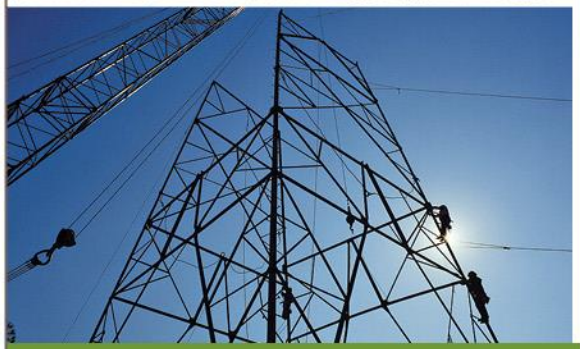
OPERATIONS

Unite. Innovate. Execute.



SOUTHERN COMPANY

A Utility's Response and Recovery

Marc Butts

Southern Company

03/19/2014

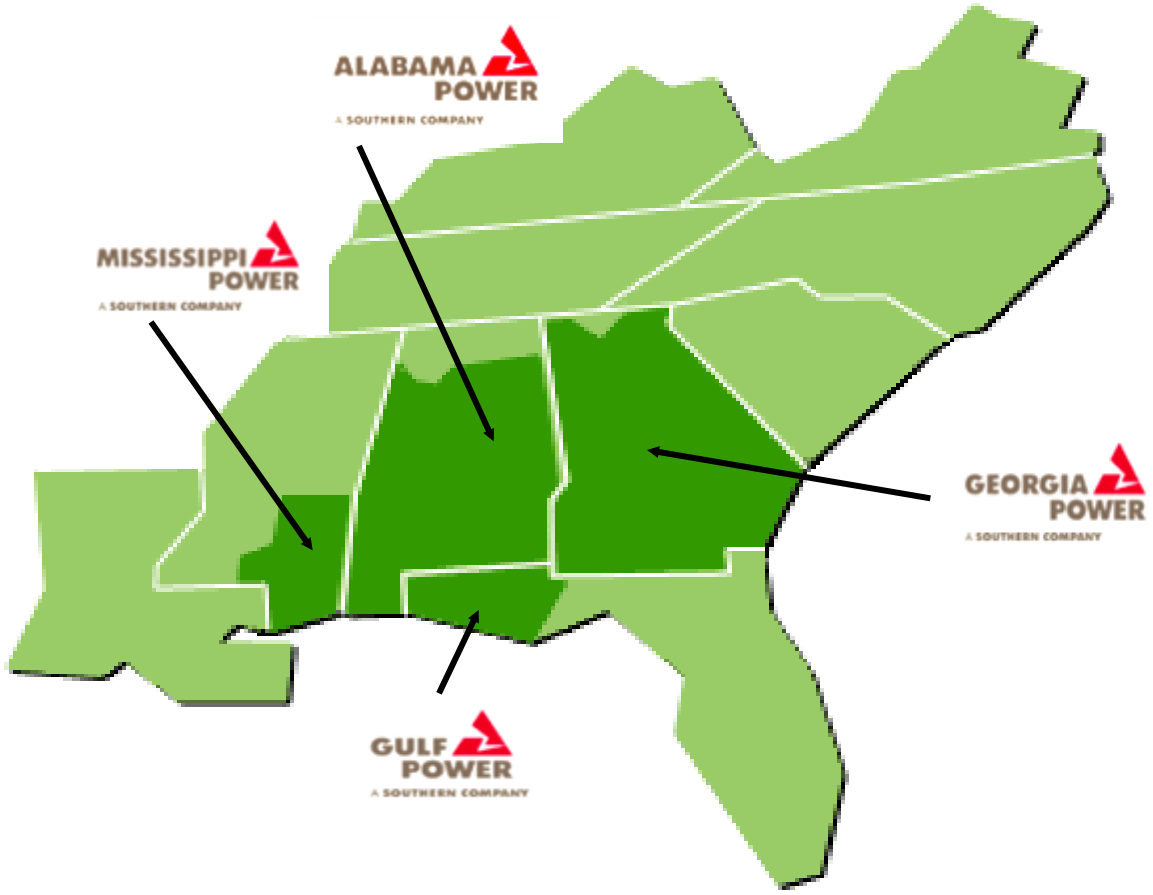
Transmission

Service territory across four states: 120,000 square miles

Serves approximately 4 million customers

Other Subsidiaries:

- **Southern Linc**
- **Southern Power**
- **Southern Telecom**
- **Southern Nuclear**



Business Continuity
at
Southern Company

Southern Company Business Assurance Model

Business Unit Management (Asset Owners)

Protect

Infrastructure Protection

- Identify critical assets and systems
- Design and implement security protocols
- Train & test

Prepare

Business Continuity

- Identify critical business processes and supporting infrastructure
- Prepare business continuity plans for restoration and recovery (including disaster recovery)
- Train & test

Respond

Incident Response

- Assess and calibrate alert levels
- Activate incident response teams
- Implement business plans
- Train & test

Storm Preparation

- **Yearly**
  - Procedures Revised and Reviewed Each Spring
  - All Employees Have Storm Assignments
  - Storm Centers Are Re-Evaluated
- **Storm Potential Identified**
  - Generation Plan….Pre, During, and Post Impact
  - Resources Secured….Fuel, Material, Logistics, Outside Manpower
- **Storm Forecast Indicates Southern Company Impact**
  - Critical Employees Secured on-site
  - Perishable Storm Supplies Secured
- **Prior To Impact**
  - Logistics Plans Implemented….Restoration Personnel Ready to Come In
  - Implement Generation Plan
  - Minimize Exposure to Transformer Banks and other assets

Physical Recovery Following a Major Disaster

August 29th 2005


Hurricane Katrina
NOAA-15 AVHRR 1KM
August 29, 2005 @ 1148 UTC
MISSISSIPPI
ALABAMA
LOUISIANA
TEXAS
Gulfport
Biloxi
New Orleans
Our Worst Nightmare

