

# Exhibit to Agenda Item #1

Board Policy Committee and Special SMUD Board of Directors Meeting  
Wednesday, June 20, 2018, scheduled to begin at 5:30 p.m.  
Customer Service Center, Rubicon Room

# Agenda

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- 2017 SD-4 annual monitoring report
- Distribution system mitigation plan status
- 2018 year-to-date distribution system reliability

# SD-4, Reliability Policy

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Meeting customer energy requirements is a core value of SMUD.

Therefore:

a) SMUD will assure all customer energy requirements are met. This will be accomplished through the use of: (i) its generation resources and purchase power portfolio 100 percent of the time; and (ii) its transmission assets to assure an overall availability of at least 99.99 percent.

b) SMUD will achieve distribution system reliability by:

Limiting the average frequency of outage per customer per year to:

- With major event : 0.99 – 1.33
- Excluding major event : 0.85 – 1.14

Limiting the average duration of outages per customer per year to:

- With major event: 67.5 – 93.3 minutes
- Excluding major event: 49.7 – 68.7 minutes

Ensuring that no individual circuits exceed these targets for more than two consecutive years. For circuits that exceed these targets for two consecutive years, a remedial action plan will be issued and completed within eighteen months.

c) SMUD will maintain the electric system in good repair and make the necessary upgrades to maintain load serving capability and regulatory standards.

# SD-4, 2017 Reliability Results

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- **Generation and Transmission System**

Met customers' energy supply needs 100% of the time through a combination of SMUD generation and purchase power supplies

- Generation Asset and Gas Pipeline Availability

- *Thermal Generation – 90.29%*

- *Hydro Generation – 75.69%*

- *Thermal Generation June through September – 98.23%*

- *Hydro Generation June through September – 84.39%*

- *At system peak, 47% of the generation was provided by internal resources and 53% was provided by purchased power*

- Overall availability of transmission system was 99.999%

# SD-4, 2017 Reliability Results

- **Distribution System**

- Met reliability metrics for outage duration excluding major events
- Did not meet reliability metrics for outage frequency excluding major events
- Did not meet reliability metrics for outage duration and frequency with major events

	With Major Events		Excluding Major Events	
Metric	SD-4 Limit	2017 Results	SD-4 Limit	2017 Results
SAIFI	1.33	1.69 (27% over limit)	1.14	1.16 (2% over limit)
SAIDI (minutes)	93.3	112.4 (20% over limit)	68.7	57.4 (20% under limit)

- 99.7% of all distribution circuits (737 circuits) met the reliability criteria

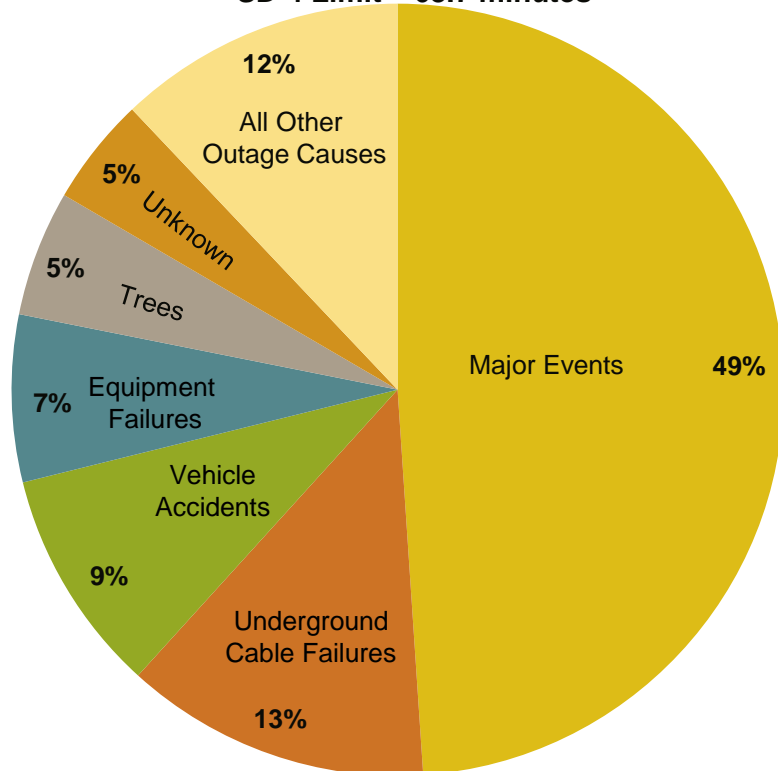
# 2017 Distribution System Reliability Performance

