EXHIBIT NO. ___(LEO-1CT)
DOCKET NO. UE-09___/UG-09___
2009 PSE GENERAL RATE CASE
WITNESS: LOUIS E. ODOM

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-09____** **Docket No. UG-09____**

PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF LOUIS E. ODOM ON BEHALF OF PUGET SOUND ENERGY, INC.

REDACTED VERSION

MAY 8, 2009

PUGET SOUND ENERGY, INC.

PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF LOUIS E. ODOM

CONTENTS

PUGET SOUND ENERGY, INC.

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LOUIS E. ODOM**

I. INTRODUCTION

Q. Please state your name, business address, and position with Puget Sound Energy, Inc.

A. My name is Louis E. Odom. My business address is 10885 N.E. Fourth Street Bellevue, WA 98004. I am the Director of Thermal and Wind Resources for Puget Sound Energy, Inc. ("PSE" or "the Company").

Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?

A. Yes, I have. It is Exhibit No. ___(LEO-2).

Q. What are your duties as Director of Thermal and Wind Resources for PSE?

A. I am responsible for planning, organizing and directing PSE's gas, coal and wind electric energy production, including operations, maintenance and modernization of the project facilities. My duties also include management of PSE's thermal and wind purchased power agreements. I also assist PSE's Resource Acquisition team in its due diligence efforts regarding future wind and thermal resource evaluations. In my current position, I am a member of PSE's energy resources senior leadership team. As such, I help to formulate the strategic direction of the group as a whole.

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

A. My testimony describes the Company's wind and thermal resources and the performance and operations of such resources; the maintenance management programs for the Company's wind and thermal resources, including major maintenance; and the service contract specifics that relate to resource maintenance. Additionally, my testimony describes how PSE's Mint Farm Generating Station ("Mint Farm") and Sumas Generating Station ("Sumas") are combined-cycle combustion turbine ("CCCT") facilities that are designed and intended for baseload electric generation.

II. OVERVIEW OF PSE'S WIND AND THERMAL RESOURCES

A. Wind Generation

Q. Which wind facilities is your group responsible for operating?

A. PSE's Thermal and Wind assets group manages and operates two wind facilities for PSE – Hopkins Ridge and Wild Horse. The Hopkins Ridge wind facility is located in southeast Washington near the town of Dayton and began commercial operation in November 2005. The project includes 83 Vestas V80 wind turbines with an electrical capacity of 149.6 megawatts ("MW"), plus 4 additional V80 units that entered commercial service in August 2008 with an electrical capacity of 7.2 MW.

The larger Wild Horse wind facility is located near Ellensburg, Washington and began commercial operation in December 2006. Wild Horse currently has 127 Vestas V80 wind turbines with a total electrical capacity of 229 MW, and PSE plans to add 22 more V80 units at Wild Horse in 2009.

Q. What are the main components of a wind turbine?

A. A modern wind turbine is composed of three main components (1) the tubular tower and foundation system, (2) the turbine nacelle (containing a gearbox, generator, and controls), and (3) the 3-bladed rotor system. This general design footprint is known in the wind industry as the "Danish" design.

Q. Please describe details of the wind turbine's components.

A. To provide the broadest understanding of wind turbine technology, the following comments describe turbine components and systems available from various manufacturers, and are not necessarily specific to the Vestas V80 units that PSE operates.

The tower of the wind turbine carries the weight and structural loads of the nacelle and the rotor. Tubular steel towers are the most common for large wind turbines due to their high strength, enclosed section for ancillary equipment, and ease of installation in the field. Towers are typically manufactured in multiple sections of 20-30 meters each with bolt flanges at either end. The towers are conical (i.e. with their diameter increasing towards the base) in order to increase their strength and to save materials at the same time.

The wind turbine rotor system consists of three glass-fiber or carbon-fiber reinforced resin blades attached to a steel hub, which drives the main shaft. The blade angle, or pitch, is adjusted by hydraulic cylinders or servo motors to maintain a nominal rotor speed for the given wind conditions. The blades may be pitched individually or in parallel, depending on the sophistication of a particular turbine control system, and the blades are continuously adjusted according to real-time wind speed data. Wind turbines are also equipped with systems to reduce rotational speed and bring the rotor to standstill in the event of a load rejection and to ensure personal safety during servicing.