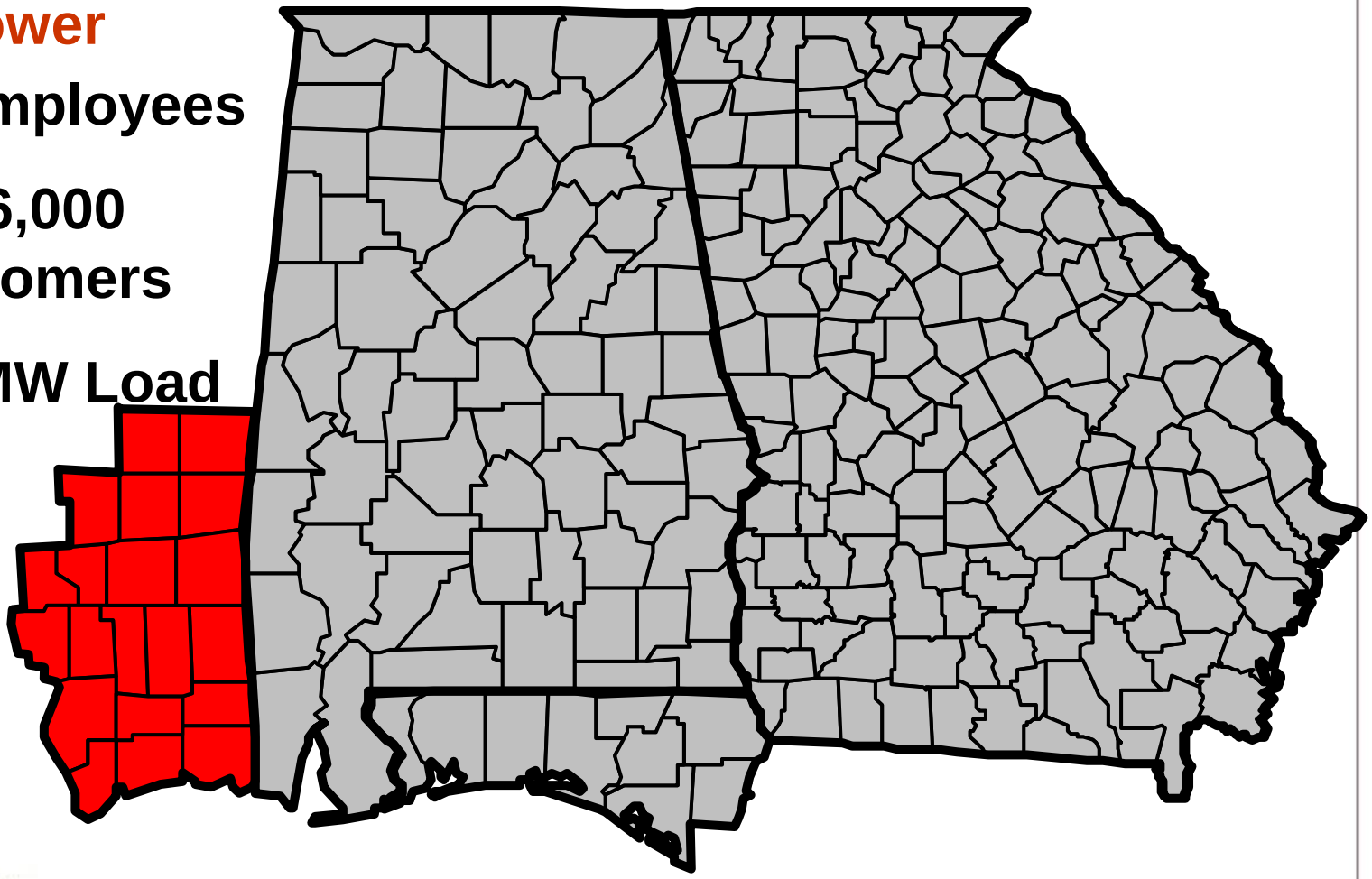
Southern Company Electric System

Mississippi Power

1250 Employees

196,000 Customers

2590 MW Load



Mississippi Power Electric System

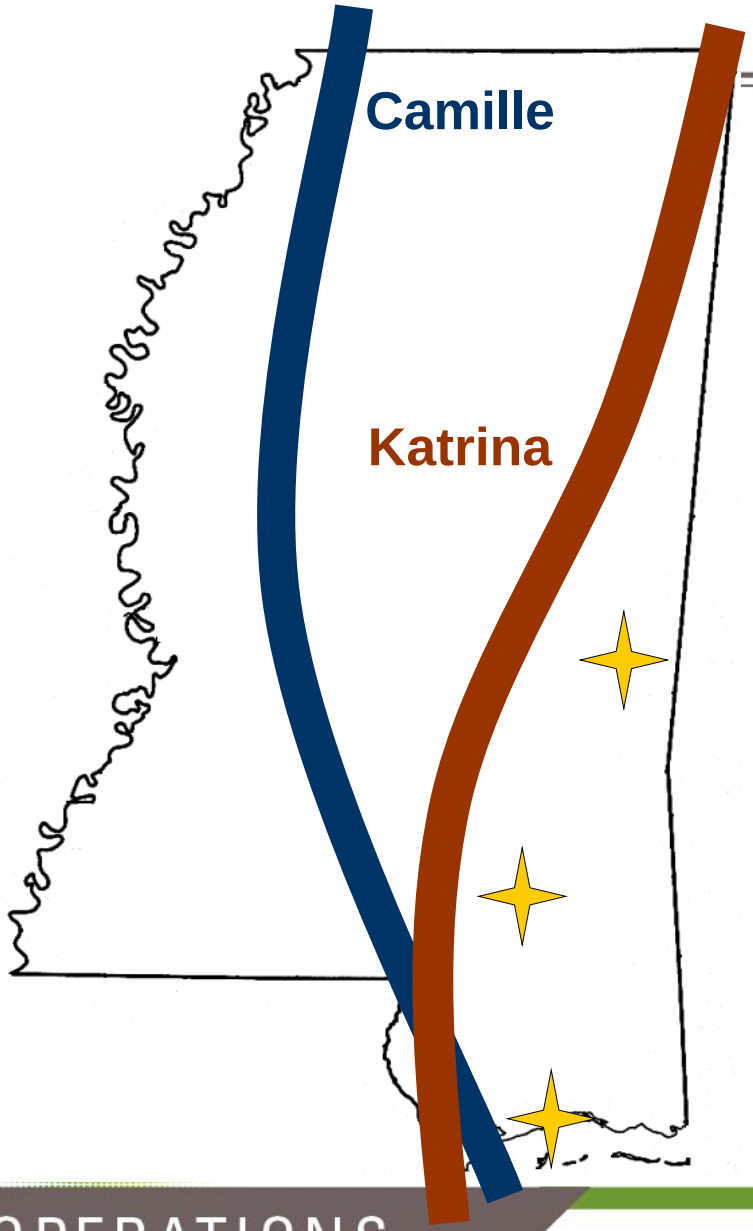
- **Generating**
  - 1750 MWs Coal
  - 770 MWs CC Gas Steam
  - 400 MWs Gas Steam
  - Two 40 MW CTs (Black Start)
- **Transmission**

