

**Approved Minutes
Oregon Energy Facility Siting Council Meeting Minutes
Columbia Gorge Discovery Center, The Dalles
November 16, 2007**

Energy Facility Siting Council:

David Ripma, Chairman
Martha Dibblee, Vice Chairman
Bryan Wolfe
Jacob Polvi
Bob Shiprack

Oregon Department of Energy:

Michael Grainey, Director
Tom Stoops, Council Secretary
Adam Bless, Siting Officer
John White, Siting Officer
Shelley Carlson, Siting Officer
Jill Hendrickson, Admin

Public:

Jesse Gronner, PMM Energy (PPM)
Sara Parsons, PPM
Scott Winneguth, PPM
John Larson, Pacific Energy Systems
David Neikirk
Cheryl Woods
John Demoss
Leslie Nelson

Oregon Department of Justice:

Jan Prewitt, Assistant Attorney General

Chair David Ripma called the meeting to order at 9:30 a.m.

Roll Call:

Council Name	Vote	Council Name	Vote
W. Bryan Wolfe	Y	Martha Dibblee	Y
Bob Shiprack	Y	Lori Brogoitti	Y
David Tegart	-	David Ripma	Y
Jacob Polvi	Y		

I. Consent Calendar:

A. Announcements.

Tom Stoops announced that Richard Whitman, who has presented information to the Council, has the opportunity to take over leadership of the Department of Land Conservation and Development (DLCD). Jan Prewitt, Oregon Department of Justice did say that Richard has agreed to continue his role as a trainer for new EFSC members on land use issues.

II. Action Items:

A. Approval of the July 27, 2007 Energy Facility Siting Council meeting minutes.

**Oregon Energy Facility Siting Council Meeting
Columbia Gorge Discovery Center Museum - The Dalles, Oregon
November 16, 2007 - Page 2 of 13**

Martha Dibblee moved to approve the July 27, 2007 minutes of the EFSC; Bob Shiprack seconded the motion and Council was polled:

Council Name	Vote	Council Name	Vote
W. Bryan Wolfe	Y	Martha Dibblee	Y
Bob Shiprack	Y	Lori Brogoitti	Y
David Tegart	-	David Ripma	Y
Jacob Polvi	Y		

B. Approval of the August 17, 2007 Energy Facility Siting Council meeting minutes.

Lori Brogoitti moved to approve the August 17, 2007 minutes of the EFSC; Bryan Wolfe seconded the motion and Council was polled:

Council Name	Vote	Council Name	Vote
W. Bryan Wolfe	Y	Martha Dibblee	Y
Bob Shiprack	Y	Lori Brogoitti	Y
David Tegart	-	David Ripma	Y
Jacob Polvi	Y		

C. Approval of the September 21, 2007 Energy Facility Siting Council meeting minutes.

Bryan Wolfe moved to approve the September 21, 2007 minutes of the EFSC; Martha Dibblee seconded the motion and Council was polled:

Council Name	Vote	Council Name	Vote
W. Bryan Wolfe	Y	Martha Dibblee	Y
Bob Shiprack	Y	Lori Brogoitti	Y
David Tegart	-	David Ripma	Y
Jacob Polvi	Y		

Tom Stoops stated that copies were sent out to Council members of a letter from Klondike Wind Power dated October 10th about turbine placement and roadways. The Oregon Department of Energy (ODOE) sent a letter back detailing why the department didn't think a Notice of Violation was required. Mr. Stoops asked if there were any comments or questions.

Chair Ripma recalled the letter and that it stated a few of the turbines were too close to public roads. Mr. Stoops said it was within a few feet of each turbine, and PPM Energy has come up with a work around to prevent future incidents from occurring. ODOE will change the language for future placements to have the survey be from centerline to centerline.

D. Approval of Klondike III replacement Letter of Credit.

**Oregon Energy Facility Siting Council Meeting
Columbia Gorge Discovery Center Museum - The Dalles, Oregon
November 16, 2007 - Page 3 of 13**

John White, Project Officer for Klondike III, referred to Amendment 2 of the Site Certificate for Klondike III, which changed the financial assurance amount and required a replacement letter of credit to be submitted within 60 days of the effective date of the amendment. Mr. White referred to the memo from Dave Stevens, Sr. Loan Officer of the Energy Loan Program, who reviewed the letter of credit of the Bank of Tokyo-Mitsubishi. Mr. Stevens felt the Council should accept the issuer for the letter of credit. The form of the letter of credit has been reviewed by Jan Prewitt, Oregon Department of Justice and is essentially identical to the previous letter of credit. Staff's recommendation is for the Council to approve the form, issuer and amount of the letter of credit. Ms. Prewitt suggested a roll call vote to approve.

