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A number of factors are increasing the risk for potential supply disruptions to adhesives users in coming months. Vessel traffic in the Gulf of Mexico remains vulnerable to contamination from the oil that has flowed from BP's damaged oil well since late April. Experts are predicting that 2010 is shaping up to be the most active hurricane season since 2005. Storm surge from a hurricane could quickly push crude oil from the spill in the Gulf towards shore, further interfering with shipping lanes and hampering the delivery of feedstocks to refineries and chemical plants. Increased demand along with a number of unexpected outages have curtailed supply this year and prevented the rebuilding of inventories throughout the supply chain. This, combined with low inventory levels following the recession, could quickly amplify the impact of any weather-related supply disruption. If that weren't enough, transportation companies downsized their fleets during the recession and are now having trouble meeting greater-than-expected demand.

Oil Spill

More than a month has passed since an explosion rocked the Deepwater Horizon oil rig, killing 11 people and initiating the calamitous release of crude oil into the Gulf of Mexico. It's clear that the tragic environmental and human impacts will be long-lasting. What's not so clear is the impact on other industries, including chemicals and adhesives industries, that rely on the Gulf for the transport of important raw materials.

Since the spill, analysts and companies alike have monitored the spread of the slick into important shipping lanes, where it could delay or divert traffic. "The biggest near-term risk from the oil spill is the potential for the disruption of shipping traffic in and out of the Port of New Orleans," said IHS Global Insight. "This could affect the barge, container and tanker traffic in the Mississippi Delta and on the Mississippi River. If traffic is affected for any extended period of time, then the prices of all types of commodities could rise, albeit probably temporarily."

A full shutdown of shipping traffic is unlikely. Decontamination stations have been set up to power-wash crude-covered vessel hulls before they are allowed to enter ports. By the end of May, all shipping lanes remained open.

Many refineries and chemical plants in the Gulf region rely on tanker shipments of imported crude to keep their facilities running. Transport delays or diversions could have an impact on the chemicals supply chain. With inventories lean following the recession and an ongoing series of planned and unplanned outages downstream from the refineries since the beginning of the year, any new bottlenecks in the supply chain would rapidly affect derivatives.

Hurricanes

June 1 marked the official start of the 2010 hurricane season. All forecasters are calling for a very active season. Meteorologists at Colorado State University (CSU) are predicting 15 named storms, well above the historical average of 10 storms. They expect 4 to be major (Category 3, 4 or 5) hurricanes. "This looks like a h--- of a year," William Gray, the hurricane forecaster who founded CSU's storm research team told Reuters.

The National Oceanic and Atmospheric Administration (NOAA) is predicting an "active to extremely active" season in the Atlantic Basin. NOAA projects 14 to 23 named storms, 3 to 7 of which could be major hurricanes.

"If this outlook holds true, this season could be one of the most active on record," said Jane Lubchenco, NOAA administrator. "The greater likelihood of storms brings an increased risk of a landfall. In short, we urge everyone to be prepared."

The tropical Atlantic Ocean acts as a hurricane factory. This is where disturbances from Africa are fuelled by warm water temperatures and transformed into full-blown hurricanes. This year, the region is experiencing record temperatures—even warmer than those in 2005—which will contribute to the fury and frequency of the storms.

The El Niño weather pattern also plays an important role. High winds in the upper atmosphere stoked by El Niño tend to tear Atlantic storms apart before they can do much damage. When conditions wane, as they are this year, winds subside and storms pass by unabated.

The Gulf of Mexico hosts 32% of domestic crude production and 15% of natural gas production. Numerous chemical refineries are strung along the Gulf Coast. When a hurricane trajectory threatens the area, companies shut down facilities, including drill rigs, refineries and chemical plants, as a security measure. This, of course, disrupts the supply chain. These disruptions are amplified when storms damage local infrastructure, like roads and electricity generation stations. Then supply quickly becomes constrained.

Post-recession Complications

The world has never seen an oil spill of the magnitude of the Deepwater Horizon accident, but hurricane season comes around every year and the memory of the supply disruptions following Hurricanes Rita and Katrina is still fairly fresh. What's different this year is that the world is just beginning to shake off the effects of the recession. Demand is on the rise but companies have been slow to ramp back up to full capacity and refill inventory pipelines (see story on Page 2). This means that the cushion that normally allows companies to absorb temporary and unexpected supply shocks is lacking.