500kV	76 miles
230kV	585 miles
115kV	1110 miles
46kV	300 miles

- **Substations**
  - 140 Transmission Stations

Three Big Ones – A Comparison

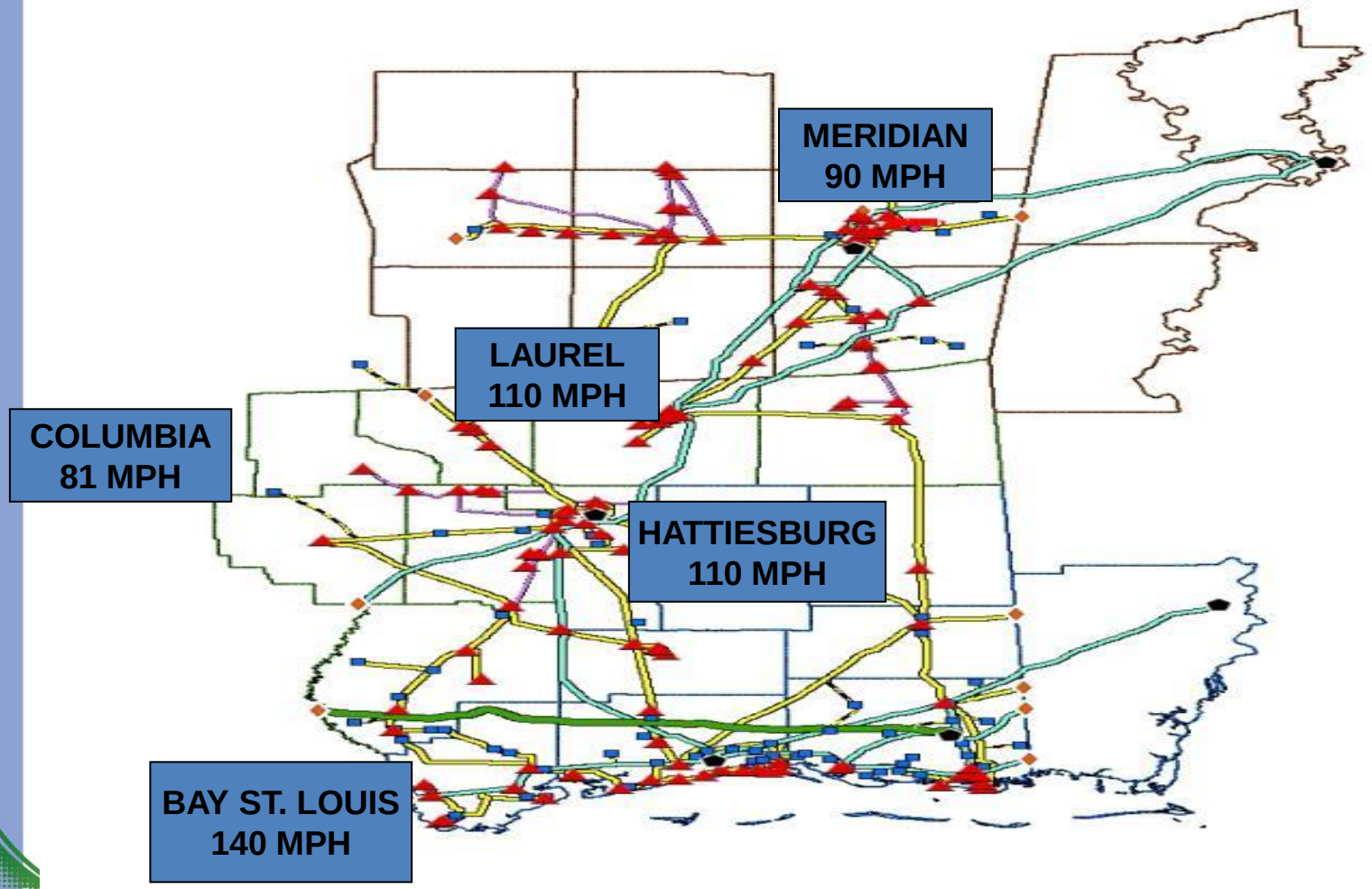
	Katrina	Ivan	Camille
Landfall Date	08.29.05	09.16.04	08.17.69
Landfall	MS/LA State Line	Eastern Mobile Bay	Waveland/BSL, MS
Category at Landfall	Category 3	Category 3	Category 5
Wind Speed/Gusts	140 / 180 mph	115 / 135 mph	190 / 220 mph
Tidal Surge (Maximum)	35-40′	10-15′	20-28′
Hurricane Winds (Size of Storm)	125 miles	35-40 miles	60 miles
Forward Motion	NNE at 15 MPH	NNE at 12 MPH	NNW at 15 MPH
	Strengthening and Expanding at Landfall	Weakening at Landfall	Sustaining at Landfall



Peak Wind Speed Comparison

	Katrina	Camille
Meridian	90 mph	55 mph
Hattiesburg	110 mph	80 mph
Gulfport	140 mph	190 mph

August 29th : 9:00 a.m. - 3:00 p.m. CDT
Mississippi Power's System



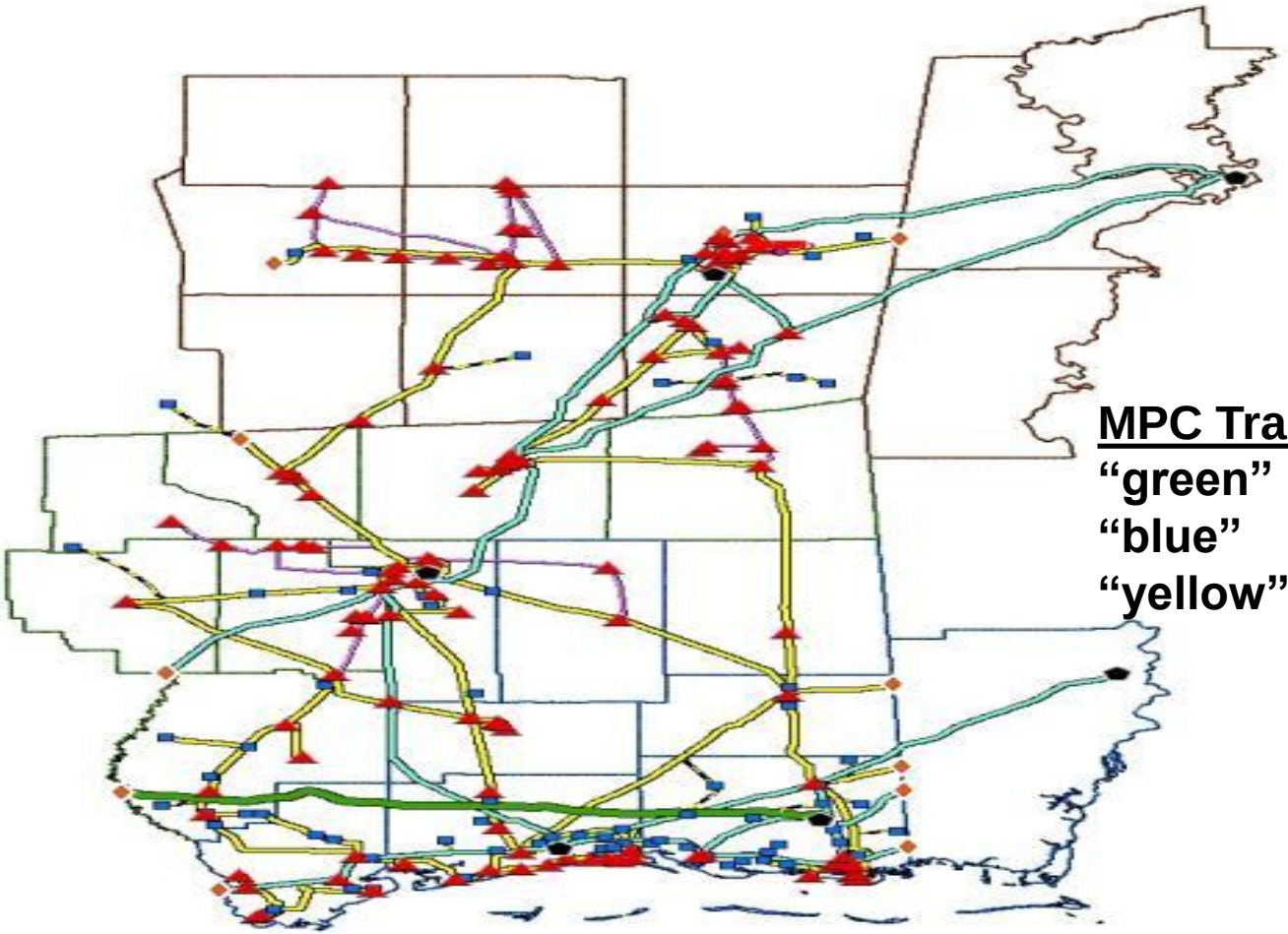
Infrastructure Damage – Mississippi Power

