RIC 2006

Session T2GH
Emergency Preparedness

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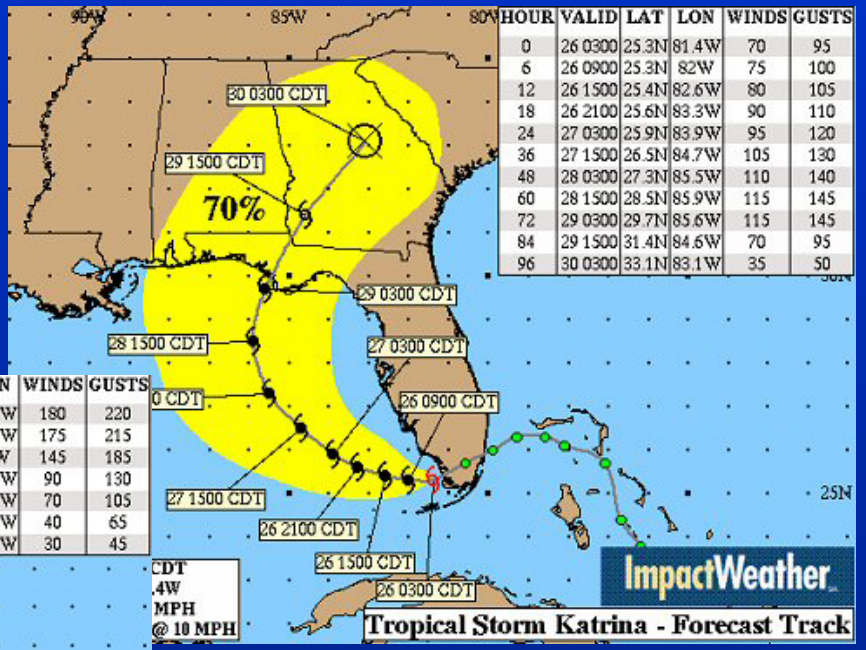
March 7, 2006

