



Blowing winds and cracking rock

Posted by [Heading Out](#) on July 12, 2005 - 10:28am

Topic: [Supply/Production](#)

Updated to add: [This article](#) (hat tip: [peakoil.com](#)) states that

the damage at BP Plc's (BP) giant Gulf of Mexico Thunder Horse platform in the wake of Hurricane Dennis will defer for at least 3-6 months 25,000-45,000 barrels a day of oil that was supposed to hit world oil markets late this year, according to Pickering Energy Partners, a Houston energy research firm.

Thunder Horse, the largest oil and gas discovery in the history of the Gulf of Mexico, has been built to reach peak production of 200,000 barrels of oil and 200 million cubic feet of natural gas per day. The massive project is currently being installed in a remote area of the Gulf of Mexico, and was supposed to hit first oil in the third or fourth quarter of 2005.

Original post: Well before I get back to some more thoughts on drilling holes in the ground, I would like to bring forward a note that Mike Watkins drew attention to in the comments on the hurricane. It appears that the Thunder Horse platform (the black dot in [this graphic](#)), suffered some damage due to Dennis (thanks to J for the photos, who says: "To get an idea of the size of this thing, each of the orange lifeboats you see can hold about 65 men crammed tightly, if I remember correctly...").



There is a photo [here too](#), but the [Reuters story](#) quotes BP as saying that the 20°-30 degree list may be just due to excess water in the ballast tanks, rather than any major structural damage. (Which may be good since Emily is already [on her way](#)).

Interestingly, at the time Thunder Horse was dedicated there were [comments](#) that it was a safer design than some alternatives.

The Minerals Management Service (the federal agency that regulates drilling, issues leases and collects royalties for the government) is currently reviewing industry

construction and operation standards for offshore platforms because of severe damage last September from Hurricane Ivan, the worst ever for the industry in the oil and gas-rich producing area.

Mercier said floating platforms fared pretty well during the storm, but some fixed rigs suffered damage. He said the worst damage was to underwater pipelines from mudslides.

Companies are still working to repair about nine platforms that remain out of production. Work is also under way on pipelines with a June 1 deadline imposed by the MMS.

The devastation from Ivan could have been even worse if it had taken a course through the western gulf, where the oil and gas production is more widespread, Trahan said.

Of interest to those concerned with the environment was a different comment:

To prevent overboard water discharges, the water produced by the platform will be mixed with sea water and re-injected for reservoir pressure maintenance, officials said.

In fact I suspect that a lot more of the material that an oilwell generates as waste, cuttings, extra cement and other fluids will also end up being re-injected into the ground deep beneath the platform. By pressurizing a dedicated well to the point that the rock cracks around the hole, it is possible to create some space in that rock, well below levels where it might create problems.

By pumping the waste into these cracks, the oil companies can minimize the total impact of the drilling on the local environment, even in very sensitive locations. It is a technique used in the North Slope and North Sea fields and is a planned answer to those who are concerned that the development of [Sakhalin Island oil field](#) might otherwise generate significant local contamination.

The technique has gained in popularity recently, and repeated cycling of the pressure within the well can lead to a family of cracks being generated and opened that can contain all the volumes of unwanted materials that might otherwise create problems. The cracks are located in a rock that can be expected to hold the material essentially in perpetuity. It does not however impact the issue of the [gray whale population](#), another problem that they have at that site.

This idea of cracking the ground is also fairly old news, since it is one of the ways in which a poorly performing well can be encouraged to perform more effectively. It is, for example, being used in Ft Worth to make the Barnett Shale there a highly productive [new source of gas](#). As [referenced earlier](#), this is making some locals there a little more comfortably off. But it requires that the rock be cracked allow the gas to flow from the rock, since naturally it will not release hardly any gas.

Finding the optimum fracture techniques was critical to the Barnett play since average permeability is in the nano-darcies and porosity averages between 5 and 6 percent," Bowker said. "Matrix permeability is nil, but we hope for permeability along the fractures."

The typical fracture stimulation today consists of a million gallons of water and 50,000 pounds of sand to create a theoretical zone of fracturing that is about 1,500 feet long in

both directions, for a total length of 3,000 feet.

Average cumulative production from the initial fracture stimulation is 1.25 billion cubic feet of gas per well. The wells initially produce for about one million cubic feet of gas per day but experience a 50 percent decline in the first year. Then the wells stabilize and produce for an average 20 years, with expected life in excess of 30 years.

Of course, when they crack this far from the original well, you have to wonder if all the neighbors are aware that the crack might be growing under their house too. But that requires that they know where all the cracks grow, and that is a little more tricky.

Technorati Tags: [peak oil](#), [Thunder Horse](#), [Dennis](#), [Hurricane Dennis](#)



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