and SO2. I will also review the Montana Department of Environmental Quality's (MDEQ) recent air quality permit Preliminary Determination on the TRC project's request for increased levels of NOx and SO2 emissions. I will review the most recent TRC emissions test data and discuss why it is reasonable to expect that the emission requirements outlined in the MDEQ Preliminary Determination will not reduce the project's ability to produce a net output in excess of 10 aMW.

I am sponsoring the following exhibits listed in the table below, which were prepared under my direction:

Exhibit No.	*Description*
211	TRC Hourly Net Output – September 2005
212	TRC - Hourly Net Output – 66-Hour Test Period (9/10-9/12)
213	Summary Comparison - TRC Air Permit Requirements
214	TRC – NOx(36% Reduction) – 66-Hour Test Period (9/10-9/12)

Q. What review of the TRC project did you perform?

A. On page 1 of a letter to the MDEQ, dated January 4, 2006, TRC explains that the "emission rate proposed as NOx BACT [best available control technology] is based on the September 2005 boiler testing performed by Luke Conner, owner of CPL Systems." The Company has, therefore, based its review of the project's emissions and net generation over this same September testing period.

I performed a review of hourly generation net output, NOx emissions, heat input, and steam output for the September 2005 testing period. In particular, I reviewed NOx emissions, heat input, and steam output data from the MDEQ records for the 66-hour period from September 10, Hour 6 through September 12, Hour 23. I also reviewed the hourly net output data from the same 66-hour period and found that the project net output averaged 11.4 aMW.

Q. Why did you pick this 66-hour period during September?

A. The project operated a total of eight days in September. The 66-hour period spans three days and represents the last multi-day continuous test period for the project and

includes those hours after start-up with the project fully stabilized and generating at nearly full output levels.

Q. How was the hourly net output data for the TRC project during the month of September obtained?

A. Exhibit No. 211 shows hourly net output graphs for every day of testing during September 2005. These numbers were obtained from TRC's Response to Production Requests Nos. 29 and 36. Each hourly data point includes the metered Northwestern kWh as well as the hourly average Thompson River Lumber energy consumption. The Thompson River Lumber daily consumption varied, but averaged 0.399 MWh/hr each day during September.

As the project was in a "testing and tuning" mode, it was often ramping up or down or otherwise simply operating at other than full net output levels. Those hours of reduced net output effectively lowered the daily net output average amounts below the level of what would otherwise be the case for a continuously operating project. Consequently, a review of the hourly net output data shows an even higher sustained capability than the daily average amounts addressed in Mr. Perk's testimony.

Q. What was the hourly net output for the TRC project during the 66-hour continuous operation period?

Exhibit No. 212 shows the hourly net output for the 66-hour period in September. The project averaged 11.4 aMW.

Q. Was the Thompson River Lumber steam load being served by the TRC project during this September 10 through September 12, 2005 66-hour period?

A. No. Based on TRC's response to a data request for steam sales information, it was indicated that the Thompson River Lumber steam supply system was not on line during any of the September 2005 testing period.

Q. Will you please review the net generation effects expected when steam is supplied to Thomson River Lumber.

A. Net generation is reduced when the TRC project supplies steam to the Thompson River Lumber Company; this represents an energy loss from the perspective of the steam turbine generator cycle. In order to quantify this effect, the Company developed a computer model of the plant using Thermoflex® power plant design and modeling software. Components for the model were chosen to match the components shown in the TRC project heat balance that we had observed during a site visit. Using the Thermoflex® model, the Company chose various lumber mill steam demands to calculate the reduction in net output. As stated previously, during the September testing, it was noted that the TRC project was not supplying steam to the lumber mill. Using Thermoflex® to simulate a 9000 lb/hr steam supply to Thompson River Lumber reduced the predicted net generation by approximately 0.35 aMW, compared to conditions where no steam is sent to the lumber mill.

Q. Please discuss the boiler output levels observed during the 66-hour testing period.

A. Based on boiler load data obtained from the MDEQ, it was also observed that the boiler was operating below full output, by an average amount of approximately 6%, during the 66-hour testing period discussed above. Again using the Thermoflex® model, the Company determined that the average net generation during that 66-hour period would have

been approximately 0.8 aMW higher if the boiler had been operated at its Maximum Continuous Rating (without exceeding its heat input limit) for steam supply throughout the period.

