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Hurricane Katrina as a Predictable Surprise*

Larry Irons

Abstract

The concept of predictable surprises, i.e. failures to take preventative action in the face of known threats, was outlined by Max Bazerman and Michael Watkins in their book by the same name. This paper discusses predictable surprises as primarily organizational events that result from failure of organizational processes to support surprise-avoidance rather than surprise-conducive actions by individual members. The analysis contends that learning organizations are characterized by processes that support surprise-avoidance. The affective heuristic is useful to prevention studies since it points to aspects of social cognition that are central to envisioning consequences for low probability events. Surprise-avoidance organizational processes are central to using the affective heuristic to bolster rational decision-making.

The paper asks whether the preparation and response of federal agencies in New Orleans to Hurricane Katrina was a predictable surprise. The discussion examines the role of the U.S. Army Corps of Engineers in preparing the levee protection system, asking whether its organizational processes supported surprise-avoidance, or were surprise-conducive. FEMA's Katrina response is also reviewed with the same concerns. The actions of each agency are considered along four characteristic traits of predictable surprises. The study offers several policy proposals, some presented by the Secretary of Homeland Security and others stemming from insights developed in the current analysis.

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INTRODUCTION

How can a surprise be predictable? Paradoxically, many people think low-probability events are just that: low probability; not impossible but very unlikely. People find it difficult to sustain a high level of preparedness for events that are unlikely to happen on any given day, especially if the preparation requires spending scarce time and resources. As Max H. Bazerman and Michael D. Watkins observe in their recent book, *Predictable Surprises: The Disasters You Should Have Seen Coming, And How To Prevent Them*, “We don’t want to invest in preventing a problem that we have not experienced and cannot imagine with great specificity.”¹

We all share a cognitive trait that inclines each of us, as individuals, to take the risk not to invest sufficient time and resources in the present to prevent a large, but low-probability, loss in the future, and choose instead to take smaller, certain losses in the present by investing less in preventative efforts. As a result, spending on prevention is too often minimized until the threats are more tangible, until people can imagine their results. At that point, it is often too late to avoid a large loss.

In an effort to understand these dynamics in the perception of risk, researchers in risk perception and risk communication explicitly address the interplay of rationality and emotion in peoples’ decisions about risk. Traditionally, the study of risk assumed that emotion (the affect) limits the degree of rationality in a decision-making process. It was assumed that emotion predisposes us to make one decision rather than another based on our perceptions of good or bad consequences. However, there is another side to the point.

Researchers in risk communication sometimes refer to the phenomena as an *affective heuristic* that can either limit rational decision-making, or enhance it.² By *affect*, we mean letting emotions about what is *good* or *bad* drive us in assessing the risk of doing something one particular way rather than another way. *Heuristic* means using those emotions as a rule of thumb for guiding the choices we make rather than having those emotions drive our choices. Therefore, following a hunch or gut instinct based on experience or professional judgment, though sometimes posing difficulty for planning and coordination can in principle enhance rational decision-making rather than limit it. The key question is how organizations can use the affective heuristic to enhance rational decision-making, and how it sometimes works against rational decisions.

We have all heard the Monday morning quarterbacking retort often made by people in charge when other people criticize decisions that went wrong. In fact, some of the official responses to efforts to understand how government at all levels prepared for, and responded to, Hurricane Katrina seem to echo the retort that criticisms are just Monday morning quarterbacking.³ Yet reluctance to assess decisions can result in a failure to learn from poorly thought out choices, where emotion limited rather than enhanced the rationality of the chosen course of action. Bazerman and Watkins believe it is possible to develop criteria for deciding whether a surprise was predictable, and envisioned, but not acted on preventatively.

The analysis here asks whether the definition of a “predictable surprise” is applicable to Hurricane Katrina and its aftermath in New Orleans. It is not obvious that the event meets the criteria for the characterization, though at first glance most people probably assume it does. Bazerman and Watkins define a predictable surprise in the following way:

Unlike an unpredictable surprise, a predictable surprise arises when leaders unquestionably had all the data and insight they needed to recognize the potential for, even the inevitability of, a crisis, but failed to respond with effective preventative action.⁴

Our key focus is whether the impact of Katrina on the New Orleans levee system was predictable, along with an associated concern about whether the federal preparedness of the levee protection system by the U.S. Army Corps of Engineers, and response to the catastrophic disaster by FEMA, were surprising. Bazerman and Watkins outline four major characteristic traits of predictable surprises.

1. Leaders know problems exist and will not solve themselves.
2. Organizational members realize a problem is getting worse.
3. Fixing the problem requires significant cost in the present with no immediate benefit (rewards for avoiding the costs of prevention are uncertain but potentially larger than incurring the costs).
4. Humans tend to maintain the status quo if it functions (minorities protect their own interests, subverting efforts by leaders to implement change).⁵

We will consider each point in detail in the following discussion, and assess the fit of each to the planning for, and response to, the devastation from hurricanes like Katrina. The key analytic goal here is to outline organizational innovations that exhibit the capacity to address the most serious shortcomings evident in the federal preparation for, and response to, Hurricane Katrina. The organizational goal is to increase the likelihood that, in the future, representatives of federal agencies in catastrophic disaster situations, i.e. FEMA and the Corps of Engineers, will effectively collaborate with state and local officials as well as the private sector. The emphasis is on how *federal* agencies initiate and maintain support and collaboration since, by definition, a catastrophic disaster overwhelms local and state resources.

Bazerman and Watkins contend leaders can encourage surprise-avoidance or surprise-conducive organizational processes. The analysis below outlines the relevance of each type of organizational process to the key federal agencies involved in the Hurricane Katrina disaster, the U.S. Army Corps of Engineers and FEMA. Surprise-avoidance, as outlined by Bazerman and Watkins, is a characteristic goal of learning organizations.⁶

Learning Organizational Processes and Surprise-Avoidance

A range of investigations is underway regarding the preparedness of the levee system to survive a Category 3 hurricane, including the Army Corps of Engineers’ study of its own design and maintenance preparations, with the American Society of Civil Engineers overseeing.⁷ The

original legislation in 1965 that authorized the hurricane protection project was only intended to protect against Category 3 hurricanes, expected every 200-300 years.⁸ In addition, Team Louisiana (a state sponsored team of academics and independent engineers), U.S. Senate and House committees, the Louisiana Attorney General, the FBI, and the National Science Foundation are involved. As the investigations continue, observers indicate that the failure of the levees points to issues in the way they were designed and prepared by the Corps of Engineers. Observers note that the Corps of Engineers failed to recognize the relevance of basic design and maintenance flaws, contending the oversight speaks to the institution itself as much as to the design of the levees. Combine that position with the common understanding that FEMA failed to mount an effective response to Hurricane Katrina and the organizational attributes of federal preparedness and response efforts in New Orleans become important concerns.

One basic lesson to learn from Hurricane Katrina is that organizations managing preparedness for flood control and hurricanes, such as the U.S. Army Corps of Engineers, as well as organizations managing responses to disasters, such as FEMA, can benefit from developing learning organizational processes. Those same processes make it more likely that staff will avoid surprises by recognizing them, prioritizing the challenges, and mobilizing resources to prevent them from developing.

