INDUSTRY IMPACT AND LESSONS LEARNED FROM HURRICANE SANDY

SUMMARY RESULTS
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Developed andCompiled by

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*Industry Impact and Lessons Learned From Hurricane Sandy*
A. BACKGROUND

- The Northeast U.S. was devastated by Hurricane Sandy on October 28-30, 2012.
- Unlike many prior hurricanes and Nor'easter storms, the Northeast had a lead time to prepare prior to Sandy making landfall on October 30th.
- The National Weather Service, National Oceanographic and Atmospheric Administration and NASA all tracked the storm via a number of weather models.
- The Futures Industry Association developed a comprehensive survey of futures commission merchants, global clearing firms, key service providers and exchanges, relative to key Business Continuity Management (“BCM”) strategies and tactics.
The FIA polled a number of its members on the impact and lessons learned from Hurricane Sandy. Futures commission merchants, global clearing firms, key service providers and exchanges responded. Respondents were surveyed on their preparedness and experience. Survey responses were collected and aggregated with no attribution to any individual or firm.
The survey was developed and the responses were analyzed by Tellefsen and Company, L.L.C.

Some respondents did not answer every question.

The survey encompassed six key BCM metrics:

- Business Continuity Preparedness
- Disaster Recovery
- Supply Chain Disruptions
- Response
- Recovery
- Risk Mitigation
B. EXECUTIVE SUMMARY

Sandy: A Storm of Biblical Proportions ...
EXECUTIVE SUMMARY

- 36 futures commission merchants, global clearing firms, key service providers and exchanges responded to the survey.
- Firms were well-prepared, given the advanced notice and media coverage.
- Firms enacted their BCP’s coming into the weekend and few had to failover to DR.
- Those that planned well - generally fared well.
- Communication with key staff, decision makers was critical to the incident management process.
- Firms regularly communicated status to staff, clients via email, direct phone call, web site postings.
Metro NYC public transportation was closed, including bridges and tunnels.

Most staff could work remote via terminal server or Citrix server connectivity, however, those that lost power and services were unable to telecommute or collaborate.

Employees were unable to leave home due to storm damage, lack of transportation or unwilling to leave their families.

The FIA and SIFMA industry calls were valuable to firms’ preparation and response plans.

Regular and recent BCP awareness training, systems testing and staff training exercises paid off.
The Lower Manhattan power grid was adversely impacted by tidal surge and was ultimately shut down.

Firms may re-consider the proximity and locations of their primary and back up facilities, going forward.

The biggest problems were caused by supply chain disruptions:

- Closure of public transportation
- Closure/inaccessibility of key roads
- Outages with power and telecomm providers
- Staff inability to commute into metro NYC due to downed trees, power lines and local street closures
Hurricane Sandy made landfall in New Jersey on Sunday evening October 30
Sandy brought with it heavy winds, rain, flooding and caused widespread power outages
Sandy impacted an area populated by over 50 million people, a greater impact than Hurricane Katrina
The heavy winds extended over 500 miles from the eye of the storm
In Chicago, 22’ waves pounded the lakefront
New York City closed public transportation, bridges and tunnels on Sunday evening.
INDUSTRY IMPACT (Cont’d) ...

- Power to lower Manhattan was cut by Con Edison on Monday to protect electrical equipment, as the storm surge threatened underground electrical equipment, including transformers and sub-systems.

- Due to the closure of public transit and road closures from downed power lines and trees, employees were unable – or unwilling - to commute.

- Firms with regional or international support offices heavily relied on staff in those offices and transferred functions to them.

- Due to the timing, month-end processing of operational events was adversely impacted.
U.S. equity and equity options markets were closed on Monday and Tuesday:
- U.S. futures markets opened on Monday, except for equity based futures products
- The NYSE and NASDAQ market closures impacted companies’ reporting of earnings

Overseas markets were tempered by the closure of the U.S. markets

Operational events such as fails to deliver, access to cash, money markets and settlements were impacted by the market closings.
Some firms had limited operation functions, as a result of system failover to DR mode.

Firms that lost grid power had to run on generator power for days.

Some firms experienced loss of key service providers, and/or counterparties.