Chair Ripma asked about the format of a letter of credit. Ms. Prewitt stated that some banks require draw certificates for their letters of credit but this bank stated they do not need that. The previous letter of credit was in this same format.

Martha Dibblee moved that the Council approve the form, issuer and amount of the letter of credit for PPM Energy issued September 26, 2007 by the Bank of Tokyo-Mitsubishi Seattle Branch. Lori Brogoitti seconded the motion and Council was polled:

Council Name	Vote	Council Name	Vote
W. Bryan Wolfe	Y	Martha Dibblee	Y
Bob Shiprack	Y	Lori Brogoitti	Y
David Tegar	-	David Ripma	Y
Jacob Polvi	Y		

E. Klondike III Amendment.

John White, Oregon Department of Energy Project Officer for Klondike III, referred to the Draft Order of Amendment #3. Mr. White showed the overhead view of Klondike III that is referred to as Figure 1 throughout the Final Order. The map showed the locations of Klondike I and II also.

Mr. White reviewed the requested changes which involves the following items:

1. Turbine Selection
2. Power Collection System
3. Operations and Maintenance Facilities
4. Access Roads
5. Additional Construction Areas
6. Expansion of the Site and Site Boundary

He stated the department reviewed all of the applicable Council's Siting Standards and issued a proposed order on October 11th, 2007. A required 30-day comment period after the proposed order was issued was allowed for public comment, and also opportunity to request a contested case if necessary. The Department did not receive any comments or requests for a contested case. Mr. White stated the matter is now

**Oregon Energy Facility Siting Council Meeting
Columbia Gorge Discovery Center Museum - The Dalles, Oregon
November 16, 2007 - Page 4 of 13**

ready for Council action and the Department recommends the Council approve the amendment request subject to the recommended revisions of the site certificate.

Mr. White referred to Page 54 of the Draft Final Order, for the listing of the Recommended Revisions.

Revisions 1 and 2: Mr. White stated these are essentially housekeeping to change some of the language to show there would be an additional amendment.

Revision 3: This alters the description of the project and increases the authorized generating capacity and the authorized maximum number of turbines. In regards to the text that has been removed, it lists the details about what had previously been approved. The changes to those details that would be allowed under Amendment #3 are described in the draft order and would be incorporated by reference in the site certificate.

Revision 4: This is a change in the facility description to refer to the second Operations and Maintenance building.

Chair Ripma asked if the rulings allow a certain size of an operation building since they are quadrupling the building but not the facility. Mr. White said there is no standard, but the footprint and location are reviewed to be sure the building meets all the existing standards. Chair Ripma asked if this new building size is a typical size for a facility this size or is it to represent future expansion. Mr. White said he does not know what their future plans are, and he was unsure off hand what size operation buildings are at other facilities.

Revisions 5 and 6: These are revisions that handle typographical errors, and also a deletion of reference to OAR 345-001-0040 that the Council repealed in May of 2007.

Revision 7: This concerns Condition 26 and 27 and changes the construction beginning and completion deadlines by inserting a specific date. Also there is language that clarifies that all amendments are under that same deadline.

Revision 8: This revision addresses the request for larger turbines which is covered by the new subsection (d) that has been added.

Revision 9: This shows text that has been deleted which refers to what the term "legal description" means. What has been deleted was addressed in rulemaking so this no longer has to be in the site certificate.

Revision 10: The financial assurance condition raised the base amount of the letter of credit from \$7.825 million to \$10.412 million in 2006 dollars, which reflects the additional turbines and the disturbance caused by the additional construction. Mr. White continued to explain the applicant's ability to obtain the letter of credit and the actual design and how this affects the adjusted Gross Cost.

**Oregon Energy Facility Siting Council Meeting
Columbia Gorge Discovery Center Museum - The Dalles, Oregon
November 16, 2007 - Page 5 of 13**

The change to Condition 32 will require a replacement letter of credit within 60 days after the Third Amended Site Certificate becomes effective. The Department will return to the Council with this request, just as was done on the 2nd amendment.

