

# Navigating the Stafford Act

## Case Study: NYC Hospitals

5 April, 2016

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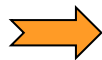


# Pre-Sandy NYC

## Background Information

2007 – “A GREENER and GREATER, NEW YORK”

- Green House Gases ↓ 16%
- Hypnotized Sea Level Rise
  - Overtopping of critical infrastructure
  - Overtopping of Battery Park, Manhattan
  - Flooding of Holland Tunnel



“Sandy did that and tragically for many New Yorkers, much more!”

# Pre-Sandy NYC

## Background Information – Updated Codes

### “Shorefront Center – Healthcare”

- Critical Facility: 500-year BFE plus 3-feet
- Critical facilities: 30 feet above grade
  - 1<sup>st</sup> floor - flood-proofed lobby
  - 2<sup>nd</sup> floor – flood proofed meeting rooms
  - 3<sup>rd</sup> floor + : patients / treatment
  - Parking – below 3<sup>rd</sup> floor

**“Provided continuous care during Sandy”**



Shorefront Center – Hospital

# Post Hurricane Sandy



**“Sandy’s magnitude taught us,  
we need to double our efforts.”**

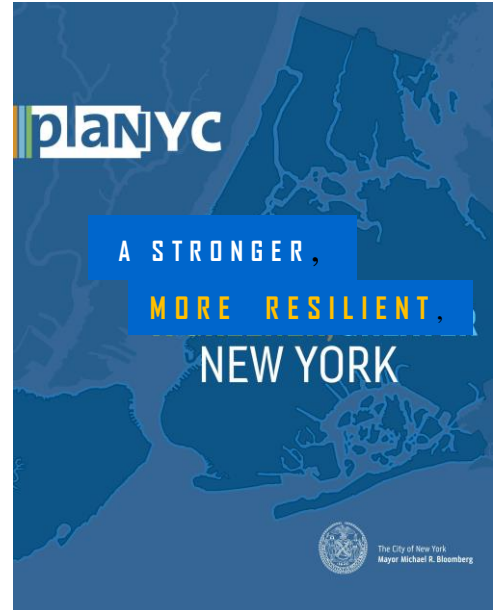
**Mayor Bloomberg**

# Post Hurricane Sandy

## Lessons for All of Us

Plan NYC transitioned

- 2007 – “**GREENER AND GREATER**”
- 2013 - “**A STRONGER, MORE RESILIENT NEW YORK**”



# “Sandy’s Magnitude Taught Us”

## NYC’s Public Hospitals

### – **Bellevue Hospital**

- No power
- Evacuating patients

### – **Coney Island Hospital**

- No power
- New ER: 1-foot water

### – **Coler Nursing Facilities**

- No power / Never evacuated
- Flood waters electrified





# NYC's Bellevue Hospital

Historical Public Hospital

Built in 1736

- 21 Stories
- 3 City Blocks
- Blend - Old and New





**NYC's BELLEVUE HOSPITAL (Basement foot-print 182,000 sq. ft.)**



# NYC's Bellevue Hospital

## Survived:

- American Revolution
- Civil War / Great Depression
- 9/11
- Tropical Storm Irene
  - Installed submarine doors
    - Protecting generator fuel pumps
    - Medical gases
- Hurricane Sandy - ???



# NYC's Bellevue Hospital

## Pre-Hurricane Sandy

– “We are a Level 1 trauma center, so we know how to handle emergencies” ... the hospital brought in:

- Extra staff
- Extra food and supplies
- Extra fuel

Top Hospital Administrator



# Super Storm Sandy – October 29, 2012

## Bellevue Hospital (Flooded)

- Surge overwhelmed the campus
  - Depth of basement flooding: 4- to 18-ft
  - > 200 critical systems (Flooded)
- Generator Fuel Pumps (Flooded)
  - In the basement / behind Submarine Doors



# NYC's Bellevue Hospital – October 29, 2012

Basement housed > 200 critical systems

- IT Servers
- Patient Records



# NYC's Bellevue Hospital – October 29, 2012

## Basement housed > 200 critical systems

- Main power grid switch gear
- HVAC / Air handling units
- Potable water pumps
- Generator fuel pumps
- **Morgue**





# NYC's Bellevue Hospital – October 29, 2012

## Basement housed > 200 critical systems

- Medical Systems
  - Bulk oxygen and nitrous oxide tanks
- Sewage Injector Pumps
  - Non-submersible



