Crisis management

In Saint Martin after Hurricane Irma

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Saint Martin - key figures

- **Volcanic - dry island** (no lake, no river, only seawater)
  - 90 km²

- **Population**: 75,000 inhab.
  - 35,000 French
  - 40,000 Netherlands

- **Water management (french side)**
  - 1 desalination plant - reverse osmosis
  - 5,000 m³/day

  - 2 tanks (2 x 2,000 m³)
  - 140 km network
  - 15,000 meters (aerian meters)

  - 15 €/m³ (vs 3 in Europe)
  - 25 l/day/pers (vs 150 in Europe)
Before the Hurricane [D day – 6]

- **Analysis and monitoring of the day-to-day situation**

- **Establishment of a crisis unit and beginning of coordination**
  - Definition of all actors and their role
    (state authorities, collectivity, military, managers, ...)
  - Update contact list
  - Definition of means (transport, logistics, ...)

- **Water management**
  - Technical studies (hydrogeological, hydraulic network, ...)
  - List of potential volunteers (put on standby)
  - Prepositioning reinforcement (in Guadeloupe)
  - Packaging of material (containers, supply, ...)
  - Definition of technical answer (... with different scenarios)
[D-Day] Septembre 06, 2017 : The Hurricane

- **IRMA**
  - Category 5
  - Wind > 400 km/h

- **Confinement and waiting**
Videos:

• Short version: https://www.youtube.com/watch?v=l7jxHVbzejY
• Long version: https://www.youtube.com/watch?v=sEX6V_drna4
Organization and strategy – Global - [D +1]

- Local staff (Veolia): 30 employees
- Veolia Fondation: additional staff - 100 volunteers (15 volunteers in rotation)

- Crisis cell: 2h/day

- Priority [first days – D+2]:
  - Security,
  - Health and first aid,
  - Shelter,
  - Field diagnostics
    - 11 dead
    - 25 injured (?)
    - 90% destroyed
    - A lot of fake news
    - No water, no electricity, no communication, no food, …
Organization and strategy - First steps (water)

At the same time ...
- Repair the main plant [start D +3]
- Reinforcement with a mobile emergency plant - reverse osmosis (600 m3/day) [start D +6]
- 12 rescue tanks supply by water trucking (1 by district) [start D +7]
Organization and strategy - second steps (water)

- Restore water in the drinking water network ... gradually
- Locate and repair leaks (night and day)
- Control and adapt the water quality
- Connect the tanks to the water network
Find the leaks, meters ... and houses
Diagnostics water quality, schools, hydraulic equipment
Technical results (Plant - production)

- Production: ok
  - 1 week after Irma: 30%
  - 2 weeks after Irma: 50%
  - 5 weeks after Irma: 75%
  - 6 weeks after Irma: 100%

> 5500 m³/day
Technical results (Network: instantaneous flow)

Before 06/09

After 2 month

Q max
350
250

Q min
150
120

Day Production < Day Consumption
« Manage the technique is (relatively) easy ...

... but crisis management requires more! »
Manage a major crisis it's also manage ...

... the teams and human needs (and skills)

Back office Veolia
- Logistics (travel, etc)

On the site
- Welcoming newcomers
- Briefing security
- Prepare the schedules
Manage a major crisis it's also manage ...

- ... hosting

Life base

In offices
Manage a major crisis it's also manage …

- … food (breakfast, lunch, diner and a lot of coffee for 15 people)
Manage a major crisis it's also manage ...

- ... vehicles (rental, gas ... with special authorization)
Manage a major crisis it's also manage …

- ... stores, supplies, orders and transportation

... after an hurricane!

Only one port
Manage a major crisis it's also manage ...

... tools and equipment

First Week
(What this ?)

(Reply ➔)

| Hammer       | Screwdriver | Leak detection |

After
First Week
Manage a major crisis it's also manage ...

- ... hygiene and health
  - Shower
  - Repair toilets
  - Tired
  - First Aid
  - Laundry
Manage a major crisis it's also manage ...

... security (wild)

Zika, Chikungunya, Dengue

Shark

Pitbull

Spider
Manage a major crisis it's also manage ...

- ... security (human)

Looting

Arms

Drugs
Manage a major crisis it's also manage ...

- ... security (of team and journalists)
Manage a major crisis it's also manage ...

... the security staff (8 men + 1 dog), to secure ...

- stores
- night interventions
- the transport of materials
Manage a major crisis it's also manage ...

- ... communication and journalists
  - Write press release
  - Interviews (radio, tv, print media)
  - Flyers (awareness, information to the population)
Manage a major crisis it's also manage ...

- ... reporting (whitout computer, internet)
Manage a major crisis it's also manage ...

... and play

Football

Tetris

Boat

Cars

Lego
# In general, a current day (during crisis)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>6h30 – 7h00</td>
<td>Briefing teams</td>
</tr>
<tr>
<td>7h00 – 9h00</td>
<td>Locate and repair leak (or manage something ...)</td>
</tr>
<tr>
<td>9h00 – 10h00</td>
<td>Daily (morning) report: PI of the day before (volumes, ...)</td>
</tr>
<tr>
<td>10h00 – 12h00</td>
<td>Crisis local cell</td>
</tr>
<tr>
<td>12h00 – 14h00</td>
<td>Call with crisis cell of Veolia (Paris)</td>
</tr>
<tr>
<td>14h00 – 18h00</td>
<td>Locate and repair leak (or manage something ...)</td>
</tr>
<tr>
<td>18h00 – 19h00</td>
<td>Debriefing teams</td>
</tr>
<tr>
<td>19h00 – 20h00</td>
<td>Daily (afternoon) report: PI, Maps, tomorrow’s schedule</td>
</tr>
<tr>
<td>20h00 – 24h00</td>
<td>Break</td>
</tr>
<tr>
<td>00h00 – 05h00</td>
<td>Leak detection by « manual DMA »</td>
</tr>
</tbody>
</table>

- **2-3 nights/week**
  - 16/09 → 08/11
  - 46 days (7/7)
  - 14 sleepless night
November 09, 2017

- Delay in projects,
- Delay in mail replies,
- Reporting, PI, Studies,
- ...

« The hardest ... ?»
Very good times and Nice meets!

Thank you

Thanks to the Saint-Martinois