Humans tend to take risks more seriously when the outcomes are vivid to us.⁹ Bazerman and Watkins argue that the challenge of leadership is to “provide the vision for change, even when the need is not yet vivid.”¹⁰ They emphasize the importance of leaders encouraging staff to remain aware of the conditions underlying predictable surprises, by providing organizational processes designed to “recognize emerging threats, prioritize action, and mobilize available resources to mount an effective preventative response.”¹¹

A basic step in preparing an organization to use the affect of its people to enhance their efficiency and effectiveness is for its leadership to admit that it is not perfect, that operations require continuous improvement. Professional criticisms of operational performance must flow up the organization as well as down, with the organization encouraging such contributions. Indeed, a learning organization does the following:

- defines a clear mission, designed to inspire workers to do their best;
- creates a culture that emphasizes professionalism;
- provides top-notch technical training;
- provides leadership development for managers;
- pushes responsibility down the ranks so employees in the field are authorized to act quickly; and
- advocates continuous improvement.¹²

Learning organizations are challenged to promote a level of awareness sufficient to enable surprise-avoidance capability from their members. Indeed, the structure of large and complex organizations increases the difficulty leaders’ face in anticipating predictable surprises.¹³ As the complexity of organizations, or even project teams, increases, the way expertise is coordinated tends to develop into silos. Organizational silos often disperse responsibility as well as information.¹⁴ In other words, organizational silos encourage staff to “let someone else” deal with recognized problems, essentially supporting surprise-conducive processes.

The following discussion makes the point that surprise-conducive processes are one likely result of diminished professional identity in organizations like FEMA and the U.S. Army Corps

of Engineers. Developing surprise-avoiding processes means providing staff with the authority and resources to make decisions and an organizational hierarchy that listens for informed, professional judgments from subordinates, especially those in the field preparing for, or facing, challenges posed by the threat of disaster. This analysis begins with a discussion of what the leadership at the federal, state, and local levels knew about the vulnerability of the New Orleans levees.

Leaders know problems exist and will not solve themselves

Leadership, as noted above, is a key point of interest when considering the way organizations attempt to avoid, or mitigate the impact of, predictable surprises. There is little dispute of the point that local, state, and federal leaders knew about the vulnerability of the New Orleans' levee protection system and the threats it posed to the city.¹⁵ Although some officials initially claimed that no one expected the levees and floodwalls in New Orleans to collapse, most experts knew about the vulnerability for many years. Indeed, the *Houston Chronicle* ran a story in December 2001 by Eric Berger offering the following assessment.

New Orleans is sinking. And its main buffer from a hurricane, the protective Mississippi River delta, is quickly eroding away, leaving the historic city perilously close to disaster. So vulnerable, in fact, that earlier this year the Federal Emergency Management Agency ranked the potential damage to New Orleans as among the three likeliest, most catastrophic disasters facing this country. The other two? A massive earthquake in San Francisco, and, almost prophetically, a terrorist attack on New York City. The New Orleans hurricane scenario may be the deadliest of all. In the face of an approaching storm, scientists say, the city's less-than-adequate evacuation routes would strand 250,000 people or more, and probably kill one of 10 left behind as the city drowned under 20 feet of water. Thousands of refugees could land in Houston. Economically, the toll would be shattering.¹⁶

Surprisingly, a recent Congressional Research Service Report, *New Orleans Levees and Floodwalls: Hurricane Damage Protection*, indicates that "Failure (often called a breach) of levees and floodwalls reportedly was a contingency not central to emergency planning and response."¹⁷ Indeed, Governor Blanco recently released an overview of her actions in preparing for and responding to Hurricane Katrina in which she states that "No one expected, or predicted, that the levees would fail in the manner which occurred after Hurricane Katrina."¹⁸ The question is whether officials knew about the potential for breaches, regardless of whether people agreed on the scenario most likely to produce them. The evidence, outlined in the following two sections, indicates the U.S. Army Corps of Engineers knew about the threat of breaches, as opposed to overtopping, since the early 1980s. Moreover, all concerned agencies, including those at the local, state, and federal levels, knew about the threat of overtopping and consequent flooding in even a Category 3 hurricane.

The *Times-Picayune's* special edition issue from June 2002, titled "Washing Away," provides key insights into New Orleans' social, cultural, and geographical history, making it clear the vulnerability of the area to hurricanes was well known. The *Times-Picayune* summarized the choices faced by New Orleans in trying to manage a situation in which an area at or below sea level experiences sinking land and a rising Gulf of Mexico.

Higher levees, a massive coastal-restoration program and even a huge wall across New Orleans are all being proposed. Without extraordinary measures, key ports, oil and gas production, one of the nation's most important fisheries, the unique bayou culture, the historic French Quarter and more are at risk of being swept away in a catastrophic hurricane or worn down by smaller ones.¹⁹

The receding coastal wetlands were a well-known fact, increasing the vulnerability of Louisiana and New Orleans to hurricanes. A statement offered to the Times-Picayune by the general manager of the South Lafourche Levee District, Windel Carole, makes it clear, noting "The biggest factor in hurricane risk is land loss. The Gulf of Mexico is, in effect, probably 20 miles closer to us than it was in 1965 when Hurricane Betsy hit."²⁰ Therefore, anyone with limited knowledge of the history of hurricanes along the Gulf Coast was aware of the vulnerability of New Orleans to a Category 4 hurricane like Katrina.²¹ Thus, as the environment surrounding the levees increased in its threat potential, the basic design choices made in constructing and maintaining the levees increased in importance.

Few people questioned the U.S. Army Corps of Engineers' competence, or diligence, in its oversight of the levee protection system. Although a contractor dispute (discussed below) pointed to the Corps of Engineers' failure to give fundamental consideration to soil composition in levee design, overall the authority of the Corps of Engineers went unquestioned by outside parties. Indeed, the draft report of Team Louisiana's investigation is expected to indicate, as its lead investigator, Ivor Van Heerden, testified to Congress, that the levee at the 17th Street Canal was built with "too little regard for the inherent weakness of the soil under the canal banks." The problem was repeated in the other major breaches in the levee system in New Orleans.²² So, on the *preparedness* side, basic design flaws in the construction and maintenance of the levee infrastructure went unaddressed. The Army Corps of Engineers is currently investigating its role in the levee design and maintenance and, aside from an interim report, has not offered its own assessment of the preparedness failures evidenced in the levee breaches.²³ This issue is discussed in more depth in the next section of this paper.

On the *response* side of the disaster, the federal government developed the *National Response Plan* (NRP) in December 2004 for leaders to use in situations just like the Hurricane Katrina disaster. The NRP included provisions for dealing with catastrophic disasters in which state and local governments are overwhelmed. These provisions go into effect when the President declares an Incident of National Significance (INS), and the Secretary of Homeland Security activates the Catastrophic Incident Annex. In fact, a Presidential declaration of Katrina as an INS, issued on August 27, 2005, covered the states hit by the hurricane before it ever touched the coastline. It was, however, the first real test of the NRP and some confusion resulted in exercising it. Examining the confusion can provide lessons to take away from the response efforts.

