

EMBRACE 2015



Hurricane Sandy - Preparedness & Response Pays Off

Presentation
September 2013



Metrics Quiz

In 1950, Mason Haire stated the concept:
"What gets measured, gets done"

In 1956, George Miller published: "The Magical Number ____, Plus or Minus Two: Some Limits on Capacity for Processing Information"


Seven

What is the most famous example of limiting information to Seven:

Phone Numbers



Initial Reports of Hurricane Sandy



Hurricane Sandy
weakly October 23, 2012
AM 2:07 Atlantic 12
NWS National Hurricane Center

Current Information:
Center Location: 22.4 N 73.3 W
Max Sustained Wind: 103 mph
Movement: 11 at 16 mph

Forecast Positions:
● Tropical Cyclone ○ Post-Tropical
Sustained Winds: □ - 39 mph
■ 39-73 mph ■ 74-110 mph ■ 111 mph

Watches:
Hurricane Tropical Storm

Warnings:
Hurricane Tropical Storm

Potential Track Area:
Day 1-3 Day 4-5

Thursday, October 25, 2012 "Management Meeting"

1 PM Management Meeting

- Reviews all reports from weather and government agencies.
- Anticipate severe winds and flooding.

Activate the Emergency Response Plan specifically Chapter 26 – Weather Emergencies (Hurricanes) – Note that we made changes to the plan after Hurricane Irene's lessons learned.

- HS&E Manager will be the Incident Commander (IC) in charge of implementing Hurricane preparedness and will manage the Emergency Operations Center. Will publish an AM and PM status report each day along with daily 3 PM conference calls.
- Human Resources will focus on the communications to employees via hotline, head counts and coordination of personnel issues.
- Flavors Plant Manager will coordinate communication to supervisors, flavors management, customers, etc. as needed.
- Ingredients Plant Manager will also coordinate communication to supervisors, flavors management, customers, etc. as needed. In addition, will have skeleton crew onsite (1 chemical operator & 1 utility operator)
- Facilities (JLL) will have one guard onsite.

Friday, October 26, 2012 "The Checklist"

Hurricane Checklist
Hurricane SANDY 10-26-2012

Actions to be taken - 48 to 12 hours prior to landfall:

- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.
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- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.

Actions to be taken - 8 to 12 hours prior to landfall:

- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.
- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.
- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.

Saturday, October 27, 2012

Situation Report #3 reported that Hurricane Sandy was expected to bring strong damaging sustained winds up to or exceeding hurricane strength (74 mph) over a prolonged period of time (24 to 48 hours) along with extremely heavy rainfall. Major coastal flooding may be compounded by the full moon on October 29. New Jersey was anticipated to feel Sandy's effects starting late Sunday and continuing into Tuesday, October 30th.

All "Actions to be taken - 48 to 12 hours prior to landfall" were completed on the Hurricane Checklist.

Daily 3PM conference calls are started by the Management Team.

Sunday, October 28, 2012 "0-12 hours prior to Landfall"

Hurricane Checklist
Hurricane SANDY 10-28-2012 @ 1 PM

(COMPLETED) Actions to be taken - 48 to 12 hours prior to landfall:

- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.
- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.
- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.

Actions to be taken - 0 to 12 hours prior to landfall:

- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.
- Final hurricane progress and forecast. Keep up to date on the forecast. Update the Hurricane Response Plan. Update the Hurricane Response Plan. Update the Hurricane Response Plan.
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Sunday, October 28, 2012 "Decision Time"

Situation Report #5
New Jersey is preparing for the arrival of Hurricane Sandy which is expected to impact the region as a Category 1 Hurricane. The New Jersey Governor declares a statewide State of Emergency with mandatory evacuations in coastal locations in the state.

Daily 3 PM conference call: the Management Team agreed to shutdown Ingredients plant operations (24/7 operation) by 0600 Monday morning. Flavor plant operations (5/3 operations) will stay down through third shift on Monday.

Restart of Ingredients plant operations is tentatively planned for night shift Tuesday unless conditions improve and flooding in the Newark area has subsided. The start-up of Flavor operations will again be reviewed at the next 3 PM conference call. Volunteers will be asked to stay with the plant through the outage with the Security service.

The last of the hurricane checklist will be completed by 0600 am.

Monday, October 29, 2012 "The Storm Hits"

Situation Report #7

Facility is shutdown and in a hurricane state of preparedness. A Utility Operator and two security guards remain at the plant. The Port Authority Police Department and Port Authority Management are ordering all personnel to evacuate Port Authority Marine Terminals by 1200 hrs noon today. Port Authority is expecting major roads in the Port to be completely impassable by early afternoon and emergency response to many facilities may not be possible. The weather has winds gusts up to 35 mph, continuous light rains and there is no flooding within the site. There is flooding along Doremus and Wilson Avenues. The site can only be accessed from Port Street which Port Authority has shutdown. Newark Mayor Booker asks for voluntary shutdown and evacuations in the lower lying areas of Newark. Facility loses power and is running on emergency generators at 7:30 PM. The weather hotline becomes inoperable.