Hurricane Katrina

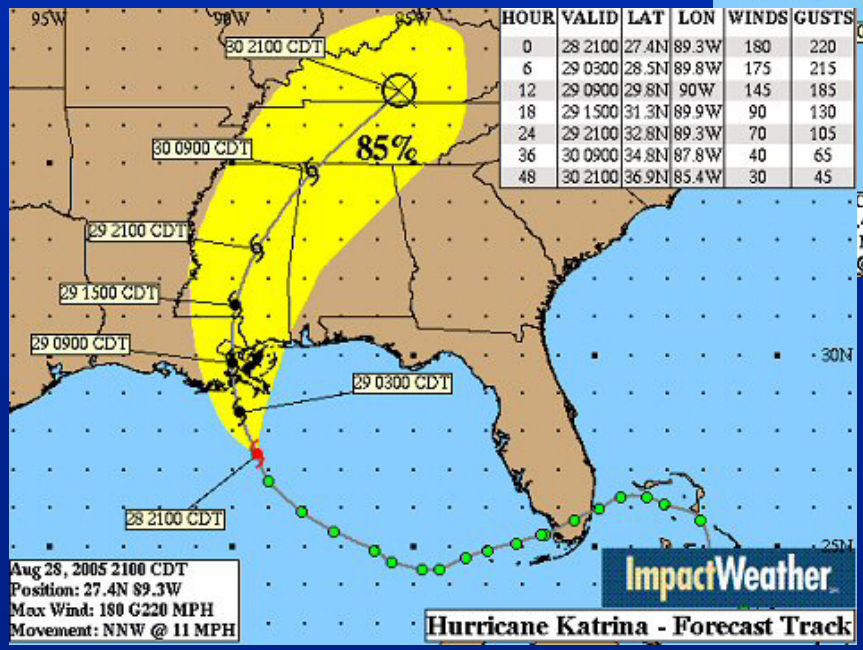
Waterford 3's Response

Katrina's Projected Path Changed Late

After crossing lower Florida peninsula, originally projected to hit panhandle…



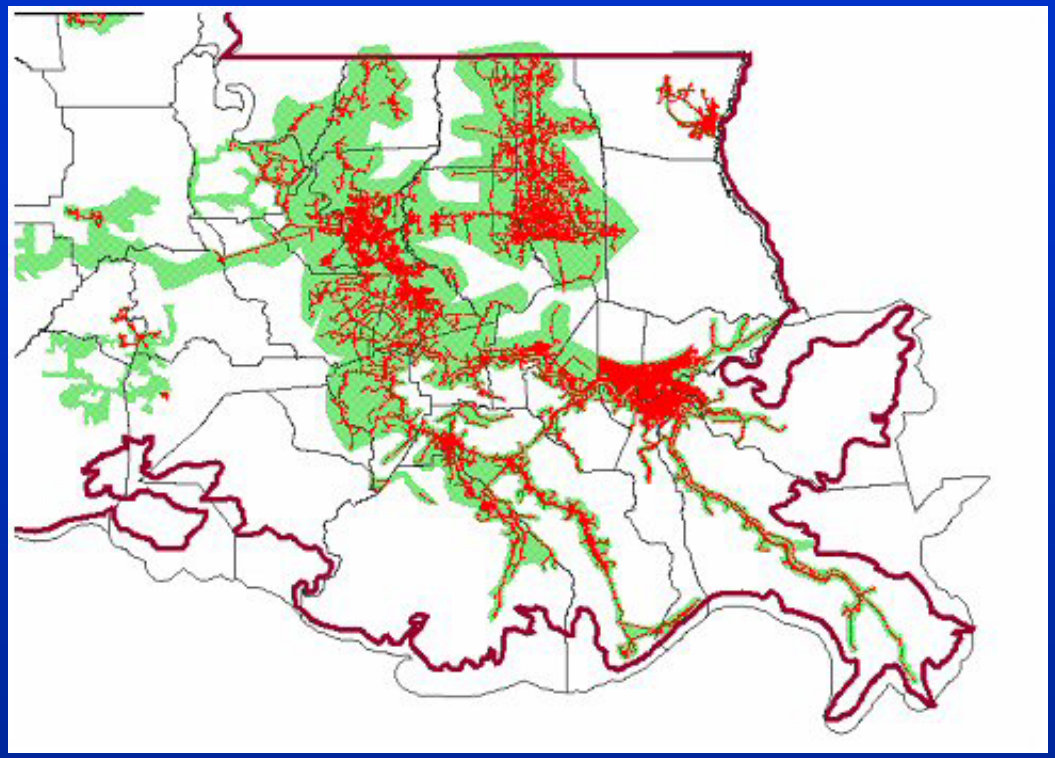
HOUR	VALID	LAT	LON	WINDS	GUSTS
0	26 0300	25.3N	81.4W	70	95
6	26 0900	25.3N	82W	75	100
12	26 1500	25.4N	82.6W	80	105
18	26 2100	25.6N	83.3W	90	110
24	27 0300	25.9N	83.9W	95	120
36	27 1500	26.5N	84.7W	105	130
48	28 0300	27.3N	85.5W	110	140
60	28 1500	28.5N	85.9W	115	145
72	29 0300	29.7N	85.6W	115	145
84	29 1500	31.4N	84.6W	70	95
96	30 0300	33.1N	83.1W	35	50

