



CASE STUDY

Shell's Mars Platform

Safety in Katrina's Wake

By Nicholas Zepeda

Situation

Hurricane Katrina significantly damaged the deepwater ten-sion-leg Mars platform, operated in the Gulf of Mexico by Shell and co-owned with BP. Four hours of 170 mph winds and 200 mph wind gusts and wave run-up heights of up to 100 feet overtaxed the massive clamps holding the 1000 ton drilling rig, causing the structure to fail and topple onto the deck. The storm also set adrift a mobile drilling rig in the Mars platform vicinity and dragged its anchor over the Mars underwater export pipelines, cracking them. Mars' oil and gas production, the largest (by daily volume) platform in the Gulf of Mexico, shut in advance of the storm and would stay at zero for some time.

Shell Operations Manager Floyd Landry led the salvage and reconstruction project. Despite the risk issues involved with working around bent steel, collapsed superstructures, and sunken materials, Shell was able to put the Mars platform back in operation staying true to their safety goal: zero serious injuries and all workers return home safely.

Solution

Shell made sure they had the right technical equipment and experts for the project. They contracted a Finnish ice breaker and Dutch derrick barges for removing the toppled drilling rig structure and ferrying it to shore for repairs. They brought in a five story flotel (floating hotel) with a unique, deepwater mooring system from the North Sea for the living space needed for the extra 600 specialists. In addition, they used remote controlled robotic units and a specially designed pipe repair kit to fix damaged pipelines 2,700 ft below the surface.

Throughout the salvage and repair operation, Shell maintained a comprehensive and rigorous safety regimen. They conducted daily management and weekly safety staff meetings, safety walkthroughs, and job site environmental audits. The Behavioral Accident Prevention Process® (BAPP®) safety initiative, Continuous Observation Awareness Technique (C.O.A.T.), remained active around the clock, training everyone on site in behavior-based safety (BBS). Interpreters enabled the work crew, made up of technicians from around the world, to fully understand the training.

Personnel from throughout Shell experienced in BBS assisted Mars with safety work sponsorship. This extra help enabled C.O.A.T. to observe all types of work involved in the project. The sponsors coached new observers in side-by-side observations. Through more than 2,600 behavior-based observations, the process tracked exposures and critical behaviors for trends that revealed barriers to safe work. One observer identified fall protection exposures under Deck 1 where much of the work was over water. The personal flotation devices workers were wearing made crawling around and among piping difficult. The observation data prompted Shell to provide a new type of fall protection with built-in flotation devices.

The presence of C.O.A.T. helped everyone on the platform stay focused on safety. The site was able to remove or mitigate 365 exposures to risk identified by observations during the project.

Results

The Mars platform went back on line in May of 2006. The safety numbers showed no recordable injuries during 1 million work hours. By the time the drilling rig was put back on in March 2007, the site had logged 1.2 million salvage and reconstruction work hours without a recordable injury. The site also added other safety features to their operations: new clamps capable of withstanding 2 million psi, four times as strong as the previous clamps, improved communications systems critical for monitoring approaching storms, more on-call helicopters and ships for evacuations, and a greater number of spare parts available for emergency repairs. Shell also began a study of alternate ways to get oil to refineries

At a Glance:

- The Mars platform is moored in 3000 feet of water 130 miles south of New Orleans
- Over 2,600 behavior-based safety observations identified 365 exposures on site
- Shell's post-Katrina repairs to the Mars platform were completed with no recordable injuries during 1.2 million work hours

when pipelines are damaged. In addition, the company participated in a joint industry effort to develop more robust mooring systems and practices for offshore drilling rigs.

Marvin Odum, executive vice president and head of Shell Exploration & Production in North and South America says, "The Mars platform recovery and deepwater pipeline repairs were among the most technologically complex operations in the world, and our people were up to the task, completing the work safely and ahead of schedule."

Acergy remains determined to position itself as an HSEQ industry leader by continuing to develop its safety culture and build in the consequences that drive safe behaviour in the most positive ways. Moving forward, they will continue to reinforce compliance with policies, procedures, and processes, reminding personnel of their obligation to stop unsafe operations, and management responsibility for both action and lack of action.