Tuesday, October 30, 2012 "First Light of Day - Storm Subsides"

Situation Report #9

Still windy with light rains. Initial report: received minor damage with lot of debris in the Ingredient plant.

The entire facility has no power and is on emergency generators (Boiler house, Admin Building & limited portions of the Ingredients plant. Note: Flavors has no emergency generator).

- An initial assessment team is deployed just after 0900 am
- HS&E Manager
 - Facility Manager (JLL)
 - Ingredient Plant's Instrumentation & Electrician Foreman

Tuesday, October 30, 2012
"The Drive In – Neighborhood"



Tuesday, October 30, 2012
"The Drive In – Neighborhood"



Tuesday, October 30, 2012
"The Drive In – Neighborhood"



Tuesday, October 30, 2012
"The Drive In – Neighborhood"



Tuesday, October 30, 2012
"The Drive In – Neighborhood"



Tuesday, October 30, 2012
"The Drive In – Plant Entrance"



Tuesday, October 30, 2012
"The Drive In – Plant Entrance"



Tuesday, October 30, 2012
"The Drive In – Plant Entrance"



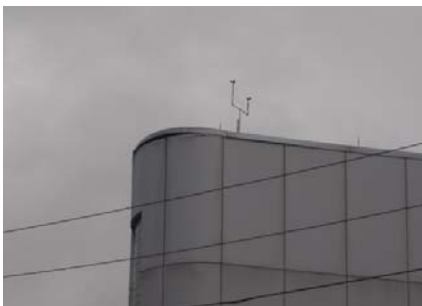
Tuesday, October 30, 2012
'Administration & Flavors Plant'



Tuesday, October 30, 2012
'Administration & Flavors Plant'



Tuesday, October 30, 2012
'Administration Building'



Tuesday, October 30, 2012
"Ingredient's Plant"



Tuesday, October 30, 2012
"Ingredient's Plant"



Tuesday, October 30, 2012
"Ingredient's Plant"



Tuesday, October 30, 2012
"Ingredient's Plant"



Tuesday, October 30, 2012
"Ingredient's Plant"



Tuesday, October 30, 2012
"Ingredient's Plant"



Tuesday, October 30, 2012
"Ingredient's Plant"



Tuesday, October 30, 2012
 “Ingredient’s Plant”



Tuesday, October 30, 2012
 “Initial Assessment”

Situation Report #10
 The assessment team outlines the necessary resources to restore Facility to operational status.

Administration building:
 No structural damage. Damage to the south stair tower roof capping. Damaged to several door ways (Doors bent/hanging off center).

Flavors plant:
 No Power in the facility. No visible damage. Trouble alarms on fire panel because of no power. All Flavors Production is shutdown and in safe status.

Ingredients Plant:
 No structural damage. Water has receded from the plant. Lots of debris in and around the plant (tires, railroad ties, part of a 28’ section of a dock, wood, plastics, garbage, etc.). Flood waters reached up to the southwest corner of Pad 1. Several drums and totes blown over with no spillage (note warehouse was full of containers). A few doors need to be repaired along with some siding. All Ingredient Production is shutdown and in safe status.

Tuesday, October 30, 2012
 “Initial Assessment”

Situation Report #10
 The assessment team outlines the necessary resources to restore Facility to operational status.

Contractors are called in to work on Wednesday/Thursday.

- Allstate ORC – Dump truck, front end loader, back hoe, vacuum truck, chain saws, dumpster, laborers, etc.
- ABM – Janitorial services. Labor
- T Farese & IPM – Garbage pickups

Like in the time of crisis, supplier relationships were instrumental in get what we need when we needed it...no questions asked.

PSE&G provides an estimate that Facility should plan on getting electric restored in 3-5 days.

The new weather hotline is cascaded to all staff as best as possible using text messaging and emails (please note that phone was severely disrupted because 25% of cell towers were either damaged or had no power).

Wednesday, October 31, 2012
 “Start of Cleanup”

Situation Report #11
 The entire facility has no power and is on emergency generators. The Facility Management team reviews the site.

Contractors are onsite for restoration activities (ABM & Allstate ORC). Allstate ORC has a backhoe, dump truck, chain saws and manpower. They are cleaning up the large debris in the Ingredient’s plant roadways and to clear the bulk unloading stations of debris. Larger debris will not be fully cleared today. ABM employees have started cleaning up small debris in the walkways and general site access areas.