Interestingly, Department of Homeland Security Secretary Michael Chertoff did not appear to recognize the implications of the designation made by the President for several days. Secretary Chertoff found it necessary to announce an INS again several days after the President, but still failed to activate the Catastrophic Incident Annex – even though the Hurricane Katrina disaster met not just one, but all four, criteria for an INS outlined in HSPD-5.²⁴ In early September, DHS spokesperson Russ Knocke explained that Chertoff's re-declaration of Hurricane Katrina as an INS was intended to create an "administrative paper trail" for the President's earlier announcement.²⁵ A month later, in mid-October, he contended that, "The

annex is intended to be used during no-notice catastrophic incidents when there is no awareness of an impending disaster and no pre-staging of people, resources, and response forces.”²⁶ In fact, reports indicate that the federal government’s authority to respond to an INS did not result from Homeland Security Secretary Chertoff’s memo, but from a statement issued by the White House on the night of August 27 while President George W. Bush was at his Crawford, Texas ranch.²⁷ Secretary Chertoff’s memo came thirty-six hours after the storm hit, declaring the Katrina disaster an INS, and, as discussed below, well after the only FEMA agent in New Orleans, Marty J. Bahamonde, knew the severity of the situation.

The President’s statement assigned William Lokey, a subordinate, as the “principal federal official” rather than FEMA Director Michael Brown. Chertoff’s memo re-declared an INS and assigned Director Brown as the “principal federal official.” We can assume the leadership at the federal level was well aware that the devastation from a hurricane like Katrina posed catastrophic risks, since the President declared it an INS before it hit land. Neither of the INS declarations activated the key provisions of the NRP that would support the proactive allocation of assets and capabilities by FEMA. As retired Admiral James Loy (who, as DHS deputy secretary, helped draft the NRP) indicated, one of the “dramatic lessons” to learn from the Hurricane Katrina response is in clarifying how and when to use the Catastrophic Incident Annex.²⁸ *Perhaps the baseline criterion to use in activating the NRP’s Catastrophic Incident Annex is whether proactive actions are required of FEMA and the agencies it coordinates to respond to any INS declaration.*

At first consideration, it is unclear why it was necessary to change the President’s designation of the “principal federal official,” especially if the Secretary of Homeland Security did not intend to activate the Catastrophic Incident Annex. Learning organizations push responsibility down the ranks so individuals faced with challenging situations are empowered to respond to them. Changing a Presidential designation so that the highest ranking bureaucrat is “officially” in charge makes it clear that FEMA, and by implication DHS, did not approach the challenges posed by the disaster with the point of view of a learning organization but, rather, as a top-down bureaucracy. Indeed, the inability of Marty J. Bahamonde, FEMA’s only agent on the ground in New Orleans immediately following the levee breach, to get the attention of the leadership in Washington D.C. is indicative of such an organization.

In describing his reporting to FEMA headquarters on Monday, August 29, Bahamonde told a Senate Committee “I believed at the time and still do today, that I was confirming the worst case scenario that everyone had always talked about regarding New Orleans,” i.e. as one of the top three most serious disaster scenarios in the United States.²⁹ There are clear indications from the Katrina response that FEMA is not organized in a manner conducive to learning, or to proactive response efforts in case of an INS. It is not unfair to characterize the agency’s processes as surprise-conducive.

Many news stories have discussed the exodus of personnel from the agency as the Department of Homeland Security integrated FEMA into its organization, and the negative impact of that reorganization on the professional identity of FEMA staff. A survey of employees last year found that eighty percent said the agency was weaker after joining DHS.³⁰ In addition, emails between FEMA officials in the field and their managers in Washington D.C. make it clear that Bahamonde, as the only FEMA official in New Orleans immediately after Katrina hit, was not empowered to solve problems on nearly the scale needed.³¹ Moreover, it appears that the agency’s leadership either discounted, or ignored, much of his information about the dire circumstances in the Superdome, and the city in general.³²

Organizational members realize a problem is getting worse

Katrina, as a Category 4 hurricane, is one of sixteen such hurricanes to hit the United States over the past century. There were three Category 5 storms during that same time-period: Camille along the Gulf Coast in 1969; Andrew in 1992; and an unnamed storm hitting the Florida Keys in 1935. All told, there were 314 hurricanes recorded in the Atlantic Ocean since 1950. Of those, seventy-two hit the United States' coastline, with fifty striking along the Gulf Coast. Fourteen of the hurricanes hitting the Gulf Coast came on land within seventy-five miles of New Orleans. Five of those fourteen hurricanes were Category 3 or greater with one – Betsy in 1965 – a major hit on New Orleans. Based on the numbers, it is certainly not surprising that hurricanes have been a longstanding concern, especially around New Orleans.³³

Before Katrina hit New Orleans, FEMA already considered the likely damage from a strong hurricane hitting the city to rank in the top three potential catastrophes facing the country. Moreover, a 2004 tabletop exercise on a hypothetical Hurricane Pam hitting New Orleans pointed to some strengths, but also significant weaknesses, in the readiness of authorities to respond to the likely devastation. A scheduled follow up exercise on evacuating New Orleans was not funded. Then Katrina triggered the actual evacuation plans of the state and city. As we know, these evacuation plans did not execute well. It seems fair to say that FEMA and the Army Corps of Engineers were well aware of the ongoing deterioration in New Orleans' capacity to withstand Category 3 hurricanes, much less a Category 4 or 5.

In the aftermath of Katrina, several investigations are underway relating to FEMA's performance in particular, but also into the U.S. Army Corps of Engineers' preparedness efforts, i.e. planning and design of the levees. The Opening Statement of Chairman Tom Davis of the House Government Reform Committee, in recent hearings on the response to Katrina, included the following key issues and questions:

I suspect we will find that government at all levels failed the people of Louisiana, Mississippi, and Alabama. I believe we will hear from Michael Brown, for example, that there simply was no unified command structure or clear lines of authority in Louisiana. That means we're confronted with profound questions about not only what went wrong with FEMA, but what may be wrong with our government at all levels when it comes to disaster preparation and response. Are we lacking a culture of urgency? A culture of getting things done? Or is it that, even when we have the best possible planning and prediction available, we come face to face with the vast divide between policy creation and policy implementation?³⁴

A partial answer to the questions raised by Chairman Davis comes from what the former FEMA Director, Michael Brown, did not mention in his own testimony. Director Brown did not mention the National Response Plan or the "Incident of National Significance" concept anywhere in his testimony.³⁵ His concept of FEMA's role, as evidenced by his testimony, failed to consider the implications of an INS declaration for the overall framework within which the agency works. The leadership at the federal level clearly failed to provide the proactive resource allocation and engagement that the challenges of Hurricane Katrina required. The response efforts were largely reactive, i.e. bureaucratic.

Bureaucracies work by the rules in order to remain accountable. There were a number of criticisms of the federal bureaucracy's slowness to respond to Katrina's aftermath. To some extent, it resulted from a *duel of competing statutes* in the thinking of those responding to the

disaster of New Orleans post-Katrina. A Congressional Research Service (CRS) Report, "The Use of Federal Troops for Disaster Assistance: Legal Issues," recently indicated that:

Unless the President determines that a disaster implicates preeminently federal interests, the declaration of an emergency under the Stafford Act requires that the governor of the affected state first make a determination that the situation is of such severity and magnitude that the state is unable to respond effectively without federal assistance, *which determination must include a detailed definition of the type and amount of federal aid required.* [Emphasis added.]³⁶

It is unclear whether the respective federal agencies understood the significance of an INS designation for the modality of the federal response. Federal officials, especially FEMA, stated several times that they needed the state of Louisiana to make specific requests. Yet, the NRP clearly makes the point in several places that federal officials need to *take the initiative* during incidents of national significance since local and state officials are likely overwhelmed by the event. It even calls upon FEMA to encourage and facilitate voluntary offers of assistance.