## Including Major Events

Year End Results = 112.4 min. (20% over SD-4 limit)  
SD-4 Limit = 93.3 minutes

## Excluding Major Events

Year End Results = 57.4 min. (20% under SD-4 limit)  
SD-4 Limit = 68.7 minutes



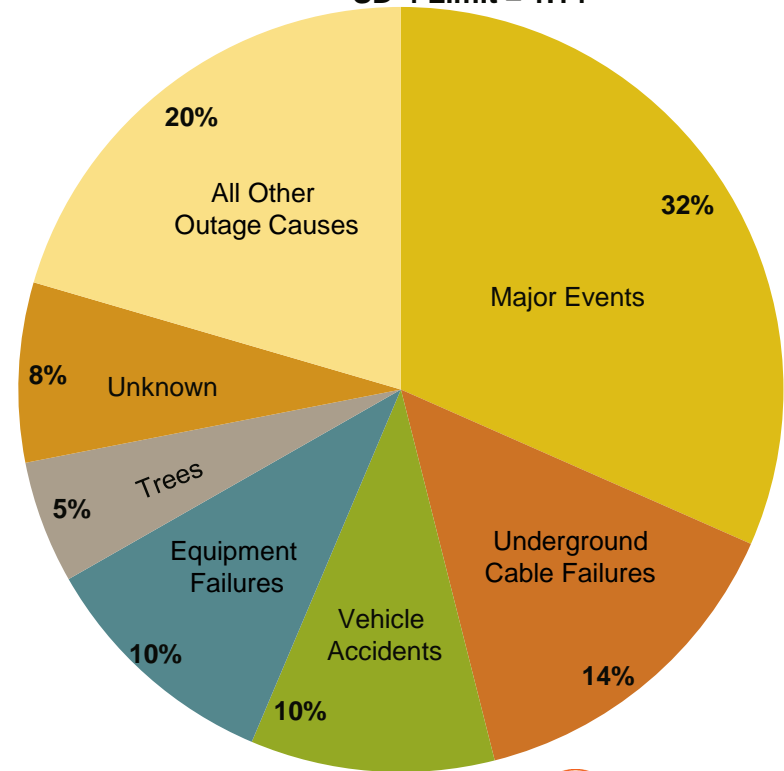
Average Outage Duration (SAIDI)