The HS&E & Facilities Managers prepare food for onsite workers.

Initial contact with employees is made and employee concerns are access to Gasoline and having no power at home. Grainger is called for assistance in obtaining gasoline cans and generators for employees. Supplies are located in Trenton. A delivery chain is created to help deliver supplies to affected employees.

Initial headcount of employees is underway.

Thursday, November 1, 2012
 “Cleanup Day 2”

Situation Report #13
 The entire facility has no power and is on emergency generators. Port Authority remains shutdown. Contractors, maintenance, I&E and logistical employees are asked to report to work and help with restoration after review site risks. The Main effort today was cleaning up the debris in the southeastern section of the Ingredient’s plant. This activity was supported by Allstate, ABM, Logistics and Production shift leaders. A total of 84.5 cubic yards of waste materials (tires, railroad ties, wood, plastics, garbage, etc.) are removed from the site. An electrical short was discovered in the CO/H2 Tube trailer area and was corrected. The integrity testing of the CO & Hydrogen pipelines was conducted after the electrical repairs were complete, no issues identified. Maintenance covered the damaged siding on the spare parts warehouse. Maffey’s Lock was onsite and has been repairing damaged doors. All of Facility’s employees are safe, as far as we know. About 75% of our employees do not have electrical power at their homes. In addition, communication is very limited and access to gasoline in the area is extremely limited (80% of gas stations have no fuel or power). Started to give gasoline to employees for generators and travel back & forth to site.

Thursday, November 1, 2012
 “Cleanup Day 2”



Thursday, November 1, 2012
"Cleanup Day 2"



Thursday, November 1, 2012
"Cleanup Day 2"



Thursday, November 1, 2012
"Cleanup Day 2"



Thursday, November 1, 2012
"Cleanup Day 2"



Thursday, November 1, 2012
"Cleanup Day 2"



Thursday, November 1, 2012
"Cleanup Day 2"



Friday, November 2, 2012 "The Waiting for Restart"

Situation Report #16

The entire facility has no power and is on emergency generators. Port Authority remains shutdown. Contractors, maintenance, I&E and logistical employees are asked to report to work and help with restoration after review site risks. The Main effort today was addressing employee concerns. Allstate ORC delivered 550-gallons of gasoline for helping employees. We picked up 8 generators (for employees), 16 - 5-gallon gasoline cans, and 24 - 2.5-gallon gasoline cans.

The Flavors building has power restored at 8:40 PM (Note: PSE&G closed line "C" and Opened line "B" in the substation. Line "C" is energized!). The Administration Building generator fails because of a water pump. A rental generator is secured and brought to the site.



Saturday, November 3, 2012 "The Waiting for Restart"

Situation Report #17

The Ingredients and Administration Building have no power and are on emergency generators. The Flavors building has power and power restoration activities have commenced. Flavors Quality activities are commencing for a Sunday Night startup (water sampling, emptying CIP tank, cleaning equipment, pest control walkthrough, etc.). In addition, the automation team commenced rebooting and reloading of all Flavors servers, networks, PLC, etc. Moreover, the plant maintenance and engineering checked and restarted all Flavors utilities. Gasoline rationing in the area starts at 1200 noon today (see status report from Friday 2000 PM). Communications are still limited & difficult.

Sunday, November 4, 2012 "Half way there!"

Situation Report #19

Facility Flavors has power and we will restart the plant at 11 PM Sunday night.

Facility Ingredients & the Administration Building have no power and are on limited emergency generators. Decision is made to bring employees back effective first shift.

Management is attempting to contact all Facility employees. Six (6) employees cannot be accounted for as of 8 PM.

The Elizabeth-Port Authority Marine Terminal is open. All other Port Authority marine facilities will remain closed until further notice.

Monday, November 5, 2012 "It's Over for Facility!"

Situation Report #21

Facility Flavors has power and is operational as of 11 PM Sunday night.

The Ingredients & Administration Building had power restored around 1:30 PM. Ingredients began production by 4 PM.

All employees are accounted for and their personal situations are known.

Situation Report #22 is issued. The Facility Management team reverted back to normal operations at 8 PM and shutdown the Emergency Operations Center.

Costs of Recovery

Facilities has identified the following costs of recovery. These estimates do not include the cost of lost production or sales.

