



# 2005 Hurricane Havoc

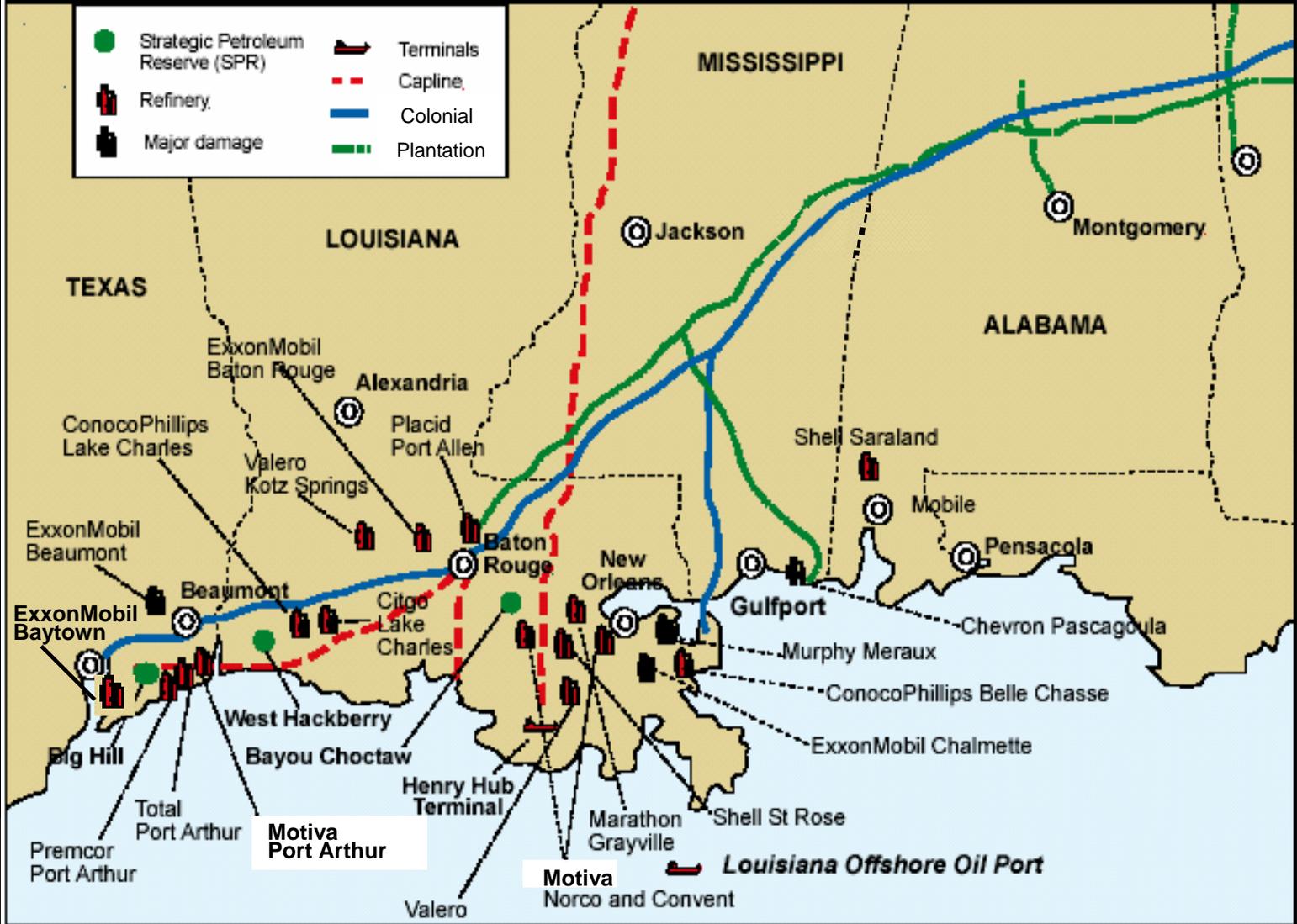
U.S. EPA  
Emission Inventory Conference  
New Orleans, LA  
Howard J. Feldman  
May 16, 2006

# Oil & Gas in the Gulf Region

- The Gulf of Mexico provides 30 percent of the oil and 21 percent of the natural gas used by the United States.
- The refineries in the region comprising around 30% of US refining capacity.
- Major pipelines serve the nation from the Gulf Coast.