Where possible, suppliers are building inventories in anticipation of disruptions. But some raw material streams have already been hit so hard this year that inventory builds are not possible. "Inventories are far too low to even consider [hurricane] contingency plans," a base oil supplier told ICIS in late May.

In addition, truck availability is already an issue in the region. The North American trucking industry has reported a surge in freight demand this year. Industry analysts expect demand to outstrip supply by mid-year. The supply situation is "turning quickly," said Bob Costello, chief economist for the American Trucking Association. Experts predict that the driver shortage that plagued the industry in past years will return this year as well.

Analysts at IHS Global Insight believe that trucking rates could rise quickly. Trucking capacity dropped by as much as 18% during the recession—15% of that is thought to be permanent. Consultants Ahern & Associates estimate that over 7,700 trucking companies went bankrupt in 2008 and 2009, contributing to the reduction in capacity. The surviving trucking companies have not been replacing trucks at a rate that will maintain existing capacity. All of this could contribute to shortages when demand increases. If a hurricane strikes and trucks are diverted to recovery activities, the problem could get a lot worse a lot faster.

Potential Impact on the Chemical Industry

All of these factors on their own—the oil spill, an active hurricane season, the low inventories and issues in the trucking industry—are of concern and could pose a threat to the smooth functioning of the adhesives supply chain. If a number of them start to interact, the risk of supply disruption grows considerably.

Experts say that a hurricane could accelerate the spread of oil from the BP spill. "It will be everywhere in the Gulf and East Coast of the U.S.," University of California, San Diego oceanographer Peter Niiler told *Discovery News*. The storm surge could move the oil slick into the mouth of the Mississippi River, causing delays to shipping traffic in the region. Any curtailment of barge traffic on the Mississippi River will have an immediate impact on the supply of raw materials to the chemicals industry.

The 2005 hurricane season caused a number of serious supply disruptions in a year when the supply chain was relatively healthy. This year, lean inventories and an ongoing series of supply outages have contributed to an extremely fragile supply chain. Any perturbation is going to be bad news and have far ranging repercussions. On a positive note, companies learned from the 2005 hurricanes and have improved their preparedness plans.

How this all plays out is impossible to forecast. Increased communication and prudent supply chain management can help to mitigate the risks to adhesives customers. Global scale and a past record of supply security can further ensure minimal disruption. ■

UPDATE: ACRYLATES CRISIS

The global supply of acrylic acid and acrylate esters remains tight. While there have been some changes to the supply landscape since the publication of the *Raw Materials Facts Special Bulletin* in early May, there has been little overall improvement in the availability of supply.

Arkema brought its Carling, France plant back online and lifted *force majeure* on its acrylic acid and acrylate esters. A source at the company told ICIS that demand was much stronger than the company's ability to supply product. Even so, the company said it would resume supplying regular volumes to customers at the beginning of May.

In mid-May, Arkema announced that its Pasadena, Texas plant—down since an explosion in December 2009—would restart in late June. The facility could be fully operational by mid-July. That doesn't mean that supply will loosen any time soon. Arkema's Clear Lake, Texas plant requires a catalyst change in June or early July, a planned turnaround in late July or early August and a longer outage in November.

The two other main North American suppliers continue to experience supply disruptions. BASF's Freeport, Texas facility is scheduled for three weeks of maintenance in June. And, according to a recent ICIS article, there's still no indication of when Dow Chemical will lift *force majeure* on production from its Deer Park, Texas facility.

With supply tight and demand steady, suppliers have been unable to build stockpiles to carry them through maintenance outages. This means that the supply chain will remain under pressure as long as plants are offline. Only when all plants are back up and running smoothly, possibly towards the end of Q3, will suppliers begin to be able to address the growing overhang of order backlogs. Even then it will still take several months for the pipeline to refill before inventory levels can rise to "safe" levels.

In the meantime, prices remain at exceptionally high levels. The contract price of glacial acrylic acid is up 56% since the beginning of the year; spot prices have almost doubled. The contract prices of acrylate esters 2-EHA and BA climbed 47% and 57%. Spot prices, when material is available, are reported to be up 200 to 300%. Buyers continue to secure supply where they can at whatever price the market is demanding. ■

INVENTORY RISK

As Q1 results were released in April, company executives appeared to be cautiously optimistic and were once again speaking about growth. At the same time, they're keeping a close eye on raw materials prices.