As the first sentence of our quote from the CRS document implies, an INS is in fact a statement that a disaster implicates preeminently federal interests. In point of fact, and as the CRS report indicates, such a declaration makes the Posse Comitatus Act *less restrictive* in its prescriptions of what federal troops can do in responding to disasters.³⁷ Nevertheless, the federal agencies responding to Katrina appeared to assume otherwise for several days into the disaster response effort. The delay in the federal response is discussed below in terms of differing groups attempting to sustain their own status quo. However, the immediate manifestation of those efforts to sustain a status quo was evidenced by the way key actors like Director Brown and Secretary Chertoff understood their own roles in the process.

In his testimony on the role of FEMA, Director Brown described it solely in the context of the Stafford Act, never mentioning the way in which an INS can alter the stipulations in the Stafford Act if the Secretary of DHS activates the Catastrophic Incident Annex of the NRP.³⁸ Moreover, in Secretary Chertoff's testimony he asserted that the NRP does not "give him any special powers that the FEMA director didn't have when President Bush declared a federal emergency the Saturday before Katrina struck on August 29."³⁹ FEMA did take proactive steps, as Director Brown's testimony indicates, by identifying Federal assets and capabilities, deployed strategically out of harm's way but within proximity. As indicated in the previous section, FEMA failed to maintain a proactive stance regarding movement of those assets and capabilities to the disaster scene after the hurricane passed. For example, on September 3 only a tiny fraction of the active duty U.S. military was engaged in rescue and relief efforts.

The situation frustrated senior military officers who attributed the issues in part to complex relationships with FEMA. Newhouse News Service quoted an officer (who asked not to be identified) as saying, "There is a tremendous amount of frustration here, that we have assets stacked up ready to go and we don't have the requests for them.... All we can do is nudge the folks at FEMA and say, 'How about if we do this or that?'" On the other hand, FEMA spokesperson Natalie Rule contended her agency's coordination efforts with the Pentagon were driven by the flow of requests from the State of Louisiana. "The military has been joined at the hip (with FEMA) since this storm was approaching Florida... We work with the state and look to the state as to what they need... If (a state request) has something to do with military assets, we would tap into those."⁴⁰ Indeed, DHS Secretary Chertoff has recognized the problem FEMA faced in using its own resources. He has promised to "re-engineer" the agency. The top two

weaknesses Chertoff intends to address are FEMA's logistical planning before and during disasters and its delivery of services to victims in the aftermath of disasters.⁴¹

On the face of it, Chertoff's "re-engineering" plan appears to address issues like the failure of FEMA to use its own pre-positioned assets and capabilities effectively, such as the difficulties in using military assets, and the reluctance of bus drivers and others to enter New Orleans because of the stories of violence. He proposed one innovative structure to incorporate surprise-avoidance processes in his recent testimony to the House Select Committee on Hurricane Katrina. Chertoff indicated that DHS is organizing emergency reconnaissance teams to go into disaster areas in the immediate aftermath of the catastrophe to provide real time situational reporting of facts on the ground. The new teams consist of FEMA specialists, Coast Guard personnel, and other DHS law enforcement officers.

The team innovation announced by Secretary Chertoff is a ready example of how to constrain the affective heuristic's impact on response decisions by putting in context exaggerated stories about what is happening on the ground.⁴² A common shortcoming of the leadership during the response to Katrina from federal, state, and local leaders was their allowing vivid accounts of looting, rapes, and murder to affect their decision-making.⁴³

More importantly, the major organizational and policy challenges lie on the other side of the affective heuristic, i.e. using it to enhance rationality. Secretary Chertoff has not spoken to how the agency will delineate the responsibilities of federal officials vis-à-vis state and local authorities in an emergency. In other words, *the key issue of how FEMA can act proactively during an INS remains unaddressed*. Much of the criticism federal officials made of local officials stemmed from the assumption that the federal government should take a reactive role to disasters. For example, Director Brown clearly discussed the inadequacies of the local response from the point of view of a federal administrator.⁴⁴ But he failed to keep in mind the way the NRP describes proactive actions:

Notification and full coordination with States will occur, but the coordination process must not delay or impede the rapid deployment and use of critical resources. States are urged to notify and coordinate with local governments regarding a proactive Federal response.⁴⁵

Nowhere in the NRP does it say that the federal response to an INS is *conditional*, based on specific requests from the state or local governments. Nevertheless, FEMA's response was directed with that conception of the agency's role. Any "re-engineering" effort for FEMA must address this basic issue of what constitutes a "proactive" action by the agency and the scope of such actions when the Secretary of DHS does not formally activate the catastrophic annex of the NRP.⁴⁶

The argument thus far is that leadership at the federal, state, and local levels was aware of the increasing vulnerability of the levee system in New Orleans to hurricanes at Category 3 and above. Key organizations, i.e. FEMA, failed to act proactively to mitigate the catastrophic disaster caused by the breach of the levees in New Orleans. The next section will consider issues relating to judgments made about the design of the levees as well as decisions made on funding ongoing maintenance and upgrades.

Fixing the problem requires significant cost in the present with no immediate benefit

Improving the levee and floodwall system in New Orleans was a recognized challenge for decades, as was the challenge of a receding delta providing less protection to the New Orleans

area from the storm surges resulting from a hurricane. The Breaux Act of 1990 created a task force involving several federal agencies and gave it the mission of restoring wetlands. The task force received only forty million dollars per year to stop the erosion of the delta. A University of New Orleans study estimated the effort averted only about two percent of the overall loss, leaving an erosion rate of twenty-five square miles of delta per year.⁴⁷

Basic flaws in the design of the levee protection system were first recognized over two decades ago, before the wetlands were so diminished. An outside contractor, Eustis Engineering, was the first to express concerns about the levee vulnerability to breaching in the early 1980s. In 1981, the New Orleans Sewerage & Water Board developed a plan to improve street drainage by dredging the 17th Street Canal. The Corps of Engineers issued permits to do the dredging in 1984 and 1992, though the Corps was not a partner in the project. As a *Times-Picayune* story explains:

Before the project, the canal formed a roughly symmetrical ‘U’ shape common to most canals. In the sections that would later fail during Hurricane Katrina, its average depth was about 12 feet below sea level and, at normal water levels, the Orleans side had about a 20-foot buffer of mud between the water and what was then a bare steel floodwall. That wall of sheet piling ran through the center of the levee to a depth of 9.8 feet below sea level. After the dredging, the bottom was 18.5 feet below sea level, and the canal-side levee had been shaved so narrow, water now touched the wall on the Orleans side. The ‘U’ was now lopsided and the water in the canal had shorter paths to the outside of the levee.⁴⁸

Eustis Engineering contracted to do a design study for Modjeski and Masters, the consulting engineers on the project, and performed soil investigations on a section of the 17th Street Canal from south of the Veterans Memorial Boulevard bridges to just north of those structures.

They found that “the planned improvements to deepen and enlarge the canal may remove the seal that has apparently developed on the bottom and side slopes, thereby allowing a buildup of such pressures in the sand stratum.”⁴⁹ Eustis’ concerns about a “blow-out”, or breach, of the levee were strong enough that the company recommended test dredging before the final design. The company recommended that, without test dredging, the bottom of the canal needed sealing with a concrete liner or building a seepage cutoff wall, like sheet pilings, to a depth of 65 feet below sea level versus the existing 12 feet. Engineers studying the levee breaches consider the report by Eustis significant because the stretch of canal the firm studied is widely considered to exhibit stronger soil layers than those that breached during Hurricane Katrina.

