


A satellite image of a large hurricane system over the Gulf of Mexico. The hurricane has a well-defined eye and a dense, swirling cloud structure. The surrounding ocean is dark blue, and the landmasses of North and South America are visible in shades of green and brown.

Natural Disaster Response


Gulf of Mexico Petroleum Industry Hurricane Season 2005

John J. Weust, International Emergency Preparedness Coordinator and
Corporate Emergency Response Team Program Manager, Marathon Oil
Company. January 25, 2006

Gulf of Mexico Hurricane Preparation

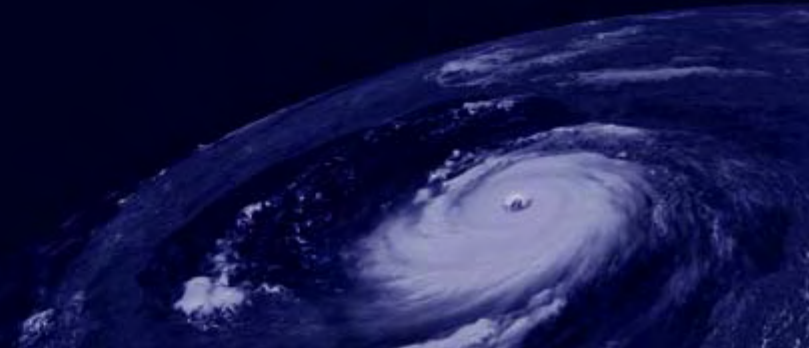
- **Shut-in offshore production well in advance, using accepted USCG guidelines**
 - **Evacuate offshore employees from platforms and move business essential employees from coastal areas to temporary business sites.**
 - **Operate onshore terminals in hurricane areas as full as possible**
 - **Increase both gasoline and crude inventories to offset expected downtime**
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Gulf of Mexico Hurricane Preparation

- **Corporate response teams and business recovery teams on standby.**
 - **Crisis centers up, running and monitoring storm progress**
 - **Critical “employee plan” in place, including:**
 - **Those who staff facilities**
 - **Timing for evacuating others (monitor local municipal plans)**
 - **Executive Relocation Plan (Corporate decision making)**
 - **Humanitarian Response Plan for Business Recovery.**
 - **72 hrs. before landfall – modify operations to protect people and assets. Start evacuating non-essential “and” moving business essential employees (and families) to alternate sites.**
 - **24 - 48 hrs. before landfall – start shutting down onshore facilities, including Corporate offices.**
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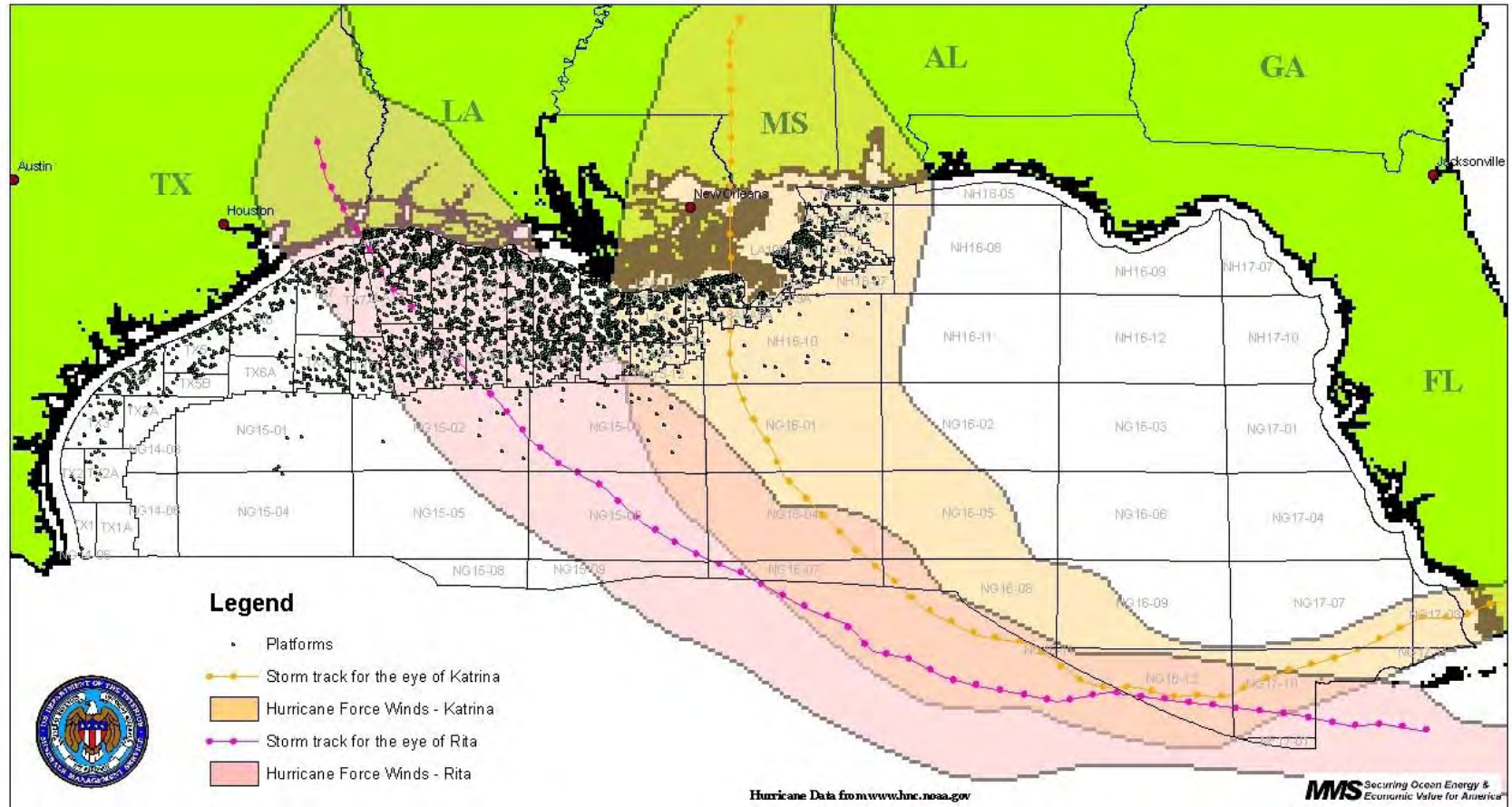
Gulf of Mexico Hurricane Preparation

