



*Yoder/Via*

**RESOLUTION NO. 6364**

**WHEREAS**, the Board of the Directors has determined it is in the best interest of the District, its employees, and its customer-owners to establish written policies that describe and document OPPD's corporate governance principles and procedures; and

**WHEREAS**, each policy was evaluated and assigned to the appropriate Board Committee for oversight of the monitoring process; and

**WHEREAS**, the Board's System Management and Nuclear Oversight Committee (the "Committee") is responsible for evaluating Board Policy SD-4: Reliability on an annual basis. The Committee has reviewed the 2019 SD-4: Reliability Monitoring Report and finds OPPD to be sufficiently in compliance with the policy as stated.

**NOW, THEREFORE, BE IT RESOLVED** that the Board of Directors accepts the 2019 SD-4: Reliability Monitoring Report, in the form as set forth on Exhibit A attached hereto and made a part hereof, and finds OPPD to be sufficiently in compliance with the policy as stated.

# Monitoring Report SD-4: Reliability

System Management & Nuclear Oversight Committee Report  
February 11, 2020



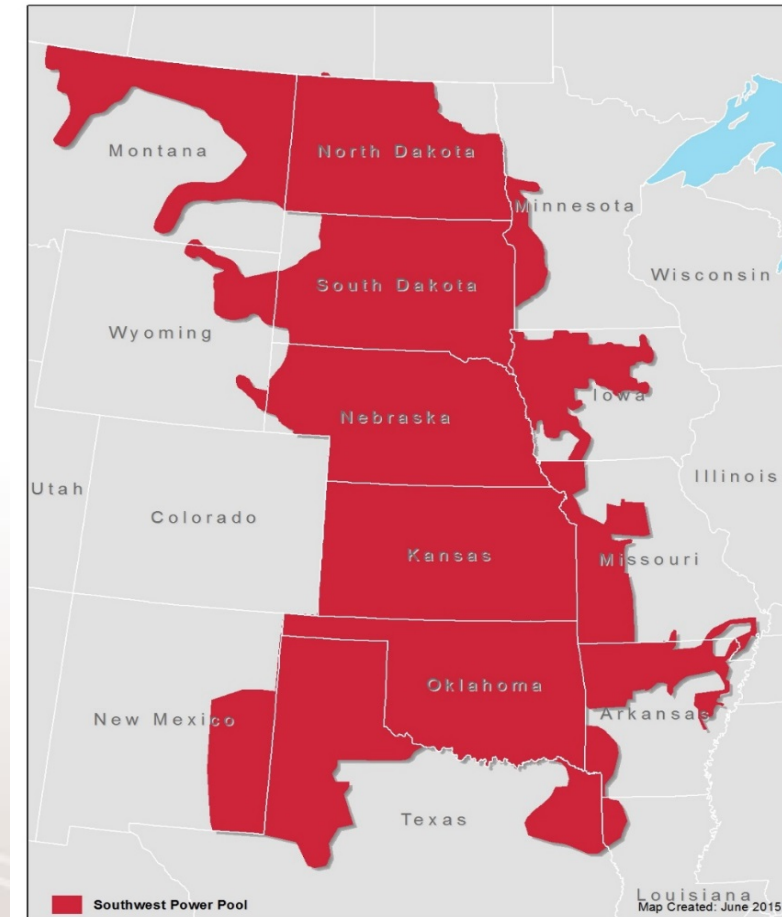
# SD-4: Reliability

Generation and delivery systems must perform at a high level to provide reliable service to customer-owners. The Energy Delivery, Energy Production and Marketing, and Nuclear Business Units of OPPD contribute to reliable electric service to customer-owners.

- OPPD shall assure all customer energy requirements are met through the use of its generation resources and purchase power portfolio 100 percent of the time.
- OPPD shall achieve generation reliability by:
  - Maintaining baseload unit equivalent availability factor at or above 90% on a three-year rolling average; and
  - Maintaining unit availability above benchmark levels per industry measures such as the NERC GADS.
- OPPD shall achieve electric system reliability by:
  - Limiting the SAIDI to 90 minutes. This is the average outage duration per customer per year excluding declared major storms; and
  - Maintaining a reliable transmission and distribution system. This will be achieved through performing the necessary maintenance and upgrades in accordance with NERC standards.

# OPPD shall assure all customer requirements are met through the use of its generation resources and purchase power portfolio 100 percent of the time

- Resource planning assessments allow us to diligently plan for sufficient generation capacity/reliability in the future
- As required, OPPD plans for accredited generation resources that are 112% of expected peak load
- As necessary, transmission ‘reservations’ are in place to ensure firm delivery of electricity creating ‘right of way’ for electricity to get to OPPD load from OPPD resources
- The SPP integrated market provides OPPD with real time access to liquid power markets
- Generation (both owned and purchased) supply requirements met 100% of the time



# Generation Reliability Benchmarks

## FERC

The Federal Energy Regulatory Commission (FERC) through the Energy Policy Act of 2005 established NERC as the “electric reliability organization” responsible for the reliability of the bulk power system

## NERC

The North American Electric Reliability Corporation (NERC) is a not-for-profit regulatory authority whose mission is to assure the reliability of the bulk power system in North America. NERC subject to oversight by FERC and some Canadian regulating authorities.