Poles:	9,000 broken poles
Transformers:	2,300 transformers damaged
Wire:	23,500 spans of wire down
Customers Out of Service:	196,000

Hurricane Katrina Statistics - Transmission

Number of Transmission Lines Affected

	500 kV	230 kV	115 kV	46 kV	TOTAL
Alabama Power	0	8	32	27	67
Mississippi Power	1	21	80	18	120



MPC Transmission
“green” = 500kV
“blue” = 230kV
“yellow” = 115kV

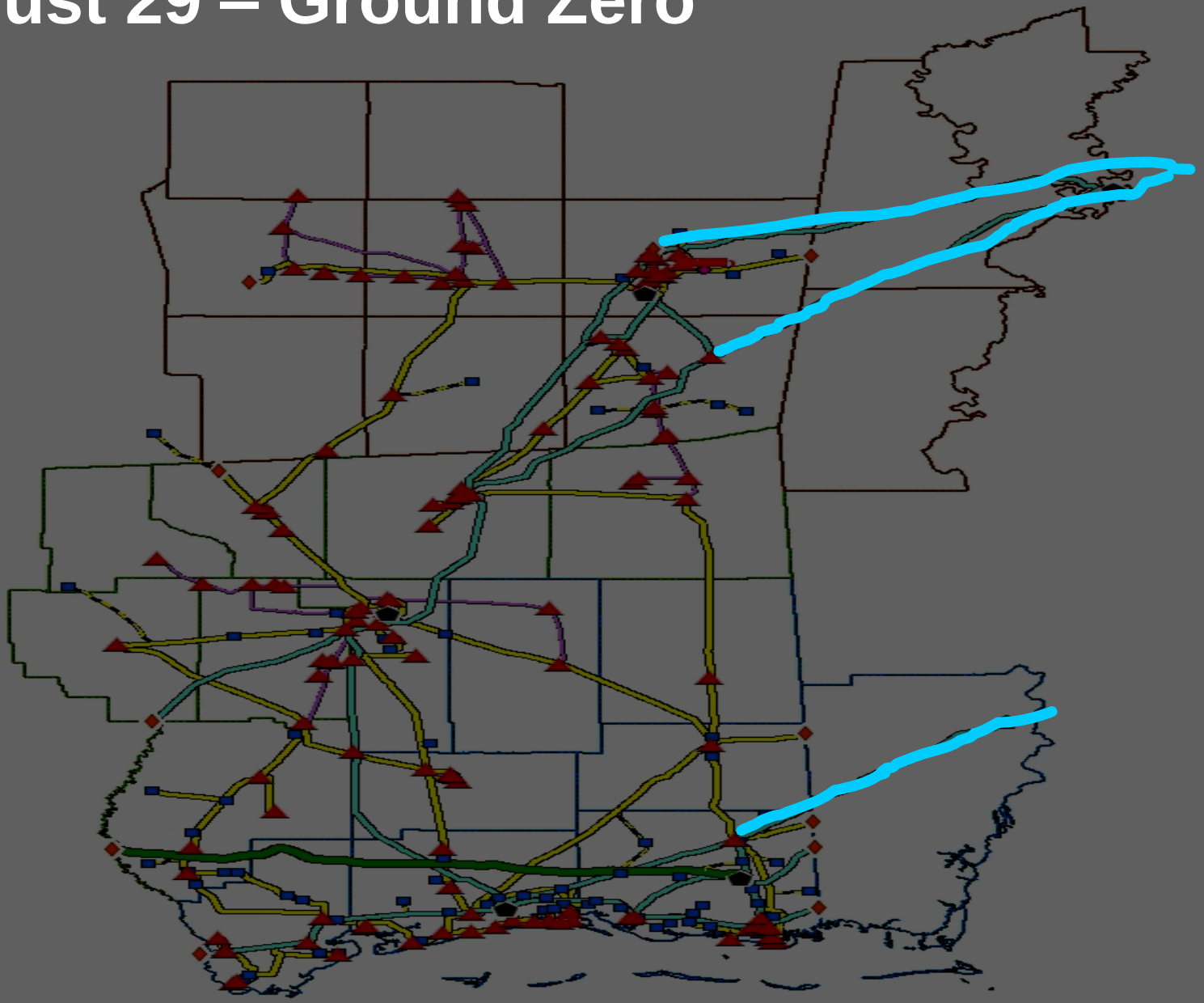
Transmission Impact

	Generators	Transmission Lines	Transmission Substations
Total	15 Units 3075 MWs	2073 miles	140
Affected	6 Key Units 1040 MWs	1914 miles 92%	None Hot 12 Flooded

