Government – Industry Response to Issues Identified During the 2004-2005 Hurricane Seasons

Following Hurricanes Ivan, Katrina, and Rita, it was apparent that significant and immediate improvements were needed in MODU mooring capabilities. As a result, Secretary Norton and MMS Director Burton convened a meeting in Washington to develop a plan for improving the station keeping performance of mobile drilling units with a timetable to ensure that mitigations would be in place prior to the following hurricane season.

The meeting was a resounding success. In addition to addressing station keeping concerns, a comprehensive list of hurricane issues was developed. Industry and government then worked together to assess mitigations and develop new standards and procedures. Much of this work was completed before the 2006 hurricane season, and all of items listed below were accomplished prior to the 2009 season. Had the government elected to act alone and draft regulations to address these issues, most of the work would still not be completed.

The following **work groups and committees** were formed:

- Committee on Hurricane Response
- MODU Joint Industry Project
- IADC jack-up rig committee
- API Hurricane Evaluation and Assessment Team (HEAT).
- Subcommittee on Offshore Structures RP 2SK Work Group

The work groups coordinated the review of design standards and provided a forum for sharing lessons learned. The following **standards** are a direct result of this initiative:

- **API Bulletin 2INT–DG, Interim Guidance for Design of Offshore Structures for Hurricane Conditions**: guidance on the use of the updated wind, wave, surge and current criteria for the design of offshore structures
- **API Bulletin 2INT–EX, Interim Guidance for Assessment of Existing Offshore Structures for Hurricane Conditions**: guidance on the use of updated metocean critieria for the assessment of existing offshore structures
- **API Bulletin 2INT–MET, Interim Guidance on Hurricane Conditions in the Gulf of Mexico**: hurricane-driven metocean criteria (wind, wave, current and surge)
- **API RP 2I, In-Service Inspection of Mooring Hardware for Floating Drilling Units**: inspection guidelines for MODU and permanent moorings, including fiber rope
- **API RP 2SK, Recommended Practice for Design and Analysis of Stationkeeping Systems for Floating Structures:** guidance for design and operation of MODU mooring systems in the Gulf of Mexico during the hurricane season.
- **API RP 2SM, Recommended Practice for Design, Manufacture, Installation, and Maintenance of Synthetic Fiber Ropes for Offshore Mooring**: guidelines on the use of synthetic fiber ropes for offshore mooring applications.
- **API RP 95J, Gulf of Mexico Jackup Operations for Hurricane Season**: siting and operational procedures to enhance jackup survivability and station keeping during hurricane season
- **API Bulletin 2TD, Guidelines for Tie-downs on Offshore Production Facilities for Hurricane Season**: guidance to prevent rig and equipment failures and movement during hurricanes

Mooring Risk Assessment Software: As a result of a Joint Industry Project, innovative software was developed to assess the probability of mooring failures on mobile drilling units and the consequences of any failures that might occur. BSEE continues to use this software to evaluate each application for

drilling during the hurricane season. Where necessary, special mitigations are employed, alternative sites are selected, or wells are deferred until after the hurricane season.

Research: To better understand past performance and prepare for future hurricanes, MMS initiated 18 projects to:

- Assess and evaluate pipeline movement or damage.
- Assess and evaluate platform damage.
- Compile hurricane hindcast data.
- Evaluate and assess the performance of jack-up rigs.
- Assess methods to eliminate hydrates in pipelines and risers during startup after a hurricane.
- Assess the response of waves and currents throughout the water column in the northern Gulf of Mexico slope and shelf.

A cooperative interagency project demonstrated the use of satellite imagery for making timely assessments of facility damage and spillage following a hurricane.