

Working Paper

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Summary: Recovery in the Aftermath of Hurricane Katrina and Rita

– A study focusing on restoring energy services

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Summary

The objective of this study is to identify, by way of American experience gained during the response to hurricanes Katrina and Rita, measures that might contribute to an enhanced Security of Energy Supply in Sweden in the event of emergency and disaster.

However, it is not possible to regard the rebuilding of the energy system independently of the overall impact and response to Katrina and Rita in the region. Thus, the first part of this report gives an overview of the Katrina and Rita timelines, the scope of the devastation, and the political and practical responses to the disaster. Conclusions concerning lessons learned from the American experiences as a whole are presented on the basis of the national evaluations conducted in the US.

In the second part of the report, a more detailed description is given of the effects on power supply and consequences for the oil and gas industry, as well as efforts to rebuild the energy infrastructure. Experience regarding emergency preparedness, and technical support and co-operation between different actors, and division of responsibilities during the rebuilding of infrastructure are also highlighted in this part of the report.

The Consequences of Katrina and Rita

At the end of August 2005, Florida, Louisiana, Mississippi and Alabama were hit by Hurricane Katrina. Katrina was the most destructive hurricane ever recorded and the largest natural disaster in the history of the USA. The most severe damage occurred in New Orleans, which flooded when the levee system failed. In the metropolitan area of New Orleans, 85 percent, or approx. 1.1 million people, were affected to some extent by the flooding. Some 250,000 homes in total were destroyed, and 785,000 people evacuated. The population most severely hit by the hurricane were those living in the lower parts of the city, to a large extent poor Afro-Americans.

However, the devastation was widespread throughout the region. Emergency disaster was declared for an area about half the size of Sweden, 230,000 km². Towns like Biloxi and Gulfport were completely devastated by the hurricane and the storm surge.

Preparations made after the hurricane warning for Katrina was declared turned out to be totally insufficient. The evacuation order for New Orleans arrived too late, and the evacuation planning failed in several respects. The situation became even worse when the authorities lost control over the situation among the population remaining in the city. Media attention was widespread and criticism of the Bush administration massive.

Just three weeks after Katrina made landfall, Rita reached the coasts of Texas and Louisiana. The damage from Rita to refineries and oil and gas production in the Gulf was extensive. Rita also revealed other weaknesses in the emergency preparedness. The evacuation of Houston created colossal traffic jams, and there was a lack of evacuation centers to handle the evacuees.

The various mistakes made by the Bush administration during the disaster and the social consequences have played a dominant role in the political discussion about the Katrina recovery. The same attention has not been paid to the initiatives taken by the energy industry to restore oil and gas production, refinery capacity and electricity supply. In contrast to the general emergency response, the rebuilding of the energy supply in the regions hit by Katrina and Rita has been rather successful.

The Political Process

Authorities at all levels of government have been severely criticized for not being proactive enough in the emergency situations that occurred immediately following the disaster. During the emergency response the lack of coordination between authorities at the federal and regional levels was also obvious.

The massive criticism rapidly led to a number of political initiatives aimed at identifying problems and lessons learned from the mistakes made and proposing measures to improve future emergency preparedness. The evaluation conducted by the White House, *The Federal Response to Hurricane Katrina*, stresses problems of a bureaucratic nature and recommends a reconstruction of federal emergency response planning in relation to natural disasters. The results of the evaluation from the House of Representatives are presented in the report *Failure of Initiative*. The report has, however, been criticized by the democratic opposition for lacking precise recommendations and scrutiny of the actions taken by the White House.

Finally, a bipartisan evaluation was also conducted on the initiative of the US Senate. Its report, *Hurricane Katrina: A Nation Still Unprepared*, expresses much criticism of how governments at all levels dealt with the disaster.

Lessons learned – Overall emergency planning

The far-reaching consequences of Katrina and failure of the emergency response to the disaster have necessitated a broadened perspective on emergency planning and security in society. The need for a more general capability to respond to different types of crises has been stressed, with specific emphasis on the need for improved coordination between federal authorities.

In all of the evaluations conducted, one of the most important conclusions concerns the need for practical training, with management teams and the full engagement of all parties involved. Practice drills are known to be crucial to the ability to deal with unforeseen scenarios. According to the evaluations, the successes of the missions performed by the Coast Guard and, in the private sector, the energy industry can be largely explained by the comprehensive planning and training performed by these actors. Maintaining adequate human resources at the regional emergency offices is also stressed as a crucial factor.

When it comes to future evacuations, one important lesson learned is the need to pay sufficient attention to both private and public transport. Another important aspect of improving evacuation plans is to include preparation for practical help to evacuees along the evacuation routes. It is also crucial to gain a better understanding of why some individuals chose to disregard the evacuation orders and what can be done to reduce this resistance.

More attention is also being given to the importance of integrating all aspects of emergency preparedness and response. Such an integrated perspective must also include surveillance and protection of critical infrastructure such as electricity supply and communication networks. Clear priority rules for the use of infrastructure resources such as electricity generators, road capacity and transport fuel, are key elements that need to be developed and taken into account.

