



**NAVAL
POSTGRADUATE
SCHOOL**

MONTEREY, CALIFORNIA

THESIS

**FINDING THE “SWEET SPOT” FOR CATASTROPHIC
INCIDENT SEARCH AND RESCUE**

by

Eric M. Bleakney

September 2009

Thesis Advisor:
Second Reader:

Stan Supinski
Houston Polson

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REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE September 2009	3. REPORT TYPE AND DATES COVERED Master's Thesis	
4. TITLE AND SUBTITLE Finding the "Sweet Spot" for Catastrophic Incident Search and Rescue			5. FUNDING NUMBERS	
6. AUTHOR(S) Eric M. Bleakney				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			12b. DISTRIBUTION CODE A	
13. ABSTRACT (maximum 200 words) This thesis examines the national preparedness to conduct catastrophic incident search and rescue (SAR) using organization-specific doctrine, concept plans, congressional research reports and testimonies, after action reviews, periodicals, federal government plans, interviews, a focus group and two benchmark studies. The research indicates that individual organizations conduct SAR activities well, but combined, joint and interagency catastrophic search and rescue preparations are lacking. Should another catastrophic incident occur tomorrow, the SAR results will likely exhibit the same unacceptable inefficiency as was found in Hurricane Katrina. Finding the sweet spot for response to catastrophic incidents is needed. There are three major findings: First, a national strategy for SAR is needed. This epic effort will help to improve the interagency coordination between equity holders of the search and rescue megacommunity and set the conditions to improve catastrophic incident SAR. Secondly, a Joint Air Ground Coordination Center (JAGCC) is critical to effective response operations. Two benchmark studies suggest a framework for developing a SAR coordination center using experiences of the wildland firefighting community and the United States Secret Service. Finally, domestic and international interagency coordination through integrated strategy development, planning, training and exercises is needed to improve response operations.				
14. SUBJECT TERMS Search and Rescue, Catastrophic Incident, Catastrophic Planning, National Search and Rescue Advisory Committee, Integrated Planning, NIFC, National Interagency Fire Center, MAC, National Multiagency Coordination Center, MACC, Multiagency Communications Center, Interagency Coordination, sweet spot, USNORTHCOM, United States Northern Command, CI SAR, Catastrophic Incident Search and Rescue, Air Force Rescue Coordination Center, Joint Personnel Recovery Center, Personnel Recovery			15. NUMBER OF PAGES 165	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU	

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**FINDING THE “SWEET SPOT” FOR CATASTROPHIC INCIDENT
SEARCH AND RESCUE**

Eric M. Bleakney
Interagency Specialist, U.S. Northern Command, Colorado Springs, CO
B.S., Slippery Rock University of Pennsylvania, 1986
M.A., Naval Postgraduate School, 2000

Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES
(HOMELAND SECURITY AND DEFENSE)**

from the

**NAVAL POSTGRADUATE SCHOOL
September 2009**

Author: Eric Bleakney

Approved by: Stan Supinski
Thesis Advisor

Houston Polson
Second Reader

Harold A. Trinkunas, PhD
Chairman, Department of National Security Affairs

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ABSTRACT

This thesis examines the national preparedness to conduct catastrophic incident search and rescue (SAR) using organization-specific doctrine, concept plans, congressional research reports and testimonies, After Action Reviews, periodicals, federal government plans, interviews, a focus group and two benchmark studies. The research indicates that individual organizations conduct SAR activities well, but combined, joint and interagency catastrophic search and rescue preparations are lacking. Should another catastrophic incident occur tomorrow, the SAR results will likely exhibit the same unacceptable inefficiency as was found in Hurricane Katrina. Finding the sweet spot for response to catastrophic incidents is needed. There are three major findings: First, a national strategy for SAR is needed. This epic effort will help to improve the interagency coordination between equity holders of the search and rescue megacommunity and set the conditions to improve catastrophic incident SAR. Secondly, a Joint Air Ground Coordination Center (JAGCC) is critical to effective response operations. Two benchmark studies suggest a framework for developing a SAR coordination center using experiences of the wildland firefighting community and the United States Secret Service. Finally, domestic and international interagency coordination through integrated strategy development, planning, training and exercises is needed to improve response operations.

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TABLE OF CONTENTS

I.	INTRODUCTION.....	1
	A. BACKGROUND	1
	B. IMPORTANCE.....	2
	C. RESEARCH QUESTION	4
	D. SIGNIFICANCE OF RESEARCH	4
	E. METHODOLOGY	5
	1. Interviews.....	5
	2. Organizational Benchmark Studies	6
	3. Focus Group	7
	F. THESIS STRUCTURE	8
II.	LITERATURE REVIEW	11
	A. BACKGROUND	11
	B. LITERATURE SUB-SETS	14
	1. Literature Related to Military SAR Operations	15
	<i>a. Three Elements of Military SAR: Personnel Recovery, Defense Support of Civil Authorities and Civil SAR.....</i>	<i>17</i>
	<i>b. Civil Support Task List</i>	<i>19</i>
	2. Literature Related to Civil SAR Operations	19
	<i>a. DHS Literature.....</i>	<i>19</i>
	<i>b. United States Coast Guard (USCG) Literature.....</i>	<i>21</i>
	<i>c. Emergency Support Function (ESF) #9 Literature.....</i>	<i>23</i>
	C. LITERATURE REVIEW SYNOPSIS.....	24
III.	ORGANIZATIONS, FUNCTIONS AND ISSUES	27
	A. INTRODUCTION.....	27
	B. ORGANIZATIONS AND FUNCTIONS.....	28
	1. Introduction.....	28
	2. National Search and Rescue Committee (NSARC)	33
	<i>a. Responsibilities.....</i>	<i>33</i>
	<i>b. Organization.....</i>	<i>34</i>
	<i>c. How the NSARC Fits in the SAR Megacommunity</i>	<i>35</i>
	3. DHS/FEMA ESF #9	35
	<i>a. Responsibilities.....</i>	<i>35</i>
	<i>b. DHS/FEMA ESF #9 Organization for CI SAR.....</i>	<i>38</i>
	<i>c. How DHS/FEMAFits into the SAR Megacommunity.....</i>	<i>39</i>
	4. USNORTHCOM.....	40
	<i>a. Responsibility</i>	<i>40</i>
	<i>b. DoD/ USNORTHCOM Organization for CI SAR.....</i>	<i>45</i>
	<i>c. How DoD/USNORTHCOM Fits in for CI SAR.....</i>	<i>47</i>
	5. State Civil SAR Responsibilities and Organization.....	52
	<i>a. Responsibilities.....</i>	<i>52</i>
	<i>b. State Organization for CI SAR.....</i>	<i>53</i>

c.	<i>How the States Fit into the CI SAR Megacommunity</i>	54
6.	The National Guard	55
a.	<i>National Guard Responsibilities for CI SAR</i>	55
b.	<i>National Guard Organization for CI SAR</i>	56
c.	<i>How the National Guard Fits into the CI SAR Megacommunity</i>	57
7.	The United States Agency for International Development/International Search and Rescue Advisory Group (USAID/INSARAG)	59
a.	<i>Responsibilities of USAID/INSARAG</i>	59
b.	<i>USAID/INSARAG Organization for CI SAR</i>	59
C.	SAR TECHNOLOGICAL TOOLS	61
1.	Sharing Knowledge is Desirable	63
2.	Operational and Strategic Implications	64
3.	The COSPAS—Search and Rescue Satellite Aided Tracking System (SARSAT) Program	65
D.	ANALYSIS	67
E.	SUMMARY	70
IV.	INTERVIEWS AND FOCUS GROUP REVIEW	71
A.	INTRODUCTION	71
B.	INTERVIEWS	73
1.	Interview Audience	73
2.	Questions Discussed During Interview	73
3.	Significant Findings of Interview Process	75
C.	SAR FOCUS GROUP	78
1.	SAR Focus Group Membership	78
2.	SAR Focus Group Vision and Philosophy	79
a.	<i>USNORTHCOM SAR Focus Group Actions and Accomplishments</i>	80
b.	<i>Near Term Objectives</i>	81
c.	<i>SAR (Cell) Focus Group Long Term Goals</i>	82
D.	MAJOR FINDINGS	82
E.	SUMMARY	86
V.	ORGANIZATIONAL BENCHMARK STUDIES	87
A.	INTRODUCTION	87
1.	Overview	88
2.	Recent Examples Indicating a Need for a JAGCC	91
B.	COMPARISON OF WILDLAND FIREFIGHTING (WFF) AND CI SAR CRISIS MANAGEMENT	93
1.	Introduction and Overview	93
a.	<i>Common Purpose</i>	94
b.	<i>Authority</i>	96
c.	<i>Incentives</i>	97
d.	<i>Culture</i>	98
e.	<i>Structure</i>	99

C.	NATIONAL MULTIAGENCY COORDINATION CENTER (NMAC)	100
D.	UNITED STATES SECRET SERVICE (USSS) MULTIAGENCY COMMUNICATIONS CENTER (MACC).....	104
E.	SUMMARY	108
VI.	ANALYSIS AND RECOMMENDATIONS.....	109
A.	INTRODUCTION.....	109
B.	A NATIONAL STRATEGY FOR SAR IS NEEDED	114
1.	Introduction.....	114
2.	Purpose.....	114
3.	Limited Centralization and Traditional Format	115
4.	Anticipated Effects and Methodology	115
5.	A Decentralized Strategy is Essential.....	116
6.	Strategic Anticipation of “ <i>Black Swan</i> ” Events	118
7.	Four Critical Lifesaving Lines of Operation	120
8.	The National Approach	120
9.	Regionalization.....	121
10	Summary.....	122
C.	JOINT AIR GROUND COORDINATION CENTER	122
D.	INTERAGENCY COORDINATION	123
1.	Introduction.....	123
2.	Developing Objectives, Training and Exercises.....	125
3.	Summary.....	128
VII.	FURTHER RESEARCH OPPORTUNITIES AND CONCLUSIONS.....	129
A.	OPPORTUNITY FOR FURTHER RESEARCH.....	129
B.	CONCLUSIONS	130
APPENDIX:	HURRICANE KATRINA SAR CRITICAL CHALLENGES	131
	LIST OF REFERENCES	135
	INITIAL DISTRIBUTION LIST	144

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LIST OF FIGURES

Figure 1.	CI SAR Megacommunity	30
Figure 2.	FEMA Regions (from United States Army North, 2006).....	38
Figure 3.	2008 Multiagency Communications Centers for RNC and DNC.....	105
Figure 4.	A JAGCC Will Facilitate Coordination and Communication Requirements for Critical Lifesaving Missions	107
Figure 5.	GAO Reports SAR Inefficiencies Related to Hurricane Katrina.....	117
Figure 6.	A National SAR Strategy Will Strengthen Interagency and Intra-Agency Links (from Brafman & Beckstrom, 2006, p. 134).....	119
Figure 7.	The GAO Finds Effective Interagency Coordination Critical During Response Operations.....	123

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LIST OF TABLES

Table 1.	Comparison of AFRCC, ESF #9 and NSP Policy Description for SAR	21
Table 2.	Description of Acronyms for Figure 1	31
Table 3.	Overview of Scope and Primary Agency Responsibility per <i>ESF #9 Annex</i> ..	37
Table 4.	Distinct Legal Status of National Guard Component	56
Table 5.	National Guard SAR Civil Support Tasks	58
Table 6.	Interview Participants, Agency and Level of Participation	73
Table 7.	Important Interview Issues.....	74
Table 8.	Interagency Coordination and Strategic Communications Strategy (after Bryson, 2004, pp. 335–354 & 377–391)	85
Table 9.	Status of White House Katrina Lessons Learned as of May 30, 2006	90
Table 10.	NMAC and Geographic Area Coordination Centers (GACC) NMAC Representation (National Geographic Area Coordination Center, 2009).....	101
Table 11.	Findings and Relationship to a National SAR Strategy, JAGCC and Improved Interagency Coordination	111
Table 12.	Advantages that May be Derived from a Strategic Planning Process	121
Table 13.	Example of Time Driven Objectives and Priority Information Requirements (J. Sokol, personal communication, February 27, 2009).....	127

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ACKNOWLEDGMENTS

The author wants to thank Prof. Stan Supinski and Prof. Houston Polson for their patience and guidance during the work of researching this paper. Great appreciation also goes to my employer, USNORTHCOM. My employer supported this research effort for a prolonged period of time. I would also like to thank my classmates and the support staff at the Center for Homeland Defense and Security as they addressed the academic, technology, administrative and logistics problems encountered over the past year and a half. Thanks to Cat Grant for editing and formatting this work. Finally, I would like to afford a very special thanks to my wife and family for all their patience and understanding.

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I. INTRODUCTION

A catastrophic incident will result in large numbers of casualties and/or displaced persons, possibly in the tens to hundreds of thousands. During a catastrophic incident response, priority is given to human life-saving operations.

National Response Framework Catastrophic Incident Annex (Federal Emergency Management Agency, 2008)

A. BACKGROUND

Individual organizations conduct search and rescue (SAR) activities well, but combined, joint catastrophic incident SAR (CI SAR) preparations are lacking. Should another catastrophic incident occur tomorrow, the results would likely exhibit the same unacceptable inefficiency as was found in Hurricane Katrina.¹

Finding the “sweet spot”² for a unified response to catastrophic incidents is needed³ (Brafman & Beckstrom, 2006, pp. 88–101). Hurricane Katrina showed that the nation is not prepared for catastrophic incident SAR and not enough has been done since 2005 to avoid a repeat of the poor multi-domain search and rescue efforts. Attempts to save lives were made within individual organizations rather than a coordinated unified command that spanned disparate organizations. It is a tribute to individual professionalism and sheer chance that there were no mid-air collisions or severely injured rescuers on the ground or in the water during the response to Hurricane Katrina. It will never be known how many lives were lost because uncoordinated hasty primary and secondary searches were not unified between multiple domains.

¹ For more information on this, see the Appendix of this thesis.

² The term *sweet spot* is used to indicate a need for federal decentralization with a distribution of capabilities to the State SAR Mission Coordinator (SMC) or other local SAR equity partners.

³ The United States Northern Command (USNORTHCOM) commander has mentioned on numerous occasions (at the 2008 National EPLO conference and a 2007 all-hands meeting conducted in the USNORTHCOM training rooms) that he is looking for the sweet spot with the intent of being neither early nor a second late.

Some actions have laid the framework for improvement, but those activities are also lagging behind where the nation ought to be four years after Hurricane Katrina. For example, a *Catastrophic Incident SAR Addendum* (CI SAR addendum) to the *National Search and Rescue Manual* was fielded in December 2008, but it does not integrate all stakeholders and has been neither trained nor exercised. This is not acceptable when the consequence of ineffectiveness is the death and injury of United States citizens. Although the CI SAR addendum was completed, the effort was through unfunded back-door channels that have left the National Search and Rescue Committee (NSARC)⁴ authors in a position without funding or a plan to train, field and integrate the CI SAR addendum into interagency operations.

Conducting multi-domain catastrophic incident SAR preparatory activities is critical to finding the sweet spot so that the most effective and safest response is available to the Incident Commander when needed.

B. IMPORTANCE

People will die unnecessarily in catastrophic events if the SAR megacommunity fails to act efficiently. Individual organizations conduct normal SAR extremely well; however, large scale CI SAR requiring an all-domain integrated response is lacking (The White House, 2006, p. 38). A need will exist in a catastrophic incident for urgent and timely federal support to search for and rescue thousands of distressed persons. When directed by the President, the SAR megacommunity must respond quickly and effectively to save lives, prevent human suffering and to mitigate great property damage. There are many indications that the SAR megacommunity is not prepared as well as possible for

⁴ The National Search and Rescue Committee is a federal-level committee formed to coordinate civil search and rescue matters of interagency interest within the United States. NSARC is comprised of the United States Coast Guard (USCG), Department of Transportation (DOT), Department of Defense (DoD), Department of Commerce (DOC), Federal Communications Commission (FCC), National Aeronautics and Space Administration (NASA) and Department of the Interior (DOI). FEMA, Federal Bureau of Investigation (FBI) and National Transportation Safety Board (NTSB) are listed as other interested federal agencies.

this daunting challenge. This research will help the entire community determine the current state of readiness for CI SAR and recommend actions that will improve preparedness.

Federal Emergency Management Agency (FEMA) Emergency Support Function 9 (ESF-9) Urban Search and Rescue (US&R) teams, the National Guard, Army, Navy, Marines, Joint Rescue Personnel Recovery Center (JPRC), U.S. Fish and Wildlife service, police, fire, etc., all conducted searches for injured, trapped and isolated people during Hurricane Katrina response efforts. Yet these searches and rescues were not coordinated in an efficient manner. Many areas were searched more than once and other areas not at all. Very little has been done to fix this enormous problem. Should another catastrophic incident occur tomorrow, the results would likely exhibit the same unacceptable inefficiency as was found in 2005. USNORTHCOM is also a part of this problem, as its internal mechanisms for coordinating SAR across components and with the interagency community are lacking.

More can be done to study existing organizations in order to improve the most important task undertaken in catastrophic incident response: saving lives. A recurring theme of joint and interagency strategic doctrine is the necessity to improve unity of effort between civil and military authorities. There seem to be two profound and recurring themes in regard to achieving unity of effort for catastrophic SAR. First, those in the homeland defense/security field profess unity of effort, but make slow and awkward progress to unifying CI SAR responses. Secondly, without having a CI SAR strategy and understanding each state SAR requirement, the SAR megacommunity will provide a proactive mass response for catastrophic events that, at times, may appear to be an uncoordinated federal mob intent on appeasing the political leadership rather than the state SAR Mission Coordinator and Incident Commander's requirements. Federal resources will be pushed to the impacted state(s) despite the cost, the National Incident Management System (NIMS)/Unified Command and the economy of force if actions are not taken to understand the issues better.

Finding the elusive sweet spot for a harmonized response to a catastrophic event in the first 96 hours demands that processes be scrutinized and contrasted with supported partners' timely, unique and surge requirements in order to save lives, prevent suffering, protect property and act quickly to mitigate or avoid a catastrophe.

C. RESEARCH QUESTION

The primary question this research attempts to answer is: How can the SAR megacommunity better prepare to conduct CI SAR? The following five elements of the primary question are examined:

- What has been accomplished since Hurricane Katrina to improve catastrophic incident SAR?
- What are the planning effort priorities?
- Who are the interagency stakeholders?
- Are there models available to emulate?
- Who should lead the collaborative effort, and what is the best organizational construct?

D. SIGNIFICANCE OF RESEARCH

Unity of effort, synchronization and interoperability within the SAR megacommunity are fundamental imperatives to lifesaving operations during catastrophic events. A coordinated operational CI SAR response in support of federal, state, territorial, tribal and local (FSTTL) partners is vital. SAR operations are the most critical undertaking in the early aftermath of any disaster. This research is intended to recommend and promulgate concepts, strategies and procedures that will improve preparedness for urgent CI SAR requirements. A number of problem areas will be addressed in this study:

1. National and state catastrophic SAR literature is outdated and lacking. This research should have influence on officials who are responsible for updating and changing these documents.
2. State and federal SAR organizations will benefit from this research as a template for their own SAR priorities and plans.

3. Strategic and operational planners and operators will require this research as a tool to help them understand gaps, seams and key nodes for catastrophic incident SAR. DoD is most concerned with incidents where the primary civil authorities are overwhelmed, and this research focuses on just such an event. The research will recommend organizational constructs, postures and preplanned multi-domain packages in anticipation of civil requirements.
4. Homeland security practitioners and leaders nationally will find this valuable for understanding the federal support plan as well as how they can best coordinate and communicate with federal SAR officials during a catastrophic event.

E. METHODOLOGY

Research methodology included interviews, two organizational benchmark studies and a focus group.

1. Interviews

The purpose of the interviews will be to learn where DoD support is likely to be needed and how to most effectively coordinate catastrophic SAR strategy, policy, plans and operations between the diverse FSTTL partners. Interviews will also be conducted to understand technical aspects of SAR and the intra-organizational concerns. The interview process will be designed to gain knowledge of whether technical experts and USNORTHCOM officials share the same sight-picture on the problem and whether this view corroborates the concepts found in the literature. Finally, the interviews will also be designed to get recommendations from experts in the SAR community.

Interviews will yield both a scholarly and operational opportunity along the research path that no other academic process can produce. Once the research is completed, the SAR megacommunity can make informed decisions to improve CI SAR preparations. Key decision makers will be better informed from the interviews of key SAR experts. The intent is to leverage the experience, influence and expertise of these participants to help policy makers make informed decisions on how to improve CI SAR preparations.

2. Organizational Benchmark Studies

Two organizations exist that could be studied and emulated as communication and coordination center success stories. Applying lessons learned from these two cases will help define the core element for a SAR communications center. The organizational benchmarks worthy of study are the United States Secret Service Multi-Agency Coordination Center (USSS MACC) and the National Interagency Fire Center National Multi-Agency Coordination Center (NIFC NMAC).

Studying these two organizations will provide a glimpse as to how to organize an interagency umbrella organization that is able to plan for a national catastrophe while in garrison and deploy to a field site during the crisis to provide integrated all-domain incident SAR support functions to an incident commander or SAR coordinator.

The first outfit is used by the United States Secret Service (USSS) for National Special Security Events (NSSEs). The Multi-Agency Communications Center (MACC) is the integrated communications hub for these large national-level events. The MACC stands up prior to the NSSE to ensure a common operational picture is available to all stakeholders (Kroener, 2007).

The NIFC NMAC is located within the National Interagency Fire Center (NIFC) in Boise, Idaho. The National Multi-Agency Coordinating Group (NMAC) is a full-time team that allocates the national assets for firefighting to the 11 firefighting regions based upon the Incident Commander's needs and resources available. The NMAC is responsible for national coordination to ensure firefighting resources are effectively and appropriately managed in a cost-effective manner (National Multiagency Coordination Center, 2008). In setting its strategy, the overriding priority in all actions is the protection of human life (Kroener, 2007, p. 8).

These two case studies offer interagency coordination success stories of very complex issues. Both organizations contend with problems similar to anticipated SAR requirements and both organizations are cooperatives rather than command and control entities. For catastrophic SAR, it may be helpful to use these cases to build an

organization that is capable of seeing the entire SAR spectrum, organizing and prioritizing tasks to save lives in the first critical hours of the incident.

After conducting the studies, the author's intent is to analyze each and compare/contrast them to the catastrophic SAR model. Evaluation of the two organizations should help elucidate how DoD and the SAR interagency community should change priorities, prepare plans and organize for catastrophic events. The intent is to compare the NMAC to current *pre-disaster* SAR community posture and both the NMAC and MACC construct to the event *response* posture of SAR interagency partners. This methodology will be used because the NMAC is involved both with planning and response activities. While the MACC is an excellent model for a response coordination cell, it does not represent a beneficial planning case study.

3. Focus Group

The author is currently engaged with a focus group of SAR professionals in order to address some of these catastrophic incident SAR issues. Participating in this group, "that existed prior to initiation of this research," during the research process allows the author to observe best practices and to influence operational decisions. The focus group includes state members, the National Search and Rescue Committee, the United States Coast Guard, the Joint Personnel Recovery Center (JPRC), the Air Force Rescue Coordination Center, the Joint Director of Military Support, USNORTHCOM and ESF #9. Achievements of the group include developing the Catastrophic Incident Supplement to the *National Search and Rescue Manual* and drafting a new *ESF #9 Annex*.

As this research progresses, members of the focus group have volunteered to assist with their respective areas of expertise. For example, the National Association of Search and Rescue (NASAR) representative assisted with state perspectives while the Air Force Rescue Coordination Center (AFRCC) representative ensured the research included the Air Forces Northern (AFNORTH) viewpoint. The focus group has produced a multi-domain, coordinated, accurate and current vision that was unattainable through other research methods. The focus group work continues beyond this research effort.

In summary, this methodology includes interviews, two organizational benchmark studies and a focus group. Each of the three methods provides a unique and important contribution to the research effort; correlating the findings from all three methods will yield a unique and thorough research product.

The interview process and the focus group members will yield expert opinions that can be contrasted with current SAR policies. The two organizational studies also offer best practices of two similar organizations that can be compared to the current SAR preparatory efforts. The resulting recommendations will be valuable to both the USNORTHCOM Commander and the SAR interagency community.

F. THESIS STRUCTURE

This thesis uses a qualitative approach by introducing the subject, presenting the problem, and defining the research question, research methods and evaluative criteria used in the subject analysis.

Chapter I presents the approach and research methodology. Interviews, organizational benchmark studies and a focus group are introduced.

Chapter II presents a literature review of current policies, doctrine, plans and practices.

Chapter III presents a historical review and analysis of how DoD and interagency partner capabilities have responded to catastrophic incidents in the past and their current planning and response posture for catastrophic incident SAR in accordance with current policies and strategic guidance. This chapter also analyzes the existing regulations and doctrine for the planning and utilization of a joint, interagency and all-domain SAR response to a catastrophic incident.

Chapter IV presents current focus group initiatives and the results of the interviews. The focus group is an ongoing effort to study, plan and prepare SAR assets for a catastrophic incident. Interviews of SAR professionals and technical experts are used to highlight problem areas and possible solutions.

Chapter V further expound on results of the literature study, interviews and focus group analysis. Two organizational benchmark studies (NMAC and MACC) are introduced. The case studies are used to analyze/compare/contrast the current DoD and interagency partner efforts to prepare for catastrophic incident SAR with two organizations that have had related successes.

Chapter VI provides an analysis of the research findings and makes three recommendations to improve preparedness for catastrophic incident search and rescue. The recommendations include developing a national SAR strategy, formulating a Joint Air Ground Coordination Center (JAGCC), and improving interagency coordination between the SAR megacommunity members.

Chapter VII concludes the research and ends with a call for further action along these lines.

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II. LITERATURE REVIEW

A. BACKGROUND

Both USNORTHCOM and the Department of Homeland Security⁵ (Department of Homeland Security, 2004, p. 1) have a primary role in catastrophic incident search and rescue. Tactics, techniques and procedures for SAR are lacking joint interagency and multi-domain guidance. Current literature on the topic consists of organization-specific doctrine, concept plans, congressional research reports and testimonies, after action reviews (AARs), periodicals and an array of state and federal government plans.

Before plunging into the literature review, below is the definition of a catastrophic incident and historical perspectives that indicate a need for better SAR preparations.

The National Response Framework (NRF) defines a catastrophic incident as:

*...any natural or manmade incident, including terrorism, that results in extraordinary levels of **mass casualties**, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions. A catastrophic event could result in **sustained** national impacts over a prolonged period of time; **almost immediately exceeds resources** normally available to state, local, tribal, and private-sector authorities in the impacted area... [emphasis added].* (Federal Emergency Management Agency, 2008, p. 43)

This literature review and the problem itself are situated around catastrophic SAR versus a progressive layered response to a more routine event that would require normal SAR or single incident limited mass rescue operations (for example: a building collapse, commercial airliner crash or a single ship sinking). In less-than catastrophic events, a response occurs from locals, both municipal and county, through mutual aid systems and then through state/regional response to a federal level as the magnitude of the event increases. For a catastrophic event, all these partners are responding immediately (if they are not victims themselves), and they need to know how they fit into the catastrophic

⁵ DHS is designated the “Coordinating Agency” for catastrophic incidents.

incident response in advance of the event to ensure efficiency measured in lives saved or lost. Research indicates that there are deficiencies in the planning for these catastrophic events.

Hurricane Katrina landed on August 29, 2005. Many of the lessons learned state that civil and military federal response for this catastrophe were inefficient and uncoordinated (Government Accountability Office, 2006, pp. 7, 35 and 65). Catastrophic search and rescue operations are specifically included in this harsh criticism and the interagency community still has not corrected the problems associated with catastrophic SAR planning and preparations.

SAR was not integrated and did not have a unified command structure. No single organization has a common operating picture for catastrophic SAR because of the event complexity, lack of planning and exercises (Government Accountability Office, 2006, pp. 1–7). During the Hurricane Katrina response (the best example of a recent catastrophic incident), DoD did not anticipate the need for damage assessment, failed to adequately conduct an assessment and then deployed forces without understanding the full extent of the damage (Government Accountability Office, 2006, pp. 1–7). As a result, some areas were searched twice and some areas not at all in the first days of the catastrophe. Ultimately, the survivors paid a very high price for uncoordinated SAR that they should never be asked to pay again, and the 1,300 dead will never tell their tale. In an evaluation of the Hurricane Rita response, Major General John White, a member of the military's joint task force on Hurricane Rita, commented to President Bush that current plans were in disarray and that numerous helicopters could show up at the same time to rescue the same person (Associated Press, 2005). There are also indications that strategic guidance is inadequate. The GAO reports that interagency strategic planning was inadequate for Katrina (Government Accountability Office, 2006, p. 28 and 29)⁶ and that DHS has not

⁶ The same GAO report goes on to state that the Secretary of Defense should establish milestones and expedite the development of detailed catastrophic plans that specifically address use of SAR capabilities and the military's role in SAR. DoD acknowledged that better integration of interagency and Title 32/10 assets would have led to greater efficiency for the SAR mission (2006, p. 35)

provided adequate guidance to partners and states. Specifically, DoD needs additional operational planning information from DHS (Government Accountability Office, 2008, pp. 8–16).