Firms did not consider that the most well-designed and well-tested plans don’t expect many things going wrong at the same time.
THERE WAS LEAD TIME PRIOR TO SANDY MAKING LANDFALL

- NASA, NOAA and major weather services tracked the genesis of Sandy as a tropical storm in the Caribbean starting on the prior Monday (10/22).
- They utilized a number of weather models showing likely trajectories and impact areas.
- Sandy hit Jamaica and Haiti on Wednesday 10/24 as a Category I hurricane with 80-90 MPH winds.
- Sandy hit Cuba, the Dominican Republic and the Bahamas on Thursday 10/25 as a Category 2 storm.
- Sandy progressed on a NNE track into Sunday 10/28 as a Category I storm and made landfall around Atlantic City NJ on Monday 10/29 with 80-90 MPH winds.

Source: LiveScience.com
Industry Impact and Lessons Learned From Hurricane Sandy
ONE WEEK LATER:
EXTENSIVE POWER OUTAGES

More Than A Million Still In The Dark

An Hurricane Sandy ripped through the Northeast early last week, millions were left without power. Outages stretched from southern Virginia to northern Maine, affecting residents, businesses and the region’s critical infrastructure. It was estimated that there were still more than 1.3 million people waiting to get back on the grid. The map below displays data from the height of the outages, as well as the current status of each state affected by the storm.

Source: U.S. Department of Energy/National Oceanic and Atmospheric Administration (NOAA)
SOME OF THE DEVASTATION ...

Industry Impact and Lessons Learned From Hurricane Sandy
AND SUPPLY CHAIN DISRUPTIONS...
D. SURVEY FINDINGS

I. Business Continuity Preparedness
II. Disaster Recovery
III. Supply Chain Disruptions
IV. Response
V. Recovery
VI. Risk Mitigation
I. BUSINESS CONTINUITY PREPAREDNESS
STAFF HAVE ACCESS TO BUSINESS CONTINUITY PLANS, BCP STRATEGIES

1. Does your firm distribute its Business Continuity Plan (BCP) to: (check all that apply)

- All staff: 60.6% (20)
- Key managers: 48.5% (16)
- Incident or crisis managers only: 15.2% (5)
- Not sure: 3.0% (1)
MOST FIRMS ACTIVATED THEIR PLANS COMING INTO THE WEEKEND

2. Did your firm enact its BCP?

- Yes: 62.5% (20)
- No: 37.5% (12)
- Don't Know

Industry Impact and Lessons Learned From Hurricane Sandy
THE MAJORITY OF FIRMS HAVE DEDICATED RECOVERY SITES

4. Does your firm have a dedicated recovery site - seats (i.e., the firm’s facilities or a contracted DR hosting site)?

- Yes: 90.6% (29)
- No: 9.4% (3)
- Don't Know: 

Industry Impact and Lessons Learned From Hurricane Sandy
MOST FIRMS EVACUATED STAFF OVER THE WEEKEND; PRE-ARRANGED HOTELS

7. If so, did you get all designated staff in place prior to the storm making landfall?

- Yes: 73.1% (19)
- No: 15.4% (4)
- Don't Know: 11.6% (3)

6. Did your firm have pre-arrangements with local hotels or car services to move/lodge key staff?

- Yes: 62.5% (20)
- No: 25.0% (8)
- Don't Know: 12.5% (4)
Almost all firms have an employee notification system.
BCP’S CONTAIN KEY CONTACT INFORMATION

11. Does your BCP encompass key vendors and service providers’ contact information?

- Yes: 75.8% (25)
- No: 6.1% (2)
- Don't Know: 18.2% (6)

12. Does your BCP encompass your key counterparty trading and/or operations contacts?

- Yes: 69.7% (23)
- No: 9.1% (3)
- Don't Know: 21.2% (7)

Industry Impact and Lessons Learned From Hurricane Sandy
FIRMS USED EMAIL, OTHER TOOLS TO CONTACT CLIENTS

13. How did your firm reach out to its clients? (check all that apply)

- Email: 70.0% (21)
- IM: 16.7% (5)
- Outgoing emergency phone message: 16.7% (5)
- Direct phone call: 46.7% (14)
- Web site postings: 40.0% (12)
- All the above: 16.7% (5)
- None of the above: 6.7% (2)

Industry Impact and Lessons Learned From Hurricane Sandy
KEY SERVICE PROVIDERS’ PREPARATION AND SUPPORT WAS HIGHLY RANKED

14. How would you grade the overall preparation and support from your key service providers? (Rank from 1-5 where 1 = Not Prepared and 5 = Very Prepared):

[Bar chart showing distribution of responses]
THE MAJORITY OF FIRMS CONSIDERED THEMSELVES WELL-PREPARED

16. How would you rank your firm’s overall state of preparedness to respond to Sandy? (Rank from 1-5 where 1= Not Prepared and 5= Very Prepared):

- 1 - Not Prepared
- 2
- 3
- 4
- 5 - Very Prepared

10.0% (3) for 1
43.3% (13) for 4
46.7% (14) for 5
FIRMS MAY RE-CONSIDER PROXIMITY, LOCATIONS OF PRODUCTION AND DR SITES

16. Did the power and breadth of Hurricane Sandy make your firm think more about having production and DR sites in the same geographic areas of the U.S.?

