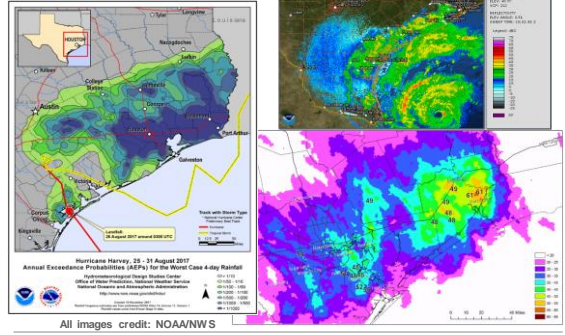


CHENIERE ENERGY, INC.
 Mayhem: A Meteorologist Guides a Business Through
 Hurricanes Harvey
 Matt Lanza
 American Meteorological Society Washington Forum, April 25, 2018



Harvey in Texas

A Forecasting Nightmare



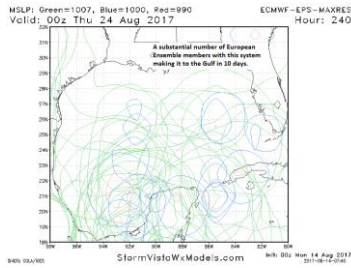
All images credit: NOAA/NWS

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Communicating Harvey

Monday, August 14th (11 days to landfall)

- "The upper level pattern over North America would support a track that could bring a tropical system into the Gulf in about 9-10 days. So this has me taking notice, and we will need to watch this disturbance very closely over the next week and beyond." – My Daily AM Tropical Update Note
- "Green" condition as a company
- Monitoring, but not much we can realistically do right now.



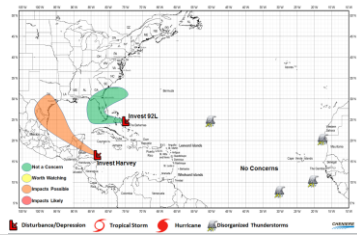
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Communicating Harvey

Monday, August 22nd (4 days to landfall)

- "Regardless of the final landfall point, it's likely that Harvey's remnants will end up in South Texas this weekend, delivering several rounds of potentially heavy rainfall...continue monitoring, because trends have shifted Harvey north lately, so these expectations could change tomorrow or Wednesday." – AM Tropical Update
- "Yellow" means it's time to start getting plans moving as necessary, given uncertainty.

Tropical Atlantic Overview



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Communicating Harvey

Tuesday, August 22nd (3 days to landfall)

- Conference calls with Corpus Christi: Emphasis on tropical storm, but did emphasize greater risk of hurricane than previously. "Red" now means it's time to act. Adapt with the forecast.
- Gas supply group: Plans to activate our disaster recovery site in Dallas in case this forecast worsened or Harvey came closer than expected.
- High uncertainty still.
- Began hammering the idea of major rains: "Weather models are all on board with a major rainfall event. A lot of rain is possible for a lot of people."

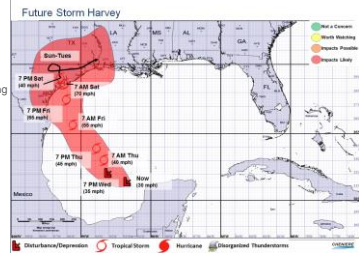


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Communicating Harvey

Wednesday, August 23rd (2 days to landfall)

- "The main concern is and remains flooding from a stalled out, slow moving system, the kind of which has historically produced significant rainfall totals in parts of Southeast Texas." – AM Email
- Corpus: Began to emphasize track to the north. (keeping the facility on the weaker side, though saying "hurricane possible.")
- Gas supply: Prepped our "go team" for Dallas.
- Corporate: Sent communication to Houston office to emphasize flooding concerns for the weekend.

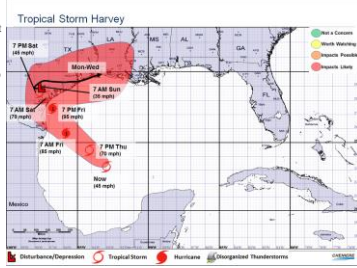


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Communicating Harvey

Thursday, August 24th (1 day to landfall)

- Sent 5 AM note to Corpus alerting them Cat 2 conditions were possible at site.
- Continued to emphasize flooding risk. ("multiple rounds of flooding in multiple locations")
- "Act II" of Harvey re-emerging over the Gulf was a significant concern at this time; rumor control an issue.
- Gas supply: Finalized decision to go to Dallas here, as rainfall forecasts continued to escalate for Houston.
- In addition to email support, up to eight conference calls per day, supporting Corpus, Sabine, the corporate office, and the executive team, including our CEO.



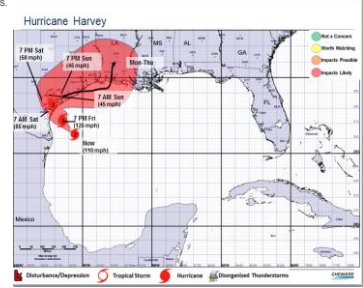
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Communicating Harvey

Friday, August 25th (Landfall Day)

- Drove to Dallas overnight to set up shop and focus.
- Emphasized 20-30" rainfall bulges.
- De-escalated "Act II" risks and told people to focus on rainfall.
- Able to breathe: Nowcasting is far easier than forecasting.



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Saturday, August 26th (Bracing for Houston Flooding)

- PM Note: "Weather modeling is in sickeningly good agreement that a major rainfall event will unfold over the entire Houston area tonight."
- Sent more urgent note at 10 PM to emphasize risk of "catastrophic flooding" especially east of I-45.
- Very strong support for my efforts from management at all levels within the company.



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Communicating Harvey

Advantages of having a staff meteorologist

- Information became of use beyond just company business.
- Became essentially the equivalent of a broadcast meteorologist being the "station scientist." I could explain flooding and hydrology and how it would impact the city, reservoirs, etc.
- Tidal currents at Sabine Pass limited vessel movements for days after Harvey as runoff poured into the river systems. This got lost in the shuffle from a forecast perspective, but we worked together to manage it.
- What a staff meteorologist can do:
 - Good quality information, which is appreciated and helpful in an extreme weather scenario.
 - Forecast is geographically customized to the business's needs.
 - Provide "smart brevity."
 - Dispel rumors or nonsense forecasts.
 - Act as an information translator for decision makers.
 - Help guide and provide input to tabletop exercises pre-season.
- While third party weather data is useful, nothing replaces having a dedicated meteorologist on staff focusing exclusively on our company's people, assets, and business operations. That starts long before hurricane season.

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Communicating Harvey

Having a meteorologist helps

"It is impossible to quantify the benefits of having a met on staff. In the days leading up to Hurricane Harvey, Matt did more than simply communicate what the weather models were showing. He is able to look 'under the hood' and explain why things were developing into the forecast that he provided. Understanding what the range of possibilities were, and not just having a simple forecast that you read off of a piece of paper enabled us to properly weigh the risks to our business and plan accordingly. Had we waited until traditional weather forecasting outlets decided that major flooding was not only possible but imminent, it would have been too late."

- Scott Culberson, Vice President, Gas Supply and Trading

Thank you!

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