Preparing for Disasters

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F O R E W O R D

On behalf of the IBM Center for The Business of Government, we are pleased to present this report, "Preparing for Disasters," which includes two essays reflecting different perspectives on preparing for and working in large-scale emergencies.

Surprises happen, whether man-made or caused by nature. Last year's California wildfires, the aftermath of the cyclone that struck Burma, the recent earthquakes in China, and this year's Hurricane Ike only remind us of how close they are and how frequently they occur.

How does government prepare in advance for a disaster when it does not know what will happen, when it might happen, or where it will happen? The authors in this report approach these questions from two different angles.

Albert Morales

The first essay, "Keys to Effectively Partner in Temporary Networks," by Ross O'Brien, examines the roles of nongovernmental organizations in large-scale emergencies. He interviewed aid workers who participated in the response to the Asian Tsunami in 2004 and leaders in nonprofit organizations involved in the response to Hurricane Katrina in 2005. He observed a series of characteristics that helps explain why some aid organizations were more effective emergency responders. Organizations that display these characteristics are more capable of creating and using temporary networks to address a specific emergency event. He offers advice on what both nonprofit and public managers might do to prepare for such networks in advance.

David A. Abel

Separately, but similarly, Dr. Richard Callahan and his colleagues Dr. Dan Haverty and Dr. Ross Clayton examine in the second essay, "Emergency Management Networks in California," how the State of California has developed a series of emergency response networks and specific tools for preparing

and responding to emergencies, whether the emergencies are forest fires, homeland security events, or public health episodes. California has one of the most developed set of emergency response networks in the country, in part from its history with disasters dating back to the 1906 San Francisco earthquake. A number of innovations, such as the Incident Command System, were developed by California and are now used nationally.

Together, these two essays provide useful insights for both nonprofit and public managers in preparing for potential future disasters. We hope this report will help them be more prepared.

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Keys to Effectively Partner in Temporary Networks

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EXECUTIVE SUMMARY

Much has been written about the need for public and private relief organizations to collaborate in their responses to natural and man-made disasters. In response, protocols and systems have been developed to coordinate the work *between* relief organizations both before and during disasters. But what about what occurs *inside* the individual organizations themselves? Is there something unique about some relief organizations that better prepares them to work with other governmental and non-governmental relief organizations? If so, what are these characteristics?

To find out, the author conducted semi-structured interviews with members of governmental and nongovernmental organizations responding to two crises: the Asian Tsunami and Hurricane Katrina. He conducted these interviews in Aceh Province, Indonesia, as well as in Texas, Louisiana, and Alabama. In addition, the author reviewed the literature related to both disasters and the subsequent relief efforts to identify organizational-level characteristics that made it easier or, perhaps, more difficult for organizations to collaborate. From these interviews and the literature review, the author identified five characteristics that seem to contribute significantly to relief organizations collaborating effectively in temporary networks during a crisis. Based on these characteristics, the author identified five specific sets of actions that nongovernmental and governmental managers could take to build a "network-ready" organization in advance of future disasters. These include the following:

- Building organizational self-awareness by conducting a self-assessment and then developing specific actions to compensate for identified weaknesses

- Creating and sustaining inter-organizational trust with relief partners through common protocols, decision tools, and training

- Developing a reserve of legitimacy and reputation in the relief community by ensuring strong technical capabilities and operational transparency and becoming active in cross-organizational networks such as Voluntary Organizations Active in Disasters

- Participating in other networks, both governmental and nongovernmental, and consciously investing in a "relationship management" function

- Using political behaviors to influence action by developing conflict resolution mechanisms in advance and cross-training with other organizations in the network

The theoretical basis for this study comes from the concept of "dynamic capabilities." A dynamic capability is defined as "the capacity of an organization to purposefully create, extend, or modify its resource base."[1] These capabilities are marked by routines and processes that enable organizations to align and realign resources to meet the organization's needs in changing environments. This study suggests that one type of dynamic capability is a "temporary network development capability," which allows an organization to extend its resource base across one or many organizations in times of dynamic change, for a limited amount of time. Characteristics that reflect an organization's capabilities to develop temporary networks suggest that developing such capabilities will expand an organization's ability to respond to crisis events in the future.

While the recommendations presented in this essay are targeted to governmental and nongovernmental relief organizations, they likely would apply to other organizations that also face a need for temporary, large-scale collaboration, such as organizations responding to a pandemic or similar event.

Background

In December 2004, the Asian Tsunami struck 14 countries and resulted in the death of more than 220,000 people and economic losses of more than $7 billion.[2] The World Bank reported that in a single year (2005) 360 natural disasters worldwide resulted in the death of 90,000 people and the loss of $159 billion in damages. Furthermore, the World Bank estimated that natural disasters result in a loss of between 2 percent to 15 percent of the national gross domestic product (GDP) in these countries.[3] When combined with man-made crises such as war and terrorism, the scope of the loss of life and property resulting from disasters is overwhelming.

In August 2005, Hurricane Katrina devastated the city of New Orleans and wreaked havoc across the coastline of Louisiana, Mississippi, Alabama, and Florida. The storm killed 1,300 people and resulted in almost $100 billion in damages.[4] The Jefferson County Department of Health (JCDH), along with the United Way of North Alabama, Birmingham Area Red Cross, and many other local social service organizations, established an integrated, single point of contact for evacuees of Hurricane Katrina who had relocated to Birmingham, Alabama. The immediacy of the evacuation forced most residents to leave all their possessions behind, including critical documents such as birth and medical records and prescriptions. Stressed, and in some cases in shock from the disaster, these evacuees were relieved to find a multiplicity of services and resources available to them and delivered in an efficient manner.[5] This example of organizations networking to better meet the needs of crisis victims was one of many success stories coming from the worst natural disaster in U.S. history. On the other hand, many stories of failure have also emerged from this event.

Although these statistics are devastating, they do not begin to tell the full stories of the people left in the wake of these disasters. In New Orleans, floods left approximately 300,000 homes uninhabitable.[6] In Aceh Province, Indonesia, 141,000 houses were destroyed, 600,000 people lost any means of earning a living, and thousands of children were orphaned.[7] As a result, public and private agencies have published "lessons learned" from these disasters.[8] Many of these documents focus on the need for collaboration across organizations, but few have looked inside the organizations themselves. Was there something specific about some relief organizations that better prepared them to work with other government and nongovernment relief organizations? If so, what are these characteristics?

Significant research has been conducted worldwide to learn from past natural and man-made disasters in an effort to better coordinate efforts across government and nongovernment agencies responding to these crises. In the United States, the Department of Homeland Security (DHS) created the National Incident Management System (NIMS), which facilitates coordination of federal, state, and local government agencies in an "all hazards approach" to crisis response through standardized protocols and procedures. NIMS and the Incident Command System (ICS) serve as tools for agencies seeking to develop a unified command to better coordinate their efforts for greater efficacy.[9] At the international level, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) has a similar mission: "To mobilize and coordinate effective and principled humanitarian action in partnership with national and international actors."[10]

It is well recognized, therefore, that collaboration among relief organizations is critical and that the processes and protocols that facilitate that effort are vital to achieving any coordinated response. However, even with these resources in place, lives and livelihoods were needlessly lost in the aftermath of both the Asian Tsunami and Katrina. Although the tools for coordination are necessary and the resources shared in these collaborative efforts are valuable, they alone are insufficient.

The organizations that use these tools for coordination must be capable of forming temporary networks efficiently to maximize an effective response to the crises in which they are involved. However, a fundamental question still remains: Do certain organizational characteristics more likely result in this capability to form temporary networks?

This essay identifies five characteristics that organizations need to develop to participate effectively in temporary networks among government and non-government organizations.

- Develops organizational self-awareness

- Rapidly creates trust with others

- Creates a reserve of legitimacy and reputation

- Participates in other networks

- Uses political behaviors to influence action

These characteristics serve as success factors for assessing how well organizations are ready to participate in temporary networks. This essay also recommends ways that managers of relief organizations can institutionalize these characteristics to foster the capacity to develop temporary networks within their organizations.

Overview of Two Crises Studied in the Development of Temporary Networks

The events surrounding the Asian Tsunami and Hurricane Katrina have been well documented and will not be repeated here in detail. Nevertheless, it is helpful to identify certain issues that affected the ability and opportunities for relief organizations to collaborate during each disaster.

Asian Tsunami of 2004

The Asian Tsunami started off the coast of Indonesia on December 26, 2004. An earthquake of magnitude 9.1 initiated the giant wave that impacted 14 countries, resulting in more than 220,000 deaths and $7 billion in destruction.[11] The worst hit region, Aceh Province, Indonesia, has yet to completely recover from this disaster. For approximately the first six months, citizens, relief organizations, and military personnel from around the world worked to remove dead bodies, prevent the outbreak of disease, clear away debris, and help people put their lives back together. After the initial six months, the Indonesian government declared the "relief" phase completed and began the process of reconstruction. Thousands of people remained homeless, so the primary focus of many nongovernmental organizations (NGOs) was rebuilding houses even though many had no experience in home construction. Larger United Nations-related and U.S. government-related organizations, such as the United States Agency for International Development (USAID), were involved in infrastructure redevelopment such as roads and bridges.[12]

Complicating factors related to the development of networks among relief organizations after the tsunami included the following:

The scope of the disaster was greater than any relief organization had seen before. Time after time, representatives interviewed for this study communicated that their organizations were simply overwhelmed by the need and the complexity of the situation. In an effort to address the need as quickly as possible, initial attention was given to going to work immediately, rather than to coordinating efforts. After the immediate needs had been addressed, work groups began to form, but most resembled information sessions rather than strategy sessions. The nature of interaction was of a pooled task interdependency, in which information was shared, rather than a reciprocal task interdependency, which could have resulted in synergistic use of complementary resources to address needs.

In some cases—for example, the work group on governance—these work groups took a more strategic look at the long-term development of the region and proactively partnered with local government agencies to ensure a smooth transition of power from the national and international levels to the local level. However, these coordinated efforts were not duplicated across all working groups.

The social and political context was underappreciated. Little known to most relief organizations before their work in the region was that Aceh Province had been the site of civil unrest for 20 years. Rebels from the Free Aceh Movement (known in Aceh by the acronym GAM) living in the mountains had been engaged in a bloody and violent fight against the Indonesian military for greater political autonomy in their region. After the tsunami struck, these fighters wanted to return to their villages to help their families and communities, but were afraid of being arrested or killed by Indonesian authorities.

A cease-fire between the warring factions was signed in Helsinki in August 2005, eight months after the disaster, but the circumstances around the violence complicated the efforts of relief organizations and created tensions and uncertainty for these organizations and their members.

In part due to the history of conflict in the area, tension existed between the Acehnese people and the dominant ethnic group in Indonesia, the Javanese. Prior to the tsunami, not only had few Westerners entered the region, but few Indonesians from outside the region had traveled in this area. Acehnese are fiercely proud of their heritage, culture, and religion, and believe that the Javanese, who dominate national politics, took a paternalistic approach when the national government sent *Badan Rehabilitasi dan Rekonstruksi* (BRR) to the region and did not see the Acehnese as equals. BRR was composed primarily of Javanese government employees from Jakarta.

The Indonesian President created BRR in April 2005 as a ministry-level agency to coordinate the use of donated money and the work of the many relief organizations, as well as the bilateral and multilateral donor nations working in Aceh Province. In May 2005, BRR relocated to Banda Aceh. The director of BRR, Kontoro, had been involved with early relief efforts and was appointed by the President to head the new agency with authority to hire whomever he wanted for this agency. Employees of the agency were paid salaries that were higher than their local counterparts in Aceh Province, in keeping with salary levels in Jakarta. Kontoro and BRR controlled much of the $7 billion donated from bilateral and multilateral donors; the provincial governor, however, controlled a much smaller amount. Furthermore, BRR moved quite quickly from a coordination function to an implementation function, which put BRR in much greater control of the recovery and redevelopment activities in Aceh Province than the local government.

Critical civic infrastructure was destroyed. The flooding that resulted from the tsunami destroyed many civic records, including land ownership. This loss of vital records complicated the work of relief organizations involved in reconstruction. How is a community or a road system rebuilt when all the geographic markings as well as the records documenting who owns which plot of land have been destroyed?

