EXHIBIT NO. ___(GJZ-5)
DOCKET NO. UE-07___/UG-07___
2007 PSE GENERAL RATE CASE
WITNESS: GREG ZELLER

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-07____** **Docket No. UG-07____**

FOURTH EXHIBIT (NONCONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF GREG ZELLER ON BEHALF OF PUGET SOUND ENERGY, INC.

DECEMBER 3, 2007

WASHINGTON UTC UTILITIES AND TRANSPORTATION COMMISSION

TO: Chairman Mark Sidran
Commissioner Patrick Oshie
Commissioner Philip Jones
David Danner

FROM: Nicolas Garcia

DATE: March 29, 2007

SUBJECT: Summary of the Public Workshop on Utility Preparation, Response, and Recovery from the December 2006 Wind Storm
Docket No. U-070067

On February 8, 2007, the Utilities and Transportation Commission (UTC) held an all-day public workshop to receive comment from the three investor owned electric utilities and four leading telecommunications companies on their preparation for and recovery from the December 13-14 wind storm. At the workshop, the UTC Commissioners also received comment from local governments, members of the International Brotherhood of Electrical Workers, and the Emergency Management Division of the Washington Military Department. More than 75 members of the public attended. This memorandum summarizes the comments provided at the workshop, and will serve as the basis for further analysis and potential policy recommendations by the UTC in the coming months.

Severity of the Storm

University of Washington Climatologist Cliff Mass classified the December windstorm as a mid-latitude cyclone with once-per-decade wind speeds.[1] However, he said that the damage caused by this storm was closer to what one would expect from a once-per-century storm, which he attributed principally to soil saturation. November 2006 was among the wettest months ever in the Pacific Northwest and the December windstorm was immediately preceded by rain that thoroughly saturated the soil and weakened the soil/root foundation of area trees. Another important factor, he said, was land use policies that left trees formerly protected within a forest directly exposed to high winds.

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[1] According to Professor Mass, high winds are relatively common in Washington State.

- Winds exceeding 40 mph occur several times per year.
- Winds exceeding 50 mph occur every 1-2 years.
- Winds exceeding 70 mph occur every 1-10 years.
- Winds exceeding 100 mph occur every 50-100 years.

The most recent wind storm of similar magnitude to the December storm occurred on January 20, 1993 (the inauguration day storm). The most severe wind storm ever recorded in Washington occurred on October 12, 1962 (the Columbus Day storm). This storm had 100+ mph winds, comparable to a category 3 or 4 hurricane.

Professor Mass noted that the ability to predict these types of storms has improved greatly over the past decade. Meteorologists correctly identified the December storm roughly a week in advance and the news media widely reported its coming. Professor Mass stated that meteorologists' predictive ability would be greatly enhanced with the installation of a coastal weather radar installation, costing about $4 million. The lack of coastal weather radar prevents scientists from seeing important windstorm details before they make landfall. He said the preventive action that could be taken with this additional information could save millions of dollars in damage from a single storm.

Professor Mass said that he and his colleagues at the University of Washington are conducting research to predict whether storm frequency or severity will change in Washington state as a result of global climate change. He expects to be able "to begin answering that question" in the next year or two.

Electric Utilities' Damage Caused by the December Wind Storm

Puget Sound Energy (PSE) reported significant service disruptions due to the storm. It was forced to repair or replace 60 substations, 700 poles, 600 transformers, and 200 miles of conductor (electric lines). PSE reported that extensive damage to more than 50 percent of its high-voltage transmission system distinguished this storm event from other recent storms. It estimated that:

- On December 15, 700,000 customers were without power;
- By December 18, 500,000 customers were without power; and,
- By December 23, 75,000 customers were without power.

To restore service as quickly as possible, some repair work was of an interim nature. PSE expected to complete permanent repairs by the end of February 2007. PSE claimed that restoration of underground lines took longer than for overhead lines due to the need for specialized equipment.

The company posted notice on its website a few days before the storm to alert customers of potential outages and issued a service alert after outages began. PSE reported that it is looking for a third party to evaluate its storm restoration and system reliability strategies.

Avista Utilities (Avista) reported that its customers did not experience winds as strong as those in Western Washington. Of its 350,000 electric customers, 113,000 lost power. Within 12 hours, 50 percent of those customers were restored, and after 24 hours, 70 percent had service.