The most puzzling point about the dredging project is that the Corps of Engineers planned to follow the project by raising the floodwall from 10 feet to 14.5 feet. It is unclear whether the Corps paid attention to the contractor’s concerns since most of the documents related to the work remain unavailable to the public. “Although the Corps of Engineers was not a direct partner in the dredging, it was aware of the work and knew it would have an impact on its later project.”⁵⁰ Indeed, contractors working for the Corps on the later project raised their own concerns about the soil and foundations of the levee.

Reports indicate that key sections of the levee system’s soil and foundation, particularly the floodwall on the 17th Street Canal where much of the serious flooding occurred, posed serious problems for the contractors involved. Court papers from 1998 show that Pittman Construction indicated to the Corps of Engineers as early as 1993 that the soil and the foundation for the walls were “not of sufficient strength, rigidity and stability” to build on. The construction company

claimed that the Corps of Engineers did not provide it with complete soil data when it developed a bid on the levee project.⁵¹

Though the construction company lost its suit against the Corps of Engineers, the gist of their complaints about the condition of the soil and existing foundation was not disproven. Engineers now say the difficulties Pittman Construction faced were early warning signs that the Corps of Engineers ignored.⁵² In fact, testimony before the U.S. Senate's Committee on Homeland Security and Governmental Affairs by several witnesses point to soil-related issues as key causal variables in the failures of the 17th Street Canal, the London Ave Canal, and the Industrial Canal.⁵³ Indeed, Van Heerden summarizes the preliminary findings well, noting:

...in the case of the 17th Street Canal, London Ave Canal and the Industrial Canal, levee collapse and flood breaching reflected unstable soils conditions and a lack of foundation support and water percolation seals, given the soft, porous and highly organic nature of the soils.⁵⁴

The Corps of Engineers officially disputed the points made by Pittman Construction regarding the soil conditions, though it now seems clear that the crucial breaches in New Orleans occurred in levees where the floodwall foundations were not as deep as the canals and that the Corps of Engineers was aware of the issue. The soil then allowed water to percolate under the levee and floodwalls, weakening the structure so that the storm surges from Hurricane Katrina moved it entirely, or breached it. *Would an organization with processes in place to support ongoing learning, and surprise-avoidance, fail to recognize the legitimacy of the contractor's point, rather than argue about purely budgetary issues related to the contract?*

The U.S. Army Corps of Engineers is historically an insular agency, known for doing things its own way. It is not possible to say whether surprise-avoidance processes are in place at the Corps of Engineers, until the public receives more access to internal documents. Robert Bea, a geotechnical engineer from the University of California at Berkeley, asserts "In my view, in the case of the 17th Street, London Avenue, and even the Industrial Canal floodwalls, fundamentally what we are looking at is a failure focused on the institutional side."⁵⁵ The failure of Corps' staff to recognize and prioritize the challenges of levee upgrades and receding wetlands to the city of New Orleans, and surrounding areas, strongly suggests that surprise-conducive processes characterize its organization. The Corps' organization has over the past few decades outsourced more work, lost many engineers to private industry, and consequently suffered a diminished capacity to attract top-notch engineers.⁵⁶

Bazerman and Watkins note that predictable surprises play out over long time frames, sometimes longer than the typical tenure of organizational leaders. They contend "This creates a variation on the free-rider problem. 'Why,' a leader might ask, 'should I be the one to grapple with this problem and take all the heat when nothing is likely to go wrong during my watch?'"⁵⁷

In other words, members of the U.S. Army Corps of Engineers, conceivably, made a collective bet that the unlikely occurrences that, in fact, did end up happening, were not worth the expense, from a professional or organizational initiative point of view. We will know more about the decision-making in the Corps, and its relationship to local agencies with levee responsibilities, as additional information is made available to the public. The sheer magnitude of the problems faced in the New Orleans levee protection system probably appeared overwhelming to members of an organization enduring ongoing budget concerns and staff turnover.⁵⁸

Consider the scale of the plans offered to fix the levee challenges: A plan floated in early 2001 involved two to three billion dollars proposed to divert sediment from the Mississippi River

back into the delta, rather than allow the sediment to wash down the levee system and dump into deep water. The project was compared to the four billion dollar restoration initiative for the Florida Everglades. However, these projects are typically funded through matching grants in which the state has to match a federal dollar with one of its own. Louisiana was only able to match each dollar with fifteen to twenty-five cents. Facing the scale of such a challenge, and the state's limited ability to pay for its share of the costs, the response of most people was to maintain the status quo. The result was a catastrophic disaster that cost many times the few billion dollars needed to initiate a full-scale rebuilding program for the levee protection system and the surrounding wetlands. Essentially, those responsible for the levee protection system in New Orleans saved money in the short term only to permit one of the largest disasters in American history to occur over the long haul.

Humans tend to maintain the status quo if it functions

We will understand the way the status quo for the New Orleans levee protection system was maintained, in the decision-making of the Corps of Engineers and their associated local agencies, as more documentation is made available to the public. On the preparedness side, the status quo self-evidently stopped functioning when the levee protection system catastrophically failed during Hurricane Katrina. The U.S. Army Corps of Engineers currently finds its authority questioned by many, not because of the competence of its engineers' expertise, but rather due to concerns about its organizational processes that allowed such basic design flaws to go without sustained questioning by engineers exercising professional judgment. More to the point, *the Corps actually contested lawsuits brought by contractors that related directly to design flaws stemming from the soil foundations of the levees.*

New Orleans had dodged the bullet many times, with the major force of hurricanes skirting around the area. Nevertheless, most people with a reason to know about it were aware that a Category 3 hurricane posed a severe threat to the New Orleans' levee protection system, and a Category 5 hitting land as a Category 4, as with Katrina, posed a catastrophic threat.

Looking at the status quo during the response effort to Katrina is a bit more complex. President Bush declared the oncoming storm an *incident of national significance* before it hit the coastline, due to widespread concern that it portended catastrophic damage and loss of life. As noted above, the NRP stipulates that the declaration of an INS will initiate a series of federal actions that, even though coordinated with the states and localities, nevertheless provides the designated authority for the "principal federal official" to initiate and take proactive steps in responding to a catastrophic disaster. In other words, when responding to a disaster where the President declares an INS, the director of FEMA is not required to wait for a request from the governor of the affected state to begin providing response aid.

The INS designation is intended to *shake-up* the status quo among federal agencies during catastrophic disasters, making agencies operate more like a network of resources than top-down bureaucratic organizations. Secretary Chertoff saw it this way when he responded to criticisms of his failure to activate the Catastrophic Incident Annex. As noted previously, he indicated that the Director of FEMA already had that authority, though director Brown did not assume the authority was his, and failed to act on it. If the authority passes automatically through the office of the DHS secretary to his designee (an insight that does not seem obvious from the NRP), there was no reason to make Director Brown the "principal federal official" for Katrina response in place of William Lokey, the first official put in charge by President Bush's declaration. The point is reinforced by the fact that the U.S. Coast Guard's Thad Allen replaced Brown as the

“principal federal official” for the Katrina response. It appears that the designation is more effective if the individual starts from an authoritative position within at least one agency in order to command belief in his/her potential effectiveness by leaders in other agencies. Though the “principal federal official” designation appears convincing on paper, in the NRP existing relationships between agencies at various levels of government dictate that the individual designated needs to already occupy a leading role in a response agency.