# NYC's Bellevue Hospital – October 29, 2012

## Basement housed > 200 critical systems

- Con-ED / Facility Steam Lines
  - Heat / Hot water



# NYC's Bellevue Hospital – October 29, 2012

Basement housed > 200 critical systems

– 32 - *Elevator Mechanisms (Flooded)*



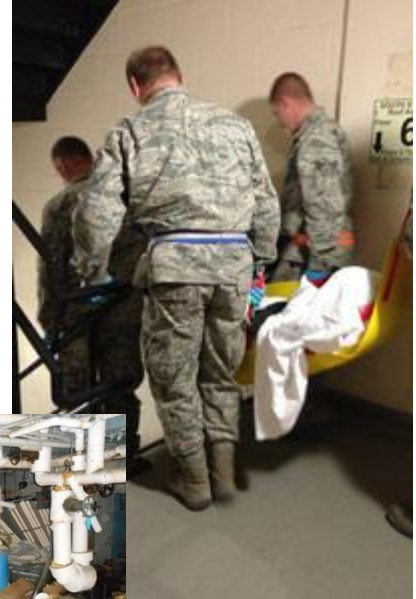
# NYC's Bellevue Hospital – Hurricane Sandy

## No Power / No Elevators

- Generator basement fuel pumps (Flooded)
- Generators @ grade and 13-floor

## ***New York National Guard Called In***

- Fuel tanker
  - 5 gallon containers
- Carried fuel
  - Up 13 flights of stairs



# NYC's Bellevue Hospital – Hurricane Sandy

## Bellevue Evacuated

- 21 –Stories
- All Staff
- **900 Critical Patients**





# NYC's Bellevue Hospital – October 29, 2012

## 200 Critical Systems **PLUS**

### – **Asbestos**

- Insulated steam Lines

### – **Black Mold**

- No power
- No ventilation

### – **Bacteria**

- Brackish flood waters
- Sea water
- Sewage

**\$167,000,000**  
**Environmental**  
**Clean-up**



# NYC's Hospitals – Hurricane Sandy



FEMA

Est. Damages - \$600,000,000

Resiliency Opportunity - \$1.2 Billion

- Repair / Reconstruct (FEMA Public Assistance)
- Comply with Codes and Standards (FEMA PA)
- Resiliency Upgrades (Hazard Mitigation 406)
- Preparedness and Recovery Planning (HMGP 404)

**FEMA is your Partner**

- Thru **Response, Recovery, Reconstruction and Resiliency**
- **But... You must know your partner** (programs, policies and procedures) to partner towards becoming **RESILIENT**



# Navigating the Stafford Act



FEMA

## **Challenges** - Chaos / abusers / ambulance chasers / stress

- Who should you trust?
- Role of private insurance?
- Which federal agency?
- Which FEMA program? Public assistance (406 / 404)
- What's reimbursable? Who pays for professional support services?
- Do I need to bid services? Professional? Contractor?
- What's my financial responsibility?
- When does clock start / stop on reimbursable?
- Need to get the doors open
  - Pay bills, provided critical community services – how to find the balance?

# Navigating the Stafford Act



FEMA

**Challenges** - Chaos / abusers / ambulance chasers / stress  
FEMA

- FEMA vs. their contractor
- Potential decreasing returns on expertise with each rotation.
- Need to document, document, document

# Hurricane Sandy – Resilient Solutions

## NYC Bellevue Hospital Today

- Emergency Room
  - Relocate to mezzanine
- Flood Walls
  - Installing network permanent / temporary
- Emergency Power
  - Relocating
  - Adding remote / mobile connectors
  - Expand coverage to more critical medical systems
    - (ie. CT scanners, MRI,...)





# Hurricane Sandy - Resiliency Solutions

## NYC Bellevue Hospital

- Electrical Switch Gear / Mechanical Systems
  - Relocated to 2<sup>nd</sup> Floor (500-yr critical facilities)
  - Add remote / mobile connectors
  - Add redundancy



# Resiliency - Lessons to be Learned by All!

- **Requires leadership**
  - To understand the value of resilience!
- **Requires holistic / proactive thinking**
  - To ID the “Weak Link”
    - Critical Facilities (ie. Hospitals)
    - Critical Systems (ie. Power Grid)
- **Requires partners**
  - Community
  - Government – FEMA / HUD
- **Requires quality planning**
  - All Hazard Plans / Emergency Action Plans
  - Catastrophic Recovery Plans



**NYC - 80% of the  
Reduction in  
Gross National  
Product was due  
to the loss of  
POWER!**

11.2

**WATER LINE**

# Navigating the Stafford Act





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## Questions