

2020 DISTRIBUTION SYSTEM RELIABILITY & OPERATIONS SURVEY

All individual data will remain confidential and presented as composite data only. *

First Name of Respondent:

Last Name of Respondent:

Title:

Utility Name:

State:

Phone Number:

E-mail Address:

1. Which outage tracking/recording technologies do you use? (*check all that apply*)

- Paper Records
- Spreadsheet (for analysis and history)
- Database (for analysis and history)
- eReliability Tracker Software
- Smart Grid/Smart Meters/ Automated Metering Infrastructure
- Outage Management System (If checked, which brand of OMS)

- SCADA System (If checked, which brand of SCADA system?)

- Other:

2. Where on your system does your utility apply reliability indices? (*check all that apply*)

- System Wide
- By Feeder/Circuit
- By Substation
- Other:

3. Has your utility implemented an automated switching scheme (distributed automation, etc.)?

- Yes
- No

4. What communications technologies do you use for retrieving information about your distribution system?

Check all that apply

- Broadband
- Fiber Optic
- Broadband Over Power-Line (BPL)
- DSL/ASDL
- Wireless
- Other:

If **Wireless** was selected, please choose from the drop down menu

Satellite	▲
Microwave	
Radio-Licensed Spectrum	
Cellular (2G, 3G, 4G, LTE,5G)	
Cell Towers	
Mesh (Wi-Fi)	▼

5. Does your utility generate reliability reports?

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- Yes
- No

If yes, how do you share your reliability reports?

- Newspaper/Web Article
- Social Media
- Internally only
- Letter to a city or PUC
- Not at all
- Other

6. Are you required by your state utility commission or public service commission to track/report reliability?

- Yes
 - No
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1. What is your utility's definition of a sustained outage, with respect to time?

- Greater than 1 minute
- Greater than 5 minutes
- Other:

2. Please input your utility's reliability statistics for each index used. The statistics will be ***for the period of January 1, 2019 – December 31, 2019*** and ***will include MEDs and exclude planned or scheduled outages.*** (See *Appendix for indices definition.*)

System Average Interruption Frequency Index (SAIFI)
[Provide # of interruptions per year]

System Average Interruption Duration Index (SAIDI)
[Provide # of minutes]

Average Service Availability Index (ASAI) [Provide
%]

Customer Average Interruption Duration Index (CAIDI)
[Provide # of minutes]

3. How do you calculate major event days (MED's) in your utility's reliability statistics?

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- IEEE 1366 2.5 Beta Methodology
- APPA Major Event Calculation
- Outages are excluded when the outage severity is such that outages are no longer countable.
- Whenever more than X% of customers are out (please note percentage your utility applies):

- We do not calculate MEDs
- Other - Write In (Required)

5. What is the total number of specifically tree-related outages that your utility has experienced in 2019 (enter '0' if none)?

1. How does your utility capture momentary events? *(check all that apply)*

- Trip and Reclose sequence with no lockout
- Individual trip and reclose events
- Customer call-in's
- Via Outage Management System
- Via SCADA System
- Via Smart Grid/Smart Meters/Automated Metering Infrastructure
- Other:

2. What is your yearly distribution system **Momentary Average Interruptions Frequency Index (MAIFI)**? *(For the period **January 1, 2019 – December 31, 2019.**) (See Appendix for index definition.)*

MAIFI:

3. Please check the top three most common causes for momentary outages for your utility in 2019. Also, enter the number of times during the year each of the three causes occurred.

Supply to City

Public

Natural

Equipment - Overhead

Equipment - Underground

Power Supply

Utility Human Error

Unknown/Other

1. Do you perform power quality monitoring?

- Yes
- No

If **yes**, where do you perform power quality monitoring? (*check all that apply*)

- Residential sites
- Commercial sites
- Industrial sites
- Substations
- Feeders/Circuits
- Other:

If **yes**, what power quality problems are of most concern to your utility?(*check all that apply*)

- Voltage Sag
- Voltage Swell
- Transient (spike)
- Noise
- Flicker
- Total Harmonic Distortion (THD)
- Frequency Variation
- Other:

2. Has your utility experienced any power quality challenges when integrating renewables or distributed generation sources in the last three years?

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Yes

No

If **yes**, please
explain:

1. Has your utility recently (in the last three years) implemented any projects to help prevent outages? (*check all that apply*)

- Vegetation management/Tree trimming
- Covered wire
- Circuit rider program
- Converted overhead to underground
- Lightning arresters
- Animal/Squirrel guards
- Thermographic circuit inspections
- Transformer load management
- Root cause analysis
- Review of worst performing circuit
- Routine distribution inspection and maintenance
- Other (please explain):

2. Does your utility have a major storm, event or disaster plan?

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Yes

No

If **yes**, is the plan written/documented?

