

# Industry gets ready for 2007 hurricane season as mooring JIP nears completion, API guide updated

A JOINT INDUSTRY project on the industry's mooring needs is nearing completion, said JIP chairman **Craig Castille**, **Dominion E&P** drilling manager. He estimated that 90%-95% of the initial scope of the project will be completed by May 2007, and the rest should wrap up by August 2007.

"We've made good progress," he said. "It's been a good forum for the dissemination of information, for active discussions and improvement in the management of risk. Very importantly, it's engaged the full industry, from suppliers to contractors to operators, both majors and independents."

According to **John Stiff** of **ABS Consulting**, which is managing the JIP, a metocean study and a failure analysis of rig performance in hurricanes Rita and Katrina have already been completed. A consequence modeling spreadsheet has been developed to calculate various parameters of the infrastructure around the rig location and to assess the

potential consequences of a mooring failure. The checklist for that tool is being updated for the 2007 hurricane season and should be ready in May 2007.

Another large piece of work that has been completed is the deterministic mooring analysis matrix by **Delmar**. The report assessed the capability of the current MODU fleet and the impact of the upgrades that drilling contractors implemented over the past 2 years, said **Delmar** engineering manager **Evan Zimmerman**. Response from participants at a meeting in early February was very positive, he said.

Additional reliability work for the JIP is ongoing, and final results are expected by June, Mr Stiff said. Efforts are under way to help determine the level of low-frequency damping suitable for different types of rigs under different mooring/metocean conditions. To improve a tool for predicting anchor capacities, the **Offshore Technology Research Center** (OTRC) is conducting both physical tests and computer simulations.

## INCREASED EXPOSURE

Mooring failures in the 2005 hurricanes weren't all that surprising, considering the intensity of the storms. "The conditions so far exceeded the conditions the mooring systems were designed for," said **Todd Veselis**, project manager with **InterMoor**, a participating service company with the JIP.

The obvious step, then, was to design for more stringent conditions.

"Now that we're operating in deeper and deeper water and further offshore with bigger rigs, our exposure to more intense storms has increased," Mr Castille said. After mooring failures in 2004's Hurricane Ivan, a lot of discussion went on at the **Offshore Operators Committee** (OOC) Drilling Technical Subcommittee. "There appeared to be a lack of a thorough understanding and consistency among the industry about what was required. There was a need to thoroughly assess the reliability of MODU moorings, and the JIP brought together the funds and the right people to do it." Ultimately, he added, the information learned in the JIP will be rolled into API to update the recommended practice.

## API RP 95F

API Recommended Practice 95F, an interim guide for Gulf of Mexico mooring practice, was published last year for the 2006 hurricane season. It was revised for the 2007 hurricane season.

According to **Karl Sellers**, **Diamond Offshore** vice president of engineering, who helped draft API RP 95F, key elements introduced in the 2006 edition are:

- The minimum design environment return period is now 10 years. Prior to the establishment of 95F, a 5-year return period storm could have been used.
- Site-specific metocean data must be obtained for each location, or the "default" metocean data in 95F must be used. Gulf of Mexico metocean was recalibrated to remove specious early data and account for the recent major hurricanes and is now significantly higher.
- Minimum wind speed to be used for analysis is 64kts, even if site-specific metocean indicates a lower value.

- A mooring strength assessment and post-installation check are recommended on top of traditional safety factor checks.
- A current mooring equipment inspection log must be maintained.
- A risk/consequence assessment must be completed for each drilling location. Factors that heavily influence the final "risk rating" include the rigs' proximity to seafloor architecture and surface facilities, anchor type and capacity, and risk mitigation measures taken.

Changes to the new RP for 2007 include additional information on mooring failures in the hurricanes, guidance on how to perform weak point analysis, and an API version of the metocean document (2INT-MET), which supplants the JIP metocean data.

The majority of MODUs in the Gulf of Mexico have been upgraded from 8-point to 12-point mooring systems. For Diamond Offshore's Gulf of Mexico fleet, Mr Sellers said, this was accomplished by adding 1 pre-set line to each corner of the rig — no additional mooring winches were added. This improved stationkeeping ability by up to 50%, he added.

## RAISING THE BAR

There's no doubt that the mooring bar has been raised, and Mr Zimmerman of Delmar said he's been impressed with drilling contractors' efforts to improve their rigs' mooring systems. "They really took the initiative, especially with rig upgrades," he said.

On the supplier side, efforts also have been made to help drilling contractors meet the higher mooring requirements, he said. "Delmar has put a lot of effort into procuring additional equipment. We've been developing a new VLA (vertically loaded anchor) for use in the Gulf of Mexico to add to the available options to get a mooring system to fit dense offshore fields." That VLA is still in the testing phase, he said.

Going into the 2007 hurricane season, the industry is much more prepared than even last year, Mr Veselis said. Upgrades have given rigs the ability "to withstand a bigger storm," he said. "In that respect, we're even further up the learning curve now. We've had a year to practice setting out the moorings, which really is more complicated — there are more of them and they're not all adjustable."

## A RISKY VIEW

For **Frank Puskar**, president of **Energo Engineering**, a specialty structural engineering firm performing reliability studies for the mooring JIP, the mooring issue has highlighted the importance of understanding risk in our industry.

"Not only is there better understanding of the metocean wind, wave and current conditions in the Gulf of Mexico, we have properly put the design of the MODU moorings on a risk basis," he said. More business decisions need to be made on risk and reliability than in the past, and he thinks the industry must do more work in this area for the future.

"I think it's important for rig owners and operators in the Gulf to account for risk on a case-by-case basis. One, we're drilling in deeper waters where there are more uncertainties. Two, we're drilling in areas close to very expensive infrastructure. You have to consider: What's at risk if a MODU breaks its mooring lines?"

Of course, no one can say we're completely ready for the next big storm. But as it always has in the past, the industry is moving forward as we adjust to a new understanding of our environment. ♠