Lessons learned from Hurricane Katrina indicate similar findings. The report states: “The Department of Homeland Security should lead an interagency review of current policies and procedures to ensure effective integration of all federal search and rescue assets during disaster response.”⁷ (Townsend, 2006, p. 57) Some of the SAR lessons learned from this report have been corrected, while others have not been adequately addressed.

One example of this would be when the NRF was published in 2008; the ESF #9 title was changed from Urban Search and Rescue to simply Search and Rescue in an effort to include all SAR under this ESF. However, definitive strategic plans are not available that explain to DoD what this means and the 28 National SAR teams are still called “urban” SAR teams; therefore, the ambiguity of responsibility and function continues. There has also been work done with the National Defense Medical System (NDMS) to ensure continuity of care for those rescued, but, again, a comprehensive interagency strategic plan is not available to determine gaps.

Another example of some work accomplished in the SAR field is found in the update of The National Search and Rescue Plan (NSP). The NSP has been updated and was endorsed by Deputy Secretary of Defense Gordon England on July 18, 2007 (National Search and Rescue Committee, 2007, p. 19), but it does not reference how the United States Air Force (USAF) will adopt its new role as a primary agency for SAR in the NRF.⁸ The NSP also has confusing verbiage about incidents of national significance

⁷ For more information on this, see the Appendix of this thesis.

⁸ On page 5 of the NSP (National Search and Rescue Committee, 2008), the USAF is a recognized “coordinator” for aeronautical search and rescue, but nowhere is the USAF listed as one of the five primary agencies as stated in the NRF in the *ESF #9 Annex*.

that need to be clarified now that the NRF has been approved.⁹ DHS is charged with overall responsibility with SAR. One could argue that the unity of effort and interagency coordination improvements needed fall under the purview of DHS and improvements in DHS policy and structure may help with interagency improvements. Also, looking at the emphasis put on homeland defense versus homeland security and allocating more resources (within DoD) to homeland security may help to integrate all national efforts for catastrophic incident unified response (Stockton & Roberts, 2008, p. 5).

B. LITERATURE SUB-SETS

Two sub-sets of literature were reviewed on this topic. One set of literature is related to the military and the second to the DHS (United States Coast Guard and Emergency Support Function #9) and other state level civil organizations. As an important theme to this review, emphasis is placed on interagency coordination comments found amongst the literature sub-sets because a point to highlight is that additional intra and interagency coordination may be necessary to ensure the most effective catastrophic incident SAR preparation and response. The literature is categorized in this manner to introduce each primary agency doctrine. The doctrine that refers to unification and partnership studies is then discussed.

⁹ To make a clarification: the NSP (National Search and Rescue Committee, 2007) references "...when the NRP is implemented." Now that the NRF is published, the assumption can be made that the same intent exists. When the NRF is implemented: "The NRP covers federal responses to declared Incidents of National Significance; this plan covers all civil SAR operations, whether conducted independently or concurrently with the NRP. If carried out concurrently, this plan becomes an NRP supporting plan by integrating on matters relating to coordination and conduct of disaster response SAR operations. When the NRP is implemented, civil SAR operations will continue to be covered by this plan; the only difference is that civil SAR services will be coordinated with other NRP operations on scene via the Operations Section of the Incident Command Post or Unified Command established under NIMS. During NRP implementation, SAR facilities may be tasked to support other operations carried out under the NRP on a not-to interfere basis with lifesaving efforts, or assistance for SAR services may be supplemented by resources available under the NRP" (National Search and Rescue Committee, 2007, p. 11).

1. Literature Related to Military SAR Operations

The first sub-set of literature is military guidance, specifically the Department of Defense Directive (DoDD) 3003.01 titled *DoD Support to Civil Search and Rescue*. This directive is the primary Secretary of Defense policy guidance for implementing military responsibilities to support civil SAR in accordance with the NSP. Who is the DoD lead for SAR? Has the lead provided strategic guidance and funding to the rest of the department for catastrophic SAR planning? Surprisingly, the lead for DoD is the Deputy Assistant Secretary of Defense for Prisoner of War/Missing Personnel Affairs. As stated in DoDD 3003.01 dated January 20, 2006 (Gordon England, 2006, p. 3):

Paragraph 5.1 states: *The Assistant Secretary of Defense for International Security Affairs (ASD(ISA)), under the Under Secretary of Defense for Policy (USD(P)), is the principal civilian advisor to the Secretary of Defense and USD(P) on civil SAR and will coordinate domestic civil SAR policy with the Assistant Secretary of Defense for Homeland Defense (ASD(HD)) as appropriate and has designated the Deputy Assistant Secretary of Defense for Prisoner of War/Missing Personnel Affairs (DASD(POW/MPA)) the Office of Primary Responsibility for DoD support to civil SAR [emphasis added].*

DASD (POW/MPA) is further tasked to coordinate with the Chairman of the Joint Chiefs of Staff et al. to develop civil SAR doctrine, guidance and implementing measures.

DoDD 3003.01 was also published prior to the NRF. The strategic guidance for integrating joint, multi-national and interagency SAR between local, state, regional and federal levels is either non-existent or unavailable. Terminology used in the directive refers to the NRP verses the NRF and does not even address the USAF as a primary agency for aeronautical SAR operations.

The USAF (Department of Homeland Security, 2008, p. 5) was designated as the primary federal agency (PFA)¹⁰ on March 22, 2008, with the release of the NRF

¹⁰ The *ESF #9 Annex* (Department of Homeland Security, 2008) to the NRF states, “DoD/USAF/AFRCC serves as the primary agency for ESF #9 during SAR operations for aviation-related incidents requiring a coordinated Federal response both in open and wilderness areas and in the vicinity of airports and urban areas requiring the coordinated deployment of rescue personnel and equipment.”

(Department of Homeland Security, 2008, p. 1). Prior to that time, National Guard and federal military response for catastrophic incident SAR did not have a single-source strategic document. A 555-page concept plan was developed by USNORTHCOM (Department of Defense, 2006) to design the DoD support to civil authorities; however, the large unwieldy plan tends to dilute other strategic documents (Wilson, 2007, p. 25). The military (National Guard, Reserves and Active Duty) had significant responsibilities for SAR prior to the release of the NRF in 2008; however, the USAF had not been designated a PFA nor does the literature indicate a great emphasis on a coordinated multi-domain SAR response plan for catastrophic incidents.

The most important document for addressing catastrophic incident SAR in the recent past is the Catastrophic Incident Search and Rescue addendum (CI SAR) to the *National Search and Rescue Manual* published first in April 2008 and updated with version 2.2 in August 2008 (National Search and Rescue Committee, 2008, pp. 3–88). The CI SAR addendum was designed to unify the efforts of all SAR stakeholders (federal, regional, state, tribal and local) because of the cultural and organizational complexity of this task. The effort to complete the CI SAR Addendum was coordinated by the NSARC after hurricane Katrina. Unfortunately, according to the First Air Force (1AF) (AFNORTH)/ Commander (Hudson, AFNORTH SAR Plan Hurricane Ike, 2008, pp. 99–111), Hurricane Ike was the “first attempt for an all agency / all domain approach to SAR.” Even with progress in coordinating the CI SAR addendum for this hurricane, a dilemma still exists in that this interagency/multi-domain solution to integrate SAR for catastrophic incidents was not funded, advertised, distributed or trained prior to Hurricane Ike.

The United States National Search and Rescue Supplement (NSS) to the *International Aeronautical and Maritime Search and Rescue Manual* (NSARC, 2000, p. i) was written prior to the establishment of DHS as the planning and standardization document for the military, federal agencies and civil authorities for a national SAR plan. The current purpose of the supplement is for training and operations associated with civil SAR. United States military authority resides with the NSARC.

a. *Three Elements of Military SAR: Personnel Recovery, Defense Support of Civil Authorities and Civil SAR*

Clearly identifying literature related to authorities for military SAR operations helps define the starting point for this research. This literature review identified three distinct components of search and rescue to which USNORTHCOM has concern: Personnel Recovery, SAR for Defense Support of Civil Authorities (DSCA SAR) and Civil SAR.

In this research, an assumption is made that CI SAR does not include Personnel Recovery¹¹ (Joint Chiefs of Staff, 2007, p. ix). Personnel Recovery assets and capabilities must be maintained during CI SAR operations, but they are not part of the CI SAR effort for either DSCA SAR or Civil SAR. They are mentioned in this literature review to identify the authorities and requirements placed upon the Joint Personnel Recovery Center to maintain the capability to conduct Personnel Recovery throughout the spectrum of normal SAR, mass rescue operations and CI SAR.

DSCA SAR is granted under authorities of the NRF and related DHS/FEMA authorities. In this capacity, DoD assets will be used to support civil coordinating and primary agencies through processes explained in the NRF/NIMS on a reimbursable basis. These support operations are authorized by the Robert T. Stafford Act Disaster Relief and Emergency Assistance Act (42 US Code [U.S.C.] §§ 5121–5206) and the Economy Act of 1932 (31 U.S.C. § 1535–1536). Immediate response authorities are provided by Department of Defense Directive 3025.1 paragraph 4.5 (Department of Defense Directive, 1993) and Department of Defense Directive 3025.15 paragraph 4.7.1 (Department of Defense, 1997, Para. 4.7.1) domestically and internationally by DoDD

¹¹ Personnel Recovery is defined by Joint Publication 3-50 as: “Personnel recovery is the sum of military, diplomatic, and civil efforts to affect the recovery and reintegration of isolated personnel. Isolated personnel are those U.S. military, Department of Defense (DoD) civilians, and DoD contractor personnel (and others designated by the President or Secretary of Defense (SecDef) who are separated (as an individual or group) from their unit while participating in a US-sponsored military activity or mission and who are, or may be, in a situation where they must survive, evade, resist, or escape” (Joint Chiefs of Staff, 2007, p. ix).

5100.46¹² (Department of Defense, 1975). The DoDDs do not mention the authority for DoD response to civil SAR emergencies under the authorities provided by the NSP and, therefore, civil SAR is mentioned separately from DSCA SAR in this literature review.¹³

Civil SAR is authorized by the 2007 National Search and Rescue Plan (NSP). As mentioned previously, the NSP references legacy organizational structure (NRP and incidents of national significance), but the document also provides important authorities related to civil SAR. The document indicates that DoD resources are provided for civil SAR without concern for reimbursement providing other ongoing military missions are not interfered with (National Search and Rescue Committee, 2007, pp. 4–5); however, the document also allows for DoD reimbursement for SAR resources when performing DSCA SAR under the Stafford Act (National Search and Rescue Committee, 2007, p. 13, Footnote 7). The differentiation between these authorities (DSCA SAR/civil SAR) is important to this research because for CI SAR the ambiguities indicate a need for clear guidance on when DoD should be reimbursed for SAR. The NSP provides leverage to conduct SAR with more concern for SAR and less concern for reimbursement than the DoDDs 3025.1 and DoDD 3025.15, which clearly indicate that all DoD support is provided on a reimbursable basis.

In summary, it is necessary to look at DSCA SAR and civil SAR separately to ensure DoD reimbursement is sought for all possible contingencies. Could/would a coordinating agency ever balk at refunding DoD for SAR based upon the NSP? DoD is not funded for DSCA SAR and DHS is funded as the coordinating agency.

¹² Foreign disaster relief is authorized/governed under a different directive than domestic immediate response. DoD Directive Number 5100.46 (1975) titled, Foreign Disaster Relief, is the source of authority for providing Humanitarian Assistance/Disaster Response to areas outside the United States but still within the USNORTHCOM area of responsibility (such as Bahamas, Caicos, British Virgin Islands and Mexico). USNORTHCOM staff is currently conducting an analysis on how to organize and respond should the need arise in these areas. Instead of immediate response, the term for a humanitarian assistance or disaster immediate response is “relief operations.” Department of State, through United States Agency for International Development and the Office of Foreign Disaster Assistance has a primary role in relief operation contingencies.

¹³ A draft of DoDD 3025.DD is available but not yet released by DoD. The new draft is expected to clarify some of the immediate response and DSCA authorities.

For all DSCA support, DoD and other primary and supporting agencies are due reimbursement after the fact for support provided, but prior to a Stafford Act disaster declaration DoD conducts civil SAR operations without reimbursement expectations.

b. Civil Support Task List

With the Office of the Secretary of Defense (OSD) funding support, the California National Guard has developed a program that will identify SAR DSCA requirements (S. Shinn, 2009). The Civil Support Task List (CSTL) is a collaborative effort to organize a common vocabulary describing military capabilities that could be provided in support of civil authorities to assist their response to disasters. The National Guards of several states, the National Guard Bureau, the Office of Secretary of Defense and several representatives of state and local emergency management organizations are actively participating in the development of this tool, which seeks to bridge military and civilian emergency response communities. Nationwide, the states have drafted over 100 tasks for inclusion in the CSTL. Of the tasks submitted, 17 SAR tasks have been identified.

The SAR tasks have also been entered into the Defense Readiness Reporting System (DRRS) database and will impact CI SAR preparations in the future for both Title 32 and Title 10 integrated planning. The CSTL development is important to this literature review as the tasks may become the basis for future SAR integrated planning efforts.

2. Literature Related to Civil SAR Operations

In this sub-set of the literature review, DHS, USCG and ESF #9 texts will be discussed.

a. DHS Literature

Two strategic documents guide interagency coordination for catastrophic incident search and rescue between the DHS and DoD. These documents are the 2007 National Response Framework (Federal Emergency Management Agency, 2008) and

USNORTHCOM's Defense Support for Civil Authorities Concept Plan (CONPLAN) 2501-05 released in 2006 (Department of Defense, 2006). Another key document for catastrophic incident SAR is the United States National Search and Rescue Committee Interagency Agreement and associated NSP (National Search and Rescue Committee, 2007).

The NSARC Interagency Agreement grants a federal committee powers to conduct search and rescue activities, conduct coordination with national and international stakeholders and promote the best practices for SAR (National Search and Rescue Committee, 2007, pp. 1–3). A previously mentioned reference, the USAF Rescue Coordination Center (AFRCC) CIS published in 2008 (National Search and Rescue Committee, 2008) is also an important document to both the military and DHS SAR communities. Although some strategic guidance has been developed, the organization cultures and the guidance suffer discontinuity. For example, the NSARC Interagency Agreement references the National Response Plan which has been superseded by the NRF and contains significant SAR changes in both language and substance.

In Table 1, the confusion in terminology, geographical boundaries and scope of responsibilities is highlighted to emphasize the lack of coordination that seems apparent in the policy literature. Does the Air Force Rescue Coordination Center (AFRCC) have responsibility for Virgin Islands and Puerto Rico? If the NSP indicates a different area of responsibility than the AFRCC, then which one is correct? Why does the *ESF #9 Annex* discuss “open and wilderness areas?” Is the AFRCC not responsible for inland inhabited areas and non-wilderness areas?

Table 1. Comparison of AFRCC, ESF #9 and NSP Policy Description for SAR

Air Combat Command Web site states about the Air Force Rescue Coordination Center (AFRCC):	The ESF #9 Annex States the AFRCC will:	The National Search and Rescue Plan of the U.S. indicates the USAF is:
As the United States' inland search and rescue coordinator, the Air Force Rescue Coordination Center serves as the single agency responsible for coordinating on-land federal SAR activities in the 48 contiguous United States, Mexico and Canada.	Serve as the primary agency for ESF #9 during SAR operations for aviation-related incidents requiring a coordinated Federal response both in open and wilderness areas and in the vicinity of airports and urban areas requiring the coordinated deployment of rescue personnel and equipment.	The recognized SAR Coordinator for the United States aeronautical Search and Rescue Region (SRR) corresponding to the continental United States other than Alaska.

b. United States Coast Guard (USCG) Literature

The mission of the USCG SAR program is to prevent death or injury to persons and loss or damage to property in the marine environment. The statutory authority for the USCG to conduct SAR missions is contained in Title 14, Sections 2, 88 and 141 of the U.S. Code (United States Coast Guard, 2007, pp. 1–2).

SAR policy is established for the USCG through three primary publications and one USCG addendum to the NSS: the NSP, *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual*, and the National Search and Rescue Supplement (NSS) to the *International Aeronautical and Maritime Search and Rescue Manual (IAMSAR)*. There is also a USCG NSS addendum that further refines USCG procedures relevant to the NSS and IAMSAR (United States Coast Guard, 2007, pp. 1–2).¹⁴ The NSS is cited as being the “primary U.S. SAR publication” (United States Coast Guard, 2008). This is another example of how the doctrine, policy and procedures for catastrophic SAR require revision since this primary U.S. SAR publication was

¹⁴ The primary USCG source documents are described in the NSS (National Search and Rescue Committee, 2008) on page 2 as: the National Search and Rescue Plan (NSP), the *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual*, in three volumes, the United States National Search and Rescue Supplement (NSS) to the *IAMSAR Manual* and the Coast Guard Addendum (CGADD) to the NSS.

released in May of 2000, preceding DHS, the NRP and the NRF. Certainly, the applicability of this document to define federal level interagency doctrine is questionable.

The USCG recognizes the difference between normal SAR operations, mass rescue operations (MRO) and catastrophic incident SAR (Button, 2007, pp. 32–38). The coordination division representative, Rick Button, explained to his Victoria, British Columbia audience that there is a difference between MRO and catastrophic incident operations. Although there is a strong description of what compromises an MRO, but the catastrophic incident implications are glossed over.¹⁵

The USCG goes on to recognize the NRF definition for a catastrophic incident in the same document briefed to an international community and posted to the USCG SAR page (Department of Homeland Security, 2004, p. 1) as an incident where there is a large incident with immediate and extraordinary levels of death and destruction. Unfortunately, the USCG analysis stops at that point and indicates interagency catastrophic SAR guidance is “being developed.” Another interesting item to note is that catastrophic incidents as described in the DHS Catastrophic Incident Supplement (CIS) also include terrorist events. In a terrorist event, either DoD or the FBI could be in charge and this introduces another aspect to the problem.

Who would be the lead for catastrophic incident SAR if DoD or the FBI were the supported agency? Do the processes change if the environment is contaminated with chemical, biological, radiological, nuclear or high explosives (CBRNE)? None of the literature reviewed addresses these command, control and coordination issues.

¹⁵ Office of Coordination for the USCG has this briefing posted to its Web site and it was briefed to an international audience (Button, 2007): “MROs are infrequent operations that require the search and rescue of large numbers of people. These operations are not normal SAR and do not meet the catastrophic incident criteria. They often need to be carried out with a wide response array that may include hazard mitigation, damage control, pollution control, traffic management, large scale logistics, coroner functions, accident-incident investigation and intense public and political attention, etc....Efforts start at an intense level and may go on for days or weeks.”

c. Emergency Support Function (ESF) #9 Literature

Another example that strategic- and policy-level interagency integration is deficient can be found when contrasting ESF #9 *Search and Rescue Annex* (FEMA, 2008, pp. 5–6) to the NSP. Although rewritten in 2007, the NSP omits any reference to the NRF or the Post Katrina Reform Act changes written into the NRF, such as designating the DoD/USAF as a primary agency for SAR. The 2008 *ESF #9 Annex* states, The law (Post Katrina Reform Act) also requires that federal plans be developed by each federal agency with coordinating, primary, or supporting responsibilities under the NRF (ESF #9 and DoD/USAF are two of these organizations). The plans MUST include “The coordination of interagency search and rescue operations, including land, water, and airborne search and rescue operations” (2006, p. 2, Section 653 (b)(4)(C) 2). Plans that include current structures and policies of the coordinating, primary and supporting SAR organizations are not available or are outdated. Until these agencies¹⁶ develop a cohesive and unified plan, it is unlikely that joint-interagency and multi-domain SAR for catastrophic incidents will be achieved in an organized and efficient manner. This research did not return evidence of any documents that would indicate how federal, state, tribal and local catastrophic incident SAR is planned or rehearsed (exercised). The best literature found was the CIS developed by the NSARC, but that document is also out of date due to fielding of the NRF in March 2008.

At the state level, a wide array of SAR plans exists. Formats of the plans, political divisions and procedures differ between states. Two examples include the Mississippi and New Mexico plans. The Mississippi plan mirrors the format of the NRF *ESF #9 Annex*, complete with coordinators, primary and support agencies (Barbour, 2008, p. Mississippi ESF #9 Annex). The information is Web-based and uses

¹⁶ The *ESF #9 SAR Annex* (Department of Homeland Security, 2008) lists coordinating, primary and support agency responsibilities as: ESF Coordinator: Department of Homeland Security/Federal Emergency Management Agency; Primary Agencies: Department of Homeland Security/Federal Emergency Management Agency, Department of Homeland Security/U.S. Coast Guard, Department of the Interior/National Park Service, Department of Defense/U.S. Air Force; Support Agencies: Department of Agriculture, Department of Commerce, Department of Defense, Department of Health and Human Services, Department of Homeland Security, Department of Justice, Department of Labor, National Aeronautics and Space Administration and U.S. Agency for International Development.

terminology compliant with the NRF and the National Incident Management System language. The New Mexico plan was prepared in 1996 and includes both the SAR Act (law) and the state plan. The New Mexico plan is Web-based, but does not have linkages to the NRF or the *ESF #9 Annex* (Search and Rescue) of the framework (New Mexico Department of Public Safety, 1991, pp. 1–18). The New Mexico plan states that implementation of their agreement must be supported by a memo of understanding between state agencies and the AFRCC commander. It is important to point out the differences between the two states in order to stress that each state has its own procedures for catastrophic SAR. Also important to note is that federal plans and policies must take the sovereign state government plans into consideration for coordination and collaboration during development of a comprehensive catastrophic incident SAR plan. Failure to take state or tribal equities in consideration will doom the efforts before they start.

C. LITERATURE REVIEW SYNOPSIS

The GAO (2006, pp. 15, 19 and 35) found that DoD had not adequately planned or exercised catastrophic incident SAR response in 2005. With a catastrophic incident addendum for SAR fielded and the DoD/USAF recently designated as one of five primary agencies for ESF #9 (Search and Rescue), it seems DoD is in the same predicament now as shortly prior to Hurricane Katrina. That is, there is guidance available for conducting catastrophic incident SAR, but training and exercise programs for the stakeholders are not available and have not been developed. Should the USCG lead the catastrophic incident SAR planning, training and exercise efforts for the maritime domain? Should the USAF lead the effort since it is designated as the single agency responsible for coordinating on-land federal SAR activities in the U.S., Canada and Mexico (First Air Force, 2008)? Would one want the USAF leading a training and exercise program for the maritime domain any more than one would want the USAF performing the maritime SAR work, or should a consortium be formed for planning and operations?

According to the USCG's Web site, "The National Search and Rescue Committee is a federal-level committee formed to coordinate civil search and rescue (SAR) matters of interagency interest within the United States" (United States Coast Guard, 2008). It has developed the most comprehensive operational interagency document available that addresses catastrophic SAR. Ironically, the CIS (National Search and Rescue Committee, 2008) was a backdoor effort by a handful of caring representatives, not from a mandated or funded source (J. Sokol, personal communication, July 14, 2008). In August 2008, the NSARC released the Catastrophic Incident Search and Rescue Addendum (Version 1.1) to the *National Search and Rescue Manual*. This document has been neither trained nor exercised within USNORTHCOM or during any Tier 1 interagency exercise. It is not clear whether the USCG, ESF #9, the USAF (NSARC) or some other organization (USNORTHCOM J7/National Guard Bureau J7) should lead the integrated planning effort.¹⁷

The NSP and NRF clearly indicate the NSARC has the federal coordinating responsibility for SAR, but DHS has overall responsibility. The NSARC is chartered to oversee the NSP and serve as a federal coordinating forum for national civil SAR matters (National Search and Rescue Committee, 2007, p. 2). Why has the supplement gone more than eight years since the last revision? Does the NSARC have funding and responsibility to update plans, policies and publications for the entire federal interagency community? Just as important, does the NSARC have the responsibility to train all FSTL partners on changes implemented when the doctrine is updated or is DHS responsible? Because of the unique, timely and surge capabilities of the DoD to support catastrophic incident SAR; should DoD have a primary role as a leader in these efforts?

¹⁷ USCG SAR mission is defined: "Search and Rescue (SAR) is one of the Coast Guard's oldest missions. Minimizing the loss of life, injury, property damage or loss by rendering aid to persons in distress and property in the maritime environment has always been a Coast Guard priority. Coast Guard SAR response involves multi-mission stations, cutters, aircraft and boats linked by communications networks. The National SAR Plan divides the U.S. area of SAR responsibility into internationally recognized inland and maritime SAR regions. The Coast Guard is the Maritime SAR Coordinator. To meet this responsibility, the Coast Guard maintains SAR facilities on the East, West and Gulf coasts; in Alaska, Hawaii, Guam, and Puerto Rico, as well as on the Great Lakes and inland U.S. waterways. The Coast Guard is recognized worldwide as a leader in the field of search and rescue (United States Coast Guard, 2009).

Because the answers to these questions are not readily apparent in the literature, one can assume a lack of preparedness for catastrophic incident SAR. If the doctrine is not current and the FSTTL partners are not training together, the SAR megacommunity is likely behind in catastrophic incident SAR preparations. In this thesis, a methodology and process to improve readiness and effectiveness of catastrophic incident SAR will be proposed.

III. ORGANIZATIONS, FUNCTIONS AND ISSUES

A. INTRODUCTION

Chapter III presents an organizational overview and analysis of how DHS, National Search and Rescue Committee participants, states, National Guard and International Search and Rescue Advisory Committee intend to organize and function for CI SAR. The information is presented in a manner that helps the reader understand the enormity of the CI SAR preparations currently underway, while recognizing that many ventures are still needed to declare preparedness. The chapter attempts to clarify current and proposed organizations and their respective obligations.

After describing megacommunity member responsibilities, organization and how they fit in, this research goes on to describe three tactical/technical systems used by SAR professionals in the USCG to elucidate why better coordination is necessary between the disparate SAR organizations and how improving the interagency coordination will provide better operational efficiency in a number of ways: The self-locating data marker beacons, the SAR Optimal Planning System and the integrated Flight Management System provide technological examples of why SAR would be improved if all partners integrated this Coast Guard-specific technology. The technological problems are introduced as a catalyst to promote more robust CI SAR preparations. The objective in providing these technological and new initiative models is to expose some current weak links between equity holders within the SAR megacommunity, and also why additional response system redundancy is necessary to improve the managerial process.

Problem areas are not, however, limited to these technologies. Challenges also exist in management of SAR resources for chaotic events, international SAR initiatives and strategic planning for these unpredictable highly complex and unexpected challenges (Ramo, 2009, p. 30). Introducing some of these difficulties provides a good framework from which the organizations can be analyzed in Chapters V and VI of this research (Townsend, 2006, p. 57). There was a lack of coordination between the constituent partners during Katrina SAR operations. SAR endeavors of individual organizations were

conducted well, but expertise for air support to cross over into urban or maritime SAR or for urban SAR to carry out searches outside the urban areas was lacking. Exceptional efforts to save lives were made in a somewhat uncoordinated manner.

GAO investigated the military planning as it related to Hurricane Katrina and found:

Uncoordinated search and rescue efforts: While tens of thousands of people were rescued after Katrina, the lack of clarity in search and rescue plans led to operations that, according to aviation officials, were not as efficient as they could have been. The NRP addressed only part of the search and rescue mission, and the National Search and Rescue Plan had not been updated to reflect the NRP. As a result, the search and rescue operations of the National Guard and federal military responders were not fully coordinated, and military operations were not integrated with the search and rescue operations of the Coast Guard and other rescuers. At least two different locations were assigning search and rescue tasks to military helicopter pilots operating over New Orleans, and no one had the total picture of the missions that had been resourced and the missions that still needed to be performed. (Government Accountability Office, 2006, p. 7)

Exploring what is done with SAR data once it is received by a single organization to ensure the widest dissemination occurs between agencies is of utmost importance to efficiency. Current organizational structures and processes to determine methods of communication and coordination that might improve the technological advantages these technologies bring to the overall SAR effort must be examined and improved upon. This chapter examines organizational components of the SAR megacommunity followed by a few examples that highlight how the organization for SAR could be improved to take advantage science and technology in a rapidly changing environment.

B. ORGANIZATIONS AND FUNCTIONS

1. Introduction

Figure 1 provides an illustration of the CI SAR megacommunity. The red area of the diagram portrays the entire SAR megacommunity. The small grey boxes along the left side of the chart represent local and state institutions, regional team members, private

and volunteer organizations and the international support system. The green box represents the federal members of the National Search and Rescue Advisory Committee. The purple box is an expanded view of the resources DoD brings to bear. DoD resources are subdivided into Title 10 (federal military) and Title 32 (National Guard). Table 2 provides a list of acronyms and brief description of the megacommunity membership.

