

Statement for the Record

Brandon Wales

Director, Homeland Infrastructure Threat and Risk Analysis Center

Office of Infrastructure Protection

National Protection and Programs Directorate

Department of Homeland Security

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Thank you Chairman Meehan, Ranking Member Higgins and distinguished members of the Sub-Committee on Counterterrorism and Intelligence for inviting me to address the issue of refinery closings in the Mid-Atlantic Region. The availability of refined petroleum products is an important issue for the Department of Homeland Security (DHS), and I appreciate the opportunity to discuss this with you.

I am the director of the Homeland Infrastructure Threat and Risk Analysis Center (HITRAC), which is charged with analyzing potential threats to, and consequences and vulnerabilities of, the Nation's critical infrastructure. Our work examines both natural disasters and terrorist threats that can disrupt critical infrastructure systems, including the petroleum fuel network, in order to improve security and enhance the resilience of these infrastructure systems.

Today, I am here to discuss DHS' views on how the planned closure of the Marcus Hook refinery might affect broader critical infrastructure resilience. In the last year, two Philadelphia-area refineries have been idled, which means they have ceased production. The first, owned by ConocoPhillips, located in Trainer, Pennsylvania, with an operating capacity of 185,000 barrels per day, was idled in September of 2011 and currently remains for sale. The second, owned by Sunoco Inc., located in Marcus Hook, Pennsylvania, with a capacity of 178,000 barrels per day, was idled in December of 2011. Recently, Sunoco announced plans to close a third refinery in the region, a 335,000 barrels-per-day refinery in Philadelphia, Pennsylvania, if no buyer is found by July 2012. These three refineries represent 50 percent of the region's refining capacity. Coupled with the closing of other refineries in the region (Western Refining in Yorktown, Virginia, at a capacity of 66,300 barrels per day, shut down in September 2010; Sunoco Inc., Westville, New Jersey, at a capacity of 145,000 barrels per day, shut down in February 2010) and refineries that supply the region (HOVENSA LLC, St Croix, U.S. Virgin Islands, at a capacity of 335,000 barrels per day, shut down in February 2012) a significant portion of the region's ability to produce refined product will be shuttered.

A simple examination of refineries does not tell the complete story, however, as there are other sources of refined product for the region. These include the Colonial and Plantation pipeline systems, which move refined product from refineries on the U.S. Gulf Coast to cities on the eastern seaboard. In

addition, the major East Coast ports receive refined product via tanker from various points in Europe and via barge from U.S. Gulf Coast refineries using the Intracoastal Waterway.<sup>1</sup>

At HITRAC, we have examined whether the loss of capacity represented by the closing of the Mid-Atlantic refineries significantly affects the resilience of the regional or national petroleum supply system. In other words, is there sufficient capacity to supply the East Coast with refined petroleum products? HITRAC's initial analysis, which included analyzing a major disruption of refineries in Louisiana coupled with the closure of the Bayway Refinery in Linden, NJ, for an unspecified reason, shows that the closing of Sunoco's Marcus Hook refinery, combined with the closing of Sunoco's Philadelphia and ConocoPhillips Trainer refineries should not result in shortages of refined products as a whole, in the Northeast or elsewhere.

Before presenting our analysis and conclusion, I would like to make an important caveat. The model focuses on refined products as a whole rather than on individual products. For example, the model does not give any insight into the specific availability of low sulfur heating oil, ultra-low sulfur diesel, or gasoline with additives for particular cities. The focus of this analysis is the availability in the Northeast of refined products in the aggregate to meet overall energy needs. The availability of these energy sources constitute the potential national security issue that may arise due to the idling of the three Philadelphia area refineries. The fact that the model does not indicate the availability of all grades of fuel limits its utility for a more detailed analysis of potential economic impacts, but not for identifying national security concerns.

The Energy Information Administration has analyzed energy market implications of the situation in detail in its February 2012 report "Potential Impact of Reduction in Refinery Activity on Northeast Petroleum Product Markets." In contrast to the HITRAC analysis, that report did explore the potential impacts of the Philadelphia refinery closures on individual products such as ultra-low sulfur diesel, and discussed a range of specific logistical challenges associated with moving replacement products into certain areas of Pennsylvania and New York.