## Including Major Events

Year End Results = 1.69 (27% over SD-4 limit)  
SD-4 Limit = 1.33

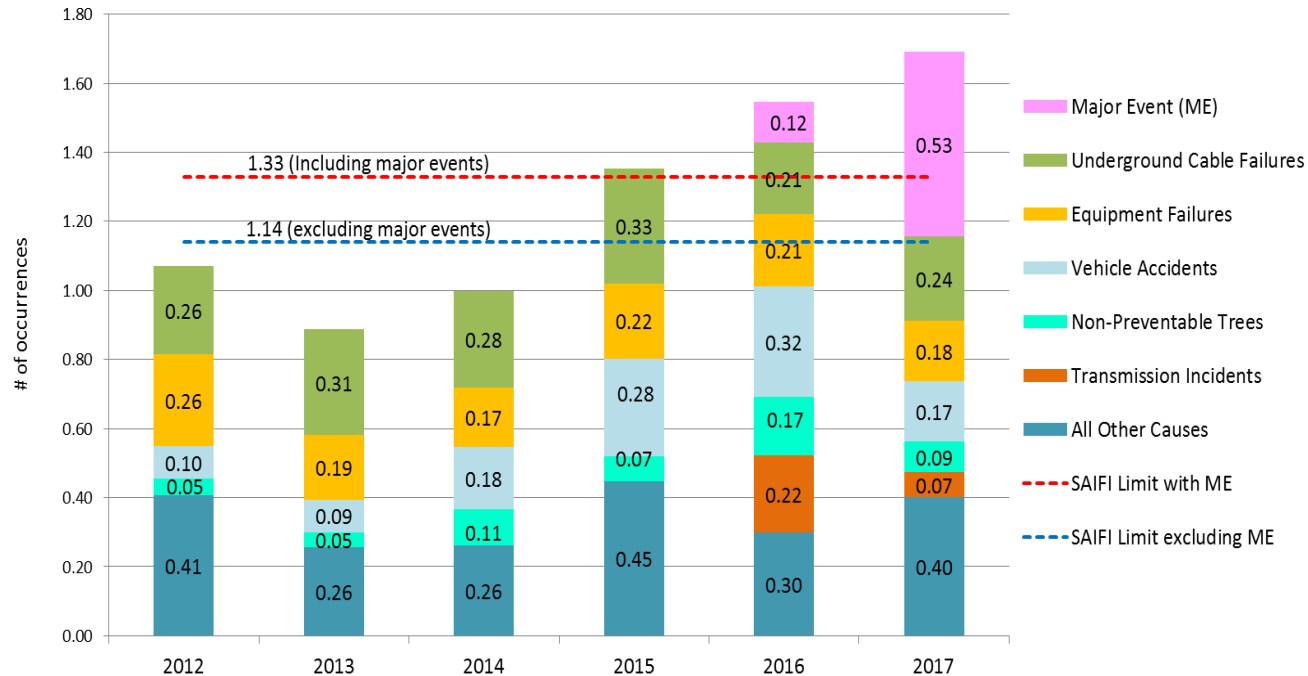
## Excluding Major Events

Year End Results = 1.16 (2% over SD-4 limit)  
SD-4 Limit = 1.14



Average Outage Frequency (SAIFI) 

# Outage Frequency (SAIFI) Performance Drivers Multi-Year Comparison



- SAIFI contribution from underground cable failures increased by 14% from 2016
- SAIFI contribution from equipment failures decreased by 14% from 2016
- SAIFI contribution from vehicle accidents decreased by 14% from 2016
- SAIFI contribution from non-preventable tree outages decreased by 14% from 2016

# Outage Duration (SAIDI) Performance Drivers Multi-Year Comparison



- SAIDI contribution from underground cable failures increased by 8% from 2016
- SAIDI contribution from equipment failures decreased by 53% from 2016
- SAIDI contribution from vehicle accidents decreased by 35% from 2016
- SAIDI contribution from non-preventable tree outages decreased by 24% from 2016



# 2017 Major Event Summary

- In 2017 SMUD experienced four major events where a declaration of emergency or 10% of customers were out of service
- By the end of February SMUD was at 40% of the upper limit for SAIFI and 64% of the upper limit for SAIDI
- During the major events that occurred in January and February, system operators were able to utilize remotely operable 69kV switches restoring customers within minutes as compared to hours.