The drive train consists of a main shaft supported by large pillow block or spherical roller bearings, a speed-increasing gearbox, flexible coupling, brake, and electric generator. Because the main shaft entirely supports the blade hub, any blade rotation is directly transferred into the nacelle bedplate. The main shaft bearings, gearbox, shaft coupling, and generator are designed specifically for rotational torque.

The wind turbine uses an asynchronous induction generator to produce alternating current. This type of generator is very reliable and has some operating properties that are useful for wind turbines. As an induction machine, the speed of the generator will vary with the input torque applied to it. This difference between generator rotor speed and synchronous (electric system) speed is called "slip." The generator's ability to increase or decrease its speed as the wind varies smoothes power delivery and reduces structural loads under turbulent or volatile wind conditions.

Q. How is a wind turbine regulated in varying wind speeds?

A. The turbine receives wind speed and direction data from an anemometer located atop the turbine nacelle. The turbine will automatically rotate, or yaw, over a 360° range to follow changing wind directions. The wind turbine will begin generating automatically at a wind speed of approximately four meters per second and increase in output as wind speed increases until full output is reached at approximately 14 meters per second. Progressively adjusting blade pitch to maintain rotor system torque allows the turbine to sustain full output as wind speeds continue to increase. At extremely high wind speeds (typically in excess of 21 meters per second) the wind turbine will feather its blades, bringing the rotor system to a stop, and wait until high wind speeds abate.

Q. What else is required to control and operate the wind turbine plant?

A. In addition to the wind turbine itself, additional infrastructure facilities are required to (1) control and monitor the operation of the wind turbine, (2) collect and transmit electrical energy to the project substation, and (3) connect to the utility or the transmission grid. The underground collection circuits, project substation, and transmission interconnection are known as the balance of plant systems.

Q. What are the key operating considerations for a wind turbine generating facility?

A. As in a traditional power station, availability is a key performance benchmark of the wind plant's operations and maintenance program. With many tens or hundreds of individual wind turbine towers across the plant site, individual turbine outage statistics have a limited effect on overall project availability. Still, maintenance related to issues with the rotor system, gearbox performance and lifecycle, and control system calibration and fault history may have a substantial collective effect on plant availability. Routine maintenance and inspection should include careful evaluation of common maintenance issues, and plant operators should review and monitor a series of key performance indicators so that equipment concerns can be addressed early.

Q. Since beginning commercial operation following initial construction, how have PSE's wind facilities performed?

A. PSE's wind facilities have generally posted high availability statistics, and have each generated more than one million MWh of electrical energy. In 2008, the contractual availability for Hopkins Ridge and Wild Horse was [redacted] and [redacted], respectively.

Q. What is "capacity factor" and how is it calculated?

A. Capacity factor at a wind facility is the ratio of the actual energy produced over a period of time divided by the energy produced if the facility had operated at full nameplate capacity for the same period. In 2008, the actual capacity factor for Hopkins Ridge and Wild Horse was [redacted] and [redacted], respectively.

Q. Are the capacity factors for Hopkins Ridge and Wild Horse consistent with the industry standard?

A. Industry wide, capacity factor is strongly influenced by the production availability of the turbines and reliability of the wind resource itself. Diminished wind turbine availability or a wind resource that underperforms early expectations will each put downward pressure on capacity factor. Actual capacity factors at specific wind projects are generally treated as commercially sensitive information due to the high growth rate of wind energy in the U.S. market and competition for wind facility sites. As a result, actual capacity factors are not easily available for comparison directly from plant operators. The wind industry is quickly maturing, and a few consulting firms are developing performance databases that will allow wind farm operators to benchmark their specific performance statistics against industry average performance. While such benchmarking is not widely available today, PSE plans to participate in the actual development of such wind energy databases and will provide performance data if confidentiality concerns can be addressed.

