Report to the Washington Utilities and Transportation Commission

Electric Service Reliability - Major Event Report

Event Date:	November 14-16, 2021
Date Submitted:	January 13, 2022
Primary Affected Locations:	Yakima
Primary Cause:	Weather
Exclude from Reporting Status:	Yes
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Report Approved By:	Heide Caswell / Carrie Laird

Event Description and Restoration Summary

Event Outage Summary	
# Interruptions (sustained)	82
Total Customers Interrupted (sustained)	21,500
Total Customer Minutes Lost	1,576,506
State Event SAIDI	11.52 Minutes
CAIDI	73
Major Event Start	11/14/21 8:35 PM
Major Event End	11/16/21 2:37 AM

From November 14–16, 2021, Washington experienced a major event as the result of several storm related outage events. Most significantly were outages which occurred as a result of a storm which passed through the Yakima service territory. Outages in the Yakima operating area which accounted for 88% of the customer minutes lost and 95% of all customer outages during the major event. The following information highlights the weather, outage, and restorations details during the major event.

On November 15, an atmospheric river brought strong and unusually widespread southwest to west winds to the Yakima area. Winds increased through the morning hours of November 15, peaked in the afternoon, then slowly decreased during the evening and overnight hours. Maximum wind gusts reached 64 miles per hour (mph) at the Vagabond Army Airfield, 59 mph at the Yakima Airport (McAllister Field), and 41 mph at the Sunnyside Airport weather stations. These maximum gust values exceed each station's 99th percentile values. Figures 1-3 show the details of winds speed and wind gusts for these three weather stations on November 15. As is typical, the strongest winds occurred on the east slopes of the Cascades where gusts up to 83 mph were measured (Sedge Ridge), as shown in Figure 4.

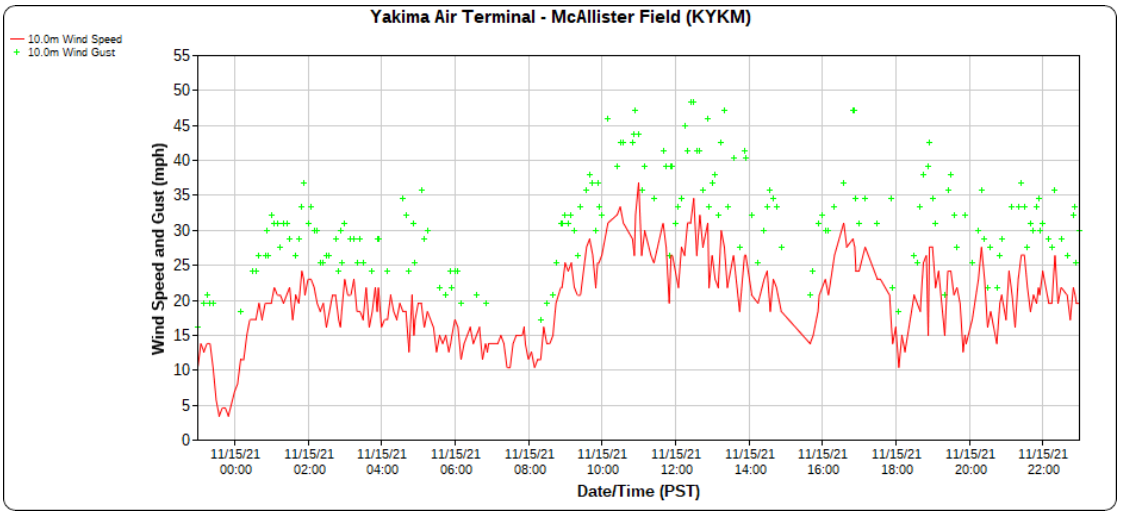


Figure 1. November 15 measured wind speed and gusts at Yakima Air Terminal weather station.