Q. After simulating steam supply to Thompson River Lumber and assuming operation of the boiler at its Maximum Continuous Rating for steam without exceeding the 192.8 million Btu/hr limit on fuel, what is your calculated average net generation for the period?

A. Using the Thermoflex® model to simulate both the anticipated reduction in net generation due to a 9000 lb/hr steam supply to the lumber mill and the anticipated increase in net generation that could be realized if operating the boiler at its maximum continuous rating, yielded a predicted average net generation during the period of 11.8 aMW. The hours immediately preceding and following this time period were start-up and shut-down periods where boiler load and output were both substantially below design and were not considered. The net output level of 11.8 aMW is even higher than the 11.4 aMW discussed earlier in my testimony, and reflects the net effect of further adjusting for both steam service to Thompson River Lumber and operating at the maximum continuous rating.

Q. Will you please review the TRC project test results for NOx?

A. Yes. The MDEQ rejected TRC's proposed NOx limit increases in its February 10, 2005 Preliminary Determination regarding TRC's application for a modified air quality permit. The MDEQ instead required a NOx BACT (best available control technology) limit of 0.178 lbs/MMBtu as measured on a 3-hour rolling basis and installation of a Selective Non-Catalytic Reduction (SNCR) system. In calculating the NOx limit, the

MDEQ assumed a SNCR NOx reduction efficiency of 36%. Exhibit No. 213 shows a side-by-side comparison of NOx and SO2 emissions limits under TRC's current air quality permit, TRC's November 16, 2005 proposed air quality permit modifications, and the MDEQ's Preliminary Determination requirements.

The Company has reviewed TRC NOx emissions levels from MDEQ data records for the month of September 2005. The Company has, in particular, reviewed test data from the 66-hour period, September 10, 2005 through September 12, 2005. As mentioned previously, that period represents the last multi-day continuous test period for the project and includes those hours after start-up with the project fully stabilized and generating near full output levels.

NOx emissions averaged 0.137 lbs/MMBtu for this 66-hour period when data is adjusted to reflect a 36% reduction in NOx using technology referenced as BACT by the MDEQ Preliminary Determination. Exhibit No. 214 shows the NOx levels for each hour of operation. After the project is up to steady-state, full load operation and when NOx emissions are adjusted downward by 36%, the NOx levels all fall below the 0.178 lb/MMBtu MDEQ Preliminary Determination limit for NOx. This indicates that the project can still operate at levels in excess of 10 aMW, even with the environmental permit limits.

Q. Will any SO2 limits required by the MDEQ result in reduced boiler capability?

A. The MDEQ states on page 3 of the Preliminary Determination that, "SO2 emissions from the boiler shall be controlled by a flue gas desulfurization (FGD) unit when combusting coal...." The MDEQ specifies on page 2 of the Preliminary Determination a

0.206 lb/MMBtu limit on SO2 emissions. The MDEQ references a number of technologies that are capable of meeting the SO2 emission limits in their Permit Analysis section. On page 26 of the Permit Analysis section, the MDEQ states, "For LSD FGD, guaranteed 85% SO2 removal can be obtained from control equipment manufacturers...". (emphasis added) Therefore, technologies are available to TRC to limit SO2 emissions, without otherwise impacting the project's ability to generate in excess of 10 aMW. (TRC will have to employ these technologies, in any event, to operate the plant.)

Q. By way of summary, can you comment on the expected impact of the new NOx and SO2 technologies on project net output?

A. On page 7 of its Application for Air Quality and Operating Permit Modifications dated November 11, 2005, TRC notes that a SO2 limit expressed in lbs/MMBtu does not limit fuel input into the boiler. Correspondingly, the steam generated is not limited. The MDEQ Preliminary Determination maintains this type of specification with respect to both the SO2 and NOx limits. The MDEQ did, however, maintain the boiler heat input limit of 192.8 MMBtu/hr. The Company's simulations already reflect this limitation as well as the maximum continuous steam rating of the boiler. Accordingly, even with the environmental permitting constraints of the MDEQ, the project's net output will exceed 10 aMW.

Q. Does that conclude your pre-filed direct testimony?

A. Yes it does.

SEE CASE FILE FOR

DEMPSEY EXHIBITS

211 - 212 – 213 - 214

WHICH COULD NOT BE

SCANNED SUCCESSFULLY