

## Community Questions

The following questions were ones posed by community members that were not answered during the meeting. Answers provided by PSE.

1. How long does an outage have to last to be included in the statistics?

Response: For the duration outage statistic (SAIDI) we use the IEEE methodology which uses outages lasting five minutes or longer (shorter than 5 minutes are not counted). For the frequency statistic (SAIFI) outages lasting one minute or longer are counted. Statistics generally exclude outage events occurring during storm events (IEEE uses the term Major Event Days).

2. Can PSE include statistics on the extent to which the smart switches are employed and the number of outages associated with switching?

Response: By smart switches I assume you refer to automated switching where sensors in our system detect problems and can respond to restore power based on programming.

We have a lot of this in our transmission system today whereby protective devices (for example circuit breakers and line switches) deenergize lines, then attempt to reenergize them after brief periods (typically 5 – 30 seconds) to allow a transient problem to clear and restore power. For problems that are not transient – for example a tree falling into a line – these auto-switching schemes can also isolate a section of a line allowing automated restoration to parts of the line and substations not affected by the problem. If a fault clears and power is restored in the time frames mentioned above, these transmission events are not included in the statistics and are not reported; whereas events lasting longer than the above time frames are included/reported.

PSE like many utilities are in the early days of installing similar smart switching in our distribution system – typically referred to as Distribution Automation (DA). To function at the distribution level a lot more equipment (switches) and communication pathways (fiber, wireless) are needed to make smart switching/smart grid/self-healing grid possible. PSE has long had limited autonomous restoration capability in parts of our distribution system serving large numbers of customers designed to isolate a part of the system when a fault is detected, then after a brief period attempt to restore power if the fault has cleared. We have been adding similar capability to areas of our system servicing smaller numbers of customers. More recently we have been adding monitoring and remote operation capabilities to such protective devices and are connecting multiple devices with communications and programming to implement DA. Eventually DA will be utilized broadly across our service area, but for now we're concentrating our efforts on circuits which historically have had poorer performance (more outages, more often). We have 90+ circuits at least partially

equipped with DA today, with our first in Bellevue going 'live' in the near future. Outage events which can't be restored within 5 and 1 minutes time frames above are now and will continue to be reported.

3. Is the number of short-term outages reasonable?

Response: "Reasonable" would need to be defined. Simply put for some customers any outages of any duration or frequency fall somewhere in the not desired – not acceptable range.

4. How many short-term outages due to switching show that something is wrong with PSE's systems?

Response: Switching automation in both the transmission and distribution systems is intended to address a couple of situations that can occur.

The first is a transitory event/problem causing a 'momentary' fault to occur. In this case, the automation can deenergize a part of the system for a brief period, then reenergize, and if the fault has cleared, power is restored.

In the second case when a problem in the system isn't transitory, the automation is intended to isolate the problem section of the system while restoring as much of the system (and customers) to service as possible (the switching part). In such instances investigation and correction/repair response is needed before service to all customers can be restored.

An electric utility system is inherently subject to outside forces/influences that we cannot fully or practically control – trees and animals for examples. As to "how many short term outages would indicate that there is an issue" to address, that would likely vary depending on the circumstances. Automated response to events affecting our system is just one way to improve system resilience and reliability. PSE will still watch for trends that indicate that other action(s) may be appropriate. Automated switching response to events does not lead to an assumption "that nothing is wrong with the system."

5. Is PSE now delaying or avoiding tree maintenance because they can rely on the switch to reduce the number of outages due to trees coming into contact with power lines?

Response: In short, no. PSE is required to maintain vegetation in proximity to our system for safe system operation with an overall intent to provide public safety in proximity to our system. PSE has not/does not reduce vegetation maintenance in proximity to overhead power lines when any form of protective/event response devices/technology is added to the system. For example, replacing bare overhead conductors (wires) with covered conductors (less affected by transient vegetation contacts) and adding event response automation to our system does not alter our vegetation management practices or management frequency.

6. Can PSE work with the City of Bellevue to improve the character of the installation of new lines to preserve the tree canopy as far as possible and, when not possible, make sure remediations are aesthetically pleasing?

Response: In short, yes; we have done and will continue to do so. When there is a need to make a system improvement, such as add a transmission line to our system, impacts to trees along the project alignment will occur. PSE works with the City and the Community to achieve replacement vegetation plantings – including trees that can be compatible with power lines – in our projects. “Aesthetically pleasing” is in the eyes of the beholder, but all PSE power line (and other facility) projects reviewed and permitted by the City typically have vegetation replacement and installation components.

7. What considerations are used to determine the aesthetics of the transmission poles? Can they be made to match existing poles?

Response: PSE selects poles to be used in transmission line construction based on the needs of the project. We will typically use round wood poles wherever possible. Many people seem to prefer wood poles compared to steel or other materials. In instances where a wood pole does not meet the engineering need, other pole types are considered, including engineered laminated wood poles (rectangular ‘glue-lams’) and steel. Fiberglass poles can also be used where there may be water quality concerns (in place a treated wood). Rather than aesthetics, pole choice is made by the engineering needs of the particular location and which type of pole can both best do the job and work in a given location – for example a laminated pole may be so large that it is undesirable for one more reasons or simply may not ‘fit’ at a given location so an alternative pole choice may be needed.

8. Why did PSE choose glulam poles in the Eastgate transmission upgrades over steel poles similar to those used for stoplights?

Response: When a pole needs to be self-supporting (not be guyed with wires to anchors in the ground) the choice is often between an engineered wood pole or a steel pole. Many people tell us they prefer the look of wood to steel. An engineered wood pole can often be installed directly imbedded in the ground or in a steel casing vibrated into the ground. By contrast a steel structure may need to be installed on a reinforced concrete foundation taking up additional ground space. Existing improvements (utilities) in the ground may also be a factor in the options for poles at specific locations. In this instance PSE understood that the community preferred use of wood poles wherever possible for



this project. Painted steel poles were used in the project at select locations as agreed with the City. Similarly, the City requested use of 'davit arms' supports for the wires at most pole locations as an aesthetic consideration.

9. What does PSE take into consideration when replacing mature landscaping? Is it possible to avoid piles of dirt by planting more mature plants immediately or not removing plants?

Response: PSE replaces vegetation removed for a project along the project alignment whenever/ wherever possible, largely based on available space and proximity/height of the power system facilities. At locations where poles need to be



installed, it is often necessary or advisable to remove most all vegetation to accommodate the construction actively and avoid damage to vegetation that might otherwise be desirable to retain. Otherwise, between poles PSE will typically only remove vegetation that is incompatible with/would be a hazard to the new power lines. For the transmission line project along NE 8<sup>th</sup> ST and 148<sup>th</sup> AVE NE, PSE agreed to replanting plans which were based on a prior City plan for planning along 148<sup>th</sup> AVE NE and otherwise as negotiated with the City. Similar to other types of project of this scope – for instance a road corridor improvement – planting is held to the later part of the project for practical considerations, including not damaging new plantings during construction and planting seasons best for plant survival. Based on my understanding of the location shown in the photograph, there wasn't any 'piles of dirt' involved (though there may have been short term a pile of topsoil here to facilitate the planting plan). In some locations, PSE had to install irrigations systems associated with the restoration work which had to be done prior to restoration planting.