## GADS

The Generating Availability Data System (GADS) tracks reliability information from stations throughout the United States. As of January 1, 2013, GADS became a mandatory industry program for conventional generating units that are 20 MW and larger





# Generation Reliability Metric

## Equivalent Availability Factor (EAF):

- Percentage of time a unit was available to generate over a total period of time. Outages and derates impact this factor.
- When a unit is available and capable of generating at full load for an entire month, then its monthly EAF would be 100%.
- OPPD's corporate EAF is megawatt weighted. Goals are established on a 12-month basis in support of the corporate 3-year target to normalize outages across the fleet.
- Target based on top quartile NERC/GADS benchmarking.

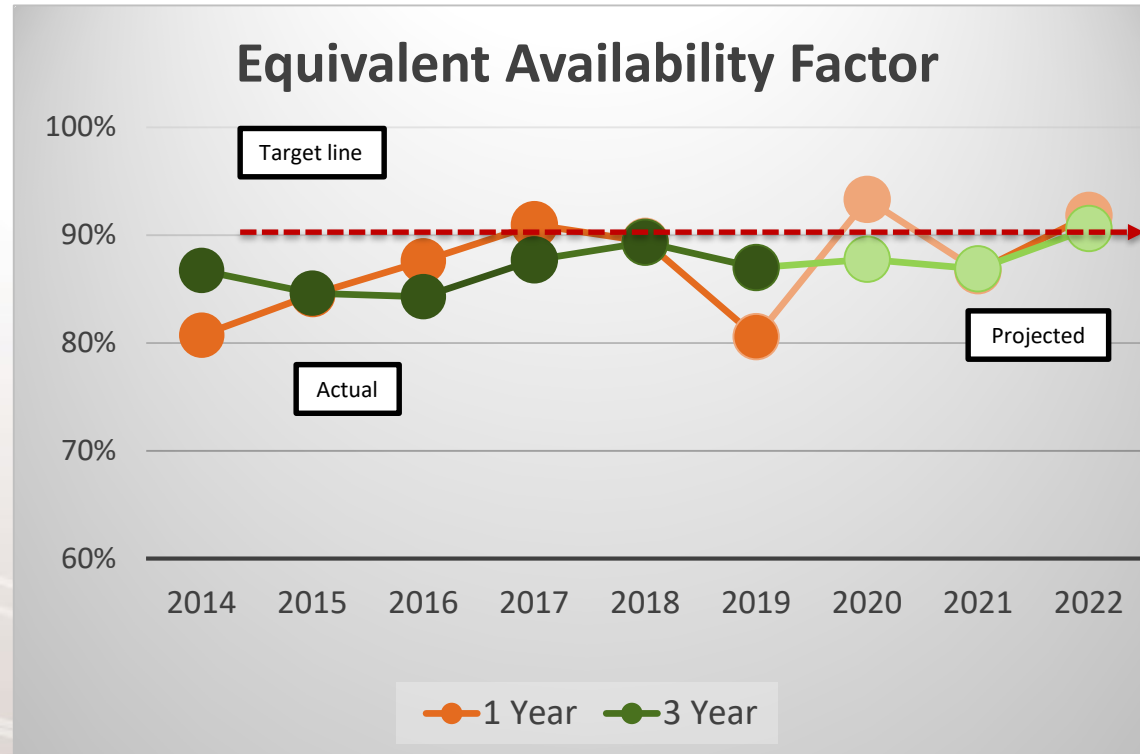


# 2019 Generation Performance

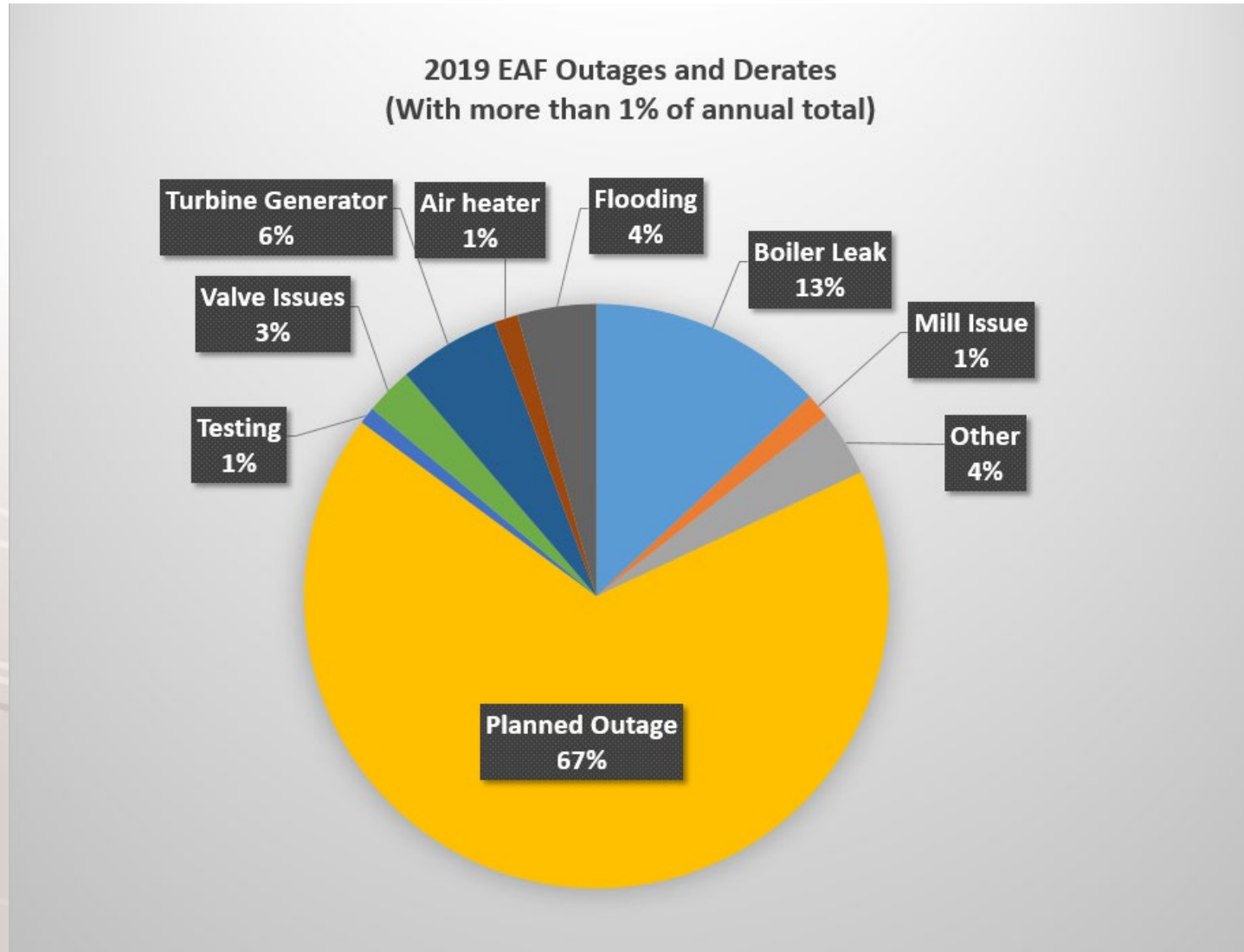
OPPD establishes a long term goal to achieve generation reliability by maintaining baseload unit equivalent availability factor at or above 90% on a three-year rolling average.