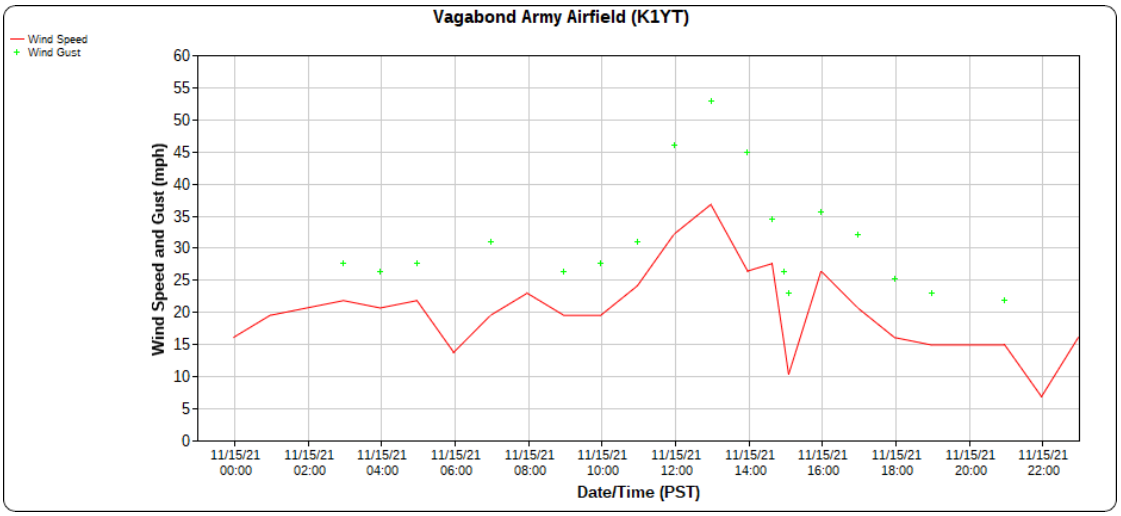


Figure 2. November 15 measured wind speed and gusts at Vagabond Army Airfield weather station.

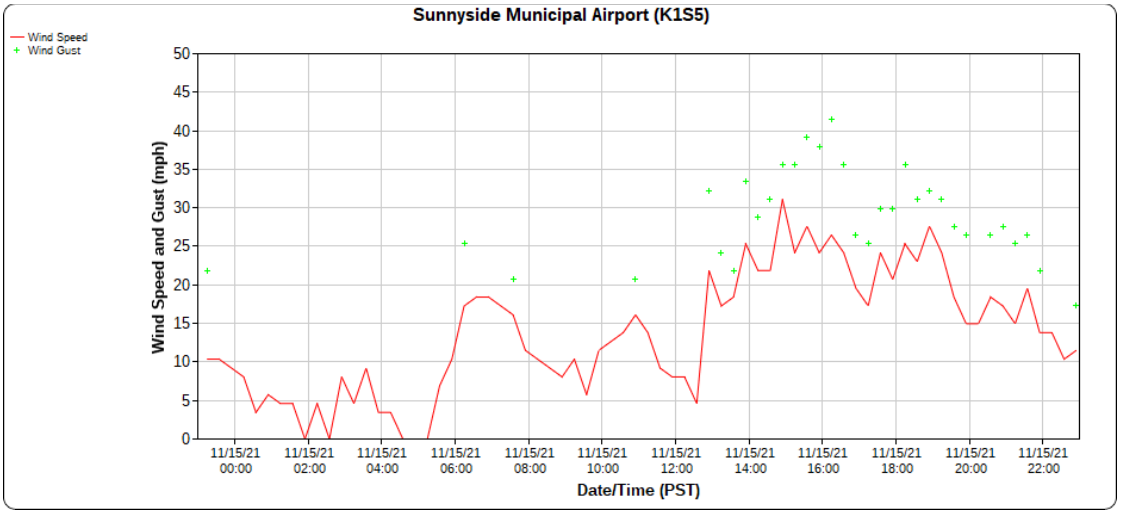


Figure 3. November 15 measured wind speed and gusts at Sunnyside Municipal Airport weather station.