	Jan 3-4, 2017	Jan 7-10, 2017	Jan 18-22, 2017	Feb 17, 2017
Maximum Wind Gust (MPH)	51	58	63	51
Sustained Wind (MPH)	33	33	43	33
Rainfall (in.)	1.5	4.1	2.5	0.9
Number of Outages	84	97	417	68
Service Outages	56	51	175	38
Customers Sustained Outages	34,027	45,263	160,053	99,356
<b>SAIFI</b>	<b>0.06</b>	<b>0.07</b>	<b>0.26</b>	<b>0.16</b>
<b>SAIDI</b>	<b>2.6</b>	<b>3.0</b>	<b>46.3</b>	<b>8.2</b>

# 2017 Worst Performing Circuits

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- Two circuits (0.3% of total circuits) exceeded the metrics for more than two consecutive years
- Seven additional circuits exceeded the metrics for two consecutive years
- Ten cable replacement projects issued and completed to improve the reliability of these nine circuits
- All projects were completed within 18 months

# Distribution Reliability Mitigation Plan

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## ***Completed***

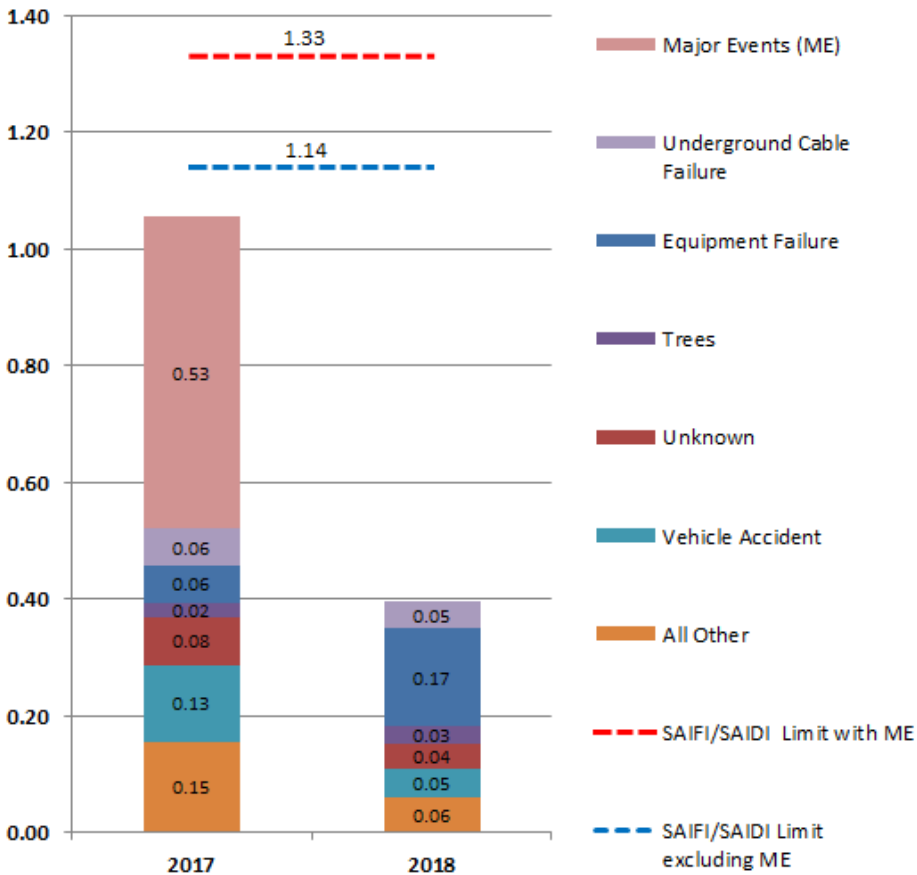
- Performed targeted patrols on 69 kV lines and deficiencies were repaired, completed in the first quarter of 2017
- Removed or trimmed 1,945 trees outside the right of way, completed in the fourth quarter of 2017, and did not encounter any outages on the 69kV system outside of the major event
- We installed 38-69 kV remotely operable switches to quickly restore large numbers of customers
- We reconfigured 69kV circuits to balance the total number of customers served per circuit to minimize the number of customers impacted by outages
- Performed Infrared inspections at bulk transmission substations to identify equipment that could be prone to outages
- Installed animal guarding at 3 substations that were most susceptible to animal-related outages
- Installed pole barrier systems at 4 pole locations, installed new visibility strips on 109 poles, and relocated 4 poles based on the analysis of car-pole incidents

