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THESIS

**FIGHTING TOMORROW'S FIRE TODAY:
LEVERAGING INTELLIGENCE FOR SCENARIO-BASED
EXERCISE DESIGN**

by

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March 2014

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There is a great opportunity for collaborative learning when agencies conduct emergency preparedness exercises together. If different members of the community contribute to the development of these exercises, then this learning benefits the entire population. As it stands, preparedness exercises are being conducted with minimal regard to recommendations from previous exercises and real-world events. Along with the incorporation of intelligence into these exercises, the objectives should promote a more inclusive design process based on focused relevance, encouraging agencies to view themselves more as members of the greater community rather than individual entities.

Terrorist organizations learn from past failures as well as successes, and emergency responders should strive to parallel this learning in order to develop tactical improvements. Emergency responders need to promote the idea of intelligence-driven exercise design in order to support community resilience through collaborative training. Municipalities should spearhead this effort, supported financially by the private sector. With this fusion of intelligence and collaborative exercise design, we can learn from the fires of yesterday and prepare for the emergencies of tomorrow.

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FIGHTING TOMORROW'S FIRE TODAY: LEVERAGING INTELLIGENCE FOR SCENARIO-BASED EXERCISE DESIGN

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iii

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ABSTRACT

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TABLE OF CONTENTS

LIST OF FIGURES

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LIST OF TABLES

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LIST OF ACRONYMS AND ABBREVIATIONS

AAR	After Action Report
AAR/IP	After Action Report /Improvement Plan
ALF	Animal Liberation Front
AQ	Al-Qaeda
AQC	Al-Qaeda Central
ALU	Autonomous Leadership Units
CI	competitive intelligence
CIA	Central Intelligence Agency
CTDP	Center for Terrorism and Disaster Preparedness
DEPICT	Disaster and Exercise Performance Information Collection Tool
DHS	Department of Homeland Security
ELF	Environmental Liberation Front
EOC	Emergency Operations Center
FBI	Federal Bureau of Investigation
FDNY	Fire Department of the City of New York
HFC	Home Front Command
HGVE	Home Grown Violent Extremists
HSDL	Homeland Security Digital Library
HSEEP	Homeland Security Exercise Evaluation Program
ICS	Incident Command System
IDF	Israel Defense Force
IED	improvised explosive device
IEM	Intelligent Exercise Model
IET	Intelligent Exercise Theory
IP	improvement plan
IPG	Improvised Projected Grenade
IT	information technology
LLIS	Lessons Learned Information Sharing
MEP	Master Exercise Practitioner
MOU	memorandums of understanding

NORC	National Opinion Research Center
NYC	New York City
NYCLL	NYC Lessons Learned
NYSIC	New York State Intelligence Center
NYPD	New York Police Department
OEM	Office of Emergency Management
PAM	Policy Analysis Market
PIO	public information officer
PIRA	Provisional Irish Republican Army
RPG	rocket-propelled grenades
SAR	Suspicious Activity Reporting
SWAT	Special Weapons and Tactics
TRVA	Threat, Risk, and Vulnerability Assessment
TTX	tabletop exercise
USFA	United States Fire Administration
USCG	United States Coast Guard

EXECUTIVE SUMMARY

Emergency preparedness has changed with the times. It used to be that disasters were viewed as independent events with scenario-specific planning, response and recovery issues.[1] After September 11, terrorism became the focus of preparedness efforts, and later, following Hurricane Katrina in 2005, the focus shifted again to an all-hazards approach.[2]

Regardless of the nature of the emergency, collaboration among competing agencies is often a difficult proposal. Each agency has individualized needs, and its survival may depend upon satisfying these needs before fulfilling those outside its area of influence. In order to prepare a community to respond to and recover from any disaster, it is important that the community views itself as a whole.

To define a community may be difficult. There are groups within each agency. Each municipal agency or private stakeholder is part of the greater community, and therefore, has a responsibility to participate in its collaborative preparedness. Fire and police departments may view themselves as independent groups, but they will work together with emergency medical personnel as members of a first responder collective. Agencies, public and private, may consider themselves part of a community that is not even aware of them, as may be the case with private security and local law enforcement.[3] The members of each group must identify themselves as members of the community first and as members of individual factions second. In this way, they can contribute to the improvements of the collective and all groups reap the benefits.

Agencies conduct preparedness exercises in an attempt to ready their personnel to respond appropriately in the event of an emergency. These exercises are evaluated and analyzed, and the results are provided to the agency in an effort to correct areas for

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[1] Donald A. Donahue et al., "The All Needs Approach to Emergency Response," *Homeland Security Affairs* 8, no. 1 (February 2012).

[2] Department of Homeland Security, *Quadrennial Homeland Security Review Report* (New York: Department of Homeland Security, February 2010).

[3] John Collicutt, "Community Resilience: The Future of Business Continuity," *Journal of Business Continuity & Emergency Planning* 3, no. 2 (2009): 145–152.

improvement or sustain strengths. The purpose of exercise recommendations is to foster improvements. The same can be said for recommendations from real-world events. Issues identified during these should be incorporated into future exercises and into an agency's corrective actions.

In order to create a baseline to demonstrate the relationship between recommendations and exercise objectives, a study of After Action Reports (AAR) was conducted. Designed to compare and contrast recommendations and objectives from exercises and real-world emergencies, this study revealed a series of inconsistencies. Several recommendations appeared repeatedly and received minimal inclusion into exercise planning. This gap results in exercises not achieving their desired effect. Until the coordination between recommendation and objective is realized, exercise planners may continue to miss their mark, and exercises will fail to deliver the desired impact on emergency preparedness.

The intelligence process is cyclically based.[4] Information is collected, analyzed then disseminated. This affects the consumer's planning and needs and the result is evaluated. The feedback provided to the producers of intelligence influence the information that is collected and the cycle continues. An exercise design program is likewise cyclical. Exercises are designed and conducted based on an agency's needs. The resultant actions are evaluated and incorporated into planning for systematic improvement and future exercises. Corrective actions are implemented and reinserted into the design of future exercises.

A strengthening of the exercise process can be anticipated if the two cycles intersect at the planning phase and intelligence is inserted into the exercise cycle. Exercise would then provide feedback to the intelligence analysts providing them with findings based on evaluation. This information would allow the intelligence professionals to both look for information relevant for future exercises and analyze trends revealed during exercises that may support future intelligence paths.

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[4] Keeley Townsend et al., "Intelligence-Led Mitigation," *Journal of Homeland Security and Emergency Management* 7, no. 1 (2010).

The fusion of exercise design with intelligence creates a supportive relationship between both that improves the abilities of each. As each profession works toward its own goals and objectives with a common focus toward the needs of others as well, the entire process begins to produce a more effective product. This gives birth to the idea of Intelligent Exercise Theory (IET) and The Intelligent Exercise Model (IEM). As agencies embrace the IEM and begin to view preparedness exercises as a natural outreach of the intelligence process, it can be expected that communications between the intelligence and exercise communities will increase. Increased communications lead to increased patterns of interaction, coordination and decision-making.[5] Since a disaster is ultimately measured by a community's ability to withstand its impact, this increase in coordinated abilities should strengthen the community's resolve when faced with the future adversity.[6]

Ultimately, as a result the development of the IEM and adoption of Intelligent Exercise, the agencies of New York City can build a cooperative exercise design community made up of public and private stakeholders and supported by the municipality. Creating a platform where entities can benefit freely from each other's exercises and intelligence analysis will encourage interagency collaboration and a common-goals approach to NYC preparedness.

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[5] Clayton M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail (Management of Innovation and Change)*, Reprint edition (Boston: Harvard Business Review Press, 2013), 208.

[6] C. Lomnitz, "What Is a Disaster?" *Natural Hazards* 18, no. 1 (1998): 87–88.

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I.   INTRODUCTION

In the midst of chaos, there is also opportunity.
                                                    —Sun Tzu, *The Art of War*

A.   INTRODUCTION

A population will be calmer in the aftermath of a terrorist attack or natural disaster if they know what to expect.[1] The municipality has a responsibility to train its employees on how to respond in the event of such a disaster. Through a robust exercise program, agencies can better prepare. Since 2004, the Homeland Security Exercise Evaluation Program (HSEEP) has offered guidance to agencies to conduct and develop exercises based on capabilities to prepare first responders and citizens for disasters, natural and man-made based on an area's risk/vulnerability analysis.[2] By injecting intelligence into the risk/vulnerability analysis, a more refined and effective exercise program can be maintained contributing the greater improvement of an area's community resilience.

B.   PROBLEM STATEMENT

The Fire Department of the City of New York's (FDNY) Center for Terrorism and Disaster Preparedness (CTDP) operates a Fire Service Intelligence branch as well as an Exercise Design program. These two entities provide the FDNY and other public and private city agencies with exceptional levels of exercise options, as well as critically astute analytical intelligence from a fire service perspective. The intelligence section weighs information from around the world, from both classified and open sources, and provides relevant analysis to first responders. At the same time, the exercise design branch partners with various agencies throughout the city to create realistic exercise scenarios that serve the needs of the department as well as those of cooperating agencies.

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[1] Consuela B. Pockett, *United States and Israeli Homeland Security: A Comparative Analysis of Emergency Preparedness Efforts*, The Counterproliferation Papers Future Warfare Series (Maxwell Air Force Base, AL: Counterproliferation Center, August 2005).

[2] "HSEEP-LLIS," Department of Homeland Security, accessed February 6, 2014, https://www.llis.dhs.gov/.2004.

The cooperative fusion of these two branches exponentially increases the capabilities of each, resulting in a progressive, intelligence-led exercise design program. Ideally, intelligence should provide the exercise design team with relevant analysis of current threats facing city properties and personnel. This, in turn, should enable the exercise design team to develop practical scenarios based on realistic concerns.

Unfortunately, intelligence and exercise professionals often operate independently of each other and often do not offer cooperative solutions to their department's needs. The problem lies, not simply with a lack of coordination between intelligence and exercise design, but in the inability to overcome, what the 9/11 Commission referred to as "the human or systemic resistance to sharing information."[3] This reluctance is not unique within the Department and can be seen on every level within the intelligence community.[4] To its credit, the CTDP intel section collaborates with the intelligence branches of other agencies, including the United States Coast Guard (USCG), Nassau County and NYC's Office of Emergency Management (OEM), and the Nationwide Suspicious Activity Reporting (SAR) Initiative with the New York State Intelligence Center (NYSIC). Internally, the FDNY's Bureau of Fire Investigation (BFI) is another partner. Yet there is a noticeable disconnect between two internal sections within the CTDP itself. In order to jointly fulfill the obligation to satisfy the needs of the department this gap needs to be addressed and minimized through changes to policy and culture.

It should be noted that there is a systemic disconnect between the exercise design and intelligence communities. Limiting the involvement of intelligence in the design of exercise limits the breadth of the exercise and thus minimizes the lessons learned. The fire service historically uses intelligence to fight fires, especially those likely to occur again. Intelligence gathered today should also help mitigate the challenges of tomorrow.

Exercise design is often based on the narrowly focused needs of individual stakeholders and facilities rather than on the more global needs of the community. When

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[3] National Commission on Terrorist Attacks upon the United States, *The 9/11 Commission Report: Final Report of the National Commission On Terrorist Attacks Upon the United States* (Washington, DC: National Commission on Terrorist Attacks upon the United States, 2004).

[4] Richard A. Best Jr, *Intelligence Information: Need-to-Know vs. Need-to-Share* (Darby, PA: Diane Publishing, 2011).

agencies conduct parallel exercises separately, rather than exercising together, the opportunity to benefit from each other's policies, procedures and lessons is lost. Since events and emergencies will undoubtedly involve multiple agencies, exercises should be conducted using as many agencies as appropriate. Objectives for these exercises must support the needs of each agency based on current intelligence and recommendations from previous events. The resultant chaos created by this collaborative gap, and the disconnect that exists between intelligence and exercise, creates an opportunity to strengthen the capabilities of each section.

The development of a model that will regularly incorporate intelligence into exercise design planning will allow for consistent reevaluation of an agency's needs and capabilities weighed against current vulnerabilities and threats. If intelligence is re-circulated into after action reports, then a steady succession of improvement can be developed. This model, then applied to an agency's intelligence and exercise design sections, will serve as a guideline to integrate the two and enable a consistent stream of intelligence-led exercise design and intelligence heavy After Action Reports (AARs), culminating in recommendations based on experience.

A 2010 *Journal of Homeland Security and Emergency Management* article explained the progression from Intelligence-led Policing to Intelligence-led Mitigation. Intelligent exercise is based on an extrapolation of Intelligence-led Mitigation.[5]

> The premise of intelligence-led mitigation includes the intelligence-led policing approach for systematically collecting, organizing, analyzing, and utilizing intelligence to make informed resource decisions. However, while the goal of intelligence-led policing is to support law enforcement actions for crime prevention, disruption, and investigation, the goal of intelligence-led mitigation is to provide organizations with public safety and emergency service functions (including law enforcement) with intelligence products which enhance their understanding of the operational environment and enable them to make informed resource decisions on appropriate preparedness, prevention, protection, response, and recovery actions to mitigate incidents.[6]

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[5] Keeley Townsend et al., "Intelligence-Led Mitigation," *Journal of Homeland Security and Emergency Management* 7, no. 1 (2010).

[6] Ibid.

C.   THESIS EXPECTATIONS

The Intelligent Exercise Model (IEM) was created to demonstrate the cyclic benefits that can be developed when intelligence and exercise communities support each other. This thesis will explain the fusion of exercise and intelligence industries and how their collaboration will benefit both. Like intelligence-led mitigation, the idea of an intelligence-led exercise is to think proactively and use intelligence to enhance preparedness and minimize the impact of future disasters.

The thesis will explore issues of organizational learning and seek to understand a lessons-learned approach to improvement, despite agency biases and focus on the principles of motivation and human decision making during disasters.[7] As groups expand and view themselves as part of a larger group, e.g., the community, they are less organizationally protective than when they view themselves as only part of a much smaller group, e.g., an individual agency. It will analyze a broad representation of the intelligence and exercise communities affecting Homeland Security primarily associated with local municipalities. The thesis will then offer recommendations to fuse the interests of both the exercise design and intelligence communities on a broad scale. By presenting a mutually beneficial proposal, it is believed that Intelligent Exercise Theory will show how the intelligence and exercise cycles can operate in synchronicity.

The purpose of this thesis is to address the greater intelligence and exercise design communities and expose an underlying inability to learn from one another and envision methods for operational collaboration between exercise and intelligence to operate in smarter collaboration. After Action Reports (AARs) from exercises and real-world events are being largely ignored as potential objectives in future exercises. This suggests that the emergency preparedness community is content to maintain the status quo rather than aggressively seek to improve community resilience. By developing and presenting the Intelligent Exercise Model (IEM) and Intelligent Exercise Theory (IET), this thesis will offer more positive and effective exercise design options.

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[7] Donald A. Donahue et al., "The All Needs Approach to Emergency Response," *Homeland Security Affairs* 8, no. 1 (February 2012).

II.   LITERATURE REVIEW

A.   EXERCISE DESIGN

Exercise can serve functions including training, gap analysis, planning, and team building.[8] As part of improvement planning, preparedness exercises can be used to identify areas where improvement is needed; to inform the process of improvements to the plans and procedures to enhance performance; and finally to re-exercise what evaluation has yielded as issues. In *Emergency Management Exercises,*[9] Regina Phelps, a consultant in the field of exercise since 1982, discusses exercises as a key to improving communications among disciplines. The book explores the planning of exercises and identifies the benefits of a sound exercise program. Exercises are conducted in order to validate training, "and practice strategic and tactical prevention, protection, response, and recovery capabilities in a risk-reduced environment."[10]

Much of the exercise literature was gathered from over 100 After Action Reports (AARs), the AAR being the key evaluation deliverable, along with the accompanying improvement plan. The AAR should be viewed as both a science and an art[11] and should not be taken as insignificant. After-action reviews identify how to correct deficiencies, maintain the sustainability of our strengths, and focus on performance of specific training objectives. According to a May 2013 training document from the United States Fire Administration (USFA), AARs should answer the following 5 questions:

- What was our mission? (Did we plan for this event? Were there any gaps in our planning?)

- What went well? (Did we have adequate resources? Did we do all that we could?)

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[8] Lisa R. Shugarman et al., *Enhancing Public Health Preparedness* (Santa Monica, CA: RAND, 2005).

[9] Regina Phelps, *Emergency Management Exercises: From Response to Recovery: Everything You Need to Know to Design a Great Exercise* (San Francisco, CA: Chandi Media, 2011).

[10] "About the Exercise & Training Program," The Kansas Department of Health and Environment, accessed February 5, 2014, http://www.kdhe-exercises.org/.

[11] Margaret S. Salter and Gerald E. Klein, *After Action Reviews: Current Observations and Recommendations* (Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences, 2007), http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA463410.

- What could have gone better? (Did we observe any unsafe behaviors? Was our training effective?)

- What might we have done differently? (If we ran the same incident, what would we do differently?)

- Who needs to know? (What needs to be fixed, and how do we pass this information to the correct source?)[12]

Several articles in the *Journal of Business Continuity & Emergency Planning* explore exercise potential both in the areas of development and evaluation. In order to build a tool that encourages documentation and analysis of relevant observations in exercises or real-world incidents to support decision makers in real time the evaluation process needs to be streamlined. This would enable the evaluators to facilitate the sharing of lessons learned, best practices and strategic improvements for the handling of future disasters and improve a "tool for collecting, processing and disseminating disaster-related information, through its integration in a series of exercises."[13] These exercises, which can be conducted to benefit multiple agencies as suggested by Margaret Crichton and Terence Kelly, need to be developed through a three-stage process of identifying the requirement for an exercise, obtaining approval for operations, and conducting an after-action review as part of a continuous improvement cycle.[14] While Crichton and Kelly address radioactive material transportation events, many of the situational factors can be generalized for the design of exercises in other areas with hazardous concerns.

The uniqueness of health care-related exercises is explored in *Making Acute Hospital Exercises More Realistic Without Impacting on Healthcare Deliver.* Many times exercises are conducted in areas where service to the public cannot be interrupted, and

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[12] "*AAR: After Action Review in the Fire Service,*" United States Fire Administration, accessed October 28, 2013, https://www.usfa.fema.gov/downloads/pdf/coffee-break/ms/ms_2013_3.pdf).

[13] Stewart D. Smith et al., "Disaster and Exercise Performance Information Collection Tool: Capturing Observations in Four Minutes or Less," *Journal of Business Continuity & Emergency Planning* 6, no. 2 (2013): 151–163.

[14] Margaret Crichton and Terence Kelly, "Developing Emergency Exercises for Hazardous Material Transportation: Process, Documents and Templates," *Journal of Business Continuity & Emergency Planning* 6, no. 1 (2012): 32–46.

the benefits of exercise need to be carefully balanced with the organization's responsibilities.[15]

1.   Scenario Development

The inherent strategy of exercise design is to develop an objectives-based scenario that allows the participants to validate their training in a realistic environment. It is important to consider the effect of scenario planning on exercise design. Scenario development gained popularity following World War II and was later used by corporations to speculate on economics, society and environmental concerns.[16] While the term "scenario planning" does not mean the same thing when applied to different strategies or organizations,[17] an acceptable definition of scenarios would include that they "are consistent and coherent descriptions of alternative hypothetical futures that reflect different perspectives on past, present, and future developments, which can serve as a basis for action.*"[18]*

Scenario planning is not a prediction, despite the various meanings of the term.[19] It is intended to help the strategizing organization determine whether they are adequately equipped to handle future challenges.[20] As we study the inclusion of scenario planning, it is important to look beyond one's own industry and see how other factors affect

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[15] Paul W. Riley, David J. Dalby, and Elizabeth A. Turner, "Making Acute Hospital Exercises More Realistic without Impacting on Healthcare Delivery," *Journal of Business Continuity & Emergency Planning* 6, no. 2 (2013): 143–150.

[16] Philip van Notten, "Scenario Development: A Typology of Approaches," in *Think Scenarios, Rethink Education* (Paris: OECD Publishing, 2006), http://www.oecd.org/site/schoolingfortomorrowknowledgebase/futuresthinking/scenarios/37246431.pdf.

[17] Kees van der Heijden, *Scenarios: The Art of Strategic Conversation* (Hoboken, NJ: John Wiley & Sons, 2005), 113.

[18] Philip van Notten, "Writing on the Wall: Scenario Development in Times of Discontinuity" (Boca Raton, FL: Dissertation.com, 2004).

[19] Van Notten, "Scenario Development."

[20] Van der Heijden, *Scenarios*, 116.

expectations.[21] How individual agency capabilities are stressed and how a variety of "operational circumstances would stress those capabilities in very different ways"[22]

B.   INTELLIGENCE SHARING

An understanding of what constitutes intelligence is important before examining intelligence sharing. In *Wanted: A Definition of Intelligence*, Michael Warner asks, "Without a clear idea of what intelligence is, how can we develop a theory to explain how it works?"[23] Warner's article includes definitions of intelligence dating back to the 1950s. Most include words like clandestine, counterintelligence, foreign and secret. The FBI takes a broader, less cloak-and-dagger approach to an intelligence definition and describes it this way: *"Intelligence is information that has been analyzed and refined so that it is useful to policymakers in making decisions—specifically, decisions about potential threats."[24]* These threats can be in any area of homeland security including the local level. Expanding upon that definition, the FBI website includes the following:

- Intelligence is a product that consists of information that has been refined to meet the needs of policymakers.