- **Critical response/ investigation vehicles moved out of harms way**
 - **Helicopters and fixed wing aircraft moved out of Gulf area**
 - **Response/ survey boats moved out of storms path**
 - **Onshore response vehicles either moved or potentially damaged or destroyed**
 - **Significant numbers of available assets “commandeered” by FEMA**



Hurricane-Force Wind Contours

Hurricanes Rita and Katrina, August - September 2005



Onshore Situation in the Aftermath

- **Heavy devastation to homes, business, industry, infrastructure and transportation**
- **Access extremely limited: flooding, debris fields, trees down, bridges damaged, power lines down, etc.**
- **Access denied by Federal, State and municipal governments.**
- **Highway access routes jammed or one way only.**



Katrina & Rita: Infrastructure Damage



- Damage to railroads and interstates
- Ship channels closed
- Ports closed
- Natural gas facilities shutdown
- Product and Crude systems shutdown
- Damage to Gulf terminals



Hurricane Impact on Petroleum Operations

Aug. 29, 2005

Production:

- 92% of U.S. offshore oil production shut-in
- 83% of U.S. offshore natural gas production shut-in

Refining:

- 9 refineries (25% U.S. capacity) shutdown
- 15 refineries affected (14% U.S. refineries reduced production)

Pipeline

- No electricity to major pipelines feeding Southeast & Midwest
- Major pipelines shutdown

LOOP

- Not operating; 10% U.S. crude imports stopped

Jan. 6, 2006

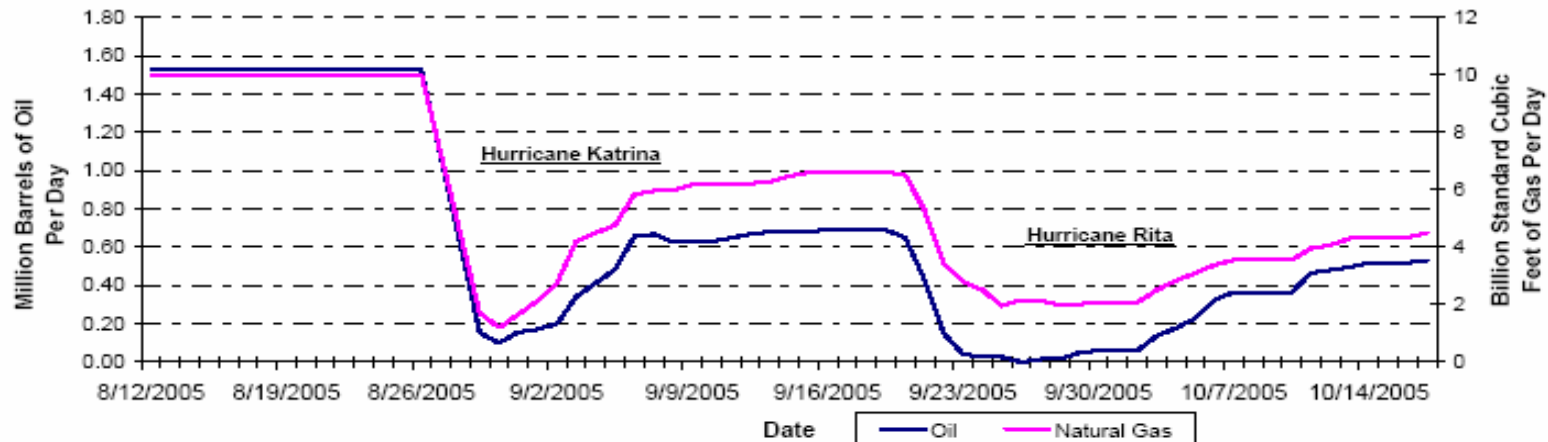
All operations normal except:

- 27% of U.S. daily offshore oil production shut-in
- 19% of U.S. daily offshore gas production shut-in
- 9% refining capacity shut-in



OCS Production Recovery

*Oil and Natural Gas Production in the OCS -
Pre and Post-Hurricanes Katrina and Rita*

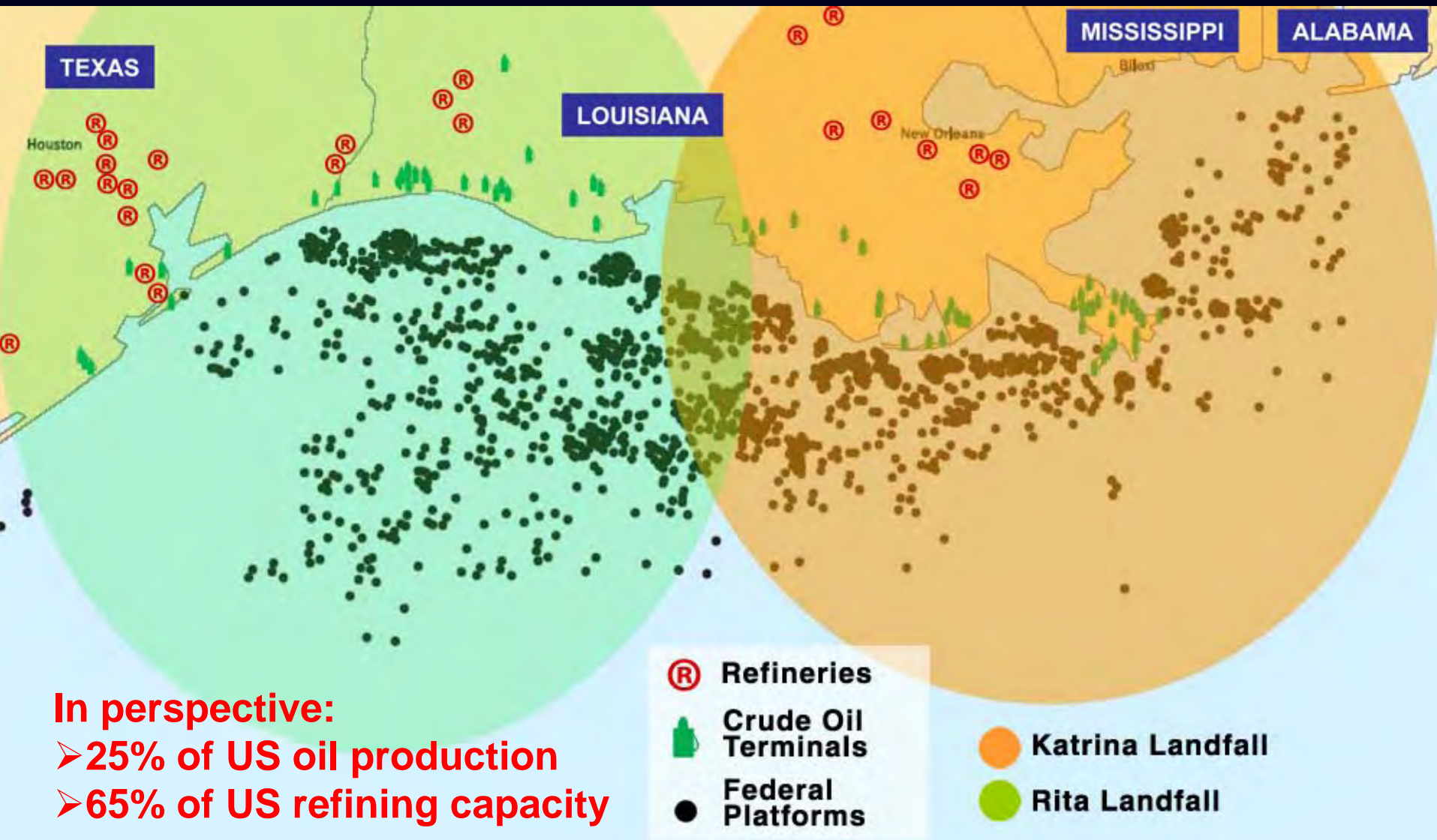


Date	Development	Date	Development
8/24	Katrina reaches Tropical Storm status	9/18	Rita reaches Tropical Storm status
8/25	Category 1	9/20	Category 1, 2
8/26	Category 2	9/21	Category 3 - 5
8/27	Category 3	9/22	Category 4
8/28	Category 4, 5	9/23	Category 3
8/29	Landfall - Category 4,3	9/24	Landfall - Category 3-1

October 2005: 65% of Oil and 52% of Natural Gas Daily Production Remained Shut-in

As of January 2006, 27% of U.S. daily offshore oil production 19% of U.S. daily offshore gas production and 9% refining capacity remains shut-in

Hurricane Impact on Gulf Oil, Refining & Natural Gas Operations



In perspective:

- **25% of US oil production**
- **65% of US refining capacity**

Gulf Coast to Midwest Pipelines

- Plantation
- Colonial
- Capline
- Centennial



➤ **Midwest crude runs cut 700,000 BOPD**

Offshore Damage Caused by Katrina and Rita

- 112 fixed platforms and well caissons destroyed.
- 1 deepwater tension leg platform destroyed
- 52 fixed and deepwater platforms with extensive damage.
- 46 drilling rigs severely damaged or impacted
- 64 offshore pipelines damages.



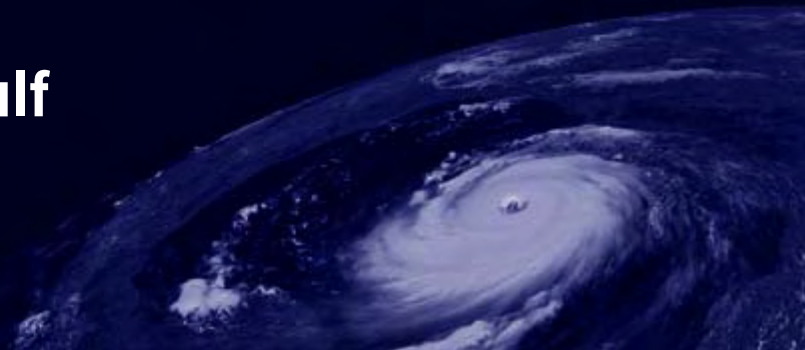
Katrina & Rita: The Human Toll

- **2.7 million customers without power**
- **An estimated 1.5 million people evacuated**
- **\$120 billion estimated damage**
- **275,000 homes destroyed**
- **1,333 confirmed deaths; 4,000+ still missing**



Katrina/ Rita Oil Industry Response Issues

- **Employee humanitarian response dominated first few days**