Nevertheless, the INS was effective in “shaking up” the status quo between federal agencies, imposing a supra-bureaucratic authority with a unified command structure for federal resources called the National Incident Management System (NIMS). Aside from reports about turf wars between the Department of Defense’s Northern Command and DHS, most federal agencies worked together successfully during the Katrina response. Consider, for example, the point made by Frank Cilluffo, director of the Homeland Security Policy Institute at George Washington University, who noted, “Quite honestly, at the federal level, the coordination was quite robust. It’s just the interface between federal, state and local where clearly we need to look to ways to improve the process.”⁵⁹ In other words, shaking up relations between agencies at the same level of government is one challenge. Shaking up relations between agencies across levels of government is a wholly different challenge.

Attempts to use the NIMS to manage the support relationship with the states, to federalize the response into a single, unified command structure, failed following Katrina. In the end, the Louisiana National Guard, Guard units dispatched from other states, and active-duty federal troops received direction through a joint command using the two existing command authorities, state and federal. Director Brown summarized the situation in his testimony as, “We federalized this operation without federalizing it.”⁶⁰ After several crucial days during the aftermath of Katrina, and failing to gain Governor Blanco’s consent to federalize the Louisiana National Guard to place it under the direction of the Federal Joint Task Force Katrina, President Bush designated a single military commander for the task force. Governor Blanco wrote to the President:

I also agree with your idea that – given the unprecedented requests for federal military assistance that I, and my fellow Governors in Mississippi and Alabama have made – a ‘single military commander’ of ‘Federal Joint Task Force Katrina’ be named for federal forces. I believe such a decision is critical to improving the timeliness of fulfilling and coordinating the requests for federal assistance that have already been made. This officer would serve as the single military commander for all Department of Defense resources providing support to the Department of Homeland Security and the State of Louisiana. This could also enhance the contribution of over 25 National Guard states currently being commanded by the Louisiana Adjutant General. I ask that you direct the assigned Federal Coordinating Officers at the Department of Homeland Security (FEMA) to co-locate with my Homeland Security and Emergency Preparedness Office at the Federal Joint Task Force headquarters. This would make the Joint Interagency Operations Center a truly integrated operation.⁶¹

The President’s decision followed several days of differences, described by some as a “political standoff,” between the federal and state governments over how to unify the command for the National Guard and federal troops in New Orleans. The differences between the state and

federal governments regarding the need for a “unified command” delayed the arrival of active-duty federal troops in New Orleans for several days. It is unclear what impact it had on FEMA’s seeming inability to act proactively, though some of the agency’s decisions not to commit resources stemmed from concerns about disorder and the safety of FEMA agents.

Governor Blanco, on August 29, a day after Katrina hit land, asked the President for “everything you’ve got,” including a specific request for a range of items, as well as 40,000 troops on August 31. President Bush sent 7,000 federal troops on September 3 after it was clear that the differences on how to organize a unified command were beyond reconciliation.⁶² The new response “status quo,” implied by the NIMS, did not prove workable in the catastrophic disaster of Hurricane Katrina.⁶³

Conclusion

The occurrence of a hurricane like Katrina was not unexpected in New Orleans; neither were the complications faced in the aftermath of the storm. Given this understanding, and the neglect in preparing for a hurricane like Katrina, as well as the ineffective response preparations, it seems reasonable to assert that Katrina as well as its aftermath was a predictable surprise. The threats posed by the hurricane, and the likely aftermath, were well known and unsurprising to most who thought about the hurricane threat to New Orleans. Unfortunately, much of the local, state, and federal leadership, especially the U.S. Army Corps of Engineers, appears to have remained complacent about preparing the levees for a catastrophic hurricane. As more information is made public, the Corps appears increasingly to exhibit surprise-conducive organizational processes in its oversight of upgrades and maintenance to the New Orleans levee protection system.

Like any predictable surprise, the preparation and response to Katrina indicate that leaders need to create structures in which the affective heuristic is *constrained* in its ability to limit rationality and *enhanced* in its capacity to inform rationality in decision-making about hurricane protection. The preparation and response to Katrina clearly poses a challenge on how we go about building those structures, both within bureaucracies and across them at different levels of government. We have suggested a number of potential organizational changes to build structures that support surprise-avoidance processes, while discouraging surprise-conducive processes.

1. Explicitly specify in the NRP that the “principal federal official” designated by DHS is authorized to activate the Catastrophic Incident Annex, pushing the authority down the organization from the DHS Secretary to his/her designee.
2. Integrate learning organization principles into the U.S. Army Corps of Engineers, FEMA, and DHS.
3. View the status quo during disasters as a multi-level, governmental reality involving ongoing compromise between authorities at each level.
4. Review the NIMS requirement for a “unified command structure” to determine under what circumstances joint commands suffice for the mission.

When combined with Secretary Chertoff’s proposed DHS reconnaissance teams, intended to provide improved “situation awareness,” the organizational innovations suggested above promise an increase in the surprise-avoidance capability of FEMA.

¹ Max H Bazerman and Michael D. Watkins, *Predictable Surprises: The Disasters You Should Have Seen Coming, And How To Prevent Them* (Boston, Massachusetts: Harvard Business School Press, 2004).

² P. Slovic, M.L. Finucane, E. Peters, and D.G. MacGregor, "Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality," *Risk Analysis* 24, 2 (2004), 1-12. They note, "the affective heuristic enables us to be rational actors in many important situations. But not in all situations. It works beautifully when our experience enables us to anticipate accurately how we will like the consequences of our decisions. It fails miserably when the consequences turn out to be much different in character than we anticipated." 12.

³ Consider, for example, the statement by Russ Knocke, a spokesman for Homeland Security Secretary Chertoff, that, speculating on whether the federal response could have been quicker if Chertoff understood the gravity of the situation sooner is playing "armchair quarterback." Jan Moller, "News of Levee Breach Hit D.C. Late," *The Times-Picayune*, December 4, 2005. <http://www.nola.com/search/index.ssf?base/news-4/1133683117177710.xml?nola> [Accessed on 12/08/05.]

⁴ Bazerman and Watkins, *Predictable Surprises*, 4.

⁵ *Ibid.*, 5-8. The authors actually outline six characteristics of predictable surprises. Four of them are basic to the concept while two others overlap with two of the basic ones, added in parentheses in our list.

⁶ We will not delve into the theory of a learning organization. However, the initial statement of the approach is most readily available in the work of Peter M. Senge on the topic. Peter M. Senge, *The Fifth Discipline* (New York: Currency Doubleday, 1990).

⁷ U.S. Army Corps of Engineers, "Summary of Field Observations Relevant to Flood Protection in New Orleans, LA. – Interim Report to Task Force Guardian," *Interagency Performance Evaluation Task Force*, December 5, 2005. <https://ipet.wes.army.mil/> [Accessed on 12/10/05]

⁸ "Army Corps of Engineers: History of the Lake Pontchartrain and Vicinity Hurricane Protection Project" (General Accountability Office: November 2005). <http://www.gao.gov/new.items/d06244t.pdf> [Accessed on 12/09/05]

⁹ Researchers in the area have done several studies that confirm the point. One in particular dealt with risk perception in making decisions about investing in airplane safety. People were asked to evaluate how attracted they were to make a decision to purchase new equipment for use in responding to an airliner crash. People in one group were told the equipment has a chance of saving 150 lives threatened by such an event. People in a second group were told the equipment has a chance of saving 98% of the 150 people threatened. The researchers predicted that a chance to save 150 lives represents a diffuse good to people, whereas saving 98% of a number is very good. The researchers found, as predicted, that support for saving 98% was stronger. It was more vivid and, as a result, people were more able to envision the consequences, see P. Slovic, M.L. Finucane, E. Peters, and D.G. MacGregor, "The affective heuristic," in T. Gilovich, D. Griffin, and D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (New York: Cambridge University Press, 2002): 391-420.