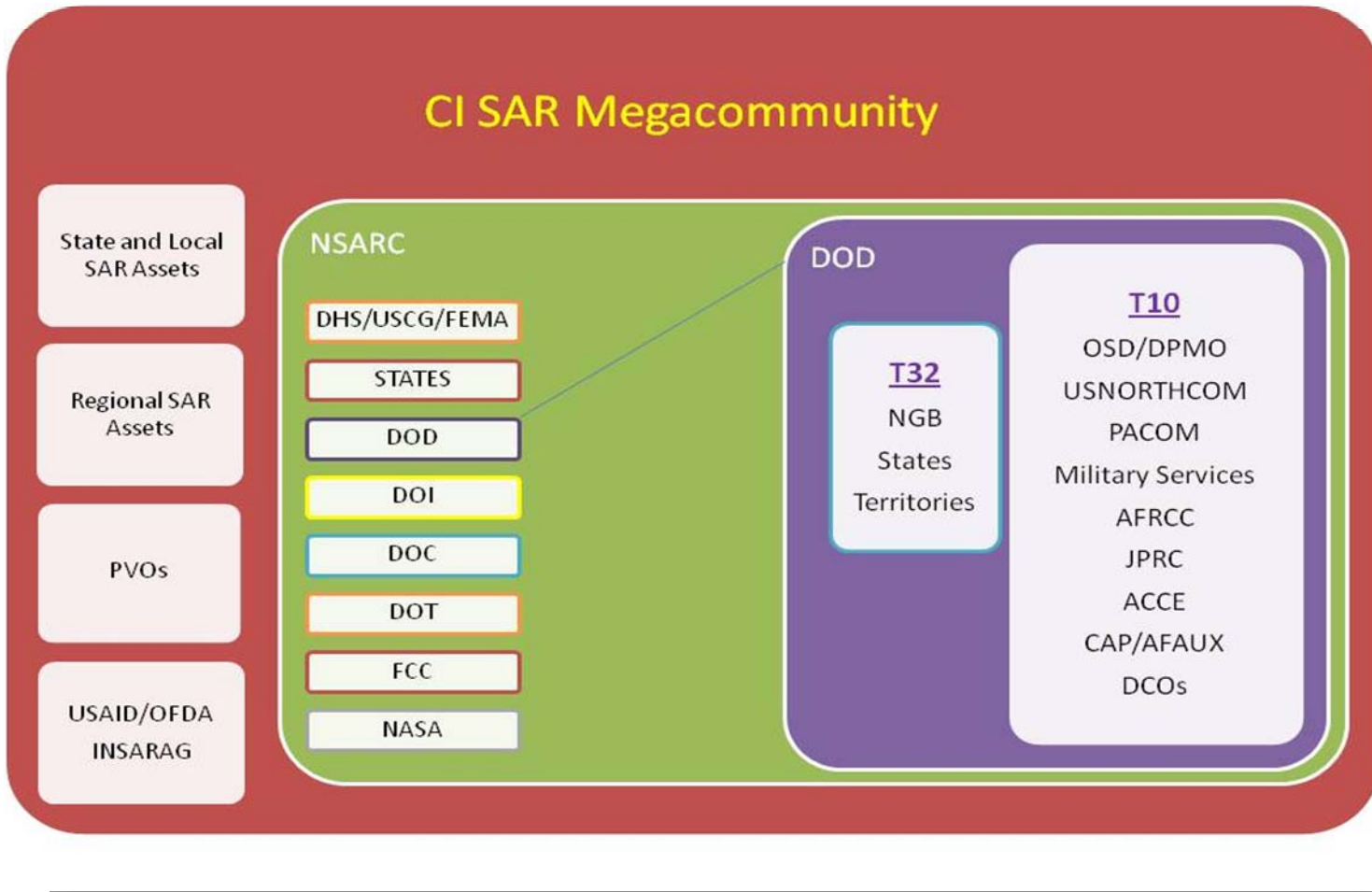


Figure 1. CI SAR Megacommunity

Table 2. Description of Acronyms for Figure 1

Acronym	Organization / Acronym	Description
State and Local SAR Assets	Local SAR managers, SAR Mission Coordinators, ESF #9 and other state SAR officials	State and local SAR organizations.
Regional SAR Assets	USCG Rescue Coordination Centers, USAF Search and Rescue Regions, maritime search and rescue regions, FEMA Regions, WFF GACCs, Regional Incident Management Assistance Teams, Task Forces for Emergency Readiness and other regional emergency management entities	Regional ESF #9, Task Forces for Emergency Response, Incident Management Assistance Teams and other regional assets
PVOs	Private and Volunteer Organizations	Organizations such as Citizen Corps, the Eagles Wings Foundation, Habitat for Humanity, etc.
USAID/OFDA/INSARAG	United States Agency for International Development/Office of Foreign Disaster Assistance/International Search and Rescue Advisory Group	Through the Department of State, these members of the megacommunity manage international aid
NSARC	National Search and Rescue Committee	Organized under the authority of the National Search and Rescue Plan, 7 federal agencies coordinate federal SAR activities. State and National Guard representatives also participate
DHS/USCG/FEMA	Department of Homeland Security/United States Coast Guard/Federal Emergency Management Agency	DHS is the SAR coordinator per the NRF and the USCG leads the NSARC. FEMA is one of the primary agencies and is also the ESF #9 lead agency for SAR
States	States are represented through the National Association of Search and Rescue (NASAR)	Each state handles SAR in accordance with the respective laws governing the state
DoD	Department of Defense	Department of Defense contributions are expanded into T10 and T32 activities
DOI	Department of the Interior	National Park Service and U.S. Geological Service
DOC	Department of Commerce	National Oceanographic and Atmospheric Administration (NOAA) and NOAA SRSAT

Acronym	Organization / Acronym	Description
DOT	Department of Transportation	Federal Aviation Administration
FCC	Federal Communications Commission	406 MHz beacons, frequencies, etc.
NASA	National Aeronautics and Space Administration	Distress Alerting Satellite System, COSPAS-SARSAT, Beacons, space rescue, etc.
OSD/DPMO	Office of Secretary of Defense/Defense Prisoner of War/Missing Personnel Office	DoD lead for SAR and Personnel Recovery
USNORTHCOM	United States Northern Command	North American Combatant Commander for 50 states, Canada, Mexico, territories coastal waters/approaches. Some responsibilities in Alaska. Awaiting designation as the SAR Coordinator from the Secretary of Defense
USPACOM	United States Pacific Command	SAR responsibilities for Alaska and Hawaii
Military Services	Army, Navy, Air Force, and Marines	Military Departments
AFRCC	Air Force Rescue Coordination Center	Single agency responsible for coordinating on-land federal SAR activities in the 48 contiguous states, Mexico and Canada 24 hours per day. Ties into the satellite alert system through a U.S. Mission Control Center
JPRC	Joint Personnel Recovery Center	Responsible for planning and coordinating personnel recovery for military operations within the assigned operational area. Provides DSCA SAR support on a non-interference basis
ACCE	Air Forces Northern Air Component Coordination Element	Coordinates the movement of Air Force assets during natural disasters or other contingencies. ACCE also supports state and federal evacuation, humanitarian relief and search and rescue missions
CAP/AFAUX	Civil Air Patrol/Air Force Auxiliary	Provides search and rescue, disaster relief, humanitarian services, and Air Force support

Acronym	Organization / Acronym	Description
DCOs	Defense Coordinating Officers	Also includes a staff of approximately 40 personnel assigned to coordinate T10 resources in one of 10 FEMA regions
NGB	National Guard Bureau	Coordinates programs with the Army and Air Force staffs. Develops operating programs for the Army and Air Guard. Participates with and assists states in organizing, maintaining and operating their National Guard units
States	50 States	States fall under the purview of the governor. Alaska and Hawaii are supported by USPACOM in federal duty status and the 38 contiguous states fall under USNORTHCOM in federal duty status. The state organization that has responsibility for SAR varies between the states
Territories	Bahamas, Puerto Rico, the U.S. Virgin Islands and the Turks and Caicos Islands in USNORTHCOM's area of responsibility	USNORTHCOM is responsible for military support to these territories. USNORTHCOM area of responsibility also extends 12 miles off the coast

2. National Search and Rescue Committee (NSARC)

a. Responsibilities

The NSARC coordinates national and international civil SAR issues amongst federal, state, territorial, tribal, local and international equity holders through a national interagency coordinating body. In addition, the NSARC provides a venue for all national agencies to meet and develop preliminary positions on SAR matters. The committee is led by the USCG under the purview of DHS. DoD is a member of the National Search and Rescue Committee¹⁸ along with Department of Interior (National Park Service), Department of Commerce, Department of Transportation (Federal

¹⁸ Deputy Defense Secretary Gordon England endorsed the 2007 National Search and Rescue Plan July 18, 2007.

Aviation Administration), Federal Communications Commission (FCC), NASA and DHS (U.S. Coast Guard and Federal Emergency Management Agency) (NSARC, 2007).

The preeminent SAR reference is the *International Aeronautical SAR Manual* (IAMSAR), Volumes 1–3. The IAMSAR and the U.S. National SAR Supplement to the *IAMSAR Manual* along with the National Search and Rescue Plan of the United States are the three primary documents orienting the strategic and operational efforts of the NSARC¹⁹ and SAR megacomunity. Out of these three documents arise responsibilities for SAR that are accomplished, not only by the NSARC, but also by other FSTTL²⁰ agencies, including DoD.

b. Organization

The NSARC (prior to 1999, called the International Committee for Search and Rescue) revised the NSP for the first time in 1999. Issues identified in the 2005 Hurricane Katrina response were the catalyst for another revision to the NSP in 2007 (Button). The 2007 version of the NSP established SAR Coordinators for the U.S. regions, provided for the establishment and coordination of SAR services to meet domestic needs and international obligations, and instituted a cooperative SAR network that can be coordinated through a single federal agency (Hudson, 2009). International and Maritime Organization and the International Civil Aviation Organization, through the IAMSAR, identify contiguous SAR regions (SRR) around the globe. Countries are responsible for coordinating SAR within each respective region. In the United States, SRRs are coordinated by SAR coordinators. The USCG is responsible for aeronautical and maritime coordination through nine rescue coordination centers (RCCs), and the

¹⁹ The NSARC history began in 1954 when an Air Coordinating Committee was requested by President Eisenhower to control and coordinate search and rescue missions. The National Search and Rescue Plan (NSP) of the United States was published as a result of the endeavor. Until 1973, The NSP languished as no federal organization had been identified to lead the effort. The Department of Transportation volunteered to implement the plan under an umbrella organization they called the International Committee on Search and Rescue (ICSAR) in 1974.

²⁰ The National Response Framework and the *Emergency Support Function #9 Annex* provide the framework for SAR response other than the authorities for civil SAR authorized by the 2007 NSP and DoD Personnel Recovery authorities.

USAF is the inland SAR Coordinator²¹ through an Air Force RCC at Tyndall Air Force Base, Florida, the Civil Air Patrol, state SAR coordinators and other government, private and volunteer organizations. The coordinator for Alaska is United States Pacific Command (USPACOM) through the eleventh RCC located at Fort Richardson, Alaska.

c. How the NSARC Fits in the SAR Megacommunity

The NSARC is the United States lead institution for developing aeronautical and maritime search and rescue policy. The NSARC is chaired by the USCG. The NSARC publishes and revises national SAR policy documents, such as the Catastrophic Incident Search and Rescue Addendum to the *National Search and Rescue Manual* and the National SAR Plan. Policy development and revision is conducted through a cooperative process with the NSARC equity holders (Button, 2007).

3. DHS/FEMA ESF #9

a. Responsibilities

DHS is charged with overall responsibility for federal CI SAR. DHS has nominated FEMA as the primary agency for SAR with responsibility to: “rapidly deploy components of the federal SAR Response System to provide specialized lifesaving assistance to state, tribal, and local authorities when activated for incidents or potential incidents requiring a coordinated Federal response” (Federal Emergency Management Agency, 2008, p. 1). DHS has also delegated responsibilities to the USCG through the NSARC for coordinating federal SAR assets. The *Emergency Support Function #9*

²¹ A draft *ESF #9 Annex* to the NRF has been prepared and is currently under review at the FEMA. The draft recommends the SC be changed from the USAF to USNORTHCOM. The USAF, through Air Forces North (AFNORTH) would retain operational SAR responsibilities while USNORTHCOM would inherit SC duties (Strategy, Coordination and Resourcing).

*Search and Rescue Annex*²² indicates scope, policies, concept of operations, organization and responsibilities of the entrusted SAR coordinator, primary agencies and support agencies within the SAR megacommunity.

The scope of SAR responsibilities is divided into four categories of specialized SAR; structural collapse (urban) search and rescue (US&R), waterborne search and rescue, inland/wilderness search and rescue and aeronautical SAR. Each of these specialized categories of SAR is assigned to a primary agency (Federal Emergency Management Agency, 2008, pp. 1–3) as found in Table 3.

²² *ESF #9* rewrite has been drafted and is currently (as of May 18, 2009) at DHS/FEMA for approval. One change for DoD in the draft is listing DoD instead of DoD USAF as one of the possible primary agency solutions that FEMA can choose for a particular incident. The intent is for USNORTHCOM to receive responsibility as the search and rescue coordinator (SC) for their area of responsibility (AOR) with the exception of AK, which comes under the purview of USPACOM.

Table 3. Overview of Scope and Primary Agency Responsibility per *ESF #9 Annex*

	Structural Collapse (Urban) Search and Rescue (US&R)	Waterborne Search and Rescue	Inland/Wilderness Search and Rescue	Aeronautical Search and Rescue
Primary Agency	Department of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA)	DHS/U.S. Coast Guard (USCG)	Department of the Interior (DOI)/National Park Service (NPS)	Department of Defense (DoD)/U.S. Air Force (USAF)/Air Force Rescue Coordination Center (AFRCC)
Overview	Structure collapse that requires US&R task force operations. A national US&R system integrates task forces, Incident support Teams (ISTs) and technical specialists	Includes waterborne SAR operations that primarily require USCG air, ship and boat force operations. Conducted in accordance with the NSP.	Includes backcountry or rural operations that require responders to use specialized equipment and unique travel methods to reach distressed persons.	Aeronautical SAR operations that require the use of aircraft to search for distressed persons to the fullest extent possible on non-interference basis with primary military duties.
Note: In the ESF #9 revision dated April 11, 2009, Inland/Wilderness SAR and Aeronautical SAR are kluged into the term “Land SAR”. Land SAR is a shared responsibility between the Primary Agencies: Department of the Interior (DOI)/National Park Service (NPS) and Department of Defense (DoD) (Department of Homeland Security, 2008, pp. 2–3)				

SAR is considered an “Element of Capability” in the *2007 National Planning Guidelines* (data derived from the *2007 Target Capabilities List*). The stated outcome for land-based SAR is: “The greatest numbers of victims (human and, to the extent that no humans remain endangered, animal) are rescued and transferred to medical or mass care capabilities, in the shortest amount of time, while maintaining rescuer safety”²³ (Department of Homeland Security, 2007, p. 8).

²³ Responsibilities for SAR are identified in a number of documents. The general SAR tasks to be accomplished by the SAR megacommunity as proposed in the *National Preparedness Guidelines* are found in three primary documents: *Target Capabilities List* (Department of Homeland Security, 2007), the *Universal Task List Version 2.1* (Department of Homeland Security, 2005) and the *National Planning Scenarios* (Department of Homeland Security Homeland Security Council, 2006).

b. DHS/FEMA ESF #9 Organization for CI SAR

FEMA was established in the executive branch as an independent agency pursuant to Reorganization Plan No. 3 of 1978 (5 U.S. Code) and Executive Orders 12127 of March 31, 1979 (effective April 1, 1979) and 12148 of July 20, 1979 (effective July 15, 1979). FEMA has more than 2,600 employees, and they are part of the DHS Emergency Preparedness and Response Directorate. FEMA works in partnerships across organizations at FSTTL levels. Figure 2 portrays the 10 FEMA regions and corresponding regional headquarters.

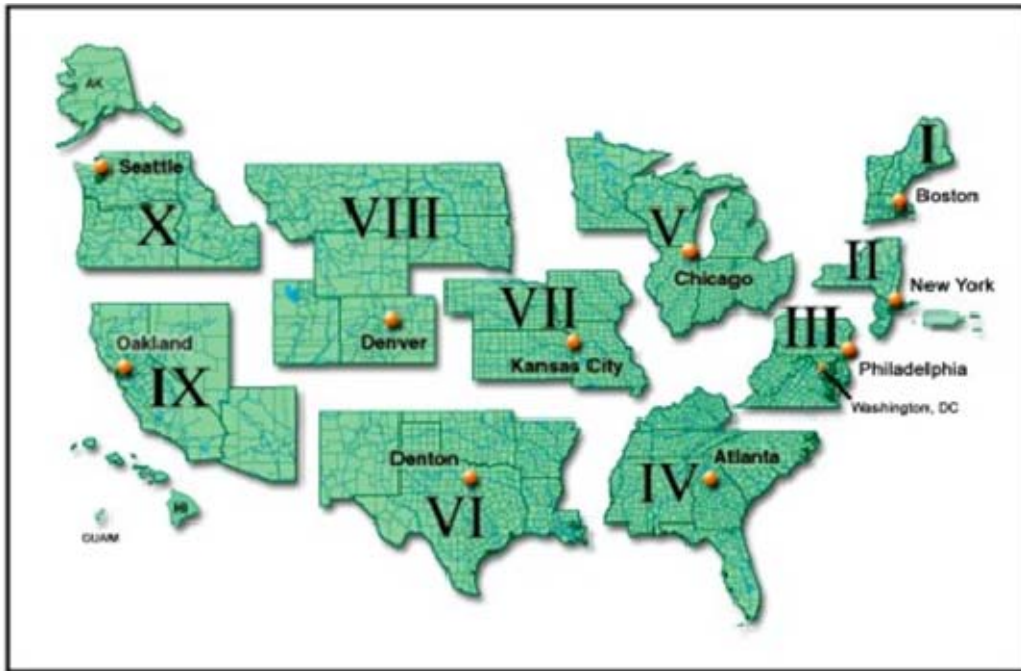


Figure 2. FEMA Regions (from United States Army North, 2006)

FEMA intends to build upon state SAR efforts for catastrophic incidents. The federal ESF #9 response assumes the states recognize that emergencies may reach such a magnitude as to require federal resources in addition to National Guard and emergency management assistance compacts (EMAC) sources. Incidents could exceed

the capability of all rescue resources within the state and regional capabilities and that federal and international support will be needed and desired.²⁴

c. How DHS/FEMAFits into the SAR Megacommunity

FEMA ESF #9 representation is found within the NSARC and the agency effort has been instrumental in rewriting the *ESF #9 Annex* to the NRF, revising the CIS SAR addendum, and actively participating in operational NSARC activities. FEMA has also recently released the Integrated Planning System (IPS) that was designed to standardize federal planning processes and support the Homeland Security Management System. Unfortunately, when the IPS was mentioned at the February 2009 NSARC meeting, none of the federal partners were interested in adopting the process for the CI SAR addendum revision.

FEMA established the US&R Response System in 1989 to provide vital specialized search and rescue task forces to local and state authorities. US&R is defined by FEMA as the locating, extraction, initial medical stabilization of a victim trapped in a confined space. Entrapment is usually the result of building collapse; however, trapped individuals are also found in transportation accidents, mines and collapsed trenches (FEMA US&R, 2007). There are 28 US&R task forces nationwide,²⁵ of which two American teams are internationally certified. If an event occurs that necessitates US&R resources, then FEMA deploys the closest three task forces within six hours. The task forces support state and local emergency efforts. A typical team is comprised of 31 people, four dogs and equipment.

²⁴ The SAR megacommunity has not clearly identified the difference between normal SAR operations, mass rescue operations (MRO) and catastrophic incident SAR. One assumption is that CI SAR will be apparent when it happens. That may be true of a no-notice event, but an event that slowly worsens will have progressively worse conditions. A clear and concise point where mass rescue operations cease and CI SAR begins is not known.

²⁵ During the National Hurricane Conference in March 2009, it was announced that additional US&R teams were going to be fielded.

4. USNORTHCOM

As mentioned in Chapter II, USNORTHCOM is not incorporated well into the operational and strategic planning documents for SAR. The USNORTHCOM Commander has taken the initiative to prepare for and anticipate CI SAR requirements despite the lack of formal tasking or authority. In the next two sections, USNORTHCOM and the USAF elements for SAR shall be discussed.

a. Responsibility

As directed by the President and Secretary of Defense, USNORTHCOM will provide DSCA SAR, civil SAR and personnel recovery.

(1) DSCA SAR. DSCA SAR is provided under a number of separate authorities. Authorities for DSCA SAR include the Robert T. Stafford Disaster Relief Act, 42 U.S. Code 5121 as amended²⁶ (106th Congress, 2000), National Response Framework, NIMS, Catastrophic Incident Annex to the NRF and ICS. AFNORTH 1AF, as the USNORTHCOM Air Component, will establish a Joint Personnel Recovery Center and establish liaison between the primary agency, Joint Task Force and other interested equity holders.²⁷ United States Northern Command (USNORTHCOM) Standing Joint Force Headquarters will support the Joint Personnel Recovery Center with this cooperative effort (United States Northern Command J3, 2008, p. C-27-10). USNORTHCOM intends to conduct SAR in a six-phase operation. The command will shape, anticipate, respond, operate, stabilize and transition back to normal operations. The phases include deployment of five AFRCC members to the AFNORTH /1AF Air Operations Center to establish a Joint Personnel Recovery Center.

²⁶ As amended by Public Law. 103-181, Public Law 103-337, and Public Law 106-390 (Public Law 106-390, October 30, 2000, 114 Stat. 1552 – 1575). 5170b c. 1–6 provide guidance on use of DoD resources. Three items to note in this authority are that DoD support may only be carried out for a period not to exceed 10 days. Work is on a reimbursable basis and the federal share of assistance shall not be less than 75percent,

²⁷ DoD Organization for DSCA CI SAR is typically from USNORTHCOM (through a Joint Task Force, Joint Force Land Component Commander, Joint Force Air Component Commander, Marine Forces for North America and Maritime components) to the Joint Personnel Recovery Center.

For CI SAR, USNORTHCOM will take immediate response actions to save lives, prevent human suffering and to mitigate great property damage under imminently serious conditions (United States Northern Command J3, 2008, p. C-27-1) through an expedited version of the six operational phases²⁸ and as authorized in the Catastrophic Incident Annex to the NRF (Department of Homeland Security, 2004).

Immediate response for SAR is authorized by DoD Directive 3025.1²⁹ domestically and internationally by DoD Directive 5100.46³⁰ (Department of Defense, 1975). Local commanders may provide assistance when time does not permit higher headquarters approval processes³¹ to assist with rescue and evacuation or the emergency medical treatment of casualties, the maintenance or restoration of emergency medical capabilities and the safeguarding of public health. USNORTHCOM will attain visibility on immediate response efforts through the National Guard, services and Defense Coordinating Officers (DCOs) as immediate response is reported through command channels using the most expeditious means possible and within 72 hours. Immediate response for CI SAR is both anticipated and encouraged; however, management and coordination of follow-on DoD support will likely be difficult to synchronize with these initial efforts. As the catastrophic event unfolds, the governor or

²⁸ The SAR Appendix 27 to Annex C to USNORTHCOM CONPLAN 3501 (DSCA) is somewhat out of date and consideration should be given to revising the document by the USNORTHCOM SAR Cell. For example, it does not reference the CI SAR Addendum; it references the 1999 version of the NSP, the appendix states inaccurately that *T10 SAR Forces will be OPCON or TACON to USNORTHCOM*; it does not discuss expedited procedures for catastrophic events and does not include discussion of the NSARC and USNORTHCOM involvement with other primary agencies. Furthermore, when the revised *ESF #9 Annex* is released, this document will not be out of date; it will be obsolete.

²⁹ DoD 3025 is in draft for approval at Office of Secretary of Defense.

³⁰ Foreign disaster relief is authorized/governed under a different directive than domestic immediate response. DoD Directive Number 5100.46 (December 4, 1975) titled, Foreign Disaster Relief, is the source of authority for providing Humanitarian Assistance/Disaster Response to areas outside the United States, but still within the USNORTHCOM area of responsibility (such as Bahamas, Caicos, British Virgin Islands and Mexico). USNORTHCOM staff is currently conducting an analysis on how to organize and respond should the need arise in these areas. Instead of immediate response, the term for a humanitarian assistance or disaster immediate response is “relief operations.”

³¹ United States Corps of Engineers (ACOE) have exceptional authorities under 33 U.S. Code 701N, which are somewhat unique. A parallel can be drawn that this ACOE exception and authorities to conduct civil SAR under the NSP are similar exceptions to ordinary authorities for DSCA SAR (C. Lystra, personal communication, 2009).

ambassador will request that the President declare a “disaster.” At such a time, the Stafford Act allows additional federal support (GlobalSecurity.org, 2005).³²

After determination is made that a catastrophic incident has occurred, federal military CI SAR support will deploy in advance of an anticipated request for assistance (RFA) from the primary federal agency in order to assist the civil authorities.

DoD is also authorized to provide DSCA SAR by 42 U.S. Code 5170a and 5170b. U.S. Code 5170a states that the President may direct any federal agency to provide DSCA without reimbursement in support of state and local authorities. U.S. Code 5170b affirms that the President may authorize federal agencies to provide work and services essential to save lives and protect and preserve property on public or private land and water. These services include SAR, emergency medical support, emergency mass care, emergency shelter and provision of food, water, medicine and other essential needs, including movement of supplies or persons. The President may also provide services to reduce immediate threats to life, property and public health and safety (U.S. Congress, 2007).

(2) Civil SAR. DoD personnel will provide civil SAR to persons, ships, and aircraft in distress under U.S. and international law and applicable regulations on a non-interference basis with their primary mission, on a reimbursable basis according to the Economy Act and Stafford Act. In the U.S., DoD attempts to ensure a synchronized DoD CI SAR response by coordinating through the civil authorities (Federal Coordinating Officer) and the civil/military state authorities (State Coordinating Officer / the Adjutant General of the National Guard) through the staff of the Regional DCO.³³

³² Other governments and territories are also eligible to request the President declare disasters as if they were states. These “states” include the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa and the Commonwealth of the Northern Mariana Islands. The Marshall Islands and the Federated States of Micronesia are also eligible to request a declaration and receive assistance from the U.S. federal government.

³³ DCO staff includes military operators and planners, Emergency Preparedness Liaison Officers (EPLOs), special staff and other liaisons.

USNORTHCOM is tasked (Secretary of Defense, 2006, pp. 5-7) to conduct a wide array of civil SAR functions (consistent with legal authority and on a non-interference basis) such as:

- Conduct civil SAR with trained personnel.
- Review security cooperation strategies and plans.
- Coordinate with headquarters, USCG office of SAR.
- Be knowledgeable of civil SAR responsibilities to complement other agreements.
- Support SAR operations of other countries.
- Negotiate and conclude civil SAR agreements with other country military counterparts.
- Provide copies of international agreements to the DoD General Counsel and DOS.
- Do not accept roles as SC or RCC for civil SAR where other nations have responsibility.
- Support civil SAR when requested by other search and rescue regions.
- DoD may support civil SAR when no other suitable facilities are available in other SAR regions.
- Include the USCG liaisons when planning and executing civil SAR activities.
- USPACOM will be recognized as the SAR coordinator for civil SAR in aeronautical search and rescue region corresponding to Alaska.

Although the tactical and operational responsibilities are similar for both DSCA SAR and civil SAR, the authorities and strategic implications are significantly different.

(3) Personnel Recovery. Personnel Recovery (PR) is authorized by U.S. Code Title 10, Section 1501, JP 3-50 and DoDD 3002.01E, *Personnel Recovery*

in the Department of Defense. (Department of Defense, 2009, pp. 1–25).³⁴ The National Security Presidential Directive 12 (February 18, 2002), “United States Citizens Held Hostage Abroad,” also refers to PR.

DoD has the primary responsibility for recovering isolated U.S.³⁵ personnel who are deployed outside the United States and its territories. It is the DoD PR policy to preserve the lives of isolated U.S. military, DoD civilians and DoD contractors. USNORTHCOM is responsible for planning and executing personnel recovery operations within the USNORTHCOM AOR (United States Northern Command J3, 2008, p. C-27-2a). Although PR is not a primary concern during CI SAR operations, it is mentioned because many of the same assets and organizations for PR are used for DSCA SAR and civil SAR.³⁶

A recent Joint Personnel Recovery Agency (JPRA) mission analysis of the USNORTHCOM Personnel Recovery program made a number of findings that are important to this study:

- Structure PR to more effectively respond to civil SAR.
- Designate USNORTHCOM as Search and Rescue Coordinator for the U.S. aeronautical search and rescue Region corresponding to the continental U.S. other than Alaska. USNORTHCOM would then delegate operational authority to AFNORTH.

³⁴ Isolated personnel (IP) are defined by Office of Secretary of Defense (OSD), Defense Prisoner of War Missing Personnel Office (DPMO) as: “United States military, Department of Defense civilians and contractor personnel (and others designated by the President or Secretary of Defense) who are separated from their unit (as an individual or group) while participating in a U.S. sponsored military activity or mission and are, or may be, in a situation where they must survive, evade, resist, or escape”. Personnel recovery is described by OSD/DPMO as: “The sum of military, diplomatic, and civil efforts to prepare for and execute the recovery and reintegration of isolated personnel” (Department of Defense, 2009, p. 25).

³⁵ The term “isolated” refers to those people that are in danger or may become endangered, beleaguered, besieged, captured, detained, interned, or otherwise missing or evading capture (Department of Defense, 2009, p. 2).