Revision 11: This change is to correct a typographical error.

Revision 12: Mr. White explained this has to do with a cultural resource survey that the applicant had Archaeological Investigations Northwest Inc (AINW) conduct. This study identified certain cultural and archaeological resources and made recommendations for avoidance of those locations, plus a 30-meter buffer.

Revision 13: The geotechnical investigation that is required to be done and that must be submitted to the Oregon Department of Geology & Mineral Industries (DOGAMI) for their consideration.

Revision 14: This revision concerns the setback condition for wind turbines that has involved considerable discussion. As mentioned by Tom Stoops earlier, some of the turbines were built closer to public roads than allowed under Condition 59.

Chair Ripma said this looks like a relaxation of the setbacks. Mr. White explained that ODOE was looking at modifying this condition before the issue of compliance came up because Amendment #3 asks for authority to construct turbines that would be taller at maximum blade tip height than the turbines that were being considered when the original site certificate was being reviewed. The "450 feet" limit was a distance that was arrived at in consultation with the applicant, based on the tallest turbines that were under consideration at that time. The proposed revision retains the 450-foot limit for the turbines that have already been built and requires for the new turbines a minimum distance of 450 feet or 110% of maximum blade tip height, whichever is greater.

Chair Ripma stated he was under the impression the 450 feet was from the edge of the road. Mr. White said this revision would clarify where the measurement should be calculated. The Department concluded that the situation of three turbines deviating from the required setback by being measured from the centerline of the public road does not compromise public safety. The Department notified the certificate holder that the Department would not recommend to the Council that a Notice of Violation be issued.

Chair Ripma asked if this centerline to centerline standard for this site certificate is to be adopted in a rule also, or applied in future sitings. Mr. White said a rule is not being adopted but this will be a precedent for future site certificates. The issue of setbacks has been under discussion and generally comes up for safety, noise and visual impact. Counties have the ability in their land use codes to establish setbacks also.

Tom Stoops, Council Secretary, stated there have been discussions with a couple of counties. This item will come up in the future for Council discussion.

Jan Prewitt, Department of Justice, stated that in the future the setback will be made more explicit instead of the ambiguity in the provisions of OAR 345.

**Oregon Energy Facility Siting Council Meeting
Columbia Gorge Discovery Center Museum - The Dalles, Oregon
November 16, 2007 - Page 6 of 13**

Chair Ripma questioned the 110% setback and whether that would be enough, considering the dangerousness. He questioned whether the roads are major roads and how this figure was determined. Mr. White said the whole idea of a safety setback from roads and residences is a new situation and staff is in the process of working out how much of a setback should be required. Stateline did not have a setback condition.

Chair Ripma asked if the additional turbines requested in this amendment would exceed the 450 feet setback by figuring the 110% setback. Jesse Gronner, PPM Energy, stated the Siemens turbines have a height of 79 meters with the rotor diameter 92.4 meters. The 3.0 megawatt turbines would be a 100 meter tower with a rotor diameter of 100 meters would use the 110% setback.

Lori Brogoitti asked about Klondike I and II and the placement of those turbines. Mr. White explained that those turbines are not under Council jurisdiction. Mr. White discussed the location of the Klondike III turbines and distances of the turbines that were less than the 450 feet setbacks based on a recent survey.

Martha Dibblee asked about the way this is being treated, if there were an accident would the state be liable for not forcing these turbines to be moved. Mr. White said he did not know of any case where a permitting agency has faced this type of situation.

Chair Ripma stated he felt this was a reasonable solution.

Mr. White asked Jesse Gronner, PPM, whether the initial phase of turbine construction is complete. Mr. Gronner said 80 GE and 43 Siemens turbines are in operation.

Bryan Wolfe commented on his appreciation for PPM's willingness to work the situation out and feels this is a good way to work this out. He did comment on the different widths of the easements that roads have and also the base of each tower needs to be taken into account.

Revision 15: This incorporates some changes to the revegetation plan, which is an attachment to the Final Order. This revision was to be consistent with the increased area of temporary and permanent disturbances.

Revision 16: Amendment #3 would authorize construction of an on-site well to service the second Operation and Maintenance facility. This revision modifies Condition 83 to clarify that total water use from all on-site wells must not exceed 5,000 gallons per day to comply with the exemption in ORS 537.545 (1) (f) for industrial and commercial uses.