Divergent cultural perspectives and worldviews among the international relief workers were evident. The scope of the disaster resulted in an outpouring not only of money, food, and materials, but also of people from all over the world. Multiple nations with their diverse worldviews were present. Diversity can hinder cohesion, limiting the ability of networks to form quickly.

Hurricane Katrina of 2005

Unlike the Asian Tsunami crisis, weather authorities accurately predicted the path of Hurricane Katrina. Touching land in Florida on August 25, 2005, the storm made its way across the southernmost part of the state, entering the Gulf of Mexico on August 26 and gaining strength. At that point, the National Hurricane Center predicted the storm would strike near New Orleans on Monday, August 29, as a Category 4 or 5 hurricane. City and state officials had three full days to begin evacuation procedures and prepare for the expected storm.[13]

Unlike the countries involved in the Asian Tsunami, the United States had developed protocols to deal with disasters of this type. After the terrorist attack of September 11, 2001, President Bush requested a major initiative to build a national system for incident management. This system would integrate separate Federal response plans into a single, all discipline incident management plan. In 2003, the President directed the newly formed Department of Homeland Security (DHS) to develop the National Incident Management System (NIMS) "to provide a consistent nationwide approach for Federal, State, and local governments to work effectively together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity…."[14] The ICS, which had been conceived as a means of dealing with wildfires in California, was incorporated into NIMS.

One might wonder then, with three days' notice and with carefully developed protocols for responses, why so many problems arose in responding to Hurricane Katrina. Because this essay examines only factors that deal with network development, only network-related issues are identified.

Problems existed with multi-jurisdictional coordination and control. The Constitution of the United States establishes the rights of the states and the relationship between the states and the federal government. In addressing disaster recovery, state and local governments are expected to expend their resources before requesting assistance from the federal government, and the federal government is to respect the sovereignty of state and local governments on this matter.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, passed in 1988, outlined the manner in which state governors should "request assistance from the Federal government when an incident overwhelms State and local resources." After 9/11, the National Response Plan (NRP) was developed, which, in part, expanded the means by which federal resources could be brought to bear at the state and local levels. Even so, confusion over the role of federal, state, and local authorities slowed the response of the agencies that could have provided better preparation for the storm.[15]

Some people and organizations worked in fear of litigation. Interviews with local government officials reflected a belief that in this litigious environment, individuals tend to operate behind the protection of policies and standard operating procedures rather than using creativity and innovation to address the immediate need by responding in a more effective or efficient way.

Risk management also created challenges for organizations. The Federal Emergency Management Agency (FEMA) sought to establish practices to eliminate risk, while the local office of Homeland Security preferred to take managed risks. When organizations cannot agree on the fundamental issue of how to deal with risk in a chaotic environment, their ability to work together effectively is limited. Even though FEMA operates under the direction of DHS, they had a difference in philosophy on the issue of risk management; this may indicate further conflicts among the cultures of various agencies within DHS.

Racial and economic tensions existed long before Hurricane Katrina came ashore. Prior experiences of discrimination, real and/or perceived, reduced the willingness and ability of Katrina victims to

trust the institutions or organizations that may have contributed to their perceptions of inequality before the disaster.

In these challenging environments, government and nongovernment relief organizations sought to work together to save lives and restore a semblance of normalcy. The following section identifies factors that enabled relief organizations to successfully form and participate in temporary networks in these crisis environments.

Success Factors That Enable Organizations to Effectively Partner in Temporary Networks

The interviews and the literature review on the Asian Tsunami and Hurricane Katrina relief efforts identified a set of success factors regarding the way government and nongovernment relief organizations worked after the two disasters.

Success Factor 1: The Ability to Develop Self-Awareness

The significance of organizational self-awareness as a success factor developed unexpectedly amid qualitative interviews with government and nongovernment relief organizations operating in the aftermath of the Asian Tsunami and Hurricane Katrina. Organizational self-awareness describes an organization's understanding of its strengths and weaknesses, its use of its strengths in service to itself and others, and its continual growth through listening and learning from others. This awareness is demonstrated among the leadership and members of the organization as they show a willingness to risk and learn from failures, to collaborate, and to share successes. Awareness is also reflected and supported through organizational structures such as feedback mechanisms and reward/compensation systems.[16]

One might argue that the urgent nature of crisis responses would make self-awareness a polite, yet irrelevant characteristic. However, this would reflect a faulty understanding of organizational self-awareness. The self-aware organization can be very assertive in dealing with a crisis, but does so in unique ways. In the difficult circumstances surrounding the Asian Tsunami and Hurricane Katrina, interviews with personnel from relief organizations identified several characteristics that constitute effective self-awareness in an organization. These include the following:

Listen before acting. Some organizations seemed to do a good job of listening to the victims of the disasters as well as to other organizations with which they were working. Other organizations, however, overwhelmed by the scope of the disaster or the challenges of operating in such difficult circumstances, failed to listen before acting.

Compassion Frisco, a small organization from Frisco, Texas, formed to respond to the Asian Tsunami, accomplished more with very limited resources than many larger, more well-established organizations. Compassion Frisco has been linked to creating a city park in Banda Aceh, providing water for a village outside the capital city, providing resources and training for trauma counseling, and developing a community center including childcare, education, computer training, and recreation. This small organization has worked with local relief organizations in Indonesia, city officials, and large international relief organizations. The director of the organization attributes much of their success to their willingness to listen to victims, to other private organizations, and to government leaders *before* setting the course of action.

Treat partners as equals and collaborators. In Aceh Province, the Indonesian national government's BRR and international relief organizations needed local nonprofits and local citizens in order to function. However, most did not see these locals as true partners, but rather as interpreters, drivers, or laborers—as resources necessary to accomplish their own purposes.

Collaborate with partners on overarching goals. Dr. Michael Fleenor, Health Officer for the Jefferson County Department of Health (Alabama), who was engaged with community and government leadership

in coordinating relief for evacuees of Hurricane Katrina, communicated a priority of accomplishing the bigger tasks regardless of who did the work or got the credit. This organization did not have the need to "own" the resources or projects, but rather worked to find the right people and organizations to accomplish the task. In contrast to this approach, many examples were seen in Indonesia of nongovernmental relief organizations working in separate silos, as each organization sought to provide housing and other services for individual villages, but failed to collaborate across villages.

Share successes and learn from failures. Dr. Kevin Stephens, Director of the New Orleans Health Department, illustrated this point by stating that when a football team wins a game, the coach gives the game ball to one of the players. In the same way, Dr. Stephens and the health department shared their successes with smaller partner organizations, giving credit for the success to the network rather than keeping it for themselves. He also communicated how the failures they had experienced along the way had shown him and his staff the areas that needed improvement so that the department would be better prepared for the next crisis. These learning routines, which became embedded in the life of the organization, enhanced the organization's ability to adapt to changes in the environment.

Acknowledge strengths and weaknesses among partners. In Jefferson County (Birmingham), Alabama, FEMA entered the picture two weeks after local agencies had already set up a "one-stop" system to provide resources for victims of Katrina. FEMA, failing to recognize its limitations in the local context, ignored the existing structure and sought to operate independently, resulting in problems for the evacuees needing their assistance.

In stark contrast to this, engineers among a variety of relief organizations in Banda Aceh, for a period of time, gathered every Friday evening to share their experiences and learn from each other. This somewhat clandestine group was transparent with each other regarding their own organizations' strengths and weaknesses, and the work among these organizations was greatly enhanced as a result. Further, in Indonesia many nongovernmental organizations volunteered their efforts to build

housing, in part because the need in this area was so great and in part due to pressure from the Indonesian government's relief agency, BRR. However, many of these organizations had little or no experience in housing development and that weakness led to failures on multiple levels. Some of these organizations, though, such as Mercy Corp, admitted their limitations in this area, did not over-commit to housing, and sought to focus their attention on the areas in which they could provide the best services, working from their strengths.

Pursue effective communication among partners. The various dimensions of organizational self-awareness outlined previously require an organization to communicate effectively both within itself and with its external partners. Dr. Kevin Stephens involved the directors within the New Orleans Health Department in external communication by assigning various community organizations and city agencies to each health department coordinator. Coordinators were designated to interact with their counterparts across the city regularly to maintain strong relationships and facilitate the flow of information across the city.

Helping Hands, a small local nonprofit in Banda Aceh, hired an outside consultant to perform employee satisfaction surveys and to analyze the internal flow of communication within its organization. These very different examples demonstrate the important role of communication inside and outside the organization.

One might ask whether the actions of those being interviewed were simply an individual's response based on their own character and virtues or whether the actions were a part of a larger culture of self-awareness found in the organization. In some cases, as with the engineers in Banda Aceh, the awareness of the individuals involved was certainly the motivator. However, time and time again the willingness to listen, collaborate, learn, sit as equals at the table, and share successes constituted an organization-wide approach to the relief organizations' operations. Organizations that reflected this organizational self-awareness seemed to develop partnerships more efficiently and work through networks more effectively.

Success Factor 2: The Ability to Rapidly Create Trust

When asked about the role that trust played among organizations in the aftermath of Katrina, Col. Terry Ebert, Director of Homeland Security for New Orleans, indicated that trust was vital to these networks. Similarly, Mr. LeRoy Hollenbeck, Advisor to the Governor of Aceh Province, agreed that without trust, little would have been accomplished across organizations. In fact, in every interview conducted, representatives of government and non-government agencies highlighted the importance both of being able to trust network partners as well as of being trustworthy oneself. This is not unexpected. Researchers have long pointed out the importance of trust in relationships in society, in business, and across all manner of individual and organizational networks.[17]

But trust in the aftermath of a disaster takes on special importance and is of a different nature. First, trust reduces complexity in the midst of uncertainty by giving a sense of assurance that "some things will remain as they are or ought to be."[18] The uncertainty-reducing component of trust is most challenged—and most needed—during times of severe crisis when little predictability remains. Second, trust carries with it a sense of expectation of competency. One can only trust those who demonstrate an ability to do what they claim they can do. Third, beyond the scope of ability, trust carries a moral expectancy, anticipating that those who act will place the interest of others before their own interests, rather than acting opportunistically.[19] Fourth, and perhaps most significant, trust in these crisis environments must take place quickly without the opportunity for the usual evaluation of network partners over time.[20]

The rapid development of trust is most often seen in temporary groups, especially those that are involved in complex tasks in environments of uncertainty without the hierarchical structures that typically define teams and guide networks. Often those involved in these networks have a great deal of knowledge or experience, but "little time to sort out who knows precisely what."[21] In the United States, the ICS alleviates this issue to a degree because various public agencies are pre-assigned to specific roles in the network. Even so, as more

and more nonprofit and faith-based organizations respond to crises, the ability to develop trust swiftly becomes more critical to network success, even within structured hierarchies such as the ICS. When and how, then, might trust form rapidly?

In some cases, latent networks resolve the problem of trust. Tom Morris, U.S. Representative to Aceh and North Sumatra, in Banda Aceh, Indonesia, described how network partners are selected by USAID. In the immediate aftermath of a crisis such as the Asian Tsunami, USAID works primarily with organizations with which they have had prior experience. These organizations have been vetted and are known for their various abilities. Once the immediate needs have been addressed, USAID accepts bids from relief organizations for the distribution of relief dollars from the United States for specific projects. The paperwork and processes involved in these bids allow USAID to invest measured trust in organizations. Further, to the degree that relief organizations, both government and non-government, respond to multiple crises around the world, they build a reputation that follows them. This is the case with many organizations with which USAID works. Yet, prior reputation is not always an accurate predictor of future performance, and the opportunity exists for trust to be damaged with each shared experience. Therefore, dormant network linkages enable trust to emerge more quickly, but do not tell the entire story.

Often organizations have no opportunity to work together prior to a crisis. Drs. Michael Fleenor and Kevin Stephens, directors of the health departments in Jefferson County, Alabama, and New Orleans, Louisiana, respectively, take a slightly riskier approach by opening the door for new organizational relationships, while also protecting the reputation and operations of their own organizations and networks. Meyerson and his co-authors point out that "role-based interactions," rather than "person-based interactions," are more likely to lead to quick bonds of trust.[22] In the case of the health organizations, new partnerships were initiated based on clearly defined roles and responsibilities, and those relationships were monitored for performance benchmarks along the way.

