



Gulf Coast hurricanes and their impact on offshore oil production.

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We have been hearing in recent months of Hurricane Katrina and of the damage it caused on- and offshore. The Gulf of Mexico has a long history of hurricanes. This first recorded hurricane in the Gulf was in 1527, at which time Spanish conquistadors were exploring there. Five vessels bearing conquistadors encountered a hurricane and were, in the words of one historian, 'tossed like driftwood'. The first Gulf hurricane in the 20th Century hit Texas in September 1900 and claimed 6000 lives. This hurricane was never assigned a name but is simply referred to as the 1900 Galveston Hurricane. There is a well known picture of the wrecked Sacred Heart Catholic Church on Galveston Island in which 400 people spent the night during the hurricane and thereby survived. There are two indices for the severity of a hurricane: wind speed and barometric pressure. The 'standard atmosphere' is, in units commonly used in the discussion of hurricanes, equal to 29.9 inches of mercury, and the extent to which the pressure during a hurricane falls below that is a measure of its power. Estimates for the 1900 Galveston Hurricane are 190 miles per hour for the wind speed and 28.2 inches of mercury for the barometric pressure. Hurricanes in the Gulf tend to occur between July and September.

It is with the effects of hurricanes on the oil industry that this article is concerned and the indirect effects of the 1900 Galveston Hurricane were far-reaching. It occurred only four months before the famous oil gush at Spindletop near Beaumont, which was to make Texas an 'oil state'. Several oil companies still in existence were formed soon after the Spindletop discovery. At least partly because of the hurricane such companies established their business centres in Houston rather than in Galveston. It is seldom productive to speculate what the results would have been if this or that event in history had not happened when it did. However, the word 'far-reaching' was used advisedly earlier in this paragraph as it is possible that had the 1900 hurricane not occurred Galveston would have had the place that Houston now has in world oil affairs.

There were about fifteen hurricanes in the Gulf between the 1900 one and the first offshore oil production in the Gulf in 1945. In early September 1948 a hurricane hit Timbalier Bay, Louisiana. Wind speeds of 90 m.p.h and barometric pressures of 29.21 inches of mercury were recorded. Heavy damage was done to the nearby offshore oil platforms, only three years after they came into service. Fortunately there was no loss of life. It is however recorded that on a platform operated by Calco (the forerunner to Chevron) fifty men were put at serious risk. The first hurricane in the Gulf to be assigned a name was 'Hurricane Flossie' in 1956. There was damage to platforms but again no loss of life, and at the time this was seen as reassurance that a major hurricane in the Gulf would not threaten the lives of persons on offshore platforms.

Flossie was followed by Hurricane Audrey in June 1957 (strictly speaking an exception to the 'July to September' rule: there are about half a dozen such exceptions in compilations of

Gulf hurricanes) which caused damage to offshore installations in the Gulf. The only platforms not damaged by Audrey were those of what was then a new design, known as the Scorpion platforms. The Scorpion was one of the earliest mobile offshore production facilities, first commissioned for the Zapata Offshore Company, Houston in 1956 for use in the Gulf of Mexico. A second such facility followed in early 1957 and both survived Hurricane Audrey. There were ten platforms of the Scorpion design in use by 1959, not all of them in the Gulf of Mexico. As a point of interest, the president of Zapata Offshore Company at the time that it obtained its first Scorpion platform was George H.W. Bush, later President of the US and father of the present President.

Hurricane Carla began on 11th September 1961, exactly 40 years before the day we now refer to as '9/11', and continued for about three days. Its minimum barometric pressure was exactly the same as that at the 1900 Galveston Hurricane. During Hurricane Carla some fixed oil production platforms in the Gulf, with supports deep into the seabed, moved eight to ten feet towards the coast.