- Yes: 65.6% (21)
- No: 25.0% (9)
- Don't Know: 9.4% (3)
HOWEVER, FIRMS ARE NOT YET CONSIDERING RE-LOCATIONS

17. If so, are you considering changing the location based on experience with Hurricane Sandy?

- Yes: 29.0% (9)
- No: 45.2% (14)
- Don't Know: 25.8% (8)
II. DISASTER RECOVERY
OVER 40% OF FIRMS FAILED OVER TO BACK UP SYSTEMS / SITES
BUT THERE WAS NO SIGNIFICANT IMPACT TO MISSION-CRITICAL SYSTEMS, INFRASTRUCTURE

24. Was there any significant impact to key mission-critical systems/infrastructure?

- Yes: 12.5% (4)
- No: 81.3% (26)
- Don't Know: 6.3% (2)
MOST STAFF COULD TELECOMMUTE VIA TERMINAL SERVERS OR CITRIX SERVERS

25. Did your staff have problems with remote access via terminal servers or Citrix servers?

- Yes: 21.9% (7)
- No: 75.0% (24)
- Don’t Know: 3.1% (1)
ONE-THIRD OF RESPONDANTS HAD SIGNIFICANT/HEAVY STORM DAMAGE

26. Did your firm sustain any physical damage from the storm?

- Yes: 28.1% (3)
- No: 66.8% (22)
- Don't Know: 3.1% (1)

27. If so, was it:

- Slight to moderate (some impact to the building, but the business can...): Yes 42.9% (3), No 42.9% (3), Don't Know 14.3% (1)
- Significant: Yes 28.6% (2), No 57.1% (4), Don't Know 14.3% (1)
- Heavy, could not use the facility, had to close it/relocate staff: Yes 36.4% (4), No 36.4% (4), Don't Know 9.1% (1)
III. SUPPLY CHAIN DISRUPTIONS

Industry Impact and Lessons Learned From Hurricane Sandy
THE BIGGEST DISRUPTIONS: PUBLIC TRANSPORTATION, ROAD CLOSURES, POWER AND TELCO PROVIDERS

29. What types of supply chain disruptions did your firm encounter? (check all that are applicable):

- Lost electrical power to building(s): 62.1% (18)
- Could not re-supply diesel fuel for emergency generators: 3.4% (1)
- Public transportation closures (subway, buses, ferry boats, PATH, etc.): 86.2% (25)
- Food suppliers/in-house cafeteria: 24.1% (7)
- Car service in accessible: 24.1% (7)
- Liquidity providers/markets/exchanges unavailable: 17.2% (5)
- Order flow providers: 13.8% (4)
- Key service providers (internet, telecom, market data, EMS, etc.): 88.6% (17)
- Other (please specify): 17.2% (5)
IV. RESPONSE

Disaster Response Unit
INCIDENT MANAGERS WERE ACTIVATED, COMMUNICATED, FOLLOWED THE PLAN

31. How did your key staff (e.g., incident managers) react to the pending storm? Please specify:

- Invoked the BCP and followed the strategy previously established by (55.2 % (16))
- Waited and watched the storm and local conditions, making dynamic decisions (27.6 % (8))
- Did nothing (10.3 % (3))
- Don't Know (6.9 % (2))
MOST FIRMS COORDINATED THEIR RESPONSES WITH KEY SUPPORT PLAYERS

32. Did your firm coordinate its response with NYC, police, public utilities, building management company, first responders, etc.? 

- Yes: 51.9% (14) 
- No: 33.3% (9) 
- Don't Know: 14.8% (4)
INDUSTRY CONFERENCE CALLS WERE VALUABLE PREPARATION TOOLS

33. Did your firm participate on any of the FIA calls during the weekend of October 27-28?

- Yes: 74.2% (23)
- No: 12.9% (4)
- Don’t Know: 12.9% (4)

35. If so, how valuable were they to your preparation and planning?

- None: 10.7% (3)
- Some: 32.1% (9)
- Significant: 57.1% (16)
FOLLOWING THE STORM, FIRMS LEVERAGED GLOBAL/NATIONAL SUPPORT TEAMS