2019 year end was 87.0%

90% EAF represents top quartile of industry peers.



# Generation Reliability Drivers





# Generation Reliability Programs

- Business Unit structure is focusing on reliability and aligning with Corporate Asset Management strategy
  - Systems and Programs Engineering Approach
  - Developing critical equipment list
  - Predictive maintenance program
  - Failure Analysis and Corrective-action Team (FACT) to address boiler reliability
  - Process Improvement Coordinators investigate apparent cause for various issues
- Outage Inspections
  - Nondestructive examinations on turbine and high energy piping
  - Boiler and critical equipment inspections
- Capital Projects
  - Evaluated and proposed based upon potential reliability impact



Engineer monitors vibrations on a generator exciter at North Omaha

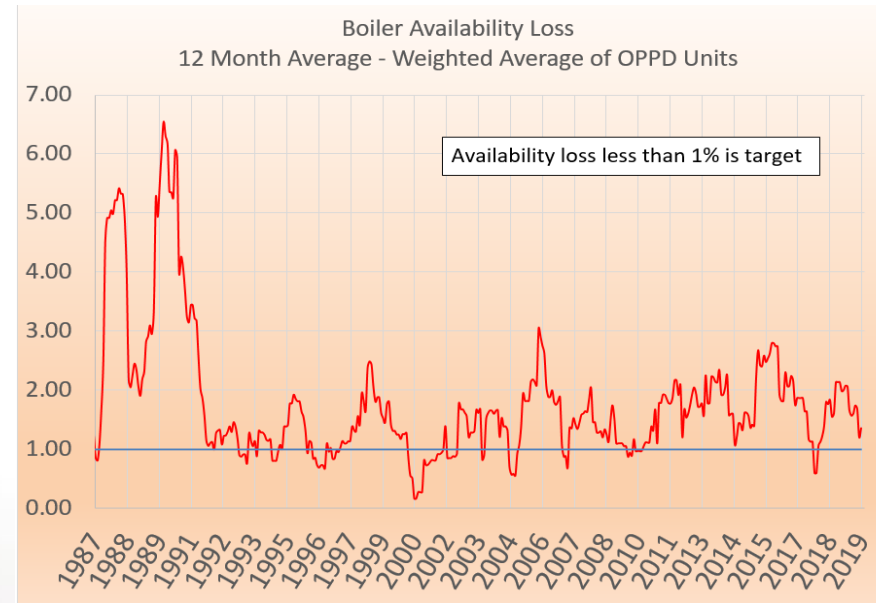


Nondestructive testing of turbine diaphragms at Nebraska City

# Reliability Implementation – Improved Boiler Performance



NC1 finishing superheat replacement



NC1 main steam header replacement



NC1 furnace slope replacement project



# System Reliability Metric

**OPPD shall achieve electric system reliability by:**

**Limiting SAIDI to 90 minutes. This is the average outage duration per customer per year excluding declared major storms.**

