Reporting Practices
Task Force Meeting

June 20\textsuperscript{th}, 2006 Montreal, Canada
Rodney Robinson TF Co-Chair
Val Werner TF Co-Chair
Meeting AGENDA

Introductions

Task Force Draft PAR

Presentation of the 2\textsuperscript{nd} task force white paper
  • “Customer Interruption Data Collection within the Electric Power Distribution Industry”

Overview of 3\textsuperscript{rd} task force white paper
  • ‘Data Usages and Practices’
  • Outline development team:
    - Val Werner    Rodney Robinson    Bob Saint
    - Heide Caswell  Keith Frost       Jim Burke
    - Cheri Warren   John McDaniel     Jim Bouford
  • Present draft Outline
  • Future direction of the Task Force activities
  • Examples of utility Data Usages
Reporting Practices Task Force

DRAFT

Scope
- The trial use guide provides information regarding the collection, categorization and utilization of information related to electric power distribution interruption events for the purpose of system reliability comparisons.

Purpose
- To foster data collection consistency among utilities to enable meaningful reliability performance assessment, trending and benchmarking practices related to electric power distribution system reliability.

Reason
- Over the years, utilities have each developed unique reliability data collection and reporting methods. The variability of data formats, accuracy and level of system reported does not allow reasonable comparisons between companies. This guide will allow the industry to make valid comparisons.
Presentation of the 2nd TF white paper on Data Collection
1. Introduction

2. Performance Assessment & Trending
   a) By Location –
      Substation, circuit, line segment, device, geographic location, or legislative district
   b) Urban, suburban or rural
   c) By Outage Cause
   d) By Time – date, time-of-day or season
   e) By Failed Equipment Type
   f) By System – OH or UG, Voltage class, T D or Sub
   g) Tracking or assessment measures – SAIDI, SAIFI, CAIDI, CEMI, CMI, CI, MAIFI, etc.
2. Performance Assessment & Trending
   h) Results of Reliability Initiative – Lightning normalization, new OMS, WPF program, CAIDI Olympics, etc.

3. Identification and prioritization of system reliability improvement activities
   a) Identify reliability problems or concerns
   b) Identify remediation opportunities
      i. Identify process improvements for reliability - Streamline restoration processes, systems/equipment for faster fault locating and sectionalizing and right size staffing
      ii. Identify program improvements for reliability - Worst performing feeders and assessing protective coordination standard practices
DATA USAGE & PRACTICES

3. Identification and prioritization of system reliability improvement activities

b) Identify remediation opportunities (continued)

iii. Inspection and maintenance practices

c) Cost/benefit analysis for reliability improvement activities
4. Standard design, construction and operating practices
   
a) Evaluating performance variations based on construction standards - Raptor protection, lightning protection, OH & UG construction

b) Installation practices vs. construction standards - Direct buried, in conduit, construction not per standards and poor workmanship

c) Operating practices - Fault indicator, staffing levels, having proper spares available and use of contract crews
5. Benchmarking
   a) Establishing company internal goals
   b) Establish performance management targets/goals
   c) Company to company comparisons – By region, by mix of urban/rural, size of utility, etc.

6. Stakeholder Usages
   a) Regulatory
   b) Public & Governmental Officials
   c) Economic development groups
   d) Customers
   e) Shareholder
   f) Annual Report
7. Real-time and near real-time usages of data
   i. Locations and quantity of current customer interruptions or device outages
   ii. Daily trending compared to weekly or monthly targets and annual goals
   iii. Etc.

8. Conclusions
EXAMPLES OF USAGE OF THE INTERRUPTION DATA BY VARIOUS UTILITIES

Real time and after restoration
Breakdown of Customers Interrupted by Cause

2005 Normalized

- **EQUIPMENT FAILED**: 381,901 (37.9%)
- **OVERLOAD**: 17,657 (1.8%)
- **ALL TREES**: 104,947 (10.4%)
- **PUBLIC DAMAGE**: 53,734 (5.3%)
- **ANIMALS/WILDLIFE**: 167,075 (16.6%)
- **DEBRIS, NATURE/WEATHER**: 9,158 (0.9%)
- **ICE STORM**: 5,129 (0.5%)
- **EXTREME WIND**: 17,975 (1.8%)
- **LIGHTNING**: 118,734 (11.8%)
- **OTHER**: 1,588 (0.2%)
- **PROCEDURAL ERROR**: 764 (0.1%)
- **LOAD TRANSFER**: 2,417 (0.2%)
- **LOAD SHED**: 11,254 (1.1%)
- **MAINTENANCE**: 19,153 (1.9%)
- **UNKNOWN**: 80,571 (8.0%)
- **COMPANY DAMAGED**: 15,290 (1.5%)