Q. What is a "Forced Outage Rate" and how is it calculated?

A. The forced outage rate at a wind facility is the percentage of real-time that the wind turbine generator is not available to generate electrical energy due to a failure or fault. Failure and fault records are logged automatically by the turbine control system and archived to the supervisory control and data acquisition ("SCADA") software for later review and modeling. In 2008, the forced outage rate for Hopkins Ridge and Wild Horse was [redacted] and [redacted], respectively.

Q. How is routine and corrective maintenance provided for the wind turbines?

A. PSE's wind turbines are maintained by the manufacturer, Vestas-Americas, in accordance with the terms of five-year service agreements negotiated concurrent with the turbine supply agreements. Please see the Second Exhibit to my Prefiled Direct Testimony, Exhibit No. ___(LEO-3C), for a copy of such agreements. These service agreements provide for (1) routine and unscheduled maintenance and service, (2) materials, supplies, parts, equipment, vehicles, and other items that support routine maintenance, (3) all equipment, tools, consumables, and protective equipment, (4) heavy equipment, test equipment, and special tools, (5) trained and qualified maintenance personnel, and (6) monitoring, diagnostics, and technical support.

Q. How are maintenance services scheduled for the wind facility?

A. The wind turbine is an extremely well designed and thoroughly tested machine, but it nonetheless requires careful operation and maintenance to maintain high availability and reliability. Vestas has established a comprehensive maintenance program to minimize the number of separate maintenance visits for each turbine. Reducing the number of turbine visits per year, grouping unrelated maintenance operations, continuously improving products and procedures, and providing continuing training to the workforce improve the overall performance of the wind turbine facility. Routine maintenance of the wind turbine is performed on a six-month cycle with additional inspections performed on an annual cycle.

Q. Does PSE have a maintenance management system?

A. In 2008 PSE worked with Deloitte-Touch to design a computerized maintenance management system for PSE's Hydro, Thermal, and Wind assets groups. In 2008 all wind balance-of-plant ("BOP") inventory was added to the system, and in 2009, PSE will use new system to schedule maintenance on BOP equipment in its Wind assets group. This system will provide notifications of time-based and event-based maintenance tasks, adding considerable value to the overall maintenance strategy. As PSE staff adds routine and corrective maintenance notes to the system, the Company expects trends to emerge, indicating which components or groups of components are consuming the most maintenance resources and causing the most downtime. Maintenance work orders will be prioritized and tracked by asset or component, equipment performance and maintenance histories will be documented, a spare parts inventory will be optimized for near-term activities, and outside service or material providers may be dispatched directly from the maintenance management system. Vestas utilizes the same maintenance management platform to prioritize and track turbine maintenance activities.

Q. Please describe the results of PSE's maintenance and monitoring efforts with regard to the wind turbine gearbox.

A. As mentioned above, the wind turbine gearbox is designed primarily for lightweight and smooth power transfer from the rotor system to the generator. PSE pays special attention to the operation, maintenance, lubrication, and condition of the gearbox because it experiences high torque, has the potential to receive external casing loads transmitted from the turbine nacelle, and because its function is critical. Turbine gearbox maintenance includes the following:

- monitoring the temperature of main shaft bearings,
- conducting routine oil sampling and analysis looking for trends in particulate contamination and moisture content,
- inspecting for buildup of metals on a magnet located in each gearbox,
- visually inspecting the gearbox, using a boroscope, to assess the condition of the gears and other internal components, and
- monitoring offline oil filtration and heating.

Some manufacturers equip gearboxes with a full suite of condition monitoring equipment while others rely on relatively inexpensive temperature or acoustic monitoring. Vestas does not currently equip its gearboxes with full condition monitoring systems, relying instead on its own remote diagnostics from its worldwide fleet of turbines to evaluate gearboxes (and other components) for proper operation. Nonetheless, PSE has been reviewing products and systems as new condition monitoring equipment becomes available.

Q, What type of remote monitoring or diagnostic services does Vestas provide?