### US Gulf coast oil infrastructure

- |   |                                   |   |            |
|---|-----------------------------------|---|------------|
|  | Strategic Petroleum Reserve (SPR) |  | Terminals  |
|  | Refinery                          |  | Capline    |
|  | Major damage                      |  | Colonial   |
|   |                                   |  | Plantation |





- Ⓜ Refineries
- 🛢 Crude Oil Terminals
- Federal Platforms



**The impact of the Katrina and Rita was unprecedented.**

# Impact on Oil & Gas Operations from Katrina and Rita

August 30<sup>th</sup>

## Gulf Oil & Gas Production

- 26% of U.S. oil
- 18% of U.S. gas

## Gulf Refineries

- 11% capacity shutdown
- 17% reduced runs (by 8/31)

## Pipelines

- No electricity to major crude and product pipelines feeding Northeast and Midwest

## LOOP

- Operations suspended
- 8.5% of crude imports lost

September 28<sup>th</sup>

## Gulf Oil & Gas Production

- 27.5% of U.S. oil
- 15% of U.S. gas

## Gulf Refineries

- 5% shutdown (Katrina)
- 23% shutdown (Rita)

## Pipelines

- Colonial -- Reduced at origin segment
- Plantation -- 100%
- Capline -- 80%
- Explorer -- Partial ops
- Centennial -- Closed

## LOOP

- Partial operations

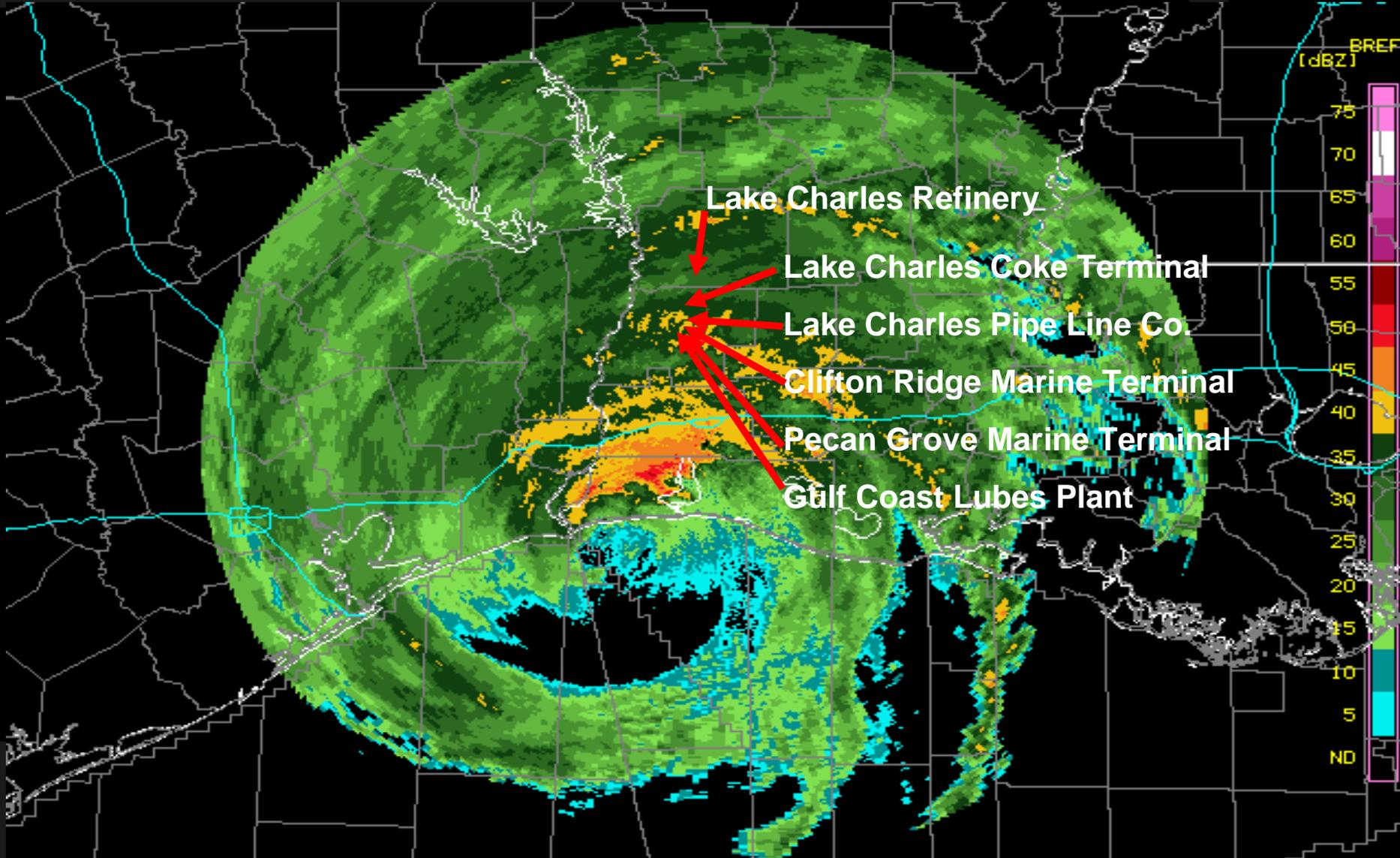
## Impact on Oil & Gas Operations from Katrina and Rita

