



Shell Exploration & Production

Shell Energy Resources Company

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U.S. Department of the Interior
Minerals Management Service
Attention: Regulations and Standards Branch
(RSB); 381 Elden Street, MS-4024,
Herndon, Virginia 20170-4817

Dear Mr. Danenburger:

SUBJECT: TECHNOLOGY SUSPENSIONS

Shell appreciates the Minerals Management Service's (MMS) efforts to address regulatory and technical challenges in the ultra-deepwater regions of the Gulf of Mexico. Shell personnel participated in the January 23, 2008, workshop hosted by MMS. The workshop was in response to an industry request for MMS to consider granting lease extensions that would allow additional time to develop technologies when high-pressure or high-temperature (HP/HT) conditions occur on leases that are beyond the capability of existing equipment. The intent of the workshop was to discuss the possible need for MMS to develop a new regulation that would allow for a Suspension of Operations (SOO) on leases that have unexpected HT/HP. The workshop also requested industry's participation on whether such suspensions are warranted. Mr. Charlie Williams made a presentation from Shell's perspective. These comments and Shell's recommendations are provided for your consideration on whether to grant such suspensions.

Shell agrees that conditions related to HP/HT are technically challenging for drilling on ultra-deepwater fields, and there are numerous complexities due to the location of these fields and the harsh environment. Because of this, there is no single technology that can be used to address such challenges. Shell has demonstrated that it is possible to address technological challenges during the standard lease terms. Shell has a long and successful history of drilling, completing, and producing in the deepwater regions of the Gulf of Mexico going back to its Auger field in 800-meter water depths in 1993. Shell has been a leader in extending the use of new technologies to deepwater areas, for example, with its record-setting tension leg platform (TLP) at Ursa in 1,220 m water depths and with the deepest spar at 2,382 m on the Perdido field. Likewise, a subsea umbilical installation record was set with the Mensa development at 1,800 m. Shell has successful experience with HP/HT conditions, demonstrated at both onshore and offshore leases, with

pressures up to 23,000 psi (onshore at Thomasville) and 16,500 psi (offshore at Alex) and temperatures reaching 485 degrees F (Fandango) and 410 degrees F at (Mobile Bay).

In regards to whether suspensions due to HP/HT are warranted, Shell offers the following responses to MMS questions that were posed to industry in the November 8, 2007, Federal Register notice:

1. Is the concept warranted? Why?

Shell believes that the existing mechanisms of SOO and Suspension of Operation (SOP) are sufficient to manage the development of current discoveries in the Gulf of Mexico. The current SOOs/SOPs provide enough flexibility to deliver the timing of first-time development technical challenges. Shell does not oppose, on an exceptional basis, specific prospect-based SOPs for technology solutions with a clear well-defined path and milestones to development.

2. How should MMS define "technological challenge" that would make one eligible for such a suspension?

- Small and/or sub-economic accumulations;
- Viscous oil and/or low energy drive and lift;
- Well testing – especially extended;
- Seismic – challenging new formations and overburden;
- Extended reach drilling – including shallow reservoirs and normal/under-pressure reservoirs;
- Subsea pumping and processing;
- New deepwater structure designs; and
- Flow assurance, long off-set, cold flow.

3. What other eligibility criteria should be considered?

Shell's approach to deepwater exploration, development and production continues to evolve and is influenced by our prior experience and emerging challenges; including water depth, subsurface complexity, and production system. Shell's initial developments in the Deepwater Gulf of Mexico focused on major development decisions employing a TLP design at Auger, Mars, Ram Powell, Ursa, and Brutus. As Shell moved into deeper water and increasingly challenging reservoirs, new production systems were developed to address these challenges; examples of these developments include Nakika and Perdido. Our current portfolio of opportunities, including the outboard Paleogene and Eastern Gulf of Mexico Norphlet plays, represent a step change in complexity - reservoir and fluid properties along with reservoir pressures and temperatures.

Given the lack of production experience and analogue field data, this third phase of exploration/appraisal opportunities are likely to require Extended Well Testing (EWT) to understand and reduce critical subsurface uncertainties prior to commitment and installation of a long-term development system(s). Any EWT would be planned and executed in the context of an overall exploration, appraisal, and delineation plan.

There is currently no vessel that exists or is being built for executing EWT activity in the Gulf of Mexico. One option is for an FPSO vessel or an FPDSO vessel (e.g., the MPF-1000 being

built) to be utilized on a specific prospect for single-well extended production tests (less than 12 month in duration).

The planning and execution of an EWT in the Gulf of Mexico will require the commitment to a deepwater test vessel along with critical long lead items (e.g., subsea equipment) up to 2 years in advance of the actual EWT. The overall process would involve drilling and completing a well, conducting a short-term test to establish commercial rates, and proceeding to EWT to study critical reservoir uncertainties.

4. What would tangible/observable milestones be for technology development related to a lease?

Technical milestones can also be included in the SOPs. For example, a HIPPS (High Integrity Pipeline Protection System) technical study could be implemented prior to moving forward with the other SOP milestones to first production. Shell fully supports joint industry (and third-party) research and development to assist in solving the challenges of the deepwater reservoirs in the Gulf of Mexico.

5. How long should such a suspension last, and should it be renewable?

12-18 months maximum.

If you should have any questions concerning these comments, please don't hesitate to contact me at 281-544-4803 or Kent Satterlee at 504-728-4143.

Sincerely,



Russ Ford
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