### **Organization Overview**

In order to put our analysis in context, it is important to understand HITRAC's role in risk mitigation, consequence analysis, and the building of resilience in critical infrastructure. Within the DHS National Protection and Programs Directorate (NPPD), the Office of Infrastructure Protection (IP) is responsible for leading and coordinating the national effort to strengthen the protection and enhance the resilience of critical infrastructure.

HITRAC serves as the analytic arm of IP and provides timely strategic, operational, and tactical analysis to our public and private-sector partners so that they can make more informed decisions regarding the management of risk. HITRAC's analytic products provide actionable information to stakeholders and decision makers at DHS; partner agencies in Federal government; state, local, tribal and territorial governments; and the private sector. Our work supports homeland security-related exercises, training activities, security and contingency planning, and response to real-world incidents that affect the Nation's critical infrastructure.

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<sup>1</sup> For additional analysis, see U.S. Energy Information Administration, "Potential Impacts of Reductions in Refinery Activity on Northeast Petroleum Product Markets," February 2012, at <http://www.eia.gov/analysis/petroleum/nerefining/update/pdf/neprodmkts.pdf>, accessed March 7, 2012.

HITRAC also manages the National Infrastructure Simulation and Analysis Center (NISAC), which was created by Congress to be the “source of national competence to address critical infrastructure protection and continuity.”<sup>2</sup> NISAC is a partnership between Los Alamos National Laboratory and Sandia National Laboratories that brings together the laboratories’ expertise in modeling, simulation, and analysis to problems of system vulnerability and consequence analysis.

Through the work of analysts and modelers at NISAC, HITRAC is able to provide decision makers with high caliber analysis of infrastructure failures and disruptions and accurate representations of how those disruptions propagate from one infrastructure to another.

### **HITRAC Analysis**

In the past two years, HITRAC has provided support to decision makers during a wide variety of real-world incidents, including flooding in the Midwest, Hurricane Irene, the Japanese earthquake and ensuing risks of tsunami and radiation fallout, wildfires in the Southwest, earthquakes in Peru and Haiti, and industrial accidents including the BP Oil Spill. HITRAC analytic products associated with these supported Executive Branch decision makers as well as decision makers at the state and local level and in the private sector. Decision makers expect HITRAC to provide information on:

- Critical infrastructure in the impacted region, prioritized by importance;
- Expected length of time before electric power is restored to 90% of the outage area;
- Expected economic impact of the incident;
- Cascading impacts to regions outside the direct impact area; and
- The importance of any supply-chain disruptions.

HITRAC analysts consider the direct and indirect impacts of a disruption—real or hypothetical—on population, critical infrastructure, and the economy. Additional analysis can include cascading impacts over time to a region and to the Nation as a whole. In the case of the oil, lubricant, and petroleum network, an example of direct impacts might be hurricane damage, which would force a temporary refinery or pipeline closure, such as when Hurricane Irene closed the Bayway Refinery in New Jersey for a few days in August 2011. Resulting temporary shortages of oil or petroleum products in other regions would be considered indirect impacts. Shortages, in turn, would drive up prices so that supply could meet demand and could affect companies or operations heavily dependent on these products. A further impact might be seen in the regional or national economy. I should note that we do not always see indirect impacts, and did not in the case of the Bayway closure.

The crude oil and petroleum product network forms a complex and integrated supply chain, which is global in its scope. Supply-chain analysis examines the ways individual firms make operational decisions in response to disruptions, including how they purchase goods, produce products, sell them in markets, and ship them via different modes of transportation. Disruptions within these chains can affect the ability of some infrastructure entities to provide their products or service to the population. Foreign facilities and foreign sources of materials are of particular concern because they are farther away, are outside of U.S. Federal assistance, and may be more prone to disruption than domestic sources and facilities.