Damaged/Affected Area	Vendor	Estimate /Meters	Notes
Admin Bldg North side Entrance glass, internal door clear areas cleaned off 2 above regions	Safe Group	\$600	Wind Damaged
Admin Bldg Main Doors. Cleaners need to be retained. Loss of all in	Safe Group	\$600	Wind Damaged
Chemical Plant Rail Fence the additional unmet Damage 200' of fence line damaged due to surge. 200' Rail fence	Guardian Fence	\$9,000	Outside of perimeter east fence line (estimate), storm surge damage
Admin South gate safety edge	Guardian Fence	\$800	Wind Damaged
Flavors Bldg HVAC Service	CAS	\$400	Restart
Emergency generator Rental	Generac	\$3,500	per week (1 week)
Emergency generator fuel pump	Generac	\$1,200	Replacement
Rail Fence the Chemical Plant 2 gates and 1.5 mile gate	Guardian Fence	\$400	Storm Surge Damage
Rail fence outside Admin Bldg	CAS	\$400	SVC Call
Rail Component replacement	CAS/Generac	\$15,000	Damaged Rail Component replacement (Estimate)
4000 and 4000' fire station alarm	Simplex Grinnell	\$500	SVC Call
SVC Cleanup efforts	Allstate ORC	\$13,310	Included Laborers and Equipment. Back Hoe, front loader and dump truck. Back 200' north of North fence line
Landscaping Clean up efforts for 200' perimeter fence	Dukes Landscaping	\$1,500	Outside of perimeter fence line north and south
Circulation Pump in Admin Bldg	CAS	\$1,200	Per 30 Minute time pump. Loss not due to lost power. About time.
Flavors Bldg Windows, Ex Fan motor	CAS	\$4,000	
Generator Fuel	None	\$24,000	75 gallons @ \$320 (estimate)
Generator	Allstate ORC	\$1,500	148 gallons @ \$10 (estimate)
Rail Shed Door	None	\$500	Replacement
South West Tower Capping	None	\$2,500	Wind Damaged

Hurricane Sandy – General Comments

Contractor Support: Facility used several contractors and service providers that provided exceptional support before, during and after Hurricane Sandy. They include:

- Facilities**, was on site from Tuesday, 10/30/12 through Friday 11/02/12. He coordinated the cleanup efforts by ABM, worked with Firmenich team managers to ensure safe operations on Administration building generator, and coordinated site repairs and replacement of the Administration building generator when the existing unit failed on Friday.
- Security** – Provided guard service (2 guards) for the 36 hours straight through the storm without question or issues to support the utility operator on site in that period.
- Cleanup Contractor**– Onsite Wednesday morning with cleanup crews (6 people) and equipment to remove debris (backhoe, front end loader, dump truck, chain saws, leaf blowers & power washing equipment) from the south-eastern portion of the Ingredients plant. Allstate also managed to secure 500-gallons of gasoline to support employee needs.
- HVAC Contractor** – On site on Saturday to restart HVAC systems in the Flavor plant that were shutdown when power was lost
- Generator** – On site on Friday in an attempt to repair the Administration building generator which failed. GenServ was also able to secure a rental unit within 8 hours after initial failure
- Janitorial Services** – Porters were on site on Wednesday supporting the cleanup of the site.

Hurricane Sandy – Critique

What did we do well:

- By shutting down early, preparing the site and allowing employees to go home to a safe location.
- Utility Operators and Security support was excellent throughout the crisis.
- Daily conference calls along with two daily published status reports (targeted 10 am & 8 PM) for communication.
- Immediate response with contractors to clean-up 84.5 cubic yards of debris within 24-hours of the storm passing.
- Issuance of gasoline for employees in order to travel back & forth to work and for generators for those who had no power. Issued approximately 237.5-gallons of gasoline in 2.5-gallon and 5-gallon increments.
- Issuance of PPE for employees to clean-up debris at their homes (gloves, tyvek suits, dust masks, eye glasses & goggles.).

Hurricane Sandy – Critique -

Potential problems that need to be addressed or What did we

NOT do well: These are items that did not go so well:

- **Fuel**– Could not be contacted for deliveries of diesel fuel or gasoline.
- **Phones/ Data** –
 - Communications to/from the plant were down after the power interruption in Administration building, weather call number also failed.
 - Communications to/from employees not always possible.
 - Communications lost between servers in Administration and Flavors Buildings because the UPS systems tripped.

Hurricane Sandy – Critique

During the crisis, 24 recommendations that were made:

- Development of restart procedures
- Cogen plant
- Updating the phone list
- Battery operated temperature recorders
- Etc.

Hurricane Sandy – Conclusion

You never know what’s going to happen.

Have an effective Emergency Response Plan (ERP). Practice it and conduct critical critique sessions.

Have an effective & flexible Crisis Management Plan (CMP). Conduct drills with upper management and critique the response.

Keep partnership’s strong! You never know when you’ll need help.

- Associations
- Support Services (contractors, suppliers & vendors)

Safety Quote

“While on a ladder, never step back to admire your work”