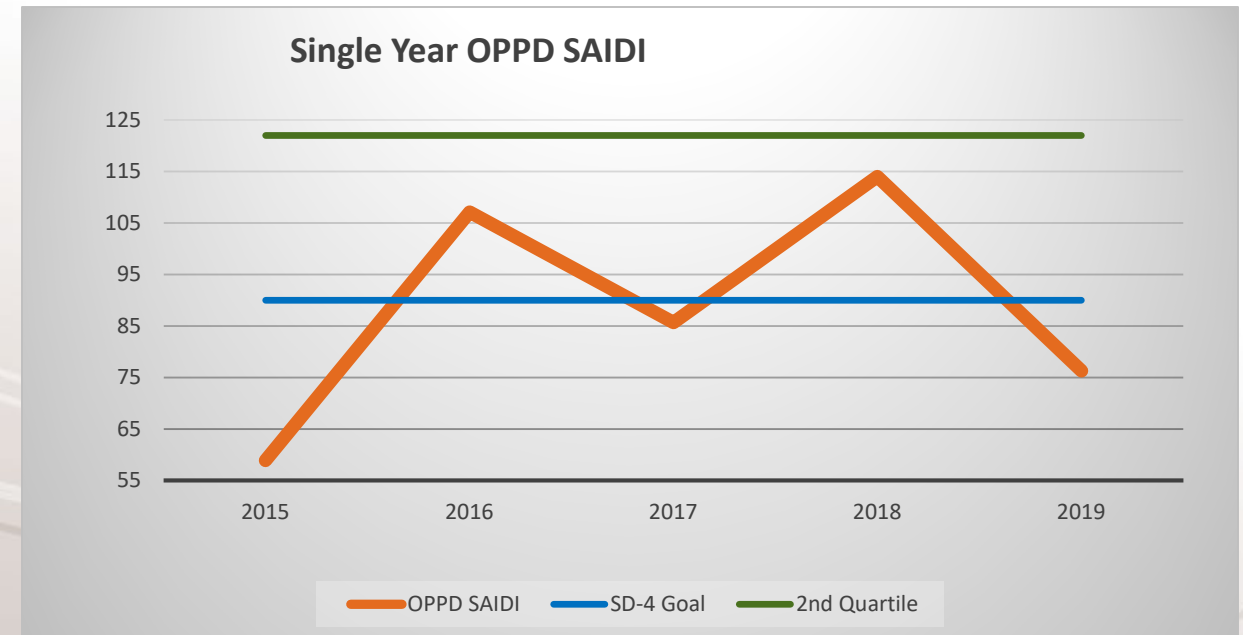
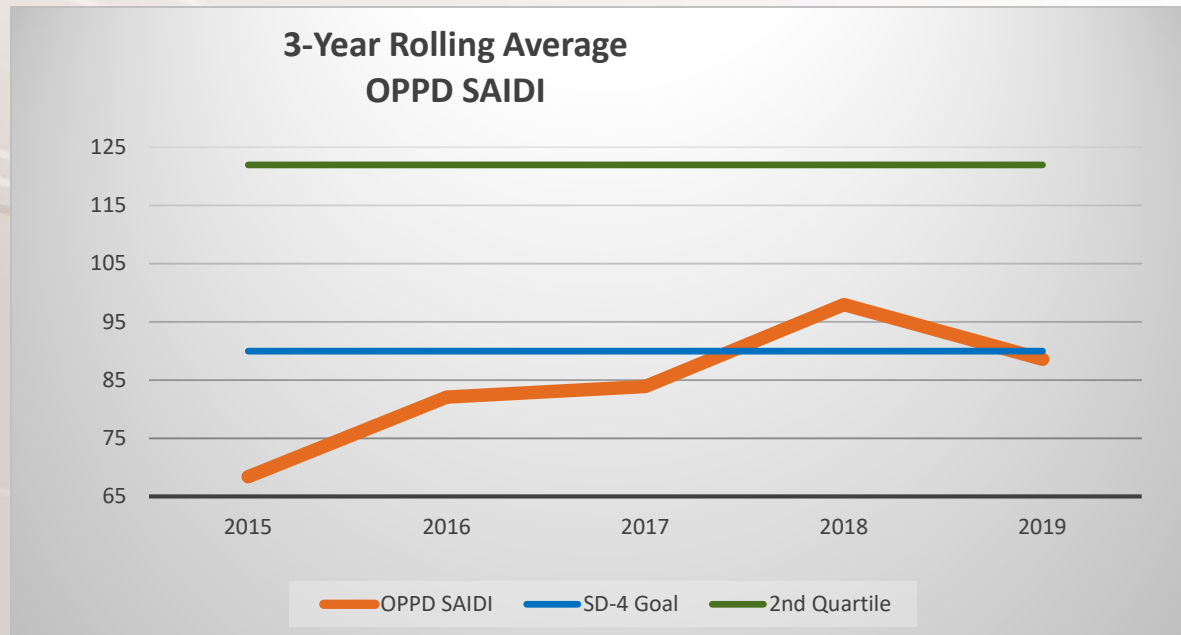
- SAIDI: System Average Interruption Duration Index
- A SAIDI of 90 minutes = 99.98% availability which will typically be first quartile
- Nationally recognized standard for measuring reliability



# System Reliability Metric: SAIDI

SAIDI at the end of 2019 was **88.6** minutes

- The 90 minute threshold was exceeded in 2018 but in 2019 has trended towards target as we increased Vegetation Management and asset replacement activities
- OPPD SAIDI is reported as a 3-year rolling average to smooth out year to year volatility