**Breakdown of Customers Interrupted by Cause**
2005 Equipment Failed - Breakdown by Equipment Type
1/1 to 12/31 NORMALIZED

SUBSTA BUS 3,972  1.0%
SUBSTA BREAKER 17,275  4.4%
SUBSTA SWITCH 2,307  0.6%
INSTRUMENT TS 62  0.0%
OTHER 8,953  2.3%
REG STATION 5,158  1.3%
CAP STATION 3,587  0.9%
STATIC WIRE 16,023  4.3%
BELLS/INSULATORS 36,606  9.3%
DIST STRUCTURE 18,259  4.7%
TRANS STRUCTURE 10,518  2.7%
TRANS SWITCH 34,343  8.9%
TRANS SWITCH  1,178  0.3%
ELBOW/POT HEAD 7,615  1.9%
UG PRIMARY 15,835  4.0%
UG EQUIPMENT 5,020  1.3%
DIST SWITCH 22,960  5.9%
TS CUTOUT  7,021  1.8%
UG PRIMARY 15,835  4.0%
UG EQUIPMENT 5,020  1.3%

ARRESTOR 28,683  7.3%
DIST SWITCH 22,960  5.9%
SUBSTA BUS 3,972  1.0%
SUBSTA BREAKER 17,275  4.4%
SUBSTA SWITCH 2,307  0.6%
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UG PRIMARY 15,835  4.0%
UG EQUIPMENT 5,020  1.3%

SECONDARY 1,785  0.5%
SERVICE 1,451  0.4%
CUSTOMER EQUIP 1,107  0.3%
TRANSFORMER 7,654  2.0%
SEC/SERV CONNECT 3,568  0.9%
PRIMARY CONNECT 35,426  9.0%
PRIMARY 76,021  19.4%

INSTRUMENT TS 62  0.0%
SUBSTA BUS 3,972  1.0%
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UG EQUIPMENT 5,020  1.3%

17,768  4.5%
Customers Experiencing Multiple Interruptions

Current Month is Previous 11 Months + Current Month to date
REAL TIME INTERRUPTIONS WHILE RESTORATIONS ARE IN PROGRESS
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As of: 6/15/2006 2:51:00 PM

11-PENT, 108
48-CANA, 8
48-EAST, 2
48-GLEN, 78
48-MINN, 8
51-ADA, 1
52-ARKA, 2
Last 24-Hour History, Total Company as of: 6/15/2006 3:01:30 PM
Pending Customers: 137
Total Restored Customers Past 24 hours: 3445
Disclaimer: This information is unaudited and dynamic and is not intended for use in corporate reports.

Accumulated Customers Remaining Out, Each Hour

Accumulated Customers Remaining/Restored by Hour

As of: 6/15/2006 2:51:00 PM
11-PENT,108
48-CANA,8
48-EAST,2
48-GLEN,78
48-MINN,8
51-ADA,1
52-ARKA,1
PacifiCorp Operations Visualization System

OVS provides an easy-to-use graphical tool to view operations information through maps and reports.

Follow the links below for:

- More information about OVS
- Assistance from Online Help
- Details about using our maps
- OVS Technical Support

Gatekeeper Systems
Applications and Systems for the Internet

http://ovs.pacificorp.com/scripts/redirect.pl?SCR=htmlreport.pl;RN=CedarsOutage;FK=331408

Outages: Outage No.: 331408 Reported: 08:34 Verified: YES Customers Affected: 298

1:2,644,492 143 x 227 (mi)
### Final Daily Outage Summary

**Report Date:** June 14, 2006

#### Interruption Summary (SAIFI)

- **Total:**
  - CA: 0.01
  - OR: 2.62
  - WA: 0.01
  - Pacific: 2.30
  - ID: 1.03
  - UT: 92
  - WY: 1.03
  - Rocky Mtn.: 94
  - PacifiCorp: 1.39

