



SNOHOMISH PUD

Resiliency and Reliability



DEFINITIONS

- Resiliency: The ability to bounce or spring back into shape. The ability to recover strength, spirits, etc., quickly.
- Reliability: A thing that is trustworthy or dependable.

DEFINITIONS, UTILITY

- Resiliency: The ability to restore the electric system to its original operating condition quickly.
- Reliability: The ability to keep the electric system in its normal operating condition when things are happening around or to the system.

STORMS OF NOTE

- Columbus Day Storm October 12, 1962
- Inaugural Day Storm January 20, 1993
- Pre-Holiday Storm December 14, 2006
- August 29, 2015
- November 17, 2015

COLUMBUS DAY STORM

- Universally regarded as the "strongest non-tropical windstorm ever to hit the lower 48 states"
- Peak gusts at Paine Field of 81 mph
- Peak wind at Paine Field were 52 mph
- Restoration times estimated at 2+ Weeks
- WA population approximately 3 million, compared to today's 7 million

INAUGURAL DAY STORM

- Many consider this one of the most severe storms
- Winds 66 mph
- Damage estimated at \$3.9 million
- All five BPA SnoKing 115 kV lines out at one point
- Damage assessment couldn't start for almost 2 days
- Total restoration took about ten days
- An estimated 224,608 customers were affected
- SAIDI 1,127.6 minutes

PRE-HOLIDAY STORM 2006

- Wind gusts of over 65 mph
- Damage estimated at \$5.6 million
- A record 655 crew jobs were handled
- 100,000 customers were restored in the first 24 hours
- Total restoration took over seven days
- 198,056 customers affected
- 95,403 customers experienced multiple outages
- 133,387,727 customer-minutes of outage
- SAIDI 429.82, CAIDI 394.76, SAIFI 1.0888



AUGUST 15, 2015

- Wind speed at Stanwood 52.0 mph
- \$5.3 million estimated cost
- 587 crew jobs handled
- Five days to restore
- 311,636 customers affected
- 318,679,822 customer-minutes of outage
- SAIDI 881.2, CAIDI 1023.0, SAIFI 0.8614

NOVEMBER 17, 2015

- Wind gust over 58 mph at Paine Field
- \$6.3 million estimated cost
- 612 crew jobs handled
- Six days' restoration
- 205,573 customers affected
- 106,458,213 customer-minutes of outage
- SAIDI 294.4, CAIDI 517.9, SAIFI 0.5685

RELIABILITY

- Pole Replacement
- Cable Replacement
- Vegetation Management
- Distribution Automation
- Lightning Arrestors
- Substation Automation
- Control Zone Relocations
- Undergrounding?

RESILIENCE

- Incident Management
- Second Jobs
- Mutual Aid and Contractors
- Back-up Personnel
- Drills and Exercises
- Plans
- Standards

INFORMATION

- Customers want to know three things:
 - Do you know my power is out?
 - Do you have a plan to restore it?
 - How long will it take?
- If we lose sight of our customers when we are putting the system back together after an event, we have lost sight of why we are in this business.



QUESTIONS?