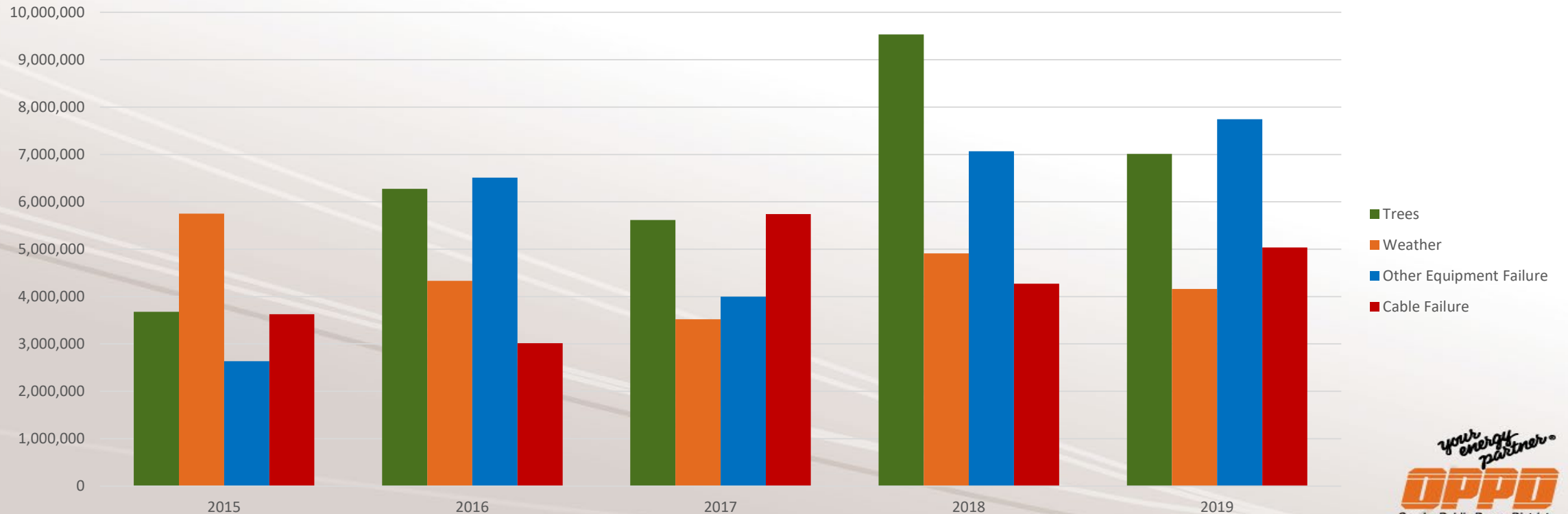


# System Performance Drivers

## 2019 Outage Causes Excluding Major Events:

- Tree Events: 24%
- Equipment Failures: 27%
- Weather Events: 14%
- Cable Failure: 17%
- All Other Causes (wildlife, public intervention, etc...): 18%

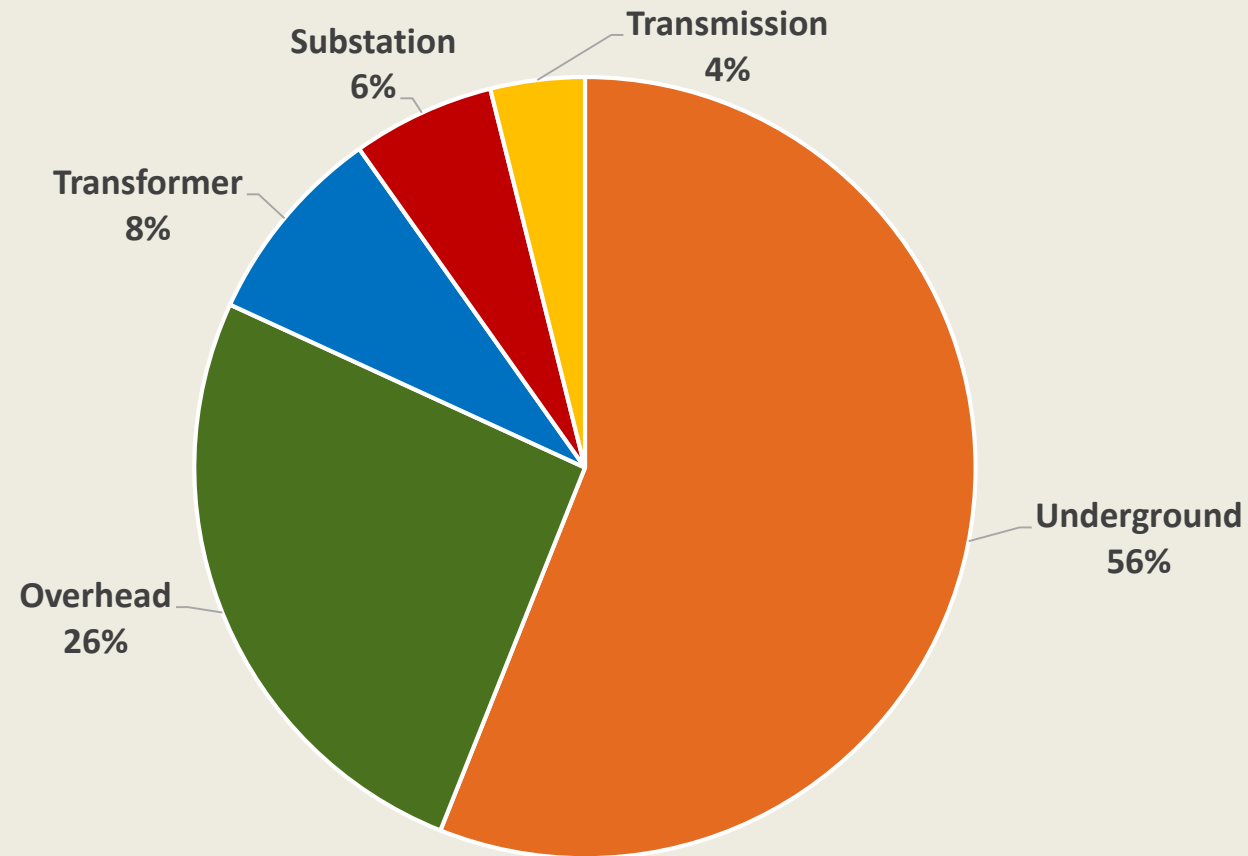
2015-2019 Top Outage Minute Causes (Excluding Major Event Days)