Finally, in cases with limited information and little or no prior interaction, decisions to rapidly trust others occur quickly when decision makers use

categorical forms for evaluation rather than time-consuming, specific details. Heuristics take the place of rational decision-making processes and are based on "roles, industry recipes, cultural cues, and occupational- and identity-based stereotypes."[23] This, in part, explains the reason that foreign personnel sought out other foreigners for information rather than locals, as trust forms more easily among those of similar backgrounds.

David Murphy, formerly of Catholic Relief Services, describes the way his organization formed a fast and beneficial partnership with Compassion Frisco, even though the organizations and individuals involved had no prior interaction. A commonality of purpose, perspective, and culture was shared across the organizations that enabled Mr. Murphy to make himself and his organization vulnerable to a partnership with a much smaller, less experienced, and relatively unknown organization. The resulting partnership benefited both organizations, the City of Banda Aceh, and thousands of citizens from the region.

Relief organizations operating in crisis environments must have the capability to make quick decisions about appropriate levels of trust and be able to swiftly trust when a crisis strikes. Indeed, "in more fluid work settings, trust may be particularly important for the ability of workers to self-organize."[24] They simply do not have the luxury to work alone or wait to get to know the partner.

Success Factor 3: The Ability to Create a Reserve of Legitimacy and Reputation

Whereas legitimacy and reputation are sometimes understood as reflecting the same attribute, they are distinct, and this distinction has important implications for relief organizations. Deephouse and Carter (2005) make the distinction in the following way: "[W]e view legitimacy as the social acceptance resulting from adherence to regulative, normative or cognitive norms and expectations. In contrast, we view reputation as a social comparison among organizations on a variety of attributes…."[25]

Milward and Provan state, "Legitimacy isn't asserted; it is externally conferred."[26] Legitimacy is important for organizations for several reasons. First, nonprofits and faith-based organizations depend on a certain

level of legitimacy to raise necessary funds. For this reason, these organizations might join associations that lend credence in the public eye, make their financial statements and audits available to the public, and seek endorsements from well-known public figures. This legitimacy provides donors with a sense of assurance that their contributions will be well used on the one hand, and provides possible network partners with a degree of predictability of honest behavior on the other. As has been discussed previously, organizations such as USAID look for an acceptable level of legitimacy when making a decision to engage another organization in a partnership.

Legitimacy is also important for public sector organizations. To a certain degree, the nature of government institutions lends a level of legitimacy not afforded to private institutions. Yet the assumption of legitimacy can be lost when a public agency misappropriates funds or violates established practices.

Reputation, on the other hand, is earned through effective practices. Not all legitimate organizations have a good reputation, and not all organizations that have a good reputation have legitimacy. Prior to Hurricane Katrina, FEMA had a good reputation for accomplishing its purpose and mission. Its legitimacy had suffered under the restructuring that placed it under DHS. Further, FEMA had been shaped by political appointments that left its leadership without significant disaster relief experience and, therefore, it had questionable legitimacy as well as reputation. Organizational changes that result in reshaping power structures can influence perceived as well as operational legitimacy, and this seems to have been the case with FEMA. After Katrina, the organization's reputation suffered greatly.

In the absence of organizational legitimacy, reputation is critical. When formulating partnership arrangements, large international nongovernmental organizations such as World Relief and World Vision had to depend on the reputation of much smaller, less known relief organizations because those organizations had little or no legitimacy. For example, when asked how Helping Hands was able to form a partnership with much larger relief organizations, the director of this small, Jakarta-based organization pointed to the effective work they had done in the community. This work was seen by representatives of the larger national and international relief

organizations as a signal of the abilities of this smaller, somewhat unknown organization.

Dr. Kevin Stephens of New Orleans suggested finding organizations that have a reputation for accomplishing the task before them and mentoring them through the process of gaining legitimacy. In so doing, not only does one benefit from the immediate assistance these organization can provide, but it also creates a closer relationship between the organizations for future interaction.

Ultimately, both legitimacy and reputation are important in terms of creating network relationships. When asked which attribute was more critical, several organizations were at a loss to commit to an answer. To the degree that an organization's legitimacy predicts its ability to fulfill its commitment to overarching goals of the network, other organizations will more quickly commit to collaborative relationships. However, in crisis situations, getting the job done effectively and efficiently is the first and most important goal. In fact, in certain situations the need to maintain legitimacy can negatively impact an organization's ability to perform. As Col. Ebert reflected, problems arise with legitimacy when it leads to bureaucratic red tape and fear of uncertainty and risk.

In the case of Hurricane Katrina, the multiple levels of bureaucracy between the federal, state, and local municipalities along with the protocols required at each level, slowed progress significantly. This, combined with a fear of litigation, can all too easily result in a greater reliance on forces of legitimization such as regulations and standard operating procedures, and less on immediate and necessary action. For example, buses that had been brought to take evacuees from the New Orleans Superdome sat idle for hours while a FEMA representative checked the tire pressure on each tire. The over-reliance on standard procedures and risk mitigation for minor, low-risk contingencies magnified the later evacuation problems.

This reliance on protocols regardless of the circumstances is not limited to efforts in the United States. In Aceh Province, one international relief organization involved in water delivery projects delayed one major project when a new director took over operations. Wanting to ensure that the project fit within the procedures and policies of the organization, the delay resulted in a lack of water for 30,000 people for almost a year.

Success Factor 4: Having Previously Participated in Other Networks

The inter-organizational networks literature suggests that prior network experience lays the foundation for future network experience.[27] Experience with networks influences future participation in two ways. First, organizations that participate in networks and receive necessary resources through those networks are more likely to seek resources through networks in the future. Second, it has been argued that strategic alliances offer opportunities to learn new capabilities. Powell et al., in their discussion of organizational learning through network involvement, point out that "an organization simultaneously learns which collaborations to pursue and how to function with a context of multiple cooperative ventures...Thus, once a firm begins collaborating, it develops experience at cooperation and a reputation as a partner."[28]

A good example of how prior network experience facilitated the development of new networks in Aceh Province took place when the International Federation of Red Cross and Red Crescent Societies (IFRC) needed to distribute transitional housing for victims of the Asian Tsunami. Recognizing that building permanent housing would take too long to meet the immediate needs for most people, and with the rainy season on the way, the IFRC developed transitional housing to assist victims who had lost their homes and needed a dry place to live until their houses could be rebuilt. After engineering a sturdy transitional shelter, the challenge of getting the thousands of shelters to those who needed them required the IFRC to create a network of relief organizations. Nearly 20,000 shelters were distributed across Aceh Province with the assistance of 32 implementing partners. The routines developed by the IFRC in prior experiences working among United Nations (UN) organizations, national Red Cross and Red Crescent Societies, and other government and nongovernment organizations enabled the organization to quickly develop a network to distribute these temporary shelters.

However, not all network relationships are the same. Inkpen and Tsang (2005) suggest that differences

across various network types should be taken into account when examining network behaviors.[29] One way to consider this dynamic is by distinguishing between weak-ties and strong-ties networks. Perry-Smith and Shalley define weak ties as "direct relationships between two actors at the low end of the tie strength continuum that involve relatively infrequent interactions, comparatively low emotional closeness, and one-way exchanges."[30] Weak-ties networks are those marked by heterogeneous membership, limited reciprocity, limited trust, and few enforceable norms. Perry-Smith and Shalley define strong ties as "direct relationships that involve relatively frequent interactions, high emotional closeness, and reciprocity."[31] Strong-ties networks are marked by homogeneous network members, strong norms that shape behavior, predictability, reciprocity, and strong levels of trust.

Therefore, the effect of network experience on future temporary network formation is not straight forward, but rather is moderated by the strength of the ties in the networks within which the relief organization has previously operated. On the one hand, if the organization has had experience with strong-ties networks, it will most likely seek to work with organizations with which it can establish strong ties in the future, and possibly with the network members it already has. This was exemplified by USAID's practice of using established network relationships as described previously in the sections on trust and legitimacy.

When network members create close bonding connections, or a strong-ties network, they build up trust and a willingness to work toward collective goals. Further, these strong-ties networks tend to endure longer than weak-ties networks. Norms of conduct develop that ensure network-oriented behavior on the part of members. In this context of close, strong network ties, social capital grows as well.[32]

Strong-ties networks foster trust and group identity usually associated with group cohesion. On the downside, the generated social capital can lead "to groupthink.[33] In addition, "close, long-term relationships are likely to result in network homogeneity, reducing the diversity of experiences."[34] Indeed, Beckman and Haunschild (2002) found that belonging to heterogeneous networks (weak-ties networks) improved certain types of organiza-

tional performance more so than belonging to homogeneous networks (strong-ties networks) due to heterogeneity in previous experiences.[35] Therefore, strong-ties networks can limit the organization's experience in working with others outside the network.

On the other hand, weak-ties networks, marked by heterogeneous members, are more likely to represent unique sources of information. Burt points out that the means by which network members strengthen their opportunities is by serving as a bridge between the network and those individuals or groups outside the network.[36] By filling the "structural holes" within the network with disparate sources of information, network members move beyond the limitations of redundant information and decrease the uncertainty for those members in the network. Yet these weak-ties networks are characterized by limited trust and interaction and a diversity of backgrounds and worldviews. It might be counter-intuitive to invest in these types of networks in environments marked by uncertainty and chaos, but by doing so an organization increases its sources of diverse information and resources. Thus, if an organization has experience participating in heterogeneous networks, it will have a greater comfort level working in relationships that are not based on strong ties and will have the capability to develop temporary networks where there is no time to build strong bonds.

World Vision describes itself as a Christian relief and development organization. A part of World Vision's standard operating procedures involves working with local organizations and citizens in the multiple locations in which they operate. Perhaps this previous experience with diverse network partners is one reason they intentionally developed a relationship with the second largest Muslim organization in Indonesia. The religious differences that might have limited the ability of some organizations to collaborate did not interfere with World Vision's network development capability.

In the United States, two initiatives by President Bush might enable public organizations to more effectively foster heterogeneous networks. The first is his mandate to incorporate faith-based initiatives into domestic responses to crisis. Organizations such as FEMA and Homeland Security now have directors of faith-based initiatives on staff. Second,

the President has pushed for cross-training employees across agencies. However, because U.S. agencies do not have much experience with heterogeneous networks, the push to include these faith-based organizations and to embed employees across various agencies will most likely take time and involve a degree of awkward and somewhat painful learning—not to mention the internal budget implications for each agency.

Success Factor 5: Selectively Using Political Behaviors to Influence Action

The final characteristic deals with the role of political behavior within and among relief organizations. Organizational politics has been described in the following ways:

- "Organizational politics involve intentional acts of influence to enhance or protect the self-interest of individuals or groups."[37]

- "Organizational politics is the management of influence to obtain ends not sanctioned by the organization or to obtain sanctioned ends through non-sanctioned influence means."[38]

These two descriptions of political behavior identify several important points that seem to be influential in terms of network development among relief organizations in the two areas of study. First, as described, political behavior involves "acts of influence" and "the management of influence." At the heart of political behavior is power. Pfeffer defined power as "the capability of one social actor to overcome resistance in achieving a desired objective or result."[39] Although various types of power are available to social actors,[40] it is the use of this power to overcome barriers and accomplish specific goals that is reflected in organizational politics.

With regard to inter-organizational networks, the first important point was that use of political behavior can be on the part of an individual within an organization or an organization within the network. However, the influence of power does not end within the boundaries of the organization or the network. One unexpected response from many relief organizations in Banda Aceh was the statement that most organizations had too much money. The outpouring of generous donations worldwide created a problem most of these organizations had

never faced. Not only was this the worst disaster these organizations had ever encountered, but they had more money to apply to the need than they had ever experienced.