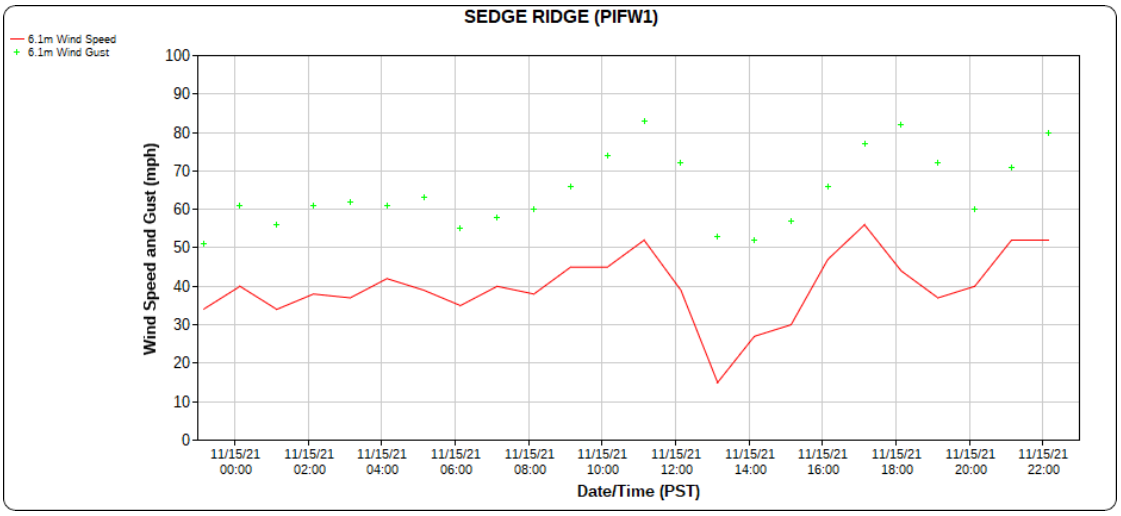


Figure 4. November 15 measured wind speed and gusts at Vagabond Army Airfield weather station.

Abnormally high winds began hitting the Yakima Valley around 8:00 a.m. on November 15. Although winds remained through most of the day, the strongest winds were on the leading edge of the storm and most of the outage damage occurred around noon, where within the span of one hour 33 outage events occurred in Yakima; including a loss of transmission line outage which affected four substations, feeding 14 circuits, serving approximately 15,600 customers. The customer outage durations for the loss of transmission line ranged from five minutes to 56 minutes. Within Pacific Powers Washington service areas, Yakima experienced 71 outage events on November 15, while Sunnyside experienced four events, and Walla Walla experienced 11 events.

Once the storm impacts were felt all available crews, both internal and contract crews were pulled off scheduled work to help restore service, including five local contract line crews working in the Yakima area, one contract line crew from the Tri-Cities, one contract line crew from Albany, Oregon, three contract tree crews, and three contract flagging crews. Internal resources were split into single responders, with the remaining being used as responders to field hazard and outage calls. Non-lineman resources from substation operations were used to field non-hazard calls and suspected non-outage calls to keep lineman resources focused on actual outage and hazard calls. Once a system outage assessment was completed internal resources were grouped back into crews, as needed, to address damages requiring larger crews.

During this time, downed trees, limbs on lines, and wire down were the main causes for the outages. Most of the distribution repairs involved removing trees and limbs from lines, putting conductors back up, patrolling lines, tightening sag, and re-energizing once it was verified no permanent fault existed. Many other outages had no cause found as the fault self-cleared and the line was able to be patrolled and re-energized after initial patrol. During the major event 25% of all customer minutes lost and 78% of all customers out were the result of the loss of transmission line event, while 63% of all customer minutes lost and 15% of all customer outages were due to wind and tree related causes. As evidenced by the large volume of

customers out in combination with the small accumulation of customer minutes lost, crews focused restoration activities on restoring outages which impacted larger numbers of customers, and then addressed the outages which occurred downstream of those larger events. Outage durations during the major event ranged from five minutes to 16 hours 20 minutes with an average restoration duration of one hour 13 minutes. Considering more the 21,500 customers experienced an outage during the period, crews were able to quickly focus on the large volume of single digit customer count outages requiring cleanup after the large bulk of customers had quickly been restored. The maps in figures 5 through 7 show the locations of customer outages and the association to wind gust locations, duration, and frequency of outages during the event period.