- Intelligence is also a process through which that information is identified, collected, and analyzed.

- And intelligence refers to both the individual organizations that shape raw data into a finished intelligence product for the benefit of decision makers and the larger community of these organizations[25]

Articles have addressed the desire and need to share intelligence. In a paper for the *George Washington Law Review*, Nathan Alexander Sales, assistant professor of law at the George Mason University School of Law, writes about intelligence sharing among

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[21] Tony Kippenberger, "Pitfalls in Scenario Planning," *The Antidote* 4, no. 4 (1999): 32–33.

[22] Paul K. Davis, "Uncertainty-Sensitive Planning," in *New Challenges, New Tools for Defense Decision making*, ed. Stuart Johnson, Martin Libicki, and Gregory F. Treverton (Washington, DC: RAND, 2003), 131–156, http://www.prgs.edu/content/dam/rand/pubs/monograph_reports/MR1576/MR1576.ch5.pdf.

[23] "Wanted: A Definition of 'Intelligence' " Central Intelligence Agency," accessed February 4, 2014, https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/csi-studies/studies/vol46no3/article02.html.

[24] "Intelligence Defined," FBI, accessed February 9, 2014, https://www.fbi.gov/about-us/intelligence/defined.

[25] Ibid.

the intelligence community. He writes that intelligence guidelines in place often end up erecting a "wall" that discourages sharing.[26] He suggests that the wall "was not intended to be impregnable" and that there exists a quid pro quo whereby agencies could trade information on a mutually beneficial basis.[27]

In *United States and Israeli Homeland Security: A Comparative Analysis of Emergency Preparedness Efforts*, Consuela Pockett writes about the cooperation of intelligence resources within the Israeli security mission. If we examine intelligence sharing in other countries, the Israeli model stands out as one that provides citizens security through multi-layer cooperatives, where the military, security, and intelligence forces work together to supply an outer layer of protection through proactive operations against terrorist activities.[28]

A 2006 *Homeland Security Affairs Journal* article looks at the negative effects of not sharing intelligence. Authors Amy K. Donohue and Robert V. Tuohy ask the following questions regarding lessons not learned after a disaster.

1. Is it true that lessons recur?
2. What lessons are persistently identified?
3. Why do these lessons continue to be identified as important?
4. Why are these lessons so hard to learn? (That is, why do agencies have difficulty devising and implementing corrective actions once lessons are identified?)
5. How do lessons-learned processes work?
6. How can they be improved?[29]

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[26] Nathan Sales, "Share and Share Alike: Intelligence Agencies and Information Sharing," *George Mason Law & Economics Research Paper*, no. 09–24 (2009): 287.

[27] Sales, "Share and Share Alike," 288.

[28] Consuela B. Pockett, *United States and Israeli Homeland Security: A Comparative Analysis of Emergency Preparedness Efforts*. (Maxwell Air Force Base, AL: Counterproliferation Center, August 2005).

[29] Amy K. Donahue and Robert V. Tuohy, "Lessons We Don't Learn: A Study of the Lessons of Disasters, Why We Repeat Them, and How We Can Learn Them," *Homeland Security Affairs* 2, no. 2 (July 2006), http://calhoun.nps.edu/public/handle/10945/25094.

Donahue and Tuohy suggest that the intelligence gathered after a natural, accidental or man-made disaster is not being shared because "lessons are too often isolated and perishable, rather than generalized and institutionalized."[30]

C.   SOCIAL ISSUES AFFECTING DISASTER RESPONSE

Enrico Quarantelli, Professor Emeritus and founding director of Disaster Research Center at the University of Delaware, is widely known as one of the founding scholars of the social science of disasters. His involvement in the area dates back to 1949 when he participated in the first systematic disaster field studies as a researcher in the National Opinion Research Center (NORC) team at University of Chicago.[31] Quarantelli studies the similarities in planning for natural and manmade disasters and notes that one method of defining a disaster is based on the notion that an event is only a "disaster" if the demands created by it exceed the community's capacity for dealing with it. Quarantelli calls this an "imbalance in the demand-capability ratio in a crisis situation."[32] Quarantelli implies that it is our level of preparedness that dictates whether or not a scenario becomes a disaster more than the mechanism of disaster.

According to the 9/11 Commission report, in the aftermath of the September 11 attacks, the FDNY was almost forced to accept the use of ICS, the scale of the response area was simply too large to manage any other way.[33]

The preparedness of the nation, post-9/11, was strongly focused on terrorism. In a post-Katrina world, the shift was toward planning for natural disasters.[34] The result is a realization that the source of a disaster is not nearly as important as a community's capacity to prepare and respond.

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[30] Ibid.

[31] "Faculty and Staff Bios," University of Delaware, DRC-Disaster Research Center, accessed August 29, 2013, http://www.udel.edu/DRC/aboutus/bios/Quarantelli.html.

[32] Enrico L. Quarantelli, *What Is a Disaster? An Agent Specific or an All Disaster Spectrum Approach to Socio-behavioral Aspects of Earthquakes?* (Newark, DE: Disaster Research Center, 1981), 453–78.

[33] National Commission, *The 9/11 Commission Report.*

[34] White House, *The Federal Response to Hurricane Katrina: Lessons Learned* (Washington, DC:White House, 2006), 12.

Historically, emergency management has been viewed as the responsibility of law enforcement and fire departments, with support in the event of a major catastrophe from public health and civil defense organizations.[35] Collaboration for homeland security can be defined as "agencies, organizations, and individuals from many tiers of public and private sectors, working, training, and exercising together for the common purpose of preventing terrorist threats to people and property."[36] Public and private partnerships, as seen in the 2001 article in *Disaster Prevention and Management* titled "Disasters and communities: vulnerability, resilience and preparedness,"[37] may be a good indicator of the level of co-operation and assistance available within a community. This can provide a measure of the likelihood of the success of mitigation strategies that require collective and coordinated action being adopted and implemented.[38] Many of the papers reviewed here laud the benefits of cooperative efforts though few of these studies have emphasized the importance of the application of strategic management to emergency management.[39]

Several articles address social issues as affecting disaster response and management. Robert Kates, who helped establish the International Initiative for Science and Sustainability, notes that "the way men view the risks and opportunities of their uncertain environments plays a significant role in their decisions as to resource management."[40] Essentially stating that an inaccurate assessment of risk will result in an inappropriate level of preparedness, Kates implies that the community needs awareness of risk before preparedness measures can begin. This opens the study of sociological differences between agencies and the willingness to recognize the benefit of training co-operatively.[41] David Alexander, professor and chief senior scientist at the Global Risk

[35] Sang Ok Choi, "Emergency Management: Implications from a Strategic Management Perspective," *Journal of Homeland Security and Emergency Management* 5, no. 1 (2008): 2.

[36] William V. Pelfrey, "The Cycle of Preparedness: Establishing a Framework to Prepare for Terrorist Threats," *Journal of Homeland Security and Emergency Management* 2, no. 1 (2005): 7.

[37] Douglas Paton and David Johnston, "Disasters and Communities: Vulnerability, Resilience and Preparedness," *Disaster Prevention and Management* 10, no. 4 (2001): 270–277.

[38] Ibid., 274.

[39] Choi, "Emergency Managem,"1.

[40] R.W. Kates, "Hazard and Choice Perception in Flood Plain Management," Research Paper No. 78, (Chicago: University of Chicago Press, 1962).

[41] Geoff O'Brien et al., "Approaching Disaster Management through Social Learning*," Disaster Prevention and Management* 19, no. 4 (2010): 498–508.

Forum in Davos Switzerland,[42] identifies six approaches to disaster research (geographical, anthropological, sociological, developmental, medical and technical) though he considers geography and sociology to be the most important.[43] He asserts that the geographical approach focuses on human-environment interactions, whereas the sociological approach has as its premise that "disasters are social events that reflect the ways, we live and structure our societies and communities."[44] Simply stated, this idea leads into the study of the predictive nature of humans based on physical surroundings versus relationships.

Literature addressing the sociological needs for and reluctance to exposing one's agency to vulnerabilities[45] emphasizes the advantages of local jurisdictions conducting Threat, Risk, and Vulnerability Assessments (TRVAs) to aid in the effective allocation of resources.[46] Kerstin Eriksson identifies a reluctance to accept knowledge transfer[47] if the source is perceived as having originated outside a particular group or profession. In short, one group may be reluctant to openly share or receive knowledge with another simply because of organizational biases.[48]

In the area of knowledge transfer, Eriksson suggests that knowledge from previous experience, applied to a current situation, was of major significance in developing emergency response capacity[49] when researching her case study. She asks if a

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[42] David E. Alexander, "Disaster Planning and Emergency Management" *Disaster Planning and Emergency Management Blog*, February 10, 2011, http://emergency-planning.blogspot.com/2011/02/offprints-available.html.

[43] David Alexander, *Natural Disasters* (London: UCL Press, 1993), 13.

[44] Ibid., 554.

[45] Allan Turner, Kenneth Glantz, and Gall, Julie Gall, "A Practitioner-Researcher Partnership to Develop and Deliver Operational Value of Threat, Risk and Vulnerability Assessment Training to Meet the Requirements of Emergency Responders," *Journal of Homeland Security and Emergency Management* 9, no. 2, article 10.

[46] John Mueller. "Assessing Measures Designed to Protect the Homeland." *Policy Studies Journal* 38, no. 1 (2010): 1–21.

[47] Kerstin Eriksson, "Knowledge Transfer between Preparedness and Emergency Response: A Case Study." *Disaster Prevention and Management* 18, no. 2 (2009): 162–169.

[48] Joseph W. Pfeifer, "Command Resiliency: An Adaptive Response Strategy for Complex Incidents" (Master's thesis, Naval Postgraduate School, 2005).

[49] Eriksson, "Knowledge Transfer," 167.

well-designed analytic preparedness plan applied to effective knowledge transfer would have similar benefits.

In an article about railway emergency preparedness, Gesine Hofinger, Robert Zinke and Stefan Strohschneider, psychologists from the Department of Intercultural Business Communication, Friedrich-Schiller-University in Jena, Germany, explain the psychological demands associated with disaster management. The trio studied the behavior of employees and civilians for the duration of a planned evacuation during a simulated below grade train accident. The impact of a quickly unfolding, dynamic event and the presence of the "fight or flight" tendency hinders the processes of conscious thinking and problem solving. Their analysis—"weighing different options for action, asking critical questions—is nearly impossible while a strong tendency toward *ad hocism* can be observed,"[50] describes how emotion can lead to deviation from plans and should be taken into consideration during the formation of these plans.

Thomas Drabek, in *The Human Side of Disaster*, explains the predictive nature of crowds and individuals during an evacuation. Drabek has written or co-written more than 100 book chapters and journal articles and 27 books including *The Human Side of Disaster* (2009) and *Human System Responses to Disaster: An Inventory of Sociological Findings* (1986). He served as the co-editor of the *International Journal of Mass Emergencies and Disasters* (1986–1990)[51] Drabek points out that our society is more susceptible to disaster because of our developing technologies.[52] The items that create ease in our lives simultaneously create increased threats.

D.   ORGANIZATIONAL LEARNING

Much has been written on the learning patterns of organizations, both positive and negative. In their two-part article titled *Aptitude for Destruction,* Brian Jackson et al., discuss the learning and improvement plans of terrorist organizations and look at the

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[50] Gesine Hofinger, Robert Zinke, and Stefan Strohschneider, "Role-specific Psychological Requirements in Preparing Public Transportation Staff for Disaster Response," *Disaster Prevention and Management* 20, no. 4 (2011): 398–412.

[51] "Faculty and Staff Bios, University of Delaware, DRC-Disaster Research Center," accessed August 29, 2013, http://www.udel.edu/DRC/Alumni%20Bio%27s/Alumni%20Bio%20Pages/Drabek.html.

[52] Thomas E. Drabek, *The Human Side of Disaster* (Boca Raton, FL: CRC Press, 2013) 31.

variety of improvement strategies for different types of terrorist groups. A pattern of adapting and overcoming is necessary for groups to learn both from successes and failures.[53] It is offered in the article how anti-terrorist movements can be coordinated by understanding the ability to improve of these terrorist groups. The second part of the document looks specifically at five groups and their unique styles of organizational learning. It provides an in-depth explanation each group's ideology, and how each has improved tactically and strategically or failed to learn from opportunities.[54]

Another way to look at how groups behave and learn can be found in the 'writings of Martin Fishbein and Icek Ajzenand and the theory of reasoned action.[55] The theory states that "behavior is rational and is dependent on the individual's analysis of available information."[56] However, in their article "A Conceptual Model of Gambling Behavior: Fishbein's Theory of Reasoned Action," Wm. Theodore Cummings and William Corney apply the theory to explain gambling patterns and behaviors; the research is applicable to organizational expectations. That is to say that an organizations learning is dependent on the information available and obtained. This would be true in a simple or chaotic situation. These situations will likely cycle between complicated, complex and chaotic, with the restoration of simplistic as a goal. Decision makers will be expected to re-evaluate the situation throughout relying on the expertise and experience of personnel.[57] Groups will analyze the information available to them and select the behavior that is optimal.[58] Groups may also make decisions based on incorrect information or a misinterpretation of it. Poker professional Annie Duke commented on decision making

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[53] Brian A Jackson et al., *Aptitude for Destruction: Organizational Learning in Terrorist Groups and Its Implications for Combating Terrorism Volume 1* (Santa Monica, CA: RAND, 2005), http://www.rand.org/publications/MG/MG331/.

[54] Brian A Jackson et al., *Aptitude for Destruction: Case Studies of Organizational Learning in Five Terrorist Groups, Volume 2 (*Santa Monica, CA: RAND, 2005), http://www.rand.org/publications/MG/MG331/.

[55] Martin Fishbein and Icek Ajzen, *Predicting and Changing Behavior: The Reasoned Action Approach* (New York: Psychology Press, 2010).

[56] Wm. Theodore Cummings and William Corney, "A Conceptual Model of Gambling Behavior: Fishbein's Theory of Reasoned Action," *The Journal of Gambling Behavior* 3, no. 3 (Fall 1987): 190–201.

[57] David J. Snowden and Mary E. Boone, "A Leader's Framework for Decision Making." *Harvard Business Review* 85, no. 11 (November 2007): 68.

[58] Monte M. Page and Carolyn Wood Sherif, eds. *Nebraska Symposium on Motivation1979: Beliefs, Attitudes, and Values* (Lincoln, NE: University of Nebraska Press, 1980) 190.

saying, "Each decision should be made based only on the math at the decision-making point." While it can be difficult to walk away from a project after committing extensive resources, often it is the wisest move.[59]

As organizations learn from outside influences, they should likewise be able to learn from each other. Jeanne B. Stinchcomb and Francisco Ordaz discuss the integration of fire and law enforcement agencies in an effort to streamline operations for the municipality,[60] understanding that successful corporations view organizational culture is as the "major distinguishing feature ... their most important competitive advantage, [and] the most powerful factor they all highlight as a key ingredient in their success."[61]

It is important for organizations to benefit not only from successful endeavors, but to take advantage of the lessons learned when things do not go well. After a 2006 West Virginian mining disaster, Wyoming Senator Mike Enzi made the following statement: "We must draw upon the experience of these recent tragedies to find better ways to respond to mining accidents so that no other family is left without a father, a brother, or a son."[62] A 2009 article in *Organization Science* addresses organizational learning by asking, "Do organizations learn vicariously from disasters experienced by others?"[63] Suggesting that perhaps if a tragedy befalls one agency, only that agency will benefit from the lessons learned, where, ideally, peripheral agencies should take advantage of the tragedy to prevent similar disasters within their own arena. The article goes on to look at how organizations tend to "improve their performance in a domain as they gain experience in that domain."[64]

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[59] Annie Duke, "Sunk Cost," *Bluff Magazine*, April 2007, http://www.bluff.com/magazine/sunk-cost-8962/.

[60] Jeanne B. Stinchcomb and Francisco Ordaz, "The Integration of Two 'Brotherhoods' into One Organizational Culture: A Psycho-Social Perspective on Merging Police and Fire Services," *Public Organization Review* 7, no. 2 (January 30, 2007).

[61] Kim S. Cameron and Robert E. Quinn, *Diagnosing and Changing Organizational Culture : Based on the Competing Values Framework*, rev. ed (San Francisco: Jossey-Bass, 2006), 5.

[62] *The State of Mine Safety and Health: Hearing of the Committee on Health, Education, Labor, and Pensions, United States Senate,* 109th Cong., 2nd Session (2006).

[63] Peter M. Madsen, "These Lives Will Not Be Lost in Vain: Organizational Learning from Disaster in U.S. Coal Mining," *Organization Science* 20, no. 5 (October 2009): 861–875, doi:10.1287/orsc.1080.0396.

[64] Ibid.

Peter M. Senge attributes this to a "Mental Models" all of us carry within ourselves.[65] Senge is credited with the iceberg model, which breaks "knowledge into three categories: events, pattern and structure."[66] This is the basis for using scenarios as part of training. Not to predict actual events but to better understand the basis for expected actions. Scenario planners begin with the idea that there is much more to analysis than simply reporting and mimicking events as they occurred.[67]

Diane Vaughn of Boston College's Department of Sociology, explores the negative side of organizations in *The Dark Side of Organizations: Mistake, Misconduct, and Disaster.* Vaughn suggests that organizations may perform detrimentally to positive expectations by conforming to organizational behaviors.[68] This may seem to run contrary to what Fishbein says regarding expected action, but may be just as predictable. Vaughn uses the term organizational deviance and defines it as "an event, activity, or circumstance, occurring in and/or produced by a formal organization that deviates from both formal design goals and normative standards or expectations, either in the fact of its occurrence or in its consequences, and produces suboptimal outcome.*"[69]*

The psychological, organizational, social and cultural barriers to change can have a very powerful effect on whether a change model will be accepted or rejected and applied by the larger whole.[70] Tension develops any time new strategies or ideas that conflict with established culture. A group may find difficulties expanding its accepted sphere of influence because of group solidarity or its rejection of outsiders. This is consistent in what was presented by Henri Tajfel in his Social Identity writings.[71] The organization may view outsiders as a threat and seek to protect its position. It may struggle with differing opinions of needs internally as well. Because of "Structural

[65] Peter M. Senge, "Mental Models," *Strategy & Leadership* 20, no. 2 (1992): 4–44.

[66] Peter M. Senge, *The Fifth Discipline* (New York: Random House Audio, 1994).

[67] Van der Heijden, *Scenarios*, 104.

[68] Diane Vaughan, "The Dark Side of Organizations: Mistake, Misconduct, and Disaster," *Annual Review of Sociology*, 1999, 271–305.

[69] Ibid.

[70] Ibid.

[71] Henri Tajfel, *Social Identity and Intergroup Relations* (Cambridge: Cambridge University Press, 2010).

secrecy" some at differing hierarchical levels within the organization may advocate for change while others resist.[72] Tension can be created when changes threaten to infiltrate an organization's way of doing things, strategically, structurally or culturally.[73]

The four psychological barriers presented, "perception, homeostasis, conformity and commitment, and personality factors"[74] are offered as issues that can affect an organization's ability not only to accept potential new ideas and advance but its capacity to develop competitively with other organizations; a shortcoming that could result in the termination of an organization. Innovation is often a barrier in and of itself though there is often an advantage when innovation is developed from within an established agency.[75] Creating a need for new technology, or in this case, a new system, is often met with skepticism. Organizations may be reluctant to accept a new system on top of a system they already understand and believe in. However, according to *The Innovator's Dilemma,* if we can create a separate organization and embed it among potential new customers that need the new process, we can anticipate success as we move the innovation forward.[76]

E.   COLLABORATION

At the municipal level, collaboration in the areas of preparedness and disaster management is not only a practical use of resources but also a far more efficient application of them. Any municipality needs a strategy in order to prepare itself for emergencies.[77]

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[72] Diane Vaughan, *The Challenger Launch Decision Risky Technology, Culture, and Deviance at NASA* (Chicago: University of Chicago Press, 1996).

[73] "The Resistance to Change," accessed February 4, 2014, https://sites.google.com/site/theresistancetochange/home.

[74] Ibid.

[75] Christensen, *The Innovator's Dilemma*, 84–88.

[76] Ibid., 90.