**Abbr. Calendar Year through June - Total**
- CA: 0.1
- OR: 2.52
- WA: 0.1
- Pacific: 2.30
- ID: 1.02
- UT: 92
- WY: 1.03
- Rocky Mtn.: 94
- PacifiCorp: 1.39

**Abbr. Calendar Year through June - underfiling**
- CA: 0
- OR: 2
- WA: 0
- Pacific: 0
- ID: 0
- UT: 0
- WY: 0
- Rocky Mtn.: 0
- PacifiCorp: 0

**Abbr. Calendar Year-end forecast**
- CA: 0
- OR: 2
- WA: 0
- Pacific: 0
- ID: 0
- UT: 0
- WY: 0
- Rocky Mtn.: 0
- PacifiCorp: 0

**Abbr. Calendar Year-end target**
- CA: 0
- OR: 2
- WA: 0
- Pacific: 0
- ID: 0
- UT: 0
- WY: 0
- Rocky Mtn.: 0
- PacifiCorp: 0

#### Incident Summary

**Transmission**
- CA: 0
- OR: 0
- WA: 0
- Pacific: 0
- ID: 2
- UT: 0
- WY: 0
- Rocky Mtn.: 4
- PacifiCorp: 4

**Distribution (10 or more customers)**
- CA: 0
- OR: 7
- WA: 0
- Pacific: 7
- ID: 42
- UT: 7
- WY: 68
- Rocky Mtn.: 123
- PacifiCorp: 63

**Distribution (less than 10 customers)**
- CA: 2
- OR: 30
- WA: 6
- Pacific: 27
- ID: 30
- UT: 96
- WY: 18
- Rocky Mtn.: 142
- PacifiCorp: 179

**Planned - Customer Involved**
- CA: 0
- OR: 1
- WA: 0
- Pacific: 6
- ID: 1
- UT: 10
- WY: 6
- Rocky Mtn.: 17
- PacifiCorp: 26

#### Outage Statistics

**Lockout - Statistics**
- CA: 0
- OR: 2
- WA: 0
- Pacific: 2
- ID: 0
- UT: 4
- WY: 1
- Rocky Mtn.: 5
- PacifiCorp: 7

#### Crew Arrivals

**Average arrival time this period (hours)**
- CA: 1.47
- OR: 1.06
- WA: 0.66
- Pacific: 1.30
- ID: 1.42
- UT: 3.40
- WY: 0.94
- Rocky Mtn.: 2.77
- PacifiCorp: 2.93

#### CO1 and FSO during Period

- Interrupted this period:
  - CA: 3
  - OR: 3678
  - WA: 11
  - Pacific: 3682
  - ID: 367
  - UT: 6001
  - WY: 722
  - Rocky Mtn.: 7690
  - PacifiCorp: 10782
Total Number of Outages Starting in Each Hour vs. Average Time to Dispatch per Outage Start Hour for 2 Year Period
IEEE Definition Interruptions excluding Major Events

West Area
2004 - 2005
Non-Storm
Storm based on ICC Definition

# Outages
Avg Minutes to Dispatch

January - March
October - December

Hours in red indicate Shift Change

Sample Data
2005 OUTAGE CAUSES - WILDLIFE

NUMBER OF OUTAGES
Primary  468
Secondary  620
Total  1,088
BREAKDOWN BY PRIMARY & SECONDARY VOLTAGES

Primary is left column, Secondary is right column.

FIVE YEAR OUTAGE CAUSES - WILDLIFE
TOTAL SYSTEM: CUMULATIVE PERCENT OF THE NUMBER OF CUSTOMERS RESTORED AND TIME TO RESTORE - NO MAJOR STORM DAYS OR EXTRAORDINARY STORMS INCLUDED

![Graph showing cumulative percent of customers restored over time with better and poorer performance](image)

- **Better Performance**
- **Poorer Performance**
Reporting Practices – 3rd White Paper
DATA USAGE & PRACTICES

Schedule of Paper development

- First draft of sections by August 1st
- Draft paper to Task Force for review prior to January 2007 in Orlando
- 3rd white paper final review by Task Force at 2007 summer meeting

Begin compiling all three white papers for the draft trial use guide in summer of 2007
Major Events
December 30, 2005 Yakima Winter Storm
February 4, 2006 Walla Walla Winter Storm
February 16-17, 2006 Washington Winter Storm