## ***In Progress***

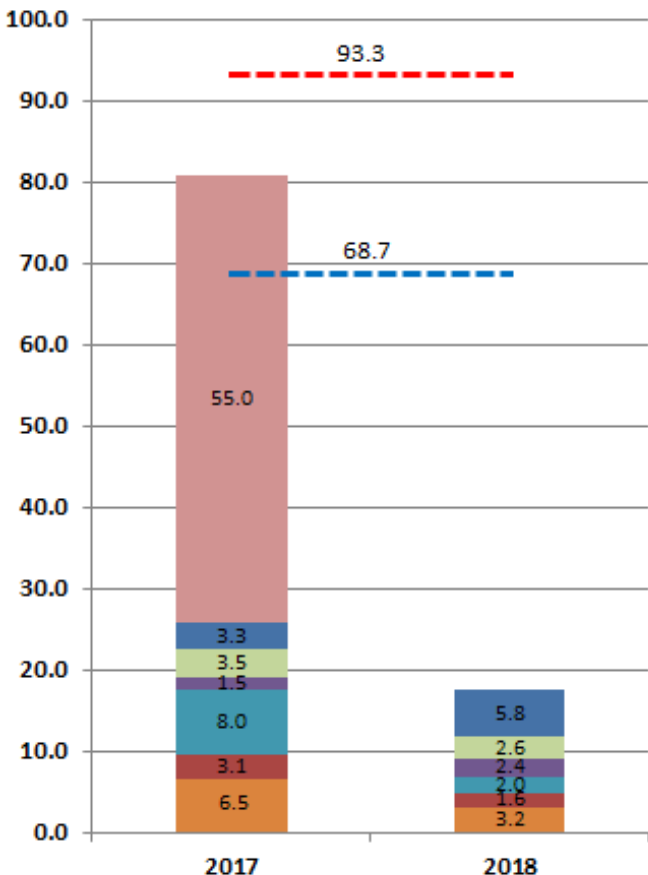
- Continue vegetation patrols on all the 69kV circuits targeting trees located outside the right of way that have the potential of falling into our lines (ongoing)
- Install 4 more pole barrier systems, install visibility strips on 400 poles and relocate or redesign 10 poles to further reduce car-pole incidents(completion date: Q4-2018)
- Install 23-69kV remotely operable switches to quickly restore large numbers of customers (completion date: Q4-2018)
- Replace 22,000 feet of underground 69kV cable to address the cable section that failed in 2017 and prevent future cable outages from occurring (completion date: Q4-2019)
- Begin the design to install a bus tie breaker at the Hurley Substation to minimize the impact of an equipment failure at the Hurley Substation (completion date: Q4-2020)
- Replace 390,000 feet of cable in 2018 with the goal of continuing to reduce cable related failures (completion date: Q4-2018)

# 2018 Distribution Reliability Update Comparison to 2017 - YTD Thru May 6

## SAIFI



## SAIDI



# 2018 Distribution Reliability Update

- Year-to-date performance was not impacted by any major events
  - The reliability comparison (without major events) through May 31<sup>st</sup> of 2018 and 2017 shows the overall SAIFI decreased from 0.52 to 0.40, and the overall SAIDI decreased from 25.9 to 17.5
  
- Mitigation plan benefits
  - Vegetation patrols on all the 69kV circuits targeting trees located outside the right of way decreased SAIDI in 2018
  - Installed pole barrier systems, visibility strips, and the relocation of poles reduced both SAIFI and SAIDI in 2018
  - Installed 38-69 kV remotely operable switches to quickly restore large numbers of customers

	Excluding Major Events		
Metric	SD-4 Limit	2018 YTD* Results	2018 YE Forecast
SAIFI	1.14	0.40	1.14
SAIDI (minutes)	68.7	17.5	57.5

\* 2018 YTD thru May 6, 2018

# Questions?

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