[77] Steven Weiss, "Review of *Communicating Emergency Preparedness: Strategies for Creating a Disaster Resilient Public*," *Journal of Homeland Security and Emergency Management* 6, no 1, article 70.
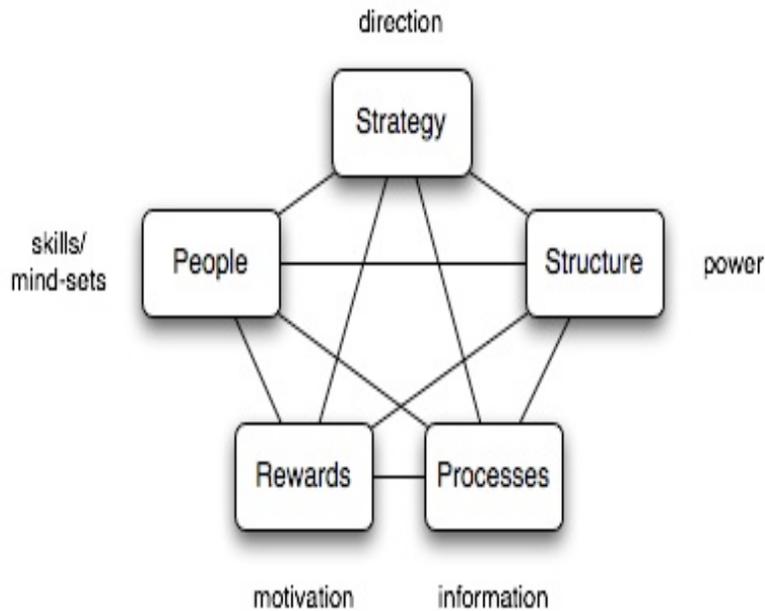
Figure 1. Galbraith's STAR Model

Many documents address the failures associated with attacks of September 11, 2001, as well as the response to Hurricane Katrina in 2005.[78] The lessons learned have steered cooperative training toward a "whole-community" approach to preparedness.[79] By learning from these events and involving multiple agencies in planning, we can ensure that redundancies best serve the greater good and help guide decision makers.

There are a number of barricades related to inter-organizational collaboration. Some research indicates impracticality to combined training based on safety factors, cost and productivity.[80] These are often case by case and are rarely systemic. In *Building Collaborative Capacity: An Innovative Strategy for Homeland Security Preparedness,*[81] the authors point to five organizational design components based on Jay Galbraith's Star

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[78]David M. Simpson, "Disaster Preparedness Measures: A Test Case Development and Application," *Disaster Prevention and Management* 17, no. 5 (2008): 645–661.

[79] Donahue et al., "The All Needs Approach to Emergency Response."

[80] Peter J. Smith, Ian Robertson, and Lyn Wakefield, "Developing Preparedness for Flexible Delivery of Training in Enterprises," *Journal of Workplace Learning* 14, no. 6 (2002): 222–232.

[81] Susan Page Hocevar, Gail Fann Thomas, and Erik Jansen. "Building Collaborative Capacity: An Innovative Strategy for Homeland Security Preparedness." in *Advances in Interdisciplinary Studies of Work Teams* (Bingley, UK: Emerald, 2006), 255–274.

framework for organization design.[82] These are: purpose and strategy, structure, processes, incentives and people. These are then divided by success factors and barrier factors. For example, among incentives, leadership support and commitment is listed as a success factor while competition for resources is seen as a barrier factor. The star model depicts a support system that is key in collaboration; a support system that needs to exist, well before the idea of interagency preparedness efforts is explored. Dealing with hurdles in advance of their effect on planning will minimize their impact during the onset of the disaster. Kincaid suggests that there is a need for the training of personnel from different agencies, with different professions and standard operating procedures, to understand each other's methods and procedures in order to coordinate response most efficiently.[83] Some of this inter-agency training can be conducted using web-based techniques,[84] which exposes each agency to the capabilities of the other, fostering a network of sharing as well as limiting the need for coordinating several agencies' schedules.

F.   CONTENT AND THEMATIC ANALYSIS

In order to develop a data series for this thesis, it became necessary to gain an understanding of a method to analyze data. Research in the areas of Content Analysis and Thematic Analysis shed some light on an important research technique. In Klaus Krippendorf's *Content Analysis: An Introduction to its Methodology* the author explains the method used to extract numeric value from text. Using an example from World War II where Allied analysts were able to extrapolate an accurate launch date for Germany's V-weapon based on the monitoring and analysis of Joseph Goebbel's speeches.[85] The example illustrates the effectiveness of the method prior to the widespread availability of computers for analytical purposes.

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[82] Galbraith, Jay R. *Designing Organizations: An Executive Briefing On Strategy, Structure, and Process* (San Francisco: Jossey-Bass), 1995.

[83]J. Peter Kincaid, Joseph Donovan and Beth Pettitt, "Simulation Techniques for Training Emergency Response," *International Journal of Emergency Management 1*, no. 3 (2003).

[84] Jenvald, J., Morin, M. and J. Peter Kincaid, "A Framework for Web-based Dissemination of Models and Lessons Learned from Emergency-response Exercises and Operations," *International Journal of Emergency Management* 1, no. 1 (2001): 82–94.

[85] Klaus Krippendorff, *Content Analysis: An Introduction to Its Methodology* (Beverly Hills: SAGE, 1980), 17.

When analyzing data for interpretive results, there can be "considerable overlap among available qualitative approaches in terms of methods, procedures, and techniques."[86] This is true in the area of participant observation which was a significant input to the methodology. As AARs are developed with contribution from participants, an added perspective is attached to the data. This, coupled with the contributions from "objective observers" leaving the analyst with additional interpretive challenges.[87]

As text is interpreted, its classification, now by computer, leads to a more accurate translation into a data set. Robert Philip Weber writes in *Basic Content Analysis* about the classifications of data, where the use of several classifications and sub-order classifications may lead to difficulties based on multiple meanings of the same text.[88] In choosing a methodology for this thesis that would allow understanding of the data presented, qualitative descriptive approaches such as content analysis and thematic analysis were chosen because they employ a "relatively low level of interpretation, in contrast to grounded theory or hermeneutic phenomenology, in which a higher level of interpretive complexity is required."[89]

Both content analysis and thematic analysis are similar in that they analytically examine narrative materials from written recommendations by "breaking the text into relatively small units of content and submitting them to descriptive treatment,"[90] which fit the data analysis for this thesis perfectly.

G.   LITERATURE REVIEW CONCLUSION

After a review of the literature associated with exercise design we are left to explain the connection between exercise design and societal biases preventing a

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[86] Mojtaba Vaismoradi, Hannele Turunen, and Terese Bondas, "Content Analysis and Thematic Analysis: Implications for Conducting a Qualitative Descriptive Study: Qualitative Descriptive Study," *Nursing & Health Sciences* 15, no. 3 (September 2013): 398–405, doi:10.1111/nhs.12048.

[87] Benjamin F. Crabtree and William L. Miller, *Doing Qualitative Research* (Thousand Oaks, CA: SAGE, 1999), 47.

[88] Robert Philip Weber, *Basic Content Analysis* (Newbury Park, CA: Sage Publications, 1990), 36.

[89] Vaismoradi, Turunen, and Bondas, "Content Analysis and Thematic Analysis."

[90] Andrew Sparkes, "Narrative Analysis: Exploring the Whats and Hows of Personal Stories," in *Qualitative Research in Health Care*, ed. Immy Holloway, 1st ed (Berkshire: Open University Press, 2005), 191–208.

realization of the collaborative benefits. How one discipline within the community may or may not accept exercise design direction from the municipality. In this case, the FDNY, but under the proper circumstances any municipal agency may be capable of offering this assistance. The literature examines the social barriers that may hinder cooperation and prevent collaborative contributions to after action reporting. A further acceptance of differing thoughts and perspectives needs to be explored and some of these barriers identified and minimized.

The literature looked at the different, predictable ways groups can be expected to behave during a disaster. This intelligence should also be applied to designing exercises for groups clustered for different reasons, for example, people grouped geographically in a train station or by virtue of similar employment like those working together in a high-rise office building.

Much of the literature reviewed comes from scholarly articles in emergency journals. These articles relate the benefits learned from the experiences of the authors. Articles on behavior, predictability and organizational biases as well as a large sampling of AARs, culled for relevance. Further investigation of the sources used in the journal articles will apply increased credibility to the articles and thoughts expressed therein. There is a need for additional studies of emergency situations and examination of the results from earlier literature to extract relevant knowledge to be transferred into various preparedness activities and future exercises and response to crises.[91]

The USFA and U.S. Army's information on AARs lays out a framework for comprehensive AAR development, but moving forward, a greater emphasis needs to be directed toward the inclusion of intelligence. Intelligence that can lead to the development of a proactive rather than reactive exercise design process, one where we design exercises based on what we should prepare for rather than one where we look back on what we should have done.

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[91] Kerstin Eriksson, "Knowledge Transfer between Preparedness and Emergency Response: A Case Study," *Disaster Prevention and Management* 18, no. 2 (2009): 162–169, doi:10.1108/09653560910953234.

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III. COLLABORATION AND RESISTANCE TO CHANGE IN DISASTER PREPAREDNESS

It is a common defect in man to not make any provision in the calm against the tempest.

—Niccolò Machiavelli, *The Prince*

A.   INTRODUCTION

The greater Homeland Security mission of community resiliency can be better achieved through the collaborative efforts of the individual entities that make up the community.[92] This includes stakeholders both public and private. While this may seem a logical assumption, often private stakeholders do not take advantage of the opportunity to participate in training exercises organized and run by public agencies. Private stakeholders often do not even exercise with each other. Municipal agencies, fire, emergency medical, law enforcement, and public utilities rarely collaborate with each other, never mind with private entities. Effective collaboration requires both cultural sensitivity and a common language.[93] "Nonetheless, conflicts are inevitable, and some organizations simply may be unable or unwilling to work with others."[94] The involvement of nongovernmental participants strengthens the community's ability to deal with future disasters. The ability of a community to respond to and recover from disasters is not enhanced when officials preempt or exclude community involvement.[95] This chapter will examine organizational roadblocks and sociological limitations that prevent organizations from attaining a realistic measure of community resiliency, with the ultimate goal being increased willingness of all stakeholders contributing to the resiliency of the community.

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[92] Hocevar, Thomas and Jansen, "Building Collaborative Capacity," 255–274.
[93] William L. Waugh and Gregory Streib, "Collaboration and Leadership for Effective Emergency Management," *Public Administration Review* 66, no. 1 (2006): 131–140.
[94] Ibid.
[95] Ibid.

B.   WHAT IS A DISASTER?

How does an event become a disaster?[96] Enrico Quarantelli, Professor Emeritus and founding director of Disaster Research Center at the University of Delaware is widely known as one of the founding scholars of the social science of disasters.[97] He determines whether an event is a disaster by the preparedness level of the jurisdiction on the receiving end of the "disaster." In their article "Response to Social Crisis and Disaster," Quarantelli and Russell Dynes summarize basic substantive and structural trends that assume that a "disaster is primarily a social phenomenon and is thus identifiable in social terms."[98] This is to suggest that the nature of the disaster, natural or man-made, is not as significant as the social impact when defining a disaster's scope. David Alexander, professor and chief senior scientist at the Global Risk Forum in Davos Switzerland,[99] asserts that the localized approach focuses on human-environment interactions, whereas the sociological approach believes that "disasters are social events that reflect the ways, we live and structure our societies and communities."[100] Simply stated, this idea leads into the study of the predictive nature of humans based on physical surroundings versus relationships. As responders, emergency planners need to focus less on the origin and more on the preparedness efforts of the community affected.

Quarantelli's argument is valid that "disasters are instabilities arising at the interface between society and the environment."[101] Four factors must be considered when defining a disaster: "the physical agent, the physical consequences of the agent, the way in which the impact of the physical agent is evaluated, and the social disruption and social changes brought about by the physical agent and its impact."[102] Even where there is evidence of societal improvement driving community-based planning for disasters, this has arisen chiefly because of a lack of resources (the term disaster implies an

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[96] Lomnitz, "What Is a Disaster," 87–88.

[97] "Faculty and Staff Bios," University of Delaware.

[98] E.L. Quarantelli and Russell R. Dynes, "Response to Social Crisis and Disaster," *Annual Review of Sociology* 3 (1977): 23–49.

[99] Alexander, "Disaster Planning and Emergency Management."

[100] "Editorial Board," Journal of Geography & Natural Disasters, accessed August 8, 2013, http://www.omicsgroup.org/journals/editorialboardJGND.php#.

[101]Lomnitz, "What Is a Disaster," 88.

[102] Quarantelli and Dynes, "Response to Social Crisis and Disaster."

overwhelming of the community's capacity to cope).[103] That is to say that the disaster exists primarily due to a community's inability to overcome the challenges presented by the event causing the "disaster." If a tornado tears through a field and damages no infrastructure, can it really be called a disaster?

In preparing for or responding to disaster, the local government has the first line of official public responsibility. However, the affected community will be responsible for itself in the initial minutes of any disaster until help arrives. Longer depending on the nature of impact and size of emergency management supports the local response effort by working with the public and private partners to develop emergency plans and capabilities that can respond to any natural or man-made hazard which threatens the community.[104] We cannot think of natural disasters as being divine in origin or intent ("acts of God") but recognize that whether natural or man-made the definition of the disaster is rooted in the "relationship between peoples and their environments."[105]

C. LESSONS NOT LEARNED

Lessons from disasters are often not incorporated into wider preparedness measures. Improvements are often only accepted as "doing it better" as opposed to "doing it differently."[106] The thought behind a lessons-learned approach to evaluation is that we strive to improve. We believe that through practice we will continue to improve and better prepare ourselves and those for whom we are responsible. By conducting evaluations and summarizing findings, we share our knowledge across a lessons-learned format. Empirical data should then show some form of consistent improvement or at least a refocusing of efforts toward those areas where we are in the greatest need of improvement. However, in many cases, the opposite was true. According to the data collected, several recommendations appeared the most after real-world events and

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[103] Geoff O'Brien et al., "Approaching Disaster Management through Social Learning," *Disaster Prevention and Management* 19, no. 4 (2010): 498–508, doi:10.1108/09653561011070402.

[104] Hocevar, Thomas, and Jansen, "Building Collaborative Capacity."

[105] O'Brien et al., "Approaching Disaster Management," 499.

[106] Ibid.

exercises, namely: ICS concerns, communications, resources, EOC issues, and documentation.

One could logically assume then that these would feature prominently as exercise objectives; however, as Table 1 shows, there was a tremendous disparity between recommendations and objectives.

Table 1.　　Disparity between Recommendations and Objectives

Recommendation	Real World	Exercise	Objective	% Disparity
ICS	55%	62%	6%	90%
Communications	70%	34%	6%	82%
Resources	38%	57%	15%	78%
EOC	48%	62%	15%	39%
Documentation	45%	38%	15%	61%

ICS was included in recommendations from exercise AARs 62% of the time but only appeared as an objective in 6% of exercises. It was a recommendation in 55% of real world AARs. This indicates a gap between lessons learned and future planning If recommendations are made in either an exercise or real world AAR then there is a responsibility to incorporate it into training and eventually include it as an objective in future exercises in an attempt to validate training. By not addressing it, we are remaining complacent and expressing contentment with the status quo, despite the fact that the very system put into place to minimize complacency identifies the status quo as being ineffective.

D.　　RESISTANCE TO CHANGE

The need for collaboration often meets resistance as a result of social and organizational biases. That is, one group may limit their preparedness activities with another group based on preconceived notions. Also, one group may exhibit perceived

superiority to the other group based on intergroup relations.[107] Viewing the benefits of collaboration as weighted in favor of one side over the other creates a competitive search for value equity. FDNY Chief Joseph Pfeifer addressed the problems associated with group biases, stating that:

> Social identity that promotes power of one organization over another organization produces two social outcomes during complex incidents. First, there is the creation of a positive in-group bias toward those who are part of the same group and a negative out-group bias against those who are part of an alternate group. When providing information across groups, individuals are prone to give more information to members of their own group and less to members outside that group. Secondly, when under stress, individuals feel little obligation to share valuable information with those outside their group since responsibility for acting is diffused within their in-group. This phenomenon excludes the out-group from receiving information that may be vital to their operation.[108]

This results in a siloed approach to preparedness, despite evidence available to individual organizations that collaboration would benefit each of them. So, why would organizations allow bias to interfere with safety? We have a tendency only to see the problems within our organizations that we are looking for. Therefore, additional perspectives applied to disaster response and preparedness are often unwelcomed and unutilized. When looking at an organization's response plan for various disaster scenarios, the assumption is made that certain sequences of actions/events are likely to happen.[109] These expectations, and the assumed secondary and tertiary responses, are partly based in the practices and routines of our organizations and in our management strategies.[110]

> Organizations fail at collaboration for many reasons: organizations have individual missions with goals and incentives that often conflict with one another; agencies often have histories of distrust that may be currently irrelevant but are,

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[107] Tajfel, *Social Identity and Intergroup Relations*.

[108] Joseph W. Pfeifer, "Understanding How Organizational Bias Influenced First Responders at the World Trade Center" in *Psychology of Terrorism* ed. Bruce Michael Bongar et al., (New York: Oxford University Press, 2007).

[109] Teemu Reiman and Carl Rollenhagen, "Human and Organizational Biases Affecting the Management of Safety," *Reliability Engineering & System Safety* 96, no. 10 (October 2011): 1263–1274, doi:10.1016/j.ress.2011.05.010.

[110] Peter Wilkin, "The Ideology of Ergonomics," *Theoretical Issues in Ergonomics Science* 11, no. 3 (2010): 230–244.

nonetheless, hard to alter; leaders may not actively support collaborative efforts; and coordination systems and structures that might support collaboration are often lacking.[111]

There can be expected reluctance to try new ideas. Those aware of the improvements associated with a new idea face the challenge of "selling" this to a group that may only be conscious of the current practices. The Allegory of Plato's Cave illustrates this well:[112]

> Plato imagines a cave, in which several prisoners are tied in such a way that they cannot move or see anything but the stone wall in front of them. These prisoners have been in this position their entire lives. These prisoners have never seen outside of the cave. Behind them is a fire, and between them and the fire is a raised roadway. Other people walk along this walkway carrying shapes. When they do, the shadows of the shapes they are carrying are cast on to the wall. Having never seen the real objects before, the prisoners believe that the shadows of objects were "real."

> Plato suggests that the prisoners would begin a "game" of guessing which shadow would appear next. If one of the prisoners were to correctly guess, the others would praise him as clever and say that he were a master of nature.

> Eventually, one of the prisoners escapes and leaves the cave. He is amazed at the world he discovers outside the cave and does not believe it can be real. He wanders about absorbing the sights and sounds of his new surroundings. As he becomes accustomed to his new world, he realizes that his former old world was inaccurate.

> He wonders at the sun and starts an intellectual journey consisting of these wonderful new experiences. He realizes also the game he had played with the other prisoners was now valueless. The prisoner returns to the cave, to share his amazing findings with the other prisoners. They do not believe him and threaten to kill him if he tries to free them.[113]

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[111] U.S. Government Accountability Office, *Homeland Security: Management Challenges Facing Federal Leadership* (Washington, DC:United States Government Accountability Office, December 2002).

[112] Plato, *The Allegory of the Cave* (Brea, CA: P & L, 2010).

[113] Ibid.

Figure 2. Depiction of the Cave

Once the prisoner returns to the others in the cave, he tries to share his experiences but the group is not interested. They cannot imagine what he is telling them to be true and suggest he rejoin the group. It is not possible for him to forget what he has seen and he is forever influenced by his experience outside. Organizations react this way when faced with significant change. Those aware of the benefits of the new proposal instinctively wish to promote the idea while those unfamiliar experience reluctance to change. "That is not how we do things" is often the death knell to many innovative suggestions.

> The transition towards a new way of accomplishing goals takes time and should benefit from innovation and experience. Learning from events, we argue, should be a catalyst for thinking about how we do things going forward. Many published articles are narratives of a single disaster written from the perspective of one individual.[114]

In the UK, for example, the fire and rescue service has experienced a successful modification from "fire fighting" to "fire prevention" that exhibits the shift in emphasis of institutional thinking, from reactive (putting out fires) to proactive (preventing fires).[115]

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[114] Erik Auf der Heide, *Disaster Response: Principles of Preparation and Coordination* (St. Louis, MO: Mosby, 1989).

[115] O'Brien et al., "Approaching Disaster Management through Social Learning."

Emergency management, as a profession has evolved into a more collaborative enterprise over the last 50 years.[116] There has been a gradual change away from the traditional hierarchical structure toward a more "dynamic and flexible network model that facilitates multi-organizational, intergovernmental, and intersectoral cooperation."[117]

Professor Arthur Stinchcombe's liabilities of newness theory explains comparative death rates of new and old organizations: A higher proportion of new organizations are likely to fail than old. Although Stinchcombe uses liabilities of newness to explain the development of populations of organizational forms, his concept also may apply to analysis of cooperative movements, explaining why new programs or ideas struggle to succeed, or even the problems associated with transitioning new personnel into organizations.[118]

The Reiman and Rolenhagen table looks at what they describe as the four thematic areas of human and organizational behavior. These are beliefs about human behavior, beliefs about organizations, beliefs about information and safety models.[119] Reiman and Rolenhagen constructed the information in Table 2 to display the integration of biases and their negative effect on the mission of resilience and safety demonstrating that biases should not be considered in isolation from each other—the biases are interrelated, as are the systems they address. The table can serve as a simplified depiction of how a bias in some area of safety management can have practical consequences for the way safety is managed in the organization. They suggest that these biases can lead to decision making in a vacuum which breeds complacency. There is a false sense of safety that develops from the deficiency of challenges to our safety; that a lack of catastrophe can be viewed as a lack of risk.

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[116] Waugh and Streib, "Collaboration and Leadership for Effective Emergency Management."

[117] Ibid.

[118] Vaughan, "The Dark Side of Organizations," 275.

[119] Reiman and Rollenhagen, "Human and Organizational Biases Affecting the Management of Safety."

