Superstorm Sandy

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conEdison | Orange & Rockland
Agenda

• Superstorm Sandy

• Preparations

• Impact

• Restoration

• Back-office Support

• Other Events

• Going Forward
Corporate Overview

Con Edison, Inc.
Assets $40 billion (est.), 2012 Operating Revenue $12 billion
2012 Net Income $1.1 billion

Con Edison Company of NY
Electric
Gas
Steam
(New York City & Westchester County)

Orange and Rockland
Electric
Gas
(7 Counties in NY, Northern NJ, Northeastern PA)

Regulated Utilities

Competitive Energy Businesses

Con Edison Solutions
(Retail)

Con Edison Energy
(Wholesale)

Con Edison Development
(Asset Ownership & Operation)
Energy Systems Overview – Gas

Orange and Rockland
- 131,000 gas customers
  - 130,000 in NY
  - 1,000 in PA
- 1,350 square miles
- 1,850 miles of gas mains and pipes
- 200 million cubic feet per year

Con Edison Co. of New York
- 1.1 million gas customers
  - 335,000 in Manhattan
  - 300,000 in The Bronx
  - 200,000 in Queens
  - 228,000 in Westchester
- 604 square miles
- 7,300 miles of gas mains and pipes
- 225 billion cubic feet per year
Superstorm Sandy
The Weather – An Unprecedented Event

- Unique hybrid storm difficult to classify
- Largest Atlantic storm on record, spanning 1000 miles
- Sustained winds reached 64 mph at New York City’s LaGuardia Airport with peak gust of 90 mph in borough of Staten Island
- Storm tide recorded at southern tip of Manhattan – 14.06’
- More than 8.5 million power outages across 21 states
The Weather – Tide Level

- 14.06’ Superstorm Sandy 2012 (9.41’ surge)
- 11.2’ Hurricane 1821 (unofficial)
- 10.5’ Hurricane 1815
- 10.02’ Hurricane Donna 1960
- 9.7’ Nor’easter 1992
- 9.51’ Hurricane Irene 2011 (4.23’ surge)
- 9.51’ Nor’easter 1953
Preparations
Storm Preparations: Guided by Corporate Coastal Storm Plan & Emergency Response Plans

• Plan triggered 5 days prior based on National Weather Service forecasts

• Reviewed:
  – 24/7 staffing plans
  – Equipment vulnerability
  – Inventories
  – Protection plans for equipment in flood zones
  – Need for outside assistance
Storm Preparations

• Restored as much out-of-service equipment as possible

• Installed sandbags and water dams to protect infrastructure

• Relocated personnel and supplies to higher ground

• Deployed thousands of personnel to work 24/7
Storm Preparations

• Communicated safety information through press releases, website updates, and email blasts to 1.3 million customers

• Contacted life-sustaining equipment customers, and critical-care facilities to warn of possible service outages

• Secured initial deliveries of dry and wet ice in anticipation of significant customer outages
Storm Preparations

- Activated Logistics Operations Control Center (LOCC)
- Established Corporate Emergency Response Center (CERC)
Storm Preparations

• Staffed Liaison positions within State, County, City and local EOCs

• Worked with New York Independent System Operator to keep additional electric generating units online
Storm Preparations – System Safety

- **Gas System**
  
  - Secured gas supply, prepared liquefied natural gas (LNG) facility, and shut down four gas regulator stations
Impact
Impact – Customer Outages

• Electric
  – 907,444 – Sandy
  – 1,115,294 – Sandy and Nor’easter

• Steam
  – 561 services
    • 142 due to electric system issues in lower Manhattan
    • 53 due to availability of steam system capacity
    • 12 due to crane incident
  – Approximately 30 miles of steam mains impacted

• Gas
  – 391 services representing 4,257 customers
    • Edgewater Park, Locust Point, City Island, Queens, and Westchester

<table>
<thead>
<tr>
<th>Steam Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲ Preemptive shutdown</td>
</tr>
<tr>
<td>▲ Remained in service</td>
</tr>
<tr>
<td>▼ Forced offline (surge)</td>
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</tbody>
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Impact – Gas Services

• Edgewater Park and Locust Point, Bronx
  – Operated main valves thus placing area on radial feed
  – Once area evacuated we isolated 220 services

• City Island, Bronx
  – 19 services isolated

• West 57th Street, Manhattan
  – Cut and Capped main isolating 9 service

• Governor’s Island, Manhattan
  – 10 services affected
Impact – Gas Services

• Queens
  – 67-35 165th Street
  – Hurricane toppled tree at location which damaged HP gas services requiring main isolation affecting 26 services

• Regulator Stations
  – Pre-emptively shut down 4 regulator stations
    • 3 in Manhattan
    • 1 in Westchester

• First Avenue Main Tunnel
  – Approximately 500,000 gallons of water
## Impact – Gas Customers Affected

