
KATRINA'S IMPACT ON WORLD ENERGY MARKETS

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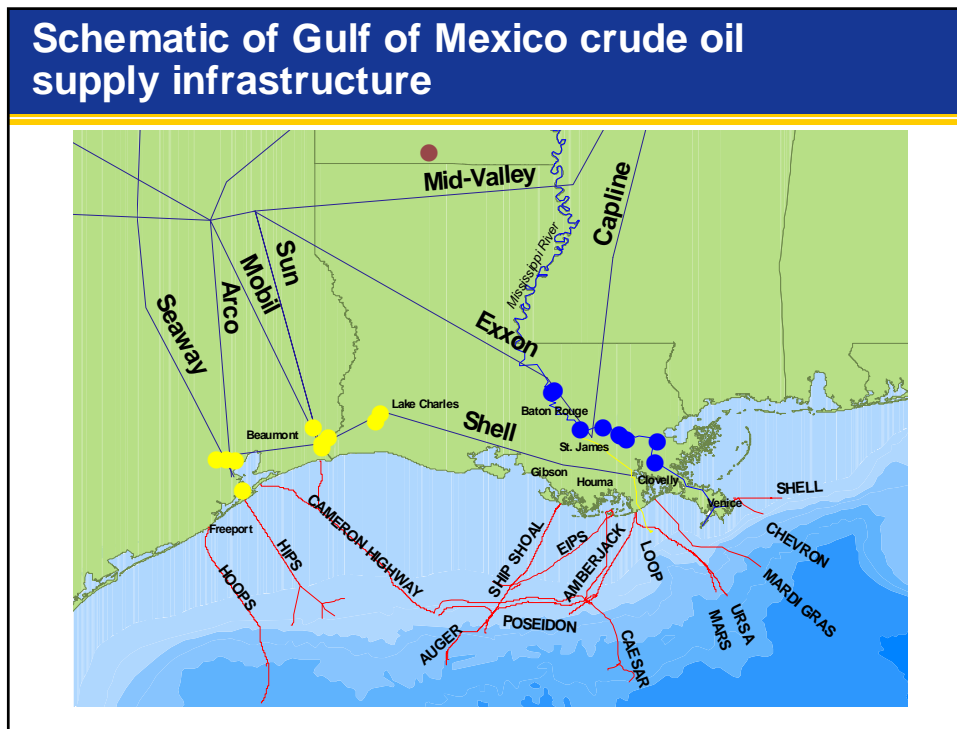
INTRODUCTION

On Monday August 29 Hurricane Katrina slammed into the U.S. Gulf Coast making landfall just east of New Orleans, Louisiana as a strong Category Four hurricane. Most news reports indicate that Katrina is likely to be one of the most devastating natural disasters ever to strike the United States. The path of Katrina as it approached landfall was through the heart of the U.S. Gulf Coast offshore oil and gas production and transportation infrastructure that supplies about one quarter of domestic oil production and about one fifth of the nations' natural gas production. To add to its impact on the nation's energy supplies, Katrina's landfall was at the mouth of the Mississippi River hitting a significant portion of the U.S. Gulf Coast refining industry and the origins of the nation's interstate refined product pipeline transportation network.

Purvin & Gertz, Inc. has prepared a brief update of the impact of Hurricane Katrina on oil and gas production, refining and product distribution operations as of September 1, 2005 as part of our continued commitment to serve our international client network. At the time this briefing paper was prepared, operating companies and local and federal government agencies were in the early stages of assessing the impact to the region's production, refining and transportation infrastructure. These operations are being hampered by transportation to and from the area and the need to deal with immediate concerns about human life and safety. The information presented in this briefing paper is our current assessment of the situation and potential impact on the U.S. and international energy industries. As details regarding the impact and devastation caused by hurricane Katrina emerge, we will provide appropriate updates on the impact to the U.S. and international energy markets to our clients.