Table 2.   Consequences for Safety of the Biases in the Four Thematic Areas Concerning the Different Elements of Safety Management[120]

SAFETY MANAGEMENT	Human behavior	Organizational behavior	Information and uncertainty	Safety models
Safety Policy	**BIAS OF REASONING:** Expressed safety policies focus on most acute things since these are most salient, with "chronic" issues under-emphasized.	**CAUSAL PRIMACY OF STRUCTURE:** Overreliance on technological means for controlling organizational performance	**UNCERTAINTY:** The policy may overemphasize the need for confidence and certainty in an environment where total certainty is impossible	**SAFETY AS ABSENCE:** The policy may overemphasize error prevention instead of safety promotion
Organizing	**HUMAN ERROR BIAS:** The starting point of organizing is in preventing errors and not in creating the context for safety performance	**CAUSAL PRIMACY OF STRUCTURE:** Overreliance on formal organizational structure in controlling safety	**UNCERTAINTY:** Uncertainty management may strive for reduction of uncertainty by standardization and formalization without perceiving the need for flexibility and adaptability.	**SAFETY AS ABSENCE:** Relying on removing the negative may not reveal the underlying dynamics of the system that are essential for creating safety
Risk analysis	**HUMAN ERROR BIAS:** Human influence on safety is considered in negative terms only as potential errors that threaten the otherwise safe system	**CAUSAL PRIMACY OF STRUCTURE:** Organizational phenomena such as norms and practices are not considered when evaluating the safety of the organization	**UNCERTAINTY:** The estimated probabilities become treated like objective attributes of the environment due to misunderstanding of uncertainty	**SAFETY AS ABSENCE:** Risk analyses may treat the absence of failures as a proof of safety
Experience Feedback	**ATTRIBUTION ERROR:** Event investigations seek to identify who made what mistake and attribute blame, instead of identifying how the actors made sense of the situation back then	**NEGLECT OF EMERGENCE:** Social phenomena, such as norms and climate, that can contribute to both similar and different events in future are ignored in analyses	**OVER-QUANTIFICATION:** Only quantitative data is considered as valid for risk analysis, neglecting harder to measure human and organizational issues	**LINEAR CAUSALITY:** Ca n lead to focus on either technical, human or organizational factors as having caused the event under investigation
Continuous Development	**ATTRIBUTION ERROR:** Development activities might be targeted at changing individual behavior instead of the wider organization due to this bias	**LEARNING AND CHANGE:** A static view on organization ignores the gradual change and optimizing of practices taking place continuously in the organization.	**UNCERTAINTY:** A quest for having all the "facts" before making decisions or improvements may lead to an organizational inability to take action	**UNDER-SPECIFICATION:** Lack of specification on what type of safety (e.g., process or personnel) an improvement focuses on can lead to wrong conclusions
Safety Indicators	**BIAS OF REASONING:** Indicator data can be used to justify preconceptions and expectations that the analyst had before seeing the data, due to a confirmation bias	**CAUSAL PRIMACY OF STRUCTURE:** Indicators focus on structural elements such as technical reliability, management system, or instructions, neglecting e.g., social issues	**OVER-QUANTIFICATION:** Only numerical indicators are considered as valid, missing other information such as intuitive judgments, social norms and subjective worries.	**SAFETY AS ABSENCE:** Indicators may be selected to measure negative outcomes(absence) instead of proactive safety activities (presence)

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[120] Ibid.

E.   DISASTER SPECULATION

A 2003 Pentagon research project called the Policy Analysis Market (PAM) was billed as "betting on terrorism."[121] While the idea was so unpopular that the project was quickly cancelled, the idea is not without its merit. In designing a speculative market that would assist in making more specific forecasts regarding terrorist attacks, one of the developers of PAM described it as "a research project to test a new forecasting institution being considered as an addition to existing intelligence institutions, to help combine individual insights into a consensus forecast."[122]

The aim of PAM was not to predict terrorist attacks but more to focus on their impact on geopolitical issues and destabilizing effects throughout the world that could be influenced by terrorist activities. Speculative markets have always used intelligence to achieve higher than average profits.[123] This intelligence is the product of both information and subjective opinion.[124] In this case, the analytical opinion of one capable of understanding the evolution of terrorist groups leading into future events.

PAM's unpopularity came from the prospective profit available through terrorism speculation. The fear was a terrorism-dependent market that could be manipulated, to the nation's detriment, by terrorists. The politically unpopular project seemed to cross "a moral boundary,"[125] and despite the favorable review it received by those knowledgeable of its true intentions,[126] the plan was finished. While the possibility of financial gain available from wagering on the actions of terrorists may appear repugnant, profit can take on many shapes. If the profit potential was presented as lives and property saved from the

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[121] Robin D. Hanson, "Designing Real Terrorism Futures," *Public Choice* 128, no. 1/2 (July 2006): 257–274.

[122] Ibid.

[123] Eric Zitzewitz and Justin Wolfers, "Prediction Markets," *The Journal of Economic Perspectives* 18, no. 2 (Spring 2004): 107–126.

[124] Stephen Figlewski, "Subjective Information in a Betting Market," *Journal of Political Economy* 87, no. 1 (1979): 75–88.

[125] Hanson, "Designing Real Terrorism Futures."

[126] Robin Hanson, *The Informed Press Favored the Policy Analysis Market (*Fairfax, VA: George Mason University, 2005) http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.67.3283&rep=rep1&type=pdf.

speculative analysis of potential terrorist activities, one could have anticipated a more positive reaction toward PAM.

The inability to collaborate in the name of disaster preparedness has a long history. Agencies, corporations and individuals often feel safer going it alone or continuing to do what has already proven not to work simply because it has always been done that way. When faced with a chaotic situation, people often revert back to a comfort system that they are familiar with. Organizations need to prepare under simple or known conditions in order to be able to function effectively under complex or chaotic situations (See Fig 3). Peter Wilkin references this idea when he states "the relationship between the necessary (structural relations) and the contingent (the acts of agents as groups or individuals) disappears."[127] In a desire to achieve true community resiliency, organizations must first see themselves as members of the community and as individual agencies or businesses secondly. Organizations need to avoid preconceived notions that will compromise their emergency management capabilities, the safety of employees and their overall contribution to a resilient community.
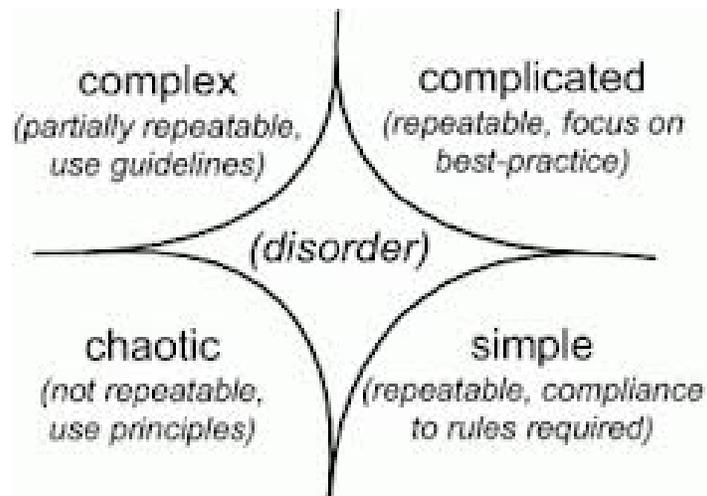
Figure 3. The Cynefin Framework

This chapter has attempted to look at various social aspects that affect a mindset toward or away from collaboration and experience contributions from outside sources. In

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[127] Wilkin, "The Ideology of Ergonomics."

an effort to increase safety and preparedness, and, through collaborative efforts, minimize organization deviances for public and private stakeholders.

Collaboration alone will not overcome the roadblocks. Valuable lessons may be missed because of the bias held for one's own organization or community.[128] Agencies, public and private, need to continually develop cooperative relationships and prevent the dissolving of existing ones. Without nurturing, the benefits of collaboration wither.

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[128] Enrico L. Quarantelli, *Human Resources and Organizational Behaviors in Community Disasters and Their Relationship to Planning* (Newark, DE: Disaster Research Center, 1982).

IV. ANALYSIS OF THE AFTER ACTION REPORTS

Practice does not make perfect. Only perfect practice makes perfect.

—Vince Lombardi,
American football player and coach

A. METHODOLOGY

This thesis requires an evaluation of current exercise design value and the development of the Intelligent Exercise Model. The culmination is a greater collaboration between fire service intelligence entities and the exercise design process. Specifically designed for the FDNY's Center for Terrorism and Disaster Preparedness (CTDP), the model will serve as a visual mechanism to reinforce the need for intelligence contributions to the exercise design process applicable to any municipal agency.

To support thesis research, After Action Reports (AAR) from numerous events, exercises and incidents were collected and analyzed. The purpose was to conduct a content analysis, coding for themes and significant language that allows us to track correlation between actual response issues and exercise issues. These AARs reviewed were taken from exercises and actual responses to emergencies from within the United States that represent a comprehensive sampling of the evaluative process and its effect on improvement planning. This thesis is not focused on proximity of exercises and events. Since the focus is on shared intelligence across boundaries, location was not considered to be a limiting factor. While it will be expected that agencies are more likely to benefit from lessons learned proximal to their area of responsibility, agencies have a responsibility to seek out intelligence gathered from exercises and events and apply that to their jurisdiction.

B.   CONTENT ANALYSIS

Richard Boyatzis stated in *Transforming Qualitative Information: Thematic Analysis and Code Development*[129] that the four stages in developing the ability to use thematic analysis are:

- Sensing Themes—recognizing the codable moment
- Doing it Reliably—recognizing the codable moment and encoding it consistently
- Developing Codes
- Interpreting the Information and Themes in the Context of a theory or Conceptual Framework—contributing to the development of knowledge[130]

There are three distinct stages involved in the use of thematic analysis: Stage I, deciding on sampling and design issues; Stage II developing themes and a code and stage III is where we begin validating and using the code.

Stage II is further divided into three different ways to develop a thematic code:

- Theory driven
- Prior data or prior research driven
- Inductive data driven[131]

In Stage I, the sample of 101 AARs was chosen to be representative of the AAR following the HSEEP framework. This would reveal trends that could be graphically illustrated for demonstration purposes.

In Stage II, the themes were revealed as the data were collected. Initially the categories used for coding the recommendations started at zero, since categories were not predetermined.

Content analysis can be defined as "a research technique for making replicable and valid inferences from data to their context."[132] The intent here was to synthesize the

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[129] Richard E. Boyatzis, *Transforming Qualitative Information: Thematic Analysis and Code Development* (Thousand Oaks, CA: SAGE, 1998).

[130] Ibid., 11.

[131] Ibid., 29.

[132] Krippendorff, *Content Analysis*. 31.

recurring recommendations from AARs for real world events and compare them to objectives established for exercises. Recommendations from exercises were collected as well. This data was then analyzed and compared. The four key components of Content Analysis are measurement, indication, representation and interpretation.[133]

1. Measurement

The measurement procedures of content analysis are based on frequency counts of semantically equivalent textual units such as words, word senses phrase or themes.[134] The data collected represented the frequency with which certain words or phrases appeared among the recommendations in each AAR. These were coded and sorted into one of, what eventually became 104 categories. The categories were chosen simply because they existed among the recommendations. Only one of the real world AARs included a recommendation that addressed a Special Weapons and Tactics (SWAT) team and only two included recommendations concerning the Stafford Act. Both were included as part of the data set for two reasons. One was to maintain objectivity. It was important not to omit any entries not matter how seemingly insignificant they may have appeared in order to create an accurate sample. Secondly, while the SWAT reference may have appeared statistically insignificant initially, its comparative value when paired against recommendations from exercise AARs becomes more evident. It was impossible to tell this during the collection process so all AAR recommendations were included.

2. Indication

Indication refers to the unmeasured aspects of the text as inferred by the analyst. For example, if an AAR refereed repeatedly to a recommendation, it would only be counted where it belongs. Special inclusion for overstated recommendation words such as *must, never* or *always* or for understated words such as *may, could* or *some* were not given as the objectivity of the person writing the AAR was not viewed as important as the content.[135] One AAR included obvious bias toward the issues affecting the special needs

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[133] Weber, *Basic Content Analysis*.70.
[134] Ibid., 72.
[135] Ibid., 75.

community and nearly every recommendation had special needs concerns, though the objectives of that exercise were not specifically geared toward a special needs population. The recommendations were interpreted and categorized as needed for "specialized equipment," "transportation resiliency" and "social media," but each recommendation was categorized based on its content and the "Special Needs" category received its single checkmark.

3.   Representation

Often criticized for its language coding limitations, content analysis can have the appearance of maintaining certain linguistic biases.[136] Since the interpretation of data into coded analysis is the responsibility of the analyst, it is important to classify words or phrases by the references they make. That is, to ignore the subjective preferences of the creator of the AAR and instead concentrate on the material recommendations. The intended definition was drawn by the comprehensive AAR and the analyst's familiarity with the process. Any recommendations that were misinterpreted from the intention of the AAR author(s) was unintentional though would have been consistent throughout the information gathering process for this thesis. To summarize, though there may be more valuable text analysis systems, some distinctions in language were not considered worth maintaining.[137]

4.   Interpretation

Each recommendation needed to be interpreted in order to find its needed location. The data did not require a high level of interpretive complexity.[138] Specifically, if a recommendation was made that included an inability to recognize the Incident Commander in the EOC, then that was included as a recommendation in the EOC, ICS and ICS identification categories. While this would leave some AARs being represented in more categories than may have seemed necessary, it ensured complete inclusion and

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[136] Krippendorff, *Content Analysis*, 43.

[137] Weber, *Basic Content Analysis*, 77.

[138] Vaismoradi, Turunen, and Bondas, "Content Analysis and Thematic Analysis," 399.

also minimized interpretation bias that would've resulted in using less categories based on the analyst's familiarity with the AAR process.

C.   THE AFTER ACTION REPORTS

1.   Selection of the AARs

The AARs selected for review were picked to cover a variety of emergency circumstances, which would be relevant to as many scenarios as possible. For example, the issues that face communities and responders during a hurricane have similarities to those that occur after tornados or blackouts. The effects of these emergencies on the healthcare system are similar to those that can be expected during a medical surge for a variety of scenarios. Therefore, the goal is to evaluate a large enough sample of emergencies to include as many of the core capabilities as possible. Significant events were included that were easily recognizable (i.e., the Oklahoma City bombing, Hurricane Katrina or the School Shooting at Columbine). Then, by comparing observations uncovered during emergencies with objectives established during the exercise design process, either a clear communal understanding of lessons learned will emerge or a gap will surface indicating a need for greater collaboration between intelligence and exercise.

In order to determine whether the hypothesis is correct, that we are not incorporating lessons learned from actual events to exercises conducted afterward, AARs were selected where a similar exercise occurred subsequent to the event. Wherever possible, data from an exercise that was conducted before the actual event would be included to provide a metric of beneficial learning. Events were chosen where the AAR was developed following the format set forth in the Homeland Security Exercise and Evaluation Program (HSEEP). The same was done for the exercise AARs. This would lend consistency to the sampling and make the extraction of recommendations and objectives

It is believed that these exercises did not necessarily need to be restricted geographically. Because of the availability of lessons learned platforms, exercises conducted in California are available to benefit exercise planners in New York. Likewise, the lessons learned from a hurricane occurring on the North Carolina Coast should

provide benefit to responders and emergency managers in Texas. Therefore, inconsistencies noticed between the AARs compiled after events and exercises are being evaluated on a systemic basis. That is, whether exercises are conducted as a direct result of a local emergency (Tornado exercise conducted in Joplin, MO or a Hurricane exercise in NY City). A gap in this area should strengthen the need for increased collaborative intelligence sharing. As common lessons learned emerge during emergencies, we should, ideally, see these identified as objectives in future exercises. It is the hypothesis of this thesis, however, that objectives and lessons learned will be dissimilar.

The sample size was drawn from exercises and events around the country adhering to the following guidelines:

- Only AARs for events occurring within the United States were included

- AARs had to follow the HSEEP format -

- The range of AARs was from 2001 through the present – The goal was to focus primarily on post 9/11 recommendation-heavy climate adhering to modern formats.[139]

- Approximate even distribution was maintained between exercises and real world events to maintain parity. (53 exercises and 48 real World events)

Searches for AARs were conducted on the DHS Lessons Learned Information Sharing (LLIS) website and The Homeland Security Digital Library (HSDL) and additional Google searches. The Google searches yielded several collections of AARs but one of the most valuable was on the WisconsinWatch.org[140] website. The website was produced by the Wisconsin Center for Investigative Journalism who requested AARs from counties across Wisconsin. The reports range from 2005–2011 and were written by a variety of agencies.[141] This accounts for the disproportionate number of Wisconsin

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[139] The only exceptions were the 1999 Columbine School shooting and the 1995 Oklahoma City bombing because of their significance as landmark events in homeland security, even though they occurred before the notion of "Homeland Security" came into existence. They were included because of their history and because the reports available were deemed sufficiently formatted in such a way that recommendations could be easily extracted. While other pre-9/11 events could also be viewed as seminal, e.g., the FBI standoffs at Ruby Ridge and Waco, Hurricane Andrew or the crash of TWA Flight 800, the primary focus was to be post 9/11.

[140] "What They Learned in the Disaster: Agencies' After-Action Reports," WisconsinWatch.org, accessed January 14, 2014, http://www.wisconsinwatch.org/viz/what-they-learned-in-the-disaster-agencies-after-action-reports/.

[141] Ibid.

AARs represented in the database. Whether some states exercise more than others, produce more consistent AARs after exercises or emergencies, or simply made their AARs more accessible was unclear.

New York City and Washington, DC, were singled out as sole city representatives because of the September 11 attacks. Figure 4 shows the AAR contribution by state for both exercise and real world events.
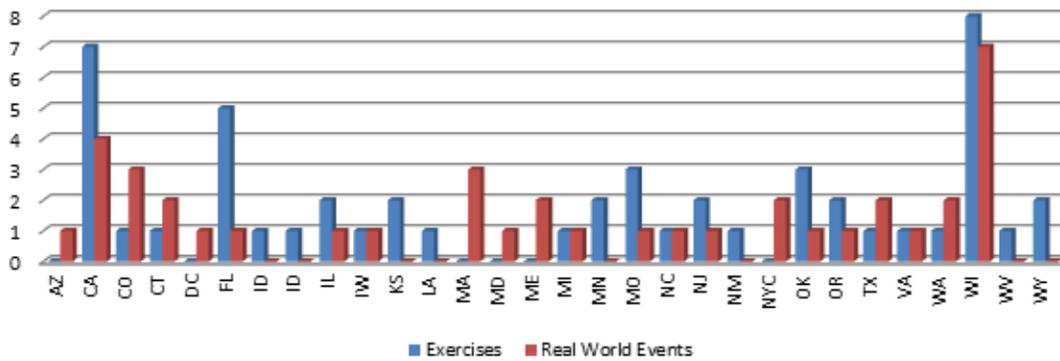
Figure 4. Exercise Contribution by State

Once found, the AARs were briefly skimmed, first for U.S. origin then HSEEP compliance. They were then filed simply as an exercise or real world event. It was important not to read the AARs at this point in order to maintain the objectivity of the sample.

2. Coding of the AARs

Content and Thematic Analysis allow the analyst to remain objective when collecting data. Either the information occurs or it does not. Since the AARs are all historical documents, meaning the information entered into them was done so before and separate from the purposes of this paper, there is no interaction between data submission

data collection which could bias the findings. Content analysis helps those evaluating to learn more about the data they are examining because it is systematic.[142]

The coding of the AARs was based on the frequency of common exercise and emergency issues, for example, ICS, communications, patient management, etc. The occurrences of common phrases will be gathered and tracked and trends among AARs will be included. The information was then assigned to categorical variables distinguishing among subject, timing and event and classified into finite number of categories.[143]

The recommendation section of each AAR was coded for themes in the areas of improvement across exercises and real world events. As a new recommendation was discovered a new category was created. This eventually resulted in 104 different categories The codification of the AARs supplied a comparative metric whereby the information contained in the recommendations could be assigned a numeric value and consistently measured against the remaining information either wholly or partially.

3.   Analysis of the AAR Coding

The occurrence rate among emergency AARs was compared to the frequency of inclusion during exercises. The expectation is this: if the AAR following an emergency identifies a shortcoming, this gap should be addressed in future exercises.

As emergencies occur across the nation, the frequency of issues raised exhibits consistency from region to region; therefore, the lessons learned should similarly maintain a consistency that is translated to exercise development regardless of location.

The data were collated into over 100 classifications. The first category that was tracked was the amount of warning time provided to civilians and responders during the scenario, whether exercise or real. The scenarios were divided among: No warning, minimal warning and significant warning events. No warning events were those where no realistic warning could be expected, such as an earthquake, terrorist attack or train derailment. The third category was for scenarios where significant warning was available,

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[142] United States General Accounting Office, *Content Analysis: A Methodology for Structuring and Analyzing Written Material* (Washington, DC: U.S. General Accounting Office, 1996), http://www.gao.gov/products/PEMD-10.3.1.