A. Vestas offers extensive site-specific monitoring and evaluating capabilities. Vestas gathers turbine operational data from each site and is able to acquire this data via the turbine control system installed at the facility. This data stream is analyzed by site or can be viewed in the context of similar units operating throughout the world. By reviewing specific turbine operating data against site- or fleet-wide data averages, Vestas is in a unique position to monitor the health and performance of its wind turbines and can suggest performance improvement based upon trends or anomalies in the data. Vestas provides fleet-wide turbine performance monitoring solutions within the scope of the service and maintenance agreements at no additional cost to PSE. Such service reduces the need for standalone condition monitoring systems that require constant monitoring and specialized training to maintain proficiency.

Q. What are some of the operational risks commonly associated with wind facilities?

A. Wind generation facilities such as Hopkins Ridge and Wild Horse are subject to risks such as fire, lightning, and vandalism. These risks may not be unique to wind generation, but the physical characteristics of a wind farm make them potentially more likely or more costly than with other forms of generation.

Q. How does PSE monitor and manage its contractors for high performance?

A. PSE's internal staff, the turbine manufacturer's workforce, and other third-party service providers work together to conduct maintenance services at PSE's wind facilities. PSE's wind facility staff manages this collaboration to ensure compliance with safety and environmental procedures, avoid miscommunication, and establish appropriate staging and responsibility boundaries.

Q. Does Vestas provide any type of performance warranty on the wind turbines?

A. During the five-year term of their service agreements, Vestas provides a warranty on turbine availability. During the first six months of operation, the expected average availability is [redacted], and for the remainder of the five-year period, the expected average availability is [redacted]. Should the actual availability fall below pre-determined levels, liquidated damages are paid to PSE and are calculated based on a defined formula within the service agreements. Likewise, Vestas is paid an incentive bonus if availability exceeds [redacted] during any twelve-month production period.

Q. How much does wind turbine maintenance cost under the terms of PSE's existing service agreements?

REDACTED VERSION

A. The 2009 annual cost payable to Vestas under these agreements is [redacted] and [redacted] per turbine at Hopkins Ridge and Wild Horse, respectively. The annual fee escalates with benchmark inflation indices and is subject to Washington State sales tax for the relevant county. During the term of the service agreements, PSE is responsible for the dispatch and operation of the turbines, overall facility management, and the operation and maintenance of Balance of Plant systems (i.e., the portion of the facility excluding the wind turbines), including the collection system, project roads, the site substation, and the interconnecting transmission line. PSE may provide some of these services via subcontract or perform them using internal staff.

Q. Are maintenance costs expected to increase as these older service agreements are replaced with new agreements?

A. Based on the per turbine cost negotiated with Vestas for both the Hopkins Ridge infill and the Wild Horse expansion service agreements, wind turbine maintenance costs are increasing at a rate that exceeds normal inflation benchmarks. This increased cost appears to be driven in part by the rapid growth of the wind industry globally constraining spare parts supplies, and in part by the service experience Vestas has gained from local facility operations. Using the negotiated Wild Horse expansion service agreement as a benchmark, PSE expects that the cost of service agreement renewal will increase to [redacted] per turbine annually, and the Company has included that expectation in its rate year forecast.

B. Combustion Turbines

Q. What type of Combustion Turbine Facilities does PSE operate?

A. PSE operates simple cycle combustion turbine generators, also known as gas turbine generators, and combined-cycle combustion turbine ("CCCT") facilities, in which the gas turbine generators are "combined" with steam turbine generators. Both types of facilities use natural gas or fuel oil ignited with compressed air to pass through a turbine and drive an electrical generator. At PSE's simple cycle facilities, combusted gas exhausts directly to the atmosphere after it passes through the turbine. At the CCCT facilities, the exhausted gas, which has a temperature of approximately 1000˚F, passes through a heat recovery steam generator. The heat recovery steam generator produces steam that drives a separate electrical generator driven by a steam turbine.

