ECLAC-CANTO Collaboration on Disaster Risk Management in the Telecoms Sector

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Port of Spain
### Storm costs to the telecoms industry

<table>
<thead>
<tr>
<th>Year</th>
<th>Storm</th>
<th>Country</th>
<th>Cost (Millions of USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Hurricane Ivan</td>
<td>Jamaica</td>
<td>25.6</td>
</tr>
<tr>
<td>2004</td>
<td>Hurricane Ivan</td>
<td>Cayman Islands</td>
<td>95.4</td>
</tr>
<tr>
<td>2004</td>
<td>Hurricane Francis</td>
<td>The Bahamas</td>
<td>21.6</td>
</tr>
<tr>
<td>2004</td>
<td>Hurricane Jeanne</td>
<td>The Bahamas</td>
<td>15.5</td>
</tr>
<tr>
<td>2007</td>
<td>Hurricane Dean</td>
<td>Saint Lucia</td>
<td>0.7</td>
</tr>
<tr>
<td>2007</td>
<td>Hurricane Dean</td>
<td>Dominica</td>
<td>5.7</td>
</tr>
<tr>
<td>2008</td>
<td>Tropical Storm Hannah</td>
<td>Turks and Caicos Islands</td>
<td>3.3</td>
</tr>
<tr>
<td>2008</td>
<td>Hurricane Ike</td>
<td>Turks and Caicos Islands</td>
<td>3.3</td>
</tr>
<tr>
<td>2008</td>
<td>Hurricane Paloma</td>
<td>Cayman Islands</td>
<td>4.7</td>
</tr>
<tr>
<td>2010</td>
<td>Hurricane Tomas</td>
<td>Saint Lucia</td>
<td>6.7</td>
</tr>
<tr>
<td>2012</td>
<td>Hurricane Sandy</td>
<td>Jamaica</td>
<td>0.8</td>
</tr>
<tr>
<td>2015</td>
<td>Tropical Storm Erika</td>
<td>Dominica</td>
<td>10.0</td>
</tr>
<tr>
<td>2015</td>
<td>Hurricane Joaquin</td>
<td>The Bahamas</td>
<td>22.0</td>
</tr>
</tbody>
</table>

Source: ECLAC; collected from official figures
ECLAC and CANTO

• Goal: To strengthen the relationship between telecommunications companies and National Disaster Offices (NDOs) to support...

  – Disaster planning
  – Public early warning systems
  – Improved disaster response
  – Outreach to disaster-affected communities
  – Post disaster damage and loss assessment
Sources of information

• 2013 ECLAC Study on ICT for Disaster Risk Management in the Caribbean

• Participation in CANTO Disaster Recovery Planning (DRP) Committee
  – Simulated Hurricane Drill

• Interviews with National Disaster Organizations and CDEMA
  – British Virgin Islands
  – Cayman Islands
  – Jamaica
  – Montserrat
  – Saint Lucia
  – Trinidad and Tobago
  – CDEMA

• Damage and Loss Assessments
External and regional entities such as:
- Intl. agencies, FEMA, U.S. Military
- CTU, ITU, Technical Advisory Council
- Regional Council of Ministers

Coordination & Regional Response Mechanisms (RRM) via CDEMA

Government Ministry w/ Disaster Mgmt. responsibility

Government Ministry w/ Telecoms responsibility

National Disaster Office (NDO)

Regulator

Telco

Utility/Telco Disaster Mgmt. Committee

National Emergency Operations Centre (NEOC)

Oversight

Is there visibility of?

Is there goal congruency?

Supports

Ownership

Executes

Reports to

Invokes

Participates in

Regulates

License

Disaster mgmt. obligations within?

Is it aligned to?

International assistance, technical advisory and policy setting intervention

Oversight

Supports

Oversight

Supports

Oversight

Supports

Supports

Reports to

Executes

Emergency Support Function (ESF)
• Measures need to be put in place to ensure first responders and disaster response personnel have priority access to networks.
• The Emergency Operations Center (EOC) should be the information and communications focal point of the government during and immediately after the disaster.
• Telecommunications companies should be required to make regular daily reports to the EOC as they assess and repair damages.
• The EOC should provide a standard template for reporting which is linked to an emergency management information system.
Recommends that telecommunications operators and National Disaster Offices enter into “formalized agreements with regard to supporting disaster response and recovery operations.”
Formalized agreements between Telecoms and National Disaster Offices (NDOs)

• There are already some formalized documents and processes
  – Operators license
  – National Disaster Plan
  – Telecom participation in disaster management committees

• Gaps:
  – Operational agreements are with regulators, not NDOs
  – Lack of congruency between telecom recovery plan and National Disaster Plan
  – Absence of clear reporting lines and post-disaster information sharing mechanism
  – Telecom reluctance to share status information
  – Lack of telecom participation in Post Disaster Needs Assessment/Damage and Loss Assessment process
Checklist for formalized agreements