To date, there have been no company or commission customer complaints made regarding the major event.

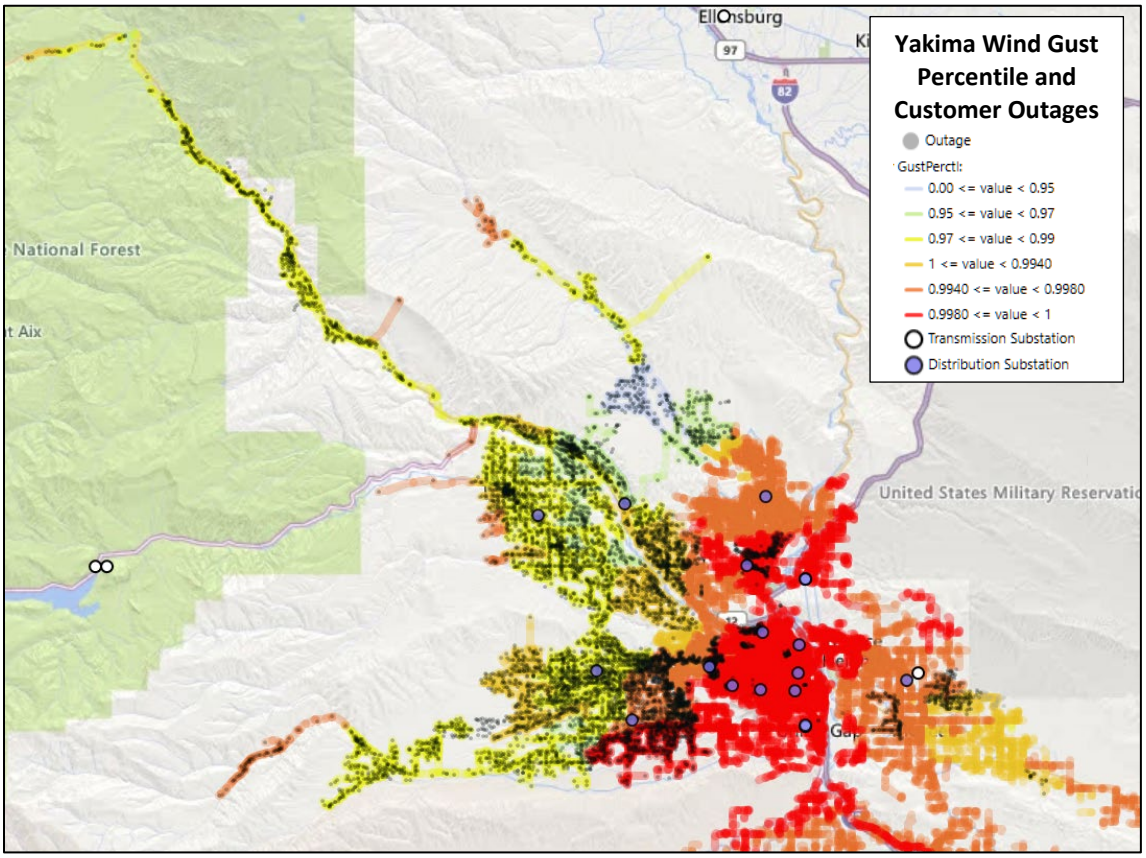


Figure 5. Yakima wind gust for November 15 mapped by circuit overlaid with event outages.