PSE operates simple cycle facilities at its Fredonia, Frederickson and Whitehorn sites. General Electric ("GE"), Pratt and Whitney ("P&W") and Westinghouse manufactured the gas turbine generators at these facilities. PSE's combined cycle facilities are located in Bellingham (Encogen), Goldendale, Longview (Mint Farm) and Sumas, Washington. PSE also owns a minority interest in a combined cycle facility in Frederickson, Washington. GE manufactured all of these combined cycle facilities' gas turbine generators.

Q. How do PSE's combustion turbine facilities contribute to PSE's electric resource portfolio?

A. PSE uses its gas turbine-based generating facilities to maintain the lowest cost generation for PSE's customers and to provide continuous transmission system stability. Both the simple and CCCT facilities operate to meet these two goals depending on customer demand and regional electric and fuel market conditions. The CCCTs have lower heat rates than simple cycle generators, which means they require a lower ratio of fuel heat input to electrical power output than the simple cycle facilities. As a result, the CCCT plants have lower average fuel costs and operate more often than simple cycle generators, as long as market conditions are favorable. The CCCT plants are designed to run at capacity factors above 90%. The simple cycle plants, known as peakers, have higher proportional fuel costs but can respond faster to system demand changes. Simple cycle units produce "peak" power during the times when the transmission system needs additional generation to remain stable.

Q. What are the different design criteria and operational and staffing requirements for PSE's simple and CCCT facilities?

A. PSE's simple cycle facilities are physically compact, with a minimum of auxiliary equipment necessary to support reliable, safe and environmentally-compliant operations. The combined cycle facilities are physically larger and are located at sites specifically approved for their operations. They possess the same basic components as simple cycle peakers, but include additional equipment required to combine the functions of the combustion and steam turbine generators. This "combined" cycle reduces the fuel cost of the CCCT facility by approximately 40%, compared to a similar simple cycle application.

The CCCT facility's design requires significant additional major components, auxiliary equipment and control systems related to the steam production for the steam turbine generator relative to simple cycle facilities. This additional equipment results in a more efficient generator but increases the complexity of these facilities' operation and maintenance.

As previously discussed, PSE's CCCT facilities are designed to operate continuously, and it is PSE's intent to operate them in this manner whenever market conditions allow. Please see the Prefiled Direct Testimony of David E. Mills, Exhibit No. ___(DEM-1CT), for details of PSE's economic dispatch procedure. PSE's CCCT facilities normally operate for days or more at a time and must be ready at any time to meet both changing market conditions and system demands. The steam production requirements of the CCCT require more direct human interface and manual operations than a simple cycle generator. PSE normally operates these facilities with an on-site staff of approximately 10 people per site covering a 24 hours per day, 7 days per week schedule, supplemented by supervisory and support personnel working a standard 40-hour week. The simple cycle facilities must also be prepared to operate at any time, but PSE can operate these facilities remotely. Further, PSE normally is only required to run a simple cycle facility for a number of hours, and can operate these facilities with a staff of fewer than six people per site. However, simple cycle facilities nonetheless require a full-time staff working a standard 40-hour week to perform routine maintenance and testing. This on-site staff is also responsible for “call outs”, in which they respond to alarms and equipment failures. The simple cycle sites also involve supervisory and support personnel.

Q. What are the maintenance requirements of PSE’s simple and combined cycle facilities?

A. Proper maintenance of power plant equipment is essential to high system availability. Gas turbine generators (“GTG”) are critical components to both PSE’s simple cycle and combined cycle facilities. As stated above, GE manufactured the majority of the GTGs at the Company’s simple cycle facilities and all the GTGs at PSE’s combined cycle facilities. GE’s technical publication, “Heavy-Duty Gas Turbine Operating and Maintenance Considerations,” is the reference document for the general maintenance requirements of GTGs. Please see the Third Exhibit to my Prefiled Direct Testimony, Exhibit No. ___(LEO-4).

Simple cycle GTGs in peaking application have a high ratio of unit starts to running hours. Simple cycle GTGs require maintenance to address metal fatigue, which results from thermal cycles that occur during unit starts and stops, and corrosion and fouling resulting from both normal operations and ambient conditions. The GTG's auxiliary equipment, such as high voltage switchgear, lubrication systems and water injection systems, also requires routine maintenance based on time, the number of operating hours, and cycles of operations.