<table>
<thead>
<tr>
<th>Region</th>
<th>Services</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronx</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Manhattan</td>
<td>106</td>
<td>3,893</td>
</tr>
<tr>
<td>Queens</td>
<td>27</td>
<td>106</td>
</tr>
<tr>
<td>Westchester</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Orange &amp; Rockland</td>
<td>391</td>
<td>788</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>782</strong></td>
<td><strong>5,045</strong></td>
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Restoration
Restoration Strategy

• Coordinated with FEMA, city, state, and local agencies
• Focused on public safety
• Prioritized restoration
• Restored networks
• Distributed dry and wet ice
• Set up command buses and outreach sites
Restoration
Restoration
Restoration
Restoration
Restoration
Restoration – Gas Mutual Assistance

- Participated in NGA Mutual Assistance Calls
  - Calls began 2 days prior to storm
  - Continued twice-daily for 3 weeks post-storm
  - As needed for the duration

- Mutual Assistance Provided to:
  - National Grid, Long Island – service restoration crews
  - New Jersey National Gas – leak survey crews
Back-office Support
Back-office Support – Preparation Phase

- Mutual Assistance requests / coordination
- Equipment relocation
- Facility evacuations
- Ensure sufficient stock of materials for restoration
- Public Affairs – press releases
- Customer Ops – contact LSE, MEDH, and CLIC customers
- Activate DESR, LOCC, and GERC
Back-office Support – Storm Phase

• Monitor and report on storm status
• Prepare restoration plans
• Update outgoing messaging to customers as conditions warrant
• Continue communications with critical customers and officials
• Accommodate Storm Riders and Mutual Assistance crews
Back-office Support – Restoration Phase

- Assess damage to computer systems and expedite repairs
- Dispatch municipal liaisons
- Outage map updating
- Support staging area and base camp operations
- Customer outreach vans
- Call centers
- Dry ice distribution
- Obtain environmental variances
- Track restoration costs
Other Events
O & R Hurricane Irene
August 28 - 31, 2011

• 30 locations where gas mains were exposed or undermined
• 5 mains needed to be cut
• More than 300 services cut and capped
• 500 customers affected
• CECONY provided mutual assistance
NYSEG Tropical Storm Lee
September 13 – 21, 2011

• 40 mile stretch of the Susquehanna River flooded
• Approximately 10,000 customers affected
• CECONY provided crews, supervisors, and support
• O&R provided crews and supervisors
Annual Gas Mutual Assistance Summit

• First held on October 26, 2011 - hosted by Con Edison
• Second held October 23, 2012 - hosted by PSE&G
• Next to be held November 2013 – hosted by O&R
• Participants have included:
  – CECONY, O&R, National Grid, PSE&G, NYSEG, Central Hudson, NGA, etc.
Going Forward
Going Forward – Regional Big Picture

- Reassess coastal flood zones
- Next generation of storm plans
- Improve evacuation plans
- Anticipate gasoline and other resource shortages
- Evaluate earlier and more extensive shutdown of key facilities, such as transportation, utilities, hospitals
Going Forward – Regional Measures

• New building codes
  – Raise critical equipment
  – Review waterfront development
  – Rebuild/retreat

• Real estate industry collaboration

• Army Corps of Engineers evaluating storm surge barriers
Going Forward – Con Edison Measures

- Electric Overhead
- Electric Underground
- Gas
- Substations
- Steam Generating Stations
Gas Distribution System

• Tunnel Hardening
  – Water Intrusion Management
    ○ Install two additional high flow rate pumps per tunnel
    ○ Install backup diesel generators
  – Build Reinforced Concrete Head Houses
    ○ First Avenue
    ○ Ravenswood
    ○ Astoria
    ○ Hudson Avenue
Gas Distribution System

- Component Hardening
  - Replace cast iron & bare steel in flood prone areas
  - Install float check valves
  - Evaluate options for 62 regulator stations in flood zones

Con Edison Developed Float Check Valve
Preparation for Future Events
2012 CERC Exercise

• Major Gas Transmission Event
  ▪ Tabletop Exercises
    ▪ Gas Control and Gas Emergency Response Center
    ▪ FDNY and NYC OEM
  ▪ Mutual Assistance Drill
    ▪ Surrounding utility partners
    ▪ NGA and AGA
  ▪ Corporate Full-Scale Exercise
    ▪ Multiple external stakeholders
CERC Table Top Exercise 2012

• Conference call conducted on March 23, 2012

• Participants:
  – Con Edison
  – O&R
  – National Grid
  – PSE&G
  – Central Hudson
  – NYSEG
  – NGA
  – AGA
TTX Resource Commitments

• O&R 10
• Central Hudson 22
• National Grid 60
• PSE&G 100
• NYSEG 25

Subtotal 217

• NGA commitment 132
• AGA assistance 151+

Total 500
Fortifying the Future

- Review all options
- Collaborate with key stakeholders
- Continue to improve communications
- Remain focused on strengthening our systems to withstand extreme weather