Along with those donations, though, was the expectation that the money would be used quickly and effectively. This expectation created two problems. First, some of the organizations decided to involve themselves in work they had never done, bolstered by the rich financial resources provided by donors. Many relief organizations volunteered to build thousands of houses in order to rebuild communities and entire villages. With little or no previous experience in housing construction or community development, these relief organizations embarked on doomed exercises. The outcome was either a failure to build the number of houses originally agreed upon or the construction of houses so poorly designed or with such little consideration of community that the victims chose to leave them empty. Second, beyond the housing problems, the need to quickly use the donations resulted in competition among organizations for ways to spend the money. Rather than working together in a network arrangement to most effectively use the billions of dollars donated, many relief organizations felt a greater obligation to their donors. In these cases, the power of external stakeholders (donors) limited the ability of relief organizations to work together.

The second important point identified in the description of organizational politics is that this influencing behavior is used for a specific, intended outcome, either sanctioned or non-sanctioned by the organization or the network. Often times, non-sanctioned activities and outcomes are self-serving in nature.[41] However, non-sanctioned activities are not always counterproductive to network effectiveness. The example given previously about the "clandestine" Friday evening gathering of engineers from relief organizations in Banda Aceh is an example of a non-sanctioned activity that resulted in the overall efficacy of the network.

Mayes and Allen point out the use of political behavior to influence the ends as well as the means of the organization. Network actors can use political behavior to shape the intended ends of network activity as well as to accomplish those ends through specific means. Ends-oriented political behavior within net-

works is seen when relief organizations use network resources to accomplish their own, subordinate purposes. In Aceh, among other places, some international relief organizations were accused of using media outlets for self-promotion in times of crisis. Once the cameras and press left the scene, these self-serving organizations also departed. Even so, the use of power and influence can accomplish network goals, even when the means are non-sanctioned.

In Birmingham, Alabama, Dr. Michael Fleenor recognized that many evacuees had fled their homes without their prescription medicines or any health records. The lack of medicines would soon result in a greater health crisis. Dr. Fleenor quickly enlisted the help of faculty from a local school of pharmacy, canvassed all the evacuees to determine their needs, and authorized the pharmacists to fill prescriptions for his "patients" using a delimited pharmaceutical formulary. While this practice was not "sanctioned" by the network or his position, the behavior mitigated a potentially disastrous outcome.

Actions Organizations Can Take to Successfully Partner in Temporary Networks

The following five sets of actions are specific steps that organizational leaders can take to more effectively create, extend, or modify their resources through routines and practices that support their use of temporary networks in emergency situations.

Actions to Build Organizational Self-Awareness

Conduct a self-audit to understand strengths and weaknesses. At the heart of organizational self-awareness is a clear-headed recognition of the organization's strengths and weaknesses. Therefore, government and nongovernment organizations should conduct regular audits of the organization's operational capabilities, intellectual capital, and social capital. These capabilities and resources should be assessed in relation to the organization's mission and primary objectives, with the understanding that these objectives can only be met if the organization has the strengths to carry them out. From this analysis, organizational managers should identify capabilities and deficiencies.

Develop training and routines to compensate for identified weaknesses. Once deficiencies are identified, the organization must consider how to compensate for the weakness. Training and development routines can be created to strengthen core competency areas that are required for the organization to conduct its work effectively. However, employees do not learn simply because they are told to learn. Rather, training is most effective if it is a part of an overall strategy to create a learning organization.

Share your areas of strength with other organizations in your networks. As an organization better recognizes its strengths and weaknesses, it should understand that some areas of weakness do not need to be remediated within its own organization. Rather, it can extend its resources through developing networks. Therefore, organizational leaders must develop routines and procedures for creating and maintaining partnerships.

Clearly identify and communicate overarching goals in your networks. Clear identification and communication of overarching goals are critical for any network relationship. Each member of the network must be willing to commit to these overarching goals, even to the degree that subordinate organizational goals are not met. If the partnership has been carefully developed and if the organization knows itself well enough, it will enter only into network arrangements when its own mission and goals can be achieved through the accomplishment of overarching network goals.

Share successes across your networks. No single organization should take the credit for the work of the network. Organizational pride is important for the cohesion and motivation of group members. However, organizational leaders must set the example of sharing successes within and outside the organization with all those who participated in its accomplishment.

Evaluate your internal and external communication processes to ensure that they are effective. Effective communication is a critical element of organizational self-awareness. Organizations should evaluate their internal and external communication processes, ensuring richness through appropriate channels for each type of communication as well as appropriate feedback mechanisms. Organizations must develop

contingency plans to facilitate communication when the physical environment limits traditional communication media. In addition, organizational leaders and members must learn and practice effective listening skills. Productive partnerships can only be developed when organizational leaders and members know how to listen both within and outside their organizations.

Actions to Rapidly Create Trust with Others

Be aware of how your organization is perceived within the relief community. A relief organization must be aware of the perception of its trustworthiness among other members of the relief community. Trustworthiness takes on two dimensions: integrity of capabilities and integrity of practices. If an organization is not perceived as trustworthy either in its ability to conduct its work or in the manner in which it treats its network partners, few organizations will be willing to collaborate with it.

Maintain latent contacts among potential relief partners. Organizations should maintain latent networks even when not involved in a crisis response. Organizations should communicate with prior network partners to maintain active connections within their dormant networks.

Train for and have access to tools to make quick decisions. Developing inter-organizational trust quickly requires the ability to scan the environment, evaluate options, and make decisions regarding partnership selection. Therefore, individuals within relief organizations should be given training and decision tools to help with this analysis. These individuals should also be involved in evaluating network ties after the crisis response is concluded.

Develop internal protocols for how and when to develop partnerships. These protocols include the amount of resources (financial, human, material, and informational) that can be committed to any network effort, the length of time an organization will commit to being involved in the network, and a flexible framework for governance mechanisms that should be put in place when the network is developed.

Actions to Create a Reserve of Legitimacy and Reputation

Periodically survey the industry and your own members. Organizations should conduct periodic surveys of staff members of other relief organizations as well as stakeholders of its organization to collect helpful feedback on organizational reputation. Similarly, the media and Internet should be scanned regularly for articles about the organization. Carefully examining the degree to which an organization has accomplished its previous goals and objectives will also provide important feedback on its reputation in the community as well as among other relief organizations. However, an organization should be careful about conducting surveys among its staff members in order to understand its perceived reputation. If the organization has a negative reputation among its staff, the staff might be hesitant to communicate this fact honestly out of fear of reprisal.

Improve your organization's technical capability. By doing so, an organization can improve its reputation in the eyes of the external environment. (See the recommendations regarding skills assessment and organizational learning in the section on organizational self-awareness for more specific information.)

Join and be active in relevant institutional organizations. Organizations should join associations such as Voluntary Organizations Active in Disasters at the local and/or national levels.[42] Membership in these associations and others like them will provide access to information about other relief organizations, resources, and training. Government agencies should also join associations and participate in conferences and related events to show support for public–private networks.

Be transparent in your operations. Organizations should provide for third-party financial audits and make financial reports available to the public. Organizations should make audits of operational practices available, as well. Transparency can also be beneficial in enabling rapid bonds of trust to develop.

Mentor newer or smaller organizations. Legitimacy and reputation often go hand in hand. When more experienced organizations mentor newer or smaller organizations, they gain legitimacy as elder statesmen and improve their performance through the enhanced

learning that accrues through these relationships. Embedding members across organizations improves the legitimacy and the reputation of an organization.

Actions to Participate in Other Networks

Develop and use feedback protocols after each crisis. Learning from prior network experience requires protocols for feedback and reflection after crises have been resolved. These protocols should seek to identify best practices: what worked, what did not work, what needs to be addressed next time the organization participates in a network, and the like. Best practices should include not only the relief work of the network, but also the formation and management of the network.

Understand the value of belonging to different types of networks. Organizations must understand the different purposes of strong-ties versus weak-ties networks and plan accordingly. Understanding these differences can help establish better expectations for network performance and reliability. Consideration of these differences should be included in protocols for future network development.

Develop a relationship-management function in your organization. As part of learning from prior network arrangements and planning for the use of future networks, organizations should develop a relationship-management function. Routines within this function should include:

- Developing a knowledge base related to alliance management

- Assigning responsibilities for scanning the environment for potential partners

- Championing and coordinating internal processes to support partnerships

- Clearly delineating the expectations of partnerships and the control mechanisms to support these efforts

Actions to Effectively Use Political Behaviors to Influence Action

Agree on common objectives and means for achieving objectives within your networks. Organizational politics is inevitable to a degree.

However, to avoid overuse of political mechanisms, an organization should develop clear objectives and acceptable means for accomplishing these objectives. When working among other organizations, these objectives and means should be agreed upon and communicated clearly across the network.

Be aware of the different tools and behaviors for gaining and using influence. Awareness of mechanisms used to gain power and influence should also be made known so that organizational members can identify political behavior at its early enactments. To the degree that political behavior helps an organization or network accomplish its objectives in responsible and ethical ways, these behaviors can be allowed to continue. However, unless network members are aware of what political behaviors look like, the danger exists that the behaviors will be enacted under the radar of the network.

Develop conflict resolution mechanisms within your networks in advance. To resolve the conflicts that are also inevitable with network relationships, organizations should develop conflict-resolution mechanisms that can be used to address internal as well as externally related conflict. Organizations should not avoid conflict; a healthy amount of process and task conflict can result in more effective operations. However, dysfunctional conflict should be addressed early on, and network members equipped with tools for dealing with conflict will be better prepared to do so.[43]

Cross-train across your various networks. Embedding organizational members across the network, as well as cross-training across organizations, can also limit organizational politics. The shared information and shared experiences that are generated through embedding and cross-training create a greater awareness and acceptance of overarching network goals.

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Appendix: Creating a Dynamic Capability to Participate in Temporary Networks

In management studies, the concept of "dynamic capabilities" emerged from a focus on the importance of resources that lead to competitive advantage.[44] The dynamic capabilities concept can be extended beyond a resource-based view into dynamic environments, where possessing critical resources alone is insufficient to be successful. If an organization cannot develop more resources, it will have to use its existing resources in more creative ways.

An organization fosters dynamic capabilities by creating routines or processes that align or realign existing resources to meet the demands of an ever-changing environment.[45] A dynamic capability, then, "is the capacity of an organization to purposefully create, extend, or modify its [existing] resource base."[46] Although the dynamic capabilities literature is most closely associated with for-profit organizations' efforts to establish and maintain a competitive advantage, the principles apply also to non-profit organizations, as well, especially those operating in dynamic environments. In these changing environments, dynamic capabilities enable organizations to sense opportunities that others miss; seize those opportunities by aligning resources to best capitalize on the opportunity; and reconfigure themselves to meet the threats that emerge in dynamic environments.[47]

How does this concept of dynamic capabilities apply to the world of disaster relief? Without a doubt, sufficient quantities and types of resources are critical to effective crisis responses. However, by the very nature of larger scale disasters, local resources are quickly overwhelmed and insufficient to address the immediate needs of a major crisis.

Examples from the two case studies are illustrative:

- In response to the Asian Tsunami, the outpouring of generosity from citizens and governments around the world accumulated more than $13 billion for relief and recovery. Nongovernment relief organizations took in more than $5 billion of these funds from their donors. Thousands of aid workers flocked to the disaster sites throughout Indonesia, Sri Lanka, and other nations. International nongovernmental relief organizations, UN agencies, representatives from bilateral and multilateral donors, and military personnel from multiple countries worked side by side in the recovery efforts.

  In Indonesia, a national-level government agency named *Badan Rehabilitasi dan Rekonstruksi* (BRR) was established to coordinate the work and the funds donated for recovery. In both the Asian Tsunami and Hurricane Katrina disasters, great amounts of tangible resources and human resources were extended.[48] Yet these resources alone did not ensure successful cooperation to alleviate suffering.