[143] Ibid.

scenarios such as hurricanes or winter storms that could be tracked for days or even weeks prior to impact. Everything else was considered a minimal warning event. Those which some amount of warning would be available like tornadoes or wild fires. These were listed as minimal warnings because there is a predictable season and while we cannot calculate where and when either will strike; there is some leverage of preparedness afforded. Specifically, they did not fall into either the No Warning or Significant Warning categories. The second category tracked the variety of hazards associated with the AARs. This would be used to determine whether exercises were being conducted in accordance with real world events. The 14 categories ranged from events associated with criminal activity and terrorism to events caused by severe weather and natural hazards like ice storms and earthquakes. The hypothesis was that there would be inconsistencies with the frequency of events that actually occurred and those that served as an exercise scenario.

The third and largest category was for recommendations. There were 104 separate classifications of recommendations taken from all of the AARs. These were recommendations from both exercises and real world events and were sorted independently.

The last category was reserved for exercise objectives. These 71 objectives were taken from the exercise AARs and were coordinated for similarities among the recommendations in order to clearly associate the recommendations with the objectives when the analysis of the data was conducted. The thought here was that exercise objectives would not correlate to recommendations and would further the hypothesis that there is a need for the insertion of intelligence into the exercise design process. When reviewing the first category of AARs, the results (see Figure 5) show that exercises favored "no warning" scenarios over "significant warning" scenarios by a nine to one ratio (54% of exercises featured scenarios that were without warning while only 6% focused on scenarios with significant warning periods.)

Real-world AARs showed almost an even distribution between "no warning" and "significant warning." This is indicative of an inconsistency in exercise planning. If the emergency community responds more frequently to events where they have significant warning then should the exercises they train on be developed in a similar manner.

Looking at the scenarios that were extracted from the database of AARs, there are two noticeable variances (see Figure 6). Real-world events featured incidents of severe weather 42% of the time compared to only 25% as an exercise scenario marking a 71% increase from exercise to real world for that scenario. Similarly, terrorism was featured in 23% of the exercises but only 6 % of the real world AARs. This represents a staggering 262% increase from real world to exercises.
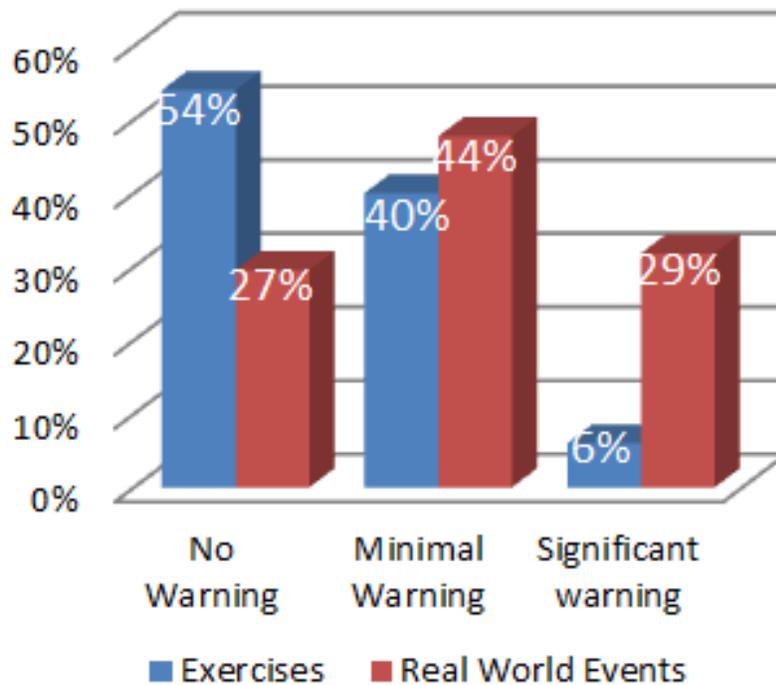
Figure 5. Warning prior to Hazard
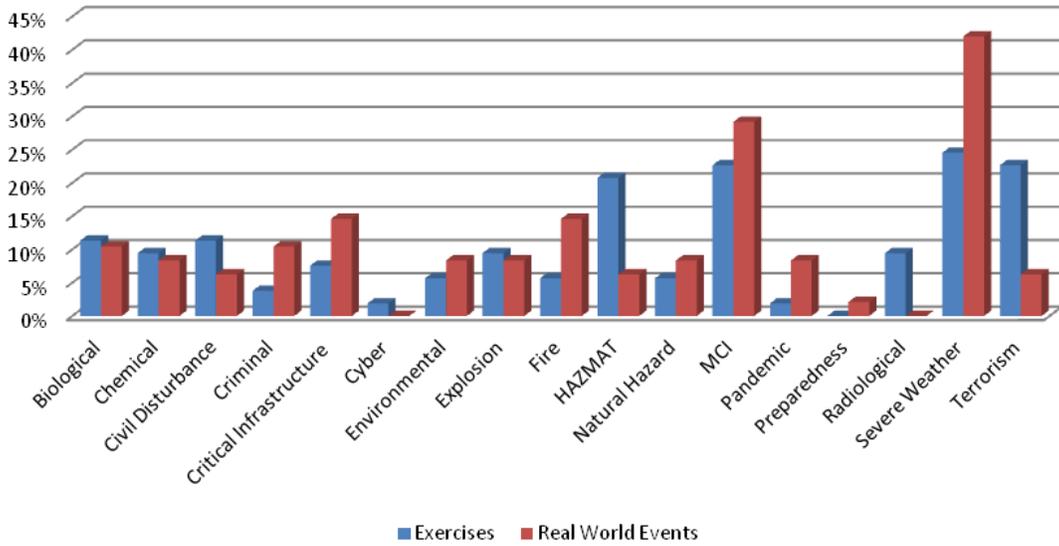
Figure 6. Scenario Distribution

While terrorism-related scenarios may be popular their occurrence in real-world events was minimal and should be reflected proportionately in exercise scenarios. A more accurate use of the terrorist scenario is reflected if we look at exercises conducted after 2008, though. In the AARs reviewed, prior to 2008, terrorism was used as an exercise scenario nine times as opposed to only three times since. This is consistent with its appearance in the real world AARs and is representative of the shift from preparedness for terrorism events to a more all-hazards approach in exercise planning.[144] Figure 7 is representative of the shift in AARs corresponding with the shift in preparedness scenarios as the data was analyzed pre and post 2008.

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[144] Department of Homeland Security, *Quadrennial Homeland Security Review Report*.
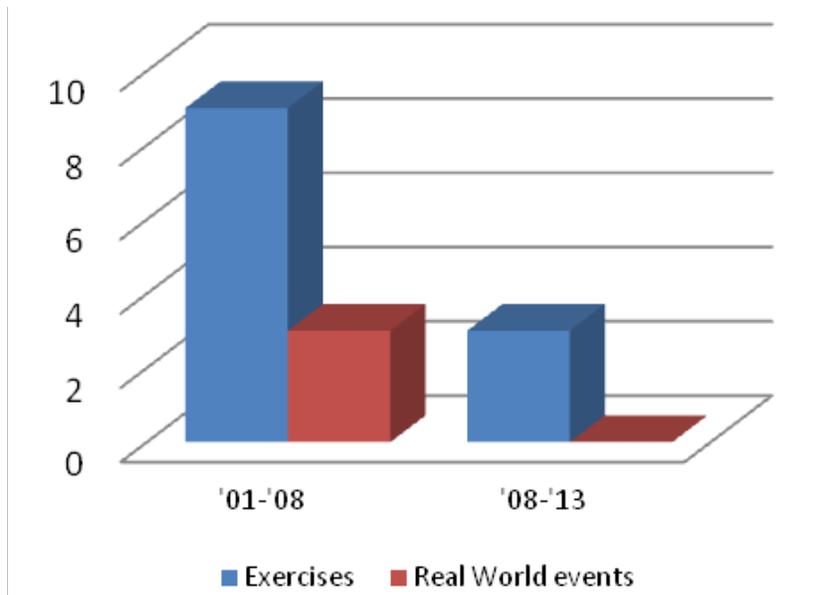
Figure 7. Terrorism Scenarios Pre- and Post-2008
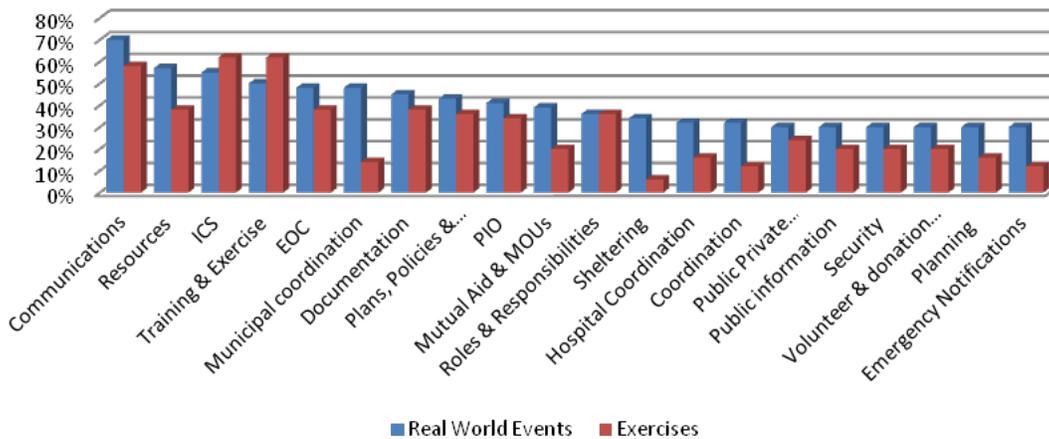
Figure 8. Recommendations Sorted by Real-World Events

When the recommendations were compared between exercises and real-world events the results were not surprising. Sorting the results by both real world events and exercises yielded similarities among needs. Among the top five in both categories were communications, training and exercise, problems with the Incident Command System (ICS), resource management and issues in the Emergency Operations Center (EOC).

46

Figure 8 lists the top 20 occurring recommendations among Real World AARs and Exercise AARs.

4.   Objective Recommendations

The similarities among recommendations are the standard issues that the exercise design community is familiar with and these findings should come as no surprise. It should reason, then, that exercise objectives should show a similar concentration of issues. If we repeatedly expose the same areas for improvement in our AARs then these would likely be the areas that receive the most attention when it comes to our exercises. Figure 9 shows a somewhat different finding, however. Based on the content analysis conducted over the sample for this thesis, there were some significant differences.

When looking at the top five based on disparity between recommendation and objective, resource management, documentation, multi jurisdictional issues, the public information officer (PIO) and mutual aid and memorandums of understanding (MOUs), there is a noticeable divide between each. Documentation, for example, was an issue in 48% of the real world AARs yet only found inclusion as an objective in 4% of exercises. Improperly documented associated costs are the primary reason local governments fail to receive reimbursement after a disaster.[145] So by addressing this one objective or, at a minimum, closing the gap, localities would be better able to qualify for reimbursement. More reimbursement would actually allow them to fund additional exercises.

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[145] State of Indiana, "Reimbursement Procedure for FEMA Public Assistance," *IN.gov*, March 2006, http://www.in.gov.
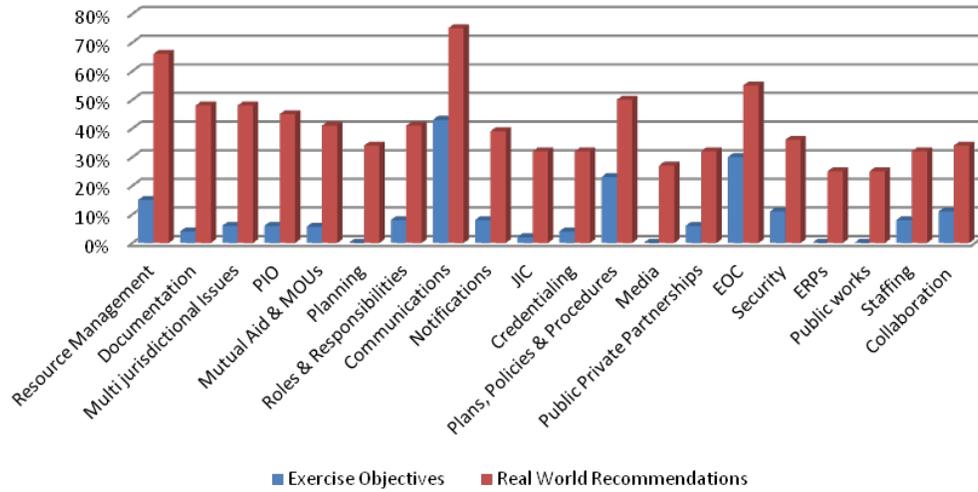
Figure 9. Disparity between Real-World Recommendations and Exercise Objectives

There were also recommendations that appeared frequently and were completely ignored as exercise objectives. Figure 10 demonstrates the recommendations that received no inclusion as objectives. This was a significant finding as the frequency of these recommendations was not minimal.
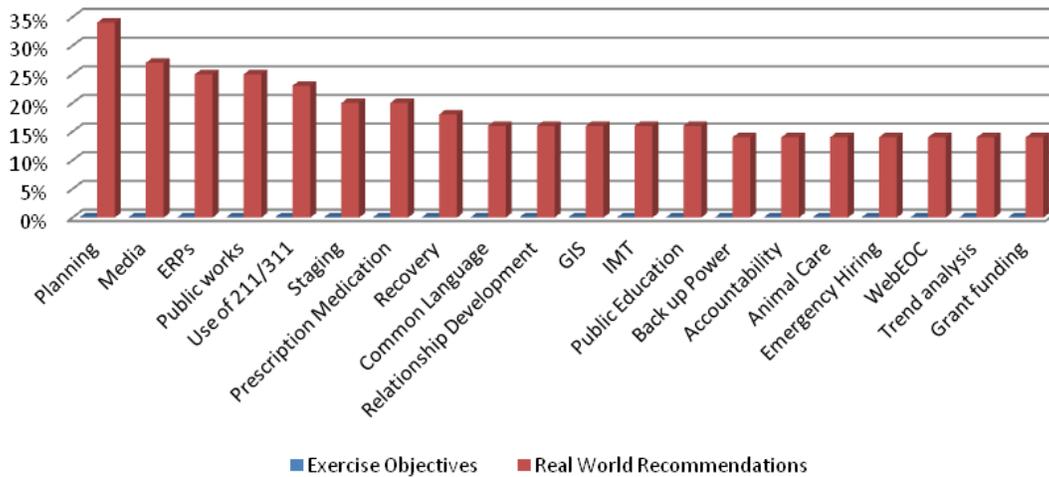
Figure 10. Recommendations Receiving Zero Inclusion as Objectives

D. ANALYSIS OF THE FINDINGS

It is apparent from the analysis that recommendations from exercises and real world events are not being transferred into our exercise process. This is a problem. What this means is that the emergency management community is content to keep exercising the wrong issues, not exercising consistent problems and not learning from the intelligence gathered and analyzed after exercises and real world disasters. This intelligence should be the driving force to guide improvement and is being largely ignored. We seem to be carrying a predetermination toward our future exercises. A predetermination that suggests recommendations almost pre-scripted.

E. LIMITATIONS OF THE METHOD

It is understood that this method contains certain limitations. Listed below are the most obvious with an accompanying analysis and explanation.

1. Sample Size

The sample size of 101 AARs represents only a small portion of exercises and real world events. Sample size will always affect the data produced. 100 events will produce a more accurate pool of data than a sample of 10 but far less than a pool of 1,000. The sample includes a mix of AARs from 30 states, which left out many locations. This was primarily due to the readily accessible nature of the chosen AARs. Specific AARs were not sought out with some exceptions. September 11 AARs were chosen as was the DC sniper AAR. The Oklahoma City bombing from 1995, the Columbine school shooting from 1999 were included as were select AARs from Hurricanes Katrina and Sandy in order not to neglect landmark events.

2. Subjectivity in Selection

One of the concerns when selecting the AARs for the data sample was the objectivity of the process. As explained earlier, AARs were chosen simply because of HSEEP compliance and U.S. origin. The intent was to maintain as much consistency in format and randomness in selection, though fully achieving this may not have been possible.

3. **Distribution**

Several states were disproportionately represented in the sample and some states were not represented at all. While this was a result of the accessibility of the AARs and not a preference for any region, the unevenness of distribution may be incorrectly attributed to bias.

4. **Limitation Solutions**

The limitations explained above could be addressed by examining a larger sample of After Action Reports. While 104 may have served the purpose of this analysis, a larger cross section, including more locations, greater scenario inclusion and use of a wider sample of Federal, State and Local AARs, would have provided a more complex data set, likely resulting in a more accurate and complete analysis.

Including more researchers would have given greater subjectivity to the analysis of the data. This, too, would have increased the depth of the results and reduced the possible appearance of analyst bias in the findings.

V.   THE CONNECTION BETWEEN INTELLIGENCE AND EXERCISE

It does not do to leave a live dragon out of your calculations, if you live near him.

—J.R.R. Tolkien, *The Hobbit*

A.   INTELLIGENCE-FREE EXERCISE

When exercises are conducted in a vacuum, that is, unaffected by surrounding environmental influences, they provide only of minimal benefit. Organizations train on what they are already efficient at and do very little to address or even identify their systemic gaps. It has been suggested that the planning process is more important than the procedures. Planning is often a result of the most recent disaster and not based on any systematic lessons learned. "This would pose no problem if the common sense notions and assumptions made about emergency time behavior were valid," though social scientists have recently asked some serious questions about common expectations during disaster responses.[146] While there may be some predictability of a crowd during an emergency evacuation, properly preparing a population to respond during a disaster situation will raise the level of expected safety.[147]

When we evaluate exercises it is useful to use something similar to the Disaster and Exercise Performance Information Collection Tool (DEPICT), developed by a joint civilian and military medical response team.[148] A repository for data collected from exercises or real world disasters, DEPICT allows field based observations to be broadly collected then analyzed with minimal bias. Frequently, the author of an evaluation is someone who was actually involved in the incident or was responsible for some aspect of the planning or response. It is not easy for one to impartially evaluate the actions of their

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[146] Quarantelli, *Human Resources and Organizational Behaviors*."

[147] Peter W. Blaich, *The Benefits of Behavioral Research to the Fire Service–Human Behavior in Fires and Emergencies* (Lincoln, NE: iUniverse, 2008).

[148] Smith et al., "Disaster and Exercise Performance Information Collection Tool."

own organization. "Too often, post-disaster critiques turn out to be defenses or justifications of what was done, rather than objective assessments of problems and mistakes."[149] By not incorporating an intelligence aspect into the planning of our exercises and thus our evaluations, we may be missing valuable lessons "because of the bias held for one's own community or organization."[150]

B. HSEEP FOR TERRORISTS

How do terrorists learn? Can we assume that they have a structured framework for evaluation that is conducted after each attack, whether successful or not? By comparing a string of "failed" attacks we can surmise a "lessons learned" structure of some sort. If so, then we as Homeland Security professionals should be able to further learn from this in an effort to be prepared for an evolving terrorist threat. As a terrorist group learns it can repair gaps in its structure and strengthen its capabilities. An ability to learn allows a terrorist group to adapt to its changing surroundings and goals by:

- Developing, improving, and employing new weapons or tactics that can enable it to adjust its capabilities as necessary

- Improving its members' skills in applying current weapons or tactics

- Collecting and utilizing the intelligence information needed to mount operations effectively

- Thwarting countermeasures and improve its chance of surviving attempts to destroy it

- Preserving the capabilities it has developed even if some of its members are lost.[151]

Observing the organizational learning that takes place among a group, more specifically than from individual to individual, we can begin to see areas where we can adapt our response in a similar, though far more positive manner. By understanding how terrorist groups continue to learn in an ever changing arena, response agencies can better organize to respond to and prepare for inevitable terrorist attacks.

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[149] Auf der Heide, *Disaster Response*.

[150] Quarantelli, "Human Resources and Organizational Behaviors."

[151] Jackson et al., *Aptitude for Destruction*.

In order to benefit from the organizational learning exhibited by a terrorist organization, it is necessary to understand why responders would want to learn from them in the first place. The objectives of the response organization need to be clearly understood. If the goal is preparedness and response, then understanding the terrorist intentions and tracking improvement plans, those tasked with preparing to respond to the next terrorist attack are armed with preparatory knowledge.

The "Open Source Jihad" section of *Inspire Magazine*, described as "a resource manual for those who loathe tyrants … a disaster for the repressive imperialistic nations: the open source jihad is America's worst nightmare,"[152] provides easy-to-follow suggestions and instructions for would be, Home Grown Violent Extremists (HGVE). An article in the magazine posed this question: "Can I make an effective bomb that causes damage to the enemy from ingredients available in any kitchen in the world? The answer is yes." And it went on to describe an easily assembled explosive device in the article "*Make a Bomb in the Kitchen of Your Mom*."[153] This was eventually the source for the explosive device used in the 2013 bombing at the Boston Marathon.[154]

This is significant both tactically and strategically. Tactically, it tells counterterrorism professionals to be stalwart in identifying the gathering of seemingly innocuous materials. Terrorists can create dangerous explosives easily, but more importantly, they can do so without leaving the country for expensive training that is available for security professionals to notice.[155] By understanding not only the methods but the motivation behind the terrorist intentions, we can begin to comprehend them strategically.

It becomes possible to anticipate the terrorists' next logical step by understanding their strategy. Understanding their particular goals and objectives and the tradeoffs they

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[152] "Al Qaida's English-Language Terrorism Blueprint: The Investigative Project on Terrorism," accessed February 18, 2014, http://www.investigativeproject.org/2056/al-qaidas-english-language-terrorism-blueprint.