Restoring The System

August 29 – September 7

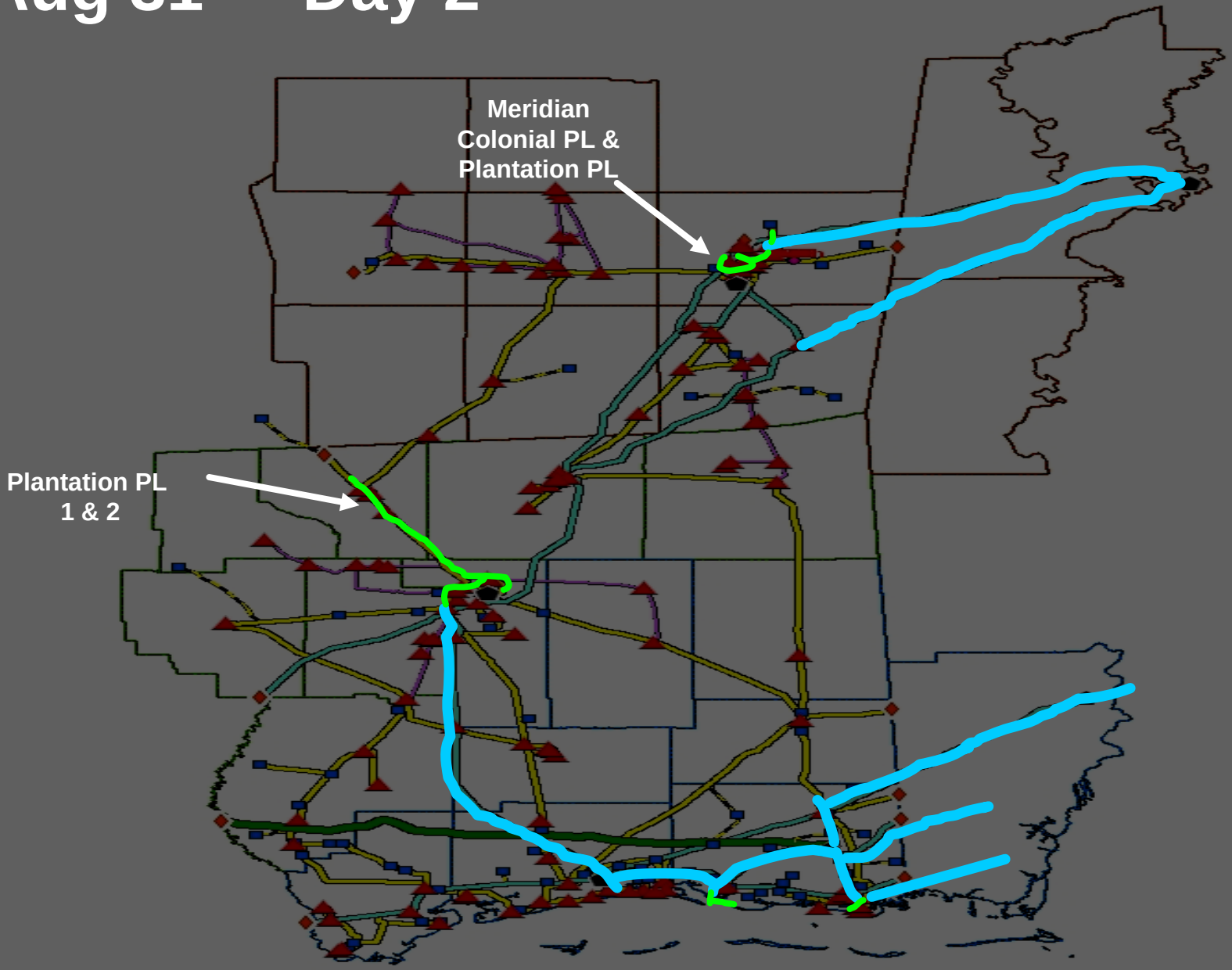
August 29 – Ground Zero

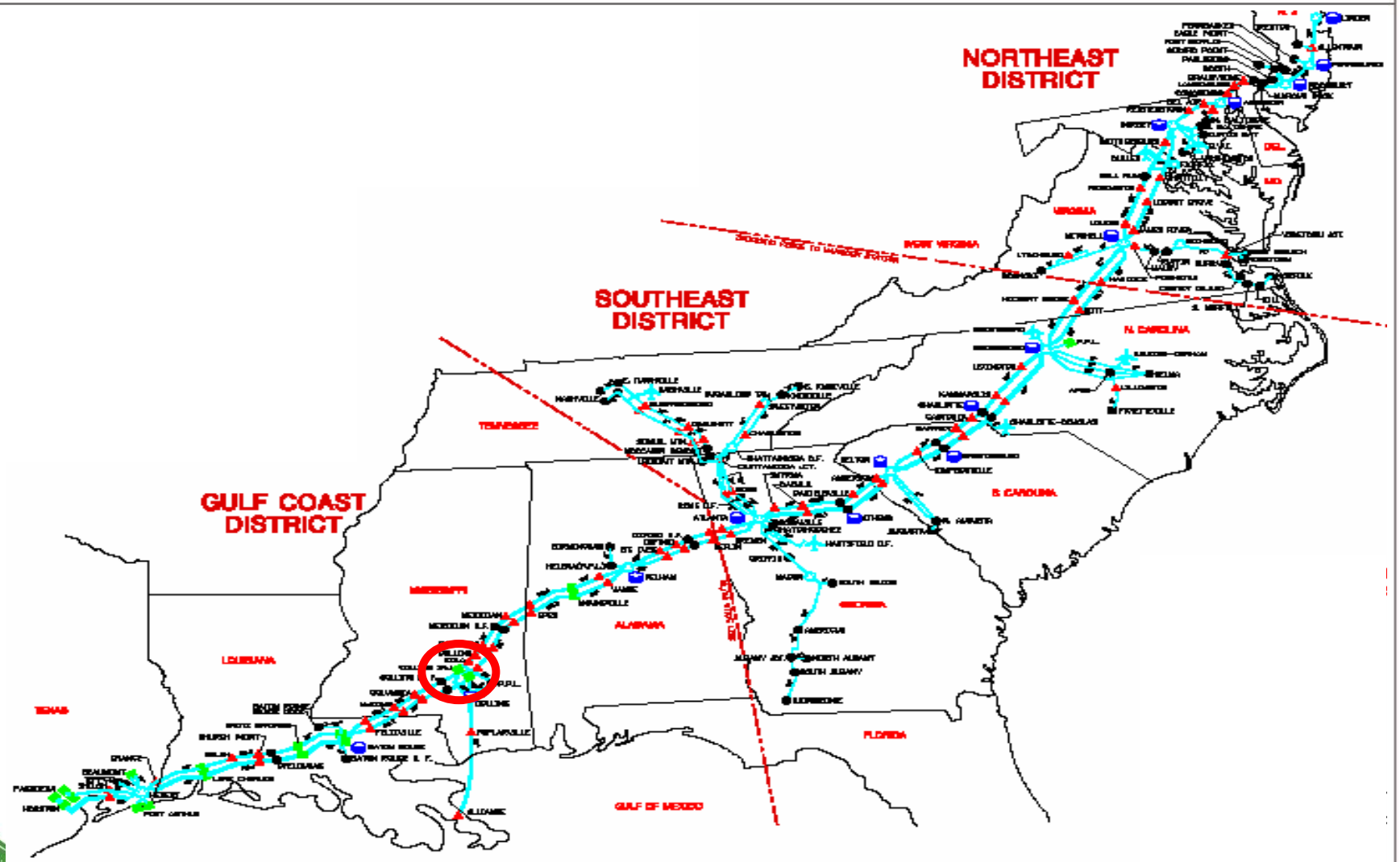


Critical Issues – 1st Hours

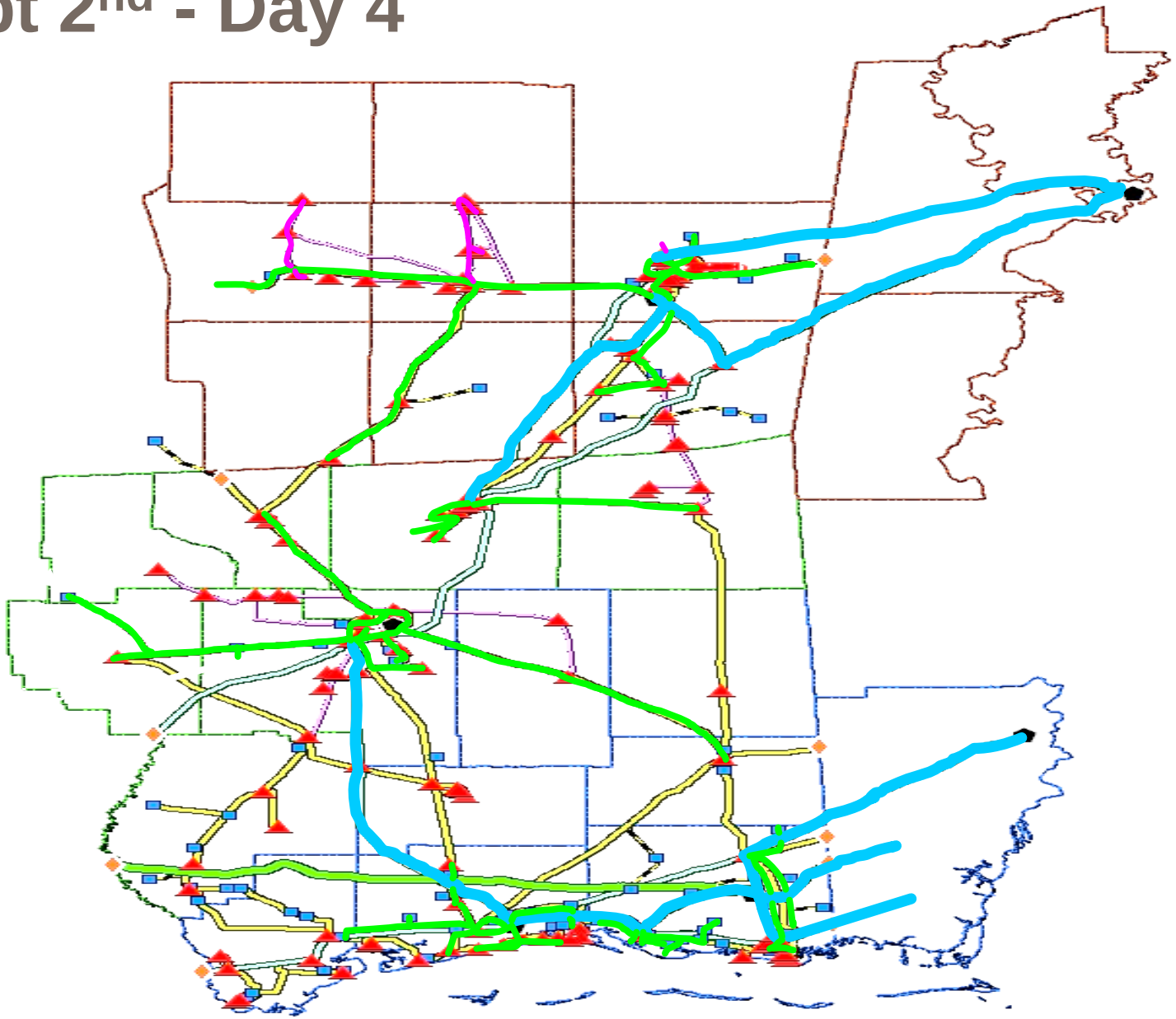
- Determine System State and Formulate 1st Steps
  - All Transmission De-energized Except 3 Sources In From Alabama
  - No Customer Load Being Served
  - One Generator at Plant Daniel Online Holding Station Service