³⁶ The USNORTHCOM commander has implemented a program to establish a fully manned and trained Personnel Recovery staff. AFNORTH has been directed to stand-up a full-time Joint Personnel and Recovery Center with eight personnel. They will be co-located with the AFRCC at Tyndall AFB, Florida (J. Sokol, personal communication, February 27, 2009).

- Re-examine United States Pacific Command designation as the Search and Rescue Coordinator for the recognized U.S. aeronautical search and rescue region corresponding to Alaska.
- Establish AFNORTH Joint Personnel Recovery Center in support of both Personnel Recovery and support to civil SAR missions.
- Have USNORTHCOM source Personnel Recovery positions.
- Provide Personnel Recovery formal education.
- Develop a concept of operations plan for Personnel Recovery (Joint Personnel Recovery Agency, 2009).

b. DoD/ USNORTHCOM Organization for CI SAR

For CI SAR, the Catastrophic Incident Annex suggests that federal agencies may mobilize resources in anticipation of a request for assistance. The purpose of pushing federal assets during CI SAR operations is that it takes some time to mobilize the resources, organize, stage and prepare the assets for employment. It is imperative to move DoD timely, unique and surge SAR capabilities near to the incident because time saved equates to lives saved in CI SAR operations (J. Sokol, personal communication, February 27, 2009).

USNORTHCOM has taken many steps to improve CI SAR organization recently as the commander attempts to anticipate the DHS requirements and identify the “sweet spot” for preparedness. The USNORTHCOM Commander stated at the National Hurricane Conference in April 2009 that the best integrated SAR plan in history was seen in 2008 with Hurricane Ike. One hundred SAR aircraft were controlled through the Joint Personnel Recovery Center and USNORTHCOM provided DSCA SAR in the form of an unmanned aerial vehicle (Global Hawk) for incident awareness and assessment. This was necessary for situational awareness in the early hours of an event in order to first anticipate the need of the civil authorities and then to harmonize the federal response efforts (United States Northern Command Standing Joint Force Headquarters, 2009). The DoD SAR organization for Hurricane Ike in 2008 provides a recent example that demonstrates efforts underway to improve CI SAR readiness (Taleb, 2007, p. xvii).

Hurricane Ike did not reach catastrophic levels; however, the SAR megacommunity prepared for the eventuality by organizing differently in Texas than had been attempted in the past. The formulation of an Air Coordination Group (ACG) organization revealed that SAR operational and centralized coordination/communications was important. The ACG was very useful to the civil authorities, as the emergency managers knew how they could quickly get air support if it was required. The ACG had representatives from 35 co-located complimentary experts representing 25 agencies. This ACG concept is now a standard in Texas hurricane preparations.

The ACG was not without problems, however. At Lake Charles, 90 ambulances waited 14 hours for litters. Some aircraft were left empty. Some aircraft were the wrong type and had inappropriate configurations (S. Kavanagh, personal communication, April 9, 2009).

Another problem that an Emergency Preparedness Liaison mentioned was that a FEMA Urban Search and Rescue team was sent to Fort Sam Houston without a state request (S. Kavanagh, personal communication, April 9, 2009). According to Colonel Young, DCO Region VI, a military installation commander called to find out who the urban search and rescue team was and why they were at Fort Sam Houston, Texas. The US&R team had begun linking with other ESFs in preparation for the anticipated employment. Their coordinating efforts had gained the attention of state emergency managers who had not requested their assistance and did not know the US&R team was even in the state. Emergency managers from Texas Task Force 1 wanted to know why the Federal Coordinating Officer was deploying national SAR teams that had not been requested. The state ESF #9 coordinator for SAR was left out of the entire deployment/employment discussion. Even though the Hurricane Ike effort shows great improvement, there was still a clear lack of unity (Kavanagh, 2009).

Hurricane Ike SAR organization provides a recent and important proof of concept that the Joint Air Ground Coordination Center concept will be well received

and useful to SAR managers and coordinators. The Air Coordination Group was a good start on working towards a Joint Air Ground Coordination Center that is recommended later in this research.

c. How DoD/USNORTHCOM Fits in for CI SAR

Civil SAR authorities are provided by the *International Aeronautical and Maritime SAR Manual*, U.S. National SAR Supplement (NSS) to the *IMASAR Manual*, the U.S. National SAR Plan, DoDD 3003.01, *DoD Support for Civil SAR* (Secretary of Defense, 2006) and DoDD 3025.1 *Military Support of Civil Authorities* and the CI SAR addendum to the *National SAR Manual*. These civil SAR services are provided by DoD on a “not to interfere with military mission” basis. Per the National Search and Rescue Plan (NSP), DoD has the primary responsibility for Rescue Coordination Center (RCC) activities in the continental U.S. and secondary support of civil SAR in the rest of the world. The military services have authority for immediate response (J. Hudson, personal communication, March 20, 2009).³⁷

The roles and responsibilities of USNORTHCOM for CI SAR are comprised of five general tasks that are at varied levels of maturity. There is initiative within the command to work on these five efforts but much remains to be done to ensure DoD has clarity of SAR requirements associated with catastrophic events.

First, DoD has been designated a primary agency by ESF #9 and the command must be prepared to fulfill those tasks. Duties related to the designation as a primary agency for ESF #9 include strategic coordination/collaboration providing

³⁷ USNORTHCOM has concerns with three designated search and rescue regions (SRRs) in the joint operations area (JOA). The continental U.S. SRR responsibilities for civil SAR are delegated to the USAF (through the USAF, Air Combat Command (ACC)), 1-AF AFNORTH and to the Air Force Rescue Coordination Center. The second search and rescue region USNORTHCOM has interests is the Alaska SRR, as does United States Pacific Command (USPACOM). USNORTHCOM and USPACOM share responsibilities in Alaska, but civil SAR is habitually conducted by USPACOM (through 11th Air Force) thru the Alaska Rescue Coordination Center (RCC). The third search and rescue region in the USNORTHCOM JOA is a Maritime SRR managed by the USCG (through Pacific Area and Atlantic Area Coordinators) to the 10 USCG District RCCs. These USCG responsibilities also include inland waterways of the United States.

guidance to other DoD operational components for the three SAR categorical requirements (DSCA SAR, civil SAR and personnel recovery) (Department of Defense, 2009).

Second, USNORTHCOM must execute roles and fulfill responsibilities as the national SAR coordinator³⁸ by developing a SAR cell in the USNORTHCOM operations directorate to oversee SAR in the USNORTHCOM AOR and to serve as the command search and rescue coordinator in the USNORTHCOM area of responsibility. Additionally, the SAR coordinator should represent DoD on the National Search and Rescue Committee, set DoD policy in the USNORTHCOM area of responsibility, develop and promulgate an aggressive training program, lead a mission analysis to determine DoD roles and responsibilities, and assist with strategy and policy development to support ESF #9 operations.

Third, the USNORTHCOM SAR representatives must maintain continuous dialog with appropriate ESF #9 primary agencies and other SAR- related stakeholders to identify and ascertain gaps in the FSTTL efforts to prepare for CI SAR.

Fourth, USNORTHCOM must prepare for deployment and employment of SAR forces ahead of or in reaction to CI SAR related requests for assistance (FEMA, 2004, pp. 1–6).

Fifth, USNORTHCOM must work closely with the Joint Personnel Recovery Center to ensure accomplishment of ESF #9 support missions. This will include advocating for appropriate staffing, providing surge manpower as required and including them as a full partner in strategic and operational planning efforts.

The next few paragraphs discuss linked military equity holders that are component parts or task organized as part of the USNORTHCOM (DoD) within the greater CI SAR megacommunity.

³⁸ The USNORTHCOM commander approved a request to nominate USNORTHCOM vice the USAF as the SC for the United States. Previous designation of the USAF was a legacy construct prior to USNORTHCOM. AFNORTH agrees with the proposal. According to the USNORTHCOM Standing Joint Force Headquarters SAR expert (personal communication, 2009), the proposal was returned by the Secretary of Defense requesting more information on the proposal in June 2009.

(1) Continental U.S. North American Aerospace Defense Command Region (CONR) and Air Forces Northern (AFNORTH). The Continental U.S. North American Aerospace Defense Command Region (CONR) and AFNORTH ensure air sovereignty and air defense of the continental United States. AFNORTH provides airspace surveillance and control and directs all air sovereignty activities for the continental United States. They are also the air component of USNORTHCOM. Three activities of AFNORTH will be discussed for the purpose of this research: the Air Force Rescue Coordination Center (AFRCC), the Joint Personnel Recovery Center and the Airspace Control and Coordination Element (ACCE).

(2) Air Force Rescue Coordination Center (AFRCC). Although at the time of this writing a draft request is pending endorsement by the Secretary of Defense to make USNORTHCOM the SC, the 2007 NSP currently designates the USAF as the aeronautical SAR coordinator for the continental U.S., other than Alaska (NSARC, 2007, p. 7). The AFRCC coordinates federal SAR services in the continental U.S. (CONUS) with federal agencies such as NPS, the USCG Rescue Coordination Centers (RCCs), the states and internationally with Canada and Mexico³⁹. Typically, state SAR coordinators will request federal SAR assistance when needed and the AFRCC coordinates federal assistance (J. Dallin, personal communication, April 16, 2009).

The AFRCC has a service chain of command (the USAF) and responsibilities commensurate with their assignment as the inland SAR coordinator for the country. The AFRCC provides day to day federal SAR services to the 48 contiguous states and derive their authority from the NSP and associated references.

AFRCC responsibilities include:

- Missing or overdue aircraft
- Inland emergency beacons

³⁹ The relationship of the AFRCC with the International Search and Rescue Advisory Group (INSARAG) of the United States Agency for International Development (USAID) is vague. When members of the NSARC were asked if they had close ties with the INSARAG during the February 2009 CI SAR addendum revision, none had heard of the lead agency for managing international SAR resources.

- Coordination of state requests for assistance (J. Hudson, personal communication, February 12, 2009).⁴⁰
- MOU, MOA and resource database
- Arrangement of civil SAR services and staff a Rescue Coordination Center 24/7 (National Search and Rescue Committee, 2007, p. 6).

The AFRCC works closely with USNORTHCOM and other members of the NSARC. As the operational experts for aeronautical SAR, they (and the USCG) clearly hold much of the megacommunity expertise that is depended upon for CI SAR preparations. The AFRCC is working closely with USNORTHCOM to develop a hurricane SAR CONPLAN to improve PR readiness and to prepare for upcoming hurricane seasons. It also makes many efforts to engage the states, such as attendance at the National Association for Search and Rescue convention May 27–30, 2009, where it informs on current efforts and operational intentions.

There are indications that the AFRCC memorandums of agreement and memorandums of understanding with the states need to be updated. The National Guard Bureau and the National Association of SAR representative to the NSARC indicated that many of those memoranda were abstract with few details and, in some cases; the agreements were outdated (the Maryland agreement was last endorsed in 1961) (C. Brown, personal communication, February 5, 2009). Also, there are political sensitivities and reluctance at the state level to provide public documentation that could hint at a lack of preparedness for SAR at the state level (C. Brown, personal communication, February 5, 2009). Therefore, it can be surmised that the memoranda that the AFRCC has on file only have limited value to state and federal equity holders.

(3) Joint Personnel Recovery Center (JPRC). The JPRC is activated for joint military operations and for mass casualty scenarios that exceed the capabilities of the AFRCC. The JPRC plans, coordinates, and recommends tasking of components to support joint rescue personnel recovery missions. The JPRC coordinates

⁴⁰ At the state's request, the AFRCC coordinates resources. Civil authorities requiring an immediate response from DoD for civil SAR within the 48 contiguous states contact the AFRCC at 1-800-851-3051 as soon as a need is anticipated or identified.

personnel recovery procedures published in the air tasking order special instructions and reviews plans and coordinates joint training and exercises.

The JPRC is appropriately staffed by participating components to coordinate joint personnel recovery requirements for contingency operations (Headquarters, Air Forces Northern, 2007, p. 41). The JPRC is in the USNORTHCOM chain of command with responsibility as an ESF #9 primary agency for aeronautical SAR. Its mission is to coordinate procurement and integration of federal aviation SAR assets in response to a disaster to all 50 states. The JPRC authority is derived from the DSCA authorities.

For DSCA SAR, the JPRC has six primary responsibilities. The responsibilities include:

- Coordinate with component commanders for timely and effective all domain integrated SAR response.
- Collaborate with FSTTL SAR authorities to integrate DoD and other federal SAR resources toward an all-domain integrated planning effort and interoperable response.
- Coordinate with USNORTHCOM to provide representation at the National Response Coordination Center (NRCC), FEMA Regional Response Coordination Centers (RRCC), established Joint Field Offices, ESF #9, and upon request state, tribal, territorial and local emergency operations centers.
- Manage DoD SAR resources in the affected area.
- Coordinate provisioning of additional support assets.
- Provide incident reports, assessments, and situation reports as required (Merrigan, 2009).

The JPRC has derived manpower from the AFRCC as contingencies demanded. Efforts are currently underway to provide them full-time manning. The JPRC was quite active during preparations for Hurricanes Ike and Gustav in 2008. They controlled more than 100 aircraft in FEMA Region VI in anticipation of CI SAR requirements for the storms. Fortunately, CI SAR was not required from the USAF during these events (United States Northern Command Standing Joint Force Headquarters, 2009).

(4) Air Component Coordination Element (ACCE). The ACCE is a deployable team responsible for coordination of air, space and information operations at the operational and tactical level for DoD. They also ensure commanders are getting required air, space and information support through multi-level integration of military planning and execution. The JFACC may establish one or more ACCE teams with interagency partners to better integrate DoD air and space operations with the SAR megacommunity. The ACCE exchanges DoD information with interagency partners to coordinate airspace use with partners through FAA- approved procedures (Headquarters, Air Forces Northern, 2007).

(5) Civil Air Patrol—Air Force Auxiliary (CAP-AFAUX). The Civil Air Patrol-Air Force Auxiliary (CAP-AFAUX) can support FSTTL authorities with more than 55,000 volunteers and a fleet of 550 aircraft nationwide (including Puerto Rico and the Virgin Islands). They are typically available within four hours to perform reconnaissance, emergency services, homeland security and disaster relief missions. The CAP-AFAUX is an auxiliary of the USAF when performing missions through AFNORTH. Its AFAUX mission is flown with a federal mission control number. Through its aircraft, satellite digital imaging systems , hyper spectral system, ground equipment and nationwide communications systems, the CAP-AFAUX can provide critical incident awareness and assessment (IAA), transportation, personnel, communications and law enforcement support for CI SAR operations (Headquarters, Air Forces Northern, 2007, pp. 46–53).

5. State Civil SAR Responsibilities and Organization

a. Responsibilities

Responsibilities for SAR vary between each of the states and territories. These fluctuating state approaches to SAR are also the keystone of a harmonized and unified all-domain FSTTL CI SAR response. The State SAR Mission Coordinator would serve the local public well if State CI SAR plans were completed and intra-state standard

procedures existed to incorporate federal SAR support into the impacted area as outlined in the Catastrophic Incident Search and Rescue Addendum to the *National Search and Rescue Manual*.

However, standardization of interstate planning is difficult to achieve. One reason is that each state has different concerns, authorities and organization. Although standardization of plans between states is an altruistic goal, it is more realistic that the aim will fall short without some type of unifying approach such as a National Strategy for SAR.

b. State Organization for CI SAR

Organization for SAR varies between states for an assortment of reasons. Typically, law enforcement has a lead function in SAR at the state level. In most cases, there is a good relationship between the State SAR Mission Coordinator, ESF #9 lead and the state emergency operations center (EOC) operations section. This triad is the bulwark for large incident response within the states. It is through these three state officials and the unified command that federal assets could be received, staged and integrated into the Incident Action Plan (IAP).

Surprisingly, the state SAR managers are not always full time employees. Approximately 13 states have full-time managers, while the rest of the states vary in their approach. Most hurricane prone states hire a full-time employee as the state manager. Other states assign the SAR coordinator on an as-needed contingency basis. For example, Maryland uses a search manager like the operational on-scene SAR coordinator.⁴¹ In the western states, law enforcement (such as the county sheriff) has responsibility for SAR

⁴¹ The *International Aeronautical and Maritime Search and Rescue Manual* (National Search and Rescue Committee, 2008) defines the on-scene coordinator (OSC) as: “A person designated to co-ordinate search and rescue operations within a specified area.”

management. In addition, each state manages volunteers⁴² and part-time workers differently. The state political systems determine how SAR is staffed at state level and below.

c. How the States Fit into the CI SAR Megacommunity

NIMS and the ICS are typically used by SAR managers in each of the states. Once the concept of operation and responsibilities for SAR are determined by the state lawmakers then the emergency managers and state SAR mission coordinators have relatively standard education, certification, expectations and deliverables (NIMS/ICS) despite a lack of standardization between the states.

Some of the states have robust SAR plans and other states, none. Links to FEMA catastrophic planning and the FEMA integrated planning system are often ignored by the states.⁴³ When a new FEMA planning guide shows up on the desk at local and state levels, it is sometimes quickly brushed aside and replaced with local imminent requirements demanded from the public and close to home.

State SAR plans are also wide-ranging and varied. Steps toward standardization are being taken, but multi-disciplinary CISAR plans are typically non-existent except in Gulf of Mexico Hurricane States where CI SAR is a concern on an annual basis. Local and state emergency managers are too busy and do not have enough money to bother with “black swan” FSTTL integrated planning efforts and gap analysis. States would be more likely to focus on CI SAR planning if they had adequate resources (personnel/funding) for the exertion. As it stands, states receive FEMA funding for NIMS compliance, but not CI SAR integrated planning efforts. State efforts, therefore, are largely centered on local events that appear at the top of the inbox.

⁴² SAR is the only emergency management segment that is comprised of 95 percent volunteers (National Association of Search and Rescue Board of Directors, 2005).

⁴³ When national programs are not well coordinated with the states during the development process, a level of frustration becomes prevalent and is currently manifested at state level and below. State acceptance of the national planning programs, FEMA gap analysis and standardization efforts could be improved if DHS/FEMA planned and coordinated with all equity holders during the development process of emergency management programs.

The National Association for Search and Rescue provides multi-disciplinary SAR certifications to SAR professionals and volunteers primarily from state and local levels.⁴⁴ Through NIMS, ICS and the NASAR certifications; standardization is being achieved up to the state level, but each state organizes and funds SAR activities using incongruent methods. Lack of standardization between states raises the level of difficulty for seamless and harmonized federal CI SAR support operations (Brown, personal communication, February 5, 2009).

Results from two interviews indicated that the Air Force Rescue Coordination Center's state memoranda of understanding and agreement are not all up to date. State and local political leadership sensitivity exists to developing agreements with federal representatives prior to the occurrence of a catastrophic incident. Asking for federal assistance can be viewed in the political arena as ill prepared or weak. Nonetheless, whether prepared for CI SAR or not, these officials are reluctant to ask for federal assistance unless the need is critical. Ironically, this cultural paradigm exists despite the fact that federal dollars come with Stafford Act declarations (D. Scott, personal communication, February 5, 2009).

6. The National Guard

a. National Guard Responsibilities for CI SAR

The National Guard has a dual mission responsibility with concerns about both the federal war-fighting mission and state threats that are either natural or manmade.

⁴⁴ In the NASAR 2005 Strategy, NASAR indicates membership records of participants are not well analyzed.

The National Guard can operate in three distinct legal duty statuses as indicated in Table 4 during response operations⁴⁵ (National Guard Bureau, 2008):

Table 4. Distinct Legal Status of National Guard Component

	Title 32 Duty Status (Title 32 U.S. Code)	State Active Duty (Per State Law)	Federal Active Duty (Title 10 U.S. Code)
Mission Type	Domestic Mission	State Missions	Federal Worldwide
Command Type	State Command	State Command	Federal Command
Funding Type	Federal Funding	State Funding	Federal Funding

For CI SAR, an assumption can be made that the National Guard will be fully involved and helping with the leadership of the overall DoD response. The National Guard will have assistance from neighboring states through emergency management assistance compact and through the National Guard Bureau (Wright, 2007).

b. National Guard Organization for CI SAR

The Adjutant General (TAG) roles vary by state according to the respective state law. Six states and the Virgin Islands have TAGs who serve as the State Director of Homeland Security and the State Director of Emergency Management, five states have TAGs that serve as the State Director of Emergency Management, one state has a TAG who serves as the State Director of Homeland Security and in the remainder of the states the TAGs serve only the singular purpose as commander of the National Guard (Wright, 2007).

⁴⁵ There are a variety of internal statuses that the National Guard uses to manage civil support. Additional Flight Training Periods (ATFP), Active Duty Special Work (ADSW), Active Duty for Training (ADT), Annual Training (AT), etc.... Not all these statuses can be used per the letter of the law for civil support missions and complications arise for liability, health and life insurance depending on the status chosen by the state or federal authorities. The type of mission helps managers determine the duty status that best fits the conditions. Some of the anticipated mission anticipated by the National Guard include: disaster response, homeland security, homeland defense, critical infrastructure protections, counterdrug, support to civil authorities, contingencies, emergency preparedness, humanitarian support and air and missile defense (National Guard Bureau, 2008).

The National Guard typically provides support to state emergency response through the Office of the Governor or the TAG.⁴⁶

c. How the National Guard Fits into the CI SAR Megacommunity

The National Guard will likely be the first DoD assets responding to a CI SAR incident and the Guard may be integrating follow-on DoD resources. The National Guard is also a full partner in SAR planning with the state leadership and is active with both a DoD focus group in USNORTHCOM and with the National Search and Rescue Committee.

The National Guard component of DoD has been working on a civil support task list (CSTL) that specifies SAR requirements demanded routinely by state authorities. The civil support tasks were developed as part of a larger project to provide a common vocabulary to aid in the assessment, request and provision of National Guard and federal military civil support capabilities during emergency planning and response. The SAR tasks developed as part of this effort are found in Table 5. The National Guard has identified 17 SAR critical civil support tasks that include three contaminated environmental conditions.⁴⁷

⁴⁶ Once NGB assistance is requested (usually through EMAC or a request for assistance from a state), the chief of the NGB coordinates with the Army and Air Deputies. The NGB joint staff works through the JFHQ-states to provide a recommendation for resourcing decisions to the afflicted state(s). National Guard liaisons, joint enabling team (JET) members and liaisons also provide situational awareness at critical interagency nodes such as state operations centers, the USNORTHCOM operations center, Regional Readiness Coordination Centers and the National Response Coordination Center.

⁴⁷ The Post Katrina Emergency Reform Act states the administrator of FEMA shall "...develop and submit to Congress annually an estimate of the resources needed for developing the capabilities of federal, state, and local governments necessary to respond to a catastrophic incident" (Post Katrina Reform Act, 2006).

Table 5. National Guard SAR Civil Support Tasks

Proposed National Guard Civil Support (CS) Tasks for SAR	
CS 9.4.4. Provide Rural SAR in a Contaminated Environment	CS 9.1.11. Provide Underground SAR
CS 9.1.3 Provide Lifting and Hauling	CS 9.1.12. Provide Vehicle Mounted SAR
CS 9.4.3 Provide Lifting and Hauling in a Contaminated Environment	CS 9.1.13. Provide Rural SAR
CS 9.1.2. Provide Structural Collapse SAR	CS 9.3.1. Provide Ice SAR
CS 9.1.4. Provide Desert SAR	CS 9.3.2. Provide Dive SAR
CS 9.1.5. Provide Wilderness SAR	CS 9.3.3. Provide Swift Water SAR
CS 9.1.7. Provide Avalanche SAR	CS 9.3.4. Provide Surf SAR
CS 9.1.10. Provide Rope Rescue	CS 9.4.1. Provide Urban SAR in a Contaminated Environment
	CS 9.4.2. Provide Structural Collapse SAR in a Contaminated Environment

In a CSTL discussion on May 14, 2009, SAR tasks became a topic of conversation. National Guard Bureau operations representatives and the project leadership from the Assistant Secretary of Defense for Homeland Defense suggested that the NSARC be contacted to ask them to determine, “What are the SAR oriented tasks that the National Guard will be expected to train/perform? What certifications are required, what equipment will be needed... Ask the NSARC to define the role of the National Guard for SAR.” After developing the requirement, the CSTL leadership suggested a collaborative dialogue about whether the Guard can maintain the highly technical and demanding certifications and proficiency or whether they should be employed only as generalists (supporting ESF #9/ other experts). These high-level questions indicate a need for a SAR strategy that has yet to define roles of the stakeholders for SAR (S. Winegar,

personal communication, May 14, 2009). This is important to mention at this point in the research because it demonstrates that the SAR megacommunity is also trying to clarify the role of the National Guard.⁴⁸

7. The United States Agency for International Development/International Search and Rescue Advisory Group (USAID/INSARAG)

a. Responsibilities of USAID/INSARAG

The International SAR Advisory group was established in 1991, and is comprised of more than 80 countries. This group was established with the dual purpose of conducting SAR operations at the site of a disaster as well as increasing and accelerating the availability of local and international resources to an incident requiring international SAR assistance (International Search and Rescue Advisory Group, 2000). The worldwide informal network is designed to improve SAR efficiencies for both responding and receiving countries.

b. USAID/INSARAG Organization for CI SAR

INSARAG is recognized internationally by the United Nations for setting US&R standards, methods and guidelines. U.S., Canada and Mexico all participate in this international effort.⁴⁹ The U.S. has two heavy⁵⁰ US&R task forces recognized by INSARAG; Virginia Task Force 1 is an international team comprised of approximately 80 members (Fairfax County Search and Rescue, 2009). The second heavy international US&R team, California-Task Force 2, is from Los Angeles County and consists of a 70-person US&R unique team that has specialized training and equipment for response

⁴⁸ Also, looking at the emphasis put on homeland defense versus homeland security within DoD, it could be argued that allocating more DoD resources to homeland security would help to integrate all national efforts for a catastrophic incident unified response and thereby improve CI SAR preparations (Stockton & Roberts, 2008, p. 5). Using capabilities-based homeland security preparedness training, CI SAR could be added into a multi-year schedule oriented toward improving this targeted capability (Department of Homeland Security, 2007, p. 37).

⁴⁹ These countries are noted because they are in the USNORTHCOM AOR.

⁵⁰ The designation “heavy” indicates these US&R teams are larger than the light or medium teams, have additional equipment and training and an international certification.

world-wide (Los Angeles County Fire Department, 2005). The Virginia and California task forces partner to provide the USAID Foreign Disaster Assistance program aid for collapsed structure SAR for both natural and man-made disasters world-wide. Canada has five heavy US&R teams and only one 32-man team based in Vancouver is certified for international deployment to assist USAID (Vancouver Urban Search and Rescue, 2006). The international team is identified as Canadian Task Force 1⁵¹ (United Nations Office for the Coordination of Humanitarian Affairs, 2009).

The UN General Assembly Resolution 57/150 endorsed the INSARAG recommendations to tailor the organization of these urban SAR teams because of the wide variety of situations that they may face during a disaster response. (International Search and Rescue Advisory Group, 2000, p. 86)

The International US&R teams are connected through the global disaster alert and coordination system and a Virtual On-Site Operations Coordination Center. The collaborative international tools allow for email, messaging and fax of three levels of catastrophe (red, orange and green). The INSARAG Virtual On-Site Operations Coordination Center facilitates decision-making for international responders through real-time information exchange. The Virtual On-Site Operations Coordination Center is also used to facilitate training, exercises and international interagency coordination.⁵² For international purposes, the Virtual Center is used by all 80 countries included in the INSARAG, but the United States SAR megacomunity does not seem to be attuned to an international standard communications suite.⁵³ More about an international strategy will be suggested in the Chapter VI.

⁵¹ This is of interest, because it is USNORTHCOM's area of responsibility that Mexico lists a point of contact in the INSARAG SAR directory but does not have even one US&R international teams.

⁵² In the United States, Homeland Security Information Network (HSIN) is an attempt by DHS to provide a comprehensive all-encompassing tool for electronic communications, but it was rejected by many of the state emergency managers and is not used by the international SAR managers operationally. The states and many other organizations favor WEB EOC and E-Team.

⁵³ Since the INSARAG concept of operations impacts both Canada and U.S., it is extremely important for the United States SAR megacomunity to immediately reach out to this group to initiate coordinated planning for CI SAR. Integrated plans should be developed after establishing a long-term international civil-military CI SAR strategy and conducting a resource analysis.

C. SAR TECHNOLOGICAL TOOLS

Three technologies used by the USCG will provide a model for the premise that technology can support knowledge management and information sharing across stove-piped organizational cultures and that the current organization for CI SAR needs improvements. The three technologies are linked in application and all are used by the USCG. They include the self-locating data marker buoy, the SAROPS Computer Drifting Simulator and the Rockwell Collins Flight Management System.

These technologies leverage the SAR community's ability to locate targets in the open ocean to save lives and prevent suffering. The following technology descriptions highlight each individual system, analyze the data handling and investigate the entire system of information gathering and dissemination. The data will seek to address three questions: How is the data for a lost person used once received by a "Coasty" (member of the USCG) on the ground? Is the information shared with other SAR partners? How could the system be improved?

