Coil Tubing Drilling and Intervention System Using Cost Effective Vessel

Research Objectives
The primary objective was to advance the work previously done with industry funding, and add engineering detail needed as the basis for an offshore demonstration of a cost-effective coil tubing (CT) system for downhole work in Deepwater Gulf of Mexico satellite wells, without need for a mobile offshore drilling unit (MODU). Completion of the design and demonstration work improved safety and environmental protection, facilitated improved resource recovery from existing satellite wells, and made it practical to develop reservoirs that would otherwise not meet economic hurdles.

Approach
Compiled reports that included a literature search on offshore use of coiled tubing, suitable vessels, and riser modeling and design work.

Accomplishments
The first phase of the project produced the conceptual design of the components needed for the subsea riser (SSR) system. Challenges addressed include the use of CT from a cost-effective vessel in deep and ultra-deep water—the size and weight of the CT equipment in relation to vessel deck space and deck load, the effects of water depth and ocean currents on the equipment, and the need to have a riser for circulation. A detailed hazard identification review concluded that the hazards identified during this design phase have been effectively managed and mitigated.

Significant Findings
Work completed shows that the goals of the project can be met. This includes improved safety and environmental protection, a design suitable for use in the strong current and deep water of the central Gulf of Mexico, and cost of less than half that of using a MODU for downhole intervention in deepwater satellite wells.

Future Plans
The second phase (10121-4505-01) includes staging of equipment, mobilization to a vessel, and safe demonstration of downhole work using concepts presented as part of the 2010 and 2011 work. This work will require a permit, based in part on control system logic diagrams developed in this project. Future work is expected to include a listing of the operators and types of completions and well heads currently installed in the Gulf of Mexico and demonstration of the technology for an innovative method for improved safety and reduced cost for well interventions in deep water.

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