- In the case of Hurricane Katrina, by August 27, 2005, shelters in Texas, Mississippi, and Louisiana were opened to accommodate the thousands of evacuees who would flee the Gulf Coast. Further, recognizing that evacuation plans might put citizens who were unable to flee at risk, such as the elderly and those with disabilities, the New Orleans Superdome was identified as a "special needs shelter." Later, this same location would become a "shelter of last resort," and was staffed with approximately 480 National Guard soldiers and 71 medical personnel. By August 29 in the preparation leading up

to Hurricane Katrina's landfall, organizations such as FEMA and the Louisiana National Guard pre-positioned more than 7.5 million pounds of ice, almost 4 million Meals Ready to Eat (MREs), and more than 3.8 million liters of water across seven states. State, local, and federal agencies prepared for this disaster more than any other in the country's history.[49]

Intangible resources, such as coordination protocols, also play important roles in the aftermath of a disaster. In 2003, in the aftermath of the September 11, 2001, attack, President George W. Bush instructed the newly formed Department of Homeland Security (DHS) to create the National Incident Management System (NIMS) "to provide a consistent nationwide approach for Federal, State, and local governments to work effectively together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity."[50] In addition, the National Response Plan (NRP) was to be developed "to provide the structure and mechanisms for national level policy and operational direction for Federal support to State and local incident managers."[51] Of strategic importance to the NIMS is the Incident Command System (ICS), which is used to coordinate the efforts of multiple responding agencies in a disaster setting. The ICS is designed to provide a well-coordinated, structured command system, while also being flexible enough to scale according to the needs of the crisis.[52]

In both the Asian Tsunami and Hurricane Katrina crises, public and private organizations with years of experience came forward to assist at great expense and risk to themselves. With all the tangible and intangible resources that were brought to bear in each disaster, one would expect a most efficient and effective response. However, this was not the outcome in all cases. Sufficient and necessary resources alone were insufficient. The inability to form strategic networks and to best utilize these resources across the networks limited the efficacy of the responses.

Some might claim that the overwhelming scope of these disasters make them poor examples of the failure to form effective networks for coordinated relief. Certainly, although many public and private organizations responding to these two crises had decades of experience, none had faced disasters on the scale of the Asian Tsunami or Hurricane Katrina. The scope of these disasters was unique, beyond anything responders had ever seen. Yet every disaster is unique in some way. The interplay of the nature of the crisis, the needs of the victims, the environmental factors, and the responding organizations ensure that no two crises are identical. Therefore, certain protocols may work reasonably well across a variety of crises, yet they will work most effectively to the degree that they enable responding organizations to use their specific capabilities in conjunction with other organizations in the context of the unique needs of each crisis.

Although resources are necessary, they are insufficient in and of themselves. Of utmost importance is the specific ability of individual organizations to align their critical resources with the resources of other relief organizations to meet the unique needs of a dynamic environment. This approach reflects the dynamic nature of crisis relief. Therefore, developing the capabilities to dynamically respond will enable organizations to sense the environment, seize opportunities, and create, extend, or modify critical resources in response to a crisis.

Dynamic capabilities take on a variety of forms, including the development of routines that facilitate learning, product development, resource allocation, and even network development.

Developing the capability to effectively participate in temporary networks is a specific capability that allows an organization to extend its resource base across one or multiple organizations in times of dynamic change for a limited amount of time. Some organizations do this better than others. Organizations that have developed such capabilities can be described as having a "temporary network development capability" or TNDC.

Organizations that exhibit a high degree of TNDC can extend their resource base in two ways. First, they have access to resources from network partners when they do not have the sufficient type or volume of resources. Second, they can invest their own resources across a network in ways that allow them to more strategically use these resources. This important distinction marks the difference between pooled task interdependence,

in which network partners simply share resources, and reciprocal task interdependence, in which network partners benefit from a greater synergistic use of resources.[53]

In the aftermath of a disaster, all parties involved face an environment that is highly complex, dynamic, non-munificent, and uncertain. At times, the limitation faced by relief organizations is not related to tangible resources, but rather to knowledge capabilities. Alliance development can alleviate this need because of the knowledge exchanges that take place in these network arrangements.[54] Networks help synthesize existing information,[55] and an appropriate information flow reduces uncertainty.[56] Further, organizational learning literature points to the advantages of interfirm learning through network/alliance participation. It has been argued that strategic alliances/networks provide opportunities to learn new capabilities. It has also been suggested that networks help synthesize existing information and facilitate the transfer of skills between firms.[57]

TNDC in an individual organization is similar to relational capabilities that are characteristic of effective cross-organizational alliances. Alliances that result in sustainable competitive advantage occur when members:

- Invest assets in the alliance that are specific to the alliance relationship

- Contribute capabilities that complement the capabilities of other alliance members

- Promote a free-flow of significant information among the alliance members

- Develop governance mechanisms that promote trust and reliability among all alliance members[58]

The primary differences between the two capabilities—TNDC and relational capability—are the time in which these relationships must be developed, the length of time the relationships last, and the relational characteristics that are influenced by these time differences.

The literature on alliances has shown great attention to "organizational capabilities that enable firms to form alliances with greater ease"[59] and a recognition of the importance of an "alliance

formation capability." It has also been recognized that, in the development of a network, someone must "make the first move" and some organizations "are shy."[60] Thus, those organizations that have the capability to more proactively develop the network and use that network's resources to respond to the crisis will be more successful in their relief efforts than those organizations that do not have such capability.

In summary, the value of a temporary network is threefold:

- It provides access to resources that are otherwise unavailable to the relief organization.

- It opens doors for more effective use of an organization's resources.

- It helps in dealing with uncertainty.

TNDC reflects a set of characteristics that form an individual organization's capability to develop strategic networks more quickly and efficiently. This essay identified the specific characteristics that constitute TNDC for relief organizations and offered insights on how organizational leaders can determine whether they have such capabilities, and if not, where to target attention to develop them.

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8. For example, The IBM Center for The Business of Government has published two excellent documents related to response protocols in disaster environments: "Delivery of Benefits in an Emergency: Lessons from Hurricane Katrina" (Stanton, 2007) and "From Forest Fires to Hurricane Katrina: Case Studies of Incident Command Systems" (Moynihan, 2007).
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47. Ibid, 6.

48.   Information regarding the effects of the Asian Tsunami, especially the effects in Indonesia, came primarily from interviews with government and nongovernment organizations responding to the crisis as well as from documentation such reports commissioned from BRR and the United Nations.

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50.   The Federal Response to Hurricane Katrina: Lessons Learned, 2006, 12–13.

51.   Ibid, 13–14.

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A B O U T   T H E   A U T H O R

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Emergency Management Networks in California

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E X E C U T I V E   S U M M A R Y

This essay is based on observations of California's emergency management system and identifies a set of practices that public managers can use to successfully develop inter-organizational networks to more effectively address their emergency management challenges. These practices will help public managers to:

- Better align needed response networks with existing organizational structures

- Leverage the value of training exercises to improve network development

- Adapt existing networks to new challenges

California has a long history in emergency response networks, in part because of its experiences with earthquakes and fires. This essay provides specific examples of how California's state government has facilitated network development in emergency management. It also examines how the state integrates two other networks related to homeland security and public health responses. California's extensive experience with natural and man-made disasters, its economy of more than a trillion dollars, and its population of more than 36 million people offer information on a scale and scope that is potentially instructive for other states and the federal government.

California uses four approaches to facilitate collaboration in California's emergency management networks:

- Incident command system

- Mutual aid agreements

- Continuous involvement of emergency management stakeholders in training and exercises

- Use of a system of horizontal, vertical, and joint networks

Ongoing contacts and linkages among various organizations and their networks are seen as critical to effective network management when emergencies occur. The public health practices are characterized by features inherent in any network: resiliency, redundancy, and the capacity to move information rapidly to adapt to new contingencies.

This essay concludes with recommendations for public managers at all levels of government for designing, managing, and evaluating networks for emergency management.

Organizational Framework for California's Emergency Response System

California's Legislative Analyst (2006) described the state government emergency management challenges as follows: "In its history, California has experienced a wide variety of disasters and emergencies. Some of these have been natural disasters—such as earthquakes, floods, fires and outbreaks of disease or pests. Others are 'man-made' disasters—such as riots, hazardous waste spills, failures of levees and shortages of energy." With a population of 36 million as of 2004, California contained 12.5 percent of the population of the United States as of Census 2000 (Starr, 2005).

To respond, three interrelated networks have evolved in California, and each has a role in responding to emergencies:

- The Governor's Office of Emergency Services (OES) is designed to respond to general emergencies such as forest fires, floods, and earthquakes.

- The Governor's Office of Homeland Security (OHS) is designed to address homeland security challenges. Its scope is broader than just emergency response; it has a responsibility to detect, deter, and prevent terrorist events, as well.

- The California Department of Public Health (CDPH) deals with public health issues, such as SARS (Severe Acute Respiratory Syndrome) or the pandemic avian flu threats. It too has a broader scope than public health emergencies; it deals with ongoing public health concerns, such as the obesity epidemic, and has detection and prevention responsibilities.

In the instance of a broad public emergency, however, these three networks need to be able to work together and share resources. The state, therefore,

has developed an integrated emergency preparedness and response system to facilitate this collaboration at both the statewide and local levels.

Governor's Office of Emergency Services

OES is the lead organization for emergency situations and recovery efforts in California. According to a 2006 study of the state's emergency preparedness system, "California's Emergency Services Act empowers the Governor to tap every dollar, every resource and every authority of the State to ensure that Californians and their property are secured from the risks of catastrophic events. That authority is housed in the Governor's Office of Emergency Services" (Little Hoover Commission, 2006:13). OES had an operating budget in 2005 of $82 million and 479 staff.

Governor's Office of Homeland Security

OHS coordinates the state's homeland security activities. In 2005/2006, it had 53 employees and an operating budget of $5.5 million. OHS serves as the lead state contact with the federal Department of Homeland Security, administering six grant programs of that agency. In addition, OHS develops, maintains, and implements a statewide homeland security strategy and is charged with terrorism prevention and protection of the state's critical infrastructure.

An important element of the state's homeland security strategy is preventing an incident through early detection. In the state's toolbox of information analysis capabilities are four fusion centers (three

regional and one state) whose role are to detect, deter, and prevent terrorism. Early detection is pursued through public safety partnerships that include local, state, and federal organizations sharing information analysis, tracking, pattern analysis, and geographic report linkages.

California Department of Public Health

CDPH is the state health department for California. One of its key responsibilities is preparing the state for public health emergencies such as natural disasters or crises that are man-made, such as bioterrorism. The department was created in 2006 as part of a larger state reorganization effort. It conducts a number of state-level exercises that have a health component and is responsible for being ready to provide a surge of resources, when needed. The department has 3,500 employees; in 2007, it had a budget of $3 billion.

California's Integrated Emergency Preparedness and Response System

In 2006, the governor put in place an overarching Emergency Operations Executive Council to serve as a coordinating body across the three emergency preparedness and response networks and organizations. Figure 1 illustrates the network of committees, advisory bodies, and state and local agencies that constitute California's emergency preparedness system.

The council was created by executive order. It comprises 32 organizational members that have operational responsibilities for day-to-day involvement in emergency planning and response. There is no separate budget for the council; it is assumed that necessary staff support will be provided by OES. Meetings are convened no less than quarterly by the Director of OES and the Director of OHS.