Revision 17: Condition 86 concerns Oregon Department of Transportation (ODOT) permits that are needed to provide electricity to the Operation and Maintenance facility, along with two turbines that need a highway approach and also collector lines from them. This involves up to three permits from ODOT. Mr. White explained the need for the three permits instead of one to cover all, subject to conditions specified in ODOT administrative rules.

**Oregon Energy Facility Siting Council Meeting
Columbia Gorge Discovery Center Museum - The Dalles, Oregon
November 16, 2007 - Page 7 of 13**

Revision 18: Condition 92 addresses the new micro siting areas for the new turbine strings.

Revisions 19 and 20: Condition 95 addresses the Wildlife Monitoring and Mitigation Plan which is incorporated in the draft order as Attachment A and the Habitat Mitigation Plan, which is Attachment C. These have been revised to conform to the specifics of the new components.

Revisions 21 through 23: These reflect wording changes because of the second O&M building, changing text to plural instead of singular.

Revision 24: The noise condition is somewhat complicated. Mr. White referred to the current design plans that have a particular sound profile. For review, the noise regulation has two parts; one is maximum allowable limit, which is no more than 50-dBA. In referring to the Predicted Noise Level chart on page 48 of the Proposed Final Order on Amendment #3 all twenty residences are below the 50-dBA limit. The ambient degradation test is based in this case on an assumed baseline ambient noise level of 26-dBA and the regulation allows an increase of not more than 10-dBA. In referring back to the chart, there are seven residences that were more than the 36-dBA. The noise regulation allows the landowner to waive the ambient standard, but not the maximum.

Mr. White referred to the residences that have not signed the waiver. The applicant was asked to conform to noise standards by having the waivers signed or change the configuration. Mr. White reviewed Condition 102 (a) which discussed the default layout and PPM's request to build at a later date around property owner R3, if a waiver has been signed or a change in configuration meets the noise level limits.

Subsection (b) of Condition 102 concerns the MHI-1 micro siting area: When Amendment #2 was approved some of the existing residences were not identified, so the revision concerns requiring a noise waiver or a new noise analysis before installation of the turbine.

Subsection (c) of Condition 102 is based on Table 5, which was referred to showing the noise levels and waivers needed.

Michael Grainey, Director of ODOE, asked about the wording on page 66 that says the certificate holder shall not install turbines that have a maximum sound power level greater than 106 dBA and how that figure ties in with the previously discussed lower levels.

Mr. White said the 106 dBA refers to a sound power level which is what the turbine puts out. The 36 and 55 dBA refers to a sound pressure level which is what the noise is as perceived at the residence. If larger turbines are put in the sound power level might be higher than 106 dBA and a new noise analysis would be done.

Bob Shiprack asked as the turbines get larger as far as the power they are producing, does it mean they are noisier. Mr. White said it is complicated but in general that is true. The actual design can affect what the sound power level is. There is also an issue about the sound power at different frequencies.

**Oregon Energy Facility Siting Council Meeting
Columbia Gorge Discovery Center Museum - The Dalles, Oregon
November 16, 2007 - Page 8 of 13**

Revision 25: This revision was added because of the second O&M building needing a septic system to handle the sanitary wastewater.

Mr. White asked for any discussion or questions.

Chair Ripma asked about the setback question again whether the possible size and height measurement of 110% would put that closer than the nearest public right of way so that the distance from the top of the blade could impinge on the road right of way.

Mr. White said this discussion could be setting a precedent to show the Council takes the right of way into consideration.

Mr. Gronner, PPM, stated he didn't have the information with him concerning the right of ways. He did say the county has major and minor arterial roads and the roads in question by the turbines are considered minor arterial roads. The rights of way are generally not necessarily on record but are calculated based on the actual roadway. They are 30 feet from centerline on minor arterial roads and 50 feet from centerline on major. He also stated the concept of 110% is that as the turbines get larger, the setback increases instead of staying at 450 feet.

Tom Stoops stated he would commit to the Council to bring information on right of ways to a future meeting.

Mr. White noted that the distance required between turbines and residences, which is 1,250 feet, provides a greater safety setback considering the more serious risk.

Ms. Brogoitti expressed her concern in missing the residences. Chair Ripma asked whose responsibility it is to identify residences. Mr. White said the applicant was asked to identify noise sensitive property, which in particular means people's homes.