"The whole industry is trying to be fairly aggressive not to get burned this time as raw [materials] move," Jim Rogers, chief executive of Eastman Chemical told analysts on the company's Q1 conference call. If the economy and volumes stay strong, "we are really going to have our work cut out for us to make sure we do our best to have pricing following raw [materials] and energy to maintain that margin."

A recent article in *Bloomberg BusinessWeek* suggests that inventory rebuilding will be necessary to help drive the recovery. The most recent Institute for Supply Management survey of purchasing managers indicates that manufacturing companies added inventories in March—the first time in four years. But industry insiders say that restocking isn't happening fast enough. And chemical companies are still having trouble deciphering demand drivers in 2010.

"Some of the performance this first quarter has to be some inventory rebuild. It is hard to know how much because, frankly, demand came on so strong I think a lot of people are having trouble building their inventories," Rogers said. "I know there are places where we want more inventory and we just can't catch up and get to the inventory level that we want."

Eastman isn't the only company with inventory challenges. The severe destocking during the recession set the stage for very low inventories going into the recovery. Now, suppliers are being surprised by the surge in demand and are having trouble meeting it. This has led to the large number of sales allocations put in place this year. In addition, a number of supply problems and unexpected outages have severely restricted supply for many adhesives raw materials. As a result, most suppliers have not had the time or the production to bring inventory levels back to "safe" levels.

Thin inventory levels are leading to enhanced price volatility and supply shortages. Many suppliers have put customers on sales allocations to manage supply; this is acting as a brake on any potential growth. Until inventories return to healthy levels, there is little realistic hope for much significant growth in the industry. ■

ROUNDUP: HOT MELTS

The story of hot melt raw materials continues largely unchanged in the second quarter: low inventories, ongoing supply issues, rising demand and climbing prices.

Tackifiers

The supply of all tackifiers remains tight. Any relief brought about by a brief switch to slightly heavier cracking slates is long gone. Cracker feed economics have moved light again, restricting the feedstock flow for C5 and C9 tackifiers. The unabated rise in Chinese gum rosin prices continues to pressure rosin ester supply and has precipitated a switch to tall oil rosins, tightening supply in the U.S. All suppliers of C5 resins have customers on sales allocations.

Tight supply, high prices and substitutions are driving increased demand for hydrogenated hydrocarbon tackifiers. A series of outages at ExxonMobil's Notre Dame de Gravenchon site in France led the company to place customers on 75% sales allocations. The company is said to be trying to meet European demand with material from its U.S. operations, which is tightening domestic supply. In response, Eastman Chemical, a major North American supplier, has put customers on 100% sales allocations. This has created additional tension in the supply chain. Once ExxonMobil's plant is back online, industry experts say it will take at least two months before supply returns to normal.

Fischer-Tropsch (FT) Wax

The supply of FT wax has tightened again as demand has improved. With only two manufacturers of FT wax in the world, problems at one can quickly derail supply. South Africa-based Sasol, the largest producer, has placed customers on sales allocations to try to manage limited supply in the face of growing demand. The second global producer, Shell Malaysia, has been experiencing an unexplained outage beginning sometime in late April, which has curtailed the flow of product from the site. There has been no information from the company regarding the outage, only a lack of deliveries. This has tightened an already-tight market.

With no extra material available, buyers are making do with the allocations. This extreme market tightness is expected to last until late 2012 when Sasol will have added capacity.

Naphthenic Process Oil

The supply of naphthenic process oil has been tight since late last year. Nynas, a key producer of the oils for the North American market, was forced to shut its refinery in Curaçao, Dutch Antilles, in December. In February, Calumet experienced problems at its Shreveport, Louisiana refinery and then an extended turnaround at the facility in April further constrained supply.

Poor refinery economics have contributed to the supply crunch. Calumet CEO and President Bill Grube told analysts on the company's Q1 conference call that the company had decided to operate at reduced rates in Q1 due to weak refining crack spreads. The company announced in early May that it would be ramping production back up to close to 100% at all its sites to meet increased demand. Tight supply, rising crude prices and steady demand have motivated suppliers to raise prices. ■

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