[153] The AQ Chef, "Make a Bomb in the Kitchen of Your Mom," *Inspire*, Summer 2010.

[154] Richard Spencer, "Boston Marathon Bombs: Al_Qaeda's Inspire Magazine Taught Pressure Cooker Bomb-Making Techniques," *The Telegraph*, April 16, 2013.

[155] "Al Qaida's English-Language Terrorism Blueprint: The Investigative Project on Terrorism."

will be willing to make in order to accomplish these, allow counterterrorism professionals comprehend when available options have been minimized.[156]

Familiarity with the learning processes of terrorist groups could make it possible to develop countermeasures to combat or possibly take advantage of terrorist groups' attempts to learn. Attacking the group's "learning systems" may lessen its ability to evolve over time.[157] While the advances made by terrorist groups to adapt and learn are often obvious in hindsight, they are harder to identify proactively. If we are going to minimize their tactical advantage, however, early recognition of operational growth is critical. Intelligence analysts need to be able to extract valuable information from the "noisy background of collected intelligence, and the analytical tools to discern what the information means in terms of terrorist group adaptive activities."[158] In order to make a calculated difference, analysts need to be able to detect terrorist groups' efforts to change and adapt, anticipate whether those efforts will be successful, and act in order to limit terrorist groups' ability to learn or undermine their learning efforts.[159]

In *Aptitude for Destruction*, Brian A. Jackson et al., characterize organizational learning as a four-part process composed of acquiring, interpreting, distributing, and storing information and knowledge.[160] All four parts must exist and be carried out successfully if knowledge is to become organizational—that is, clearly tied to group objectives, accessible to many different group members, and resistant to the loss of individual members.[161] This approach is similar to a corporate strategy where the system is designed to survive not because of the abilities of the personnel but in spite of them. The successes of the organization are procedurally based rather than personnel based. This is evident with a group like al-Qaeda (AQ), which exists in 2014 more as a philosophy than a hierarchical organization. This is not to say that al-Qaeda central

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[156] Jackson et al., *Aptitude for Destruction. Volume 2,1.*
[157] Jackson et al., *Aptitude for Destruction: Volume 1, xiv.*
[158] Ibid.
[159] Ibid.
[160] Ibid.
[161] Ibid.

(AQC) no longer operates, but rather emphasize its many splinter organizations thriving under the AQ ideology.[162]

In August 2001, actor James Woods saw a number of apparently Middle Eastern men behaving so oddly on a flight from New York to San Francisco that he reported them to the FBI. This was possibly a test run for what would later be the September 11 high-jacking.[163] By monitoring routine actions by a transcontinental flight crew, the terrorists were able to gather significant information that may have provided the operational groundwork needed to carry out the most successful terrorist operation in history. The knowledge that terrorists conduct "dry runs" offers an insight into their meticulous planning and preparedness.

1. Tactical Growth of Terrorist Organizations

Understanding the tactical growth of two specific organizations may shed some light on how responders can react to an increasing threat as it develops rather than reacting to the aftermath of that process.

a. The Radical Environmentalist Movement

Groups such as the Environmental Liberation Front (ELF) and the Animal Liberation Front (ALF) have existed within the U.S. as leaderless organizations since the early nineties fighting for the rights of the environment and animals at the expense of hard working Americans. Since 1976, 1,100 criminal acts have been committed in the United States by radical environmentalist groups, resulting in more than $110 million in property damage alone, a figure that does not include the significant additional costs associated with lost research, increased security, and dampened productivity.[164]

Groups such as ELF and ALF share a unique organizational structure as they are essentially leaderless. The ELF considers any person who acts on behalf of the

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[162] Margaret Coker and Keith Johnson, "The Death of Osama Bin Laden As Al Qaeda Adapts Its Tactics, Threat From Splinter Groups Persists," *Wall Street Journal*, May 3, 2011.

[163] "James Woods Reported Suspicious Passengers to FBI" *ABC News*, accessed November 8, 2013, http://abcnews.go.com/Entertainment/story?id=102335.

[164] Kristen Phillipkoski, "Eco-Terror Cited as Top Threat," *Wired*, June 16, 2004.

organization, so long as such actions are consistent with ELF guidelines, to be an "Elf," or agent of the organization, and any actions undertaken by Elves can be considered actions of the ELF as a whole.[165] This makes it difficult to track organizational learning and knowledge management among the group.

> The main aim is to base a group on so-called phantom cell networks or "autonomous leadership units" (ALUs) that operate completely independently of one another, but which are able, through the combined force of their actions, to precipitate a chain reaction that eventually leads to a national revolution. Integral to the concept is information technology (IT), which is used to facilitate communication between like-minded individuals and as a means for circulating and distributing propaganda and information. Of particular importance are mediums such as the Internet, email and the world wide web. These cyber based mediums play a crucial role in ensuring that all individuals are kept fully abreast of events, allowing for planned responses and attacks but always on the basis of individual initiative. Used in this way, IT both overcomes the 'tyranny of distance' and obviates the necessity for orders and directives—thereby precluding the need or a physical group [or a centralized leadership].[166]

b.   The Provisional Irish Republican Army

The Provisional Irish Republican Army (PIRA) has a 30-year history of organizational growth both strategically and tactically.[167] The group consistently fought to sustain a war of attrition against the occupying British with limited success.[168] One of the PIRA's alleged leaders summarized the group's strategy as "blattering on until the Brits leave."[169] This caused a re-structuring of organizational goals.

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[165] Brian A Jackson et al., *Aptitude for Destruction. Volume 2: Case Studies of Organizational Learning in Five Terrorist Groups (*Santa Monica, CA: RAND Corp., 2005).

[166] Peter Chalk, "U.S. Environmental Groups and 'Leaderless Resistance,' " *Jane's Intelligence Review*, July 1, 2001.

[167] Jackson et al., *Aptitude for Destruction. Volume 2: Case Studies of Organizational Learning in Five Terrorist Groups.*, 93–140.

[168] Ibid., 95.

[169] C.J.M. Drake, "The Provisional IRA: A Case Study," *Terrorism and Political Violence* 3, no. 2 (1991): 43–60.

"The remarkable evolution of this organization has been characterized by internal learning, an exceptional ability to adapt, reorganize, and restructure, and the impressive development of a highly efficient and multi-dimensional support apparatus"[170]

While the PIRA used Rocket-Propelled Grenades (RPGs) in many of its attacks, the weapon's limitations caused the group to develop its own version, the Improvised Projected Grenade (IPG).[171] The newer weapons were more accurate and caused less accidents with unintended consequences; accidents which damaged sympathetic support.

As the PIRA learned, it began operations aimed at specific targets which furthered its need for organizational improvements. As it increased its "out-of-theater" targets its intelligence needs also increased. This lead to strategic improvements as well. "In any conflict the tactical efficiency with which military operations are executed will be meaningless unless they form part of a coordinated plan to achieve political ends, because the success of a strategy can only be judged with reference to attainment of the overall political objective"[172]

c.   *Summary of Organizational Learning*

Both the PIRA and leaderless environmental groups like ELF and ALF have benefitted from organizational learning. There is no single way that organizations learn from past successes and failures.[173] Some professionals define organizational learning as a "change in behavior in response to stimulus,"[174] while others suggest learning is sought after,[175] a desire to improve based needs and shifting objectives. If an organization is going to continue to survive, it will have to benefit from a combination of techniques and frameworks. Homeland Security professionals will have to follow and anticipate the

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[170] John Horgan and Max. Taylor, "The Provisional Irish Republican Army: Command and Functional Structure," *Terrorism and Political Violence* 9, no. 3 (September 1997): 1–32.

[171] Jackson et al., *Aptitude for Destruction. Volume 2*, 107.

[172] Ibid.

[173] Danny Miller, "A Preliminary Typologoy of Organizational Learning: Synthesizing the Literature," *Journal of Management* 22, no. 3 (1996): 485–505.

[174] Ibid.

[175] George P. Huber, "Organizational Learning: The Contributing Processes and the Literatures," *Organization Science* 2, no. 1 (1991): 88–115.

organizational development of terrorist organizations and likewise, have to develop as organizations themselves.

C. AGGRESSIVE INTELLIGENCE

Is it possible, then, to use exercise design as an offensive weapon more so than a reactionary support tool. Can we, by combining the resources of an intelligence section with that of our exercise design capabilities, seek to prepare our responders and civilians for events that haven't happened yet? The incorporation of competitive intelligence (CI) into a cyclic exercise design process will allow an agency to monitor evolving threats that could potentially affect their agency or community and exercise accordingly.

While the idea of CI is primarily a corporate tactic, it allows a company to anticipate market developments proactively—rather than merely react to them.[176] The company is more able to remain competitive by improving its strategic decisions and leading to better performance against competitors.[177] An exercise design team, charged with the responsibility of preparing its agency for unforeseen disasters, maintains a similar need for a competitive edge. The competitor, in this case, is an evolving terrorist or complex natural threat, rather than a rival business. Anticipating the learning potential of an organization will help "predict" the next realistic threat and attempt to learn from that prior to its occurrence.

D. THE MUMBAI—NAIROBI CONNECTION

The 2008 terrorist attack in Mumbai can be used as an example of how intelligence could be used to create a predictive exercise. In November of 2008, 10 terrorists attacked several locations in Mumbai, India killing at least 172 people. Referred to as "India's 9/11," the attack was carried out inexpensively and without the use of unconventional weapons. However, parts of this attack were noteworthy, specifically, its scope, complexity and the diversity of its targets. "The prolonged nature of the episode,

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[176] Ranjit Bose, "Competitive Intelligence Process and Tools for Intelligence Analysis," *Industrial Management & Data Systems* 108, no. 4 (2008): 510–528.

[177] Ibid.

which went on for 60 hours with the steadily mounting death toll, made it a slow-motion shoot-out and siege that mesmerized the world's news media."[178]

According to the NYPD's analysis of the attack at the Westgate Mall in Nairobi, Kenya, early on the afternoon of September 21, 2013,

> four terrorists associated with the Somali based terrorist organization Al-Shabaab launched an armed assault using rifles and hand grenades at the Westgate Shopping Mall in Nairobi, Kenya. The attack resulted in the deaths of 67 people and it took almost four days before authorities declared the scene safe. This terrorist attack was the largest loss of life in Kenya due to terrorism since the 1998 bombing of the U.S. Embassy in Nairobi in which 212 people were killed. This high profile armed assault successfully raised Al-Shabaab's worldwide profile as a terrorist organization. It also clearly illustrates that armed assaults by terrorists on "soft" targets such as a shopping mall are a simple, effective and easy to copy tactic.[179]

Bruce Hoffman looked at Mumbai as a benchmark for terrorist success, stating, "the long, drawn-out assault in Mumbai produced round the clock coverage around the globe, something other terrorist groups want to emulate."[180] This emulation appears to play out at Westgate.

To summarize the two events, if we focus on the similarities between Mumbai and Nairobi, both events featured moving teams of attackers armed with assault weapons and grenades. Both targets were assumed to contain affluent visitors to the locations and it could be anticipated that most of the victims would likely only be familiar with the exit through which they entered minimizing their egress options. Both events lasted for days and were captured live for the world to see. Terrorism's intent is to intimidate those watching.[181] "Terrorism is meant to hurt, not to destroy."[182] The use of gunfire, as opposed to indiscriminate use of bombs as used previously in Mumbai attacks (2006 Mumbai train attack, in which 209 people were killed by seven bombs, and the 1993

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[178] Angel Rabasa et al., *The Lessons of Mumbai* (Santa Monica, CA: RAND, 2009).

[179] New York City Police Department, *Analysis of Al-Shabaab's Attack at the Westgate Mall in Nairobi Kenya*, New York: New York City Police Department, November 1, 2013.

[180] Peter Bergen, *Assessing the Terrorist Threat* (Darby, PA: Diane Publishing, 2011).

[181] Martha Crenshaw, "The Psychology of Terrorism An Agenda for the 21st Century.pdf," *Political Psychology* 21, no. 2 (2000): 405–420.

[182] Ibid., 406.

Mumbai attack where 257 persons died as a result of 13 blasts across the city), provided the "emotional value" sought by terrorists.[183]

There are similarities in the Westgate Mall. If, as a result of the mall shooting in Nairobi in 2013, intelligence analysts discover a systemic gap in evacuation policies in Nairobi, then that analysis will be shared with exercise design. A joint exercise between fire, emergency medical and law enforcement personnel as well as private local stakeholders with a vested interest in mass evacuation of customers will be developed, conducted and evaluated. The location is not as important as the similarities in consumers. For example, the mall in Nairobi contained a transient population, marginally familiar with the facility and not fully familiar with its exits or available areas of refuge. These factors influenced the chaotic movement of the crowd which fueled the attacker's assault targets.[184]

If the development of the exercise scenario includes multiple insults to normal movement with various points of egress blocked, then the challenge of the exercise becomes compromised evacuation. The evacuation exercise becomes the benefit to the facility as a result of the intelligence provided.

1. Lessons Learned from Mumbai and Nairobi

If we were required to conduct an after action review of the two events from the point of view of the "bad guys," what would be areas for improvement? Would the following recommendations be considered appropriate?

- **RECOMMENDATION:** While the fire set at the Taj Hotel was effective in garnering media coverage for a prolonged period, it should have been set on a lower floor and set sooner.[185] This would ensure more trapped occupants and a higher causality count.

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[183] Rabasa et al., *The Lessons of Mumbai*, 6.

[184] Daniel Howden in Nairobi, "Terror in Westgate Mall: The Full Story of the Attacks That Devastated Kenya," *The Guardian*, October 4, 2013.

[185] Rabasa et al., *The Lessons of Mumbai*.

- **RECOMMENDATION:** Disruptive explosions away from the hotel caused confusion among responders. Explosions early in Nairobi had a similar confusing and chaotic effect.[186]

- **RECOMMENDATION:** Response of fire and police units is often predictable so the effectiveness of prepositioned IEDs should slow response.

- **RECOMMENDATION:** Use of a "command post" allowed for coordinated communications as well as real time intelligence for attackers in both Mumbai and Nairobi.[187]

Another incident worthy of review, at this point, would be the Westfield Galleria Mall arson attack form October of 2010. During this Roseville, California, incident, an armed suspect, believed to be carrying an explosive device, entered a crowded, upscale mall. The suspect later started a fire and barricaded himself in the back of one of the stores. Through the confusion, the fire sprinklers were deactivated and were not reactivated until 71 minutes into the incident.[188] While it is unclear as to why the sprinklers were deactivated, what is clear is how this exacerbated the fire. The important lesson learned here, for the would-be terrorist is that the absence of the fire suppression system, for over an hour, resulted in 55 million dollars in damage to the mall.[189] One of the goals of terrorism is financial disruption to the target. The motivation of the attacker in Roseville, for the purposes of this evaluation, is irrelevant. What is relevant is that one armed attacker occupied a mall, terrorized its occupants and set fire to the facility, holding responders at bay. His actions caused excessive damage.

E.   INTELLIGENT EXERCISE THEORY

1.   Predictive Scenario

After an emergency, such a focus on the most recent event is common and the planners often concentrate exclusively on planning for future scenarios of the same

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[186] New York City Police Department, *Analysis of Al-Shabaab's Attack*.

[187] Ibid.

[188] City of Roseville, *Westfield Galleria Arson. After Action Report* (Roseville, CA, City of Roseville, CA, October 2010).

[189] Ibid.

type.[190] Ideally, intelligence analysts should focus on what the terrorists view as their lessons learned and provide this to exercise planners. This allows for the development of a predictive exercise where we begin to prepare for what may be next.

If terrorists in the U.S. were intent on carrying out an active shooter event, then the lessons learned from Mumbai and Nairobi should help in the planning stage. Supplementing this intelligence with what could, conceivably, be learned from Roseville, should yield a complex active shooter event, carried out by four to six gunmen in a reasonably crowded facility e.g., a mall, theater or rail station, occupied by transient population unfamiliar with all the exits or nuances of the building.

By triggering several explosions prior to entering the facility, the attackers could cause a distraction. Then, by compromising the fire suppression system the attackers could begin moving through the facility firing their weapons, eventually starting the fire and either trapping victims on floors above or siphoning them to specific exits using the directionality of the fire. This corralling would leave the victims extremely vulnerable.

If this event were to take place in a location with an extremely vulnerable population, a hospital for example, then the casualty count could be significant. As would the emotional impact the attack would have on a U.S. population. A New York hospital emergency planner, speaking on the condition of anonymity, stated her biggest concern in preparing the hospital was its over 50 exits and the hospital's inability to secure them all.

The incorporation of intelligence allows us to anticipate what challenges may lay ahead and begin to prepare for them.

2. Predictive Exercise

Taking the lessons learned from previous events and adding them to what we can expect would be an attractive soft target in the U.S., should lead us to conduct evacuation exercises that focus on compromised evacuation routes. As people unfamiliar with additional means of egress, other than the one through which they entered, can be expected to behave as part of a crowd during unscheduled evacuation, we, as emergency

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[190] Allan McConnell and Lynn Drennan, "Mission Impossible? Planning and Preparing for Crisis," *Journal of Contingencies and Crisis Management* 14, no. 2 (2006): 59–70.

planners, need to provide scenario based exercises that would help a facility develop alternative response plans when faced with a chaotic, aggressive obstacle.

When developing an exercise intended to prepare people for any emergency, the scenario is not nearly as important as are the objectives. Using the intelligence from above, it is important to realize that our exercises do not need to mirror our intelligence, merely shadow the objectives. What this means is that it is not necessary to conduct an active shooter exercise in a hospital to provide hospital personnel with the benefits of the intelligence shared. A Tabletop Exercise (TTX) conducted in a hospital with discussions considering a variety of compromises to safety should lead to anticipatory solutions.

3.   Intelligent Exercise Cycle
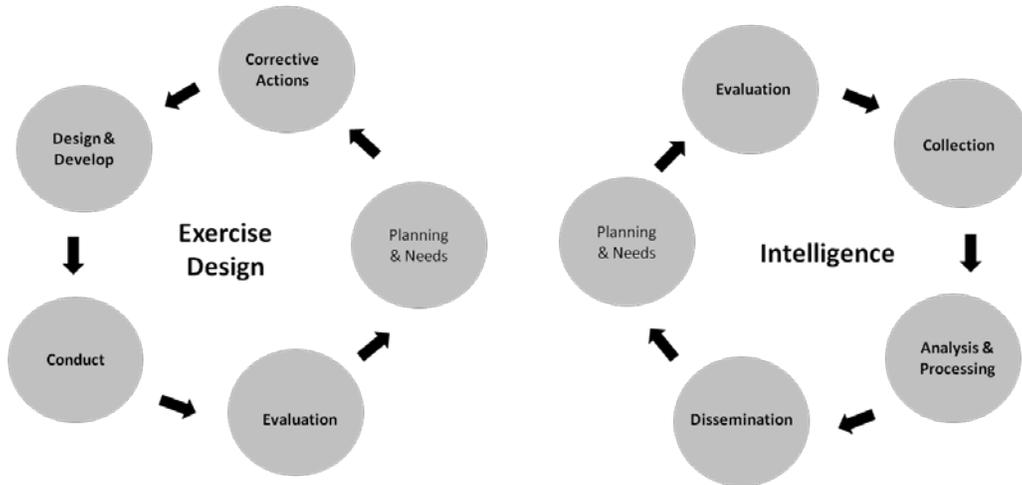
Figure 11.   At Left is the Exercise Cycle, at Right, the Intelligence Cycle

In order for exercises to remain current and relevant, they need to be based on new intelligence. Ideally, this will provide the exercise cycle with constant input. The cycle, in this way, however, is stagnant within the exercise agency. As the new intelligence is fed to the exercise cycle, the exercises are conducted and evaluated, improvement plans are developed as are corrective action plans. New exercises are created and the cycle continues. As the intelligence community gains new information, this is analyzed and processed then disseminated according to the needs of the consumer.

