HOW UNUSUAL WERE HURRICANES KATRINA AND IVAN?

While the major difficulties facing the offshore energy industry are minor compared to the overwhelming problems affecting residents of New Orleans and the Gulf Coast following the truly catastrophic landfall damage afflicted by Katrina, there is no doubt that following several years of relatively low hurricane activity in the Gulf of Mexico Hurricanes Katrina and Ivan have provided a wake-up call to the energy and marine sectors, highlighting the substantial disruption to offshore energy production that severe storms can cause.

Prior to these hurricanes there had been a recent lack of 'damaging' events, a factor which accounts for why so many were surprised by the ferocity of Katrina and Ivan.

However, an examination of the historical records shows that hurricanes of Ivan's intensity are not uncommon and that Katrina is not the strongest hurricane to have affected the region.

Given that oil and gas from the Gulf of Mexico are crucial to the US economy, providing 25% of America's energy consumption, and given the current boom in offshore energy production means the number of oil rigs and platforms in the Gulf - which already number 4,000 - is only likely to grow, it is clearly of vital importance to quantify the frequency with which hurricanes of Katrina's and Ivan's intensity are likely to occur in the region.

Katrina and Ivan tore through the Gulf (see chart) in late August 2005 and September 2004 respectively, causing immense disruption. Ivan destroyed seven platforms and 2 rigs and caused significant pipeline damage - an issue which proved most problematic taking several months to diagnose and repair - at its peak 83% of the Gulf's total oil production was shut down. Initial reports indicate Katrina destroyed 18 platforms significantly damaged a further 13, and caused the total or constructive total loss of six rigs – many pipelines will have been damaged. Nine refineries were shut down prior to landfall and three remain closed.

Katrina had 1-minute sustained winds of about 150mph and Ivan 1-minute sustained winds of some 130mph when they caused their extensive damage to the Gulf's energy installations - intensities which over the last decade have only been approached, let alone reached, by two other hurricanes as they crossed the Gulf offshore energy-production belt. Opal in 1995 had sustained winds of 120mph and Lili in 2002 achieved sustained winds of 110-120mph.

However, since 1900 12 hurricanes with an intensity higher than Ivan have made landfall between Pensacola (Florida) and Brownsville, (Texas), the coastal extent which encompasses where the Gulf's offshore oil and gas production is situated.

The strongest landfalling hurricane was Camille which struck southeast Louisiana in August 1969 packing sustained winds of 190mph (gusts in the range 210-220mph) and causing a storm surge of 22-25 feet above mean sea level.

Camille's 190mph winds were approximately 25% higher than Katrina's peak wind and 45% higher than Ivan's peak wind. Clearly the damage Camille would inflict if she happened today could be worse than that caused by Katrina and far worse than that caused by Ivan.

From these statistics one may conclude that a hurricane of Katrina's strength or stronger will happen again and that hurricanes of at least Ivan's strength will affect Gulf offshore energy production at least once a decade. What is more, an intense hurricane, ie one with sustained winds of at least 111mph, is likely to affect the region every three years.

In addition, with global warming expected to raise the peak intensity of Atlantic hurricanes by 6% during the 21st century these return periods may become shorter.

Clearly the catastrophe models used by the energy and marine sectors should now be reflecting the fact that Katrina and Ivan are not unusual occurrences.

This year, in addition to Katrina, we have already seen hurricanes Dennis and Emily and tropical storms Arlene and Cindy (see chart) cause disruption to Gulf offshore energy production – as an example Dennis is known to have caused BP's new Thunder Horse PDQ platform to list by 20% - and as forecasters are still predicting an exceptionally active 2005 hurricane season, further disruption can be expected.

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** Professor Saunders will be discussing new forecasting developments for predicting the likelihood of offshore energy loss from hurricanes/typhoons at the annual International Union of Marine Insurance conference in September 2005. To receive a copy of his presentation contact:*

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HURRICANE FORECASTS WORSEN

Award winning forecasting venture, Tropical Storm Risk (TSR), has warned that due to further strengthening of key climate signals their forecast of an exceptionally active 2005 hurricane season is now expected to deliver Atlantic basin activity of 150% above-average (a 30% increase on July) and US landfalling tropical cyclone activity of 90% above-average.

TSR's updated outlook issued on 5 August includes warnings of:

- 22 tropical storms for the Atlantic basin as a whole of which 11 will be hurricanes and seven intense hurricanes;
- Seven tropical storm strikes on the US of which three will be hurricanes; and
- Three tropical storm hits, including two hurricanes, on the Caribbean Lesser Antilles.

TSR's latest forecasts and wider research are available via the TSR website at: **www.tropicalstormrisk.com.**

The paths and intensities of Hurricanes Katrina and Ivan plotted along with those of four other storms that affected Gulf offshore energy production in 2005.