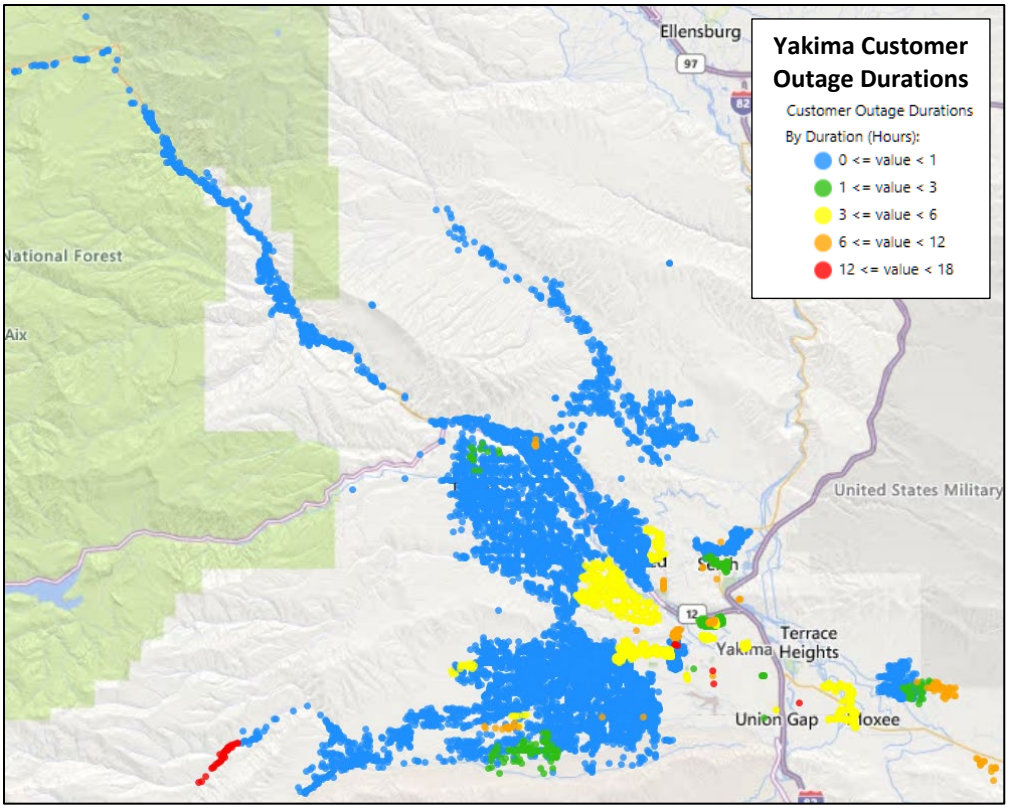


Figure 5. Yakima Customer outage durations during the Major Event.