Feedback is received from within the intelligence community and the cycle continues as in Figure. These two cycles can benefit from each other through their mutual cooperation. The development of the Intelligent Exercise Model (IEM) will consist of integrated versions of both the exercise design cycle[191] and the intelligence cycle.[192] Each cycle operates independently while running a constant flow of feedback between the two entities. As evaluation information from one cycle is fed into the other, each cycle supports the momentum of the other, theoretically leaving the cycles in perpetual motion dependent upon influences from each other. The key to the sustainability of the procedure is that the entire process is constantly fueled by new intelligence. The feedback from the exercise design team is delivered, post-exercise, to the intelligence producers. They, in turn, continue to provide intelligence to the exercise design professionals in an effort to stay informed concerning current trends and threats.
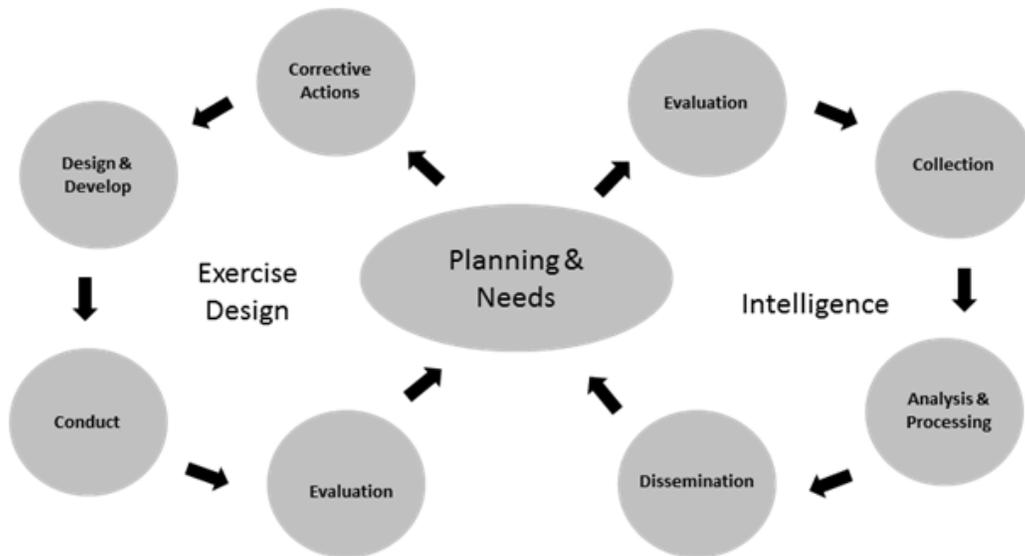
Figure 12.   Intelligent Exercise Model

The research conducted for the analysis of this thesis produced the Intelligent Exercise Theory (IET). Which can be defined as *"The use of intelligence gained from a*

.[191]"HSEEP-LLIS," Department of Homeland Security, accessed February 6, 2014. https://www.llis.dhs.gov.

[192] Townsend et al., "Intelligence-Led Mitigation," 5.

disaster or terrorist attack to prepare for future events, while only recreating the most salient facets of the event to drive the exercise design learning cycle in anticipation of future crises. This is to suggest that reconstructing the entire disaster for the purposes of exercise is not nearly as effective as exercising those aspects of the disaster deemed significantly influential as to manipulate reaction to future disasters."

Exercises are often location driven. This means that if a facility of interest becomes available, the calendar turns out to be the motivating factor. Projects are derived from relationships that exist between agencies and a mutual interest in a particular facility rather than based on a realistic threat assessment of locations. This limits the scope of the exercise. By narrowly focusing our scenarios based on the availability of exercise partners, rather than allowing current threats and vulnerabilities to steer our exercise goals and objectives, we are limiting opportunities for conducting successful, effective exercises. The union of intelligence and exercise design into a symbiotic process will simultaneously broaden the inclusion of exercises while pinpointing the focus of design capabilities.
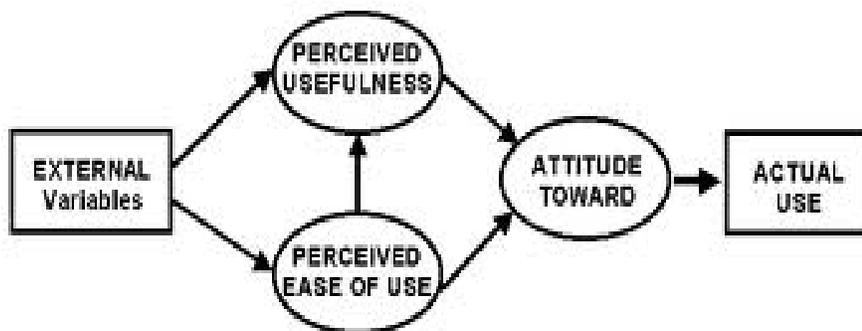
Figure 13.   Technology Acceptance Model[193]

Since the IEM integrates variations of two accepted models; the intelligence cycle[194] and the HSEEP[195] exercise cycle, participants from exercise and intelligence are

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[193] Martin Fishbein and Icek Ajzen, *Predicting and Changing Behavior: The Reasoned Action Approach* (New York: Psychology Press, 2010).

[194] Townsend et al., "Intelligence-Led Mitigation."

already familiar with them, minimizing the learning curve. The fact that these two models are already widely accepted means that there should already exist an anticipated ease of use as well as an expectation of value added to the process.

It is important to understand the details of objectives. We can't find a solution until we have understood the problem. Gathering information from many sources will broaden the field of information and eventually improve the focus of the project; what the final project is supposed to look like. Initially, an increase in information leads to better solutions, but there comes a point at which more information has a diminishing effect. Information by itself does not produce solutions. We need the ability to work with the information effectively.[196] The incorporation of intelligence into exercise design provides intelligence producers and analysts with a measureable consumer. While intelligence often is left with intangible performance successes, the consumer and producer rarely exchange thoughts.[197] The development of exercises based directly on intelligence delivered can provide a performance measure and apply realistic objectives, as well as collaborative feedback based on new intelligence and proposed exercises. The intelligence officers actually contribute and participate in the next step in the intelligence cycle.

The exercise evaluation will then result in a comprehensive After Action Report and Improvement Plan (AAR/IP) that will be disseminated among responding agencies and the private stakeholders. Developed cooperatively by responders and private industry, the AAR/IP can benefit all agencies involved in the exercise. Lessons learned from these exercise should be shared among participating agencies but, more importantly, made available to non-participating agencies that would benefit from the findings. Competitive interests between competing agencies (i.e., hotels, hospitals, office buildings) need to be set aside and allow the greater interest of community resilience take precedence. Each individual agency or stakeholder needs to view itself first as a member

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[195] "HSEEP_Revision_Apr13_Final," Department of Homeland Security, accessed October 31, 2013, http://www.nmdhsem.org/uploads/files/HSEEP_Revision_Apr13_Final.pdf.

[196] Semyon D. Savransky, *Engineering of Creativity: Introduction to TRIZ Methodology of Inventive Problem Solving* (Baco Raton, FL: CRC Press, 2002).

[197] Sales, "Share and Share Alike."

of the community and secondly as an individual interest. This eliminates multiple in-groups focused on their own needs and creates a collective in-group focused on the community's needs.

This is the idea currently in use in Israel[198] where the community is focused on the protection of Israeli interests ahead of individual interests. The Israeli model is "based on a series of concentric circles of increasing protection, with the individual citizen at the center."[199] This is a definitive, almost literal view of community resilience, where the community has an active participatory role in its own security. To provide the civilians with the necessary tools to respond appropriately and immediately when faced with an emergency, the Israel Defense Forces' Home Front Command (IDF HFC) orchestrates exercise and drills that prepare the civilian population to interact, where necessary with first responders.

Community resilience is not just about how we respond during times of crisis. Additionally, it raises questions that challenge how we build strong and sustainable communities in the face of the demographic, social, and economic changes of the 21st century. For example, how do we bring together government and private partners equitably in planning discussions? How do communities care for their most vulnerable?[200] By exercising and training together, each agency begins to understand the capabilities and needs of the other in an effort to support the overall vision of Israeli security. This is, simply stated, the tenet of community resiliency.[201]

4. New Solutions Create New Problems—A Case Study

In 2008, the New York City Fire Department's (FDNY) Exercise Design team created a bus bombing scenario that allowed over 100 FDNY responders to exercise in a realistic atmosphere, complete with an eviscerated bus, numerous simulated injuries and secondary threats. This exercise, consistent with global events and threats, i.e., the 2005

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[198] Pockett, *United States and Israeli Homeland Security*.

[199] Joshua Sinai, "How Israel Approaches Homeland Security," *The Journal of Counterterrorism & Homeland Security International* 10, no. 1 (Summer 2004): 1–6.

[200] "Translating Policy into Action to Build Community Resilience, RAND, accessed October 28, 2013, http://www.rand.org/blog/2013/09/translating-policy-into-action-to-build-community-resilience.html.

[201] Department of Homeland Security, *Quadrennial Homeland Security Review Report*.

terrorist attack on London's mass transit system, was later incorporated into the FDNY's regular training schedule and allowed every member of the Department, fire and medical, to participate. In May of 2010, members of the FDNY responded to an attempted car bomb in Times Square and acted in accordance with their training to safely mitigate a potential disaster.[202] This cycle, consisting of:

Intelligence → Exercise Design → Training → Practical Application

should serve as the model for Intelligence-led Exercise design. The events of May 2010 actually validate the IEM. Consistent, determined training provides a path for effective responder performance.

Any new procedure runs the risk of failure. To incorporate a cooperative working relationship between an intelligence section and its agency's exercise design personnel is going to run somewhat contradictory to current operating procedures. Intelligence is now collected, analyzed and evaluated by the intelligence section. Intelligence is then packaged for dissemination. The IEM will need at least a year to test for effectiveness. If ineffective, the transition back will also take time. This could, conceivably, result in two year absence from the traditional established exercise design procedures that a skilled team has grown familiar with. If affected personnel, reluctant to change initially, are now faced with reinstituting the methods they had fought to keep, the possibility exists of never re-establishing the original procedures.

The new integration may also develop new problems not yet conceived. In order to maintain smooth effectiveness, these will have to be identified and controlled on an individual basis.

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[202]Al Baker and Karin Henry, "Car Bomb Leads to Evacuation in Times Square," *New York Times*, May 2, 2010.

VI. CONCLUSION

A. SUMMARY OF ISSUES

The intent of this thesis was to explain the need for incorporated intelligence into an agency's exercise design model. The idea of exercise design is to validate existing training. The addition of intelligence into the planning process means that we will be preparing to meet tomorrow's challenges as well as yesterdays. This allows us to think forwardly and attempt to predict where our future challenges lie, rather than solving problems where we have already demonstrated measured success.

The fusion of intelligence and exercise design will produce a more integrated exercise product that the FDNY can share the benefits with other city agencies as well as private sector entities. The goal is not simply to improve the exercise design methods but to increase the usability of exercise design as a building block of community resiliency. The incorporation of intelligence with preparedness efforts is essential in order for the community to achieve true resiliency. Improving public and private communications and the exchange of information is possible through the strengthening of these relationships. The new efficient development of exercise design should highlight exercise deficiencies overlapping the concerns of city agencies and private industry and lead to the creation of exercises that produce more value that can be reinserted into the exercise design model and continue to build on the cycle. The fusion of exercise design with intelligence will perpetuate both the exercise design and intelligence cycles, resulting in the development of predictive exercises that build a closer public-private relationship and a more resilient community.

The plans listed above include a recalibration of the way exercises are planned and conducted; from a stagnant, scenario driven enterprise to one fueled by current analytical expertise.

B. FINAL THOUGHTS

If we wish to have collaboration between agencies, we must first foster an atmosphere whereby mutual acceptance of ideas exists. By using intelligence analyzed

from real world events, predictive exercises can be developed incorporating the needs of the community, public and private. In order to implement this strategy to benefit a department like the FDNY and a city like New York will require the creation and staffing of additional positions.

Initially, this is important to both the FDNY's Center for Terrorism and Disaster Preparedness's (CTDP) Intelligence division and Exercise design section. The success will have a cascading effect. As the CTDP conducts more intelligence lead exercises, those involved in the exercises, the FDNY personnel and community stakeholders, will begin to enjoy more realistic results in the exercise. This can be measured in increased collaboration in future exercises as well as increased sharing of intelligence between the agency and private stakeholders.

The idea of intelligence driven exercise design may seem a simple and logical one. We receive information from various sources every day. This information is analyzed and compared to what is already known, then is synthesized and distributed as intelligence. A careful analysis of this intelligence should enable us to develop exercises that look forward rather than backward, to allow responders to learn from yesterday's emergencies and prepare for tomorrow's.

C.   RECOMMENDATIONS

While the core of this thesis was directed toward the exercise design and intelligence communities, the recommendations will be directed primarily toward the FDNY and its intelligence and exercise needs. In order to successfully implement the intelligent exercise model, the following recommendations are suggested.

1.   Promote Intelligent Exercise Theory

As this thesis has made clear, Intelligent Exercise needs to be the future of exercise; and the future of intelligence. The two communities need to realize their significance to one another and work on developing mutual objectives. As each realizes the other is part of their in-group and that they are not individual entities competing for

the same commodity but partners working toward the same goals, they can begin to develop intelligent exercises that benefit the entire community.

2. Clearly Define the Exercise Design Model

Intelligent exercise is a simple fusion of the intelligence cycle and the HSEEP exercise design cycle, the process needs to be fully explained. The benefits that come from the intersection of the cycles at the evaluation process drive the incorporation of intelligence into exercise. The re-evaluation process will have to be apparent as will an anticipated benefit and an obvious ease of use.

3. Create an Exercise Intelligence Liaison Officer

This position would serve as a liaison between exercise design and intelligence. Not dedicated to either exercise design or intelligence, but committed to the fusion of both interests, the liaison position will function as a bridge between current trends and future exercises. By understanding the principals of intelligence gathering and information sharing as well as the fundamentals of exercise design, the officer assigned to this task can link the two fields in an effort to increase the value of preparedness exercises. It would also serve the fusion of the two sections to obtain a level of security clearance for this officer so he may further bridge the gap between the fields. The cost will be dependent on the member filling the new position. This can be satisfied by assigning a current member of either the intelligence section familiar with exercise design or similarly with a member of the exercise design team possessing intelligence experience. Since both sections are already established, the impact on cost should be minimal. The cost can be split across the budgets already allocated for the two sections. However, transitioning a member between both sections will essentially leave both sections with a partial personnel deficit as the new position will remove them from current responsibilities. Conversely, if a new member needs to be assigned from outside the Center, the cost will be consistent with the member's pay rate and will require new budget lines. The creation of a new position will definitely have an impact on the grant funded budget that the CTDP survives on.

This initial financial influence can be offset by future anticipated efficiency. By increasing the value of exercises conducted and relying on participation from private stakeholders, the quantity of exercises conducted should decrease while the value per exercise increases. It can be anticipated that the cost of fulfilling the new Liaison position will be, at least partially, compensated through the efficiency of the new procedure.

The implementation procedure should not be lengthy but identifying the new exercise intelligence liaison officer may take several months. The position is new and untested. Identifying an appropriate officer who is a Master Exercise Practitioner (MEP) and an experienced and qualified Intelligence analyst will be time consuming. A person with these specific characteristics may not exist and the position may be filled by an individual with only partial qualifications. Also, once filled, as the position is un-established, there will be a positional learning curve. The size of the learning curve will be dependent on individual skills.

4.   Develop a N.Y. City–Centric Exercise Design Platform

Similar to the DHS National Lessons Learned Information Sharing (LLIS),[203] this online platform would actively seek collaboration citywide when intelligence dictates the need for a specific exercise. Made up of public and private stakeholders, agencies would be responsible to share intelligence and ideas and offer personnel committed to the design team. At the conclusion of the exercise, collaboration on the AAR would result in a shared NYC Lessons Learned (NYCLL) platform that would serve as a foundation for future collaborative exercises. Transfer of knowledge is not an easily identified process,[204] but the potential return on investment that can be associated with collaborated exercises can be assumed to be significant. When multiple agencies look at an issue through a variety of perspectives we can gain greater insight into potential areas of concern invisible to one agency or another.

As a result of its commitment to improvement through exercise, the FDNY currently employs over 40 Master Exercise Practitioners (MEP). Many NY city agencies

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[203] "HSEEP-LLIS," https://www.llis.dhs.gov/.

[204] Eriksson, "Knowledge Transfer," 162–16.

have zero. That doesn't mean they do not have an interest in exercise, they may not have the personnel or resources available. This limits their capability to contribute. By making lessons learned and AARs available on an open source, citywide platform, each agency would have the potential to learn from every exercise and all city agencies.

As a result of the NYCLL, agencies without exercise design personnel could also find more openness in the NYC exercise design community allowing them to observe and/or contribute to exercises from other agencies and remain within their budgetary or personnel constraints.

New ideas drive change. Change, however, is often met with resistance. This resistance is what we need to overcome. The idea of moving procedures forward, while on the surface would seem to resonate progress, is frightening or intimidating to some. Likewise, interagency biases may prevent collaboration between agencies, public and private. While many agencies are comfortable exposing deficiencies internally, they tend to be less comfortable having these publically known.[205] This can be true internally as well as externally. If each section views itself as part of the in-group and the other section as the out-group, then collaboration will not flourish.[206] By developing exercises based on intelligence together, both sections will realize that they are part of the same in-group. Only then can true effective collaboration be expected to grow.

D.   METRICS OF SUCCESS

Stakeholders will look to participate in the development of these exercises, as FDNY exercise design improves its reputation among the city exercise design community. Insurance underwriters, aware of the benefits reaped by their clients will encourage this participation by offering incentives to these stakeholders. Therefore, the stakeholders, private industry, can offset the cost of the exercise by partially funding this exercise based on the cost savings rewarded them by their insurance companies. Consequently, by improving the exercise design product and exploiting its collaborative benefits citywide, the new process can become self funding.

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[205] Best, *Intelligence Information.*
[206] Tajfel, *Social Identity and Intergroup Relations.*

In order to determine successfulness, progress will have to be measured incrementally. First, the length of time to identify an Intelligence exercise liaison should serve as a significant indicator of anticipated success. A prolonged search with several starts and stops could be indicative of future systemic problems. Conversely, if the position is filled quickly and the transition begins cooperatively, expectations of success are realistic. The positional requirements are only part of the anticipated systemic concerns.

The true measure of success will be the observation of increased collaborative interest among additional city agencies (e.g. NYPD) and private stakeholders with FDNY exercise design. It is possible that knowledge developed from the analytic preparedness activities may be transferred to individuals that participated in the exercises by discussions or other activities not necessarily acknowledged by the individuals.[207] This means that some of the benefits derived during the exercises may simply result in performance improvements with individual applications. Employees and responders may find themselves more prepared and familiar with their evacuation and response capabilities in ways that are not tangibly measureable, but result in overall improvements that extend to non-emergency situations.

E.   POTENTIAL OPPOSITION

There is an organizational reluctance to change for several reasons. Teemu Reiman, and Carl Rollenhagen outline human and organizational biases that have an effect on the management of safety in four thematic areas: beliefs about human behavior, beliefs about organizations, beliefs about information and safety models.[208] It is possible that the new procedure will be met with resistance from both the exercise design and intelligence sections. The fusion of exercise and intelligence is not the way things are currently done and siloed operations are often preferred to change. The two divisions currently operate with stovepipe functionality. That is to say, while they are certainly aware of each other, there exists a territorial protection around which each section

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[207] Eriksson, "Knowledge Transfer," 162–169
[208] Reiman and Rollenhagen, "Human and Organizational Biases."

operates and cooperative analysis rarely occurs. The inclusion of intelligence into exercise may result in mission creep, where exercise design feels that intelligence is guiding their exercise plans. Likewise, Intelligence may feel as if Exercise is trying to coax intelligence to fit the desired exercise plan. The two sections will have to realize a common goal and work together to achieve it. Each will also have to respect the role of the other in order to maintain unified objectives. In other words, each section will function as independent elements of the same corporation realizing the same goals. In order to achieve this, an exercise can be developed with the interests of the intelligence section featured prominently. By including the intelligence personnel in each step of the exercise process, they can see, firsthand, the benefits that will be gleaned from this fusion. Allowing them to have structural input toward the completed exercise will let them direct the exercise to include the intelligence they have analyzed including anticipated actions by players and antagonists, whether man-made or natural.

Intelligence has historically been labeled as a trade that shares information reluctantly.[209] Exercise design needs to establish itself as a legitimate consumer of intelligence in order to encourage intelligence sharing. To accomplish this, exercise design is going to have to demonstrate a value added to the intelligence community. The incorporation of the two cycles demonstrates this. The evaluation step in each cycle is designed to support the movement of the other. Exercise design can provide valuable action items recovered after an exercise showing a need for additional intelligence.

After Action Reports written at the conclusion of an exercise can show successes from intelligence inserted into the process but, more importantly, exhibit a need for additional intelligence.

This model is asking the FDNY intelligence community to share openly. Not only to share intelligence but to offer analysis relevant to the exercise design community. The fact that they are being asked to share internally may not matter. This transition from two independent sections to two parts of the same whole operating cohesively may meet some opposition.

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[209] National Commission on Terrorist Attacks upon the United States, *The 9/11 Commission Report.*

Specialized training is required to become an Intelligence analyst. Exercise design professionals receive training to become Master Exercise Practitioners (MEPs). Both specialists are proud of their certifications and protective of them. If the model is successfully implemented within the FDNY, then it could serve as the ideal for incorporation between the two communities beyond the Department. This could create territorial defensiveness by both communities, if either the intelligence or exercise design community feels the other is attempting to assume their responsibilities without the benefit of appropriate training.

F.   ADDITIONAL RESEARCH NEEDED

Several areas require additional research in the area of Intelligent Exercise. The relationship between recommendations and objectives needs to be expanded. While the research conducted was sufficient for this study, it should be continually expanded and monitored. This will produce evidence of improvement trends or show continued stagnation in areas that require improvements.

The Intelligent Exercise Theory and the Intelligent Exercise Model need to be exercised. A viable metric must be developed by which the theory can be tested and evaluated and resources and time committed to its use and necessary improvement. To simply adapt a new policy without a willingness to support its progress is counterproductive to the theory's premise.

Collaboration should be part of every agency's strategic plan. Public and private agencies must perceive themselves as part of the larger community first and foremost and realize that their participation in an agency should come secondary. Community resiliency should be the goal of every member of the community.