Mr. Gronner, PPM, mentioned the waivers talked about in the condition have been obtained from property owners.

Bob Shiprack moved that the Council approve Amendment #3 for the Klondike III Wind Project. Martha Dibblee seconded the motion and Council was polled:

Council Name	Vote	Council Name	Vote
W. Bryan Wolfe	Y	Martha Dibblee	Y
Bob Shiprack	Y	Lori Brogoitti	Y
David Tegart	-	David Ripma	Y
Jacob Polvi	Y		

Chair Ripma invited public comment.

David Neikirk stated he understood the Council's concern about the setbacks, but wondered why all members approved it. Also, he said if sound setbacks for people in housing are done as an amendment to Antelope, this should not be done as a basis for sound analysis in other projects.

Mr. Neikirk also expressed that these facilities don't belong around houses. He felt these companies are testing the authorities by exceeding the rules and saying they won't do it again. He also referred to the Goldendale area and turbines sited there.

Mr. Neikirk also asked about the status on another project. Adam Bless, Project Officer for the UPC Cascade Wind Project, said a request for additional information was sent to UPC in June stating the application was incomplete. There were many complicated questions and knew it would take time to conduct studies and asked UPC to give an estimate when they could have the information. They felt by September they would have the information, but only a part of the information was received October 2nd. The studies hadn't been completed yet but they stated they were still working on them.

Mr. Neikirk added this is typical of the industry. He also stated the towers were sold as a "portable" idea; why can't they be removed if they are put in the wrong place. He also expressed his thanks for the time to comment.

III. Information Items:

A. Klondike III Wind Tower Incident Briefing

Sara Parsons, PPM Energy, introduced herself and started by giving background information. Iberdrola purchased PM in April 2007 and together they are the 2nd largest wind energy firm in the United States. They do the development, construction and operation of the facilities.

Ms. Parsons briefly went through the development process and the steps involved. Next, she highlighted some of the construction and details of the turbine foundations. Photographs were shown of a tower being erected. Graphics were shown of the connection from the turbine to the transformer and the electrical collection system.

Bob Shiprack asked how the four sections of the tower are assembled. Scott Winneguth, Director of Wind Plant Engineering for PPM, went back to a few slides to explain the process.

Mr. Winneguth said all wind turbines are designed around tip speed ratio. The tip is going about 170 miles per hour through the wind, the ratio being about 5-6 times the wind speed. If the power output is rated at 30 mph, that is about 180 on the tip. He stated that is one of the major components to noise.

Mr. Winneguth said the sections of the tower are bolted together with approximately 100 bolts per section, about 1 inch diameter. At the pedestal one row is bolted to the outside and one row to the inside. Each joint they are bolted on the inside. Every year 10% of the bolts are re-torqued and identified and the next year another 10% is re-torqued and identified.

Mr. Winneguth next reviewed the foundation highlighting details. He also said many people have asked if electricity is stored. He noted that the demand for electricity is used immediately as it is produced.

**Oregon Energy Facility Siting Council Meeting
Columbia Gorge Discovery Center Museum - The Dalles, Oregon
November 16, 2007 - Page 10 of 13**

There was discussion about the Operations and Maintenance Building. Mr. Stoops asked if the turbines are operated from those buildings. Mr. Winneguth said each turbine acts autonomously but its computer is connected to a local area network that feeds into the substation and then into the O&M Building. From this building there is a connection to Portland where Portland remote operations controls all of the assets in off hours, when people are not at the site.

When wind farms are under construction they are a sequential type operation. The collection circuits are hooked up, towers start being erected, nacelles and rotors come and then the manufacturer provides the expertise called commissioning crews that actually get those wind turbines ready to produce electrical power.

He explained further the testing the crews go through, called PCAT (Pre-Commissioning Acceptance Test) and FCAT (Field Commissioning Acceptance Test). Once these steps are done the Converter Commissioning Test (CCT) is synchronized with the grid voltage. Once these steps are complete, the manufacturer will bring that turbine up and put it online. They then go through a Turbine Reliability Test (TRT) where the turbine is run for 6 hours and monitored to make sure it's producing the amount of energy expected for a given wind speed and that all the vitals are within established parameters. Once all the individual wind turbines have passed the TRT then the plant as a whole is put through a Project Reliability Test (PRT) for 75 hours and needs to meet a 95% availability run; also 6 hours at 100% +/- 10% power production run. Once all of this is completed the plant is deemed commercial and is taken over by the authority of the sale of the power.