The priority focus areas of the council include the following:

- To assess and provide necessary information to the governor, the legislature, local agencies, and the public on pending emergency conditions that threaten public health and safety

- To develop a consolidated set of budget, legislative, and administrative actions, and to identify

additional federal resources required to improve state prevention and response capabilities to deal with pending threats to public health and safety

- To assist in the management of emergency preparedness, response, recovery, and mitigation efforts

Figure 1: California's Integrated Emergency Preparedness and Response Framework

FEDERAL LEVEL

U.S. Department of Health and Human Services

U.S. Department of Homeland Security

STATE LEVEL

California Department of Health Services

Joint Advisory Committee on Public Health Preparedness

Health Services' Statewide Emergency Preparedness Training Collaborative

Other advisory bodies with one-time roles, including Emergency Services' Strategic Plan Advisory Task Force and Health Services' Strategic Planning Workgroup‡

California Emergency Council†

Governor's Emergency Operations Executive Council*

Governor's Office of Emergency Services

Public Safety Radio Strategic Planning Committee

Emergency Partnership Advisory Workgroup

Emergency Response Training Advisory Committee

Standardized Emergency Management System Advisory Board

Governor's Office of Homeland Security

State Threat Advisory Committee

Homeland Security Senior Advisory Committee

Other state entities, including California Highway Patrol, California Military Department, California Service Corps, Emergency Medical Services Authority, and State Terrorism Threat Assessment Center

LOCAL LEVEL

Local entities, including operational areas, cities, regional transit security working groups, local health departments, local emergency medical services agencies, and nonprofit organizations

Grant funds and guidance

Advice

Entities established by statute

Entities established by executive order

Entities established by state entity

Entities established by state regulations

Sources: *Various web pages and other documents obtained from, and interviews held with, employees of the California Department of Health Services, the Governor's Office of Emergency Services (Emergency Services), and the Governor's Office of Homeland Security (State Homeland Security).*

Note: *The State Strategic Committee on Terrorism, created in 1999, was disbanded because it was unable to provide the comprehensive approach to homeland security envisioned in a 2001 executive order, according to the Legislative Analyst's Office.*

* The Governor's Emergency Operations Executive Council, created by executive order in April 2006, has met once as of June 30, 2006, according to a deputy director of State Homeland Security.

† The California Emergency Council, established by statute, has not met since 2002 according to a deputy director of Emergency Services.

‡ Advice lines are not included for these bodies because they advise different entities and had a specific, one-time purpose.

Source: *State Auditor, 2006.*

Four Approaches California Uses to Deploy Collaborative Response Networks in Emergency Situations

California's challenges have been both vertical and horizontal in moving across organizational structures to the design, management, and evaluation of networks to address specific emergencies. The state has developed several mechanisms at the statewide and local levels to tackle them. These mechanisms include an incident command system (ICS), mutual aid agreements, training exercises, and the creation of horizontal, vertical, and joint networks.

Approach 1: Use of Incident Command System

The ICS approach originated in the U.S. Forest Service in the early 1970s in response to wildfires. It has subsequently been used by the civil defense and fire services to provide a temporary organizational framework that unifies the management of emergencies addressed by a network of multiple organizations (see Figure 2). The State of California's version of ICS is called the California Standardized Emergency Management System (SEMS). When the ICS approach was adopted nationwide as part of the 2003 federal emergency management system, the national version was named the National Incident Management System (NIMS).

California's SEMS was developed in response to criticisms regarding the handling of the 1991 fire in the Oakland Hills. In response to the California Emergency Services Act, an emergency plan was developed that established a number of mutual aid systems as well as SEMS, a nationally recognized emergency management system. The NIMS, now the country's mandated emergency management system, was developed using the essential concepts of SEMS.

To guide the development of California's response to adapting its SEMS to federal requirements for homeland security, a lead agency was selected. A facilitator, Adam Sutkus, of the staff of the Center for Collaborative Policy of the California State University at Sacramento, was hired in 2006 to help the state adapt SEMS to the required framework of the NIMS.

Adam Sutkus was a former senior staff member of the Governor's Office of Emergency Services and one of the senior facilitators at the Center for Collaborative Policy. He played a key role in establishing a set of important ground rules, including the following:

- Insulating the process from direction by any single agency

- Putting all participating agencies and levels of governments on an equal footing regardless of differences in their political standing, reporting relationships, and organizational cultures

- Providing a neutral turf to ensure that the processes will be followed and that outcomes will be continuously transparent

Initially he launched a series of policy design seminars to bring participants up to speed and to work through their differences in a neutral environment. The participants developed a template and tested it collaboratively. The template essentially overlaid the federal NIMS requirements on California's existing SEMS. Gaps between the two were identified, as were the steps necessary to bring the two systems in alignment.

The process to align the national and state systems included agreeing on a structure in a sequence of facilitated meetings; development and testing of a strategic plan of the state's response; continual

Figure 2: Five Primary Functions of the Incident Command System
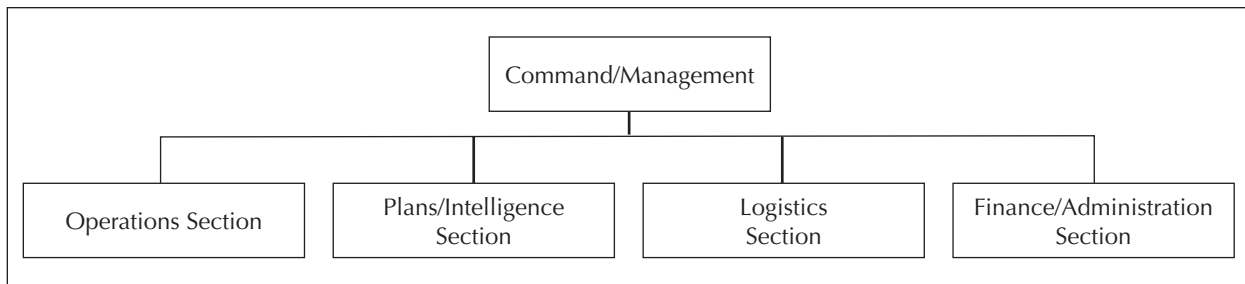
Source: *California's Little Hoover Commission*

participation by all stakeholders via video confer-encing; collaborative editing of drafts to reflect stake-holder inputs; and participatory decision making. When completed, the participants jointly took the state's draft response to the governor and legislature for their approval. A partial list of the tasks per-formed includes the following:

- Formulating and implementing policies

- Acquiring necessary resources, including politi-cal support

- Designing and establishing governance struc-tures

- Managing participant expectations

- Building trust and social capital for a supportive culture based on shared values

- Interest-based bargaining to resolve disputes and conflicts

The outcome of this facilitated collaborative under-taking was a timely state response to the NIMS mandate, satisfying the governor and the legisla-ture, the federal government, and the participating organizations.

Approach 2: Creation of a State–Local Mutual Aid System

The California Master Mutual Aid System is a series of agreements between state agencies and individual counties and municipalities. The agreements, devel-oped in advance of any emergency, are used to call up, deploy, and manage resources during emergen-cies—as well as to reimburse local governments for the use of their resources during emergencies. The system is wholly dependent on voluntary cooperation and sharing resources in times of emergency. A good

example is the State of California's ability to mobilize thousands of firefighters and requisite apparatus to fight wildfires annually.

Mutual aid agreements started out as informal arrangements but have become formal agreements. These agreements were entered into by specific types of responders, for example, police, fire depart-ments, and public health organizations (Legislative Analyst's Office, 2006-2007:149). When disasters and emergencies occur that require more resources than a single local government can provide, formal mutual aid agreements are brought into play. Help may be provided by the following:

- Neighboring jurisdictions

- Operational areas (the 58 operational areas correspond to California's 58 counties)

- One of the six formal OES mutual aid regions

- Statewide assistance through OES

- Other states

- Federal Emergency Management Agency (FEMA)

Figure 3 on page 46 shows the mutual aid resource request flow between the several SEMS levels for different mutual aid systems.

Approach 3: Use of Training Exercises to Build Cohesive Networks

Training exercises across functional areas (law enforcement, fire, medical personnel) have been important components in the development and man-agement of cross-agency and cross-governmental responses networks. The statewide network for emergency response is based on the three emer-gency management regions of the state: coastal,

Golden Guardian 2006 Exercise

Exercise planners, subject matter experts, and local representatives from multiple agencies participated in the planning process and played critical roles in the exercise's conduct, control, and evaluation. The development of the Golden Guardian 2006 full-scale exercise included an aggressive series of concept meetings, seminars, workshops, tabletop exercises, and functional exercises conducted across the state. In a stair-step fashion, each meeting, workshop, and exercise increased in complexity and capability, building up to the full-scale exercise.

All the functional area initiatives were planned, developed, conducted, and evaluated using a methodology developed by the federal Department of Homeland Security—in use by all states and territories to one degree or another—including initiatives for large stadiums, agriculture, mass transit, small counties, and cyber-terrorism.

Golden Guardian 2006 engaged a wide network of local, regional, state, and federal agencies, including the Department of Defense. In addition, the Department of Homeland Security, FEMA Region IX, and the United States Northern Command included new elements of the National Response Plan in the exercise with the state. Federal Homeland Security Secretary Michael Chertoff designated a Principal Federal Official for Golden Guardian 2006. Although the position had been used at recent federally sponsored Incidents of National Significance exercises (National Response Plan, 2006), this was the first time the secretary had designated one for a state-level exercise.

The statewide exercise incorporated a series of specific activities to develop and practice network management. These included a "preventive" activity, a trio of geographically diverse activities (for each of California's three emergency regions), and a joint activity with federal and military participants. At the conclusion, the participants jointly conducted an "after-action" review to collect lessons learned about what went well and where improvements were needed.

Preventive Exercise: Analyzing Terror Threats. For six weeks, the State Terrorism Threat Assessment Center, the Los Angeles Joint Regional Information Center, and the San Bernardino Terrorism Early Warning Group participated in an information functional exercise to test the capabilities of these fusion centers to analyze terrorism threat information, share that information within their network, and develop the threads of a building scenario. The scenario was then linked to active exercise play during a full-scale exercise at the Hyundai pavilion in San Bernardino County in southern California.

The homeland security fusion centers were designed to share information across departmental boundaries and to improve the response to problems through better communication and collaboration.

Southern Region: Responding to Improvised Explosive Devices. The exercise began with the simulation of multiple improvised explosive devices (IEDs) exploded at a large stadium in San Bernardino, simulating hundreds of fatalities and injuries. This simulation caused activation of the San Bernardino emergency operations center; this in turn caused activation of the Governor's Office of Emergency Services Southern Region Emergency Operations Center.

Simultaneously, a simulation introduced the dissemination of a biological agent in a small portion of this exercise venue, causing the activation of special medical and law enforcement precautions and field decontamination.

More than 1,200 local first responders, as well as nearly 100 FBI agents from greater Los Angeles area offices, responded to the situation in a full-scale exercise event. San Bernardino County hospitals, public

health agencies, and the San Bernardino County Office of Emergency Services picked up on play two days later and continued the biohazard piece of this exercise as an element of the Emergency Medical Services Authority Medical Health Statewide Exercise.

Coastal Region: Responding to an Earthquake. A simulation replicated the 1906 San Francisco magnitude 7.9 earthquake along the San Andreas Fault west of San Francisco. This catastrophic event simulation caused county operational area emergency operations centers to activate and to initiate requests to local jurisdictions for mutual aid, mass care and sheltering, evacuation, emergency medical services, and rescue requirements. As a specialized functional exercise, the San Francisco Fire Department hosted a heavy rescue exercise at its training facility on Treasure Island, drawing task forces from four operational areas. These crews worked a structural debris pile in two-hour rotating operational periods and engaged in live fire training.

Inland Region: Responding to Evacuees. Following the earthquake exercise, the California Inland Region prepared for and received voluntary evacuees from the Bay Area. The region activated emergency operations centers in the cities of Fresno and Clovis to establish reception centers for the American Red Cross to use as mass care and sheltering facilities. During this exercise element, the California Department of Health Services (CDHS) deployed the Strategic National Stockpile.