GTGs used in CCCT facilities have modified maintenance requirements to fit their operating mode. These facilities have a longer operating life because they are more efficient and have a lower ratio of starts to operating hours than simple cycle facilities. They also contain additional major components, known as balance of plant, such as heat recovery steam generators, selective catalytic reduction systems to meet exhaust emission limits, steam turbine generators, water treatment systems, and cooling towers not normally found in PSE's simple cycle facilities. These additional components must be put through start and stop cycles with their GTGs, and each component has specific maintenance needs dependent on its design and its operating environment. Both the GTGs and BOP components require maintenance due to "fatigue", wear experienced during the plant's thermal start and stop cycles, material "creep" at high operating temperatures and corrosion and fouling that occurs in all operating conditions. Fatigue causes the loss of a metal component's strength by repetitive aerodynamic forces and thermal cycles experienced during normal high temperature operations and start/stop cycles. Creep also causes metal component strength loss as the parts experience minor shape changes and coating cracks as they operate over time at high temperatures. Both root causes of component wear and failure are due to GTG components operating at high rotating speeds and temperatures near their material design limits.

Q. What type of maintenance PSE perform on its simple and combined cycle facilities?

A. PSE performs several levels of maintenance at its facilities to ensure safe operations and to reduce the probability of premature equipment failure and to prevent unplanned maintenance events, also known as "forced' outages. PSE is diligent in preventing forced outages because such outages remove facilities from service when their electrical output may be needed. Forced outages often result in collateral damage that costs more to repair than planned.

PSE performs routine minor maintenance activities, also called preventative maintenance, and major maintenance activities at both types of its GTG-based facilities. PSE personnel or specialty contractors normally perform preventative maintenance on a calendar or running-time basis, or equipment condition basis. The goal of routine minor maintenance is preventing failure from occurring, with tasks such as lubrication, calibration, alignment, balancing, adjustments, programmed replacements, vibration analysis, oil sampling, leak detection and current readings.

For rate recovery purposes the Company is proposing that major maintenance will refer to work and associated expenditures of $2 million or more. This definition includes large maintenance projects and covers costs such as inspections, modifications, replacement or repair of parts contained in key components of the facilities. PSE normally schedules planned major maintenance outages for its simple and combined cycle facilities in the spring and fall of the year, when customers reduce electrical demand. The operating history of the GTG and balance of plant equipment determines the scope and duration of major maintenance outages.

A GTG's combustion components must be replaced and inspected on a regular basis. The period between these inspections is normally between two to three years, and the replacement period normally lasts between two to three years, depending on the number of starts the GTG experiences and the amount of time the GTG operates during the period. The inspection and repair of a GTG's combustion components is known as the combustion inspection.

The scope of every other alternate combustion inspection is expanded to include the GTG's turbine section, where the hot gas from the combustion components flows, and the compressor section, which compresses ambient air before it enters the combustion components. Planned maintenance of the turbine section is known as the hot gas path inspection and planned maintenance of the compressor section is known as a major inspection. Each major inspection normally includes an inspection of the turbine's generator.

Heat recovery steam generators, which include its selective catalytic reduction system, require an inspection and some amount of repair work every year. The steam turbine generator and other BOP equipment will have minor inspections every year and major overhauls on a five to ten-year cycle, depending on the equipment's operating profile, condition and environment.

Q. What are the PSE costs associated with routine minor maintenance?

A. The estimated average annual costs for minor maintenance are $10.8 million for the current fleet of turbines. The average is calculated from the forecast of the five-year period 2010-2014 for maintenance at each of the company's combustion turbine facilities. The forecasts were derived by the management of each plant and include the costs for planned minor maintenance as well as corrective maintenance. Maintenance costs also include costs for planned major maintenance for the combustion turbines not covered under maintenance contracts.