Impact on the oil and gas industry

The impact on oil and gas production and refineries in the Gulf, from Katrina and especially from Rita, was profound. As a result of the two hurricanes, 20 percent of the manned platforms in the Gulf were damaged or destroyed and 8 percent of the overall refinery capacity in the US was shut down. The size and the path of the hurricanes, the high wind speed, and the destructive force of the storm surge, were the main reasons for the widespread devastation.

The majority of the refineries damaged were back in operation already in the fall of 2005, but it was not until April 2006 that the production was pretty much back to normal. In January 2005, about 75 percent of the normal offshore daily crude oil production and 80 percent of the gas production were up and running again.

The interruption in oil and gas production had an immediate effect on oil and gas prices. In the beginning, US national oil prices fluctuated substantially and there was a spike in crude oil prices on the international market. To increase the supply of oil and thus curb the price increase, the member countries of the *International Energy Agency (IEA)* decided to release part of their strategic reserves of petroleum products. This action helped to calm the market and oil prices stabilized in the beginning of September. Another measure to cut price increases was implemented by the *Environmental Protection Agency (EPA)*. The EPA decided to allow exceptions from certain environmental related fuel standards for a limited period of time.

Impact on Electricity Supply

The electricity supply to roughly 1.3 million customers was interrupted in the region hit by Katrina. Even Rita left a large number of customers without power, in Texas in particular, but also in parts of western Louisiana. From a practical standpoint, the challenges resulting from Katrina and Rita were unique with respect to both the extent of the devastation, the logistics needed during rebuilding, and the circumstances for employees at the electricity companies. The most severe damage from Katrina was caused by water. Natural gas facilities and electrical substations were flooded, with severe damage as a result. Rita, on the other hand, gave rise to extensive damage to transmission systems, and several electricity generation plants were damaged or isolated from the rest of the grid.

In the immediate response to Katrina, one of the largest problems was the breakdown of almost all communication systems. The only systems working were utility private communications systems, private fiber networks, and land mobile radio systems.

Although the devastation was far-reaching and the practical difficulties enormous, the rebuilding of the energy system functioned efficiently. Electricity supply to critical services such as hospitals was in place within 24 hours, and to almost half of the customers still in need of electricity after one week. Already two weeks after Katrina made landfall, service was restored to a large majority of the customers in the region, who were able to receive electricity. By the middle of January 2006, the electricity supply was more or less restored in the region except in parts of New Orleans where the power grid as well as major parts of buildings were completely destroyed.

Lessons Learned – Energy Emergency

The most important experience highlighted by everyone involved was the importance of working communication networks. As a precaution, if communications are out of service, everyone in the emergency organization should have a clearly defined mission to fulfill

during the first 48 hours after impact. Another preparation detail is to equip all employees with cash and cars with a full tank of gasoline prior to response.

When communications are restored, getting information to customers and the media is crucial. A clear and realistic timeframe for restoring electricity supply should be determined and communicated.

The recovery of electricity supply by *Mississippi Power (MP)* in their distribution area is largely regarded as a success story both within the electric industry and according to the evaluations conducted in the aftermath of Katrina. One main explanation for this success is the emergency planning principles developed at *Southern Company*, of whom MP is a subsidiary. According to these principles, experiences from emergency response are shared among Southern's subsidiary companies after each hurricane season and emergency response plans are revised and complemented according to the lessons learned. Clear common rules for prioritizing during recovery of electricity supply are also developed.

The procurement procedures developed by MP to secure resources prior to the disaster were also crucial to their response achievements. By the time Katrina made landfall, the company had already spent seven million USD in pre-arrangements to secure the resources needed. This acquisition included manpower, materials, transport, fuel, tent camps, etc. Close coordination between different actors regarding, among other things, land used for tent camps, has also been highlighted as an important area of preparatory work with respect to procurement. Another aspect of high relevance to several of the utilities concerned during recovery was the mutual-assistance contracts already in place between electricity companies throughout the region.

In emergency planning, clear coordination of interdependent critical infrastructure – such as telecommunications, electricity, gas and water supply – is needed. In proposals presented by the National Security Telecommunications Advisory Committee (NSTAC), companies responsible for this type of infrastructure should be defined in the National Response Plan as “Emergency Response Providers”. It should also be made clear that these companies should be given priority when it comes to critical resources such as fuel, water, vehicles, food and lodging. Emergency response plans should also include clear rules concerning access to different areas during disaster.

From a company's – and management's – perspective, another lesson learned is the need to plan for taking care of the company's own employees. Some key personnel may have to leave to take care of their own families and homes. Furthermore, the cooperation with local first responders must be developed and integrated into the emergency planning. The importance of redundancy in the system is equally stressed, i.e., in the form of back-up operational centers, back-up servers, arrangements for payment, etc., and planning for cascading effects, e.g., no roads or access to repair services, is also highlighted.

And last, but not least, the commitment of management is crucial as is active training, with all personnel involved participating. A key conclusion stresses the importance of this preparedness because, in the middle of an actual emergency response and major restoration effort, the influence of senior executives on utility performance may be only marginal.