Hurricane Hilda in 1964 severely impacted the town of Erath Louisiana. This is of course the location of Henry Hub, where many major natural gas pipelines interconnect. Internationally the 'Henry Hub price' is the benchmark price for natural gas, the counterpart of Brent crude or the OPEC basket in the pricing of oil. More importantly in terms of the content of this article, Hilda destroyed 13 offshore platforms and caused damage to several more. Only a year later Hurricane Betsy destroyed eight more installations in the Gulf including one belonging to Zapata: a \$5 million insurance payout was received by the company. Over the period of our discussion offshore platforms were of course becoming more advanced in design and resistance to hurricane damage was one important factor. Shell in particular attempted to construct safer platforms, having taken measurements of such quantities as wave height during a hurricane. During Hurricane Camille in 1969 wind speeds of 190 m.p.h. occurred and the barometric pressure dropped to 26.84 inches of mercury. Three Shell platforms designed to have improved hurricane resistance were destroyed by Camille, one of them having commenced production only earlier that year.

The 1970s saw three hurricanes in the Gulf, the final one in 1979 - Hurricane Bob - being the first to be assigned a masculine name! Hurricane Allen in 1980 was one of the strongest ever recorded anywhere and destroyed several platforms. In discussions of offshore matters a baseline in time terms is the July 1988 Piper Alpha accident in the North Sea, the worst ever accident in this history of the offshore industry: the death toll was 167. One of many spin-offs from Piper Alpha was that insurers of oil platforms required much more information on a particular platform insured than previously. For this and other reasons one encounters the term 'post Piper Alpha' in accounts of offshore matters including hurricanes in the Gulf of Mexico. The era of 'post Piper Alpha' Gulf hurricanes was not long in coming:

Hurricanes Florence and Gilbert both occurred in September 1988. Gilbert was followed by Andrew in 1992 which caused major damage to platforms, especially in shallow water on the continental shelf off Louisiana. The 1990s also saw Hurricanes Opal, Josephine, 'Danny the Second', Frances and George. The opening years of the 21st Century, as a reader will be aware, saw Hurricanes Ivan, Rita and Katrina, which destroyed respectively 7, 47 and 66 platforms.

A point which has been touched on twice in the earlier parts of this article is insurance of offshore platforms. At present premiums are about 0.75 of one per cent of the platform value for a year's cover, meaning that a platform worth \$1 billion - a fairly typical figure - would cost \$75 million to insure for a year. Obviously insurers are re-evaluating premiums after the recent severe hurricanes. There are about 4000 platforms in the Gulf therefore the total annual payment of premiums is of the order of tens of billions of dollars. Lloyds are well represented in the Gulf and have a major centre in Houston. Part of the insurance is for the platforms whilst of course part is for the lives of persons on them. It has accordingly been suggested that premiums might be reduced if selected platforms were to cease operations during the hurricane season so that there would be no component of the insurance for lives over that period. In any case some major measures are likely as otherwise premiums might well more than double as a result of the recent hurricanes.

This article has varied in its content from an account of the activities of 16th Century colonists to the current reality of insurance costs of oil platforms in the Gulf of Mexico. The propensity of the Gulf region to hurricanes is relevant to both. The last decade has seen significant growth in non-fossil fuels, largely in response to the Kyoto Protocol, and the senior author of this piece is very much an advocate of such things as wind farms and energy crops. However, even if and when Kyoto targets for carbon dioxide emissions are reached the world will continue to be dependent on the major oil producing regions of the world for energy and organic chemicals. Recent months have seen unprecedentedly high prices of crude oil and these are at least in part due to the hurricanes. The compilation of Gulf Coast hurricanes, available in several forms on the Internet, will continue to lengthen and, according to recent experience, any such hurricane impacting the offshore industry will have effects on oil prices with all that that involves in terms of international financial affairs.

Acknowledgement

The authors drew on a number of sources in the preparation of this article, including: 'A 65 Year History of Hurricanes and Some of the Resultant Impacts on the Offshore Industry' Benfield Corporate Risk, London

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