Joint Activity: Other State Agencies, Federal, and Military. In each exercise venue, other levels of government played integral roles in mitigating the emergency. The state, especially the Governor's Office of Emergency Services, played a crucial role as resource coordinator among regions within California, as well as to the federal government and directly to other states. Other state agencies—including the Health and Human Services, Emergency Medical Services Authority, California Highway Patrol, and State Military Department (National Guard)—provided on-scene resources and assisted in statewide command and control functions.
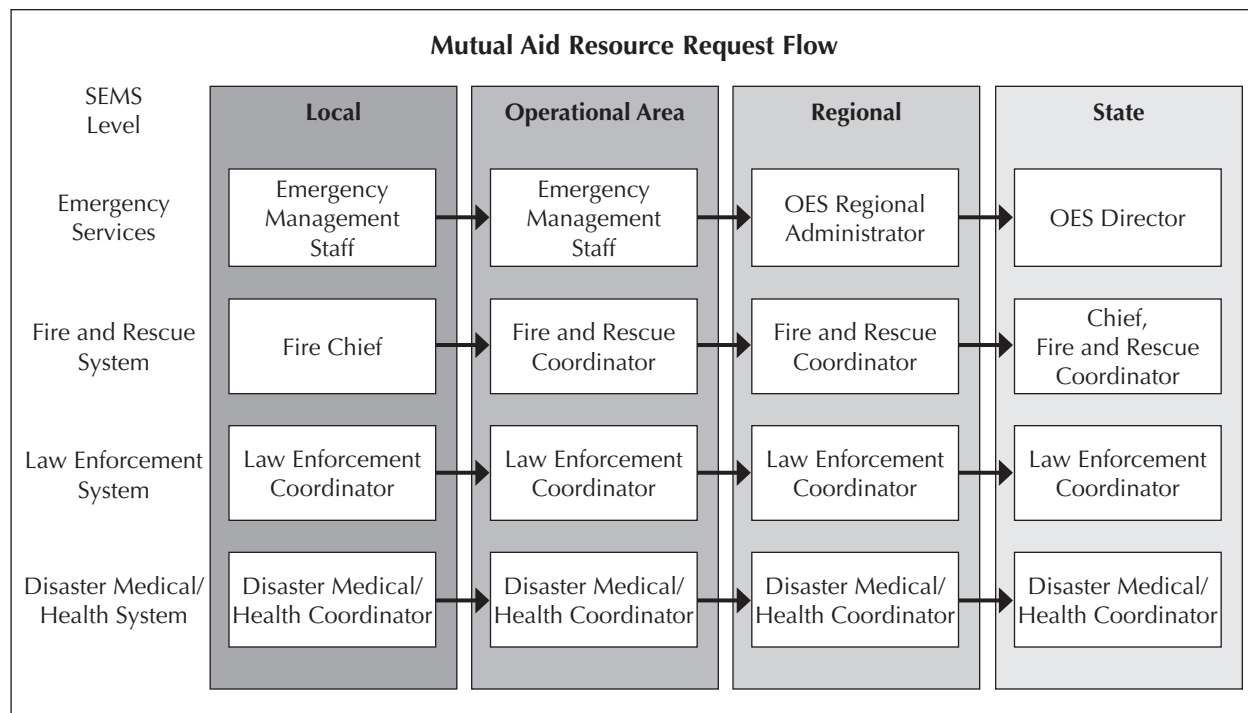
After-Action Assessments. Each Golden Guardian exercise has included an after-action assessment to gather lessons learned. The 2006 after-action process began immediately at the exercise conclusion. Each location and work group conducted a "hot wash" to elicit comments from participants, controllers, and evaluators while the observations were still recent. A key focus of the review was defining and understanding the governance seams between federal military forces, FEMA, and state agencies under the National Response Plan. These interactions were new and based primarily on joint decision making and coordinated efforts.

An executive-level post-exercise discussion, facilitated by one of the co-authors, was held at the conclusion of the weeklong exercise among state agency leaders, top managers from FEMA Region IX, and representatives from the Department of Homeland Security to examine critical top-level exercise lessons and to begin work toward identifying solution paths. At this discussion, the leadership focused on the need to move problem-solving energy from the traditional hierarchical approach to one displaying the characteristics of a network. As an example, Nancy Ward, FEMA Region IX Director, and Henry Renteria, California OES Director, recommended solution-based and inclusive (government, nongovernmental organization, and private sector) efforts to locate suitable facilities in strategic locations within the state for the future Joint Field Office.

Within 30 days following the exercise, all the exercise evaluation guides completed by field evaluators were consolidated and examined for trends. More formal after-action conferences were held in each region, as well as in Sacramento, for state agencies to gather additional comments and provide the attendees an overview of significant comments and trends that were recognized. These findings, together with other data about the exercise, made up the After-Action Review, a document to guide future improvements in preparedness as well as in exercise design and conduct.

Figure 3: California Mutual Aid System

Mutual Aid Resource Request Flow

SEMS Level	Local	Operational Area	Regional	State
Emergency Services	Emergency Management Staff	Emergency Management Staff	OES Regional Administrator	OES Director
Fire and Rescue System	Fire Chief	Fire and Rescue Coordinator	Fire and Rescue Coordinator	Chief, Fire and Rescue Coordinator
Law Enforcement System	Law Enforcement Coordinator	Law Enforcement Coordinator	Law Enforcement Coordinator	Law Enforcement Coordinator
Disaster Medical/ Health System	Disaster Medical/ Health Coordinator	Disaster Medical/ Health Coordinator	Disaster Medical/ Health Coordinator	Disaster Medical/ Health Coordinator

Source: California State Auditor

inland, and southern. An annual training exercise to develop, conduct, and assess statewide preparedness—called the Golden Guardian Exercise Series—is one of the largest exercises in the nation.

This large-scale, statewide exercise was first conducted in California in 2004 as an element of a larger national defense exercise. It is now conducted annually to coordinate the activities of city, county, state, and federal governments; first responders; volunteer organizations; and the private sector in response to potential acts of terrorism and catastrophic disasters. This exercise is accomplished in an "all-risks" environment, allowing advances in training, skills, and knowledge to be used regardless of the event challenging the state—that is, whether the event is a terrorist, public health, or natural emergency.

The goal of the Golden Guardian Exercise Series is to continually improve emergency preparedness capacity by building from the lessons learned from this and subsequent exercises. The exercise series, entering its fourth year, has gained positive national attention, while improving in its design, scope, complexity, comprehensiveness, and strategy.

Approach 4: Creation of a System of Horizontal, Vertical, and Joint Networks

The use of a variety of types of networks is reflected in an array of emergency responses in California, most notably in the public health arena. The challenges of responding to bioterrorism and other homeland security public health threats helped drive the adaptation of existing public health networks to respond to emerging threats. The adaptation can be viewed as "… an amplification of normal work" (Freedman, 2006). The consistent observation in public health in California has been the role of networks in advancing public health planning, disaster mitigation, response, and recovery.

California's structure for managing public health emergencies is shared by the State of California's Department of Public Health and 61 local health departments (Governor's OHS, 2006:26). The opening paragraph of California's public health emergency response plan states the purpose and scope as follows: "The integration and close coordination of the public health response with that of other emergency response agencies is critical" (CDHS,

2005:3). This vertical and horizontal network engages in "… leveraging resources through coordination" (CDHS, 2005:26). Network capacity building occurs through a nested set of activities that guides responses to acts of terrorism, natural disasters, and infectious disease outbreaks.

The importance of responding to a wide range of homeland security challenges in public health contributed to formation of a new state-level Department of Public Health. In separating this new department from the larger Department of Health Services, the intent was to facilitate preparedness for threats to public health for more than 36 million Californians (Horton and Lyman, 2006) and to secure adequate funding to address these challenges (Pomer, 2007). This state reorganization paralleled the creation of a separate county department of public health for the County of Los Angeles, serving more than 10 million residents.

A variety of networks have evolved, designed to cross boundaries between prevention, response, and recovery preparedness activities. Network management is not limited to separate networks for planning, mitigation, and response. Rather, the players, individuals, and agencies in each of those activities are involved through varied mechanisms in a wide range of contacts.

Public health management networks in California represent a rich set of ongoing iterative experiences, as opposed to one-time exercises. The numerous interactions that build public health capacity have created related networks that are used regularly in planning and emergency response testing. The key network feature is that the partnerships extend through varied activities. The challenge of understanding these networks is not in locating them but in recognizing the repeated nature of the interactions. "No one may be in a position to dictate a particular solution—you have to think through—and not take any option off the table" (Freedman, 2006). The experience of daily interactions in public health where no one person may dictate a solution has led to a complex set of inter-organizational networks.

Using Vertical Networks to Build Capacity
Network development requires coordination across state players such as the Governor's Office of Emergency Services, the Governor's Office of

Homeland Security, and the California Department of Health Services. Coordination is needed also across local health and law enforcement agencies. Specific mechanisms that have been developed and used to implement these networks include the following:

- A health services strategic planning work group
- A joint advisory committee expanded beyond the federal requirements to encompass planning for pandemic influenza, including state and local public agencies as well as community and nonprofit groups
- A state operations center, with planning across the state and private medical sectors through the state's Emergency Medical Services Administration
- Development of regional consortia among local health agencies
- Updated process for the state Public Health Emergency Preparedness Plan
- Governance of local readiness evaluation with the California Conference of Local Health Departments and the County Health Executives Association of California
- Operational area planning groups
- The State Terrorism Advisory Committee
- The Emergency Response Training Advisory Committee
- Emergency exercises such as the annual Golden Guardian Exercise, Avian Influenza Workshop, and Health Agency Preparedness and Response Exercise

The development of different types of networks in public health has generated experience in planning, delivery, information sharing, mutual problem solving, and community building that readily transfers to addressing new threats. The daily practices of public health professionals have become the foundation for adapting existing networks into new networks. The personal relationships, organizational relationships, and institutional arrangements developed for specific public health responses have become the building blocks for the evolution of existing networks into networks designed to respond to new threats. The public health practice—characterized by features inherent to any network:

resiliency, redundancy, and the capacity to move information rapidly—becomes the experience needed to adapt to new contingencies.

Using Horizontal Networks to Respond to Emergencies

California public health emergency services have developed networks horizontally through local entity collaborative planning. The service delivery network is tested through statewide and local all-hazard exercises each year, as well as through exercises specific to health, such as those related to avian influenza. The mechanisms that support emergence of these networks include the following:

- A local authorizing agency of five officials including fire and police officials and the county public health officer (CPHO)

- A pre-existing agreement splitting funding percentages at 20 percent each for fire, police, and emergency response, with 40 percent going to public health

- A range of eligible activities that can be applied to local needs

- More than 60 grant workshops and training exercises in a year and a half

- A working group of local sub-grantees to recommend changes in the funding processes

- Multiyear planning and prioritization

The federal funding for bioterrorism public health services has positive spillover effects for public health networks. The mandate for local disease reporting provides a vivid example of an ongoing network (Horton and Lyman, 2006). Medical doctors are required to report up to 80 diseases to the CPHO, who in turn reports these diseases to the state public health officer. This network provides an ongoing flow of information. The information provided locally offers opportunities to detect the emergence of disease patterns in a region or statewide. This early detection system for potentially large-scale disease threats is driven from the bottom up.

The network pushes disease detection to the local level and then moves the information up for analysis. The strength of this network derives from statutory reporting requirements, as well as from the immediate benefits to all involved in the detection of a potential epidemic. This network operates in both directions: bottom-up with the sharing of specific cases and top-down with the analysis of specific epidemiological threats.

Local medical doctors know to whom to report, and the CPHO has a current list of all providers that can be contacted if a public health threat emerges. From the perspective of homeland security, this type of pre-established public health network offers the potential for information sharing in real time. There is no need to try to establish new relationships, build new lists of contacts, or rely on lists of contacts developed for training exercises but rarely tested. This network's ongoing use establishes tested and available working relationships.

Using Joint Networks for Targeted Issues

Staffs in public health organizations at the local, county, and state levels focus on solving existing, complex problems with the primary purpose of setting the agenda for policy related to critical regional and national responses. In California, many characteristics of this type of network are found in the network planning for pandemic influenza.

The network planned for solving the problems of a pandemic influenza features varied mechanisms to facilitate rapid deployment of network resources to address the public health threat. The initial step begins with the premise of coordination through a joint emergency operations center in collaboration with other state organizations. A second mechanism for building a network response is a disaster policy council that advises the directors of the Department of Health Services and the director of the state's Emergency Medical Services Authority. A third mechanism for developing a networked response is a multi-agency coordinating group for multiple disciplinary or cross-jurisdictional responses (CDHS, 2006:12).

The development of this network begins in the planning stages with convening advisory groups and developing response plans and a range of preparedness activities. Surveillance activities are carried out both at the national level via the Health Alert Network and at the local level through local health departments, medical providers, and hospital-based infection control practitioners (CDHS, 2006:20).

Actions taken in response to pandemic influenza focus on local health departments with a wide range of activities, including but not limited to primary surveillance and reporting, through vaccination and other means of preventing spread, "informing and educating other local and state agencies" (CDHS, 2006:22).