In addition to the maintenance costs described above, an adjustment is made to include the prepaid maintenance expense associated with the combustion turbine facilities under maintenance contracts. This amount represents the monthly payments to GE that are deferred to a prepaid expense account. These amounts are recognized for each plant as a maintenance expense when the underlying maintenance event occurs.

The total forecasted maintenance expense including the recognized prepaid expense is reduced for the costs of the major maintenance events, defined as greater than $2 million. The major maintenance costs will be treated as discussed by Mr. Story in his Prefiled Direct Testimony, Exhibit No. ___(JHS-1T). The resulting difference is the annual costs for minor maintenance for the five-year period. Please see the Fourth Exhibit to my Prefiled Direct Testimony, Exhibit No. ___(LEO-5C).

Q. Please describe the scope and benefits to PSE of service agreements executed with GE.

A. PSE executed a Contractual Services Agreement ("CSA") with GE for PSE's Goldendale GE Model 7FA GTG in December 2007, following the purchase of Goldendale combined cycle facility from Calpine earlier in the year. This contract provides parts and services for planned maintenance for this GTG until its next major inspection, expected by the year 2020. The benefits of this contract to PSE include (1) predictable, discounted prices for parts and services necessary to perform planned maintenance, (2) technical and organizational support from a

GE Contract Performance Manager and (3) cost sharing for unplanned maintenance events. In return, PSE pays fees to GE based on calendar time (fixed fees), operating time (variable or fired hour fees) and milestone payments. Please see the Fifth Exhibit to my Prefiled Direct Testimony, Exhibit No. ___(LEO-6C), for a copy of the contractual services agreement with GE for Goldendale.

PSE's purchase of the Sumas CCCT facility included an existing CSA with GE covering this plant's GTG and steam turbine generator. This contract was executed in 2001 and expires in 2014. The payment structure is similar to PSE's Goldendale contractual services agreement, but its costs are less because the Sumas GTG is an older model than Goldendale's GTG. Please see the Sixth Exhibit to my Prefiled Direct Testimony, Exhibit No. ___(LEO-7C), for a copy of the contractual services agreement with GE for Sumas.

PSE's purchase of the Mint Farm CCCT facility in December 2008 included a long-term services agreement with GE covering the plant's combined cycle facility's Model 7FA GTG. This contract was originally executed with one of this facility's previous owners in 2004. Please see the Seventh Exhibit to my Prefiled Direct Testimony, Exhibit No. ___(LEO-8C), for a copy of the long-term services agreement with GE for Mint Farm.

Q. What are the costs associated with the CSA and LTSA contracts?

A. Generally, these contracts call for a monthly fixed fee, a variable fired factored hour fee, and periodic milestone payments. In the cases of Goldendale and Frederickson 1, PSE also pays a variable compressor and turbine rotor and casing fired factor hour fee. The contractual payments for Mint Farm are based on a factored fired hour fee.

The **Fixed Monthly fee** is related to the ongoing operations of equipment at the plant and monthly services received from GE. This cost is incurred and expensed to a maintenance of electric plant account monthly. PSE is required to pay this fee whether the plant is running or not.

The **Variable Compressor and Turbine Rotor and Casing fee** is related to the maintenance of the compressor and turbine rotor and casing and collateral damage repair. The variable fee is calculated using a factored fired hours calculation. The fee is expensed monthly to a maintenance of electric plant account as incurred.

The **Variable Monthly fees** are for the field services to be performed by GE at the time of planned maintenance events and the refurbishment of parts shortly after the planned event. This fee is calculated using the fired factored hours. PSE defers the variable monthly fee to Prepaid Expense and Prepaid Inventory balance sheet accounts when paid using the deferral method. As explained by Mr. Story in his Prefiled Direct Testimony, Exhibit No. ___(JHS-1T), at the time of the planned maintenance event the associated prepaid expense cost will be expensed if it is less than $2 million. If the associated prepaid expense cost is $2 million or greater, it is proposed that the cost will be deferred and addressed in a future rate proceeding. The prepaid inventory will be capitalized to inventory as the parts are received by PSE and capitalized to utility plant at the time the associated parts are installed in the unit during the maintenance event.