PacifiCorp reported that 16,000 of its 128,000 Washington customers lost power. Most of PacifiCorp's problems were related to downed distribution lines. The company stated that service to all customers was restored within 72 hours.

Telecommunication Companies' Damage Caused by the December Wind storm

The four telecommunication companies represented at the workshop – Qwest, Verizon, CenturyTel and Comcast – identified three principal problems in the aftermath of the storm. First, the restoration of telephone lines brought down by falling trees and utility

poles was delayed for safety reasons due to downed power lines. Second, downed trees made it difficult at times to place portable generators and to refuel the portable and fixed generators needed to power their communication systems. Third, telecommunication companies reported that it was difficult at times to acquire fuel for their generators and trucks, as many refueling stations lacked electricity and therefore could not pump gasoline.

Qwest reported that its network design limited its problems largely to its distribution plant. At peak 15,000 customers were without service and most service was restored within 48 hours. The deployment of portable generators largely mitigated the loss of electrical service.

CenturyTel reported that most service disruptions occurred in the rural locations of Kitsap and east King Counties. The company estimated that more than 28,000 customers lost telephone service. Between December 16 and December 22, CenturyTel used some 76 portable generators in the field. It relocated a large number of employees, portable generators, and other equipment from other parts of Washington and other states to help with service restoration.

Verizon said that it was not hit as hard as some other telecommunication companies. During the worst of the storm about 18,000 of its customers were without service. Most service disruptions were due to distribution plant problems and power outages.

Comcast said that distribution plant and power problems interrupted service to 100,000 of its telephone customers, 400,000 of its internet customers and 700,000 of its video customers. It said that the customer equipment associated with its new internet protocol phone service includes eight hours of battery backup. The company's standards for backup power at its own facilities are: 72 hours for hubs, eight hours for coaxial cable, and 24 hours for system offices (e.g., repair centers). This backup power includes both batteries and generators.

Issues Identified at the Workshop

Communication: A number of participants called for improved communication among utilities, government entities and the general public. They said the information they received from utilities was often inaccurate, untimely, and inconsistent. In particular, they said that PSE did not communicate adequately with officials and customers regarding restoration priorities and the expected timing of repairs.

Lacey City Manager Greg Cuoio stated that his city has a good working relationship with PSE and its contractors. However, he identified two communication problems. First, city officials were unable to speak directly to PSE representatives at their Emergency Operations Center during the storm. Second, the city lacked up-to-date information about the status and timing of PSE's restoration efforts. Mr. Cuoio made the following suggestions:

- PSE needs to improve its 1-800 customer service information to be more responsive during adverse weather outages.
- PSE should provide a "war room" -type facility where various agencies and government entities can gather to receive live updates, including area-specific information.
  - PSE should publicize its restoration priorities and the consistency of its recovery efforts with those priorities.
  - Communities need the ability to provide feedback so that PSE can best match its restoration priorities with community needs.
- PSE should require local managers to get to know its local communities and community leaders.

Woodinville City Councilman Mike Roskind requested a review of strategies for improving communications among utilities, government entities and the general public.

Grace Reamer, representing the King County Council, made several recommendations to improve communication, including:

- Utilities should coordinate with local radio stations to get outage and restoration information out to communities;
- The State should fund a radio repeater serving Snoqualmie Valley.
- On-line emergency information should be in a format that can be easily downloaded to smaller devices.

Several participants stressed the importance of households to retain a "land line" phone. Because the public switched telecommunication system has its own supply of low-voltage electricity, it usually works through electrical system disruptions. However, telephones with portable handsets require supplementary electricity and do not operate during an electrical power outage. Apparently, many households lost telephone service during the December storm because they relied on telephones with portable handsets.

Priorities for Service Restoration: The order in which the electrical and telecommunication systems were restored was the subject extensive discussion. Several participants asserted that the order of restoration appeared to favor certain customers. Bellevue Deputy Mayor John Shelminaik asked PSE to work with local officials in determining the order in which it restored power.

The utilities responded that while certain facilities such as schools and hospitals were first in order of priority, the location and extent of damage dictated much of their restoration effort. Qwest identified its restoration priorities as follows:

1. Fire, life, and public safety;
2. Outages impacting large numbers of customers;
3. Outages impacting multiple customers; and,
4. Outages impacting single customers.