¹⁰ Bazerman and Watkins, *Predictable Surprises*, 93. As the authors note, "In many real-life situations, people fail to act until confronted with vivid data. In the case of predictable surprises, action is required to avoid the disaster, but until the disaster occurs, the need for change is not vivid," 92.

¹¹ *Ibid.*, 153.

¹² Brian Friel, "Weathering the Storm," *Govexec.com*, October 26, 2005. <http://www.govexec.com/dailyfed/1005/102605mm.htm> [Accessed on 11/15/05]

¹³ Bazerman and Watkins, *Predictable Surprises*, 102.

¹⁴ *Ibid.*, 106.

¹⁵ “New Orleans Disaster Was Predicted,” *Reuters*, September 2, 2005. http://news.com.com/Experts+New+Orleans+disaster+was+predicted/2100-1008_3-5846233.html [Accessed on 10/10/05].

¹⁶ Eric Berger, “Keeping Its Head Above Water,” *Houston Chronicle*, December 1, 2001. http://www.hurricane.lsu.edu/in_the_news/houston.htm [Accessed on 10/10/05].

¹⁷ Nicole T. Carter, “New Orleans Levees and Floodwalls: Hurricane Damage Protection,” *CRS Report to Congress* (September 6, 2005), 1. “Levees are broad, earthen structures, while floodwalls are concrete and steel walls, built atop a levee or in place of a levee,” 2.

¹⁸ “Overview of Governor Kathleen Babineaux Blanco’s Actions in Preparation for and Response to Hurricane Katrina,” *Response to the U.S. Senate Committee on Homeland Security and Governmental Affairs Document and Information Request Dated October 7, 2005 and to the U.S. House of Representatives Select Committee to Investigate the Preparation for and Response to Hurricane Katrina*. December 2, 2005, 18. http://www.gov.state.la.us/assets/docs/PDFs/Gov_response.12.2.05.pdf [Accessed on December 7, 2005]

¹⁹ “Washing Away,” *The Times-Picayune*, June 23-27, 2002. <http://www.nola.com/hurricane/?/washingaway/> [Accessed on 10/10/05].

²⁰ John McQuaid and Mark Schleifstein, “In Harm’s Way,” *The Times-Picayune*. http://www.nola.com/hurricane/index.ssf?/washingaway/harmsway_1.html [Last accessed on 10/10/05].

²¹ Indeed, a recent report by the Government Accountability Office is critical of the Corps management of compensatory mitigation in the wetlands of the delta. Compensatory mitigation involves restoring a former wetland, as a condition of a permit when the loss of wetlands is unavoidable. It observed: “The Corps required monitoring reports for 89 of the 152 permit files reviewed where the permittee was required to perform compensatory mitigation. However, only 21 of these files contained evidence that the Corps received these reports. Moreover, only 15 percent of the 152 permit files contained evidence that the Corps had conducted a compliance inspection. The Corps districts provided somewhat more oversight for mitigation performed by the 85 mitigation banks and 12 in-lieu-fee arrangements that GAO reviewed. For the 60 mitigation banks that were required to submit monitoring reports, 70 percent of the files contained evidence that the Corps had received at least one monitoring report. However, only 36 percent of the mitigation bank files that GAO reviewed contained evidence that the Corps conducted an inspection. For the 6 in-lieu-fee arrangements that were required to submit monitoring reports to the Corps, 5 had submitted at least one report. In addition, the Corps had conducted inspections of 5 of the 12 arrangements.” “Corps of Engineers Does Not Have an Effective Oversight Approach to Ensure That Compensatory Mitigation Is Occurring” (Government Accountability Office: September 2005). <http://www.gao.gov/new.items/d05898.pdf> [Accessed on 12/09/05]

²² John Schwartz and Christopher Drew, “Louisiana’s Levee Inquiry Faults Army Corps,” *New York Times*, December 1, 2005.

²³ U.S. Army Corps of Engineers, “Summary of Field Operations.”

²⁴ “The Secretary shall coordinate the Federal Government’s resources utilized in response to or recovery from terrorist attacks, major disasters, or other emergencies if and when any one of the following four conditions applies: (1) a Federal department or agency acting under its own authority has requested the assistance of the Secretary; (2) the resources of State and local authorities are overwhelmed and Federal assistance has been requested by the appropriate State and local authorities; (3) more than one Federal department or agency has become substantially involved in responding to the incident; or (4) the Secretary has been directed to assume responsibility for managing the domestic incident by the President.” *Homeland Security Presidential Directive/HSPD-5*. <http://www.whitehouse.gov/news/releases/2003/02/20030228-9.html> [Accessed on 12/09/05]

²⁵ Shannon McCaffrey, Alison Young, and Seth Borenstein, “How Homeland Security Chief Missed Signs of Storm’s Severity,” *Pittsburgh Post-Gazette*, September 18, 2005.

²⁶ Chris Strohm, “DHS failed to use catastrophe response plan in Katrina's wake” *Govexec.com*, October 18, 2005. http://www.govexec.com/story_page.cfm?articleid=32586&printerfriendlyVers=1& [Accessed on 12/09/05].

²⁷ “Conflicting accounts from top on Katrina response,” *Reuters*, September 15, 2005. <http://abcnews.go.com/US/wireStory?id=1129877> [Accessed on 10/10/05].

²⁸ Chris Strohm, “DHS failed.” Admiral Loy’s comments are important because, as an author of the NRP, he is also aware of what the classified part of the NRP says, if anything, about activating the catastrophic annex.

²⁹ “Testimony of Marty J. Bahamonde to the Senate Committee on Homeland Security and Governmental Affairs,” October 20, 2005, 3. http://hsgac.senate.gov/_files/102005Bahamonde.pdf [Accessed on 11/05/05]

³⁰ Angie C. Marek, Edward T. Pound, Danielle Knight, Julian E. Barnes, and Kevin Whitelaw, “A Crisis Agency in Crisis,” *U.S. News & World Report*, September 19, 2005. FEMA’s senior staff is currently made up of about a third “acting” employees.

³¹ Bahamonde, “Testimony.”

³² Mary Curius, “Insider Condemns FEMA Response,” *The Los Angeles Times*, October 21, 2005. <http://www.latimes.com/news/nationworld/nation/la-na-fema21oct21.0.5147785.full.story?coll=la-home-headlines> [Accessed on 11/05/05].

³³ The Category level of a hurricane indicates its intensity. It is estimated using the Saffir-Simpson Hurricane Scale, a 1-5 rating based on the hurricane's present intensity. <http://www.nhc.noaa.gov/aboutshs.shtml> [Accessed on 10/10/05].

³⁴ “Opening Statement of Chairman Tom Davis,” *House Select Committee to Question Former FEMA Director Michael Brown*, September 23, 2005. <http://reform.house.gov/GovReform/News/DocumentPrint.aspx?DocumentID=34826> [Accessed on 10/10/05].