The Self-Locating Data Marker Buoy (SLDMB) is a technology first developed in 1985 for use by the USCG. This buoy is deployable by boat and all USCG helicopters and airplanes. The SLDMB parachutes down and self-deploys if dropped from the air. During the following 30 days, it sends GPS position, drift data and water temperature with a satellite transmitter every 30 minutes. At the end of the 30 days, the beacon scuttles itself. The SLDMB was designed specifically for USCG SAR missions in the ocean, and it is currently used by other countries as well as the United States (The Martec Group, 2002). In the U.S., only the USCG is using the technology. The display software allows the GPS drift characteristics to be visualized and the buoys are automatically tracked by the USCG after deployment on the displays.

Search and Rescue Optimal Planning System (SAROPS) is a relatively new computer-drifting simulator fielded in 2006. It simulates 10,000 search objects all drifting differently based on winds, currents, tides and forecasted weather taking into consideration the drift object composition. A person in the water drifts much differently than a 40-foot sailboat. In the past, these computations were done manually. The manual

computations for multiple objects were quite difficult and time consuming to map. The SAROPS program is able to quickly build a visual depiction of optimal search patterns for different sized objects floating in the water. For example, if a luxury liner sank in the ocean, the people in the water, the lifeboats and the debris would all drift in different patterns.

The Rockwell Collins Flight Management System (FMS) on each aircraft is designed to plug in air and water searches and fly them without pilot manipulation of the flight controls. One simply configures the FMS with the search vehicle data, type of search, starting point, direction and size, and it does the rest. The FMS will compute the most efficient air and sea search patterns.

Rockwell Collins developed FMS-800 and Mission Planning Ground Station flight planning software in order to load previously planned flight data into the aircraft. Depending upon the specific FMS-800 FMS configuration, the software allows the loading of navigation, communications and refuel location information into the aircraft, greatly improving the time on station and performance of the platform (Rockwell Collins, 2008).

Leveraging these three technologies changes the way the USCG conducts business for maritime SAR. Just a few years ago, it would have been necessary to collect information about the incident, manually enter drift computations on a chart and then continually update the chart. Optimal search patterns were at the discretion of the crew and each time the area was searched by a particular vessel, manual adjustments had to be entered into the equations. Presently, not only are the search area and drift pattern computations conducted automatically, but the data can be uploaded to the search vehicle navigation management system to instruct the computers on the best route and pattern to search. Furthermore, as environmental conditions change, the SAR specialist receives updated SAR maps automatically.

A review and analysis of the current capabilities indicates great satisfaction with the way these three technologies work together. One interviewee, a pilot, indicated that his workload in the cockpit was greatly reduced by the integrated FMS (C. Day, personal

communication, September 12, 2008). He is able to program data into the FMS provided by SLDMB and SAROPS. His aircraft will download data and program SAR flight patterns from the real-time information. Inevitably, these technologies will help the USCG save an untold number of lives (C. Day, personal communication, September 12, 2008).

1. Sharing Knowledge is Desirable

There is a missing component to these technologies that is critical to optimizing the multi-domain SAR efforts. Research indicates there has been little effort to share this information with interagency partners outside of the USCG. One SAR expert at USNORTHCOM was consulted (C. Day, personal communication, September 12, 2008). The USCG officer confirmed that the SAR data was used exclusively in the United States by the USCG crew and was not part of a larger scheme of systems that would automatically share with partners to unify the SAR efforts (C. Day, personal communication, September 12, 2008). This interesting and perplexing news indicated that there is a lack of interoperability and knowledge management between SAR stakeholders. The fact that this information is not shared through technological means is probably not important for small-scale contingencies but will likely cost people lives in a catastrophic event because knowledge is not shared across SAR equity holder organizational boundaries.⁵⁴

When the USCG deploys to conduct a hasty search for a catastrophic incident, the information they gather could be used by a wide array of agencies and departments to expeditiously begin primary and secondary searches.⁵⁵ SAR experts know the first 72

⁵⁴ Lack of sharing is only one piece of this conundrum. In addition to the lack of sharing there are overlapping regional interfaces between the USCG, FEMA and the USAF. There is a lack of agreement on which navigational systems to use (military grid/latitude and longitude/area reference system). These individual problems may be surmountable during crisis response, but clearly more sharing and uniformity would be useful (J. Hudson, personal communication, March 20, 2009).

⁵⁵ The Catastrophic Incident Addendum to the *National Search and Rescue Manual* states, “Most CIS search operations generally progress through a sequence of rapid, primary and secondary searching. These search phases may overlap or vary within different portions of the overall search area. Increasing levels of search planning are customarily involved as searching progresses to the primary and then to the secondary phases” (National Search and Rescue Committee, 2008).

hours of an incident are critical to the victim and sharing this technology with local and state emergency management officials could save lives. Any time these technologies can be applied to a rescue is likely to equate to lives saved in a catastrophic incident. Neither the USAF nor the United States Navy (USN) has access to the SAROPS and FMS data from the USCG efforts except through manual exchange of information. There is no method to incorporate this timely information into the database of the other equity holders. USCG crews would have to relay information manually about searches conducted to incoming crews of the police, fire, ESF #9, National Guard, U.S. Fish and Wildlife Service or a wide variety other megacommunity members in this example.

2. Operational and Strategic Implications

Reaching beyond the example of the three aforementioned tactical systems, this study indicates that there are technological, organizational and functional barriers that hinder information sharing. It should be possible to relay information between disparate SAR organizations in order to combine and supplement search teams from a variety of organizations for catastrophic SAR. SAR stakeholders would greatly benefit from a system that could take advantage of these technological tools, but the knowledge management and information sharing between organizations needs improvement.

This research has shown three useful tactical systems (SLDMB, SAROPS and FMS) and disjointed knowledge management at operational and strategic levels. Information derived from current technologies is not being shared across cultural and organizational boundaries. The inability to share inter-organizationally adversely impacts the ability of the nation to strategically respond to a catastrophic event with SAR assets.

Another high-tech SAR structure is found in the *Cosmicheskaya Sistema Poiska Avariynyh Sudov*⁵⁶ (COSPAS-SARSAT) system. This model shows clear

⁵⁶ COSPAS is an acronym for the Russian, “*Cosmicheskaya Sistema Poiska Avariynyh Sudov*” that roughly translates to: “Space System for the Search of Vessels in Distress.”

interdependencies between SAR organizations with another obvious indication that information and sharing of the technical data between organizations would greatly benefit responders to a catastrophic event.

3. The COSPAS—Search and Rescue Satellite Aided Tracking System (SARSAT) Program

The COSPAS-SARSAT program is managed by a number of the National Search and Rescue Committee members: Department of Commerce (National Oceanic and Atmospheric Administration (NOAA)), DHS (USCG), DoD (USAF), and the National Aeronautic and Space Administration (NASA) (Button). This system is described in the next few paragraphs in order to highlight the complexity, technological interdependence and unity of effort found in the SAR megacommunity for normal SAR.

The Federal Communications Commission, by way of the NOAA, using low-earth and geostationary orbiting satellites, operates an international satellite system for SAR. The COSPAS-SARSAT system assists worldwide SAR activities by providing accurate, timely and reliable alert and location data to the international community on a non-discriminatory basis to assist persons in distress (International Satellite System For Search and Rescue, COSPAS-SARSAT). The SARSAT relays aeronautical, land and marine distress beacons to ground equipment that subsequently retransmits to local SAR authorities who will assist persons in distress.

The system was established by the United States, the former Soviet Union, France and Canada in 1979 and now includes 38 nations and two independent SAR organizations participating 24 hours a day (National Oceanic and Atmospheric Administration, 2009). The system provides alerting services for 406 MHz Emergency Locator Transmitters, Emergency Position-Indicating Radio beacons for maritime use, personal locator beacons and ship security alert beacons. Signals from the low-altitude Earth orbit satellites and the geostationary Earth orbit satellites are received by local user terminals that receive and process the satellite data and subsequently relay the information to the mission control centers, rescue coordination centers and other SAR points of contact.

In the United States, a mission control center is located in Suitland, Maryland and is the focal point for the COSPAS-SARSAT data. Much of the downloaded data is handled through automated processes, but the center is staffed 24/7. The USCG or USAF officials operate the rescue coordination centers that receive the COSPAS-SARSAT alerts sent by the mission control center and each service approaches the process differently.⁵⁷

- The Air Force Rescue Coordination Center at Tyndall AFB, Florida: Coordinates continental U.S. SAR activities but does not carry out rescues. The rescues are carried out by Civil Air Patrol and rescue organizations designated by the respective states.
- Alaska Rescue Coordination Center at Ft. Richardson, Alaska (operated by the Air National Guard): Alaska SAR is conducted by the local borough SAR teams, state police and Alaska National Guard North of Anchorage.
- USCG: Coordinates and performs maritime SAR. The RCCs are both geographic command and coordination centers and parsed between nine Coast Guard commands and two rescue sub-centers (RSCs)⁵⁸ (National Oceanic and Atmospheric Administration, 2009).
- The COSPAS-SARSAT program works well through the interagency partners for normal SAR and even mass rescue operations, but a number of problems may exist when the crisis faced is a frenzied catastrophic incident.

States conduct SAR in a manner consistent with their own policies, procedures and legislation. Not all state SAR coordinators are full-time and the agency responsible for SAR varies by state. When CI SAR is required and beacons are used across a multi-state area, then confusion can be expected throughout the impacted area as a variety of response options present themselves. State policies will govern the local, state and even

⁵⁷ A related issue is also evident when examining physical regional boundaries of SAR, emergency management and wildfire geographic regions. The USAF regional boundaries differ from the USCG International Maritime Organization (IMO) regions. Even the Civil Air Patrol within the USAF identifies regions that are different than those of the USAF (J. Dallin, personal communication, July 1, 2009). FEMA regions and wildland firefighting regions are also different than all others. Defining regions in such a manner does nothing improve or to help unify CI SAR response operations (USCG, 2008).

⁵⁸ RCCs and RSCs are located in: District 1: Boston, MA; District 5: Portsmouth, VA; District 7: Miami, FL; District 8: New Orleans, LA; District 9: Cleveland, OH; District 11: Alameda, CA; District 13: Seattle, WA; District 14: Honolulu, HI; District 17: Juneau, AK; Puerto Rico RSC: San Juan, PR; Marianas RSC: Guam (National Oceanic and Atmospheric Administration, 2009).

tribal response, but the federal response will be in accordance with DHS directives, the CI SAR addendum to the *National Search and Rescue Manual* and the established unified command managers.

A surge requirement will exist for SAR personnel to manage both the CI SAR and normal SAR operations outside the impacted area concurrently. Coordinating and integrating technologies during response operations, harmonizing disparate management systems across organizational boundaries and developing and resourcing a national/international strategy for CI SAR is a highly complex task for the NSARC.

D. ANALYSIS

This chapter has presented a view of organizations and functions for CI SAR followed by an example of SAR technical systems (SLDMB/SAROPS/FMS and the COSPAS/SARSAT systems). This final section analyzes the organizations, functions and technologies already discussed. The analysis touches on current technologies related to CI SAR, initiatives and potential problem areas that were discovered as a result of the research.

In August 2008, the NSARC released the *Catastrophic Incident Search and Rescue Addendum* (Version 1.1) to the *National Search and Rescue Supplement* to the IAMSAR (National Search and Rescue Committee, 2008, pp. 3–88).⁵⁹ The manual and the revision were developed by the NSARC members over the course of many months. The NSARC has not received funding for fielding this initiative and those assigned to write, edit, revise and publish the addendum do so as an ancillary duty. In addition, this document has not been trained or exercised within USNORTHCOM, the USAF, the SAR megacommunity⁶⁰ (Gerencser, Van Lee, Napolitano, & Kelly, 2008, p. 232) or during any tier 1 interagency exercise.

⁵⁹ Version 2.0 of the CI SAR Addendum to the *National SAR Manual* is currently drafted.

⁶⁰ Megacommunities are defined as: “A collaborative socioeconomic environment in which business, government, and civil society interact according to their common interests, while maintaining their unique priorities (Gerencser, Van Lee, Napolitano, & Kelly, 2008, p. 232).”

Therefore, one can understand why the three technologies explored in this research (SLDMB, SAROPS and FMS) have great tactical utility but limited operational or strategic application to the entire SAR spectrum. That is, there have been limited efforts to coordinate between agencies for CI SAR strategy development, knowledge management during response operations or integrated operational planning.

In 2005, the GAO (Government Accountability Office, 2006, pp. 15, 19 and 35) found that DoD had not adequately planned or exercised a catastrophic incident SAR response. With a CI SAR Addendum to the *National Search and Rescue Manual* fielded and the DoD/USAF recently designated as one of five primary agencies for ESF # 9 (Search and Rescue), it seems DoD is in the same predicament at the time of this writing as shortly prior to Hurricane Katrina. That is to say, there is guidance available for conducting catastrophic incident SAR, but training and exercise programs for the stakeholders are not available and have not been developed through a comprehensive national/international strategy or single program. This has likely occurred because of rapid technological developments that have outpaced legislative and operational adaptations in SAR. For instance, the three technologies in the example were not available 10 years ago. Computers could not handle large amounts of imagery data, nor could the large files be transmitted efficiently to remote locations (such as a Joint Air Ground Coordination Center (JAGCC)) for awareness, consumption and action by the interagency partners.

These technological advances are also apparent in other SAR process areas. Interoperable communications, global positioning, personal locator beacons and even cell phones have improved the ability of searchers to find and rescue victims while concurrently increasing the workload of the SAR managers around the world (International Satellite System For Search and Rescue, COSPAS-SARSAT). The management of this information has not kept pace with the technical advancement. The organizational structure, although improving, lags behind the requirements.

Lessons learned from Hurricane Katrina indicate a lack of cultural integration in the SAR community. The report states, “The Department of Homeland Security should lead an interagency review of current policies and procedures to ensure effective integration of all federal search and rescue assets during disaster response” (Townsend, 2006, p. 57). Some of the SAR lessons learned from this report have been corrected and others have not been adequately addressed.

There are other indicators that catastrophic SAR issues identified in the Katrina lessons learned have not been corrected. It is necessary to look for some clues as to the lack of integration and how the sharing of technologies might improve while also improving command, control, coordination and information sharing.

DHS is assigned SAR coordinating responsibility in the Catastrophic Incident Annex to the National Response Framework (Department of Homeland Security, 2004). Emergency Support Function #9 is further tasked for SAR in the *ESF #9 Annex* of the NRF (Department of Homeland Security, 2008). Neither the DHS nor ESF #9 has succeeded in unifying efforts of either their own team or the local and state organizations they would support (Stockton & Roberts, 2008, p. 5). DoD has an important role in this effort because of the unique, timely and surge capabilities. DoD also has a pool of human resources that are on-call 24/7 that are not available to the civil authorities.

Effectiveness may be measured via post-event casualty rates, so the plans put together now should place the highest emphasis on and include all available technologies such as those used by the USCG. Many large and complex organizations have a stake in catastrophic SAR. Centralized oversight from a council or a committee to coordinate and unify the efforts of this group of stakeholders may be the best solution to the problem.

The NSARC does have responsibility to coordinate all SAR activities in the operational area for catastrophic incidents, but since DoD is a signatory of the NSP and much expertise resides within the community, it would seem worthwhile to approach DHS and ESF #9 to develop some type of multi-agency deployable SAR joint air and

ground coordination center that harmonizes the efforts of the equity holders. DoD should help facilitate this effort that ought to be built from the local level up and should be facilitated (not controlled) through a consortium of partners.

E. SUMMARY

This chapter provided a diagram and description of the CI SAR megacommunity followed by a discussion of responsibilities, organization and place in the system of each organization and comments about current efforts and associated challenges. Two SAR technologies were introduced that could be used as examples of how information is managed at tactical and operational levels. Information gathered through these technical tools was useful to the tactical organizations and this research emphasized that it would also be useful to the greater megacommunity for CI SAR but inhibitors to inter-organizational sharing exist. SAR technologies could be better utilized by the megacommunity equity holders. SAR managers could leverage stove-piped technologies and share the knowledge outside the proprietary organization.

The chapter concluded with an analysis and subsequent discovery that suggests some sort of strategy to unify the megacommunity efforts and a coordination center to capture and manage technical rescue data are needed. Some type of communications or coordination center would facilitate this interagency coordination during response operations for CI SAR. Both the strategy and coordination center would require a great deal of interagency coordination to work out the details.

IV. INTERVIEWS AND FOCUS GROUP REVIEW

A. INTRODUCTION

Between February and May 2009, the author conducted 14 interviews to ascertain the current state of affairs for CI SAR and to develop a framework of where the megacompany thought there might be shortcomings and to get suggestions of where enhancements were needed to make systemic improvements. Another purpose of the interviews was to learn whether the SAR megacompany⁶¹ could identify CI SAR tribulations and what measures would be necessary to reduce or eliminate risks through investment in human capital and resources.

The interview process was designed to gain knowledge of whether technical experts, SAR managers and USNORTHCOM officials shared the same stance on the problems. Finally, the interviews were designed to discover whether or not the community was likely to support the policy changes that might be recommended as a result of this research.

Interviews yielded an academic and operational opportunity that no other academic process could have produced. Candid discussions with members of the NSARC, Office of the Assistant Secretary of Defense-Homeland Defense and American Security Affairs (OASD-HD&ASA) staff, Joint Director of Military Support (JDOMS) staff, the National Interagency Fire Center (NIFC) staff, the USNORTHCOM staff, National Guard Bureau J3, the National Park Service (NPS) and a National Association for Search and Rescue representative provided a well-rounded strategic-to-operational view of the current CI SAR posture, as well as perspective on a few problem areas and recommendations for improving CI SAR processes. The interview method was deemed to be the best way to include the interviewees in this ongoing process so that once recommendations were formulated; these key leaders would remain enthusiastic

⁶¹ Although these problems and solutions are primarily interagency issues, the author's parent organization is USNORTHCOM. Attempts were made to identify issues in all domains while also identifying USNORTHCOM roles in the system.

emissaries to assist in making catastrophic search and rescue more efficient. Through these interviews with key civil-military SAR experts, their concerns and recommendations were voiced, captured and incorporated into recommendations found in Chapters V and VI of this study.

The focus group included members of the NSARC, Defense Prisoner of War Office, the USNORTHCOM staff, 1AF/AFNORTH and NGB. This group of professional experts was formed out of operational necessity for hurricane support operations and to update legacy policy documents. The primary purpose of the focus group was to prepare for search and rescue necessitated by hurricanes in the USNORTHCOM area of operations. Operational and academic research was encouraged by the group leadership to facilitate this study. The focus group also provided input to this research that went beyond hurricane response. Discussions and strategy sessions included interagency coordination and organization for CI SAR.

Meetings were held as needed in person, via teleconference and through electronic staffing. The issues discussed were primarily the DoD role in DSCA SAR, civil SAR and PR, as well as how the DoD perspectives are nested within the SAR megacommunity. To take this research from an academic problem to a real-world effort also requires the support of this same group of professionals. The organizational representatives have, in part, proposed the findings identified later in the chapter and have participated through this entire study as participants through either interview, focus group or both.

This chapter is divided into three sections. The first section discusses the interview audience, questions and findings. The second section repeats the process for the focus group initiatives. Finally, an analysis is provided that incorporates the findings from both the interviews and the work group.

B. INTERVIEWS

1. Interview Audience

Participants were selected because of their expertise with SAR and because of their positions within the SAR megacommunity. Local, state and federal representatives were chosen so the sampling of the group was an accurate cross-section of the megacommunity. Table 6 identifies the participants and the level of participation. The method used to interview the contributors was face to face for all but two of the participants.

Table 6. Interview Participants, Agency and Level of Participation

Agency	Level of Participation
FEMA	Federal
NPS	Federal
USNORTHCOM SJFHQ	Federal
USNORTHCOM Standing Joint Force Headquarters	Federal
USNORTHCOM Standing Joint Force Headquarters	Federal
USNORTHCOM Standing Joint Force Headquarters	Federal
Joint Director of Military Support	Federal
Assistant Secretary of Defense, Homeland Defense & American Security Affairs	Federal
National Guard	Federal/State
National Search and Rescue Committee	Interagency
National Interagency Fire Center	Interagency
Air Force Rescue Coordination Center	Interagency
United States Agency for International Development/National Interagency Fire Center	International
Colorado County Sheriff	Local
National Association for Search and Rescue Representative	State

2. Questions Discussed During Interview

In the following paragraphs, equity partner comments and concerns relevant to CI SAR are summarized. General topics and information that were sought through the interviews are identified. Participants were encouraged to elaborate on other areas of concern relevant to their own background and experience. In Table 7, a number of the important issues discussed during the interview process are displayed.

Table 7. Important Interview Issues

Organization	Is a CI SAR Study Needed?	Is a National Strategy for SAR needed?	Is this an interagency problem that requires additional unity of effort?	Are policy documents dated? And is multi-level planning needed?	Would a Joint Air and Ground Coordination Center be useful?	Would using a model similar to the USFS Wildland Firefighting work	Should DoD be the lead for CI SAR? Does it default to DoD?	Is the community prepared for CI SAR in a CBRNE environment?
LOCAL	YES	YES	YES	YES	MAYBE	YES	NO	NO
ARNG	YES		YES	YES	YES			NO
DoD	YES	YES	YES	YES	YES	MAYBE	MAYBE	MAYBE
NSARC	YES	YES	YES	YES	YES	MAYBE	MAYBE	NO
USAID	YES	YES	YES	YES	YES	YES		NO
NIFC	YES	YES	YES	YES	YES	YES		NO

Participants felt this research was worthwhile and all felt that a strategy and updated plans would be useful to the megacomunity. They were also interested in the concept of a Joint Air Ground Coordination Center and finding ways to harmonize the SAR response more effectively. None of the participants felt that the nation was capable of searching for and rescuing tens to hundreds of thousands of people in a CBRNE contaminated environment, and most of the participants felt that DoD should not lead the effort.

The National Guard expressed concern that even with SAR tasks identified in the CSTL, the technical expertise required for DSCA and civil SAR missions would require unavailable and unachievable time, training and equipment. It was suggested that the National Guard and civilian volunteers (such as Citizen Corps) might be organized under teams of technical experts and provide manpower for searches while technical rescue was left to civil authorities. These comments did not apply to fixed or rotary wing support for CI SAR and the aviation community intends to supply this support.

Training and equipping National Guard aviation for CI SAR is another critical component of finding the sweet spot. For example, aircrews ought to be preidentified so they can routinely practice hoist and litter operations as part of their annual proficiency program. In practicing these missions, costly flight hours and equipment are required. Communications and navigation equipment are also expensive but should be identified and installed on aircraft that are selected for SAR so the crews can speak with civil authorities on the ground, receive clearances/directions and navigate with global area reference system (GARS), universal transverse mercator (UTM) grid or latitude and Longitude (lat/long).

3. Significant Findings of Interview Process

After the interviews, the responses were analyzed, synthesized and evaluated to find patterns or replicated areas of general concern. The analysis included kludging responses into general areas of concern. An example is the concerns over Homeland

Security Presidential Directive (HSPD) 8, which establishes policies to strengthen U.S. preparedness for attacks and disasters (Bush, 2003).

HSPD 8, National Preparedness, identifies the eight priorities for preparedness (Bush, 2003). This framework was used to synthesize the responses from the participants and blend the conversational topics into categories under each of the preparedness categories. HSPD 5 is the companion document to HSPD 8, which discusses management of domestic incidents (Bush, 2003). HSPD 5 tasks DHS to develop and administer a unified, national system for managing incidents regardless of size or complexity.⁶² The guidance of HSPD 5 was also considered while analyzing the interview records.

HSPD 8 proved to be a worthwhile analytical tool to help synthesize and articulate recommendations for improvements of CI SAR. The eight categories of preparedness from HSPD 8 were used as a framework to analyze the interview responses below:

- **Development of a National Preparedness Goal**
 - National SAR strategy or DHS planning guidance for CI SAR response
 - Update SAR plans and policies
 - Increase USAID and Canadian involvement in the SAR megacommunity
- **Federal Preparedness Assistance**
 - Obligation of funds to provide staffing solutions (NSARC increase, SC designation of USNORTHCOM, JPRC full-time employees and state SMCs)
 - Provide federal allocations for CI SAR FSTTL funding requirements
 - Increase interagency coordination with FEMA catastrophic and integrated planning experts

⁶² HSPD 5 (2003) states, “the Secretary of Defense and the Secretary shall establish appropriate relationships and mechanisms for cooperation and coordination between their two departments... The heads of all Federal departments and agencies are directed to provide their full and prompt cooperation, resources, and support.....” HSPD 5 also demands a NIMS and National Response Plan from DHS.

- **Equipment**
 - Support civil support task list development
 - Inter-organization interoperable standards and procurement practices for communications equipment, navigation equipment, aircraft, aircraft special equipment, contracts and special tools etc.)
 - Predesignation of organizations so equipment costs can be minimized and proficiency with the equipment maximized through routine training
 - New initiatives funding (NIF) like the Canadians for CI SAR improvements
- **Training and Exercises**
 - All-domain exercises driven by local and state SAR mission coordinators
 - Develop and integrate CI SAR Training programs with national level exercises
 - Develop a standard domestic and international lessons learned process and provide results to senior leaders
 - Ensure SAR tasks are included in the CBRNE consequence management response forces training
- **Federal Department and Agency Preparedness**
 - Develop and rehearse a process for incident awareness and assessment, response integration and management through Joint Air Ground Coordination Center
 - Identify contaminated environment requirements for SAR
 - Use of integrated planning system (IPS) and catastrophic incident planning for CI SAR
 - Identify links to other critical lines of operations (emergency medical, mass evacuation and IAA)
- **Citizen Participation**
 - Take additional steps to incorporate the public sector, private, businesses and volunteer organizations into CI SAR planning and response at the national strategic levels
 - Identification, recruiting, training and certification program improvement

- **Public Communication**
 - Strategic communications/interagency coordination strategy for planning and response is needed as displayed at Table 8.
 - Need to use technologies better to improve knowledge management (KM) and information flow
- **Assessment and Evaluation**
 - Rigorous honesty reporting CI SAR preparedness to the President through DHS:
 - Ensure all CI SAR equity holders have input
 - Report normal, mass rescue and CI SAR preparedness
 - Identify and report CBRNE SAR capabilities and shortfalls
 - Air to Ground communications capability reporting procedures (numbers that can and can't communicate air to ground)
 - Aircraft and aircrew special mission training and equipment status
 - Interagency issues and friction points
 - Taking lessons learned and integrating improvements into the other seven preparedness goals (i.e., if exercises indicate air to ground communications do not work, how will the correct radios be identified, installed, maintained and exercised in the future? Who leads the effort?) (Bush, 2003).

Using HSPD 8 as a framework to analyze interview responses facilitated development of a general framework for categorizing the information derived from the subjects. These un-prioritized findings are further refined in Chapter VI in order to develop the study recommendations.

C. SAR FOCUS GROUP

1. SAR Focus Group Membership

The focus group activities conducted as part of this research were important for two reasons. First, these SAR experts were working on operational level problems that dealt specifically with this topic. Operational problems were observed and incorporated

into the research findings. Secondly, the operational endeavor produced revised policy documents such as a revision to the Catastrophic Incident Supplement (CI SAR Addendum) to the *National Search and Rescue Manual* and a revised *ESF #9 Search and Rescue Annex* to the National Response Framework.

Participating in the focus group activities from both an academic and operational perspective was a unique opportunity to keep abreast of both current operational efforts and unresolved friction points⁶³ while concurrently conducting academic research. Furthermore, it was possible to contrast some of the interview responses with operational activities underway. The group activities are mentioned here because both interview and focus group findings are intertwined.

2. SAR Focus Group Vision and Philosophy

The USNORTHCOM group formed because of recognition that individual organizations conducted SAR extremely well; however, CI SAR requiring integrated response operations were lacking. Process improvements are needed to ensure DoD readiness to support the civil authorities. USNORTHCOM is not well positioned and organized to support CI SAR, nor is USNORTHCOM well integrated with FSTTL SAR planners.

The vision for the SAR focus group has been to build capacity for USNORTHCOM to provide policy and strategic oversight of the full spectrum of civil SAR and personnel recovery in the USNORTHCOM AOR by establishing USNORTHCOM as the SAR coordinator and to evolve the capability for USNORTHCOM to fulfill the primary agency responsibilities in ESF #9.

⁶³ The focus group works in a multi-domain environment marked with a number of tensions. There are interagency concerns and friction points within the emergency management community. Cultural and interagency problems exist that hinder effective DoD support to civil authorities. There are friction points between the Army National Guard and the regular Army, between DHS and state emergency managers, between National Guard Bureau and State Joint Force Headquarters, between DHS and FEMA and, finally, between the political parties. Unless the many friction points are addressed, DoD will remain only 1/16th of an unbalanced and uncoordinated response.