# Equipment Outage Minutes

## Equipment Failure Contribution by Category



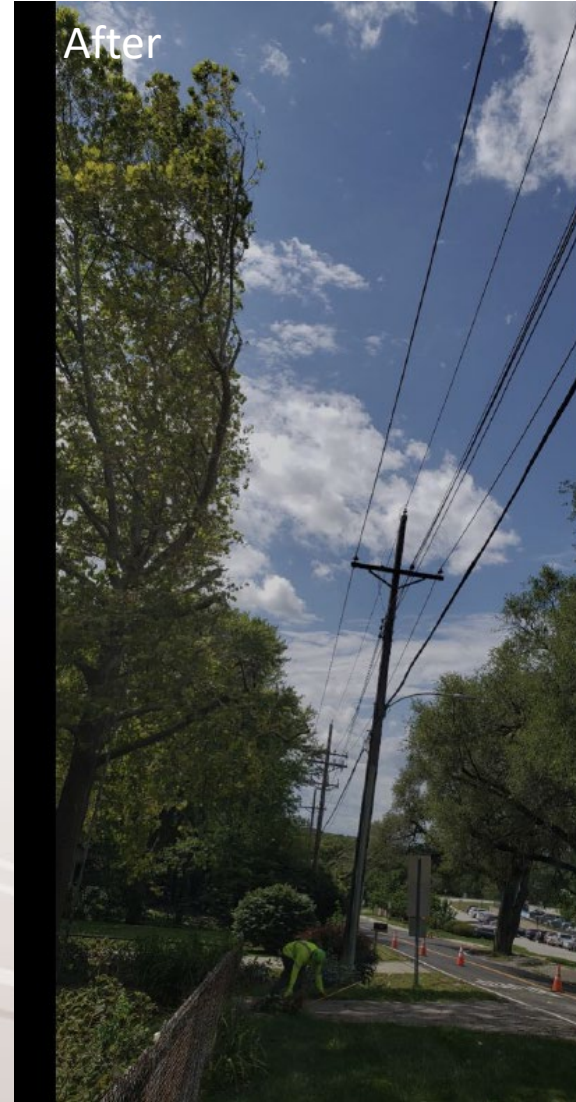
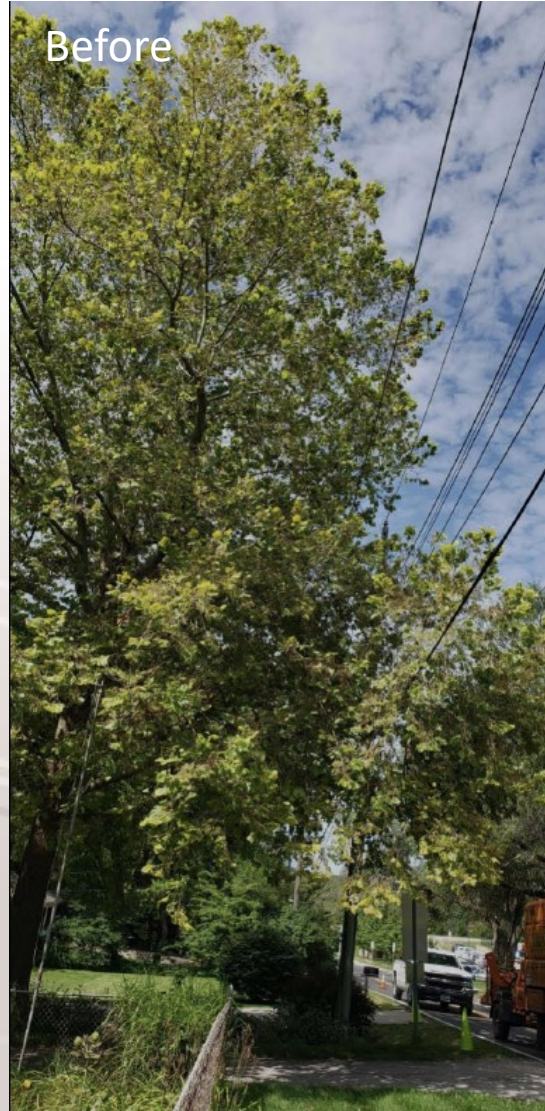
\*Does not include Major Event Days