### **Prior Petroleum Industry Analysis**

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<sup>2</sup> Section 1016(d)(1) of the USA PATRIOT Act; Public Law 107-56; October 26, 2001

A massive and complex network of refineries, transmission pipelines, tank farms, and terminals produces and delivers refined petroleum products in the United States. Because the network is so interconnected, interruption of any of these components can quickly cascade into other parts of the system, causing imbalances and shortages. However, the system is also dynamic: companies and consumers make decisions as conditions change. For example, in the event of a disruption in one part of the pipeline network, flow can sometimes be diverted to functioning pipelines or production can be surged at another refinery, and imports can increase, while consumers can respond to shortages and resulting price increases by limiting consumption.

Because of the significant role that petroleum plays in our economy, we have undertaken a number of capability development efforts to better understand the domestic and international oil markets. As an example, in 2011 we completed a model of the national transportation fuel system. This dynamic model includes estimates of how corporations and individuals would respond to a disruption in some part of the petroleum system. This model is designed to help analysts estimate the availability of transportation fuel in the event that a component (e.g., refineries, pipelines, or storage tanks) of the national fuel supply chain is damaged or disrupted. In the event of an unforeseen disruption, analysts can use this model to determine:

- Which regions of the United States will experience shortages of transportation fuel, given the specific disruption to one or more components of the fuel infrastructure.
- What the duration and magnitude of the shortages will be.

### **Mid-Atlantic Refinery Closure Analysis**

In examining potential implications of the closure of the Marcus Hook Refinery, in addition to the closure of the Trainer refinery and the planned closure of the Philadelphia refinery, HITRAC executed a simplified analysis of the potential closures. The analysis included a determination as to the availability of transportation fuels throughout the Mid-Atlantic and Northeast States. The analysis included:

- A baseline assuming that no refineries close;
- Analysis assuming that all of the specified refineries close with shortfalls made up through the Colonial Pipeline and imports from other parts of the United States and Europe; and
- Analysis assuming that a major hurricane, similar to Hurricane Katrina (2005) or Hurricane Gustav (2008), strikes Louisiana and disrupts impacted Gulf Coast refineries, associated storage terminals, and Colonial Pipeline shipments to the Mid-Atlantic and North East states.

The model assumed that no additional refined product supplies above normal deliveries would be available from Europe, and that all shortfalls would have to be filled domestically.

The initial analysis we conducted suggests the closure of the three refineries in the Mid-Atlantic region will have a negligible impact on the availability of refined petroleum products as a whole along the East Coast. Again, our analysis does not focus on individual products. We estimate that refined product from various sources with spare capacity will be sufficient to meet demand. This is comprised of some combination of spare capacity in Northeast and Mid-Atlantic refineries or additional refined product moving via various transportation modes from refineries in Texas, Louisiana, and other locations on the U.S. Gulf Coast.

The hurricane analysis suggests that there would be supply shortages, irrespective of whether the three Mid-Atlantic refineries operate. Montgomery, Alabama; Knoxville, Tennessee; Nashville, Tennessee; Columbus, Georgia; Bainbridge, Georgia; Augusta, Georgia; Roanoke, Virginia; and Raleigh, North Carolina would experience some unmet demand during this period. Washington, DC, would not be able to meet its demand in the disruption scenarios, falling approximately 35 percent short for a period of six

days. The analysis shows that the Northeast does have sufficient inventories of refined petroleum product, transportation capacity from unaffected domestic sources, and normal supplies from Europe and thus would not be impacted by a hurricane in this case.

It should be noted that HITRAC's initial analysis should not be misconstrued as a full study of all of the implications of these refinery closures, but it does give us a preliminary estimate of how these closures impact the Nation's fuel supplies. Should more detailed work be required, we will consult with our partners to ensure that our analysis is based upon the full expertise contained throughout the government. Our analysis also does not cover particular blends of transportation fuels refined for certain markets or ultra-low sulfur distillates. There may be shortages of these types of products.

## **Conclusion**

Our vision is a safe, secure, and resilient critical infrastructure based on and sustained through strong public and private partnerships to mitigate risks to, strengthen the protection of, and enhance the all-hazard resilience of the nation's critical infrastructure. Thank you for holding this important hearing. I would be happy to respond to any questions you may have.