Recommendations: Actions to Build Networks That Can Respond Effectively to Emergencies

Based on the evolution of California's emergency response system, the state's key challenge is aligning the current organizational structures with collaborative network practices.

California's experience supports network design, management, and evaluation as a learned set of skills, nested in past experience and adaptive to emerging challenges. However, this implies moving away from a hierarchical, top-down model or regulatory approach toward an emphasis on the importance of sharing lessons from past experience and facilitating network development through drawing on the experiences of public managers. This approach tends to be counter to traditional bureaucratic culture.

One of the challenges of working with networks has been to align the current organizational structure of agencies with the realities of network practices. An aspect of this challenge has been to facilitate public managers' use of network language that expresses the realities of network practices, within the context of the bureaucratic oversight that evaluates organizational structures.

Given the four approaches used in California's emergency response networks, this section identifies 11 actions to better facilitate the alignment, management, and adaptation of networks in emergency responses.

Agree on a Strategic Business Model

- **Create a governance framework.** Use an established, neutral facilitator or mediator with established standing, but who is also outside the emergency response agencies, to guide a process to reach agreement on roles and responsibilities.

- **Share information on an ongoing basis.** Reduce asymmetries in information among various agencies through policy and information sharing seminars and activities.

Agree on How to Collaborate Together

- **Formalize agreements in advance**. Move from informal to formalized agreements, not only for responsibilities but also for flow of resources across the network.

- **Extend the use of the mutual aid system.** Plan, develop, and leverage assets of resource interdependent networks for all foreseeable events, much like that of the Fire Master Mutual Aid System in use in California for more than 30 years.

Systematically Practice Collaborating

- **Train together regularly.** Use training exercises iteratively to develop, expand, and improve emergency response networks.

- **Link practice exercises.** Design exercises for specific geographic and functional needs, but link these area and functional networks statewide through annual exercises.

- **Plan exercises together.** Have the planning and design of exercises include the range of network partners so that network activities occur before, during, and after actual exercises.

- **Emphasize after-action reporting**. Develop network learning through after-action debriefing of participants from each part of the network vertically and horizontally.

- **Test networks horizontally and vertically.** Use regional and statewide exercises across a range of functional responses to vigorously test the practice network management both vertically and horizontally.

Continually Assess the Network

- **Map the relationships among players**. Identify the nested relationships of each network, the regular contacts of players across the various types of networks, and the overlapping experiences in varied network mechanisms to leverage past experience in adapting to new challenges.

- **Adapt governance structures to new requirements**. Leverage a range of mechanisms, such as committees, planning and evaluation oversight, and exercises, from existing practices to adapt existing networks to new response requirements.

Appendix: Management of Training Exercises for Networks

This appendix provides an overview of exercise program management (see Figure A.1) including design, conduct, and evaluation in accordance with the U.S. Department of Homeland Security doctrine, Volumes I-V at hseep.dhs.gov. The term exercise includes seminars, workshops, tabletops, games, drills, functional exercises, and full-scale exercises. As Figure A.2 depicts, exercises are of two types: discussion-based (seminars, workshops, tabletops, and games) and operations-based (drills, functional, and full-scale).

Large-scale exercise program management in California's Homeland Security exercise program begins with the "foundation" of relationships of individuals representing organizations that have a common purpose in exercising readiness capabilities. Existing networks are leveraged to build a core group of exercise planners (see Figure A.3) tasked with design and development of exercise program components.

Figure A.1: Exercise Program Management Phases

Figure A.2: Exercise Types
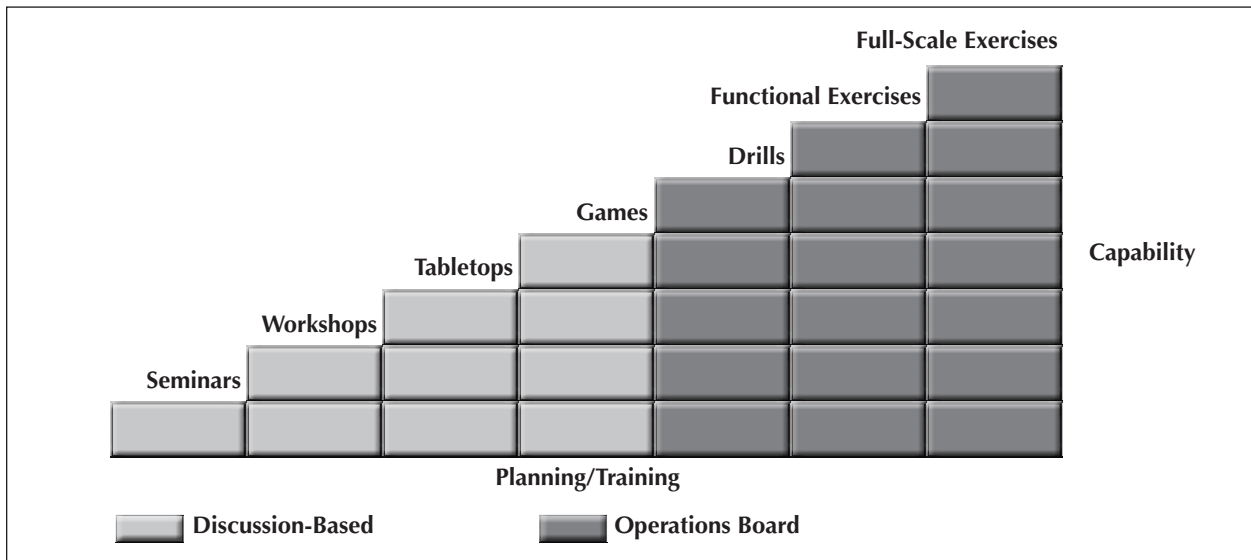
Figure A.3: Organizational Structure of an ICS Planning Team

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                          ┌─────────────────────────┐
                          │  Exercise Policy Council │
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│  Allied Agencies │------- │   Exercise Director   │────────│   OHS Public Affairs │
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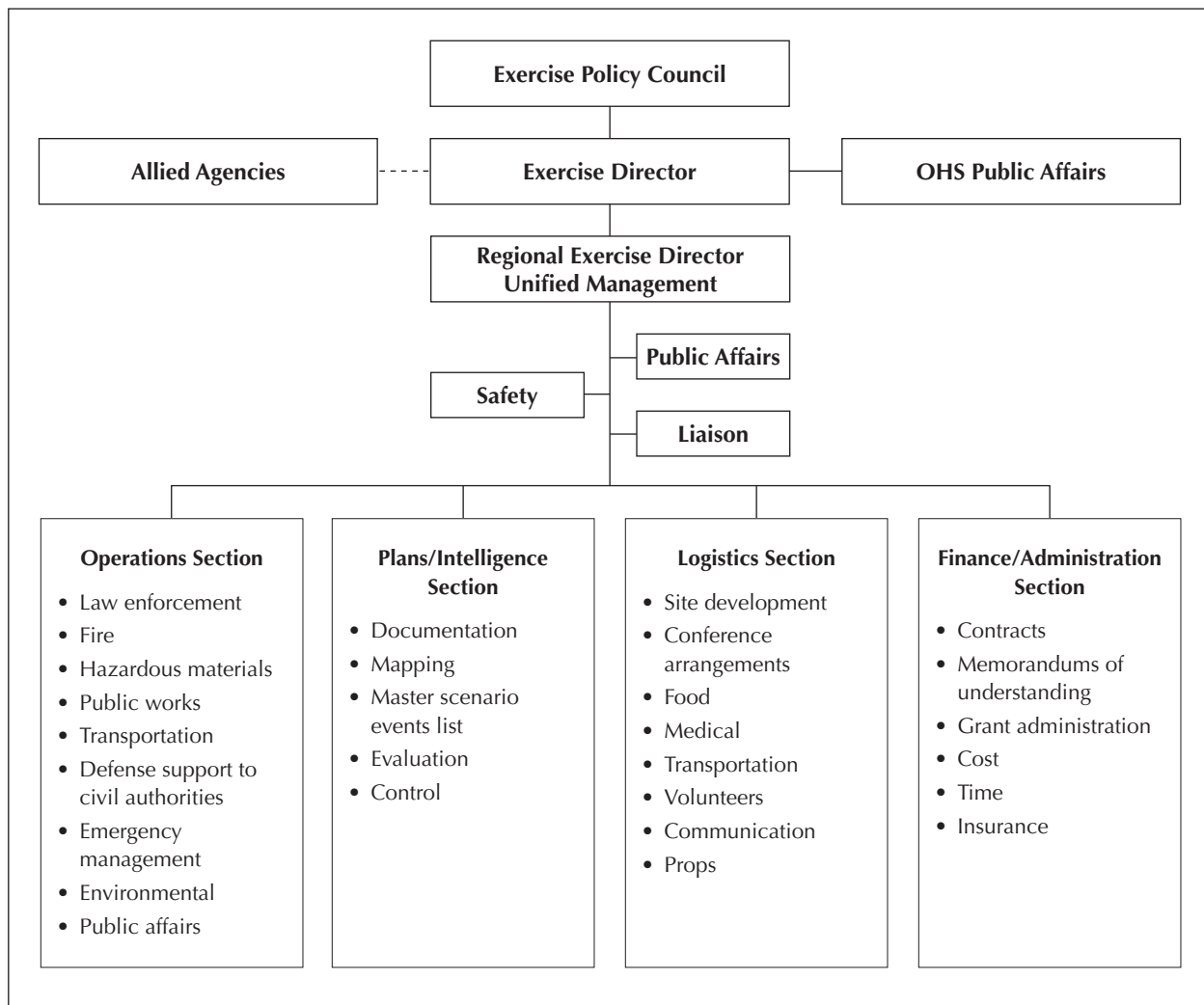
Operations Section	Plans/Intelligence Section	Logistics Section	Finance/Administration Section
• Law enforcement • Fire • Hazardous materials • Public works • Transportation • Defense support to civil authorities • Emergency management • Environmental • Public affairs	• Documentation • Mapping • Master scenario events list • Evaluation • Control	• Site development • Conference arrangements • Food • Medical • Transportation • Volunteers • Communication • Props	• Contracts • Memorandums of understanding • Grant administration • Cost • Time • Insurance

The "design and development" phase consists of planning activities, including concept meetings, initial planning conferences, mid-planning conferences, master scenario script writing meetings, final planning conferences, communication plan development meetings, controller and evaluator training, and other building block types of meetings and conferences. For a statewide exercise in California, this process can consume the better part of 12 months.

The "conduct" phase of an exercise is usually of a finite time period during which a particular seminar, tabletop, or full-scale exercise is played out. Exercises are conducted typically within a time period of several hours to several days. However, the exercise program examined for this study is actually a series of interrelated exercises conducted over several months, culminating in a weeklong set of linked exercises in November of each year.

The "evaluation" phase begins early in the exercise design phase with inclusion of methods to evaluate the success during the conduct of the exercise. Exercise evaluation guides (EEGs), based on national guidance and the needs of specific agencies, provide agency evaluators with performance criteria. Evaluation also includes participant and controller observations in after-action reports (AARs) intended to capture lessons learned and identify performance gaps. Nationally, these lessons learned are made available to local, state, and federal agencies.

"Improvement planning" is the last phase of this process, but the most important phase. Using the challenges and performance gaps identified in the evaluation phase, decision makers set organizational goals, establish priorities, and commit resources to implement remedies.

The planning team determines exercise objectives, tailors the scenario to jurisdictional needs, and develops documents used in exercise simulation, control, and evaluation. The team includes representatives from each major participating jurisdiction and agency (while being limited to a manageable size). The membership of an exercise planning team can be modified to fit the type or scope of an exercise.

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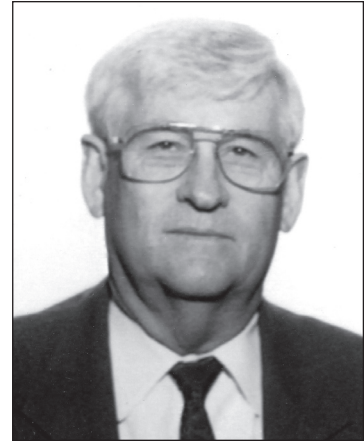
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