Avista described the distribution monitoring system that it put in place after the 1996 ice storm. This system allows Avista to identify customers without service quickly and to coordinate repair efforts to minimize outage times. The company asserts that this system allowed Avista to respond quickly and accurately to customer inquires as to when their power would be restored.

Staffing: PSE reported that about a month before the storm (November 7) 70 work crews were available from its service provider Potelco. In early December PSE brought in a few extra crews to deal with unrelated service problems, and retained these crews for anticipated storm restoration. By December 14, PSE states that it had 400 crews available, about a quarter of which were vegetation management crews provided by a separate contractor, Asplundh.

Several members of the International Brotherhood of Electrical Workers (IBEW) asserted that utilities' exclusive use of contractors to provide maintenance and repair slows response times. They questioned whether the training program of PSE's contractor, Potelco, is comparable to the utility's previous in-house training, and asserted that by 2010 there will be a serious problem finding experienced line workers to respond to weather-related outages and daily maintenance requirements. The union members asked the UTC to review PSE's service provider model. It said that contracted service providers lack familiarity with the electrical systems in particular localities, and are therefore slower to respond to outages.

Avista and PacifiCorp use mostly in-house crews. Avista reported that it had 68 crews on payroll and that those crews were able to restore its system. PacifiCorp stated that it brought in 40 linemen from Iowa and another 40 from Utah to work on storm-related restoration in Washington and Oregon.

Hardening: Several people stated that utilities should "harden" their facilities and equipment, that is, make them better able to withstand wind storms. For example, Councilman Roskind requested a detailed investigation of electric system vulnerabilities and the issues involved with hardening facilities. UTC staff noted that system reliability has been an ongoing concern for some time and staff closely scrutinizes utility reliability reports. The UTC Energy Section's strategic plan calls for a review of information and analysis regarding potential improvement of utility system reliability. Avista reported that it has been taking steps to improve its storm preparation since the 1996 ice storm. The company has upgraded its transmission system and replaced many wooden transmission poles with steel and concrete structures.

Many members of the public called on utilities to "underground" their distribution lines. This is an issue mostly in older sections of cities and towns as land use regulations require most new distribution lines to be buried. Currently, 58 percent of PSE's distribution lines are underground, compared with 37 percent for PacifiCorp and 34 percent for Avista. According to Avista, the cost to bury an existing overhead line ranges from $500,000 to $5,000,000 per mile. While underground wires have fewer outages,

they are more expensive than overhead wires and require longer restoration times. Their life expectancy is 20 years versus 70 years for overhead wires. The utilities noted that burying high voltage lines is usually not practical for technological reasons. As a result, underground distribution systems remain vulnerable to weather related outages.

Vegetation Management: Many participants commented on the need to expand vegetation management efforts. Utilities do not have the authority to remove or prune trees that are outside their rights-of-way without permission of the property owners.

UTC staff discussed PSE's "tree watch" program – a preventive measure program to trim identified "danger" trees located beyond the company's right-of-way that may threaten power lines. Under this program PSE has spent approximately $44 million over ten years. This equates to a per-customer cost of 23¢ per month. The UTC approved a continued and enhanced tree watch program as part of PSE's 2004 rate case. The present set-aside for PSE's tree watch program and other vegetation management efforts is 77¢ per customer per month. PSE uses a contractor, Asplundh, to perform it's vegetation management.

Avista stated that as part of its vegetation management program, it inspects its distribution and transmission lines at least every five years to identify potentially hazardous trees. Avista contracts with a private company, Asplundh, to remove or pare hazardous trees.

Backup Power: Several participants discussed the importance of backup power. Qwest stated that most telecommunication sites, including all central offices, have onsite backup batteries or generators. Remote sites such as fiber and subscriber carrier locations use smaller capacity battery backup and portable generators to maintain service during power outages. Moreover, when a storm is anticipated Qwest loads and fuels service trucks, inventories and fuels portable generators, determines the available fuel stocks, and gathers electric cords and other equipment needed to run the generators.

Mr. Cuoio stated that Lacey's heavy investment in generators helped City Hall maintain operations.

As noted above, several parties reported that many gasoline stations lacked back-up generators and therefore were unable to provide fuel for motorists or private generators. Grace Reamer of the King County Council recommended that the State provide incentives for residential and business customers to acquire and properly install generators. She also recommended that the State publish safety brochures on the use of generators, and partner with local governments to fund training in the use of generators to prevent carbon monoxide poisoning.

