Consolidated Edison
Stray Voltage Program

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Consolidated Edison Co. of NY, Inc.
Con Edison Service Territory

Con Edison Company of NY

- NYC and Westchester
- Area: 660 sq. mi. (Elec & Gas)
- Population: 9.1 million

- 3.1 million electric customers
- 13,141 MW 2006 Peak
- In some areas, Load Density up to 2000 MW per Sq Mile
Stray Voltage Mitigation Strategy

- Testing
- Inspection
- Systems approach to safety
- Research and Development Initiatives
- Stakeholder Communications
- Future Challenges
Manual Testing Program

- 2009 Manual Testing
  - 183,000 underground structures
  - 285,000 overhead poles
  - 130,000 streetlights
Mobile Stray Voltage Testing Program

- Annual goal is to complete 12 scans of our underground system goal between April 1, 2009 – March 31, 2010
- Eliminated the need to manually test 144,000 objects
- Testing is conducted 5 nights per week
- 14 vehicles per night
Results of mobile testing

- Mobile Program tests entire landscape rather than discrete objects
- More than 45% of detections are on items that would not be tested during manual testing

<table>
<thead>
<tr>
<th>Stray Voltage Location</th>
<th>Percentage of total detections (2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Lights</td>
<td>26.63%</td>
</tr>
<tr>
<td>Street Lights</td>
<td>19.28%</td>
</tr>
<tr>
<td>Sidewalk</td>
<td>16.80%</td>
</tr>
<tr>
<td>Fence</td>
<td>8.52%</td>
</tr>
<tr>
<td>Customer Equipment</td>
<td>6.40%</td>
</tr>
<tr>
<td>Gate</td>
<td>3.65%</td>
</tr>
<tr>
<td>Con Edison Manhole</td>
<td>3.50%</td>
</tr>
<tr>
<td>Non-Con Edison Manhole</td>
<td>3.02%</td>
</tr>
<tr>
<td>Fire Hydrant</td>
<td>1.91%</td>
</tr>
<tr>
<td>Gas Cap</td>
<td>1.73%</td>
</tr>
<tr>
<td>Street Signs</td>
<td>1.46%</td>
</tr>
<tr>
<td>Scaffolding</td>
<td>1.40%</td>
</tr>
<tr>
<td>Metal Door</td>
<td>1.34%</td>
</tr>
</tbody>
</table>
Facility Inspection Program

• Currently in final year of five year inspection cycle
  – 282,000 Overhead structures
  – 286,000 Underground structures

• Preventative program

• Requires detailed visual examination of facilities and its equipment.

• Test for stray voltage conducted at the beginning and end of each inspection.

• Deficiencies identified during inspections are prioritized for repair in four levels.
Systems Approach to Safety

- Cable replacement program
- Composite cover program
- Streetlight Isolation Transformer Installations
- Vented manhole and service box cover programs
- Transformer reliability programs
- Periodic System Safety Meetings
Research and Development

• EPRI personal arc fault detector
  – Portable device
  – Intended for crews to use in manholes while performing work
  – Possible mobile application

• Texas A&M network arc fault monitor
  – Online system
  – Data collection and analysis ongoing

• Advanced Stray Voltage Detection initiative
Stakeholder Communications

- Annual Jodie S. Lane Conference (NYC)
- IEEE – Working Group Meetings
- NYC Department of Buildings
- NYC Department of Transportation
- Other municipal stakeholders
- Community Board Presentations
- Employee awareness
- NYPD
- FDNY
Future Challenges

• Identify methods to deploy mobile detectors more effectively

• Develop models to evaluate inspection and testing cycles to ensure that they are optimized

• Collect and analyze harmonic data to better understand failure modes

• Continue to invest in the development of new mobile detection technology
Questions