37. How much did your firm leverage services from outside the U.S. during the storm and its aftermath?

- A Lot: 16.7% (5)
- Some: 30.0% (9)
- None: 30.0% (9)
- N/A: 23.3% (7)
Almost all firms have dedicated emergency response teams.
V. RECOVERY
FIRMS WERE WELL PREPARED FOR RECOVERY ACTIVITIES
MOST MISSION-CRITICAL FUNCTIONS COULD BE RECOVERED ALMOST IMMEDIATELY OTHERS WITHIN 2-4 HOURS

41. What is the timeframe for recovery and operation of your firm’s most critical operating, service and technology functions (Recovery Time Objectives)? (Check all applicable):

- Almost Immediately: 31.0% (9)
- 1-2 Hours: 27.6% (8)
- 2-4 Hours: 27.6% (8)
- 4-8 Hours: 6.9% (2)
- Next Business Day: 3.4% (1)
- 2 Business Days: 3.4% (1)
- 1 Week: Not Sure
VI. RISK MITIGATION
MANY FIRMS ARE COVERED BY CATASTROPHIC RISK INSURANCE

43. Does your firm have catastrophic risk insurance as well as other forms of coverage (e.g., business interruption, property/casualty, employer’s liability and general liability and life insurance coverage)?

- Yes: 56.7% (17)
- No: 6.7% (2)
- Don't Know: 36.7% (11)
FIRMS FREQUENTLY CONDUCT BC/DR TESTING ACROSS MULTIPLE LOCATIONS

47. How often does your firm conduct BC/DR testing? (Please check one):

- Monthly: 6.9% (2)
- Quarterly: 44.0% (12)
- Semi-annually: 24.1% (7)
- Annually: 24.1% (7)
- Have not done any yet
- Don't Know

50. Has testing included the activation of remote facilities and back up data centers?

- Yes: 92.9% (26)
- No: 3.0% (1)
- Don't Know: 3.6% (1)
STAFF REGULARLY PARTICIPATE IN BC/DR TEST EXERCISES

48. Has your firm conducted staff BC/DR training drills for all locations?

- Yes: 71.4% (20)
- No: 17.9% (6)
- Don't Know: 10.7% (3)

49. If yes, how frequently have drills been conducted?

- Quarterly: 25.0% (6)
- Semi-Annually: 33.3% (8)
- Annually: 37.5% (9)
- Other (please specify): 4.2% (1)
E. LESSONS LEARNED

(Incident Managers Must Continue to be Vigilant …)
LESSONS LEARNED (Cont’d) …

- Firms that heeded the storm warnings, communicated early and often, were better prepared and fared well.
- Regular BC/DR testing of systems, infrastructure and staff paid off.
- Actions from the authorities to close down mass transit, highways, bridges and tunnels impacted service providers, impeded the movement of key staff, support services.
- The late decision to close the U.S. equity markets caused confusion, impacted liquidity and operations functions - but was the right thing to do.
- Firms are re-evaluating their overall BC/DR preparedness, including the performance of service providers, what worked well, what did not, etc.
FIRMS HAD ADVANCE WARNINGS, WERE WELL PREPARED

51. Unlike 9/11 and other sudden-onset disasters, the approach of Sandy dominated news for days prior to its effect reaching shore. How do you rate your firm’s preparedness and actions, given the lead time? (Based on the lead time for warnings please rank from 1-5 where 1= Not Prepared and 5= Very Prepared):

52. Did your firm make any adjustments to its DR plan between the time Sandy was forecast and the time the plan was invoked?

Yes - 22.2% (6)
No - 66.7% (15)
Don’t Know - 11.1% (3)
WE HAVE A PLAN, IT WORKED!

53. In retrospect, what worked well for your firm? (Check all that apply):

- We have a plan, it worked well: 84.5% (22)
- We planned for the worst case: 42.3% (11)
- The staff was well trained and responded well under the circumstances: 76.9% (20)
- Testing of staff and systems paid off: 61.5% (16)
- The back-up data center worked as planned: 42.3% (11)
- The recovery site/location worked and was utilized by key staff: 42.3% (11)
- Our technology failed over/our infrastructure held up as expected: 53.8% (14)
- Other (please specify): 11.5% (3)
THOSE IN HARM’S WAY, DID NOT ANTICIPATE SUCH A WIDESPREAD, CATASTROPHIC EVENT
FIRMS ARE CONTEMPLATING CHANGES...