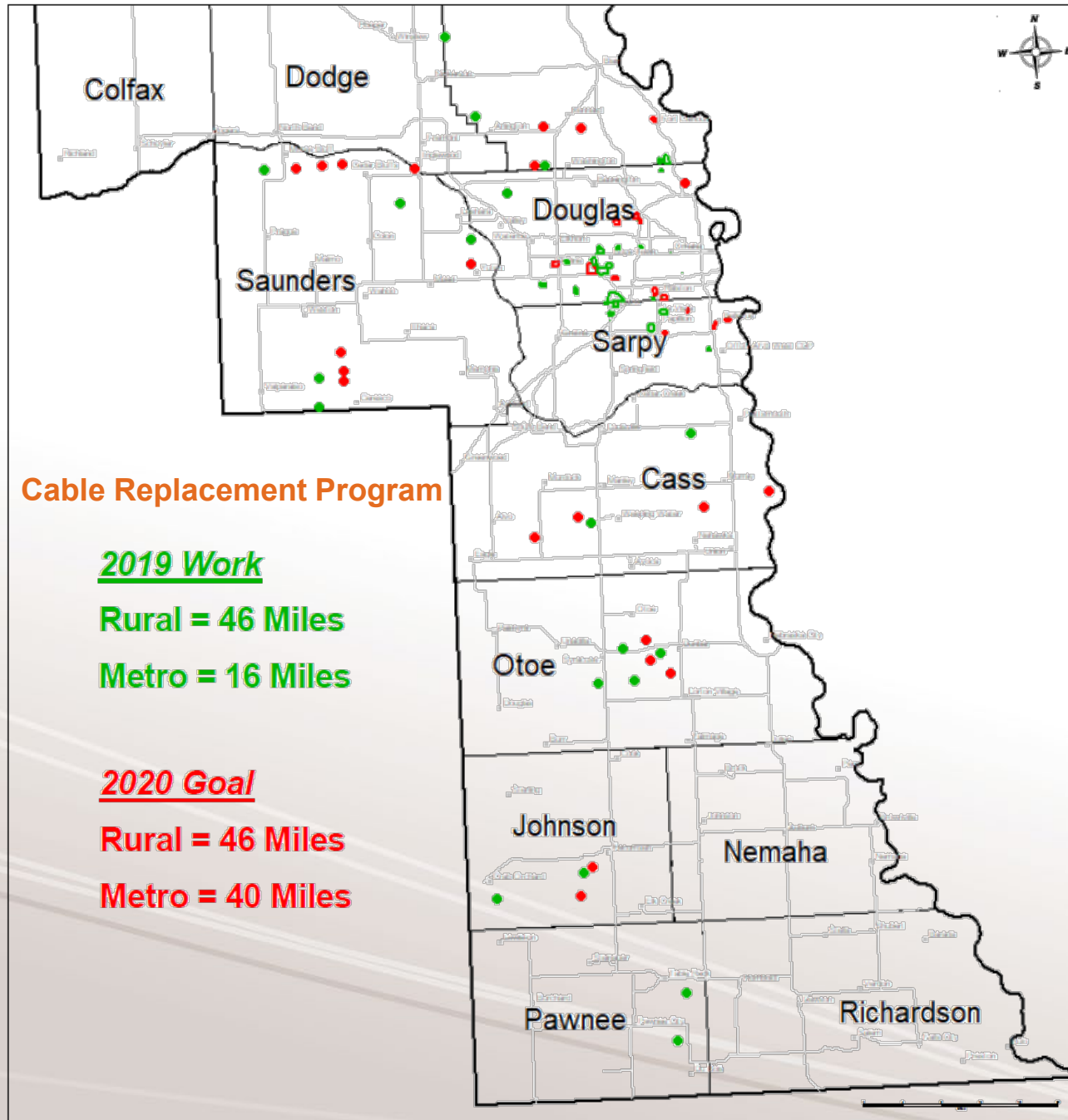
# Reliability Improvement Programs



- A more aggressive Vegetation Management program was launched in 2019 with increased funding
- TDIP funding focus
  - Underground cable replacement
  - Wood poles evaluation and replacement
  - Downtown Network upgrades
  - Overhead conductor
- Power quality programs focus on addressing pocketed areas needing attention
- System Planning & Expansion continues to add new facilities to strengthen reliability

