Connecticut Legislature

November 15, 2017
Hartford, CT

10/29/17
Major Storm Restoration

Joseph Thomas
Electric System Operations
Preparation

UCONN Damage Prediction Model / Weather Services

Friday, 10/27/17 - Storm Preparations began

• Plan and Implement for a Level 5 Event
• Incident Management Team Lead meetings started

Sunday, 10/29/17

• 10:00 hrs.: Incident Management Team Lead call
• 14:00 hrs.: Forecast heavy rain, E/SW winds at 25-35 MPH, wind gusts to 60 MPH
• 18:00 hrs.: UI opened the EOC
• Customer Impact Projection: 10,000 – 31,356
Overview – Storm Results

EOC Opened: 18:00 on 10/29/17
Storm Duration: 18:00 on 10/29/17 to 08:00 on 11/1/17
Peak Wind Gusts: 22:00 on 10/29/17 through 02:00 10/30/17

- 25,488 Customers Affected
- 14,412 Customers Affected at the peak of the storm, 23:00 on 10/29
- 6.4 hours - Customer Average Interruption Duration Index (CAIDI)
- 1 Transmission line trip with an automatic reclose
- 302 Outage Events, 9 Critical, 372 Medical
- 515 Tree Events (outages and trouble spots)
- 322 Wires Down Locations
- 283 Service Wire Events
- 9 Broken Poles, 17 Transformers replaced
- 5 Environmental issues remediated
Restoration

Time Line – to Peak Outages

- UI mobilized resources at 18:00 on 10/29/17 continuing through 08:00 11/1/17
- A contingent of EOC resources worked on 10/29/17 evening during the height of the storm.
- Restoration Support staff, Line Crews and Vegetation Crews were brought in at 06:00 on Monday to address restoration needs.
- Participated in 2 NAMAG calls
- No State or Municipal EOC were activated during the storm.
  - UI EOC Leadership and Municipal Liaisons on site, ready for deployment
  - Municipal alerts issued on 10/30 and 10/31
# Post Restoration - Circuit Sweep Assessment

## Post Storm System Inspection

- 274 feeders (2,889 Miles of overhead circuit lines) were patrolled to verify the integrity of the system
- 695 post restoration locations required follow-up repair – Projected completion 11/16/2017

<table>
<thead>
<tr>
<th>Issues Found</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broken Limb On Wire</td>
<td>327</td>
<td>47%</td>
</tr>
<tr>
<td>Wire Off Pin</td>
<td>112</td>
<td>16%</td>
</tr>
<tr>
<td>*Other</td>
<td>93</td>
<td>13%</td>
</tr>
<tr>
<td>Broken X-Arm</td>
<td>55</td>
<td>8%</td>
</tr>
<tr>
<td>Secondary Wire Down</td>
<td>53</td>
<td>8%</td>
</tr>
<tr>
<td>Leaning Pole</td>
<td>24</td>
<td>3%</td>
</tr>
<tr>
<td>Broken Pole</td>
<td>12</td>
<td>2%</td>
</tr>
<tr>
<td>Service wire down</td>
<td>10</td>
<td>1%</td>
</tr>
<tr>
<td>Primary wire down</td>
<td>9</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>695</td>
<td></td>
</tr>
</tbody>
</table>

*Note: The “Other” category includes issues such as foreign objects on primary, broken guy wires, UI fiber optic issues, and broken cutout brackets.*
Tree Caused Outages

Forensics – Utility Protection Zone (UPZ)

Outage Investigations for this Storm:
- 82% of the tree related outages were in areas not yet addressed by UPZ program
  - Of the 82% - 51% were caused by trees within the UPZ (8’)
- 2% were caused by objection trees

Overall Tree Related Outage Investigations for 2014 – 2017 to date:
- 96% of the events came from areas where we have not yet performed UPZ
- Of the 96% - 66% of the events were caused by trees within the UPZ (8’)

Results

Level 5 Event as Predicted

• Customers safely restored, no injuries occurred
  ▪ 10,000 to 31,356 customer outages projected
  ▪ 25,488 actual customer outages
• Emergency Response Plan executed as designed
• Leveraged technology for outage assessments, crew assignments and restoration completion
• Resources were staged and used effectively
Looking Ahead – UI’s Ongoing Commitment

Continue with the Storm Resiliency Plan

• Continue to execute the UPZ where approved
  ▪ UPZ Clearance will reduce the number and duration of outages

• Infrastructure resiliency
  ▪ Replace aging infrastructure - poles & wires
  ▪ Increase system back-up capability (Perimeter Feeder ties)
  ▪ Flood mitigation

• Evaluate and Leverage new technology
  ▪ Focal Point upgrade, Drones, Distr. Lidar, Grid Analytics, etc.
Questions