Billing: Most of a monthly bill for electric service is based on the amount of electricity used. When the utility cannot read a meter, it often substitutes an estimate of consumption based on historical usage patterns. In the aftermath of the storm, this

procedure resulted in some customers being billed even though service was not provided. The utilities indicate that in such cases, the following month's bill shows the actual electrical consumption for the two months and then subtracts the amount paid the previous month. In this way, any overcharges in one month are credited back to customer in the following month.

By contrast, telephone service is not metered. With the exception of long-distance calls, telephone customers receive a flat monthly fee regardless of the number of calls made. The companies say that because they do not monitor customer usage or service interruptions to individual customers, they cannot determine which customers have lost service during the storm or for how long service was disrupted. The companies said that they give out-of-service credits only when customers call and request the credit. Some commenters suggested that customer outage credits should be automatic rather than making customers request the credit.

Storm Damage Costs and Electric Rates: Because storm costs vary significantly from year to year, UTC policy is to include in rates the average storm costs over the previous six years. For PSE, these costs averaged $5.5 million. In addition, PSE has special authority to defer costs when storm costs in any given year exceed $7 million. Presently, PSE has about $9 million of deferred storm costs on its balance sheet and recovers about $3 million of these deferred costs each year. The recovery of deferred storm costs adds roughly 14¢ per month to customer's bills. Neither Avista nor PacifiCorp have pre-existing deferral authority for unusually high storm costs, but may file a request to defer such costs. At the time of the workshop, no company had requested to defer costs associated with the December storm.

The Commission's Role in State Emergencies: Doug Kilpatrick of the UTC staff discussed the Commission's role under the state's Comprehensive Emergency Management Plan (CEMP). The CEMP includes issue-specific appendices (Emergency Support Functions or ESFs) that lay out state agency responsibilities during an emergency. The Department of Community Trade and Economic Development (CTED) is the lead agency for Emergency Support Function 12 (ESF 12), the energy portion of the CEMP. The UTC is a support agency to CTED in this regard. A primary action under ESF 12 is to gather information from utilities about outages and estimated restoration times. During the December wind storm, the UTC maintained contact with both the Emergency Management Department and CTED to track this information.

Disaster Plans: The Washington Military Department's Emergency Management Division (EMD) discussed the importance of sound disaster recovery plans. The Division advised that citizens be prepared to be on their own for 72 hours, have a disaster kit, a disaster plan, and exercise the plan. King County Emergency Management makes a similar point with its "three days, three ways" campaign, in which it recommends that citizens be able to survive on their own for a minimum of three days following a disaster. This includes having a three-day supply of food, water, clothing, fuel, medicine, and other necessities**.** It also recommends "three ways" to be able to respond better to a

major earthquake, a winter storm, a terrorist act or a pandemic flu: 1) make a plan, 2) build a kit, and 3) get involved.

Prior to the storm, the UTC notified all utilities of its intent to review their disaster recovery plans in the coming year. The Commission is currently developing the process and schedule for this review.

911 Services: Bob Oenning of EMD, who serves as the state's 911 coordinator, said that calls reporting service outages (both electrical and phone) overloaded the 911 systems. For example, many cell sites on Bainbridge Island were lost and calls to 911 were automatically routed to the next available Public Service Answering Point, which was in King County. Those calls added to the 911 overflow and proved difficult to transfer to the correct geographic area. He said that utilities should improve public information and information flow, and should identify areas that they anticipate will be without power for more than three days.

Lester Olson of Thurston County Emergency Management also called for improved coordination among the Emergency Operation Centers. He said that local governments need to be able to provide direction to utilities on priority areas for restoration efforts.

Follow-Up

Based on the workshop presentations and public response, the following issues may warrant further review:

1. Improved communications among utilities, governments, and the public before and during an emergency.
2. Adequacy of utility infrastructure to withstand severe wind storms
    a. Undergrounding of overhead wires
    b. Trimming and/or removal of potentially threatening trees.
3. Need for residential and business customers to acquire generators.
4. Possible improvements to the emergency 911 system to maintain operations during and immediately after a wind storm.
5. Billing practices relating to service disruptions.

We will arrange to meet with you next week to determine the best course for further analysis of these issues and possible development of policy recommendations. In the meantime, we will proceed with our ongoing disaster recovery planning efforts. Please call me at 664-1346 if you have questions.