SUPPLEMENTAL

Analysis of 101 After Action Reports Research conducted for this thesis was based on 101 After Action Reports (AAR) that were evaluated for themes in recommendations and objectives. The AARs were separated by real-world events and exercises. Each exercise AAR was coded for inclusion into 71 categories of objectives and 107 categories of recommendations. Each real-world AAR was coded for recommendations in the same categories. The frequencies of occurrence were then compared and analyzed.

Those interested in obtaining the supplemental can contact Dudley Knox Library at Naval Postgraduate School.

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LIST OF REFERENCES

ABC News. "James Woods Reported Suspicious Passengers to FBI" Accessed November 8, 2013. http://abcnews.go.com/Entertainment/story?id=102335

Alexander, David E. *Natural Disasters*. New York: Springer, 1993.

AQ Chef. "Make a Bomb in the Kitchen of Your Mom." *Inspire* (Summer 2010).

Association of State and Territorial Health Officials. *A Summary of Four After-Action Reports on Hurricane Katrina*. Arlington, VA: Association of State and Territorial Health Officials, 2006.

Auf der Heide, Erik. *Disaster Response: Principles of Preparation and Coordination*. St. Louis, MO: Mosby, 1989.

Baker, Al, and Karin Henry. "Car Bomb Leads to Evacuation in Times Square," *The New York Times*. May 2, 2010.

Bergen, Peter. "Al Qaeda, the Organization—A Five-Year Forecast." *Annals of the American Academy of Political and Social Science* 618 (July 2008): 14–30.

———. *Assessing the Terrorist Threat*. Darby, PA: Diane Publishing, 2011.

Best Jr., Richard A. *Intelligence Information: Need-to-Know vs. Need-to-Share*. Darby, PA: Diane Publishing, 2011.

Blaich, Peter W. *The Benefits of Behavioral Research to the Fire Service - Human Behavior in Fires and Emergencies*. Lincoln, NE: iUniverse, 2008.

Bongar, Bruce, Lisa M. Brown, Larry E. Beutler, James N. Breckenridge, and Philip G. Zimbardo. *Psychology of Terrorism*. New York: Oxford University Press, 2007.

Bose, Ranjit. "Competitive Intelligence Process and Tools for Intelligence Analysis." *Industrial Management & Data Systems* 108, no. 4 (2008): 510–528.

Boyatzis, Richard E. *Transforming Qualitative Information: Thematic Analysis and Code Development*. Thousand Oaks, CA: SAGE, 1998.

Cameron, Kim S., and Robert E. Quinn. *Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework*, Rev. Ed. San Francisco: Jossey-Bass, 2006.

Central Intelligence Agency. "Wanted: A Definition of 'Intelligence.'" Accessed February 4, 2014. https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/csi-studies/studies/vol46no3/article02.html

Chalk, Peter. "U.S. Environmental Groups and 'Leaderless Resistance' ." *Jane's Intelligence Review*, July 1, 2001.

Chandra, Anita and Joie Acosta. "Translating Policy into Action to Build Community Resilience." *RAND*, September 4, 2013.http://www.rand.org/blog/2013/09/translating-policy-into-action-to-build-community-resilience.html.Choi, Sang Ok. "Emergency Management: Implications from a Strategic Management Perspective." *Journal of Homeland Security and Emergency Management* 5, no. 1 (January 7, 2008).

Christensen, Clayton M. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail (Management of Innovation and Change)*. Reprint ed. Boston: Harvard Business Review Press, 2013.

City of Roseville, CA. *Westfield Galleria Arson. After Action Report*. Roseville, CA: City of Roseville, CA, October 2010.

Coker, Margaret, and Keith Johnson. "The Death of Osama Bin Laden As Al Qaeda Adapts Its Tactics, Threat From Splinter Groups Persists." *Wall Street Journal*, May 3, 2011.

Collicutt, John. "Community Resilience: The Future of Business Continuity." *Journal of Business Continuity & Emergency Planning* 3, no. 2 (2009): 145–152.

Crabtree, Benjamin F., and William L. Miller. *Doing Qualitative Research*. Thousand Oaks, CA: SAGE, 1999.

Crenshaw, Martha. "The Psychology of Terrorism: An Agenda for the 21st Century." *Political Psychology* 21, no. 2 (2000): 405–420.

Crichton, Margaret, and Terence Kelly. "Developing Emergency Exercises for Hazardous Material Transportation: Process, Documents and Templates." *Journal of Business Continuity & Emergency Planning* 6, no. 1 (2012): 32–46.

Cummings, Wm. Theodore, and William Corney. "A Conceptual Model of Gambling Behavior: Fishbein's Theory of Reasoned Action." *The Journal of Gambling Behavior* 3, no. 3 (Fall 1987): 190–201.

Davis, Paul K. "Uncertainty-Sensitive Planning." *In New Challenges, New Tools for Defense Decisionmaking*, edited by Stuart Johnson, Martin Libicki, and Gregory F. Treverton, 131–156. Washington, DC: RAND, 2003.

Department of Homeland Security.."HSEEP_Revision_Apr13_Final.pdf." Accessed October 31, 2013. http://www.nmdhsem.org/uploads/files/HSEEP_Revision_Apr13_Final.pdf.

———."HSEEP-LLIS." Accessed February 6, 2014. https://www.llis.dhs.gov/.

———. *Quadrennial Homeland Security Review Report*. New York: Department of
Homeland Security, February 2010.

Disaster Planning and Emergency Management Blog. http://emergency-
planning.blogspot.com/2011/02/offprints-available.html.

Donahue, Amy K., and Robert V. Tuohy. "Lessons We Don't Learn: A Study of the
Lessons of Disasters, Why We Repeat Them, and How We Can Learn Them"
Homeland Security Affairs 2, no. 2 (July 2006).

Donahue, Donald A., Stephen O. Cunnion, Carey D. Balaban, and Ken Sochats. "The All
Needs Approach to Emergency Response" *Homeland Security Affairs* 8 (February
2012).

Drabek, Thomas E. *The Human Side of Disaster*, Boca Raton, FL: CRC Press, 2013.

Drake, C.J.M. "The Provisional IRA: A Case Study." *Terrorism and Political Violence* 3,
no. 2 (1991): 43–60.

Duke, Annie. "Sunk Cost." *Bluff Magazine*, April 2007.
http://www.bluff.com/magazine/sunk-cost-8962/.

Eriksson, Kerstin. "Knowledge Transfer between Preparedness and Emergency
Response: A Case Study." *Disaster Prevention and Managemen*t 18, no. 2 (2009):
162–169.

FBI. "Intelligence Defined." Accessed February 9, 2014. https://www.fbi.gov/about-
us/intelligence/defined.

Figlewski, Stephen. "Subjective Information in a Betting Market." *Journal of Political
Economy* 87, no. 1 (1979): 75–88.

Fishbein, Martin, and Icek Ajzen. *Predicting and Changing Behavior: The Reasoned
Action Approach*. New York: Psychology Press, 2010.

Galbraith, Jay R. *Designing Organizations: An Executive Briefing on Strategy, Structure,
and Process*. San Francisco: Jossey-Bass, 1995.

Hanson, Robin. "The Informed Press Favored the Policy Analysis Market." Fairfax, VA:
George Mason University, 2005.

———. "Designing Real Terrorism Futures." *Public Choice* 128, (July 2006): 257–274.

Hocevar, Susan Page, Gail Fann Thomas, and Erik Jansen. "Building Collaborative
Capacity: An Innovative Strategy for Homeland Security Preparedness." In
Advances in Interdisciplinary Studies of Work Teams, 12: 255–274. (Bingley,
UK: Emerald, 2006).

Hofinger, Gesine, Robert Zinke, and Stefan Strohschneider. "Role-Specific Psychological Requirements in Preparing Public Transportation Staff for Disaster Response." *Disaster Prevention and Management* 20, no. 4 (2011): 398–412.

Horgan, John, and Max. Taylor. "The Provisional Irish Republican Army: Command and Functional Structure." *Terrorism and Political Violence* 9, no. 3 (September 1997): 1–32.

Howden, Daniel. "Terror in Westgate Mall: The Full Story of the Attacks That Devastated Kenya." *The Guardian*, October 4, 2013. http://www.theguardian.com/world/interactive/2013/oct/04/westgate-mall-attacks-kenya-terror.

Huber, George P. "Organizational Learning: The Contributing Processes and the Literatures." *Organization Science* 2, no. 1 (1991): 88–115.

Investigative Project on Terrorism. "Al Qaida's English-Language Terrorism Blueprint: The Investigative Project on Terrorism." *IPT News,* July 13, 2010. http://www.investigativeproject.org/2056/al-qaidas-english-language-terrorism-blueprint.

Jackson, Brian A, John C Baker, Kim Cragin, John Parachini, Horacio R Trujillo, and Peter Chalk.. *Aptitude for Destruction. Volume 1: Case Studies of Organizational Learning in Five Terrorist Groups*. Santa Monica, CA: RAND, 2005. http://www.rand.org/publications/MG/MG331/.

———. *Aptitude for Destruction: Organizational Learning in Terrorist Groups and Its Implications for Combating Terrorism Volume 2*. Santa Monica, CA: RAND, 2005. http://www.rand.org/publications/MG/MG331/.

Jenvald, Johan, Magnus Morin, and J. Peter Kincaid. "A Framework for Web-Based Dissemination of Models and Lessons Learned from Emergency-Response Exercises and Operations." *International Journal of Emergency Management* 1, no. 1 (2001): 82–94.

Journal of Geography & Natural Disasters. "Editorial Board," accessed August 8, 2013, http://www.omicsgroup.org/journals/editorialboardJGND.php#.

Kansas Department of Health and Environment. "About the Exercise & Training Program." Accessed February 5, 2014. http://www.kdhe-exercises.org

Kates, Robert W. *Hazard and Choice Perception in Flood Plain Management*. Paper No. 78. Chicago: The University of Chicago, 1962.

Kincaid, J. Peter, Joseph Donovan, and Beth Pettitt. "Simulation Techniques for Training Emergency Response." *International Journal of Emergency Management* 1, no. 3 (2003): 238–246.

Kippenberger, Tony. "Pitfalls in Scenario Planning." *The Antidote* 4, no. 4 (1999): 32–33.

Krippendorff, Klaus. *Content Analysis: An Introduction to Its Methodology*. Beverly Hills, CA: Sage 1980.

Lomnitz, C. "What Is a Disaster?" *Natural Hazards* 18, no. 1 (1998): 87–88.

Madsen, Peter M. "These Lives Will Not Be Lost in Vain: Organizational Learning from Disaster in U.S. Coal Mining." *Organization Science* 20, no. 5 (October 2009): 861–875.

McConnell, Allan, and Lynn Drennan. "Mission Impossible? Planning and Preparing for Crisis1." *Journal of Contingencies and Crisis Management* 14, no. 2 (2006): 59–70.

Miller, Danny. "A Preliminary Typology of Organizational Learning: Synthesizing the Literature." *Journal of Management* 22, no. 3 (1996): 485–505.

Mueller, John. "Assessing Measures Designed to Protect the Homeland." *Policy Studies Journal* 38, no. 1 (2010): 1–21.

Nairobi, Daniel Howden. "Terror in Westgate Mall: The Full Story of the Attacks That Devastated Kenya." *Guardian*, October 4, 2013.

National Commission on Terrorist Attacks upon the United States. *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks upon the United States*. New York: Norton, 2004.

New York City Police Department. *Analysis of Al-Shabaab's Attack at the Westgate Mall in Nairobi Kenya*. New York: New York City Police Department, November 1, 2013.

O'Brien, Geoff, Phil O'Keefe, Zaina Gadema, and Jon Swords. "Approaching Disaster Management through Social Learning*." Disaster Prevention and Management* 19, no. 4 (2010): 498–508.

Page, Monte M, and Carolyn Wood Sherif, eds. *Nebraska Symposium on Motivation1979: Beliefs, Attitudes, and Values*. Lincoln, NE: University of Nebraska Press, 1980.

Paton, Douglas, and David Johnston. "Disasters and Communities: Vulnerability, Resilience and Preparedness." *Disaster Prevention and Management* 10, no. 4 (2001): 270–277.

Pelfrey, William V. "The Cycle of Preparedness: Establishing a Framework to Prepare for Terrorist Threats." *Journal of Homeland Security and Emergency Management* 2, no. 1 (January 2, 2005).

Pfeifer, Joseph W. "Command Resiliency: An Adaptive Response Strategy for Complex Incidents." Master's thesis, Naval Postgraduate School, 2005.

Phelps, Regina. *Emergency Management Exercises: From Response to Recovery: Everything You Need to Know to Design a Great Exercise*. San Francisco: Chandi Media, 2011.

Phillipkoski, Kristen. "Eco-Terror Cited as Top Threat." *Wired*, June 16, 2004.

Plato. *The Allegory of the Cave*. Brea, CA: P & L, 2010.

Pockett, Consuela B. *A Comparative Analysis of Emergency Preparedness Efforts*. Maxwell Air Force Base, AL: Counterproliferation Center, August 2005.

Quarantelli, Enrico L. *An Agent Specific or an All Disaster Spectrum Approach to Socio-Behavioral Aspects of Earthquakes?* Newark, DE: Disaster Research Center, 1981.

———. "Organizational and Group Behavior in Disasters." *The American Behavioral Scientist* 13, no. 1 (January 1970): 325–330.

———. *Human Resources and Organizational Behaviors in Community Disasters and Their Relationship to Planning*. Newark, DE: Disaster Research Center, 1982.

Quarantelli, Enrico L., and Russell R. Dynes. "Response to Social Crisis and Disaster." *Annual Review of Sociology* 3 (1977): 23–49.

Rabasa, Angel, Robert D. Blackwill, Peter Chalk, Kim Cragin, C. Christine Fair, Brian A. Jackson, Brian Michael Jenkins, Seth G. Jones, Nathaniel Shestak, and Ashley J. Tellis. *The Lessons of Mumbai*. Santa Monica, CA: RAND, 2009.

RAND. "Translating Policy into Action to Build Community Resilience." Accessed October 28, 2013. http://www.rand.org/blog/2013/09/translating-policy-into-action-to-build-community-resilience.html.

Reiman, Teemu and Carl Rollenhagen. "Human and Organizational Biases Affecting the Management of Safety." *Reliability Engineering & System Safety* 96, no. 10 (October 2011).

"The Resistance to Change." Accessed February 4, 2014. https://sites.google.com/site/theresistancetochange/.

Riley, Paul W., David J. Dalby, and Elizabeth A. Turner. "Making Acute Hospital Exercises More Realistic without Impacting on Healthcare Delivery." *Journal of Business Continuity & Emergency Planning* 6, no. 2 (2013): 143–150.

Rittel, Horst WJ, and Melvin M. Webber. "Dilemmas in a General Theory of Planning."
Policy Sciences 4, no. 2 (1973): 155–169.

Sales, Nathan. *Share and Share Alike: Intelligence Agencies and Information Sharing*.
Arlington, VA: George Mason University School of Law, 2009.

Salter, Margaret S., and Gerald E. Klein. *After Action Reviews: Current Observations
and Recommendation*s. Arlington, VA:U.S. Army Research Institute for the
Behavioral and Social Sciences, 2007.

Savransky, Semyon D. *Engineering of Creativity: Introduction to TRIZ Methodology of
Inventive Problem Solving*. Boca Raton, FL: CRC Press, 2002.

Senge, Peter M. *The Fifth Discipline: The Art & Practice of The Learning Organization*.
New York: Random House Audio, 1994.

———. "Mental Models." *Strategy & Leadership* 20, no. 2 (1992): 4–44.

Shugarman, Lisa R., Elise Eiseman, Arvind Jain, Nancy Nicosia, Stefanie Stern, and
Jeffrey Wasserman. *Enhancing Public Health Preparedness*. Santa Monica, CA:
RAND, 2005.

Simpson, David M. "Disaster Preparedness Measures: A Test Case Development and
Application." *Disaster Prevention and Management* 17, no. 5 (2008): 645–661.

Sinai, Joshua. "How Israel Approaches Homeland Security." *The Journal of
Counterterrorism & Homeland Security International* 10, no. 1 (Summer 2004):
1–6.

Smith, Peter J., Ian Robertson, and Lyn Wakefield. "Developing Preparedness for
Flexible Delivery of Training in Enterprises." *Journal of Workplace Learning* 14,
no. 6 (2002):

Smith, Stewart D., Richard Smith, Joseph Albanese, Elaine Forte, James Paturas, William
Halstead, and Anthony Tomassoni. "Disaster and Exercise Performance
Information Collection Tool: Capturing Observations in Four Minutes or Less."
Journal of Business Continuity & Emergency Planning 6, no. 2 (2013): 151–163.

Snowden, David J., and Mary E. Boone. "A Leader's Framework for Decision Making."
Harvard Business Review 85, no. 11 (2007): 68.

Sparkes, Andrew. "Narrative Analysis: Exploring the Whats and Hows of Personal
Stories." In *Qualitative Research in Health Care*, edited by Immy Holloway,
191–208. 1st ed. Berkshire, UK: Open University Press, 2005.

Spencer, Richard. "Boston Marathon Bombs: Al_Qaeda's Inspire Magazine Taught
Pressure Cooker Bomb-Making Techniques." *The Telegraph*, April 16, 2013.

State of Indiana. "Reimbursement Procedure for FEMA Public Assistance." *IN.gov*, March 2006.

Stinchcomb, Jeanne B., and Francisco Ordaz. "The Integration of Two 'Brotherhoods' into One Organizational Culture: A Psycho-Social Perspective on Merging Police and Fire Services." *Public Organization Review* 7, no. 2 (January 30, 2007): 143–161.

Tajfel, Henri. *Social Identity and Intergroup Relations*. Cambridge: Cambridge University Press, 2010.

Townsend, Keeley, John P Sullivan, Thomas Monahan, and John Donnelly. "Intelligence-Led Mitigation." *Journal of Homeland Security and Emergency Management* 7, no. 1 (2010).

Turner, Allan, Kenneth Glantz, and Julie Gall. "A Practitioner-Researcher Partnership to Develop and Deliver Operational Value of Threat, Risk and Vulnerability Assessment Training to Meet the Requirements of Emergency Responders." *Journal of Homeland Security and Emergency Management* 9, no. 2 (January 28, 2012).

Tyszkiewicz, Mary T., Edward R. McCleskey, and Russell Miller. "Updating the National Planning Scenarios: Using Wicked Problems and Capability-Based Planning Concepts for Homeland Security." *Journal of Homeland Security and Emergency Management* 9, no. 1 (January 22, 2012).

United States Fire Administration. "AAR: After Action Review in the Fire Service.." Accessed October 28, 2013. https://www.usfa.fema.gov/downloads/pdf/coffee-break/ms/ms_2013_3.pdf.

United States Government Accountability Office. *Content Analysis: A Methodology for Structuring and Analyzing Written Material*. Washington, DC: U.S. General Accountability Office, September 1996. http://www.gao.gov/products/PEMD-10.3.1

———. *Homeland Security: Management Challenges Facing Federal Leadership*. Washington, DC: U.S. Government Accountability Office, December 2002. http://www.gao.gov/products/GAO-03-260.

University of Delaware, DRC-Disaster Research Center. "Faculty and Staff Bios." Accessed August 29, 2013. http://www.udel.edu/DRC/aboutus/bios/Quarantelli.html

Vaismoradi, Mojtaba, Hannele Turunen, and Terese Bondas. "Content Analysis and Thematic Analysis: Implications for Conducting a Qualitative Descriptive Study: Qualitative Descriptive Study." *Nursing & Health Sciences* 15, no. 3 (September 2013): 398–405.

Van der Heijden, Kees. *Scenarios: The Art of Strategic Conversation*. Hoboken, N.J.:
John Wiley & Sons, 2005.

Van Notten, Philip. "Scenario Development: A Typology of Approaches." In *Think
Scenarios, Rethink Education*. Paris: OECD Publishing, 2006).

———. *Writing on the Wall: Scenario Development in Times of Discontinuity*. Boca
Raton, FL: Dissertation.com, 2004.

Vaughan, Diane. *The Challenger Launch Decision Risky Technology, Culture, and
Deviance at NASA*. Chicago: University of Chicago Press, 1996.

———. "The Dark Side of Organizations: Mistake, Misconduct, and Disaster." *Annual
Review of Sociology* (1999): 271–305.

Waugh, William L., and Gregory Streib. "Collaboration and Leadership for Effective
Emergency Management." *Public Administration Review* 66, no. s1 (2006):
131–140.

Weber, Robert Philip. *Basic Content Analysis*. Newbury Park, CA: SAGE, 1990.

Weiss, Steven. "Review of Communicating Emergency Preparedness: Strategies for
Creating a Disaster Resilient Public." *Journal of Homeland Security and
Emergency Management* 6, no. 1 (January 2, 2009).

Wilkin, Peter. "The Ideology of Ergonomics." *Theoretical Issues in Ergonomics Science*
11, no. 3 (2010): 230–244.

White House. T*he Federal Response to Hurricane Katrina: Lessons Learned*.
Washington, DC: White House, 2006

Wisconsin.Watch.Org. "What They Learned in the Disaster: Agencies' After-Action
Reports." Accessed January 14, 2014. http://www.wisconsinwatch.org/viz/what-
they-learned-in-the-disaster-agencies-after-action-reports/.

Zitzewitz, Eric, and Justin Wolfers. "Prediction Markets." *The Journal of Economic
Perspectives* 18, no. 2 (Spring 2004): 107–126.

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