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**Development Lessons at Holstein Field, Deepwater Gulf of Mexico: Integrating Datasets, Analogs and Disciplines to Optimize Development Well Placement and Assure Reservoir Value**

The Holstein Field is a 350mmboe development in the northern Gulf of Mexico comprising multiple, stacked, turbidite sands deposited above salt. The field's location far from infrastructure and in water depths exceeding 1300 meters poses cost challenges common for many frontier deepwater developments. BP is operator and in partnership with Shell the project has benefited from the collective experience in other deepwater projects.

In addressing cost challenges, the development strategy was made more critical by the nature of the multiple reservoirs. Following discovery in 1999, a rapidly-paced, one-well appraisal program established commerciality. At this stage, development planning proceeded with core data, conventional 3D seismic, analogs, depositional models, and engineering sensitivity studies. Reservoir connectivity and permeability were critical uncertainties for rate and recovery in a waterflood program. The plan to acquire reservoir data during development included:

- Early commitment to proprietary high-resolution 3D survey (pre-sanction in time to plan wells).
- A pre-drill program of key wells to be drilled early with dual objectives of appraisal and development.
- Establish a plan, baseline and dataset for dynamic data including pressure monitoring and 4D seismic.

The pre-drill program was completed in 2002 with significant lessons learned to employ in the remainder of development drilling in 2004. Success and cost savings of this program were the result of a deliberative well planning process integrating opposing objectives of drilling engineers, reservoir engineers and geoscientists who led the effort utilizing 3D visualization techniques to enlist understanding of reservoir architecture, risks and objectives.