

# THE UNIVERSITY OF TEXAS MEDICAL BRANCH (UTMB) AT GALVESTON



## Energy Security on a Barrier Island

*Presented to*  
Energy Master Planning for Resilient  
Military Installations  
December 6, 1017

Jerry A. Schuett, PE  
Principal, Energy and Utilities  
[jschuett@aeieng.com](mailto:jschuett@aeieng.com)

# Agenda

- UTMB Galveston circa 1890's
- Hurricane Ike
- A Three Step Solution
- Hurricane Harvey



# Galveston Island, circa 1890's



*UTMB Photos: Old Red/John Sealy*

# The Great Storm of 1900



*UTMB Photos: Old Red/John Sealy*

# Hurricane Ike, September 13, 2008

## Water/Storm Surge –

Approximately 17 ft to 18 ft based on the information gathered to date. NOAA



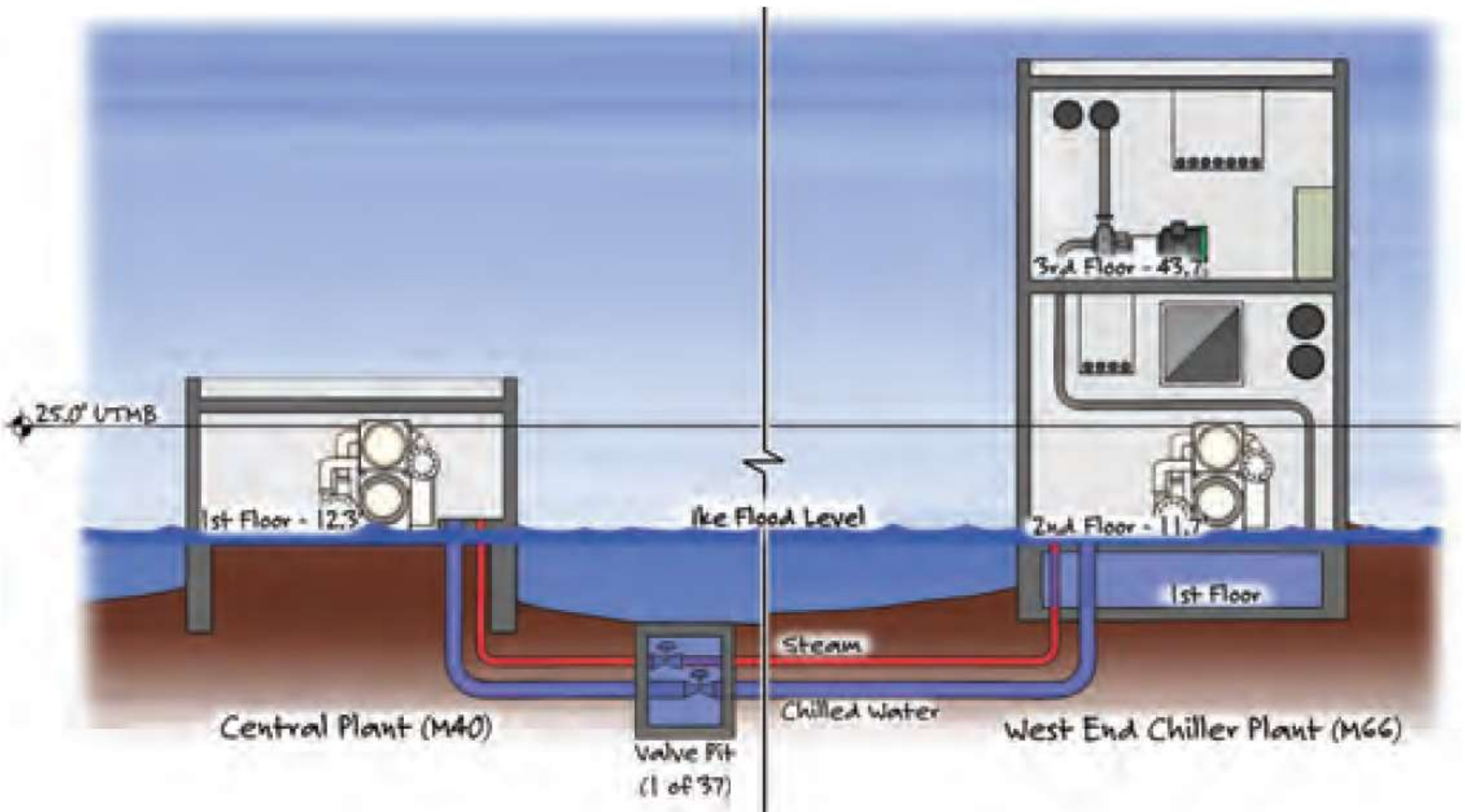
Image courtesy: noaa.gov

# Hurricane Ike, September 13, 2008



*Image courtesy: noaa.gov*

# Hurricane Ike, September 13, 2008



# Hurricane Ike, September 13, 2008





# Impact of Ike

- Cost of stabilization: **\$14,000,000**
- Unable to operate hospital: **90 Days**
- Lost business revenue: **\$2,000,000/day**
- Cost of evacuation
- Underground steam distribution system a complete loss
- Lost research materials
- Over 1 million sf of campus buildings damaged
- Estimated over 1 billion dollars in damages

# A Three Step Solution



# Step One Go Away from Buried Steam Pipe

- Convert most buildings to heating hot water.
- Distribute steam overhead to research buildings



# Step Two Elevate the Boilers and Chillers



# Step Two West Plant Flood Walls



# Step Three Produce On-Site Electricity via Combined Heat & Power (CHP)

Combined heat and power systems are approximately 50% more efficient than traditional systems



# Hurricane Harvey vs. UTMB Galveston

- Local utility lost two electrical feeders due to a flooded transformer vault, *no problem*
  - The East Plant CHP system operated trouble free in “Island Mode”
- Heavy rainfall caused minor street flooding, *no problem*
  - For the new overhead steam and underground heating hot water distribution systems “It was just another day at the office”.
  - As a precaution, the gates in the new floodwall surrounding the older West Plant were secured.

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# QUESTIONS

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