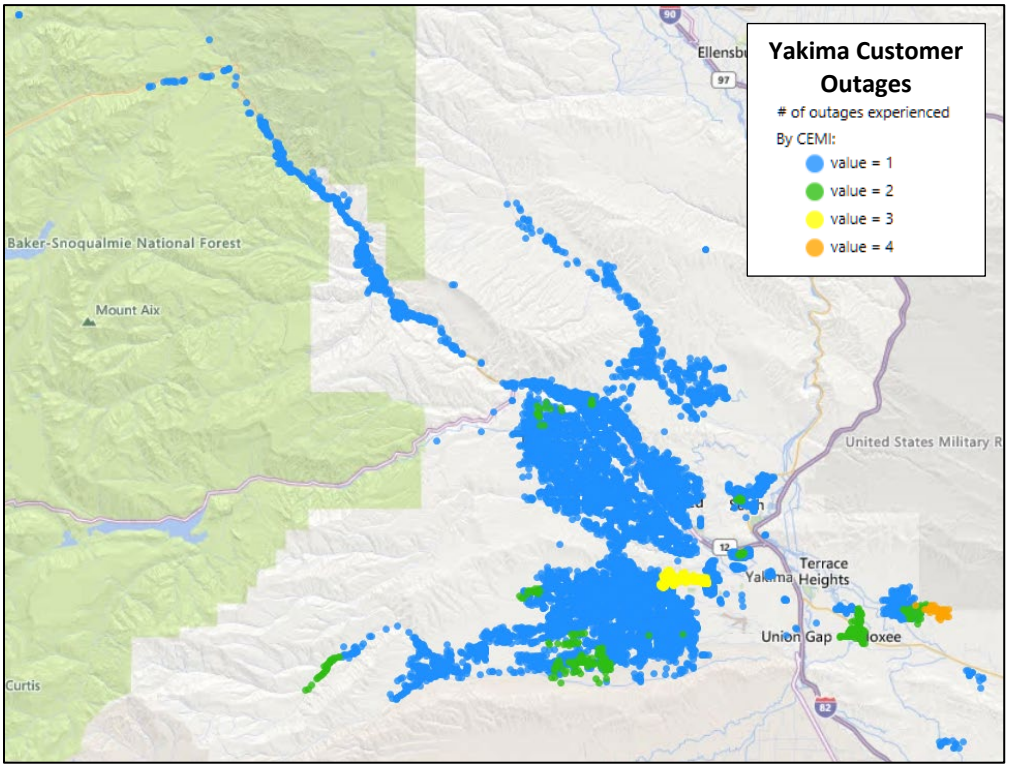


Figure 7. Yakima Customer outages during the Major Event.

Restoration Intervals

Total Customers Sustained	< 3 Hrs.	3 - 24 Hrs.	24 - 48 Hrs.
21,500	18,258	3,242	0

Restoration Resources [1]

Personnel Resources			
Collector	**2**	Field Manager	**3**
# Support staff	**1**	Foreman	**1**
Line crewman	**19**	Substation	**7**
Contract crewman	**21**	Warehouseman	**1**
		Total	**55**

Materials			
Poles (D)	**16**	Cutouts	**31**
# Approx. conductor Line (feet)	**1,130**	Regulator	**1**
Transformers	**4**	Line splices	**148**
Crossarms	**11**	Pole Reinforcer	**4**
Insulators	**32**	Wood Pole Protection Wrap	**25**

State Estimated Major Event Costs

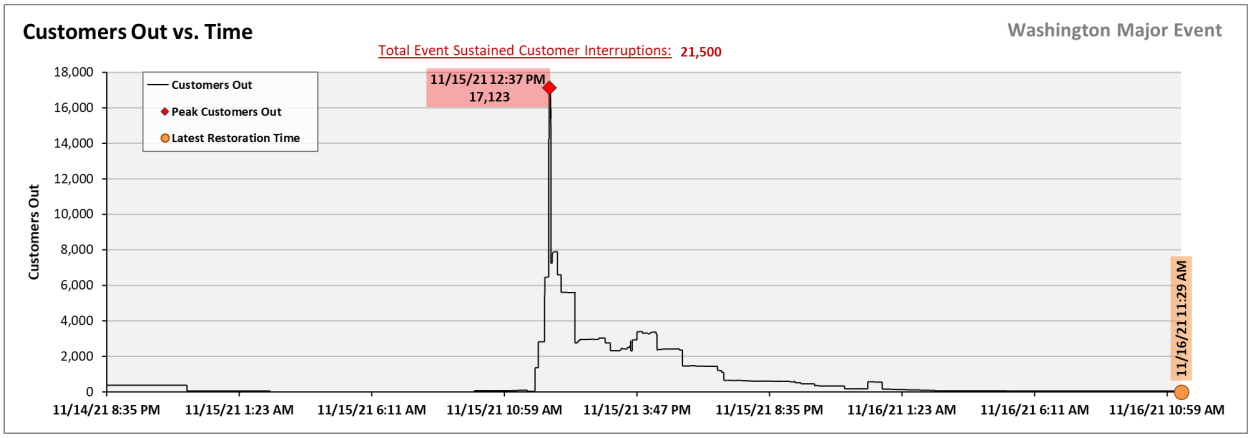
Estimate $	Labor	Contracts	Material	Overhead	Total
Capital	$8,038	$13,660	$32,963	$6,604	$61,264
Expense	$78,605	$86,494	$22,022	$7,572	$194,694
Total	**$86,643**	**$100,154**	**$54,985**	**$14,176**	**$255,957**