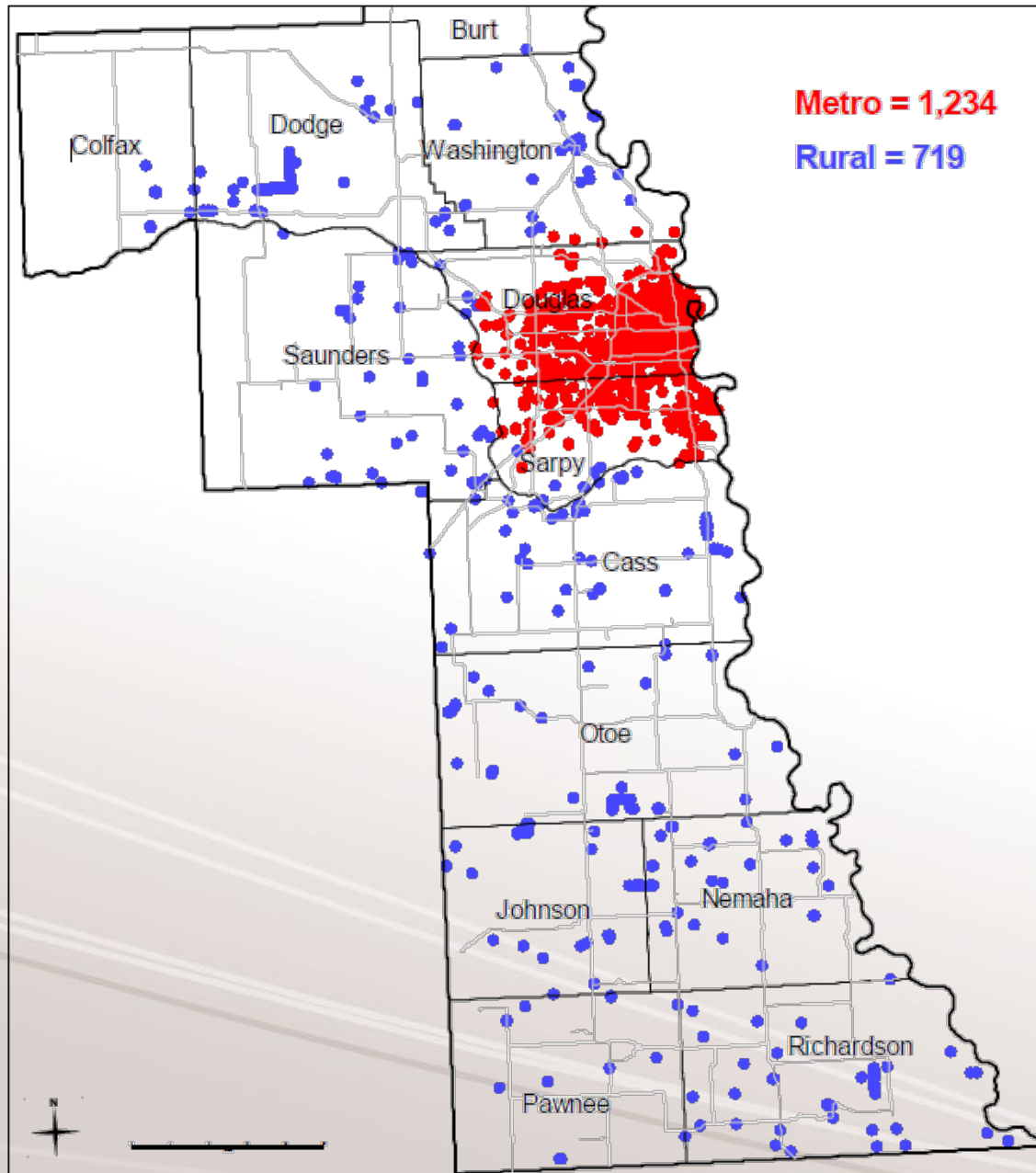
# Vegetation Management







# DISTRIBUTION POLES REPLACED IN 2019





# Smart Technology

- Northeast Omaha Distribution Automation
  - Real-time communication and control
  - System visualization
  - Self healing technology
  - Reduction of outage hours
- 2020 testing of smart reclosers in the northwest rural portion of the service territory
  - Targeting circuits that have experienced recent reliability challenges
  - Data will help identify outage locations faster for quicker response
  - Long circuits can be sectionalized



# Reliability Focus Circuits 2019-2020

- **North Bend**
  - Distribution circuit proactive maintenance
  - Smart line device additions
- **Near Colon**
  - Conductor replacement including some overhead to underground conversion
- **Mead/Yutan Area**
  - Adding air flow spoilers to limit galloping
  - Smart line device additions
- **Wahoo Area**
  - Rerouting conductors for enhanced reliability outside of Wahoo substation
- **SE Nebraska / Rulo Area**
  - Creating a new 12 mile circuit tie from Preston to Rulo, NE
  - Distribution circuit preventative maintenance
- **Miracle Hills Area**
  - Replacing cable
  - Rebuilding overhead to underground terminations
- **Harry Andersen Dr /Millard Area**
  - Created new tie and diversified large customer load to two different circuits
- **Downtown Omaha**
  - Replace underground equipment to allow for more flexibility
- **Pepperwood (Omaha)**
  - Replace underground cable

# Recommendation

The System Management and Nuclear Oversight Committee has reviewed and accepted this Monitoring Report for SD-4 and recommends that the Board find OPPD to be sufficiently in compliance with Board Policy SD-4.



# Board Action

## BOARD OF DIRECTORS

February 11, 2020

### ITEM

SD-4: Reliability Monitoring Report

### PURPOSE

To ensure full board review, discussion and acceptance of the 2019 SD-4: Reliability Monitoring Report.

### FACTS

- a. The first set of Board policies were approved by the Board on July 16, 2015. A second set of Board policies were approved by the Board on October 15, 2015.
- b. Each policy was evaluated and assigned to the appropriate Board Committee for oversight of the monitoring process.
- c. The System Management and Nuclear Oversight Committee is responsible for evaluating Board Policy SD-4: Reliability.
- d. The System Management and Nuclear Oversight Committee has reviewed the 2019 SD-4: Reliability Monitoring Report and is recommending that OPPD be found to be sufficiently in compliance with the policy as stated.

### ACTION

The System Management and Nuclear Oversight Committee recommends Board approval of the 2019 SD-4: Reliability Monitoring Report.

RECOMMENDED:

Troy R. Via

APPROVED FOR BOARD CONSIDERATION:

Timothy J. Burke

TRV:mfh

Attachments: Exhibit A – Monitoring Report  
Resolution