The focus group philosophy is based on the belief that there is no time to waste for CI SAR. Time is the enemy and any delays in readiness will result in unnecessary death and injury to people in distress. Time-driven objectives guide the megacommunity partnership's actions in all domains and at all FSTTL levels. The group has already been effective at implementing some change within USNORTHCOM by hiring full time staff, developing CONPLANS and supporting Texas Task Force 1 during Hurricanes Ike and Gustav with SAR experts and liaisons.

a. USNORTHCOM SAR Focus Group Actions and Accomplishments

This focus group has been involved with actions that reduce friction points and improve CI SAR readiness. Some of the recent accomplishments include:

- Providing support to the USNORTHCOM SAR Cell
- Assisting with the rewriting of the National Search and Rescue Plan (NSP)
- Helping develop a CI SAR addendum to the National Search and Rescue Manual
- Drafting a new Emergency Support Function #9 annex to the NRF
- Standing up USNORTHCOM as the search and rescue coordinator vice the USAF⁶⁴
- Supporting an Air Coordination Group (ACG) for Hurricanes Ike in 2008
- Practicing the ACG concept in conjunction with a defense coordinating officer (DCO) exercise in San Juan Puerto Rico from March 24–27, 2009
- Drafting SAR PSMAs in conjunction with the USNORTHCOM J35, Joint Personnel Recovery Center and the AFRCC

⁶⁴ Memorandum endorsed by General Renuart (Commander, USNORTHCOM) was sent to the Secretary of Defense and under consideration as of August 19, 2009.

- Beginning a rewrite of the USNORTHCOM policy on personnel recovery 10-210 (Joint Chiefs of Staff, 2007)⁶⁵
- Participating in the rewrite of DoDD 3002.01E personnel recovery in the Department of Defense
- Providing input to the *Quadrennial Defense Review* (QDR)
- Conduct recurring meetings and conducting interagency outreach
- Drafting a hurricane SAR concept plan (P. Merrigan, personal communication, April 24, 2009).

b. Near Term Objectives

The SAR focus group has been successful in establishing permanent manning in USNORTHCOM for a two-person SAR cell and an eight-person fulltime cell in the JPRC.⁶⁶ Personnel in these positions and other members from USNORTHCOM SJFHQ have become the core element for the SAR focus group. The group has established the following near term objectives:

- USNORTHCOM SJFHQ provides leadership for SAR until the fulltime SAR cell is able to contribute to SAR megacommunity policy and strategic decision-making
- Clarify PR and DoD support to civil SAR roles and responsibilities in the USNORTHCOM AOR
- Rewrite, review and coordinate DoD SAR policy documents
- Conduct interagency coordination with FSTTL SAR partners

⁶⁵ JP 3-50, Personnel Recovery (Joint Chiefs of Staff, 2007), states on page I-1, “Military commanders must prepare for, plan, and execute recovery operations for isolated personnel. Within the US, coordination for such support should be made with the appropriate regional rescue coordination center (RCC) that has responsibility for the operational area. Commanders may provide support to civil authorities during search and rescue (SAR) missions for other than isolated personnel as long as that support does not interfere with the military mission and is accomplished IAW the U.S. National Search and Rescue (SAR) Plan. DoD supports domestic and international search and rescue efforts of the general public IAW the US National Search and Rescue Plan.” Appendix A to JP 3-50 describes lead responsibility of the United States Coast Guard and the military support to civil SAR and principles of the National Search and Rescue Plan. The NSP integrates the U.S. SAR into plans that exist for the rest of the world. DoD support of civil SAR is based on a noninterference basis with primary military missions in accordance with the NSP and DoD policies. The NSP is synchronized with the International Civil Aviation Organization and the International Maritime Organization (ICAO and IMO respectively) (Joint Chiefs of Staff, 2007, Appendix A1-A4). The 2007 JP 3-50 also references the NRF predecessor, the NRP, and describes processes that are now out of date for SAR.

⁶⁶ The process to select and employ personnel is underway as of August 3, 2009.

- Promulgate standing response policy and objectives for CI SAR
- Develop and harmonize a regional approach to SAR
- Coordinate the Catastrophic Incident SAR Addendum (P. Merrigan, personal communication, April 24, 2009)

c. SAR (Cell) Focus Group Long Term Goals

- Attend all of the National Search and Rescue Committee and other strategic (some operational) meetings
- Build a an operational network of SAR mission coordinators and SAR coordinators
- Provide strategic direction to the JPRC
- Define USNORTHCOM SAR response into the DSCA CONPLAN 3501
- Improve cooperation with the SAR international community (especially Canada)
- Develop a SAR Military Use Handbook (J. Sokol, personal communication, July 14, 2008)

This section has introduced a research observation that the USNORTHCOM commander recognizes a need to expend DoD resources in anticipation of CI SAR requirements and he does so by supporting the efforts of this focus group. This group has the willingness and capability to lead and solve CI SAR issues despite a lack of civil authority to do so. Unfortunately, DoD is only one segment of the megacommunity and both improved interagency coordination between all equity holders and a binding national SAR strategy are needed to align and guide the larger megacommunity efforts to improve CI SAR.

D. MAJOR FINDINGS

While researching the primary CI SAR organizations and their functions, a number of recurring themes became apparent. These discoveries were discussed during interviews and with SAR focus group members between February and May 2009. These findings are quite broad and require some manner of prioritization that will be discussed in Chapter VI. The general findings of the research follow:

- CI SAR awareness, anticipation and preparations can be improved through development of a national strategy for SAR.
- A flexible and scalable Joint Air Ground Coordination Center concept must be institutionalized by DHS and DoD to ensure efficient CI SAR management. The JAGCC must take advantage of the technologies and communications systems of participating members to coordinated CI SAR response at the national and international level.
- The NSARC should develop a strategic interagency engagement plan with all equity holders. (This outreach can only be accomplished if DHS and USNORTHCOM fund additional full-time positions for this critical national outreach effort).
- It is necessary to eliminate delays in DoD deployment by developing integrated SAR plans and using predisaster declarations when possible.
- The SAR megacommunity must strive to reduce deployment times for CI SAR by organizing more effectively and developing time driven objectives.
- NSARC members should empower the umbrella organization (through funding and additional authorities) to collaborate, coordinate and train with regional and state partners to ensure they understand how the federal government intends to support state and local authorities.
- National and international resources must be deployed and employed efficiently; therefore, processing time of requests for assistance must be reduced by planning and exercising the use of expedited FEMA mission assignments (MAs), the use of SAR Prescribed mission assignments (PSMAs) and DoD use of verbal orders of commanding officer (VOCO) authorities.
- DHS (through the NSARC) must create a more robust regional interagency organizational construct to prepare for CI SAR.
- USNORTHCOM must create a robust SAR cell in the operations directorate to ensure the significant DoD resources are brought to bear in a timely manner. The cell must include linkages to the components, National Guard, FAA and other critical equity holders.
- USNORTHCOM must develop a plan to kludge DSCA and civil SAR and also combine the JPRC and AFRCC.

- DHS, through the NSARC members, should encourage greater coordination between state SAR planners, FEMA catastrophic planning officers; FEMA integrated planning officers, USNORTHCOM planners and state SMCs. This coordination can be accomplished through planning efforts, conferences, memoranda of understanding or other outreach methods.
- DHS should create and manage a more robust national SAR budget and include incentives for initiative similar to the Canadian New Initiatives Fund.
- The NSARC should develop a better relationship with the INSARAG and USAID for more robust international CI SAR preparation (especially with Canada).
- The NSARC and USNORTHCOM should identify CI SAR Civil Support Task List requirements to the National Guard Bureau and the states. Supporting the CSTL effort will encourage National Guard SAR resourcing and training through the Defense Readiness Reporting System.
- The NSARC and USNORHCOM should leverage additional volunteer support for SAR (such as Citizen Corps / the Eagles Wings Foundation) through integrated planning, training and exercises.
- DHS and USNORTHCOM should develop CI SAR FSTTL training scenarios.
- DoD (through USNORTHCOM) should clarify civil SAR, PR and DSCA SAR roles in the USNORTHCOM AOR.
- USNORTHCOM should review, rewrite and coordinate DoD PR/SAR policy documents and author concept plans and concepts of execution (CONEXs).

The Participation Planning Matrix for SAR (Table 8) is designed to demonstrate the requirement and value of an interagency outreach strategy within the SAR megacommunity. Developing a coordinated interagency outreach plan including SAR equity holders will enhance recognition of the proposed changes and improve both the change process and the end product (national SAR strategy and organizational reconstruction). Developing an interagency outreach strategy will also help each of the equity holders determine for themselves where they fit into the SAR system. Each organization can determine if more or less involvement in the change process is needed and managers will also be able to quickly identify the decision-making authorities.

Table 8. Interagency Coordination and Strategic Communications Strategy (after Bryson, 2004, pp. 335–354 & 377–391)

Participation Planning Matrix for Search and Rescue (SAR)					
Which Stakeholders to Approach by Which Means					
	Inform	Consult	Involve	Collaborate	Empower
Strategic Management Function or Activity	Promise: We will keep you informed.	Promise: We will keep you informed, listen to you, and provide feedback on how your input influenced the decision.	Promise: We will work with you to ensure your concerns are considered and reflected in the alternatives considered and provide feedback on how your input influenced the decision.	Promise: We will incorporate your advice and recommendations to the maximum extent possible.	Promise: We will implement what you decide.
Organizing Participation	State Associations, Public/Private and Volunteer Organizations (PVOs)	State JFHQs, National Interagency Partners other than NSARC members	International Association of Emergency Managers (IAEM), National Emergency Management Association (NEMA)	State SMCs, JPRC, AFRCC, NGB, National Association for SAR (NASAR), NC and Service PA, DCUs, NIFC, NGA	DHS/NSARC/FEMA, USNORTHCOM Operations (SAR Cell), USNORTHCOM Commander and INSARAG/USAID
Creating ideas for strategic actions (including issue identification and strategy formulation)	State Associations, PVOs,	State JFHQs, National Interagency Partners other than NSARC members, Services, Subordinate JTFs	USNORTHCOM Staff, IAEM, NEMA.	State SMCs, JPRC, AFRCC, NGB, NASAR, USNORTHCOM and Service PA	DHS/NSARC/FEMA, USNORTHCOM J3, USNORTHCOM Commander, DCUs, INSARAG/USAID
Building a winning coalition around proposal development, review and adoption	State Associations, PVOs,	State JFHQs, National Interagency Partners other than NSARC members, Services, Subordinate JTFs	JPRC, AFRCC	State SAR Mission Coordinators (SMCs), USNORTHCOM and Public Affairs Organizations	NGB, NSARC, FEMA, USNORTHCOM Staff, IAEM, NEMA, NASAR
Implementing, monitoring, and evaluating strategic actions	USNORTHCOM Staff, INSARAG/USAID	NSARC	State JFHQ	NSARC, USNORTHCOM SAR Cell, NIFC, NGA	JPRC, AFRCC, NGB, State SMCs, NASAR

How To Use This Matrix: Interagency Coordination is necessary to include multi-domain stakeholders in the Catastrophic Incident Search and Rescue (CI SAR) preparations. Across the top of the matrix is the type of coordination needed to conduct the functions found in the left column. For each step/function, coordination and collaboration is necessary with one or more stakeholder. This matrix is used to ensure stakeholders participate in the planning processes at the correct time and levels. If organizations desire more or less interaction in the effort, this chart will help them visualize where they might find their best-fit in the effort.

E. SUMMARY

The synthesis and analysis of interviews, interaction with the SAR focus group and the earlier research affords 17 major findings that are valuable to the SAR megacommunity. These findings will improve readiness to provide FSTTL CI SAR response in a manner consistent with public expectations. Taking these actions will also help the partners better anticipate the requirements for CI SAR. The sweet spot for CI SAR will become more apparent to federal and state equity holders.

In this chapter, the interviews and resulting discoveries were discussed. The USNORTHCOM SAR focus group was introduced to point out DoD current efforts and future intentions. An analysis of the research data yielded 17 general recommendations for consumption by the SAR megacommunity, with special interest to the federal and DoD equity partners in particular. In the next few chapters, an effort is made to identify which steps should be taken first and how managers can approach the work to undertake these 17 recommendations.

V. ORGANIZATIONAL BENCHMARK STUDIES

A. INTRODUCTION

Whether a crisis is environmental, political, human, or technological in nature, it demands preparation, response, and resolution at a level of organizational complexity that matches the needs of the situation. We must remember that crises are nonlinear; their inputs and outputs are not proportional; the situation is not equal to the sum of its constituent components; it is difficult to see the boundaries of their scope. Therefore, the response to a crisis must possess the capacities to deal with nonlinear, chaotic, multidimensional realities through intense collaboration and coordination with reasonable potential to draw on all available resources to respond effectively. (Hillyard, 2000, p. 6)

When the need for federal assistance is obvious and immediate because of a catastrophe, SAR organizational leadership must deploy assets in anticipation of requests for assistance in order to search for and rescue what may be hundreds of thousands of victims (Federal Emergency Management Agency, 2008, p. CAT 2-6). Temporary suspension of the request for assistance process is anticipated and the prompt anticipatory response of federal, state, territorial, tribal and local partners may be an uncoordinated attempt rather than an integrated and unified team unless SAR managers can find a way to coordinate the interagency, joint, multi-component effort for catastrophic events. A scalable, flexible and adaptable Joint Air Ground Coordination Center may provide the best organizational construct to conduct this time-critical CI SAR management and coordination.

During preparations for Hurricane Ike in 2008, USNORTHCOM SJFHQ, the Joint Personnel Recovery Center and Air Force Rescue Coordination Center formed an ad hoc coordination center. Fortunately, CI SAR was not needed for Hurricane Ike and USNORTHCOM was able to take lessons learned from this initial effort and apply the lessons to a better solution. An organizational construct, communications equipment and

a standard methodology are needed to share time-critical lifesaving information. The JAGCC will provide that very important venue for the most important mission—saving lives.

A predetermined communications and synchronization methodology is necessary for catastrophic⁶⁷ SAR to coordinate communications, resources, personnel and supplies. For a catastrophic event, the SAR megacommunity intends to respond immediately and the equity holders need to know how it fits into the bigger picture to ensure efficiency of the response.

The many lessons learned from hurricane Katrina assert that civil and military federal responses for this catastrophe were inefficient and uncoordinated (Government Accountability Office, 2006, pp. 7, 35 and 65). Catastrophic search and rescue operations are specifically included in this harsh criticism and the interagency community has not corrected the problems associated with catastrophic SAR planning and preparations. Both USNORTHCOM and DHS⁶⁸ (Department of Homeland Security, 2004, p. 1) are primary stakeholders in this community. DHS holds accountability as the SAR coordinator for the nation and DoD because of the responsibilities for Defense Support for Civil Authorities SAR, civil SAR and personnel recovery. A collegial approach to SAR requires interdisciplinary leadership that values consensus building, teamwork, and participation as part of a system of systems.

1. Overview

For CI SAR, no single organization has a common operating picture for catastrophic SAR because of event complexity and intensity. There is also a lack of valuable planning and exercises (Government Accountability Office, 2006, pp. 1–7).

⁶⁷ Before plunging into analysis of need for a JAGCC, there is a need to look at the definition of a catastrophic incident. The NRF (Department of Homeland Security, 2008, p. 43) defines a catastrophic incident as “...any natural or manmade incident, including terrorism, that results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions. A catastrophic event could result in sustained national impacts over a prolonged period of time; almost immediately exceeds resources normally available to state, local, tribal, and private-sector authorities in the impacted area...”

⁶⁸ DHS is designated the coordinating agency for catastrophic incidents.

During the Hurricane Katrina response (the best example of a recent catastrophic incident), DoD did not anticipate the need for damage assessment, failed to adequately conduct an assessment, and then deployed forces without understanding the full extent of the damage (Government Accountability Office, 2006, pp. 1–7). The GAO reported that interagency strategic planning was inadequate for Katrina (Government Accountability Office, 2006, p. 28 and 29)⁶⁹ and that DHS has not provided adequate guidance to partners and states. Specifically, DoD needs additional operational planning information from DHS (Government Accountability Office, 2008, pp. 8–16). Lessons learned from Hurricane Katrina indicate similar findings. The report states, “The Department of Homeland Security should lead an interagency review of current policies and procedures to ensure effective integration of all federal search and rescue assets during disaster response” (Townsend, 2006, p. 57). Some of the SAR lessons learned from this report have been corrected and others have not been adequately addressed.⁷⁰ Table 9 provides recommendations and an analysis of the status of the recommendations.

⁶⁹ The GAO report goes on to state that the Secretary of Defense should establish milestones and expedite the development of detailed catastrophic plans that specifically address use of SAR capabilities and the military’s role in SAR. DoD acknowledged that better integration of interagency and Title 32/10 assets would have led to greater efficiency for the SAR mission (Government Accountability Office, 2006).

⁷⁰ In an evaluation of the Hurricane Rita response, Major General John White, a member of the military’s joint task force on Rita, commented to President Bush that current SAR plans were in disarray and that numerous helicopters could show up at the same time to rescue the same person (Associated Press, 2005).

Table 9. Status of White House Katrina Lessons Learned as of May 30, 2006

Hurricane Katrina SAR Lessons Learned (Townsend, 2006, p. 57)	Status	Current Status of the Recommendations
44: DHS should lead an interagency team to review and revise the NRP to ensure the integration of all federal search and rescue assets.	Partially Addressed	The NRP is revised and the label for US&R is now changed to include civil SAR, however the nation falls far short of having integrated urban and civil SAR functions in a manner that would encourage all-domain integrated response for CI SAR. Furthermore, this research indicates that all SAR functions (aeronautical, inland and maritime of the FSTTL partners) should be integrated and coordinated, not just federal assets.
45. The National Search and Rescue Committee should revise the National Search and Rescue Plan (NSP) to include disaster response operations.	Partially Addressed	The NSP was revised in 2007, however, it is quickly becoming outdated and airspace control and coordination measures are still topics of discussion for CI SAR ⁷¹ .
46. Each state and major city should incorporate Search and Rescue and US&R annexes into their overall disaster response plans.	Partially Addressed	State SAR plans are at various levels of completeness. The plans are not integrated and many do not address a CI SAR environment (Brown, NASAR Representative to NSARC, 2009).
47. DHS should expand the National Preparedness Goal's Target Capabilities List (TCL) Capability: Urban Search and Rescue to require Federal Urban Search and Rescue teams and State and local entities to train, equip, and exercise for civil search and rescue missions.	Incomplete	This research indicates there are inadequate FSTTL integrated CI SAR training and exercises. Furthermore, the finding leaves out the military component and does not suggest CI SAR versus normal SAR training and exercises are important or different from the sequential and layered SAR response training and exercises at severity levels less than catastrophic.
48. DHS should create a national search and rescue volunteer certification program.	Incomplete	A comprehensive SAR volunteer support system trained in CI SAR response operations does not exist at the national level. ⁷²

⁷¹ During a February 2009 NSARC discussion, it became clear that not all partners agree on navigational systems: latitude/longitude, global area reference system (GARS) or universal trans mercator (UTM) between air, land and maritime resources. Using a mix of these systems will cause confusion and difficulty that may adversely impact airspace control and coordination.

⁷² Organizations such as the Eagles Wings Foundation for Disaster Relief could provide incident management teams and manpower for searches during catastrophic incidents. During discussion with Mr. Scott P. Lewis, President of the Eagles Wings Foundation for Disaster Relief, on April 9, 2009, he revealed that coordination with the foundation for CI SAR has been negligible and the volunteer organization leadership has not been exposed to the CI SAR Addendum to the NSM (P. Lewis, personal communication, April 9, 2009).

2. Recent Examples Indicating a Need for a JAGCC

Progress was made to improve SAR operations during Hurricane Ike in 2008. The First Air Force Commander (Morrow, 2008) briefed the USNORTHCOM staff that the JPRC and AFRCC had full coordination with USCG, National Guard Bureau and the state of Texas. It was divulged that Texas was using a draft SAR plan and this was a first attempt for an all agency/all-domain SAR effort. Members of the USNORTHCOM Standing Joint Force Headquarters were deployed to support the effort without having had benefit of either training or exercises for CI SAR deployments. Fortunately, Texas Task Force 1 was not required to conduct CI SAR for Hurricane Ike. Had Hurricane Ike caused catastrophic damage, integrated SAR across multiple domains would likely have been impossible.

Another example is that the SAR megacommunity has recognized a need for some type of organization to coordinate SAR response to catastrophic incidents was found in the exercise Vigilant Guard Puerto Rico (VGPR) that took place March 24 through March 26, 2009. A hypothetical catastrophic earthquake and tsunami demanded CI SAR. An ad hoc coordinating center was established by DoD. The coordination center was staffed by JPRC members, Defense Coordinating Element members and USNORTHCOM liaisons, but the tie to the National Guard and state EOC was lacking. The exercise even taught bad habits because the federal response was not immediate as it would be for a real-world event. The CI SAR addendum to the *National SAR Manual* received no attention during the exercise in the state EOC. The exercise was designed in a manner that taught both civil and military authorities inaccurate and improper processes for a unified response to a catastrophic incident. Mission assignments were processed as they would be for a less than catastrophic event and the DCO was not involved with immediate coordination of federal assets. An interagency coordination element could have helped solve the enormous CI SAR problem associated with this exercise. VGPR provided another indicator that operational elements continue to recognize that some type of coordination or incident management team for SAR is needed.

This was another forward step towards a desperately needed Joint Air Ground Coordination Center, but the air coordination group is in the early stages of development and lacks standards and structure. The Air Coordination Group was first conceptualized for Hurricanes Ike and Gustav in 2008. The effort is staffed and coordinated by the land, air and maritime components of DoD and the USCG. It is led by the JPRC with USNORTHCOM strategic support through liaisons. For this exercise, the group conceptualized a DoD centric response to the catastrophe. This was an excellent effort as far as it went; however, it did not include interagency and multi-level representatives. It was a DoD rescue coordination cell that planned to divide the impacted area into sectors then parse out the DoD resources to those sectors.

This excellent coordination center effort was sorely needed and represented a step in the right direction, but it did not develop a multi-domain solution to CI SAR issues. The DoD response still looked sorely like the Hurricane Katrina effort with many assets in the JOA providing resources in an uncoordinated and inefficient manner. The SAR cell was also completely and artificially separated from the National Guard exercise since the VGPR series is designed and funded for the National Guard only. This added artificiality taught the National Guard and federal SAR responders that sequential CI SAR processes should be anticipated rather than expecting an immediate unified response from the primary federal partners (as explained in the CI SAR Addendum). For Puerto Rico, this is tragic because it is already so far away from mainland assistance that pushing critical SAR assets to it will stretch EMAC and federal logistical and transportation capabilities.

Instead of a unified local, territorial, and federal CI SAR response, the exercise injects for VGPR dealt only with the National Guard, while an ARNORTH exercise of the same name was underway in the FEMA building in downtown San Juan a few blocks away. On top of the confusion of having two exercises occur at one time, FEMA was evaluating the Puerto Rico Emergency Management Agency. The result was that Puerto Rico civil authorities, the National Guard, the DCO and the SAR coordination center were separated geographically and artificially through the exercise and throughout the communications systems.

Not only were these key nodes not talking or working together, they were working against each other. This exercise did little at the territorial and municipal levels to promote CI SAR learning opportunities. The exercise confused civil authorities and demonstrated that the National Guard and federal military systems are still separate and have difficulty unifying the DoD effort.

The wildland firefighting (WFF) community and the USSS have communications and coordination center models that might be useful to CI SAR managers. In the next few pages, a comparison of the WFF and SAR megacommunities is provided using a framework based upon five principles of crisis management. Using the five principles, it becomes clear that some type of communications or coordination center is necessary for CI SAR. Finally, it is recommended that the DHS/FEMA begin developing a concept for a JAGCC modeled after the USSS MACC and the NMAC.

B. COMPARISON OF WILDLAND FIREFIGHTING (WFF) AND CI SAR CRISIS MANAGEMENT

1. Introduction and Overview

Research has shown that the SAR megacommunity is in need of a management concept that can provide comprehensive strategy, policy-maker support, and long-term focus in a manner that includes skilled equity holders working together through minimal barriers and across their respective agency boundaries (Hillyard, 2000, pp. 35–36). An authoritative national strategy from DHS could facilitate this effort and will be discussed more in Chapter VI. However, with or without a national strategy for CI SAR, a collaborative strategy similar to that of the National Interagency Fire Center seems like it could incorporate the equities of the many partners through a holistic approach that will dovetail with NIMS/ICS to ensure the largest number of lives saved. Substantial involvement of the megacommunity would be required to develop a comprehensive solution to the CI SAR problems and the organizations involved must all share in what may be substantial obligation. The innovative and flexible approach will require intense coordination, communication, commitment and dedication of a core group guided by a national strategy of some sort.

There are organizations that have experience organizing coordination and communications functions for large public tragedies. This section presents the Emergency Support Function #4, WFF community, organization for public crisis management and compares five WFF management principles with the CI SAR management method. Using Michael J. Hillyard's (2000) study of *Public Crisis Management, How and Why Organizations Work Together to Solve Society's Most Threatening Problems*, an organizational benchmark is identified that provides a model for managing intense, complex and even chaotic catastrophic incidents. Using Hillyard's five principles of crisis management: common purpose, authority, incentives, culture and structure (Hillyard, 2000); a need for a Joint Air Ground Coordination Center to manage CI SAR becomes apparent.

a. Common Purpose

The wildland firefighting community pre-event coordination is based upon a total asset mobility concept. The manager's organizing efforts deliberately deliver its mobile assets on time in order to control and suppress wildfires. This is similar to the requirement placed upon SAR managers in that the common purpose is to arrive in a timely manner with the right mix of managers, workers and resources to do a job (search for and rescue distressed persons). These assets could include incident awareness and assessment, management teams, as well as air and ground equipment. The WFF community manages the resource dependence of separate organizations using the NIMS through national and geographic regional coordination centers. The common purpose comes from the resource dependence and needs of many independent organizations for limited resources and the National Response Framework (Hillyard, 2000, p. 46). In both organizations, timely response is critical to saving lives. Failure in the CI SAR or WFF response efforts will result in lives lost. The common purpose drives the need for national umbrella organizations in both the WFF community and the SAR megacommunity (NIFC/NSARC); however, the two lead federal organizations do not manage the demands in a similar manner.

Eight federal agencies and organizations are organized by memorandum of agreement under the NIFC for efficiency, cost avoidance and operations coordination through the National Interagency Coordination Center (NICC) (National Interagency Coordination Center, n.d.). The NICC accomplishes the coordination through local services (such as as-needed or on-call contracts with public businesses) within eleven geographical areas and at the national level. National WFF coordination is managed through the National Multi-Agency Coordination Group (NMAC).

Similarly, seven federal SAR organizations are signatory to the 2007 NSP and organized under the NSARC.⁷³ The NSARC, to date, has not organized at the national level in a manner similar to the NMAC even though the common purpose of the two organizations (NMAC/NSARC) clearly depicts analogous requirements. Independent states have not developed common standards and similar response plans. At the regional level, interagency coordination centers for SAR do not exist that are similar to the WFF geographical area coordination centers (GACCs).

A unifying national SAR strategy could help drive legislation and policy to provide the NSARC additional resources that would help them organize the SAR megacommunity and operate in a manner similar to the NMAC. Advantages that could be realized if the NSARC adopts a role similar to the NMAC include:

- Inventory and classification of SAR assets across the SAR spectrum.
- Standardize similar SAR practices and techniques in all organizations.
- Meet the desire and need to conduct interagency SAR coordination pre-event and during CI SAR events.
- Develop common training and evaluations⁷⁴ across the megacommunity.
- Fund priority regional and state needs that promote standardization.

⁷³ A number of relatively recent external and internal pressures are driving change in the SAR community. External factors influencing the NSARC include the NRF, Katrina lessons Learned, Post Katrina Reform Act, HSPDs, DoD becoming a primary agency in ESF #9, US&R teams becoming S&R teams in the NRF etc. Internal pressures include SAR technological developments (COSPAS/SARSAT), resource dependence for unique capabilities, limited key resources, growing population centers etc.

⁷⁴ Improved standardization beyond NIMS including: training, certification, deployment standards, navigation methods, techniques, organization, procedures and configuration of equipment.

- Develop regional interagency agreements and centers to form SAR geographic area coordination facilities similar to the eleven GACCs⁷⁵ (National GACC Website Committee, 2008).
- Improve coordination with the International Search and Rescue Advisory Group in a manner similar to the NIFC coordination with the Canadian International Forest Fire Center (CIFFC) (Canadian International Forest Fire Center , 2007).

b. Authority

Legal authorities for CI SAR were discussed at length in Chapter II and III for DSCA SAR, civil SAR and PR. There is also a rational authority that is the basis for the legal authorities (Hillyard, 2000, pp. 84–92). American society accepts that lifesaving operations are necessary and that organizing to accomplish the rescue and saving the lives of distressed persons is important.

The SAR megacommunity is decentralized so much so that additional central involvement at regional and national levels may help to unite the states and regions.⁷⁶ Additional network coordination and central influence for prioritization and resource allocation during CI SAR response operations could help FSTTL members manage and prioritize critical timely resources. Authority would be needed by regional geographic centers and the NSARC. These additional authorities (more than the 2007 NSP provides) should be sought from local and state establishments through contracts such as memoranda of agreement or understanding. These types of agreements have been effective in the WFF community and within DoD. DoD has also used comparable inter-organizational and multi-level constructs such as Joint Interagency Task Forces, Humanitarian Support Operations Centers, Civil-Military Operations Centers, Regional Joint Task Forces, etc. for national building, humanitarian support operations, disaster response operations and non-combatant evacuation operations.

⁷⁵ The USCG has regional coordination centers (RCCs), ESF #9 is represented in the FEMA regions and DoD has regional defense coordinating units, but there is not a regional interagency construct similar to the GACCs. A regional construct with Web-based portals to each region could greatly enhance CI SAR response effectiveness.