³⁵ Statement of Michael D. Brown, *House Bipartisan Select Committee to Investigate the Preparation for and Response to Hurricane Katrina*, September 27, 2005. <http://reform.house.gov/UploadedFiles/FEMA%20-%20Brown%20Katrina%20Testimony.pdf> [Accessed on 10/10/05].

³⁶ Jennifer K. Elsea, “The Use of Federal Troops for Disaster Assistance: Legal Issues,” *CRS Report to Congress*, September 16, 2005, 5. <http://fpc.state.gov/documents/organization/53685.pdf> [Accessed on 10/10/05]

³⁷ *Ibid*, p. 4.

³⁸ As the NRP says, “while all presidentially declared disasters and emergencies under the Stafford Act are considered Incidents of National Significance, not all Incidents of National Significance necessarily result in disaster or emergency declarations under the Stafford Act.” “National Response Plan,” *Department of Homeland Security* December 2004, 7. http://www.dhs.gov/interweb/assetlibrary/NRP_FullText.pdf [Accessed on 12/08/05].

³⁹ Alison Young, “Chertoff Says Ex-FEMA Director was ‘Commander’ during Katrina,” *Knight Ridder/Tribune News Service*, October 20, 2005.

⁴⁰ David Wood, “Military Expresses Frustration Over Red Tape,” *Newhouse News Service*, September 3, 2005. <http://www.newhousenews.com/archive/wood090305.html> [Accessed on 12/08/05].

⁴¹ Siobhan Gorman, “Homeland Security Chief Set to ‘Re-Engineer FEMA,’” *Baltimoresun.com*, December 6, 2005. <http://www.baltimoresun.com/news/weather/hurricane/bal-te.chertoff06dec06.1.7009208.story?coll=bal-nationworld-headlines> [Accessed on 12/09/05]

⁴² Michael Chertoff, “Statement by Homeland Security Secretary Michael Chertoff before the United States House Select Committee on Hurricane Katrina,” October 19, 2005.

⁴³ As a recent Wall Street Journal article indicated, the stories of mayhem, and unsubstantiated rumors echoed by politicians and federal officials, led the military to feel compelled to plan for a military operation rather than a straightforward relief effort, delaying their response. FEMA officials delayed on-the-ground relief efforts, turning routine trips into armed escorted movements in response to the vivid accounts of violence reported in much of the media. Aside from the fact that much of the looting appears to have included local police, the Coroner of New Orleans, Dr. Frank Minyard, noted recently that he has found only around seven gunshot victims. He added, “Seven

gunshots isn't even a good Saturday night in New Orleans," Christopher Cooper, "Misinformation Slowed Federal Response to Katrina" *The Wall Street Journal Online*, September 30, 2005.

http://online.wsj.com/public/article/SB112804420733656428-Zm6OU8yHnUC6B8RDoPaDUyKFJs4_20060929.html?mod=tff_main_tff_top [Accessed on 10/10/05].

⁴⁴ He asserted, "I assume that someone today will ask me about whether I did all that I could, or whether I would have done anything differently. The answer to that question is yes...I regret not being able to persuade Governor Blanco and Mayor Nagin to sit down and coordinate their response," Michael D. Brown, Statement, September 27, 2005, 13. Contrast Brown's statement with one reportedly made by Governor Blanco, "I believe my biggest mistake was believing FEMA officials who told me that the necessary federal resources would be available in a timely fashion." Joy Warrick, Spencer S. Hsu, and Anne Hull, "Blanco Releases Katrina Records,"

WashingtonPost.com, December 4, 2005. http://www.washingtonpost.com/wp-dyn/content/article/2005/12/03/AR2005120301480_pf.html [Accessed on 12/10/05]

⁴⁵ National Response Plan, 44.

⁴⁶ Martha Mendoza, "Red tape hampering assistance," *The Tribune*, September 6, 2005.

<http://www.tribtown.com/print.asp?ArticleID=15399&SectionID=1&SubSectionID=186> [Accessed on 12/09/05].

⁴⁷ Eric Berger, "Keeping Its Head Above Water," http://www.hurricane.lsu.edu/in_the_news/houston.htm [Accessed on 10/10/05].

⁴⁸ Bob Marshall and Sheila Brissett, "Dredging Led to Deep Trouble, Experts Say," *Times-Picayune*, December 9, 2005.

⁴⁹ Ibid.

⁵⁰ Ibid. J. David Rogers, a University of Missouri-Rolla professor who is an expert on levee failures summarized the situation as follows: "I can say that categorically, it's not something (an engineer) can debate. You were heightening the levee and not broadening the base. You were increasing the load but not the support. So your factor of safety had to be going down."

⁵¹ *Pittman Construction Co. vs. Department of the Army*

http://msnbcmedia.msn.com/i/msnbc/sections/news/050929_leveesuit.pdf [Accessed on 10/10/05].

⁵² John McQuaid and Bob Marshall, "Evidence Points to Man-Made Disaster," *The Times-Picayune*, December 8, 2005.

⁵³ See written testimony of Ivor L. Van Heerden, "Failure of Levee Systems Surrounding Greater New Orleans During Hurricane Katrina – Preliminary Assessment," November 2, 2005.

<http://hsgac.senate.gov/files/110205vanHeerden.pdf> [Accessed on 11/05/05]; Raymond Seed, "Hurricane Katrina: Performance of Flood Control System," November 2, 2005. <http://hsgac.senate.gov/files/110205Seed.pdf> [Accessed on 11/05/05]; Peter Nicholson, "Hurricane Katrina: Why Did the Levees Fail," November 2, 2005. <http://hsgac.senate.gov/files/110205Nicholson.pdf> [Accessed on 11/05/05].

⁵⁴ Ibid., 1. Van Heerden is the lead investigator of Team Louisiana, the investigative group for the State of Louisiana. The team consists of six L.S.U. professors and three independent engineers.

⁵⁵ John McQuaid, "Problems May Lie Within, Some Say," *The Times-Picayune*, December 8, 2005.

⁵⁶ Ibid.

⁵⁷ Bazerman and Watkins, *Predictable Surprises*, 107.

⁵⁸ An overview of the Corps of Engineers budget issues is available in "Army Corps of Engineers: History..."

⁵⁹ Martha Mendoza, "Red Tape."

⁶⁰ Chris Strohm, "DHS failed."

⁶¹ Letter from Governor Blanco to President Bush on Saturday, September 3.

http://www.nola.com/katrina/view.ss?katrina/blancodocs/Bob_Mann_Documentation.pdf [Accessed on 12/10/05].

⁶² See the full discussion of this issue from the perspective of Governor Blanco in “Overview of Governor Kathleen Babineaux Blanco’s Actions...,” 12-15.

⁶³ Indeed, this observation builds on a point offered by James J. Carafano in his testimony on the FEMA response to Katrina. He noted: “State and local governments assume in virtually every instance, state and local leaders will remain in charge and national assets, whether they come from other states, the private sector, or the federal government, will be in support of their efforts. That is the right approach, even for catastrophic disasters,” James J. Carafano, “Improving the National Response to Catastrophic Disaster,” Statement before the Committee on Government Reform, September 15, 2005, 6. <http://www.heritage.org/Research/HomelandDefense/tst091505a.cfm> [Accessed on 12/05/05]

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