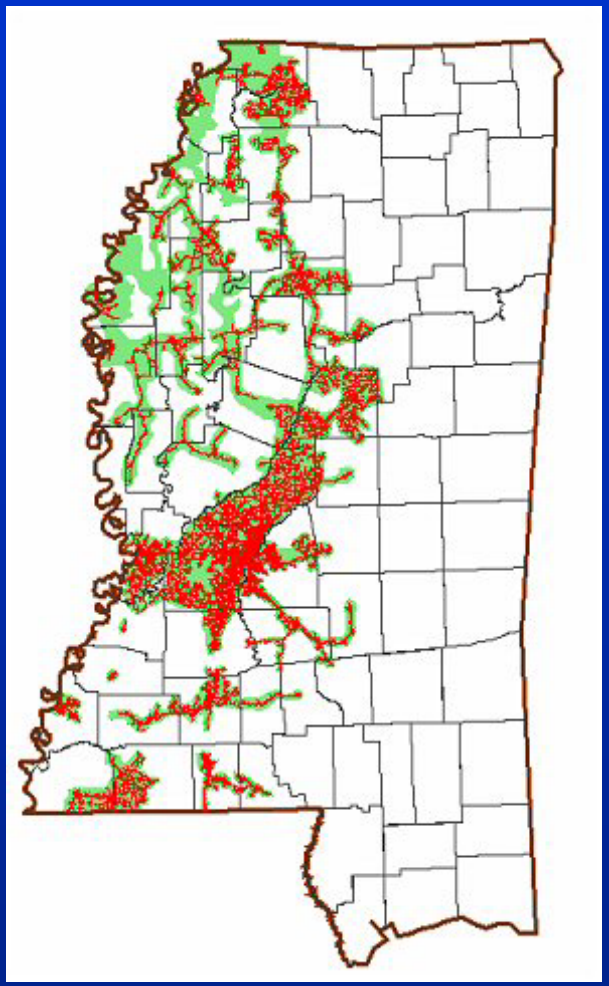


HOUR	VALID	LAT	LON	WINDS	GUSTS
0	28 2100	27.4N	89.3W	180	220
6	29 0300	28.5N	89.8W	175	215
12	29 0900	29.8N	90W	145	185
18	29 1500	31.3N	89.9W	90	130
24	29 2100	32.8N	89.3W	70	105
36	30 0900	34.8N	87.8W	40	65
48	30 2100	36.9N	85.4W	30	45

…but moved much further west.