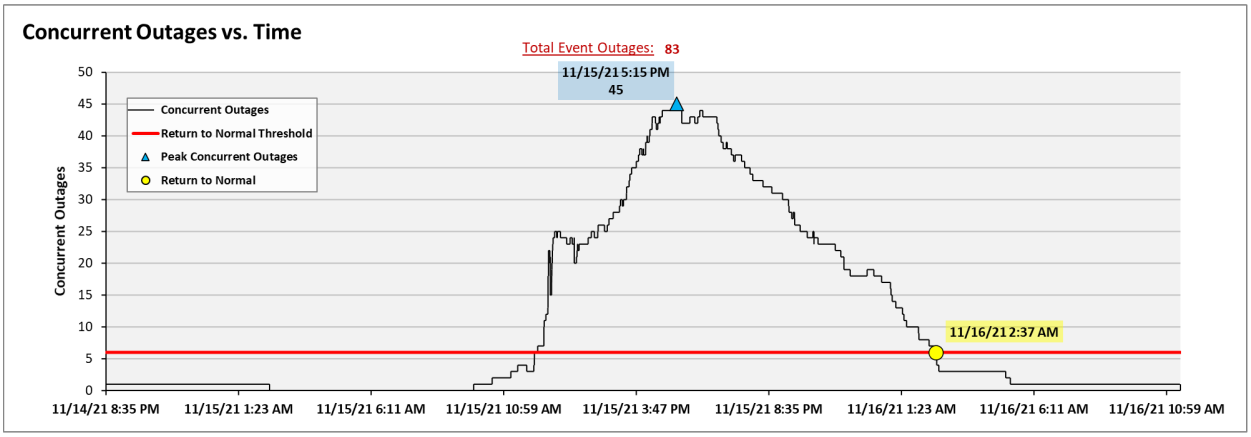
Major Event Declaration

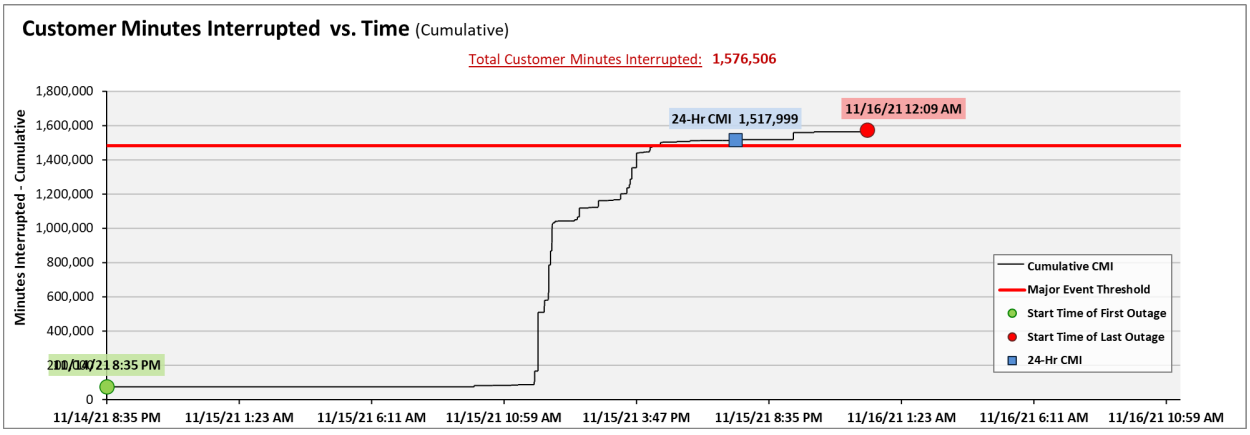
Pacific Power is requesting designation of this event and its consequences to be classified as a "Major Event" for exclusion from network performance reporting with the IEEE 1366-2003/2012. This major event exceeded the company's 2021 Washington threshold of 1,482,928 customer minutes lost (10.8 state SAIDI minutes) in a 24-hour period.

[1] Data provided represents specific system records for personnel, resources, and costs; and is specific to the event, not inclusive of state delineation. However additional resources whose participation did not get individually captured in transaction recording systems were utilized during the event, thus the data presented here effectively understates the resources, including cost, involved in restoring the system to normal.

Event Detail







SAIDI, SAIFI, CAIDI by Reliability Reporting Region

Please see the attached system-generated reports.