The allocation of the variable monthly fee between prepaid expense and prepaid inventory was determined by evaluating the related activities. The cost of refurbishment are expense, and costs of the field services was allocated between capital and expense activities based on a detailed forecast provided by GE of the “man-hours” GE typically spends on such activities during the associated planned event. This forecast is a detailed listing of the work activities to be performed such as removing equipment to access parts, removing of and installing parts, various inspections of equipment, preparing the site for the maintenance event, etc., and the associated hours to complete the activity.

Milestone payments are for the purchase of capital parts that will be used for a maintenance event. Milestone payments will be recorded as prepaid inventory until the parts are received by PSE, at which time the cost is transferred to inventory. Upon completion of the actual work, the appropriate inventory is capitalized.

Q. How does PSE record the costs associated with these contracts?

A. PSE follows the guidance from the FASB Staff Position AUG AIR-1 for accounting purpose and is proposing to follow the same guidance for rate recovery as described in the Prefiled Direct Testimony of John H. Story, Exhibit No. ___(JHS-1T).

Q. What were the scope and benefits to PSE of its Multiyear Maintenance Plan contract, executed with GE in April 2008?

A. PSE's Multiyear Maintenance Plan ("MMP") contract with GE involved a major inspection of the Whitehorn #3 simple cycle GTG and upgrades of the Whitehorn #2 and #3 GTG control systems at competitive, firm prices. This major inspection was required by the plant's operating history and environment and by the unplanned forced outage of its adjacent Whitehorn #2 GTG in 2006. Whitehorn's controls systems required an upgrade because their original components were designed based on the technology available in 1981 and were no longer serviceable. The MMP contract includes GE parts and services discounts for GTG maintenance at PSE's Encogen combined cycle, and Frederickson and Whitehorn simple cycle facilities. Further, the MMP provides for the services of a GE Contracts Performance Manager to support operations and maintenance activities at these three plants. Please see a copy of the MMP contract, attached as the Eighth Exhibit to my Prefiled Direct Testimony Exhibit No. ___(LEO-9C).

Q. Does PSE contract for other maintenance at combustion turbine facilities?

A. Yes. Both types of PSE's facilities require specialty contractors to support the plants' staff for planned and unplanned maintenance. These contractors deal with equipment and control systems outside of the GTGs "covered" by the previously mentioned GE service contracts. The scope of supply of these other specialty contractors is broadest at the CCCT facilities, with their extensive BOP equipment. Examples of these other specialty contractors' supply capabilities are

- pump and fan rotating equipment maintenance,
- pressure vessel and piping "Code" repairs for the HRSG and steam piping,
- insulation and scaffolding required for high temperature component safe access,
- specialty chemical supplies and services for the cooling tower water, heat recovery steam generator feedwater and steam production, and
- specialty control systems maintenance support for systems such as distributed control systems and continuous emission monitoring systems.

III. MINT FARM ENERGY CENTER AND SUMAS ARE DESIGNED AND INTENDED TO OPERATE AS BASELOAD ELECTRIC GENERATION

Q. On what do you base your conclusion that Mint Farm and Sumas are designed and intended for baseload electric generation?

A. Mint Farm was developed and designed around the year 2000 when high capacity factors for gas fired generation was anticipated due to electric power market conditions in the Western United States. As previously discussed, Mint Farm, Sumas, and other combined-cycle plants operating during this period are designed to operate with Capacity Factors above 90%. The only operating limitations are plant outages required for maintenance activities. In addition to their efficiency and low emissions, these plants have design criteria that allows them to start and stop more often and more efficiently, thus providing additional flexibility to dispatch economically when market conditions dictate.

Q. How does PSE intend to use the plants?

A. PSE intends to use the plants as baseload electric generation to the extent it is economical to dispatch the plants. Please see the Prefiled Direct Testimony of David Mills, Exhibit No. ___(DEM-1CT), for a discussion of the Company's economic dispatch procedures.

IV. CONCLUSION

Q. Does that conclude your testimony?

A. Yes, it does.