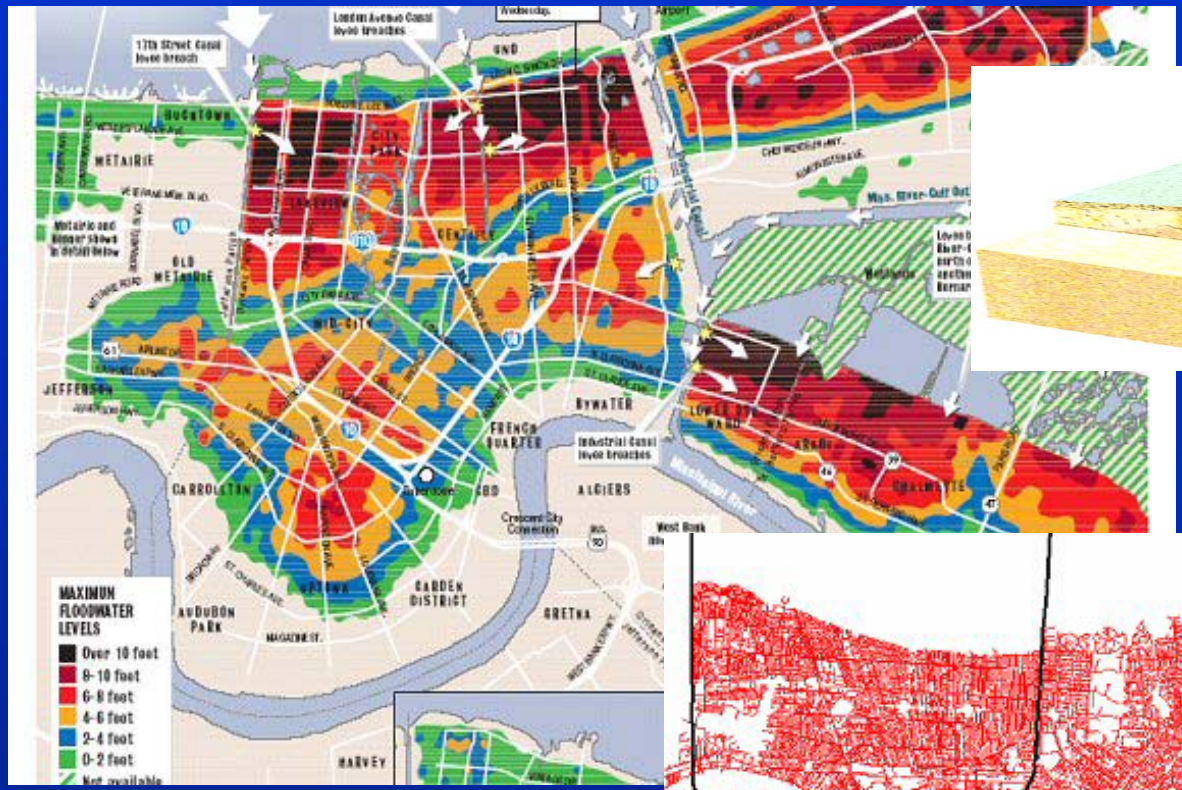
The Destruction Was Widespread…

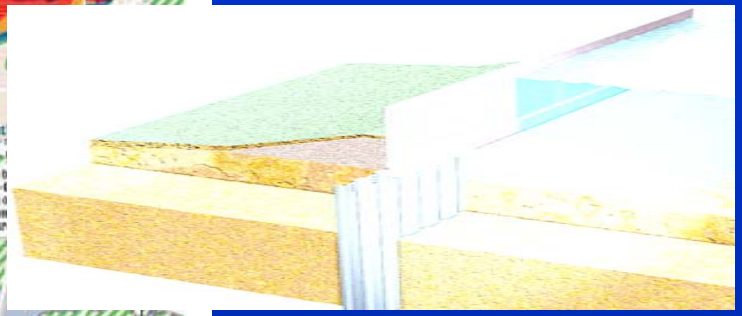


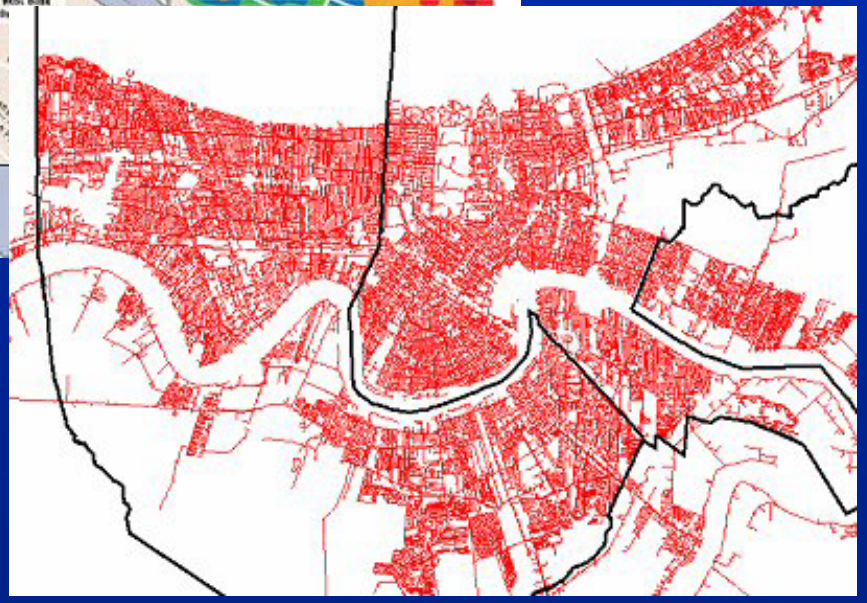


17,000 square miles affected in Louisiana, 20,000 in Mississippi

…and Our Largest City Flooded







Prepping for the Storm

- Hurricane duty roster
- Site walkdowns/preparations completed promptly
- Implemented Entergy Nuclear corporate hurricane response procedure
- Communications equipment testing
- Rooms for Core Team families

Prepping for the Storm

- Excellent coordination with offsite agencies throughout the event
- St. Charles Parish communications
  - Twice daily industry meetings
  - Highway contraflow
  - Evacuations started
    - St. Charles Parish 0900 August 27

Hurricane Command Center

- Activated Aug. 27
- Day/night shifts report to stay
- Hurricane Command Center activated 8:00 AM
  - Response directed from Command Center and Technical Support Center
  - Operations staff free to focus on the plant
- Hurricane Watch 10:00 AM
- Core Team onsite 5:00 PM
  - Briefings
  - Collateral duties
  - Accountability
- Hurricane Warning 10:00 PM

Hurricane Command Center

- Emphasis on personal accountability and safety throughout response
- Move to power block for all personnel on Aug. 28 before weather conditions deteriorated

Hurricane Command Center

- 138 personnel on site (including 2 NRC)
- Plant shutdown initiated 10:59 AM before tropical storm winds
  - Reactor and turbine offline 1:16 PM
  - Mode 4 at 8:58 PM and throughout storm
  - Mode 5 and forced outage on 09/01/05