⁷⁶ Regions could be defined as SAR regions, FEMA regions, firefighting regions or other methods of centralizing coordination and communications centers in a manner that CI SAR resources could be efficiently requested and employed.

In the WFF community, operational authority is divided into two categories: resource management and incident command. The NMAC establishes the national priorities, leadership and direction to the participating community members. As the magnitude of a fire event grows, both resources and incident command flow first from local responders through the geographic area coordination centers, then continues through the National Interagency Coordination Center to the National Multi-Agency Coordination Center. As part of the national response, these operational authorities are provided through the NRF, ESF #4 and memoranda of agreement. Response is coordinated through the Department of Agriculture/Forest Service to save lives, protect property and the environment—in that order⁷⁷ (Department of Homeland Security, 2008). Operational SAR authorities are more ambiguous. The coordinated sharing of resources through ESF #9 does not have the same structure or operational authorities as the WFF community. Without a CI SAR organization managing resources at a national/international level, a unified CI SAR response will be difficult to manage.

In sum, the authority for resource allocation is horse trading between firefighting regions. Organizations participate and recognize operational authorities out of necessity to share resources. The WFF community follows the principal that events happen locally first, but it readily accepts regional and national aid to save lives, prevent suffering and protect property and the environment. In contrast, national and regional CI SAR centers do not exist to assist with resource and incident management even though a need is recognized. A team of SAR experts has not been acknowledged as an identified incident management team, while in the WFF community, teams of incident managers are trained and ready in scalable teams.

c. Incentives

Allocation of resources and reciprocity from other participating organizations is the biggest enticement to participate in a public crisis management

⁷⁷ The National Response Coordination Center establishes communications with the NIFC and regional representatives (GACCs) for assessment within two hours. Managers analyze the situation, prioritize, mobilize, deploy and employ resources in a unified and coordinated manner.

cooperative (Hillyard, 2000, pp. 121–143). The benefits of participating in an organization such as the NMAC or the NSARC include shared resources only available to members, shared funding, technologies and the reciprocity that others in the collective bring to bear for any of the members in a time of need.

At the national level, fewer incentives exist to participate in the NSARC than can be found in the WFF community. Providing the NSARC and the constituent members a more robust budget to integrate a wider array of participants would increase interest and improve their ability to reach out to the megacommunity from the national level. The expectation would be that the NSARC and USCG regional rescue coordination centers would become more like the NMAC and GACCs. National and regional coordination centers would develop more interagency appeal to the SAR community. Without funding to deliberate or implement an organizational structure similar to the NMAC or GACCs, there is little likelihood that organizational change could occur. A federal budget would also support efforts to group resources, provide jurisdictional incentives and fund special priority programs to fill niche requirements.

Incentives for participation in a more robust SAR megacommunity would include the grouped resources, special program funding and the desire for reciprocity. Currently, the NMAC has a much greater attraction because of the national resource incentives and the recognized ability to reciprocate. The NSARC could have the potential of becoming this attractive to the SAR megacommunity if a national strategy provided resource and budget authorities that made clear the advantages of participating to the states and territories.

d. Culture

The WFF community and the SAR community each have a macro culture that drives them to perform very hard tasks in extreme conditions. There is a bottom-up appreciation in both environments because of the highly technical and dangerous job of the tactician. There is a high degree of respect for the tactical response teams from national level managers as a result of an intrinsic desire to find and help people in

distress. This macro culture is obvious in the esprit de corps in both organizations. Both the WFF and SAR megacommunities have certification programs and the leadership elements of their respective teams. Other similarities of the two include the ability to risk manage, training/certification processes, and safety awareness and professionalism. These desires can be leveraged to form a CI SAR bottom-up strategy that will ensure the community is prepared for an event where hundreds of thousands of people may need assistance. An inter-organizational culture is trying to emerge in the SAR community as was found during Hurricanes Ike and Gustav and exercise Vigilant Guard Puerto Rico. The community has recognized a need for some type of national coordination or communications center, but a standard template for organizing seems to elude the SAR professionals. A method is needed to manage the CI SAR resourcing, supplies and personnel just like in the WFF community.

e. Structure

A highly intense and complex environment can be expected when CI SAR is needed. Technological advancements promise additional layers of complexity as numerous organizations respond to the calls for help. The SAR megacommunity has choices about how to organize for these intense and complex events. Resource typing helps at all levels but does not leverage the private or public volunteers that may also be available to assist. Resource typing does not currently include the National Guard and other DoD assets that would be a large part of the CI SAR response (FEMA, 2005).

The structure chosen must be effective in the existing National Incident Management System and must also be a collaborative approach similar to the WFF techniques. Clear communications that are accessible and direct between distressed persons and rescuers will be the hallmark of the effective system.

Using Hillyard's five principles of public crisis management to look at both the WFF and SAR megacommunities, it becomes apparent that some type of coordination center or communications center for CI SAR will be helpful. Two examples exist that may prove helpful to organizing CI SAR Joint Air Ground Coordination Center

for an extreme and multifarious catastrophic situation. These include the NMAC that has been discussed at length in this chapter and the United States Secret Service Multiagency Communications Center used in managing communications between a wide array of disparate organizations for National Special Security Events (NSSEs).

C. NATIONAL MULTIAGENCY COORDINATION CENTER (NMAC)

The NMAC is responsible for national strategic coordination to ensure firefighting resources are effectively and appropriately managed in a cost effective manner (National Multiagency Coordination Center, 2008).⁷⁸

The NMAC can be thought of as the managerial part of command and management mentioned as component IV of the National Incident Management System. Regional and National Multi-Agency Coordination Centers have responsibilities that include managing resources, people and time to sustain the incident commander and the staff through resource allocation. NMAC is comprised of representatives from six organizations: United States Fish and Wildlife Service, National Park Service, Bureau of Land Management, United States Forest Service, Bureau of Indian Affairs and the National Association of State Foresters⁷⁹ (National Association of State Foresters, 2000).

Table 10 shows the National Multi-Agency Coordination Center (NMAC) and Geographic Area Coordination Center (GACC) members as of June 6, 2008. The process that these members follow on a daily basis during fire season is described because a similar process could be useful to CI SAR managers.

⁷⁸ The NMAC is responsible for establishing national and geographic area practices, national level management, and resource allocation to regions. Members include Department of Interior, Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Service, National Park Service, United States Forest Service, U.S. Fire Administration, and National Association of State Foresters (many of the organizations also sit on the NSARC and conduct CI SAR ops) (McManus, 2008).

⁷⁹ NASF is a nonprofit organization that represents the directors of forestry agencies from the 50 states, eight U.S. territories and associated states and the District of Columbia.

Table 10. NMAC and Geographic Area Coordination Centers (GACC) NMAC Representation (National Geographic Area Coordination Center, 2009)

National Representatives in the NMAC	
National MAC Group (NMAC)	NMAC Chair
Geographic Area CG Advisory Council (GACAG)	NMAC
National Incident Management Organization Implementation Team (NIMO) ⁸⁰	NMAC
National Predictive Services Group (NPSG)	NMAC
National Coordinators Group (NCG)	NMAC
National IC/AC Group	NMAC
Geographic Area Command Liaisons in the NMAC	
Alaska	Fish and Wildlife Service Representative
Eastern Area	National Association of State Foresters (NASF) Representative
Eastern Great Basin	Bureau of Land Management Representative
Northern California	US Fire Administration Representative
Northern Rockies	National Park Service Representative
Northwest Area	Bureau of Indian Affairs Representative
Rocky Mountain	NASF Representative
Southern Area	U.S. Fish and Wildlife Service Representative
Southern California	US Fire Administration Representative
Southwest Area	USFS Representative
Western Great Basin	Bureau of Land Management Representative

Prior to the daily NMAC meeting, national NMAC executives contact their respective regional multi-agency coordination centers to understand the incidents underway in their region, resource requirements, and analysis and projections. After receiving the regional information and analysis, the NMAC conducts a daily meeting (more often, as-required) during the wildfire season. A wide array of stakeholders is invited to attend the weather and situational updates. Afterwards, only the senior executives remain to hear specialist comments such as fire behavior issues. NMAC members then receive the NICC analysis and recommendations. With data reflecting regional and national analysis, weather and resources available in hand, the NMAC

⁸⁰ NIMO teams are comprised of seven professional members that manage complex incidents. NIMO teams are available year round for incident management. The CI SAR community does not currently have such a team structure for deployable operations (National Incident Management Organization, n.d.)

executives prioritize their resources and efforts (D. Shinn, personal communication, March 5, 2009). Once resources are prioritized, notifications are made for movement of the resources. These resources could include air or ground forces, international aid, civil or military assets. There are significant similarities between the wildland fire resources and those resources that would be required for CI SAR. The similarities include the types of equipment, personnel with a high degree of technical knowledge and both rotary wing and fixed wing aircraft. Technical assets are also being used in the fire community in the form of unmanned aerial vehicles for incident awareness and assessment. The fire service has found a method that enables them to share time driven technical information effectively while the SAR community lags behind in this regard.

Four national incident management organization (NIMO) teams⁸¹ (United States Department of Agriculture, 2007), four area command teams, 17 type I incident command teams and 37 type II incident command teams are relied upon by the NMAC to manage and command large wildfires. As a general rule, type I national teams manage highly complex and very large wildland fires with over 600 people assigned. Type II teams are involved when less complex fires are ignited and less than 500 people are assigned to fire mitigation (Wildlandfire.com, 2008). The SAR community has not planned for this type of command and management overhead structure, nor has the SAR megacommunity exercised using the WFF management organization during exercises for CI SAR management.

These managerial teams not only deploy to wildland fires, but they are allocated for a wide array of large incidents needing incident command and management. As examples, they have been used for New Castle Disease outbreak of 2002, Pentagon and New York City on 9-11, Columbia disaster in 2003, and Hurricane Katrina in 2005. The teams have standard procedures, depth and a rotating schedule for 24/7 availability (T. Frey, personal communication, February 19, 2009).

⁸¹ Four teams assist the NMAC with a seven-man type I capability. The NIMO teams work with the NMAC to identify opportunities, evaluate performance and determine the future direction of their team. These teams deploy to large incidents and assist with the incident command teams apply efficient, risk-based solutions or they can be employed in a garrison environment as educators.

One example of how to improve interagency management of CI SAR is found with the USFS NICC national incident management teams. The four national incident management organization (NIMO) teams may be available for national and international incidences; they are comprised of 10 primary members and up to 27 members in a long configuration. NIMOs are similar in nature to type I incident management teams with years of technical incident management experience for very large incidents. The teams may not be available for all-risk events since their emphasis is on fire service rotational needs; however, the expertise they have should not be ignored when determining incident management structure.

The NIMO teams could leverage their experience to help with planning, check-in, operations management and unified command. The groups could also assist with setting priorities and asset ordering using the standard ICS forms (T. Frey, personal communication, February 19, 2009). They could be used as the hub in a catastrophic incident or on the periphery of the event to help sector commanders unify efforts, report, plan and order resources. They are also familiar with status check-in reporting processes and could run the check-in group. The teams could be a key resource in getting everybody to stop individual or singular efforts and concentrate more effectively on a unified response effort. It was also stressed that rehearsal and practice is what makes the teams effective, and it is this lesson that should be taken to heart as the SAR community plans the DoD response effort for CI SAR.

According to a USFS expert, an example of how the NIMO teams could be useful for SAR is found in their 2005, Hurricane Katrina response at the New Orleans, Louisiana airport. NIMO leadership found that there were many organizations conducting their own activities to help the citizens of New Orleans but the efforts were uncoordinated. The NIMO team, recognizing this lack of teamwork, visited with other organizational leaders. Under the NIMO leadership, a number of organizations developed a unified command that spanned each group in the vicinity of the airport. Process integration was achieved and the overall impact was unification of effort and a synchronized response to mitigate the effects of the hurricane. The NIMO team turned

operational chaos into an integrated operation at the federal level. Leveraging the type I teams already in existence should be part of the comprehensive federal CI SAR planning effort (D. Shinn, personal communication, March 5, 2009). The SAR community has not yet developed a plan for CI SAR incident management teams. SAR professionals currently rely on the NIMS/ICS structure, knowing that SAR assets will immediately self-deploy on life-saving missions prior to receiving mission assignments leaving an information void about who is in the area and what life saving actions were taken. If consideration were given to developing a managerial CI SAR management team structure similar to the wildland firefighting area, type I, type II and NIMO teams, a more unified allocation of resources, more efficient searches and more lives saved could be realized. Through coordination with the NMAC, it may be possible to employ the current teams as a starting point for SAR type I/II team development (D. Shinn, personal communication, March 5, 2009).

D. UNITED STATES SECRET SERVICE (USSS) MULTIAGENCY COMMUNICATIONS CENTER (MACC)

The MACC manages operations for NSSEs⁸² (Kroener, 2007). The MACC is a communications coordination center that stands up for a NSSE in close proximity to the activities. Tactical, operational and strategic stakeholders are invited to participate in the multi-domain center. Stakeholders staff the center and have access to computers, Internet

⁸² The Assistant Director, Office of Protective Operations, Timothy J. Koerner described the MACC in an August 10, 2007 subcommittee meeting: “The MACC serves as a central 24-hour communications hub throughout the event and is staffed by representatives from all participating law enforcement and public safety agencies, as well as personnel from public utilities, public works departments, district attorney’s offices, and other organizations that have unique roles in the overall security plan. The primary purpose of the MACC is to provide the timely dissemination of information to all entities participating in security operations, and to serve as the centralized coordination center for security-related activities. In addition to being an information collection and dissemination center located in close proximity to the event site, the MACC also shares connectivity with command posts and with emergency operations centers of agencies throughout the area and nationwide. The MACC shares information and situational awareness with the following coordinated components: the Joint Information Center (JIC), Intelligence Operations Center (IOC), Airspace Security Operations Center (ASOC), Principal Federal Official’s Cell (PFO) and the Emergency Operations Center (EOC). Typically, the MACC is also virtually connected to the following national operations centers: the Secret Service Joint Operations Center (JOC), FBI Strategic Information Operations Center (SIOC), DHS National Operations Center (NOC)—which includes the FEMA National Response Coordination Center (NRCC), and the DoD Northern Command (USNORTHCOM), among others” (document provided to author by USSS agent).

and telephone through the USSS architecture. The purpose of the center is timely information- sharing and coordination of all participating agencies involved in the operation. The center also serves as a center for security-related activities. Another important contribution of the MACC is that participants share connectivity with command posts and emergency operations centers in the local area and also nationwide. This connectivity promotes information sharing and situational awareness that spans all domains.

As an example, USSS MACC and the Federal Bureau of Investigation (FBI) intelligence operations centers were co-located for both the Republican National Convention (RNC) and Democratic National Conventions (DNC). Approximately 70 agencies were represented in the RNC and 63 in the DNC respective MACCs in 2008 (Gottfried, 2008) as presented in Figure 3.



Figure 3. 2008 Multiagency Communications Centers for RNC and DNC

The MACC is a good example of a field communications hub used by voluntarily participating agencies. The USSS stands up and manages the MACC to ensure 24-hour operational support for the duration of an event. This same type of concept could be used for development of a JAGCC.

The SAR megacommunity should consider contacting the USSS to evaluate the MACC in order to conduct a feasibility study. For example, the NMAC organization and facility could be used as the prevailing organization for steady-state operations. The MACC construct could be used as a deployable operational coordination center. This concept is not unheard of in the emergency response community.

Department of Transportation or Emergency Support Function #1 uses a crisis management center for day-to-day operations, but when a crisis occurs then the ESF #1 Secretary deploys an emergency response team to a field site and establishes a coordination center near the incident site (Lowder, 2009, pp. 10–31). Furthermore, the Department of Transportation uses a regional construct that is aligned with the FEMA regions. FEMA also plans to send coordination elements forward while retaining a national operations center. The USSS MACC may prove to be an advantageous model for the SAR megacommunity to consider for a forward deployed JAGCC.

The USSS MACC organizational benchmark would be most applicable to response operations in a deployed location while the NMAC model would best suit pre-event coordination and a non-deployable national center for CI SAR requirements.

Figure 4 provides a picture of how a SAR JAGCC could organize and coordinate resources, people, supplies and communications for a wide array of SAR equity holders.



Figure 4. A JAGCC Will Facilitate Coordination and Communication Requirements for Critical Lifesaving Missions

E. SUMMARY

The CI SAR megacommunity has identified a need for some type of communications or coordination center. The need is recognized by USNORTHCOM, AFRCC, JPRC and the National Search and Rescue Committee; however, additional effort is needed to ensure that a Joint Air Ground Coordination Center is able to coordinate lifesaving operations in the first few days of an incident, which, in turn, requires CI SAR. A JAGCC is necessary for catastrophic⁸³ SAR, as opposed to a progressively layered response to a more routine event, because, in a catastrophic event, all partners respond immediately, and the responders need to know how each organization fits into the response to ensure efficiency—measured in lives saved or lost.

A deployable, scalable and modular team with equipment could coordinate between CI SAR stakeholders, interpret disparate organizational technologies, and manage and parcel out resources, personnel and supplies. This would ensure all searches and rescues are conducted in the well-organized manner.

Replicating the NMAC and MACC benchmarks could provide a starting point for the NSARC to develop a robust national-level coordination center. The benefit of building a robust JAGCC that emulates the NMAC and MACC is that lives could be saved and unnecessary suffering prevented through more efficient CI SAR. A JAGCC would help the SAR mission coordinator see across the entire CI SAR spectrum. This would improve resource-ordering processes, organization and communications and could save lives in the crucial hours of the incident.

⁸³ Before plunging into analysis of need for a JAGCC, it is prudent to look at the definition of a catastrophic incident. The NRF (Department of Homeland Security, 2008, p. 43) defines a catastrophic incident as “...any natural or manmade incident, including terrorism, that results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions. A catastrophic event could result in sustained national impacts over a prolonged period of time; almost immediately exceeds resources normally available to state, local, tribal, and private-sector authorities in the impacted area....”

VI. ANALYSIS AND RECOMMENDATIONS

A. INTRODUCTION

This study was designed to examine whether the search and rescue (SAR) megacommunities are prepared to respond in an expedient and efficient manner to calamitous events. The research effort, which was derived from a literature review, interviews, a focus group and organizational benchmark studies, points toward a need for a national SAR strategy, a multi-disciplinary center to coordinate CI SAR activities and, finally, improved coordination between the equity holders.

The SAR megacommunity is driven by plans and policies that do little to harmonize the efforts of the partners. While plans exist, many are outdated at the national level. A strategy is needed to bind and organize those equity holders to ensure SAR managers at all levels are aware, trained and equipped to provide and/or accept federal SAR support for catastrophic events. A national strategy for SAR is needed that will span all scenarios and focus on time-driven objectives, rather than the scenario that caused the catastrophic event. An important part of the strategy will be to identify how the disparate organizations will communicate and harmonize response efforts to efficiently task-organize for CI SAR.

A communications hub, as part of a JAGCC, is needed to harmonize the difficulties managing the SAR during “Black Swan” events. Joshua Ramo (2009) suggests in *The Age of the Unthinkable* that the world is more likely to suffer calamitous, unforeseen and interconnected catastrophes as a result of diplomatic, informational, technological, economic and social interdependencies. As a result, it is necessary to task-organize a decentralized SAR megacommunity that is able to rapidly assess, communicate and respond to all disasters (regardless of the scenario) (Ramo, 2009, pp. 10–35). The hub could be modeled after the USSS MACC or the NMAC. It must be flexible and scalable so that support is provided to the impacted state or regions in a

manner that supports their planning and response operations. It is critical that the center be able to leverage different technologies and communications methods into one harmonized common operating picture.

Improved coordination between equity holders is the third strategic recommendation made in this research. This is a broad and general category that captures the need for outreach, planning, training, exercises and an approach that might be used to successfully motivate the megacommunity equity holders to prepare for the CI SAR necessitated by an extremely large, chaotic and intense event.

These three major recommendations incorporate the research, as outlined in Chapter III, into bins that are designed to capture the important undertakings identified as “findings.” Table 11 recommends one approach to integrate the findings into the three above-stated primary recommendations (a national SAR strategy is needed; a JAGCC will help manage communications and additional interagency coordination is critical). The table incorporates the research findings into three recommendations and suggests a federal office of primary responsibility, and the inclusion of all equity holders, the National Search and Rescue Committee and DoD/USNORTHCOM, in pursuing resolution of the issues.

Table 11. Findings and Relationship to a National SAR Strategy, JAGCC and Improved Interagency Coordination

All Equity Holder Findings			
Finding	National SAR Strategy	JAGCC	Interagency Coordination
<p>1. National and international resources must be deployed and employed efficiently; therefore, processing time of Requests for Assistance (RFAs) must be reduced by planning and exercising the use of expedited FEMA Mission Assignments (MAs), the use of SAR Prescribed Mission Assignments (PSMAs) and DoD use of Verbal Orders of Commanding Officer (VOCO) authorities.</p> <p>2. DHS should create and manage a more robust national SAR budget and include incentives for initiative similar to the Canadian New Initiatives Fund.</p> <p>3. DHS and USNORTHCOM should develop CI SAR Federal, State, Territorial, Tribal and public sector training scenarios.</p>	<p>The strategy should provide integrated planning guidance for concept plans and concepts of execution for the megacomunity. Standard procedures and resource packages should be pursued. The strategy and resulting concept plans should be based upon synchronized time-driven objectives.</p> <p>Funding and budget issues should be addressed by policy-makers in the strategy to ensure cost sharing is encouraged.</p> <p>Training and exercises should be addressed in the national strategy. DHS and USNORTHCOM exercise planners should be consulted to integrate the requirements into existing programs.</p>	<p>Standard procedures, interoperable communications, prescribed mission assignments, predesignated forces for CI SAR coordinated through a National center will ensure efficacy of the response operations.</p> <p>Training and exercises of participating JAGCC members will require financial commitment from host organizations.</p> <p>The JAGCC participants must be educated, trained and exercised in international procedures to send and receive international SAR aid.</p> <p>A fund source to reward SAR initiatives should be considered. Canadians have a New Initiatives Fund (NIF) that is utilized to fund priority enterprises.</p>	<p>Integrated planning and a more robust regional organizational construct are needed. Equity holders need to identify the best assemblage to provide timely, unique and surge capabilities to state and local officials.</p> <p>A predisaster declaration process can be codified that will ensure equity holders have ample time to pre-position resources for timely employment. For no-notice events, this coordination is important so that supported SAR mission coordinators know what to expect from the federal response.</p> <p>Training programs already exist and synchronized event lists could be developed and put into existing exercises. Funding for these efforts and similar requirements need to be corroborated.</p>

NSARC Directed Findings

Finding	National SAR Strategy	JAGCC	Interagency Coordination
<p>1. NSARC members should empower the umbrella organization (through funding and additional authorities) to collaborate, coordinate and train with regional and state partners to ensure they understand how the federal government intends to support state and local authorities.</p> <p>2. DHS (through the NSARC) must create a more robust regional interagency organizational construct to prepare for CI SAR.</p> <p>3. The NSARC should develop a better relationship with the INSARAG and USAID for more robust international CI SAR preparation (especially with Canada).</p> <p>4. The NSARC and USNORTHCOM should develop a strategic interagency engagement plan with all equity holders. The effort should leverage additional volunteer support for SAR (Citizen Corps / The Eagles Wings Foundation) through integrated planning, training and exercises (funding of full- time positions in the NSARC and USNORTHCOM is needed for this initiative).</p>	<p>These relationships need to be spelled out in the strategy. The NSARC should make these recommendations based upon analysis and consensus of the NSARC signatory organizations.</p> <p>USAID/OFDA/INSARAG equities should be considered when developing the strategy. Canadian, Mexican and territorial jurisdictions must be a part of the strategy development process.</p>	<p>Many organizations may need to participate in the JAGCC for extremely large events or the center may only require a few key experts in other circumstances. Proficiency in right-sizing the center will only come through training and standardization.</p> <p>Determination of which organizations should have a seat in the JAGCC and what circumstances trigger the stand-up of the center should be part of a DHS/DoD concept plan. A standard operating procedure will be needed.</p>	<p>An interagency coordination strategic communications/outreach matrix will help organize this effort.</p> <p>A combined strategic, operational and tactical outreach and coordination effort should be pursued to develop the three recommendations of this research... Develop a National SAR strategy, develop an concept of operation and implement an interagency JAGCC and continually refine and improve the process through interagency coordination between multi-disciplinary equity holders.</p>

DoD/USNORTHCOM Directed Findings

Finding	National SAR Strategy	JAGCC	Interagency Coordination
<p>1. USNORTHCOM must create a robust SAR cell in the operations directorate.</p> <p>2. DoD should clarify civil SAR, PR and DSCA SAR roles in the USNORTHCOM AOR. This effort may include kludging DSCA and Civil SAR and also combining the JPRC and AFRCC.</p> <p>4. USNORTHCOM should review, rewrite and coordinate DoD PR/SAR policy documents and author Concept Plans (CONPLANS).</p> <p>5. Eliminate delays in DoD deployment by developing integrated SAR plans and predisaster declarations.</p> <p>6. The NSARC and USNORTHCOM should identify CI SAR Civil Support Task List (CSTL) requirements to the National Guard Bureau and the states through the Defense Readiness Reporting System.</p>	<p>USNORTHCOM has made significant investment in improving CI SAR preparedness in anticipation of the requirement, however, much remains to be done. DoD and USNORTHCOM have revised some plans and directives, but more remain to be revised. A CI SAR concept plan needs to be developed. A military use handbook and mobilization guide may also be useful to the megacomunity.⁸⁴</p> <p>USNORTHCOM should support CSTL development to identify SAR supporting tasks in the event of a catastrophic event. Civil authorities, through the NSARC, should be asked to identify type, quantity and role of DoD T32 and T10 support. This gap analysis should be tied back into the FEMA gap analysis, catastrophic plans and the <i>National SAR Manual</i>.</p>	<p>The JPRC, AFRCC and USNORTHCOM have been engaged in establishing ad hoc centers in the recent past. The expertise of these organizations and interagency partners (USSS/ESF #4) should be consulted to determine best practices as options for the JAGCC are determined. Both DoD and DHS have national coordination centers that should also be part of a deliberate analysis on how to manage CI SAR complexities.</p> <p>Standard procedures can be developed and codified for use in the JAGCC. These procedures could provide catalogues of SAR resources from the Defense Readiness Reporting System. Using a database of available T32 SAR resources will improve response times and efficiency of DoD.</p>	<p>Plans development must include gap identification by civil authorities.</p> <p>Solutions must include the public, private and volunteer sectors of the megacomunity.</p> <p>DoD must ensure equity holders understand capabilities and limitations of the military. CBRNE, IAA and aviation support are unique and limited commodities. Ensuring all stakeholders understand capabilities and limitations will ensure the best practices are put forward.</p> <p>The USNORTHCOM SAR cell and focus group should lead the effort to ensure all DoD components are involved in CI SAR preparations.</p>

⁸⁴ The WFF community uses a series of checklists and a timeline for mobilization and employment of Department of Defense resources. They have also developed a military use handbook to facilitate deployment, integration and employment of Department of Defense personnel into the unified response (National Interagency Coordination Center, 2006).

B. A NATIONAL STRATEGY FOR SAR IS NEEDED

1. Introduction

The search and rescue megacommunity (Gerencser et al., 2008, p. 232) lacks a *National Strategy for Search and Rescue*⁸⁵ (Button). National strategies exist for a number of other functional areas. It is surprising that the mission listed on most incident commander (IC) incident action plans (IAP)⁸⁶ as the top priority, *saving lives*, has not received senior level attention or emphasis through a strategy development process that aligns demands for SAR with innovative national and international resourcing solutions. To satisfy shared intersecting interests of the catastrophic incident search and rescue (CI SAR) megacommunity (Gerencser et al., 2008); *a national strategy for search and rescue* is needed.

The national strategy for SAR must stress the critical lifesaving lines of operation demanded of the stakeholders⁸⁷ for catastrophic incidents rather than focusing on the types of events or causes of the tragedy. CI SAR time-driven requirements remain relatively constant despite environmental complexity in *Black Swan* type events⁸⁸ (Taleb, 2007, p. xvii).

2. Purpose

The purpose of the strategy will be to build a wider CI SAR coalition, create ideas and energy for strategic action, organize the stakeholders and to fund and implement the strategy to produce actions that posture the community for timely and effective CI SAR in all environments (Bryson, 2004, p. 28). Energizing the megacommunity to take actions

⁸⁵ *The national strategy for SAR* should include requirements for catastrophic incidents and international incidents as these are the most dangerous contingencies and the most likely events to demand DoD support.

⁸⁶ ICS Form 202. USCG IAP for Katrina period beginning September 12, 2005 listed “Saving” as the number one priority. Most incident managers address saving lives, preventing suffering and protecting property as the first three objectives during the first hours of an incident.

⁸⁷ Critical timely, unique and surge capabilities that DoD may be asked to provide during the first hours of a catastrophic event include: search and rescue, emergency medical support, mass evacuation support and incident awareness and assessment.

⁸⁸ A chemical, biological, radiological, nuclear or high explosive (CBRNE) event will provide significant additional complexity to the integrated CI SAR response.

strategizing against CI SAR anticipated requirements is the main effort⁸⁹ since the interagency coordination is also a key element needed to improve CI SAR groundwork.