Chair Ripma asked about the incident and where it was in the process. Mr. Winneguth said they were past the TRT but had not run the PRT because the main power line had not been connected. There was not enough capacity to run the Siemens plant at full power in conjunction with the Klondike I and II sites.

Chair Ripma said news accounts said the accident was while a test was occurring. Mr. Stoops asked if the 75 hour PRT is a continuous 75 hour test. Mr. Winneguth said it is, but you don't get to pick the wind speeds during that 75 hour testing.

Next, Mr. Winneguth talked about the sequence of events. A three person crew was called late Friday and asked to come to the site on Saturday morning to finish up break-in maintenance. After a TRT Siemens wants to run the turbine 500 hours and then come back and do a tune-up. They make sure all levels are where expected; gear box oil levels, hydraulic levels and paint touch up from construction activities. From this maintenance there were several large torque tools and Monday morning they had to be inventoried. There were about four duffle bags brought down. There was a hub entry from the nacelle into the hub which requires some very specific procedures to be followed. The work was performed around lunch time, they completed the hub entry, come back into the nacelle and configured the turbine to be in an idle position while they had there lunch. After lunch two of the crew members were doing tower "torqueing" (the 10%) while the third member was doing the cleanup and touchup.

**Oregon Energy Facility Siting Council Meeting
Columbia Gorge Discovery Center Museum - The Dalles, Oregon
November 16, 2007 - Page 11 of 13**

Mr. Winneguth next explained on Monday morning he and the Controls Engineer met with Siemens Engineering and recovered the turbine computer, which is down at the tower base. The data was downloaded and came up with a sequence of events to try to understand what happened.

The unusual thing is, for reasons unknown, the deceased crew member pitched the blades to a full power position. Mr. Winneguth referred to old water pumping windmills on the prairies are called impulse where the wind drives against an angle and causes a rotation. The Siemens wind turbines actually produce power by actually producing lift on an air foil. Mr. Winneguth gave a demonstration how the blades should be configured so they do not produce any lift; therefore no rotation.

For some unknown reason the third crew member configured the blades that way and proceeded to enter the hub; rumor has it he was looking for his cell phone, went into the hub and came back out. These blades were in the full position for about 90 minutes preceding the accident. When the blades are at that power position there are really no structural or safety concerns; it's only when they are allowed to rotate and then they start to produce lift that there is a tremendous potential energy situation.

Going into the hub is an increased level of risk, because it is the rotational part of the turbine. A sequence of events has to be used to make sure nothing rotates while you are in the hub. You reverse those steps to come back out. Mr. Stoops asked about the 90 minutes period, full power, and whether it was a non-rotational configuration. Mr. Winneguth agreed and stated that a graph of the rotation speed showed "0." They have indications of the brake pressure being at maximum, and also a third safety measure called a rotor lock which is 2 one-inch diameter steel pins which are inserted through a structural member of the gear box to prevent any kind of rotation.

The final maintenance activity of the day was to change out a circuit board on the wind turbine controller. The circuit board talked to another circuit board and it was hypothesized that during the maintenance activity a sequence of events started that allowed the brake to release. The brake released in conjunction with the blades at a full power position allowed the turbine to rotate. According to Siemens Engineering it would take about sixty seconds for the blades to reach the standard rotational rpm which is about 15 revolutions per minute; it would take only another ten seconds to go into an over speed condition which is about 20 revolutions per minute. Without the benefit of the generator to resist the lift generated by the blades, the rotor just kept spinning up until such point the blades deflected into the tower and started the break up sequence. He continued by saying to test that hypothesis, he and Siemens Engineering went up into the adjacent wind turbine and performed some of the steps. This validated that if power is removed from the nacelle's controller it interprets that as a grid outage. The way that all wind turbines are designed these days, in an outage condition they want to be in a free-wheeling state, with no brakes applied. That has a lot to do with where on the gearbox it is constrained with the brake because if the rotor is left to rock back and forth in the wind – that rocking motion through all of the gears causes wear and reduces the life of the gearbox. The standard industry accepted configuration is to release the hydraulic brake.