Loss of Offsite Power August 29

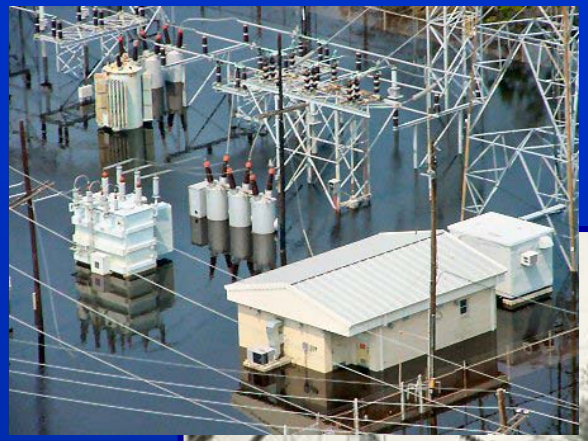
- Both emergency diesel generators started and supplied safety busses
- Just-in-time loss of offsite power and shutdown training provided
- Emergency diesel generators ran until offsite power restored
  - A Train – 9/1/05
  - B Train – 9/2/05

Loss of Offsite Communications August 30

- Maximum winds
  - Gusts –86 mph at 199 ft 7:20 AM
    199 ft sensor lost ~ 8:00 AM
  - 62 at 33 ft 1 minute averaged
- Contingency measures
  - 501 area code
  - Nextel
  - Additional satellite phones

Katrina's Unique Challenges…

- Corporate HQ evacuated
- Employees' homes destroyed
- Security threats in New Orleans
- Flooded gas facilities
- Contractors' bankruptcy fears
- Inoculations for workforce
- Severe substation flooding
- Communications knocked out
- Massive scale/logistics challenge
- Gasoline/Diesel shortages
- Inaccessibility



Restoration

- “Safety Trumps Speed”
- 1.87 million total electric customers
- 145,000 gas customers
- 28,900 Distribution poles replaced
- 522 Transmission lines out of service
- 715 Substations out of service
- 29 fossil/1 nuclear units shut down

Human Resources Challenges Met…

- Severity of Hurricane Katrina and flooding meant accounting for all employees in affected areas - 119 unaccounted for by Sept. 9; all located by Sept. 14
- Helped employees locate missing family members
- Continued salary and benefits for all employees
- Monitored and responded to employee hotline
- Facilitated time off for employees to check on homes
- Expanded on-site counseling
- Temporarily modified medical and pharmacy procedures and requirements
- Temporarily modified savings plan to allow easier access to funds

Restart

- Coordinated with support from entire Entergy Fleet
- NRC/FEMA restart assessment teams onsite on Sept. 6
- Permission for restart, Sept. 9
- Reactor critical and synced to the grid on Sept. 13
- Vital to the restoration

Final Critique

- Sept. 22 Event Critique
- Communications improvements needed
- Core team staffing additions
- Many improvements made for Hurricane Rita Preparations
- Plant Safety Systems and plans functioned as designed

Employee Assistance

- Training Center tent city
  - Housed 800 Transmission & Distribution workers
- Employee family trailer city/hotel rooms
  - 141 employees' homes uninhabitable out of 600 employees
  - Presently houses 35 families
  - Nursery, day care, arcade, computers
  - Laundromat
- Cash disbursements
- Gasoline

Camp Katrina at W3

Camp Katrina at W3

Family Living Center at W3

Relationships

- Strong offsite relationships paved the way for the quick restart
- Work force rebounded quickly

Fleet Support

- Support from Entergy Fleet instrumental in recovery
- Performance of Entergy's four southern plants provided critical generation for the restoration

RESTART ASSESSMENTS

- 10 Emergency Planning “Gaps” identified
  - Evacuation time estimate
  - Transportation resources for public evacuation
  - AC power to Alert Notification System sirens
  - Emergency Response Org. call-out
  - Backup Emergency Operations Facility
  - Emergency News Center
  - Rumor Control
  - One reception center not available for use
  - NRC Emergency Notification System (ENS)
  - National Weather Center Alert Toning System

In Conclusion…

- Plant safety systems and emergency plans functioned as designed
- Strong offsite relationships paved way for restart
- Waterford 3 workforce rebounded quickly
- Support from Entergy and nuclear fleet instrumental in response and recovery
- Performance of Entergy's four southern nuclear plants provided much needed generation
- Entergy orchestrated outage repair and restoration at a record pace
- Information shared by industry helped Waterford 3 prepare