PETROLEUM INDUSTRY BACKGROUND

The Louisiana Gulf Coast region is a major oil and gas supply center for the U.S., with significant offshore production, and numerous refining, gas processing, and petrochemical facilities onshore, plus pipeline infrastructure connecting all of the segments of the energy value chain. Crude oil refining capacity in the region is around 2.4 million B/D, most of which is in large, highly complex facilities that are capable of upgrading the lowest quality crudes available in the world. Current estimates are that 90% of this capacity has been seriously impacted or shut down by Katrina, with no definitive timetable for restart in most cases. A significant portion of the refined product volumes generated by these facilities (gasoline, diesel, jet fuel) are moved via the Colonial and Plantation pipelines, or via barge and ship transport on the Mississippi River, to markets along the Eastern Seaboard. Without this U.S. Gulf Coast production, drawdown of existing inventories and increased foreign imports will be required to maintain adequate finished product supply in the U.S. market, at least until production is restored. A simplified map of the major energy infrastructure in the region is provided below.



NEAR TERM ISSUES

The near term concerns are many and great which creates the tendency to push some issues out of context. The loss of refining capacity and crude oil production are intertwined with the complex logistical constraints of transporting crude and finished products to market. The following discussion provides an overview of the near term impacts to energy operations in context of the overall and evolving market situation.

CRUDE OIL SUPPLY DISRUPTIONS

The immediate impact of Katrina was the shut in of oil and gas production from coastal and offshore Gulf of Mexico oil fields. The shut in production at present is approximately 1.4 million B/D of oil and 7.9 BCF per day of gas. As assessments of offshore production facilities are underway, prospects for an immediate return are limited. Although reports from ExxonMobil, BP, Kerr-McGee and others indicate that their offshore facilities appear intact, early indications are that Shell's Mars platform has sustained significant damage. It alone was supporting production of around 150,000 B/D of crude. The overall recovery in production will be dependent on the conditions of sub-sea pipelines, many of which were heavily impacted by Hurricane Ivan last September.

The Louisiana Offshore Oil Port (LOOP) was also shutdown just ahead of Katrina's arrival, halting imports of more than 1 million B/D of crude oil. The facility is now moving crude from storage and assessing its offshore marine terminal. Resumption of LOOP's operations will

be critical as many of the refineries will not be able to receive crude supplies by tanker from the Mississippi River until storm related damage can be repaired. A large number of barges have reportedly broken loose and sank in the river. The ship channel is not recognizable in some stretches. The U.S. Army Corps of Engineers must remap the channel before it can open for tanker traffic. At present, the Corps is resource-constrained and preoccupied in trying to address the New Orleans levee breaches that have catastrophically flooded of the city. The timing to reopen the river to ship traffic is a major unknown at this time.

The tight crude oil market situation that existed before Katrina suggests that the ability to make up for lost crude oil supplies will be constrained by the lack of meaningful spare production capacity in other producing regions. Incremental output that might come from OPEC would also tend to be heavier and more sour in quality than some of the domestic production that was lost. The ability to make up for a loss in crude oil supply from shut in production by increasing imports usually takes a significant amount time. Even though the U.S. crude oil stocks were well above 5-year average inventory levels heading into the hurricane, the U.S. Government has decided to open the Strategic Petroleum Reserve's 700 million barrels of inventory. ExxonMobil and Valero Energy have already initiated draw-downs from the SPR. This offering appears to have directionally quieted the speculative market element on the supply side until further offshore assessments can be known.

NATURAL GAS IMBALANCES

Many of the supply-side issues affecting crude oil and refined products production are also impacting natural gas production in the Gulf of Mexico. At present, approximately 7.9 BCF per day of natural gas production remains shut-in. This loss of production represents about 80% of the natural gas that is produced from the Gulf of Mexico, and represents about 14% of the United State's total domestic gas production. The duration of the production outage is as yet unknown until the extent of damage to both offshore production platforms and sub-sea natural gas pipelines can be assessed. Additionally, several natural gas processing plants that remove contaminants and liquids from the natural gas are currently offline, but many are reportedly preparing to restart when gas production resumes. The amount of natural gas in storage near the end of August totaled about 2.6 TCF, which was slightly lower than last year, but about 130 BCF above the five-year average level. Only ten weeks remain in the traditional gas injection season, at which time total gas storage levels need to reach approximately 3.5 TCF.

The demand side issues affecting the U.S. natural gas market are somewhat different than the crude oil market because damage caused by the hurricane will reduce gas consumption. In the industrial sector, consumption will be reduced due to refinery outages, as well as seven ethylene plants and several ammonia plants that are out of service because of either damage from the hurricane or loss of feedstock. Additionally, natural gas consumption for electrical power generation will be reduced until the power distribution infrastructure can be repaired. The magnitude and duration of the reduction in gas demand cannot yet be accurately determined, but Hurricane Ivan last year was partly responsible for a 3% dip in demand by the industrial sector.