A combination of the blades locked and a maintenance event that configured the wind turbine in an outage condition led to the rotor speed increasing beyond design limits and subsequent failure of the system. Mr. Winneguth said there is one more part of the investigation left to do. The brake in the gearbox is unfortunately buried. Mr. Stoops clarified that it is presumed the 2 one-inch pins were removed. Mr. Winneguth agreed. He also stated that OSHA has been on site conducting an investigation. He has not seen any findings published yet.

The turbines were being operated by Siemens or their contract personnel before the commercial operation was started. Subsequent to this accident Siemens has refined the turbine control software such that you can't move all three blades at once. For service a technician is no longer able to move all three blades in a full power position. Siemens has also instigated a more stringent "lock-out-tag-out" procedure. The two pins are really the best control of the rotor rpm; there is no way the rotor can turn with the pins inserted. Previously these two pins were installed and two cotter pins inserted; now the two pins are inserted and two padlocks with only one operator with the key.

Mr. Winneguth continued to explain the hub hydraulic safety valve. When they were doing the investigation and climbed into the hub, they found the three valves were still in the closed position so that prevented the possibility that the turbine controller could pitch the blades. They hypothesized the blades were inadvertently pitched to a full power position, the technician followed the rest of the steps to get into the hub, locked all of the valves, which were in a full-power position instead of a feather position. Compounding the problems when he came back out of the hub, they hypothesized he did not return them to the operational position such that when he returned the turbine to operational mode the turbine controller could not move the blades because they were locked.

The turbine computer did not record the last ten minutes of the life of the turbine because as the tower collapsed electrical power was interrupted.

The question was asked if there have been other turbines collapse. Mr. Winneguth said there has been and he investigated one in Oklahoma 2½ years ago. In that case it was unattended and was a combination of human intervention and mechanical failure. The result was rotor over speed, blade strike and subsequent collapse to the ground. The tower actually separated at the first section and came down to the ground. The problem there was an inexperienced crew remotely resetting the wind turbine as it faulted out on a problem. The crew did not go to the site to check and subsequently through this cycle of resetting it went over a day and a half. The secondary and other safety systems finally failed and the next time the turbine called for the safety systems there were none to be enacted so the rotor over sped.

Mr. Winneguth said he has seen several runaways of smaller wind turbines where the nacelle portion separated from the tower top and came down to the ground.

Chair Ripma asked about the last ten minutes and the lack of electricity. Mr. Winneguth said they have asked Siemens to install uninterrupted power supplies. There was a power supply in place that fed many subcomponents of the turbine but once the power cables severed it shorted out all of the breakers and everything in the path.

There was continued discussion about the timeframe on the continuing investigation.

Also, Mr. Winneguth discussed the wind directions and the setbacks. He pointed out the debris field with this accident was all within the setback area.

Bob Shiprack asked about the blades hitting the tower and what actually bends. Mr. Winneguth explained it is the blades in the downwind direction. Under normal circumstances there is about 3-4 feet clearance between the blade tip and the tower under full power conditions. As full power conditions are exceeded those blades start to pitch to feather to spill that excess energy.

The question was asked if the blade hitting the tower is what caused the collapse. Mr. Winneguth agreed. Martha Dibble asked what could be done to strengthen the towers. He said that lightning can actually damage the towers also.

Tom Stoops asked about the Siemens technician training. Mr. Winneguth said he doesn't know the training of the Siemens crews.

A question was asked by a member of the public about the procedures used and the crew working together. Mr. Winneguth discussed questions asked about locking safety measures. He expressed that safety and proficiency are needed and expected in a technician.

John Larson asked about the thickness of the steel at the break point of the tower. Mr. Winneguth was unsure of the thickness on this turbine.

David Neikirk asked about the GE turbines and their safety precautions that are in place. Mr. Winneguth discussed the electrical systems that move their blades and the safety systems in place.

Chair Ripma asked about the rams. There was discussion about these.

Tom Stoops asked Jan Prewitt to give an update on the Request for Proposal (RFP) for consultant services.

John White brought out more photographs of the tower collapse.

Shelly Carlson gave a briefing on the site tour of the proposed Cascade Wind and Golden Hills sites with herself, Adam Bless and the noise consultant, Kerrie Standlee.

Tom Stoops gave a briefing on the bats and birds group, focusing on the Columbia Basis and looking at the cumulative impacts on birds and bats.

Future meeting dates were also discussed.

There were no further comments. Chair Ripma adjourned the meeting at 1:54 p.m.