- Begin Extending 230kV Path from APC Sources to Key Subs & Load Centers
  - Stations With Hospitals
  - Stations Serving Public & Emergency Response Support
- 1st Night and Morning Spent Inspecting and Clearing Target Subs and Transmission ROW

Aug 31st - Day 2

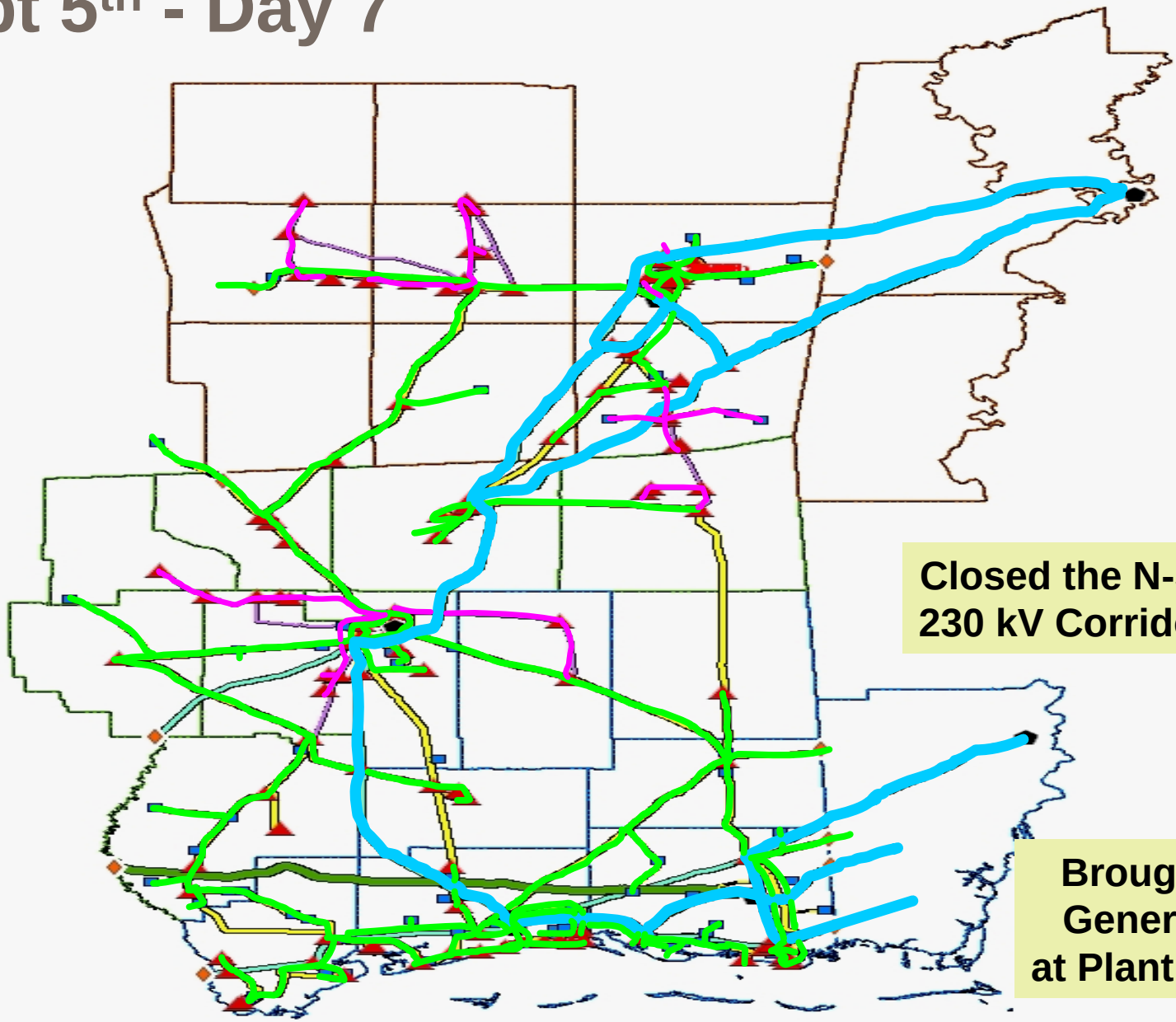



NORTHEAST DISTRICT
SOUTHEAST DISTRICT
GULF COAST DISTRICT
VIRGINIA
N. CAROLINA
S. CAROLINA
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
LOUISIANA
TEXAS
FLORIDA
GULF OF MEXICO

