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-05-07

Testimony of

Charles Frederick Busch

on behalf of

Thompson River Co-Gen, LLC

November 9, 2005

Q. Please state your name and business address for the record?

A. My name is Charles Frederick Busch. My address is Savage Services Corporation, 6340 S 3000 E, Salt Lake City Utah 84121.

Q. Please describe your educational background and experience?

A. I have a B. S. in Fuels Engineering from the University of Utah in 1976, as well as considerable experience in engineering as it relates to power plants. I have 3 years experience in combustion research and engineering for coal-fired plants, principally with a boiler manufacturer, Combustion Engineering Inc. where I conducted combustion studies on western coals for boiler design, as well as 3 years experience in the utility industry on coal-fired power plants with Utah Power and Light Company as its Fuels Specialist working with seven coal fired plants on performance problems related to the coal supply.

I also worked as a consultant for 3 years working with coal producers such as Coastal Coal Company, and power plants such as Nevada Power and Light, on coal fired plant performance. I have had 20 years project development experience with Savage including Project Manager for an independent coal terminal. My current title is Sr. Vice President Development of Power Generation Services Projects including projects to provide operating and maintenance services to plants such as TRC.

Q. What is your involvement, if any, with the Thompson River Co-Gen ("TRC") facility?

A. I am the Project Development Manager for Savage as Operating Contractor for TRC.

Q. What is the subject matter of your testimony?

A. I am testifying regarding TRC plant performance as well as the start up and testing phase of the facility.

Q. Please describe the physical description of the facility, including the generator, steam host, and related equipment?

A. The plant consists of a two-drum, Sterling boiler fitted with a two stage economizer and a primary and secondary economizer designed by Babcock and Wilcox Company. This system is designed to provide 130,000 pounds of continuous steam per hour with final steam conditions of 850 psig and 900 degrees F and to provide 137,500 pounds of peak steam per hour for 4 hours. Steam temperature is controlled by a Graham steam attemperator, with spray water supplied from a sweet water condenser.

The combustion system is a traveling grate solid fuel combustor designed by Detroit Stoker Company which is supplied by a Ramsey coal feeder and conical distributor to four Detroit Stoker under-throw slinger type rotary feeders. Bottom ash is collected by an Allen Shermanhoff vacuum system with two clinker grinders, a vacuum system and a tertiary ash separator which is located external to the boiler building and adjacent to a 200-ton ash silo.

The boiler is a balanced draft unit utilizing a forced draft and induced draft fan system, including a cinder re-injection system and mechanical separator designed to minimize carbon carryover to the bag house collector. The bag house is an Environmental Elements-designed pulse jet fabric filter with 6 collection cells and a 3.75:1 air to cloth ratio.

The SO2 removal system is located in the duct work between the mechanical separator and the bag house and consists of a dry hydrated lime dry injection system and mixing venturi.

Flue gas exits the bag house through the induced draft fan and is disbursed to a 100-foot, 6 foot diameter steel stack structure. The system was engineered and manufactured by Anderson 2000, to the specified emission requirements of the 2001 Air Quality Permit issued to TRC by the Montana Department of Environmental Quality. TRC has determined that the current SO2 scrubbing system must be modified to meet the the current permit requirements (as issued in November 2004). TRC intends to make appropriate modifications.

The condensing steam turbine has a 16.5 MW name plate, rated for 850 psig at 900 degrees F., 3600 rpm, coupled to a 17,650 KVA generator, including a condenser, circulating water pumps, condensate pumps, a lube system and gland steam condenser, all manufactured by Elliott Turbine Company. TRC retained Elliott to evaluate the performance of the turbine and to make recommendations regarding the potential to improve the actual operating efficiency of the turbine. The original plant configuration as constructed in North Carolina used a turbine was a non-condensing, 8.7 MW name plated unit.

Cooling water is provided by a forced draft, four cell cooling tower manufactured by Marley.

The main boiler master and plant control system is a PLC-based system provided and programmed by CPL systems.

Water conditioning is provided by an initial sand filter system and a reverse osmosis water conditioning unit.

Miscellaneous systems include a plant air conditioning and compressor system, a waste water oily water separator and a pond system.

Coal fuel is delivered via a 23-car capacity rail siding with an under-track coal dump and coal handling system. Wood-fuel is supplied via a pneumatic feeding system connected to the woodwaste storage site at Thompson River Lumber, with the capability of adding additional wood fuel as available.

Q. Please describe the fuel source?

A. The fuel supply is a Montana subbituninous coal produced by Roundup Trading at its underground mine in Billings Montana. Biomass, in the form of sawdust is available locally through TRL and in the form of forest trimmings through local lumber contracts with the U.S. Forest Service.

Q. Where are the meters located for that equipment?

A. The meter, and point of telemetry, measuring power generated by TRC and delivered to the grid is on the high side of the TRC 115K/13.2K transformer located at the TRC substation, approximately 50 feet west of the Boiler Building. The meter for power delivered from TRC to Thompson River Lumber is on the 13.2KV breaker supplying power to the mill from our 13.3KV bus. All power delivered through this meter is delivered internal to TRC. During normal plant operations, the meters record independently.

Q. How and where is the facility interconnected to the local distribution facility?

A. TRC is connected to the transmission grid via a 115KV transmission line from the TRC 115KV/13.2KV step up transformer located at the TRC substation, to NorthWestern's Kerr B transmission line, located approximately three fourths of a mile from the plant, at the Thompson Falls interconnect point.

Q. Do you know what the facility's net average generation is, exclusive of plant load requirements and transmission losses prior to the point of delivery?

A. To date, the highest average monthly output, net of service load, measured at the high side of the TRC substation was slightly over 9 MW (including the electric energy delivered to Thompson River Lumber Company). Though the plant has been mainly concentrating on startup and tuning, it is clear that the average generation on a monthly basis has been much lower than 9 MW. I would anticipate that the net monthly average to be 8-10 MW, on a sustainable basis.

Q. How much electrical energy does TRC sell to Thompson River Lumber Company ("TRL")? Can you describe how and where power is dispatched and received by TRL from TRC?

A. TRC sells approximately .75 MW/HR to Thompson River Lumber.

Q. Has TRC to your knowledge ever generated more than 10 average Megawatts ("maw") in any month?

A. To the best of my knowledge, TRC has not generated more than 10 average Megawatts, net of the plant service requirements, in any month since startup of the plant.

Q. In your opinion, without significant upgrades, will TRC be in a position to generate 10 aMW in any given month?

A. As previously stated, the original construction of the TRC included an 8.7 MW non-condensing turbine, requiring substantial make-up water. With the required water and associated water treatment costs economically and environmentally prohibitive, TRC identified a 1960's

vintage rebuilt 16.5 MW turbine that had been overhauled by De Laval Turbine, Inc. using parts specified to OEM standards.

TRC understood at the time of purchase that the boiler did not have the capacity to meet full capacity requirements of the Elliott turbine. However, TRC believed that an acceptable level of turbine performance could be achieved, though exact performance would not be known until actual operation. The turbine has achieved sound and sustainable performance through initial operations although, as expected, generation levels are substantially less than plated ratings. TRC has since investigated the potential to increase generating capacity (estimated up to 2 MW) at an initial estimated cost in excess of $1.3 million dollars without any guarantee of actual performance.

In the event it appeared as though TRC were going to exceed 10 aMW generation in any given month, does TRC have sufficient permitting and other flexibility to ramp down its generation to accommodate load.

The plant does have the capability to throttle down its output in the unlikely event that average generation would near 10MW average per month.

Q. Does this conclude your testimony?

Yes