20 refineries in the path of Katrina and Rita were shut down which accounted for about 29% of U.S. capacity.

3,050 of the 4,000 platforms and 22,000 of the 33,000 miles of pipelines in the Gulf were in the direct paths of the storms.

Together they destroyed 115 platforms and damaged 52 others.

No loss of life or significant oil spills from wells on the Outer Continental Shelf from either storm.



- Lake Charles Refinery
- Lake Charles Coke Terminal
- Lake Charles Pipe Line Co.
- Clifton Ridge Marine Terminal
- Pecan Grove Marine Terminal
- Gulf Coast Lubes Plant













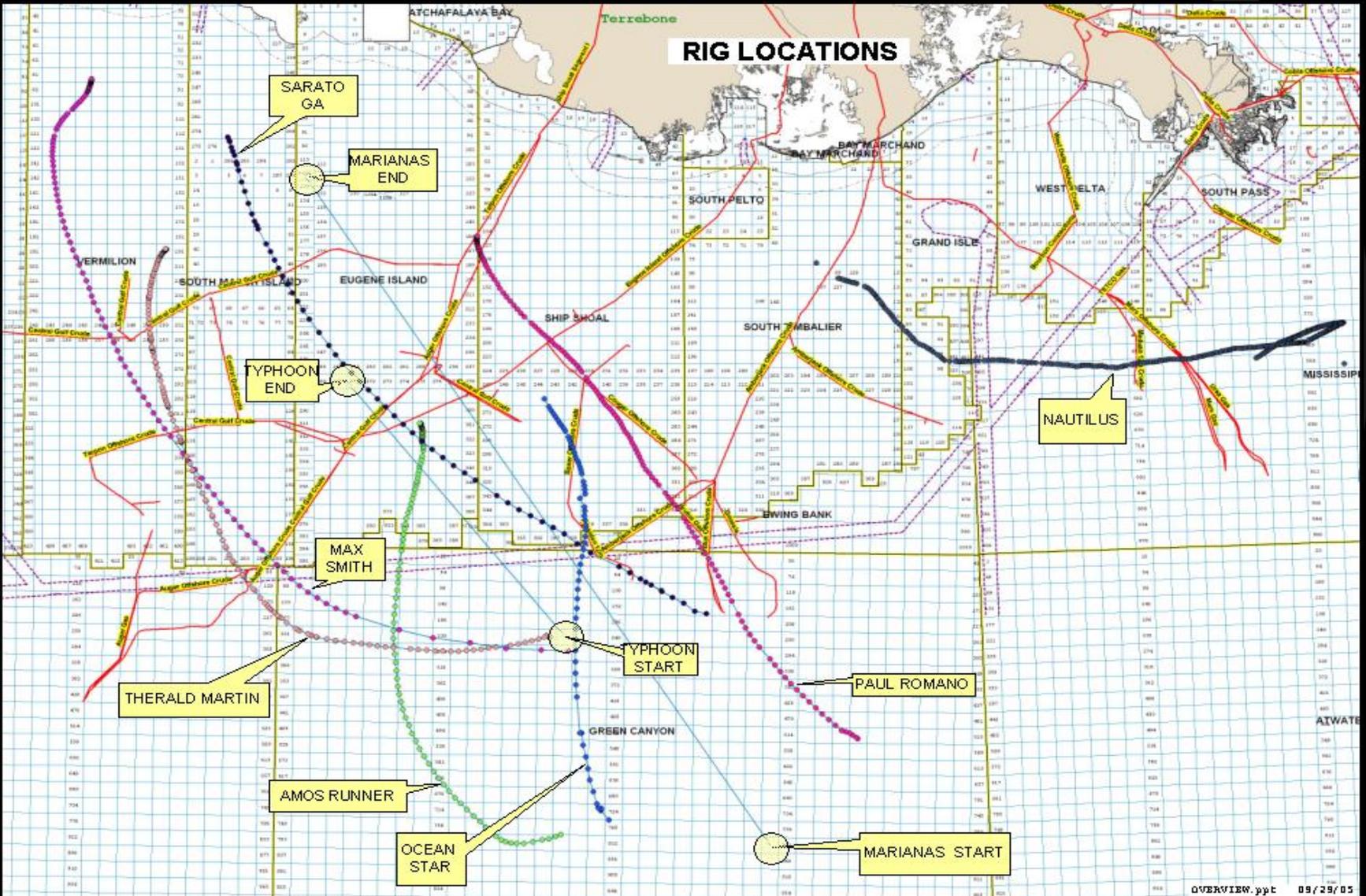












CANYON OFFSHORE XL-19

Time 08:04:17

DATE: 10/02/05

HEADING: 273

DO DEPTH: 523.24

ALTITUDE: 6.18

OTSL / Shell

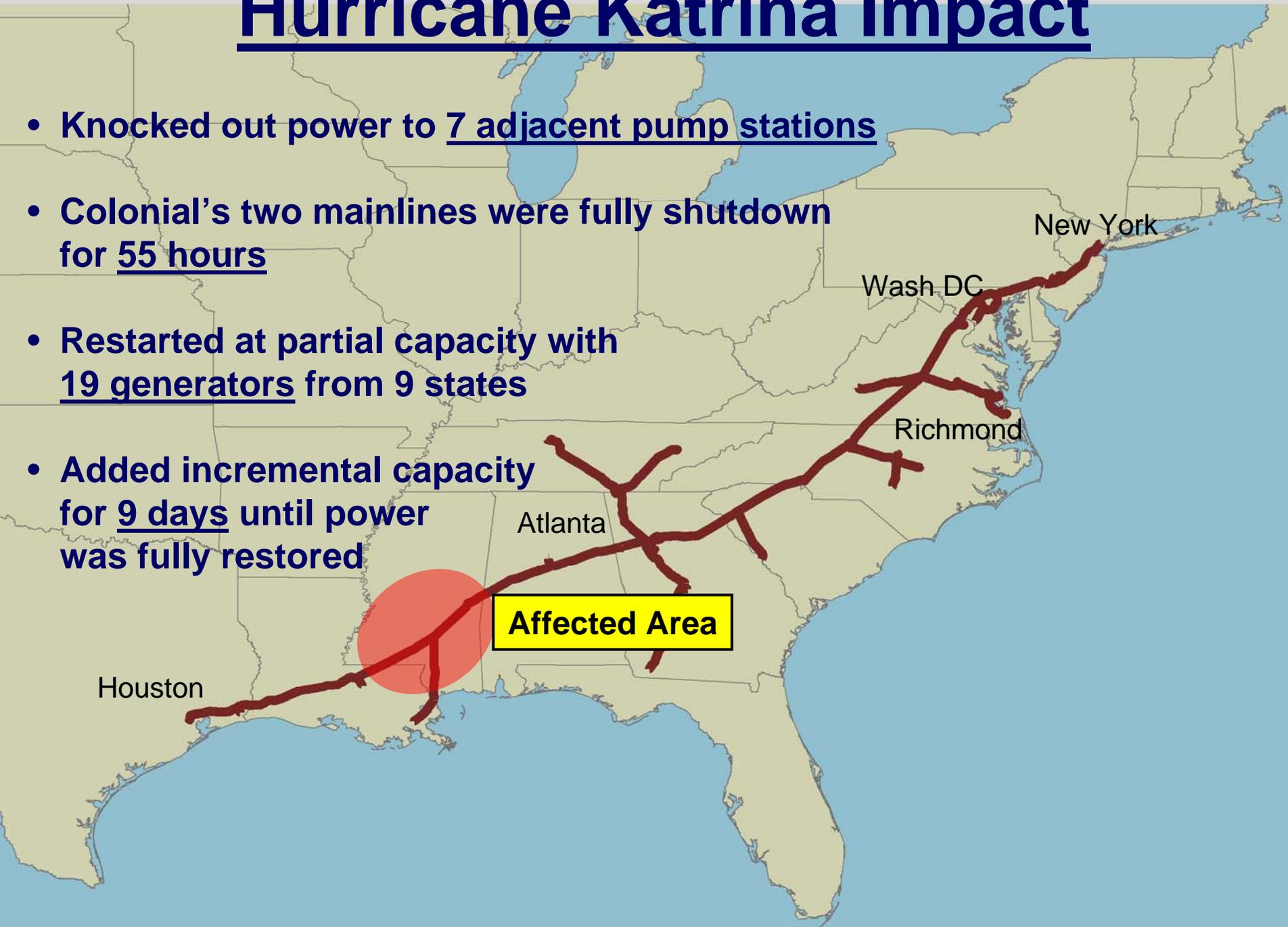
Post Hurricane Inspection



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# Hurricane Katrina Impact

- Knocked out power to 7 adjacent pump stations
- Colonial's two mainlines were fully shutdown for 55 hours
- Restarted at partial capacity with 19 generators from 9 states
- Added incremental capacity for 9 days until power was fully restored



# Hurricane Rita Impact

- Knocked out power to 5 adjacent pump stations
- Colonial's two mainlines were fully shutdown for 48 hours
- Restarted at partial capacity with 15 generators from 9 states
- Added incremental capacity for 19 days until power was fully restored



# API Hurricane Conference

Two-day hurricane conference in March, 2006 to discuss:

- Success stories
- Lessons learned
- Areas for improvement.

Government participation included DHS, DOE, EPA, DOT, USCG, and state and local agencies

Almost 200 industry participants from refineries, pipelines and corporate headquarters

# Common Themes

Planning - Response/continuity plans, training, exercises, inclusion of vendors