58. What areas does your firm plan to make changes to going forward? (Check all applicable):

- Review of key facilities and infrastructure in “Zone A” areas (NY/NJ): 50.0% (10)
- Consider “hardening” of data centers: 10.0% (2)
- Consider moving/increased distancing of the data center(s) and/or sites: 35.0% (7)
- Adding more dedicated seats and/or equipment to recovery site: 25.0% (5)
- Increased spending on overall BC/DR planning and preparedness: 20.0% (4)
- Increased staff training on BCP strategy and tactics: 30.0% (6)
- Other (please specify): 30.0% (6)

Industry Impact and Lessons Learned From Hurricane Sandy
F. ANECDOTAL FEEDBACK

“The FIA/SIFMA committees made a significant impact on helping firms with their strategies”

“Our plan worked very well, and we feel very good about how we executed it”

“So many people have replaced their analog phone service with VoIP or broadband packages. After 3-4 hours of the power outage, these people lost phone service. Those who had old copper, analog phone service were hardly affected at all. We will probably have more people keep old-style phone service in the future”

“The fact that we can operate in New York as well as we can in London and Paris makes our BC/DR plan close to fool-proof. We have staff in London that can run our business for us. We just need to make our clients aware of our situation, and we are good to go”.

Industry Impact and Lessons Learned From Hurricane Sandy
ANECDOTAL FEEDBACK (Cont’d) …

- “We did not anticipate the extent of mass transit outages”
- “Staff’s loss of power at home impacted remote access / remote working abilities”
- “The extent of power outages and inaccessible roads greatly impeded recovery”
- “Staff did not make it to hotel rooms, due to hotels are located in Zone A, not because of timing issues”
- “Given the concentration in the lower Manhattan area and what appears to be a power grid in lower Manhattan vulnerable to flooding, these events are probably something that should be expected again in the future. Hopefully brighter minds are thinking about this”.

G. CONCLUSIONS

Industry Impact and Lessons Learned From Hurricane Sandy
CONCLUSIONS (Cont’d) …

- The decision to close the equity markets was the right thing to do.
- Even the most well-constructed and well-tested plans do not address multiple events all happening at the same time!
- Firms were well-prepared, given the advanced warnings and extensive media coverage.
- Firms enacted their BCP’s coming into the weekend, and few needed to failover to DR mode.
- Those that planned well - generally fared well.
Communication with critical staff and decision makers was key to the incident management process.

Most staff could work remote, however, widespread power outages impeded employees’ telecommuting and collaboration abilities.

Employees were unable to leave home due to local storm damage, lack of transportation or unwillingness/inability to leave families.

CONCLUSIONS (Cont’d) …
Some firms had significant damage to mission-critical systems or infrastructure and facilities.

As a result, firms may re-consider the proximity and locations of their primary and back up facilities, going forward.

The biggest problems were caused by supply chain disruptions:
- Closure of public transportation
- Closure/inaccessibility of key roads
- Outages with power and telecomm providers
- Inability of staff to commute, telecommute

CONCLUSIONS (Cont’d) …
CONCLUSIONS (Cont’d) …

- Firms are contemplating changes to key locations, further hardening of data centers and sites, and increased BCP training going forward.
- The FIA and SIFMA industry calls were valuable to firms’ preparation and response plans.
- Regular and recent BCP awareness, systems testing and staff training exercises paid off.
H. DISCUSSION AND NEXT STEPS

- What would your firm have done differently if you only had one day’s notice from the national weather services and the authorities? Would your firm’s outcome have been the same?
- What if Manhattan lost power for a week?
- What if Sandy came further inland, up the Hudson River?
- How concerned are you about the proximity and location of your production and DR sites?
- Are there areas where firms can collaborate for services or to procure equipment to save money and/or to evaluate best options?
- What changes to your firm’s BCP are you contemplating?
Firms should conduct post-mortem evaluations to learn from the experience:

- What worked well, what didn’t
- Identify gaps, update plans, processes and technology accordingly

Post-mortem reviews should consider:

- Potential vulnerabilities of key service providers, especially cloud service providers DR failover capabilities
- Insurance policies for loss of use, flood coverage, etc.
- Hardening of key staff home set ups
- Diversity of telecoms providers, as those relying on 3G/4G networks as a back-up were unsuccessful.
DISCUSSION AND NEXT STEPS Cont’d) …

Production and DR data center engineering and design should be revisited for:

– Redundancy of voice and data infrastructures
– Portability of phone systems
– The locations of generators and fuel pumps
– Review of fuel supply contracts with multiple suppliers from diverse locations
– The number and location of recovery site seats for key staff.
Be Prepared for Unexpected Things That Can Jump Out and Bite You…