Although the physical impact of Katrina was concentrated mainly in part of the Gulf Coast region, the market impacts have and will continue to be felt across the rest of North America through regional price interrelationships. A combination of bringing natural gas infrastructure back online and reducing demand is required to stabilize the market fundamentals, reduce pricing pressure, and allow sufficient inventory injections to resume in preparation for the upcoming winter season.

REFINING CAPACITY OFFLINE

Just prior to Hurricane Katrina's arrival on the Gulf Coast, refining utilization was above 95%, leaving little spare capacity. The U.S. Gulf Coast refinery utilization as represented by PADD III operating rates was just above this level for the past 5 weeks. Katrina's impending arrival took down over ten major refineries totaling 2.4 million B/D of capacity. At present, refineries representing nearly 900,000 B/D of capacity have restored partial operations. Another 500,000 B/D of capacity has reported minimal damage with startup planning underway. This leaves another 1 million B/D of capacity to be assessed. Generally, most refineries that are up or are planning to do so soon are supply and power constrained, of which both factors are being addressed. Some refiners have had flooding to deal with which will complicate the repairs necessary for restart but no permanent damage has been reported to take out any significant amount of capacity on a longer-term basis.

The affected refinery capacity is typically filled with crude that is 64% import supplied and 36% supplied by domestic production. The crude oil quality mix of this capacity is estimated to be around 36% light sweet, 34% light sour and 30% heavy sour. The implication is that restoration of domestic light sweet production will be necessary to prevent continued widening of the light/heavy differential.

PETROLEUM DEMAND

Many of the affected refineries provide product that is transported to other markets, including the U.S. Eastern Seaboard via Colonial Pipeline, Plantation Pipeline, barges and ships. The loss of power shut down the main pipelines but is now being restored through the impacted areas. The combination of the pipeline capacities is around 2.6 million B/D. The logistics of transporting multiple grades to marketing outlets is also being simplified by the elimination of some product specifications that are imposed by the U.S. Environmental Protection Agency.

The U.S. just relieved the Jones Act shipping requirements that will allow foreign flagged, built and crewed vessels to move product from U.S. ports (refineries) to other U.S. ports (markets such as Florida which is not pipeline connected). Imports of light products should increase but the timing will be somewhat delayed as transit time and allocation of ships must be accounted for. Availability of European stocks is limited by two issues: primary inventories and compulsory government stocks. Current inventory is about 10 million barrels above last year's levels which indicate only a small potential contribution to the U.S. supply picture. Movements would require more vessels than are currently in the trade, potentially raising spot freight rates.

In total, the relief of product trade restrictions, specifications and the restart of pipelines should work to mitigate near-term supply shortages.

SITUATION SUMMARY

Market conditions will adapt and reflect both good and bad information as assessments of production and refining infrastructure get underway. Short of a full recovery in domestic production, which is unlikely short term, the supply/demand balance will tighten significantly. A majority of refining capacity appears to be in or heading to startup mode, alleviating some concerns and increasing product supplies. Product inventories will likely be tight as refineries play catch up with demand. The advent of increased product imports will eventually take some pressure off the market.

The oil and gas industry is among the most efficient commercial enterprises in the world. With the vast expertise and a committed work force, all available avenues will be pursued to safely restore production, restart refineries, and deliver petroleum products to market. Thus far, the overall temporary loss of crude production is less than the shutdown refinery capacity as indicated by the greater increase in product prices than crude prices. On hand crude inventories should be sufficient to bridge the restart while refinery operations are being restarted. We will continue to monitor the pace of recovery in production and refinery operations that will be reflected in our supply/demand fundamentals and our regional crude/product price outlook. The near-term impact on crude oil prices will depend on the amount and duration of lost domestic production which is likely to remain below pre-hurricane levels for some time. Worldwide crude pricing patterns will be impacted as they were during the aftermath of Hurricane Ivan in September 2004. If you would like to discuss any aspects of this paper, please feel free to call Stephen Jones at 713.236.0318 or email him at sljones@purvingertz.com.