Preparation - Stage equipment and supplies, employee contact info/mechanisms

People - Find them, feed them, house them, keep them safe

Power - Reliable electric power not assured – backup generation considerations, priority restoration of services

# Common Themes

Coordination- Internal, community, government (fed/state/local), interdependent facilities and services, suppliers

Communication - Redundancy, diversification

# Planning

Companies update and practice incident response plans throughout the year.

# Preparation

Began reviewing hurricane emergency plans with personnel  
5 days before landfall

Secured tanks and facilities

Gathered contact information for all area employees

Evacuated employees in LA, MS and TX prior to landfall

Maintained contact with employees to confirm their safety and  
provide direction as they reported to work locations

# Preparation

Home Depot/Wal-Mart/Others “canned” disaster planning

Effective Emergency Operating Centers (EOC’s)

Leveraging resources throughout company and on company to company basis



# Emergency Response Centers



# Compassion towards Employees

The first priority was to locate employees and assess their needs

- Financial assistance to impacted employees
- Temporary housing (RV's, apartments, floating vessels, FEMA trailers)
- Consumables and equipment for employees and their families (food, water, ice, generators, batteries, etc....)

One Refiner re-established community daycare

Multiple Refiners provided meals for their employees during the recovery period







**Temporary Canteen**



**Dry Goods Storage**



**Relief Supplies**



**Relief Supplies**

## Power Issues

Refineries and pipelines were impacted by the damage to the power transmission infrastructure

- Generator needs were substantial to provide temporary power until permanent power was restored
- Pre-planning in the future will help better position for loss of power supply