- **Facility/ spill investigations delayed**
 - **Limited air, sea and land transport available**
 - **Local employees unavailable and out of region employees unfamiliar with local operations**
- **Rigs missing, pipelines displaced, multiple spills**
- **Gulf of Mexico Response Oil Spill Response Organization's also impacted and left with limited capability**
 - **MSRC, NRC, CCA, Clean Gulf**
 - **Response capability limited**
 - **OSRL (UK) put on standby**



What can NOAA do to fill the gaps?

- Use remote satellite imagery and aerial overflights to investigate
 - Damaged/ toppled platforms
 - Missing/ relocated offshore drilling rigs
 - Damage/ access to refineries, onshore pipeline terminals
 - Oil spill source and severity
 - Assess damage to surrounding area
 - Etc.



What can NOAA do to fill the gaps?

- **Additional benefits**
 - **Develop a list of new hazards to shipping industry**
 - **Assist transportation sector with bridge/ road damage assessment**
 - **Assist FEMA with development/ location of humanitarian response sectors, damage assessments and location of adequate distribution sites.**
 - **Provide industry and response agencies with access route plans for both humanitarian and industrial response.**



Industry/API Cooperation with NOAA

- **Develop database of GPS coordinates for**
 - **Platforms**
 - **Drilling rigs**
 - **Pipeline corridors**
 - **Refineries**
 - **Terminals**
 - **Access Routes**
 - **Pre-storm satellite/ over-flight imagery**



Agency/Agency Cooperation

- **Key to success of major response is communication**
- **Sharing of information critical to rapid, efficient and effective response**
- **Is communication within NOAA sufficient?**
- **Other agencies?**
 - **Participation/role in IIMG?**