Yes

No

3. Does your utility conduct regular tree trimming?

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Yes

No

If **yes**, what is the frequency of tree trimming?

Annually

Every Other Year

Every Three Years

Continuous

Other - Write In

If **yes**, are there local regulations that limit your tree trimming policy/practice?

Yes

No

If **yes**, what is the approach to tree trimming?

Spot

Percentage of System

Other - Write In

If **yes**, what percent of the tree trimming work is contracted? (please provide a numerical value **without** the percent sign)

If **yes**, what is the total tree trimming cost (\$) to your utility **annually**?

1. How does your utility provide twenty-four hour crew coverage?

3 eight hour shifts

2 eight hour shifts with lineworkers on call

1 eight hour shift with lineworkers on call

Other (Please explain-i.e., do not provide twenty-four hour coverage, two twelve hour shifts etc.):

2. How many lineworkers does your utility employ?

Number of Journeyman
lineworkers?

Number of Apprentice
lineworkers?

Number of Contracted lineworkers?

Total

Monthly Average

Peak

3. What is the **average number of lineworkers** that your utility has on a crew?

4. Do you allow crews to take utility vehicles home?

- Yes
- No
- Depends (please explain):

a. What type(s) of breakers do you use in your substation? (*check all that apply*)

- Vacuum
- SF6
- Bulk Oil
- Minimum Oil
- Air Blast

b. How many total distribution **substations** do you currently have in operation?

c. How many total distribution **substation transformers** do you currently have in operation?

d. What is the total substation transformer capacity on your distribution system (not transmission) **in MVA OA** (Open Air Self Cooling)?

e. Do you test transformer oil?

- Yes
- No

f. What is the total installed distribution (field) transformer capacity at your utility (**in MVA**)?

a. Do you have transformer overload guides?

- Yes
- No

b. Do you have an established transformer maintenance program?

- Yes
- No

c. Does your utility calculate its 'A' and 'B' factors?

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- Yes
- No

If **yes**, does your utility use the A & B factors as part of the transformer buying process?

- Yes
- No

d. Does your utility use amorphous core transformers?

- Yes
- No

e. How would you describe your experience with the amorphous core units?

- Worse than steel core
- Same as steel core
- Better than steel core

f. Do you use different transformers for lower and higher loading factors?

- Yes
- No

g. What are the lowest and highest loading factors that you use to specify transformers for on your system (e.g. 0.3, 0.75, etc.)

Lowest:

Highest

a. What distribution system voltages do you operate? *(note all that apply)*

	Number of Miles Overhead	Number of Miles Underground
4160Y/2400	<input type="text"/>	<input type="text"/>
6900	<input type="text"/>	<input type="text"/>
8320Y/4800	<input type="text"/>	<input type="text"/>
12000Y/6930	<input type="text"/>	<input type="text"/>
12470Y/7200	<input type="text"/>	<input type="text"/>
13200Y/7620	<input type="text"/>	<input type="text"/>
13800Y/7970	<input type="text"/>	<input type="text"/>
20780Y/1200	<input type="text"/>	<input type="text"/>
22860Y/13200	<input type="text"/>	<input type="text"/>
23000	<input type="text"/>	<input type="text"/>
24940Y/14400	<input type="text"/>	<input type="text"/>
34500Y/19920	<input type="text"/>	<input type="text"/>
Other:	<input type="text"/>	<input type="text"/>

Total Number of Miles:

Overhead:

Underground:

b. Does your utility perform maintenance in-house?

Yes

No

d. Does your utility use a network distribution system?

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Yes

No

If yes, how many customers do you serve by networked distribution? (See Appendix for network distribution system definition.)

e. If your utility has/uses any power systems modeling software for its distribution system (i.e. to model voltage drop, solar PV loading, conservation voltage reduction modeling, etc.) please identify software(s).

- M-Power
- Milsoft
- Cyme
- EPRI (GIS)
- Open DSS
- Gridlab-D
- Custom spreadsheet
- Other/custom

a. Please indicate the material composition that your utility generally specifies on its primary feeder cables. *(check all that apply)*

- Aluminum
- Copper
- Stranded
- Compressed stranded
- Compact stranded
- Other:

b. What is the most common underground insulation used by your utility? (rank using numbers 1-4)

	Rank (1-4)
Tree Retardant Cross Link Polyethylene (TRXLPE)	<input type="text"/>
High Molecular Weight Polyethylene (HMWPE)	<input type="text"/>
Cross-linked Polyethylene (XLPE)	<input type="text"/>
Ethylene Propylene Rubber (EPR)	<input type="text"/>
Other	<input type="text"/>

If **other**, please describe.

c. What method do you use for installation of URD cable?

- Direct Buried
- In Conduit

a. Distribution system fuse philosophy:

- Fuse Save (i.e. instantaneous trip first, then blow fuse.)
- Fuse Force (i.e. fuse blown prior to breaker operation.)