• Pre-disaster information sharing
  – Capability of networks and information systems
  – Sharing of GIS mapping data
    • Telecoms overlay
    • Hazard maps
    • Alignment of disaster plans
  – Priority service needs for first responders and Emergency Operations Center
  – Emergency contact listing

• Emergency scenario testing

• Information dissemination protocol
  – Early warning
  – Post disaster status and needs
  – Damage and loss assessment
Post-disaster status reporting

CANTO
DISASTER STATUS REPORT

Name of telecom organization:

Date:

Time:

Disaster type

Contact name:

Contact telephone:

Contact e-mail:

Alternate contact:

Alternate telephone:

Alternate e-mail

Summary of current network status:
Include estimated percentage of customers without service, list of areas without service, and other pertinent information.

Summary of response efforts:
Include information on assets deployed in the field, forecasted timeframes for service restoration, status in fulfilling any requests for special assistance by external agencies, and any current challenges to response efforts.

Requests for assistance:
Refer to any current or outstanding requests for assistance, including the name of the agency from which assistance has been requested.

Damage and impact log

<table>
<thead>
<tr>
<th>Damage description</th>
<th>Location</th>
<th>Current Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of locale</td>
<td>Latitude</td>
<td>Longitude</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ECLAC Damage and Loss Assessment for the Telecommunications Sector
Costing report on disaster damages and additional costs

<table>
<thead>
<tr>
<th>Name of telecom organization:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of disaster event:</td>
</tr>
<tr>
<td>Contact name and email:</td>
</tr>
<tr>
<td>Date:</td>
</tr>
<tr>
<td>Currency:</td>
</tr>
</tbody>
</table>

**Damages Assessment**

- Damages may be reported as line-item costs, or in the aggregate.
- Costs should be estimated based on the replacement value of damaged equipment or facilities.
- Labour costs should not be included in this section of the estimate; these are covered elsewhere under "additional costs."

### Damage to wireless telecommunications facilities

This category may include items such as tower and radio equipment, antennas, microwave equipment, routers, generators, batteries, and other equipment associated with the operation of wireless networks.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost of damage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total damage to wireless telecommunications facilities: 0

### Damage to wired telecommunications facilities

This category may include items such as fiber and copper cables, pylons and posts, submarine landing stations, and networking equipment associated with the operation of wired networks.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost of damage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total damage to wired telecommunications facilities: 0

### Damage to other telecommunications facilities

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost of damage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total damage to other telecommunications facilities: 0
Model of service losses associated with storm impact on a cellular network
Using Call Detail Records to Analyze Population Displacement

Mobility patterns have been identified by analyzing CDRs, providing more accurate post-analysis of population migration during the Haiti earthquake.

Figure 1: The visualization shows the distribution of population migration from Port au Prince (PaP) after the Haiti earthquake obtained by analyzing CDRs. The circles represent locations that received at least 500 people from the estimated distribution of those in PaP on the day of the earthquake, but outside the city 19 days after the earthquake. Source: Lu et al., 2012.

Source: UN Global Pulse / Mobile Phone Network Data for Development
“There was no warning.”
Hurricane Joaquin in The Bahamas: A Late Warning

30 September, 5:00 p.m. AST

Legend:
- hurricane warning
- tropical storm warning

Acklins and Crooked Island
No warning until 5:00 PM

Source: NOAA and US National Hurricane Center
SMS-based Public Warning Systems

• Frequency of testing ranges from every 4 weeks to “one time 4 years ago” to “never.”
  – Systems are not tested at scale

• Past experience has shown delay in message delivery and messages delivered out-of-sequence.
  – “up to 24 hours later”

• There is no “geo-fencing” capability to target users in a particular region.

• Can contribute to post-disaster network congestion.
Cell Broadcasting

• One to many messaging avoids network congestion

• Recipients can be targeted based on the location of cell towers

• Deployed for emergency alert systems in United States and Europe

• Investment required - $$$
“The telephone company is just not interested in supporting cell broadcasts, even in a limited way.”

- Head of a National Disaster Office

Source: Report of the Expert Group Meeting on Information and Communication Technologies for Disaster Risk Management in the Caribbean
http://repositorio.cepal.org/bitstream/handle/11362/38258/LCCARL419_en.pdf?sequence=1
Possible way forward

• CDEMA / CANTO / CTU / ECLAC collaboration to recommend a regional standard for technology and an administrative model

• Telecoms, NDOs, and Regulators work together to make the case for support from national governments

• Search for funding sources
  – Universal Service Funds
  – Development Banks
  – Caribbean Catastrophe Risk Insurance Facility (CCRIF)
  – Climate Change Adaptation Fund
  – Capitalism
Thank you

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