3. Limited Centralization and Traditional Format

There are two important considerations for the development of the CI SAR strategy. First, the CI SAR effort will be comprised of a megacommunity with distributed power and limited centralization (Brafman & Beckstrom, 2006, p. 19). According to a number of SAR experts interviewed for this research, state SAR plans vary significantly as do the political environment, legislation, funding and organization for SAR at the state level. The national strategy must account for the various open components within the system to be valuable to federal, regional, state, territorial, tribal and local and international SAR organizations. Furthermore, the strategy must recognize that the stakeholders will be unable to quickly change the way state SAR operations are conducted due to these exogenous realities. The second characteristic of the strategy is that it will be somewhat bound by the community conformation requirements. That is, the end product must look and read in a similar manner to other national strategies and approaches to ensure it is understood by the readers.

4. Anticipated Effects and Methodology

Currently, the 2007 National Search and Rescue Plan plunges into operational guidance and task organization without the benefit of a national strategy promoting adequate national and international strategic coordination, policy or funding. If *The National Strategy for Search and Rescue* is formulated, it would help the National Search and Rescue Committee⁹⁰ get the attention of law-makers, department secretaries and cabinet heads to highlight the importance of this critical mission. A SAR expert in USNORTHCOM believes that *The National Strategy for Search and Rescue* must allow for variance of state plans while standardizing the overall CI SAR efforts, thus improving

⁸⁹ Please note that an end product was intentionally omitted as the main purpose for the effort. Instead, the result will be a valuable derivative of the all-important interagency coordination and planning procedure that develops the objet d'art.

⁹⁰ The NSARC will need contract or other full-time personnel support to assist with writing the strategy.

efficacy. The state individuality must be encouraged and supported while expectations of federal response efforts should be coordinated through a standard process with state SAR mission coordinators (Merrigan, 2009).

The strategy must be developed around the SAR *sweet spot* to take advantage of best practices of the pre-existing networks, ideologies, communication systems and leadership of the SAR community (Brafman & Beckstrom, 2006, pp. 88–101). In this context, the term *sweet spot* is used to indicate a need for federal decentralization with a distribution of capabilities to the regions and state SAR coordinator or other local SAR partners that have local and municipal institutional knowledge and tactical experience. For CI SAR, the federal assets would deploy under federal authorities and they would be employed by state, territorial, tribal, regional or local incident management/command systems (Brafman & Beckstrom, 2006, pp. 181–196). The difficult and esoteric facet of this approach is how to remain connected with the supported and supporting organizations to ensure air and maritime safety while distributing assets to a geographically dispersed and devastated region. Adequate interagency coordination and a center for managing information in a catastrophic environment are keystones of the strategy.

5. A Decentralized Strategy is Essential

A strategy must be proposed and formulated as a Web-based solution versus a vertical solution (Brafman & Beckstrom, 2006, pp. 155–158). It is critical for the strategy to work horizontally and vertically simultaneously to enable the megacommunity empowerment and to manage the exceptional influx of federal SAR assets in a coordinated manner. To organize a coordinated multi-domain response, a multi-level coordinated and decentralized approach should be agreed upon by the strategic planners.⁹¹

The strategy must also include the social reality of the stakeholders and disparate members. CI SAR will be time driven and the federal organizations will have to deploy

⁹¹ The strategy will be characterized by a decentralized Web-like task organization of multi-disciplinary FSTTL and international organizations synchronized through a JAGCC to efficiently manage the response.

without the benefit of coordinated requests for assistance. The strategy will ensure the SAR community avoids unfavorable reports like the GAO (2005) findings (Figure 5). The strategy must recognize this unique process and environment. A decentralized approach that addresses the need for federal authorities to provide a supporting role to the impacted state or region will suit the environment better than a traditional strategy using a structural (hierarchical) strategic approach (Kim & Mauborgne, 2005, pp. 209–212).

GAO investigated the military planning as it related to Hurricane Katrina and found...

Uncoordinated search and rescue efforts: While tens of thousands of people were rescued after Katrina, the lack of clarity in search and rescue plans led to operations that, according to aviation officials, were not as efficient as they could have been. The NRP addressed only part of the search and rescue mission, and the National Search and Rescue Plan had not been updated to reflect the NRP. As a result, the search and rescue operations of the National Guard and federal military responders were not fully coordinated, and military operations were not integrated with the search and rescue operations of the Coast Guard and other rescuers. At least two different locations were assigning search and rescue tasks to military helicopter pilots operating over New Orleans, and no one had the total picture of the missions that had been resourced and the missions that still needed to be performed

Government Accountability Office, 2006, p. 7

Figure 5. GAO Reports SAR Inefficiencies Related to Hurricane Katrina

The SAR focus group members stressed that the NSARC should consider an approach to leverage the interconnected technologies and communications systems of the megacommunity. During response and recovery operations the hasty, primary and secondary searches must be conducted quickly and efficiently to ensure survivors are located and moved to a final place of safety. Only a strategy that leverages the multi-domain dissimilarities will match the intensity and chaos that will be present in the catastrophic environment. The primary goal of the strategy will be to ensure that the

searches and rescues can be performed in a timely manner.⁹² Finally, CI SAR must be stressed in the strategic document since normal SAR and mass rescue operations (MRO) are typically managed satisfactorily and the challenges highlighted in this research refer primarily to CI SAR (J. Sokol, personal communication, February 27, 2009).

6. Strategic Anticipation of “*Black Swan*” Events

This approach is intended to span organizational boundaries of the megacommunity as well as to ally the three components of DoD (Government Accountability Office, 2006, pp. 8–16). At the operational level, it is also necessary for CI SAR to span the National Incident Management System (NIMS) operations, plans, logistics and administrative/finance sections to unify the SAR effort. By focusing on demands and requirements of the FSTTL partners, “preparedness” may be discovered through the strategy development process. The strategic document will be the apparatus that identifies that pathway to CI SAR preparedness as proposed in HSPD 8.

Breaking from the DHS/FEMA 15 planning scenarios concept where a SAR annex is prepared for each plan and is focused on the demands of the supported FSTTL organizations will require a paradigm shift. The value of an innovative approach is the opportunity to identify and prepare for DoDs four critical lifesaving lines of operation. These time-driven objectives will provide for the demands of the FSTTL stakeholders while pushing the entire SAR megacommunity to a multi-disciplinary preparedness that has eluded them so far (Kim & Mauborgne, 2005, pp. 209–212). This approach will also take the planning out of the hands of the planners and ensure the operators are a large part of the strategy development process. The result will be that equity partner approval will occur during the interagency coordination as part of the staffing process.

As depicted in Figure 6, CI SAR system links are strong in some cases and weak in others. These strong and weak links occur between and within response levels. For example, one state may have a strong tie with a state SAR mission coordinator from the

⁹² Examples of single event situations are the 15 national planning scenarios. Using a scenario-based strategy does not address the Black Swan eventuality of not being able to predict the type of event. A functional strategy using time driven objectives will ensure CI SAR assets are available for all scenarios encountered.

sheriff's office through integrated planning. In other cases, a state may only have a protocol for SAR that is unrehearsed. In both weak and strong link examples, the megacommunity benefits through a JAGCC because the communications and coordination channels are streamlined.

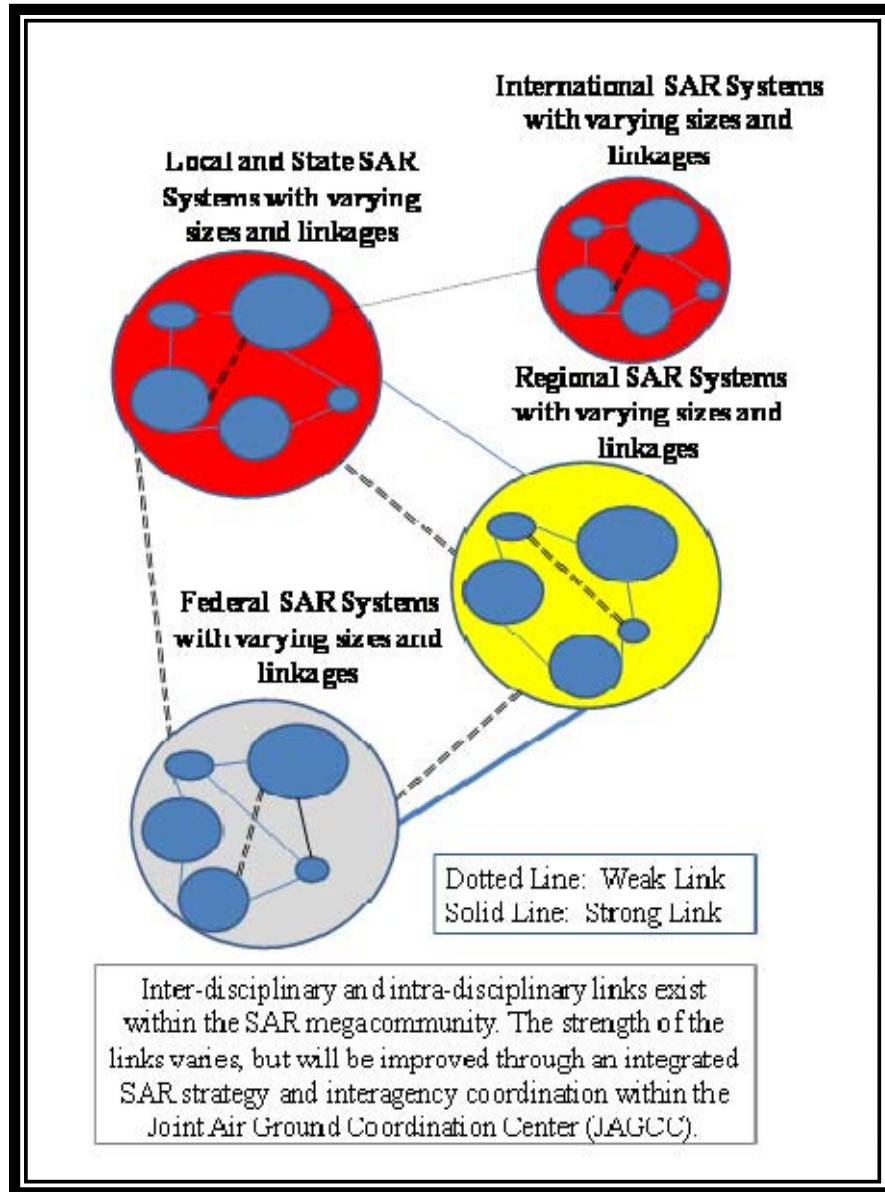


Figure 6. A National SAR Strategy Will Strengthen Interagency and Intra-Agency Links (from Brafman & Beckstrom, 2006, p. 134)

7. Four Critical Lifesaving Lines of Operation

A number of interviews indicated that the federal partners must set objectives and provide SAR resources while the operational team concurrently sequences, synchronizes and integrates those capabilities into the incident objectives effectively. There are three additional lines of operation that are beyond the scope, but closely related, to this research. During the strategy development, these other lines of operation, which include emergency medical support, mass evacuation (assisted and unassisted) and incident awareness and assessment (J. Sokol, personal communication, February 27, 2009), will need to be considered because they are linked closely to CI SAR. These four critical functional requirements recur for a wide array of events, yet the emergency management community's approach to solving these problems has traditionally been through scenario-based planning. All four critical lines of operation should be addressed in *The National Strategy for Search and Rescue* because the four priorities suffer overlapping resource competition and occur at the beginning of event response operations (J. Sokol, personal communication, February 27, 2009).

8. The National Approach

In the proposed strategy, DHS (through the NSARC) should strive to overcome strategic implementation hurdles (Table 12). They should endeavor to approach the SAR megacommunity in a manner that encourages a cognitive revelation (waking up to the need for a strategic shift), motivational awakening (encouraging voluntarily embracing and executing the strategic shift), resource mobilization (convincing that major change does not require significant additional resources) and political empowerment (tackling opposition from powerful vested interests). Accomplishing these four goals will increase momentum and improve preparedness for CI SAR (Kim & Mauborgne, 2005, pp. 147–171). The keys to successful strategy implementation are leadership involvement at all levels, SAR megacommunity participation in strategy development and willingness to embrace organizational changes to allocate human and material resources to prepare for CI SAR.

Table 12. Advantages that May be Derived from a Strategic Planning Process

	Leadership	Community Support	Organizational Change
Cognitive Awareness and logic	Leaders do what they know is the best for constituents	Social Trust from State SAR Mission Coordinators thru the NSARC	Interagency Coordination and participation in development of the processes gains FSTTL support through reason
Motivational	Multi-disciplinary input to strategy development serves the common purpose of saving lives	Must be done or lives will be lost unnecessarily	Knowing changes are being made that will save lives is important as a catalyst to change
Resources	Manpower costs to put the “right” people in place to ensure “preparedness”	Costs will be minimized and reciprocity maximized	Costs are worthwhile and all community members receive an opportunity to state what they need. Change is for the best and costs are sensible
Politics	Lifesaving is the highest priority and focus on the priority is obvious to the leaders	Local and State support will welcome a well-coordinated national approach	Common purpose, authority, incentives, culture and structure will improve the crisis management mechanisms

9. Regionalization

A regional approach to building SAR capacity is necessary during the strategy development. Leveraging the FEMA regional construct, WFF regions, USAF, CAP or the existing USCG rescue coordination centers will enhance SAR preparedness. This can be accomplished by engaging the respective regional leadership, DCOs and National Guard⁹³ to analyze the best course of action. The regional approach will also highlight gaps and strengths (emergency management assistance compacts) between state and regional equity partners that might not otherwise become apparent during strategy development.

⁹³ Also plan to leverage the task forces for emergency readiness (TFERs) as they mature and adopt processes of the DHS integrated planning system (IPS) to ensure standardization and conformity of the final product.

10 Summary

The *National Search and Rescue Strategy* should be developed to meet the community equity holders' anticipated requirements for CI SAR. The strategy should fulfill the anticipated gaps for Black Swan events. These gaps will become apparent by analyzing the time-driven priorities and critical lifesaving lines of operation (J. Sokol, personal communication, February 27, 2009).

C. JOINT AIR GROUND COORDINATION CENTER

The wildland firefighting provides a benchmark that can be used for catastrophic incident management. The management processes and the methods used by the NMAC, GACCs and incident command to collaborate and communicate have many similarities to those that exist for CI SAR.

Interviews and focus group discussions indicate that communications and information sharing improvements could be made in the CI SAR community and the NMAC organization and management system may be a good example for the CI SAR community to follow. CI SAR could be rendered ineffective if the megacomunity does not learn how to share technical information and communications between organizations more effectively than in the past. SAR effectiveness will depend more on a significant interagency solution than is currently planned. Using the NMAC model is an alternative that should be studied to help understand and remedy the technology and communications sharing issues. SAR coordinators might benefit from a site visit with the NMAC to further evaluate this analysis and note additional best practices.

The NSARC, AFRCC, USNORTHCOM and JPRC have attempted to coordinate through a variety of methods including: exchange of liaisons, telephone and email. Some success was seen for Hurricanes Ike and Gustav, however, this research indicates that difficulties still exist that will emerge as federal authorities move their timely, unique and surge capabilities forward in anticipation of a catastrophe. The NMAC and the USSS MACC have been able to overcome these obstacles through integrated planning, adherence to NIMS and ICS, an embedded resource ordering and tracking system, interoperable communications, standardization of equipment, training and, finally, a

decisive method of prioritization and allocation of resources. This recommendation incorporates suggestions from a number of interview subjects and focus group members to advocate that the SAR megacommunity should consider adopting the NMAC WFF or the USSS MACC processes for CI SAR management (T. Frey, personal communication, February 19, 2009).

D. INTERAGENCY COORDINATION

1. Introduction

The 2008 NIMS does not provide a definition for interagency coordination, however, the NRF states: "...many incidents require virtually reflexive activation of interagency coordination protocols to forestall the incident from becoming worse or to surge more aggressively to contain it" (Department of Homeland Security, 2008, p. 8). Interagency coordination is defined by the DoD Joint Staff as: "the coordination that occurs between agencies of the US Government (USG), including the Department of Defense (DoD), for the purpose of accomplishing an objective" (Joint Chiefs of Staff, 2006). The Government Accountability Office recognizes that interagency coordination is critical to strategy development (Figure 7).

Without effective interagency coordination and planning and clearly defined roles and responsibilities, there is a risk that NORTHCOM's, NGB's, and other nationwide efforts to respond to an incident may be fragmented and uncoordinated, such as in the aftermath of Hurricane Katrina.

Government Accountability Office, 2008, p. 33.

Figure 7. The GAO Finds Effective Interagency Coordination Critical During Response Operations

A recent example of a SAR interagency coordination strategy is found in the USNORTHCOM Commander's communication strategy for Hurricane Ike. The strategy for Hurricane Ike stated that SAR was conducted as an interagency operation that included FSTTL governments, private sector, non-governmental organizations and international partners. Timely and effective civil support was provided through unity of

effort using mission and international partners to meet the theater objectives. Mutually supportive and effective interagency coordination was necessary to save lives, mitigate suffering and to conduct coordinated SAR operations (USNORTHCOM Strategy Integration Group, 2008). In other words, interagency coordination is a critical component of a harmonized and unified response to any crisis. The more intense and chaotic the event; the more important relationships, familiarity and collaboration become to solving associated complexities.

Although the USNORTHCOM report indicates headway in developing an interagency coordination process for SAR, the GAO reported that the SAR megacommunity was not prepared to respond to catastrophic disasters (Government Accountability Office, 2007). The GAO found that improved SAR capabilities were needed for catastrophic disasters and GAO-07-395T recommended using the National Response Framework, National Incident Management System and the National Preparedness Goals as the standards (Government Accountability Office, 2008, pp. 9–33).

Interagency coordination and integrated operations are the hallmarks to success for the strategy development process, organizational change and the CI SAR incident management. In this section, a recommendation is made to continue efforts that will improve FSTTL interagency coordination practices. This recommendation was also echoed by the Emergency Preparedness Liaison Officer assigned to the Texas Task Force 1 Air Ground Coordination Center for Hurricane Ike in 2008.

Interagency coordination and collaboration is a difficult iterative process domestically and will be even more difficult should the need to integrate international efforts arise. As the domestic initiative to develop a national strategy unfolds, the Canadian and Mexican governments should also be invited to participate in the interagency discussions through the United States Agency for International Development. The northern border has significant vulnerabilities and promises extreme complexities should a cross-border event occur in one of the large metropolitan areas.

2. Developing Objectives, Training and Exercises

CI SAR strategy development will require identification of interagency time-driven objectives (J. Sokol, personal communication, February 27, 2009). Priority information requirements in the first few hours of a catastrophic incident are critical to ensuring appropriate and timely federal response. Decision points must be developed based upon saving the maximum number of lives, preventing suffering, protecting property, minimizing financial expenditures and advancing the recovery process. These interagency decision points must be embedded with FSTTL SAR plans and the national SAR strategy.

Equity holders ought to understand logistical timelines of organizations in addition to their own. Activation, deployment, employment and transportation times must be coordinated between the various state SAR mission coordinators so that a comprehensive understanding is achieved on the time lag between a request for assistance and when an asset becomes available to the incident commander. Interagency coordination and integrated planning with focus on time-driven objectives will ensure that equity holders understand the capabilities and limitations of the SAR collegial organizations.

An example of a priority information requirement driven by time is provided in Table 13. In this example, interagency strategists and planners could confer regarding requirements, capabilities and timelines in order to synchronize response operations for catastrophic events. This process would ensure that the interagency community has a clear understanding of each organization within the entire SAR system.

According to a number of interview subjects, synchronized interagency training and exercises should be developed to test CI SAR strategy and plans as they are developed. The training opportunities provide ideal venues to refine priority information requirements of the SAR community members. Interagency training should involve master scenario event lists that test these proposed timelines as well as the incident manager/commander's knowledge of comprehensive CI SAR response plan. State SAR

mission coordinators must understand the local, state, regional, federal and international assistance plans. It is critical that the state SMC have a trained, exercised and rehearsed integrated and coordinated CI SAR plan.

The time-driven objectives, priority information requirements and decision points must be understood by the incident commanders/managers (Table 13). Training, exercising and adjusting timelines will ensure the megacommunity identifies and finds the sweet spot for CI SAR operations.

Table 13. Example of Time Driven Objectives and Priority Information Requirements (J. Sokol, personal communication, February 27, 2009)

Example of Time-Driven Priority Information Requirements			
2 Hours	4 Hours	6 Hours	8 Hours
Size of Affected Area	SAR Hubs (Lily Pads)	Environmental Safety	Updates to previous priority information requirements
Environmental Conditions	Shelters of Last Resort, Hospitals/Nursing Homes	Dam/Levee integrity	Initial SAR Plan availability
Impedance (water depth, airports or seaports closed, contamination etc...)	Available SAR Resources	HAZMAT risk	Real-time Tracking & Accountability of SAR Assets/Forces/Teams
Travel Routes in/out (road/bridge)	First Responder shelters	Fires, Location & Intensity	Environmental Update
Staging bases	Environmental updates	SAR Forces/Resources changes	Incident Management and Command
		Environmental Update	

3. Summary

Increased collaboration between CI SAR equity holders through an intentional, measured process will improve the readiness for low probability, but high consequence events. Standardization of procedures and processes for this outreach effort will improve through training and exercises that promote collaboration both domestically and internationally. Time-driven interagency objectives are an important aspect of CI SAR interagency endeavors (J. Sokol, personal communication, February 27, 2009).

Engaging FSTTL and international partners will ensure the megacommunity is involved in strategy development and subsequent planning efforts that may involve organizational and/or process changes. Leaders will be able to adopt best practices of the many constituents by ensuring that a wide array of participants work on the national strategy for SAR and help improve readiness to respond.

VII. FURTHER RESEARCH OPPORTUNITIES AND CONCLUSIONS

A. OPPORTUNITY FOR FURTHER RESEARCH

First, this thesis did little to discuss chemical, biological, radiological, nuclear and explosive environments that could be present should a weapon of mass destruction be used against the United States. This research indicated that the nation is less ready for CBRNE CI SAR than a conventional problem such as a natural disaster.

For example, as a part of this research, Department of Defense, National Park Service and FEMA ESF #9 professionals were interviewed and asked if they could perform ground searches in a contaminated environment. None of these organizations has a robust CBRNE capability. The National Park Service and ESF #9 US&R teams have proximity suits that allow them to operate in the vicinity of a contaminated area for a short period of time or to protect the rescuer until a hasty exit from the contaminated area can be accomplished. DoD has some limited capability but nowhere near the capability to search for and rescue thousands of people needing assistance in a CBRNE environment.

Secondly, little time was spent discussing the international aspects of CI SAR. The United States Agency for International Development through the Office of Foreign Disaster Assistance and the International SAR Advisory Group have established international protocols that the SAR focus group and other SAR experts interviewed were unfamiliar. A better understanding of international processes for humanitarian assistance and disaster response is an area that could also use additional research.

Finally, the SAR megacommunity would benefit if further study was done to understand linkages between international, national and state organizations. In this research, it was found that very loose links exist between catastrophic planning efforts underway in FEMA, integrated plans being developed in FEMA regions, the *Quadrennial Homeland Security Review* recommendations and development of a Civil

Support Task List as examples. All of these efforts will have an impact on CI SAR capabilities and studying how to strengthen those linkages would be beneficial to the entire homeland security community.

B. CONCLUSIONS

CI SAR preparations have momentum as evidenced by the NSARC development of the CI SAR Addendum to the National Search and Rescue Manual, USNORTHCOM reorganization to better support civil SAR, DSCA SAR and personnel recovery. Momentum is also seen in updating policy guidance such as the 2007 National Search and Rescue Plan and DoDD 3003.1 DoD Support to Civil Search and Rescue and through exploration of an ad hoc air ground coordination cell for Hurricane Ike in 2008. Despite this momentum, significant effort is still required to improve CI SAR preparedness.

A national strategy for CI SAR is needed to define priorities and objectives for the SAR megacommunity. The strategy process will help align time-driven objectives with equity holder capabilities. The strategy will also drive interagency coordination through the entire spectrum of partners. The strategy development process will provide local to international disciplines a venue for recommendation of best-practices and techniques. The strategy will provide a base document for CI SAR training and evaluation standards tied to NIMS, ICS and the national preparedness goals.

A Joint Air Ground Coordination Center is a tool needed by the CI SAR megacommunity to manage intense and chaotic incidents. The wildland firefighting community has significant experience that can be tapped for regional, national and deployable domestic and international incident management and command experience.

Finally, both domestic and international interagency coordination necessitated by the strategy development and integrated planning will facilitate multi-disciplinary training, operations and exercises that, in turn, ensure the SAR megacommunity equity holders find the sweet spot for domestic and international catastrophic incident search and rescue.

APPENDIX: HURRICANE KATRINA SAR CRITICAL CHALLENGES

This appendix is an excerpt from Appendix A of the *Katrina Lessons Learned. Search and Rescue* is listed as a critical challenge in the document. Recommendations 44 through 48 are found below (White House, 2006, pp. 101–102):

Critical Challenge: Search and Rescue

Lesson Learned: The Department of Homeland Security should lead an interagency review of current policies and procedures to ensure effective integration of all Federal search and rescue assets during disaster response.

Recommendations:

44. DHS should lead an interagency team to review and revise the NRP to ensure the integration of all federal search and rescue assets. This review should:

a. Expand ESF-9 to ensure the coordination of all federal search and rescue operations, not just urban search and rescue. Under this new construct, both the urban and civil search and rescue coordinators would report to the Operations Section Chief under the Incident Commander. This structure is consistent with the National Search and Rescue Plan (NSP) requirement for the civil search and rescue coordinator to serve as the search and rescue representative to the Incident Commander, as well as with NIMS and ICS principles that place both urban search and rescue and civil search and rescue under the Operations Section. It would allow both coordinators to support each other and share resources, depending on the nature of the incident. Ideally, the ESF-9 coordinator in the Joint Field Office (JFO) should have extensive training and education in both urban search and rescue and civil search and rescue.

b. Require coordination throughout Incident Command to ensure continuity of care for those rescued. The ESF-9 coordinator should work with the logistics section under ESF-5: Emergency Management and the other ESF's grouped under the

Emergency Services Branch (including ESF-8: Public Health and Medical Services) to ensure victims receive medical care and are transported to an adequate housing shelter.

c. ESF-9 must include the United States Forest Service's (USFS), DOI and EPA capabilities to perform search and rescue operations. USFS is given the role as primary agency under ESF-4: Firefighting and as supporting agency under ESF-9. DOI is a principal partner with USFS in carrying out ESF-4 functions. As firefighters make up a large percentage of FEMA Urban Search and Rescue teams, their expertise and capabilities should also contribute to search and rescue operations. Under ESF-9, the mission statements of USFS and DOI should include the availability of firefighting personnel, not just equipment and supplies, for use in search and rescue operations. ESF-9 must include the capabilities of all participants in the National Search and Rescue Committee.

45. The National Search and Rescue Committee should revise the National Search and Rescue Plan (NSP) to include disaster response operations. The NRP references the NSP as a supporting operational document. However, the NSP is confusing because it specifically states that it does not cover overall response to disaster operations, as called for in the NRP. The NSP should therefore be revised to clarify its role in disaster response operations. The revision should specifically address air traffic control and coordination.

46. Each State and major city should incorporate Search and Rescue and US&R annexes into their overall disaster response plans. Federal grant assistance should require each state, under the State Homeland Security Grant Program, and urban area under the Urban Areas Security Initiative, to develop a search and rescue annex within its specific disaster response plan, as part of its concept of operations. This search and rescue annex should be scalable, modular, organized along ICS principles, and be all-hazards in scope. It should also specifically delineate which agencies have primary responsibility for each aspect of search and rescue. The plan should specify in what order Federal assistance assets or state-to-state mutual aid assets (through the Emergency Management

Assistance Compact) will be requested and detail how search and rescue coordination will be integrated into incident command. These search and rescue annexes should identify where victims are to be taken in the event that federal, state, and local logistical support to the victims is required. Representatives of National Search and Rescue committee organizations should assist the development of state and local search and rescue plans.

47. DHS should expand the National Preparedness Goal's Target Capabilities List (TCL) Capability: Urban Search and Rescue to require Federal Urban Search and Rescue teams and State and local entities to train, equip, and exercise for civil search and rescue missions. Currently, this capability only focuses on urban search and rescue and does not include any of the types of civil search and rescue, such as maritime rescue. An expanded capability should use the NSP as the guide for including civil search and rescue performance standards. State and local entities not currently in the national civil search and rescue community could then use the expanded search and rescue capability as a reference to plan, train, and exercise for both urban search and rescue and civil search and rescue missions. Funding for urban search and rescue teams should reserve a portion of their funding allocated to train and equip FEMA Urban Search and Rescue Task Force members for civil search and rescue operations.

48. DHS should create a national search and rescue volunteer certification program. This national certification should be used to verify the identity and the level of skills and training of search and rescue volunteers. Volunteers could report to "reception centers," which should be established along the perimeter of any impacted area to receive spontaneous volunteers. A national certification program would speed the incorporation of these individuals into the unified search and rescue command structure and greatly increase the effectiveness of the response. Voluntary organizations such as the National Association of Search and Rescue (NASAR) should be requested to assist with such a certification program.

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