- Imperative to work with Utilities to get priority restoration of power





# Resourcefulness to Minimize Production/Supply Impacts

One Refiner shipped in crude up Mississippi River due to outage of LOOP and associated pipeline

Refineries operated as terminals to minimize supply disruptions

One Refiner provided response support for LOOP and emergency generators for a products pipeline

## Coordination

Utilities staged and used personnel from across the country to restore destroyed power infrastructure

Government agencies were flexible to address supply:

- Gasoline RVP waivers
- Temporary Jones Act waiver to allow increased crude/product movement by ships

Major issue for refinery restarts was the “outside the fence” supply issues (hydrogen, nitrogen, oxygen, natural gas, crude oil & product pipeline infrastructure)

# Communications Issues

Land phones and cell phones largely inoperable

- Satellite phones helped but had their limitations
- Government Emergency Telecommunications Service (GETS) helped get priority service for emergency personnel
- Portable communication trailers helped restore phone and computer capabilities quickly

# Portable Communication Trailer



# Mobile Communication Suites: Satellite Phone, Internet, Fax



According to MMS Regional Director Chris Oynes,

**“The overall damage caused by Hurricanes Rita and Katrina has shown them to be the greatest natural disasters to oil and gas development in the history of the Gulf of Mexico.”**

22.7% of daily oil production and 13.6% of daily gas production in the Gulf of Mexico remain offline;

Only 3.3% of refinery capacity remains offline or operates at reduced rates.

(late April data)

# Going Forward

2006 Hurricane Season is around the corner

API & companies continue to work on improvement opportunities and prepare for 2006 season