Sept 2nd - Day 4



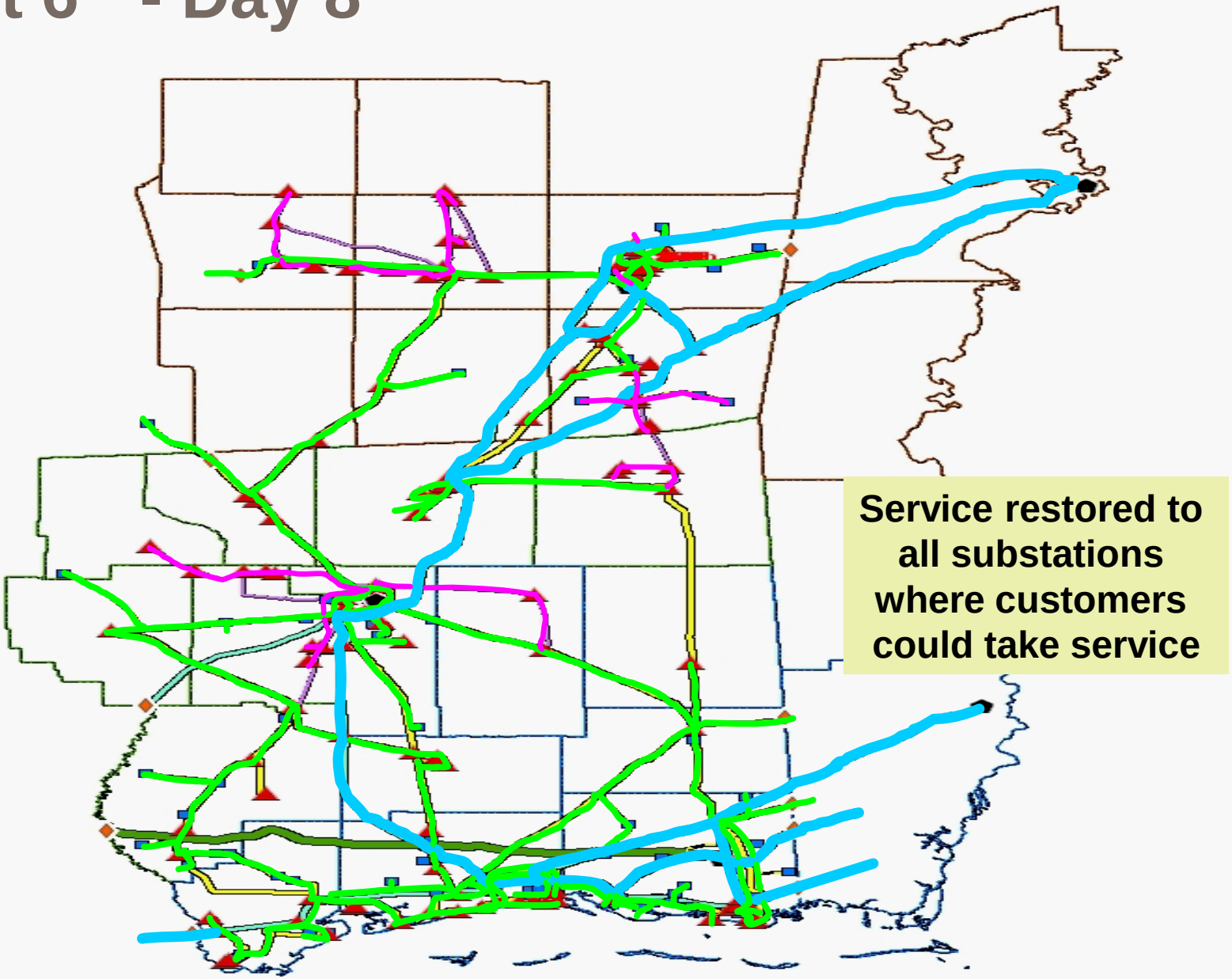
Sept 5th - Day 7



Closed the N-S 230 kV Corridor

Brought up Generation at Plant Daniel

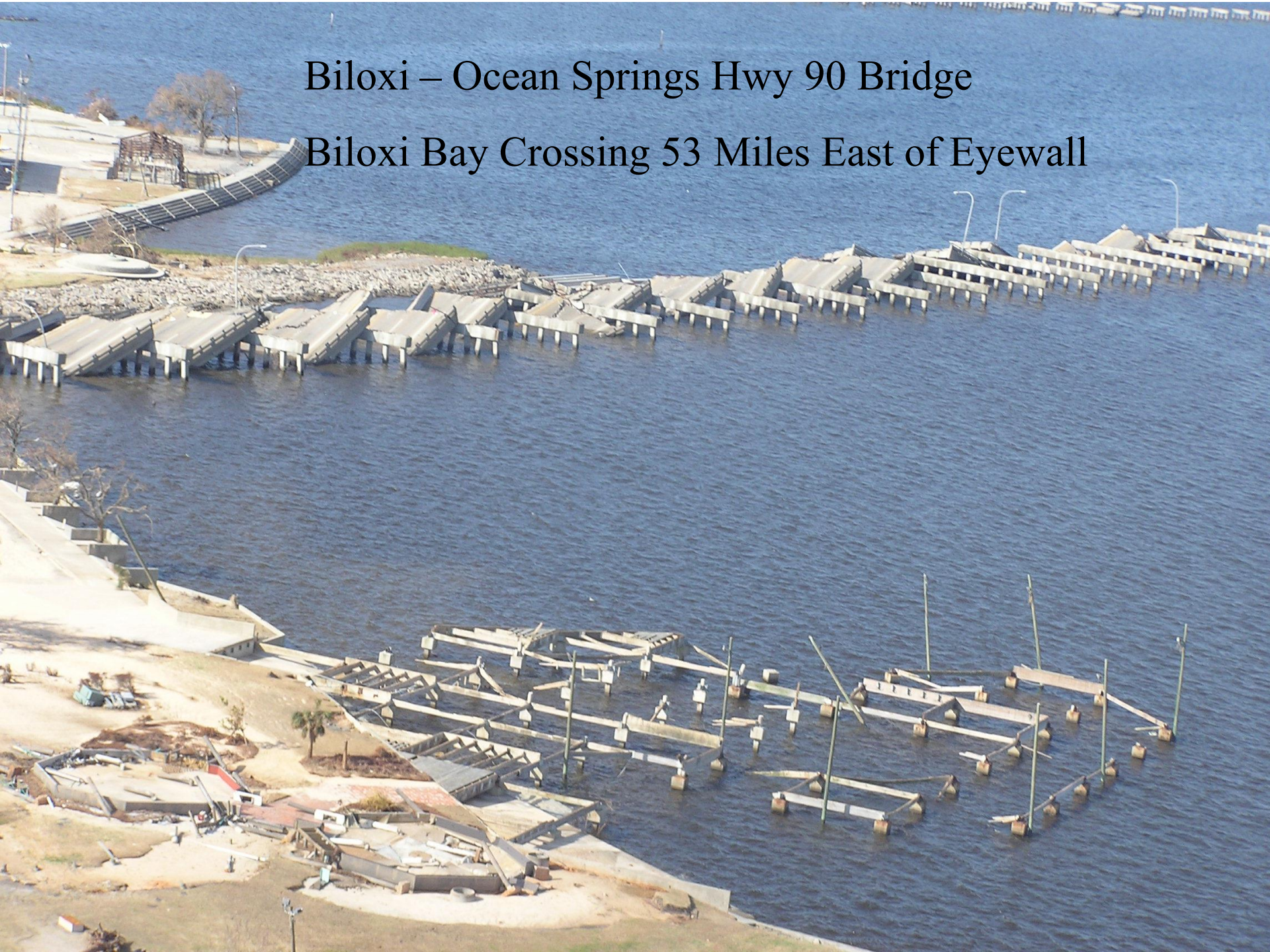
Sept 6th - Day 8



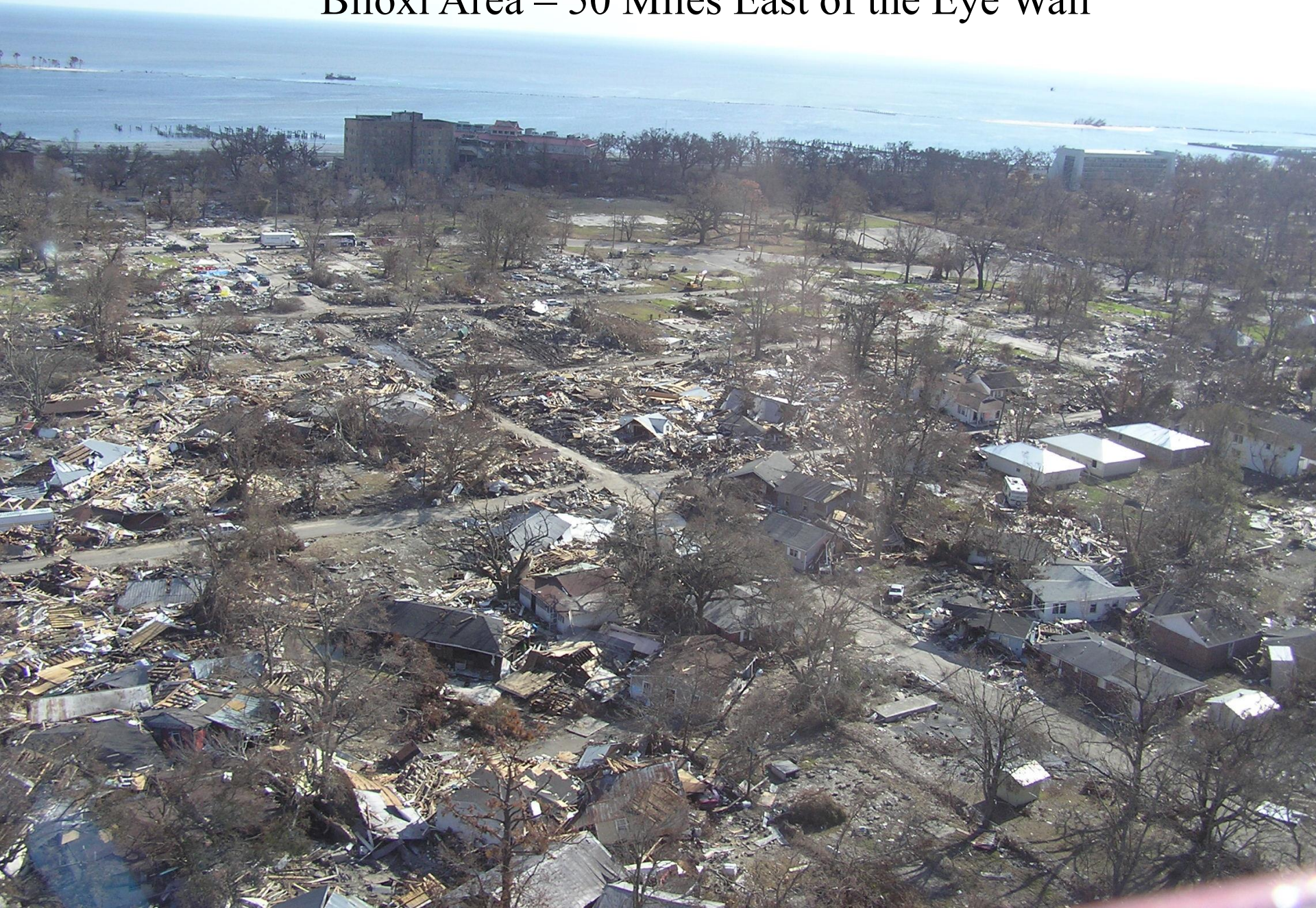
Service restored to all substations where customers could take service

Employee Parking at Plant Watson


Pass Christian Area - 20 Miles East of the Eye Wall


Biloxi – Ocean Springs Hwy 90 Bridge
Biloxi Bay Crossing 53 Miles East of Eyewall

Biloxi Area – 50 Miles East of the Eye Wall




Moss Point East – Ocean Springs
230kV

April 27th, 2011

April's Fury

Lessons Learned

- Be Prepared to set up a temporary/mobile emergency operating center
- Plan to operate with no communications for at least 48 hours
- Plan to operate without SCADA/EMS
- Maintain Detailed Non-Electronic System Diagrams or Mapboard
- Identify 2 alternates for every critical storm assignment
- Reassess and identify all critical customers


What Was It Like
Before SCADA and
Telephones?
BUDAPEST

Lessons Learned

- Substantially increase logistics, procurement and management support capabilities
- Be prepared to be as self-sufficient as possible for some period of time
- Prepare for potential hostilities and civil unrest
- Prepare for substantial employee property losses and family crises
- Store Enough Potable Water For Showers & Flushing – At Least 5 Days

Employee Personal Loss

Homes Destroyed	86	7%
Homes Flooded	196	16%
Homes Damaged	441	35%
Total	721	58%


Disaster Relief

Facing Realities

- Realize the electrical system - by its very nature - cannot be protected from all catastrophic events – may need backup source
- The only thing certain about catastrophic events is that they cannot be predicted with accuracy - prepare for anything
- Table-top exercises with various scenarios conducted on a regular basis can and will better prepare you for what can happen
- Meaningful communication throughout your organization before, during, and after an event will increase everyone's effectiveness
- An empowered and committed work force is key to success

Questions to ask:

1. How robust is your overall Business Continuity Plan?
2. Have you identified your critical assets and service requirements?
3. Is there an organization like SEE that mutual assistance can be called upon?
4. Have you created a partnership with your energy suppliers?
5. What is your response time to major events like Hurricanes, Ice Storms or Tornadoes?
6. What type of emergency plans do you or your providers have in place for Transmission and Distribution?

Recipe For Success

- **Leadership**

  "at all levels"

- **Plan, Plan and Plan again**

  "the ability to adapt and expand plans to meet the objective"

- **Expertise and Knowledge**

  "employees that know the system and how it operates"

  "employees that understand and know their storm assignment"

- **Commitment and Dedication**

  "from management, from each employee"

- **Pride**

  "self pride, company pride"

- **Teamwork, Teamwork, and more Teamwork**

  "working as one with common goals"

Easy Questions?