The following questions are about *reclosers*. *Reclosers* are circuit breakers with a mechanism to automatically close the breaker after it has been opened due to a fault. They are used on overhead distribution systems to detect and interrupt momentary faults.

b. Typical number of recloses to lockout:

c. Open duration prior to reclosure (in seconds) (if using current-sensing to set open duration, put 'tc' in the field):

	Commercial/Industrial Feeder/Circuit	Residential Feeder/Circuit
1st	<input type="text"/>	<input type="text"/>
2nd	<input type="text"/>	<input type="text"/>
3rd	<input type="text"/>	<input type="text"/>
4th	<input type="text"/>	<input type="text"/>

a. What types of fault signals do your fault indicators use? (*check all that apply*)

LED indication

Sound

Mechanical flag

Manual or auto reset

None

Other:

b. How does your utility sectionalize faulted sections of cable? (*check all that apply*)

Fuse

Section by Section

Phase Stick

High Pot

Other:

c. How does your utility locate faults? (*check all that apply*)

Thumper

Radar/TDR Device

Other:

d. If your utility uses fault indicators, please indicate the typical system characteristics where they are used below:

- Overhead
- Underground
- Both
- Other

A. Do your easements, or property rights, include: (*check all that apply*).

- Right to construct, maintain, operate, replace, upgrade, or rebuild pole lines or underground cable and appurtenances thereto
- Right of ingress and egress
- Right to trim and remove all trees on or adjacent to the easement strip necessary to maintain proper service
- Right to keep easement strip free of any structure or obstacle which the company deems a hazard to the line
- Right to prohibit excavation within 5 feet of any buried cable, or any change of grade which interferes with the cable
- Right to install overhead or underground necessary wiring for street lighting that is requested and/or required, but no more than 5 feet from any lot time
- Other - Please Explain

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B. Does your utility have cable in the right-of-way and/or front easement?

Yes

No

C. Does your utility have side yard and/or front yard easements? (Check all that apply)

Side yard

Front yard

D. Does your utility have codes/standards for construction and installation practices? (Check all that apply)

Utility has own set of codes

RUS standards are used

State codes

NESC

None

Other:

1. For new underground subdivisions, excluding house services, please check how your utility charges customers (select one):

- No charge
- Full cost of installation
- Per specific design
- Flat fee
- Differential cost (underground vs overhead)
- Bill on actual costs
- Estimated costs
- Depends

- Other, please describe:

1. On an existing service that is to be converted from overhead to underground service, does your utility charge?

- Yes
- No

1. Does your utility allow cable/telephone service wires in your house service trench?

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- Yes
- No

If **yes**, is there a charge?

- Yes
- No

2. In new construction, can overhead be installed or is it mandatory to be underground?

- Can be overhead
- Mandatory to be underground

1. Does your utility have an initiative to convert existing overhead lines to underground?

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- Yes
- No

If **yes**, this initiative is:

- Voluntary
- Mandatory

If **Mandatory**, how is it funded?

1. . Does your utility install sub-grade equipment? (ie. Transformers, switchgear)?

- Yes
- No

2. Do you allow housing developers to install any facilities?

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- Yes
- No

If **yes**, where?

- Complete underground system
- Conduit and ground sleeves only
- Sub-surface infrastructure
- Other:

3. Does your utility standardize the size of the following? (*check all that apply*)

- Substations
- Substation transformers
- Field transformers

4. For new residential construction, what is the standard distribution transformer installed (size) and how many customers are typically connected?

Transformer size (in kVA):

Customers connected:

5. What is your utility's clearance policy? (The intent of the question is to see whether your utility follows the NESC code regarding clearances (Section 23) or whether you have created your own policies for clearances when constructing new lines.)

1. Utility Peak Load (Distribution System):
*(For the period **January 1, 2019 – December 31, 2019.**)*

(in
MW):

2. *For the period **January 1, 2019 - December 31, 2019***, please provide the average number of customers below:

Residential

Commercial

Industrial

Total

3. What is your service area in **square miles**?

4. Predominate Load Concentration (if your city has no definition of urban, it is defined for this survey as areas of cities that have an overall average density of at least 500 people per square mile):

Urban (%)

Rural (%)

5. Please provide the number of vehicles your utility has in its fleet that are **less than or equal to one ton?**

6. Please provide the number of vehicles your utility has in its fleet that are **greater than one ton?**

7. What is your utility's Energy Information Administration ID number? (used when submitting EIA form 861)

1. What is your utility's involvement in APPA's RP3 Program?

- Currently an RP3 designated utility.
- Currently an RP3 designated utility, and applying for re-designation.
- Currently applying for first-time RP3 designation.
- Not involved in RP3 program.

Comments: