THE INCIDENT COMMAND SYSTEM: A 25-YEAR EVALUATION BY CALIFORNIA PRACTITIONERS

EXECUTIVE PLANNING

BY: Dana Cole, Assistant Chief
California Department of Forestry
and Fire Protection
St. Helena, California

An applied research project submitted to the National Fire Academy
as part of the Executive Fire Officer Program

February 2000

ABSTRACT

Few innovations in recent years have had more impact on emergency services than the introduction and widespread adoption of the Incident Command System (ICS) for managing emergencies of all types. The problem addressed by this research is that, despite the emergence of ICS as the world's leading management system for the command, control, and coordination of emergency scenes, there has never been a comprehensive performance evaluation of the system.

The purpose of this research project was to provide the beginnings of a such an evaluation of ICS at the end of its first quarter-century of use in California. To accomplish this a system performance audit was conducted using information provided by Command and General Staff members of California's 17 standing major incident teams, most of whom have used ICS since its very inception in California in the 1970s.

An evaluative research methodology was applied using an approach called a "SWOT" analysis (the acronym standing for strengths, weaknesses, opportunities, and threats) to answer the following questions:

1. What are the primary strengths of ICS?
2. What are the primary weaknesses of ICS?
3. What strategic opportunities and threats are suggested by the analysis of ICS strengths and weaknesses?

To conduct the evaluation a 21-item survey instrument was distributed via electronic mail to 206 current and past Command and General Staff members of California's major incident teams, which consist of representatives from local, state, and federal government agencies. Respondents rated 16 attributes of ICS on a 10-point scale. A 60 percent response rate allowed for rigorous statistical analysis of the results. A rank order listing of the attribute ratings is presented in Table 2, but perhaps the most significant result was that none of the ICS attributes received a mean rating in the lower half of the 10-point scale. Thus, statistically speaking, none of the ICS attributes was considered an absolute weakness by the sample population. Even the lowest-rated attribute, with a mean rating of 6.23, was rated significantly greater (at the 95 percent confidence level) than the statistical midpoint of the 10-point scale used.

Using statistical confidence intervals, the author stratified the 16 attributes into three mutually-exclusive tiers of statistical significance. The highest rated of these, or "first tier strengths," represent the essence of what California's veteran ICS practitioners most value about the system, which the author describes as *predetermined internal alignment*. The second and third tier attributes were also evaluated, and "opportunity targets" for improving ICS were identified, primarily in the area of improving the system's *external alignment* with non-ICS users.

Based on the performance evaluation by California's veteran ICS practitioners, the author offers three recommendations for improving the Incident Command System. The first of these is to establish a formalized national systems management process. Second, develop a strategy for promoting ICS as the standardized model for emergency management. And third, institutionalize an ongoing national systems evaluation process.

TABLE OF CONTENTS

PAGE

LIST OF TABLES

INTRODUCTION

One of the most significant trends to occur in the emergency services field during the last quarter of the twentieth century has been the widespread adoption of the Incident Command System (ICS) as "the model tool for the command, control, and coordination of resources and personnel at the scene of emergencies" (Federal Emergency Management Agency [FEMA], 1992).

The ICS was initially developed by a group of seven fire agencies[1] who came together in the aftermath of the disastrous 1970 wildfire season in California. This coalition took the name Firefighting Resources of Southern California Organized for Potential Emergencies, or FIRESCOPE.[2] Chartered by the U.S Congress in 1972, the FIRESCOPE coalition was charged with a national mandate to develop a system for multi-agency coordination of complex emergencies that exceeded the capabilities of any single jurisdiction (FEMA, 1987).

As one of the original seven FIRESCOPE cooperators, the California Department of Forestry and Fire Protection (CDF) has participated in the development of ICS since the very beginning. CDF was among the first agencies to test the earliest versions of ICS, and to adopt ICS as the standard system for managing emergencies of all types.

Since 1987 CDF has continuously staffed a cadre of on-call Major Incident Command Teams. These teams, which also include representatives from local government, are available year-round to respond to the most complex and difficult incidents--typically those that exceed the management capability of single jurisdictions. Over the past 12 years these teams have managed hundreds of major incidents, including not only large wildfires but also high-rise fires, floods, earthquakes, multi-casualty incidents, hazardous materials accidents, search and rescue operations, and more. They have been sent to dozens of states across the U.S., as well as to other countries.

Within CDF there is no longer any doubt about the adaptability and effectiveness of ICS for managing emergencies. The majority of CDF's employees have never known another system for managing emergencies, and although ICS was originally developed for use on major emergency incidents, the system has proven so adaptable that its principles have become integrated into most facets of CDF's day-to-day emergency management activities. ICS is also being used increasingly as a management system for planned non-emergency events, such as major conferences and training exercises, and for coordinating long-term capital improvement projects.

From the birthplace of ICS in California to the National Fire Academy (NFA) and FEMA, the consensus among long-time practitioners seems to be that "ICS works." In all my years as a member of a Major Incident Command Team, and in all my research and review of the

[1] The original seven "Partner Agencies" are: California Department of Forestry and Fire Protection, California Office of Emergency Services, Los Angeles City Fire Department, Los Angeles County Fire Department, Santa Barbara County Fire Department, Ventura County Fire Department and the U.S. Forest Service.
[2] In 1986, the word "Southern" was dropped from the acronym when FIRESCOPE was formally established as a statewide program.

literature, I have not yet heard a single suggestion that ICS should be abandoned. But neither have I heard anyone claim that ICS is perfect.

The specific problem that this research is meant to address is that, despite the widespread adoption of ICS, there has never been a comprehensive strategic evaluation of the system. The purpose of this research project is to provide the beginnings of a such an evaluation of the Incident Command System at the end of its first quarter-century of use in California. To accomplish this a system performance audit was conducted using information provided by some of the most experienced practitioners of ICS: current command and general staff members of California's 17 standing Major Incident Teams.[3] The target sample population represents some of California's most seasoned fire and emergency professionals, many of whom have used ICS since its very inception, and in some cases, participated in the system's design and development.

An evaluative research methodology was used to answer the following questions:

1. What are the primary strengths of ICS?

2. What are the primary weaknesses of ICS?

3. What strategic opportunities and threats are suggested by the analysis of ICS strengths and weaknesses?

BACKGROUND AND SIGNIFICANCE

California's wildfire problem has grown steadily throughout the twentieth century. By 1970 the problem had grown so severe that a series of devastating wildfires in late September completely overwhelmed the state's wildfire protection system. Several weeks of unrelenting Santa Ana winds had resulted in wildfires that raged from the Oakland Hills in the northern part of the state to the Mexican border, 400 miles to the south. Never before had so many fires, affecting so many communities, ignited in such a short period of time. And never before had the state's firefighting resources at all levels of government been spread so thin for such a sustained period. One fire alone, the Laguna Fire in San Diego County, had personnel and equipment committed from more than 70 fire departments.

By late September dozens of uncontrolled fires were simultaneously spreading across the Los Angeles Basin with no regard to jurisdiction--from national forests to unincorporated state watershed lands and regional parks, across county boundaries, and into the City of Los Angeles. Wildfires jumped freeways and roared through suburban housing developments. In the bedroom community of Chatsworth, for example, dozens of homes burned to the ground, none of them more than 5 years old. In all, 885 home were destroyed and 16 people killed. The economic loss was approximately $233 million (FEMA, 1987).

[3] In California, teams comprised of representatives from state and local government go by the name Major Incident *Command* Teams. Federal teams are termed Major Incident *Management* Teams. For purposes of this paper, the generic term Major Incident Teams is used.

But the numbers do not tell the story of the total chaos that enveloped the dozens of emergency services agencies that responded to these fast moving, erratic wildfires. A primary reason for the confusion was the sheer number of agencies involved, each with its own jurisdictional mandate. This resulted in a "stovepipe" management mentality in which each jurisdictional unit had its own vertical structure of policies and protocols, communications and feedback. In hindsight, responding departments recognized that the emphasis on vertical flow inhibited the sharing and coordination of information between jurisdictions. This meant that as fires burned across and out of one jurisdiction to another, individual jurisdictions were often "flying blind" and forced to improvise management response with no clear organization of authority between departments, no predetermined rules for collective decisionmaking, and no coordination of even the most basic communications.

The lack of unifying concepts and systems thinking resulted in unprecedented operational problems. Fire engines from the north part of the state would pass engines from the south on Interstate 5, each dispatched to fires hundreds of miles away when they could have been dispatched closer to home. Confusion reigned over the nomenclature for equipment, lack of compatibility of communication frequencies and "ten-codes," and disparate command and span-of-control management approaches used by the dozens of responding agencies. At times even the most experienced firefighters were forced to throw up their hands in the spiraling chaos that crashed the public fire protection system in California during September of 1970. While there were plenty of examples of heroic and effective firefighting, these were accomplished mostly on a freelance or ad hoc basis. Coordination was often impossible (FEMA, 1987).

The FIRESCOPE program rose out of the ashes of this multi-jurisdiction debacle when representatives from the initial seven cooperating fire agencies came together in mutual frustration. Working with consultants from the Rand Corporation and the aerospace industry, who brought with them the latest concepts in the burgeoning field of "systems theory" (Lilienfeld, 1978), the FIRESCOPE partners began to develop improved procedures for utilizing and coordinating firefighting resources. This included the development of a new systems approach to overcoming the complexities of emergency management. In the early 1970s this new "Incident Command System" represented one of the first practical applications of modern systems thinking to the organizational management of complex and dynamic operational problems. The key to this systems approach was the recognition that "the fire problem and potential solutions must be addressed as a single entity consisting of the sum of all subsystems and their interrelationships" (Maloney and Potter, 1974).

By 1980 this evolving standardized emergency management system had taken root in California, and in 1982 it became a cornerstone of the National Interagency Incident Management System. A year later FEMA's NFA adopted and began teaching ICS, which it recognizes as "the model tool" for emergency management (FEMA, 1992).

But ICS is far from perfect. As is the case with any rapidly growing technology, the adoption of ICS by new user groups is rarely painless or seamless. For example, few fire departments have escaped the "growing pains" that inevitably accompany the initial integration of ICS into traditional operational environments (Wenger, et al., 1990). For non-fire agencies, the transition to ICS has proven even more difficult. Law enforcement agencies, for example,

have often been reluctant to "play by ICS rules" (Ullman, 1998). And when it comes to integrating non-government agencies and the private sector into incident operations and management, the challenges to using ICS can be even greater (Kincaid, 1997).

One of the problems often encountered when introducing ICS to new users is the difficulty in communicating key concepts and procedures that were developed primarily for emergency fire response to cooperators who may not have a fire background, or who may not even be emergency responders at all. This can necessitate a virtual translation of terminology, principles, and working relationships to those cooperators who have little or no experience with ICS.

Adopting ICS represents a monumental change to many potential users. Before they will undertake such a substantial effort they must be convinced that the effort is warranted. Certainly one major incentive for fire agencies is the adoption of ICS by the NFA as the national emergency management standard, but other potential users may require a more thorough assessment of the pros and cons of ICS before embracing it. The intent of this research paper is to provide the beginnings of such an assessment based on the experience CDF and its partner fire agencies in California.

The approach taken in this research has been influenced by both the *Strategic Management of Change* (SMOC) and the *Executive Planning* courses at the NFA. With respect to SMOC, there has been perhaps no more significant strategic change in the California fire service over the past 25 years than the universal adoption of ICS. And yet according to the NFA's "Change Management Model," which is the cornerstone for the SMOC course, if change is to be strategically managed it must not merely be planned and implemented, but also formally evaluated (FEMA, 1996). This research is an attempt to begin just such a systematic evaluation of ICS from the point of view of some of California's most experienced practitioners.

The evaluation approach taken in this research is specifically linked to the Applied Strategic Planning Model presented in the *Executive Planning* course (Goodstein, et. al.,1992). This model calls for organizations to identify and evaluate the *strategic lines of business* used to fulfill their missions. In the private sector, for example, a strategic line of business for a bank might be real estate loans. For this research I treated incident management as a strategic line of business for my department.

In the Applied Strategic Planning Model a performance audit is conducted using employees to evaluate the lines of business in which they work. This activity is accomplished through a tool called a "SWOT" analysis (the acronym standing for strengths, weaknesses, opportunities, and threats). The three research questions presented in the "Introduction" of this paper are designed to collectively comprise a SWOT analysis of California's experience with the Incident Command System.

LITERATURE REVIEW

In *The Fifth Discipline*, the required text for the *Executive Planning* course, author Peter Senge (1990) describes five "component technologies that are converging to innovate learning organizations" (p. 6). It is the fifth of these that ties them all together into an "ensemble of technologies that are critical to each others' success" (p. 6). The fifth discipline of Senge's title is ***systems thinking***. According to Senge:

> Systems thinking is a discipline for seeing wholes. It is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static "snapshots." It is a set of general principles--distilled over the course of the twentieth century, spanning fields as diverse as the physical and social sciences, engineering, and management…for seeing the "structures" that underlie complex situations (Senge, 1990, p. 68).

The Incident Command *System* may well be considered one of the longest-running experiments in applied systems thinking. It is a systems design-in-progress that has been applied to literally thousands of "complex situations" worldwide during the last quarter of the twentieth century. It is a framework not just for "seeing" the interrelationships and structures that underlie crises, but also for managing them.

ICS allows management of the underlying structures of crisis at two primary levels: conceptual and operational. At the conceptual level it represents an acknowledgment that complex crises usually transcend jurisdictional and functional boundaries, and thus can best be addressed systematically. At the operational level this translates to a coordinated approach to crisis by all responding entities utilizing a prearranged *system* of constituent principles that are consistent from one incident to another, regardless of type, geography, or jurisdictional involvement.

Before strengths and weaknesses could be identified it was necessary to identify the most important constituent parts of the whole system. Perhaps the most valuable resource in this regard was a unique monograph published in 1987, in which FEMA cited the Incident Command System as an "exemplary practice in emergency management" due largely to a set of "unifying operational principles" (FEMA, 1987, p. 20).

Several authors subsequently suggested additional management principles that are built into ICS. Ted Goldfarb, a 33-year veteran of the New York City Fire Department, noted the importance of a clear chain of command and unity of command (i.e., each person reports to and receives orders from only one boss). Another principle he describes is "parity of authority and responsibility," by which he means "each person receives the necessary authority to fulfill given responsibilities to accomplish goals" (Goldfarb, 1997).

Flexibility and adaptability are ICS strengths that are frequently mentioned in the literature. For example, FEMA training materials point out that while the ICS concept was originally devised to address complex wildfire scenarios in California, it has subsequently proven flexible enough for managing any type of emergency, including floods, hurricanes, earthquakes,

hazardous material releases, riots, and other natural and human-caused emergency incidents (FEMA, 1992). Lois McCoy, President of the National Institute for Urban Search and Rescue, describes how ICS became the "preferred choice" for rescue operations, especially in multi-agency and long-term emergencies. In the 1989 double-deck freeway collapse in Oakland during the Loma Prieta Earthquake, she points out, the Oakland Fire Department (which had not used ICS previously) "asked the State of California for assistance in its command and control operation. A CDF overhead team…was successfully integrated into a tired and overextended local command, without friction and with satisfactory operations continuing under ICS Unified Command" (McCoy, 1990, p. 11).

The adaptability of ICS means that the system can accommodate not only a variety of incident types, but also a variety of incident sizes and operational environments. Since specific functions and organizational elements are activated only at the time and to the extent dictated by the operational requirements of a particular incident, the system can be custom-scaled to the needs at hand (Chase, 1980; Goldfarb, 1997). And because of its flexible design ICS "may be used in a variety of organizational structures, including single jurisdiction/single agency involvement, single jurisdiction with multi-agency involvement, and multi-jurisdiction/multi-agency involvement" (FEMA, 1992).

Kincaid (1997) documents the successful use of ICS in cooperation with the Walt Disney World Company in Buena Vista, Florida. Brewster (1990) touts ICS as a model for implementing broad community-wide planning efforts by providing a system for incorporating not just emergency responders, but "all community assets and missions into an on-scene management structure" (p. 9). Irwin (1990) echoes this sentiment, calling ICS an effective vehicle for "integrating different disciplines, agencies, and government levels" (p. 9).

But ICS has also been criticized for its failure to accommodate non-fire entities into its management structure. For example, one article makes the claim that the fire department orientation of ICS inhibits the interaction with other "relevant local and outside organizations" and that "the system is particularly weak in integrating the activities of relief and welfare agencies as well as being not receptive to the use of volunteers" (Wenger et al., 1990, p. 12). Other authors address some of the difficulties of integrating law enforcement into a multi-disciplinary approach to incident management (Rubin, 1997; Ullman, 1998).

Another attribute of ICS that is mentioned as a weakness by more than one author is the process for transferring command to more senior staff as incidents escalate, and vice-versa as they de-escalate. One author recounts an instance where a fire chief was issuing orders as an "advisor" on an incident for an hour and a half before taking over as Incident Commander (Goldfarb, 1997). Others describe command transitions as "blueprints for the loss of information and effective management" (Wenger et al., 1990, p. 12).

Another common criticism of ICS is that there are considerable differences in how the system is implemented from one agency to another, and from one region to another. According to one article, "For some departments the ICS simply means someone is 'in charge' of the disaster site" (Wenger, et al., 1990, p. 9). McCoy (1990) suggests that FIRESCOPE funding for the development of ICS expired before protocols could be completed for a "top level of the ICS

system" that presumably could coordinate implementation nationally and reconcile agency and geographical inconsistencies (p. 11).

A final criticism of ICS noted in the literature is what is sometimes referred to as "mobilization overkill." One article suggests that because ICS was developed originally to manage diffuse and spreading disaster impacts such as wildfires, it is not well designed to deal with incidents where impacts occur in limited areas. Without offering specific examples, the authors state that ICS can create "serious problems of convergence and congestion at the disaster site" (Wenger, et al., 1990, p. 9).

PROCEDURES

As a first step in evaluating the Incident Command System, a preliminary online literature review was conducted during the months of May through July of 1999. This was followed by an exhaustive onsite literature search at the National Emergency Training Center's (NETC's) Learning Resource Center (LRC) and at the publication center of the Emergency Management Institute (EMI) during two weeks in August of 1999. More than 50 published articles, monographs, and EFOP research papers were reviewed. Many of these documented the successful application of ICS principles, quite often in non-fire contexts, while a smaller number directed criticisms at ICS. Collectively, these writings provided a draft list of attributes to be evaluated as perceived strengths and/or weaknesses of ICS.

This draft list was distributed to a test group of 10 veteran ICS practitioners. Based on progressive input and discussions with this test group, the list was revised three times before it was finalized. Following a final draft review and discussion with this group, a comprehensive questionnaire was prepared for distribution (Appendix A). Questions 1 through 5 were designed to characterize the experience of the sample population. Question 6 was designed to evaluate a total of 16 attributes of the Incident Command System. Respondents were asked to rate these 16 attributes on a scale of 1 to 10 to indicate the relative weakness or strength of the attribute as a feature of ICS. To remove any order bias from the statistical analysis 16 versions of the questionnaire were distributed, each presenting the 16 items in a different order. Finally, respondents were invited to add their own comments about ICS.

The questionnaire was distributed by electronic mail to current and recent Command and General Staff members of the 17 major incident teams in California. These include 12 statewide Major Incident Command Teams comprised of representatives from state and local government, and the five federal Type 1 Major Incident Management Teams assigned to California. Questionnaires were sent to each Team's Incident Commander, Command Staff (Information Officer, Liaison Officer, and Safety Officer), and General Staff (Operations Section Chief, Planning Section Chief, Logistics Section Chief, and Finance/Administration Section Chief). Questionnaires were sent to about 50 veteran ICS practitioners who have "rotated off" team assignments, but who are still active and available for overhead assignments as needed. In total, 206 questionnaires were distributed.

This sample population was selected for its knowledge and expertise, and represents some of the most experienced practitioners of ICS anywhere. It is only after years of training, certification, and successful completion of ICS assignments at progressively higher levels of incident management responsibility that one can qualify for appointment to these teams at the Command and General Staff level. In CDF, for example, fewer than two percent of the department's emergency response personnel are assigned to Major Incident Command Teams.

Electronic mail via the Internet (and CDF Intranet) proved to be a convenient vehicle for the distribution of the questionnaire, as respondents merely had to type their answers into the body of the message and use the "Reply to Sender" feature to return the completed questionnaire. In this manner, 40 completed questionnaires were returned on the first day alone. In all, 122 completed questionnaires were returned between November 15 and December 31, 1999. This represents a 60 percent response rate, and except for three questionnaires returned by Fax and one by postal mail, the entire sampling procedure was conducted online.

Limitations

A generic comment that is sometimes made regarding ICS is that it is "the California system," probably because ICS originated in California in the 1970s, and has been applied in California longer than anywhere else. One limitation of this study is that only California practitioners were surveyed. A benefit in using such a sample population lies in the sheer amount of ICS experience it represents: It's not probable that a sample population this large, with this much experience using ICS during the system's first 25 years, could be found anywhere else. And yet a limitation of using this sample population is that the results may be seen to exhibit a "California bias" or a "wildland bias." As such, it is important to emphasize that this study does not purport to be a comprehensive analysis of ICS, but rather an evaluation from the point of view of the first generation of California practitioners.

A second limitation of this study pertains to the use of e-mail for sampling purposes. A handful of the target sample population could not be reached by e-mail, either because they had no e-mail address or because a correct one could not be located.

Definitions of Some Selected Terms

CDF: California Department of Forestry and Fire Protection
Command and General Staff: The Command Staff consists of the Information Officer, Safety Officer, and Liaison Officer; the General Staff consists of the Operations Section Chief(s), Planning Section Chief, Logistics Section Chief, and Finance Section Chief. All of these incident management personnel report to the Incident Commander.
FIRESCOPE: Firefighting Resources of California Organized for Potential Emergencies.
ICS: Incident Command System
Line of business: Major category of activity pursued by an organization to fulfill its mission.
SWOT Analysis: A strategic analysis of an organization's line of business based on an assessment of strengths, weaknesses, opportunities, and threats.

RESULTS

As illustrated in Table 1 the sample population represents a high level of career experience, both in the fire service (average 26.6 years) and using the Incident Command System (average 17.7 years). The 122 respondents to this research study also exhibit a great deal of executive-level ICS experience as indicated by the average of 6.5 years of Command/General Staff assignment on one of California's major incident teams. In this capacity respondents have been assigned to an average of 14.5 major incidents, or just over two per year on average. For the purpose of this study "major incidents" were defined as those lasting for three or more consecutive operational periods. Major wildfires, floods, and earthquakes accounted for the majority of such incidents.

Table 1
Sample Population Characteristics (n=122)

EXPERIENCE	YEARS
Fire Service	26.6
Using ICS	17.7
Member of Major Incident Team Staff	6.5

Evaluation of ICS by Practitioners

To address the first two questions posed by this evaluative research study, the questionnaire directed the veteran practitioners to evaluate 16 attributes of ICS and rate them on a 10-point scale, with "1" indicating maximum weakness and "10" indicating maximum strength (see Question 6 in Appendix A). The results of this evaluation are summarized in Table 2, in which the 16 attributes are listed in rank order from highest to lowest mean rating.

Table 2
Rating of ICS Attributes (10-point scale)

ATTRIBUTE BY RANK ORDER n = 122	Mean Rating	Standard Error	Statistical Significance (95% Confidence)*
1. Predefined hierarchy	8.80	0.105	A
2. Uniform terminology	8.73	0.115	A, B
3. Modular organization structure	8.70	0.113	A, B
4. Incident Action Plans	8.68	0.126	A, B
5. Span of control	8.42	0.140	B
6. Standardized forms	8.17	0.152	C
7. Delegation of authority	8.06	0.131	C
8. Cross-jurisdictional relationships	7.78	0.154	C, D
9. Communications plan	7.73	0.158	D
10. Decision-making process	7.67	0.145	D
11. Transition of authority	7.50	0.196	D
12. Resource mobilization	7.27	0.183	E
13. Integration of non-fire agencies	6.84	0.189	F
14. Consistency of implementation	6.61	0.175	F, G
15. Integration of non-government	6.27	0.205	G
16. Agreement on system modifications	6.23	0.231	G

*Those attributes with the matching letters in Column 4 are **not** statistically different at the 95 percent confidence level. All others are. For example, Items 1-4 are not statistically different from one another (all have A's), nor are Items 2-5 (all have B's). But Item 1 is statistically different from Item 5.

Each ICS attribute was analyzed using mean, mode, standard deviation, coefficient of variance, and 95 percent confidence intervals (Wonnacott and Wonnacott, 1985). Modal tendency and coefficient of variance provided minimally useful information. The employment of confidence intervals, on the other hand, provided a useful measure of the range of actual population norms, which are illustrated by the letters in the last column of Table 2. Only those attributes with no matching letters in this column can be considered to have statistically different strength ratings at the 95 percent confidence level (indicated by "P=95 percent"). Thus, for example, the data shows with 95 percent confidence that the highest rated attribute (*Predefined hierarchy*) has a significantly higher strength rating than attributes 5 though 16. On the other hand, it cannot be said with 95 percent confidence that the differences in mean rating scores of attributes 1 through 4 are due to anything other than sampling error, as indicated by the "A" accompanying these attributes in column 4. All attributes denoted with an "A" can therefore be considered co-equal strengths at the 95 percent confidence level; likewise for each letter B through G.

Comparison of confidence intervals with the rank order of attributes allows for a more realistic interpretation of the data than by using rank order alone to evaluate strengths and weaknesses. Viewing the data in this manner suggests that ICS attributes should be placed in tiered groupings of roughly equal levels of significance rather than on an absolute scale of 1 through 16. These groupings are presented in the "Discussion" section of this paper.

Perhaps the most significant result is that none of the ICS attributes received a mean rating in the lower half of the 10-point scale, and thus the data does not support stratification of attributes as absolute strengths or weaknesses. In fact, statistically speaking, none of the ICS attributes is considered a weakness by the sample population. Even the lowest-rated attribute (*Agreement on system modifications*) with a mean rating of 6.23, is significantly greater (P=95 percent) than the presumed neutral value of 5.5, which is the statistical midpoint of the 10-point scale used.

An interesting observation can be made regarding the standard error (SE) values presented in Table 2. The highest rated attribute, *Predefined hierarchy*, also exhibits the lowest SE value (0.105), indicating a strong tendency toward unanimity in rating this attribute highly. Conversely, the lowest rated attribute, *Agreement on system modifications*, exhibits the highest SE value (0.231), which indicates a great deal of disparity in how this attribute was rated.

Finally, the third question posed by this evaluative research project pertains to the "opportunities and threats" suggested by the SWOT analysis approach described earlier (Goodstein, et. al., 1992). Due to the interpretive nature of this aspect of the analysis, "opportunities and threats" are presented in the "Discussion" section that follows.

DISCUSSION

The evident reluctance to assign "weakness" values to any of the 16 attributes indicates that even those attributes receiving the lowest mean ratings are not considered by the veteran ICS practitioners to be system "weaknesses" so much as the "weakest of the strengths." By using the confidence interval codes from Table 2, the attributes can be clearly stratified into three tiers of statistical significance: the "AB" tier, the "CD" tier, and the "EFG" tier. The three tiers are mutually exclusive in that the attributes in each have significantly different ratings than attributers in the other two tiers (P=95 percent). The terms assigned to these categories are *first tier strengths*, *second tier strengths*, and *third tier strengths*. The three tiers are summarized in Table 3 and will be discussed in turn.

Table 3
Tiered Groupings of ICS Attributes

CATEGORY	ICS ATTRIBUTE
First Tier Strengths (A, B)*	Predefined hierarchy, uniform terminology, modular organization structure, Incident Action Plans, span of control
Second Tier Strengths (C, D)*	Standardized forms, delegation of authority, cross-jurisdictional relationships, communications plans, decision-making process, transition of authority
Third Tier Strengths (E, F, G)*	Resource mobilization, integration of non-fire agencies, consistency of implementation, integration of non-government, agreement on system modifications

*Letter codes indicate statistical significance at the 95 percent confidence level. They are taken from Table 2.

First Tier Strengths of ICS

These five highest-rated attributes constitute the essence of what makes ICS an effective management system in the eyes of California's veteran practitioners. Using the specific wording from the questionnaire (attached as Appendix A), the five major strengths of ICS, in rank order, are:

1. *Predefined hierarchy, including chain-of-command and delineated responsibilities for every position.*
2. *Uniform terminology for identifying resources and organizational functions.*
3. *Modular organizational structure that is expanded and contracted as needed.*
4. *Incident Action Plans that are updated for each operational period.*
5. *Manageable span-of-control.*

Taken together, these five attributes constitute something that can be termed ***predetermined internal alignment***: It is *predetermined* because due to these attributes the workers know the rules by which the system functions even before the incident begins. In CDF, this is true not just for Command and General Staff, but for all personnel on an incident. Since ICS is incorporated into the most basic training, even the rookie firefighter knows the rules and operates in "ICS mode" on a routine basis. These rules seem to work best *internally*; that is, within the system, where all the workers know the terminology and roles. They know where

their own specific responsibilities begin and end, and they have an understanding where they fit within the system's span of control. And they are in *alignment*, which, according to Peter Senge, is a phenomenon that occurs "when a group of people function as a whole so that a commonality of direction emerges, and individuals' energies harmonize" (Senge, 1990, p. 234).

The predetermined features of the system ensure that workers can "hit the ground running" because they use common terminology and function within a common organizational structure and planning process; time and energy need not be wasted negotiating "who does what" and "who reports to who." Since everyone within the system "speaks the same language and works from the same script" they are able to get immediately to the most important business at hand: managing the problem.

It is remarkable how rare this approach is outside the field of emergency services. ICS may in fact may be one of the most advanced and well-practiced examples of applied systems thinking anywhere. Peter F. Drucker, who has been writing about management issues for more than 60 years and is considered by many to be the most important management thinker of the 20th century (Stone, 1998), recently proposed a set of principles he calls "Management's New Paradigms for the 21st Century" (Drucker, 1999). Among the very first of these is the seemingly obvious principle that "Organizational Structure is Needed." But as he explains, there are hundreds of versions of organizational structure; the key is to identify the specific one "that fits the task" (p. 16).

ICS is an excellent example of Drucker's principle: The average practitioner represented by this research study--27 years in the fire service, 18 years using ICS--is someone who has spent most of a career helping to define and refine a specific organizational structure "that fits the task" of managing complex emergency incidents. Drucker has never written about ICS, but he may as well be referring to the system's major strengths when he writes:

> One hears a great deal today about "the end of hierarchy." This is blatant nonsense….In a situation of common peril--And every institution is likely to encounter it sooner or later--survival of all depends on clear command. If the ship goes down, the captain does not call a meeting, the captain gives an order. And if the ship is to be saved, everyone must obey the order, must know exactly where to go and what to do…. "Hierarchy," and the unquestioning acceptance of it by everyone in the organization, is the only hope in a crisis (Drucker, 1999, p. 11).

Second Tier Strengths of ICS

The second tier of ICS strengths consists of six attributes that are rated significantly lower (P=95 percent) than those in the first tier strengths. Even so, it should be noted that these are still rated in the upper quartile of the 10-point scale, which can be interpreted as favorable endorsement by the sample population. Again, using the specific wording from the questionnaire and rankings from Table 2, the second tier strengths, in rank order, are:

6. *Standardized forms are used for all incidents.*

7. *Ample flexibility and authority are given to staff for accomplishing objectives.*

8. *Cross-jurisdictional and cross-functional working relationships when ICS is used.*

9. *Communications plan that is coordinated among responding agencies.*

10. *Clear decision-making process.*

11. *Process for transitioning command authority from one level of government to another as incident complexity changes.*

Whereas ICS is characterized by *internal* alignment as indicated by the first tier strengths, the system is not quite as strong in effecting *external* alignment; that is, alignment with forces outside the system structure itself. External forces include organizations that do not use ICS, as well as political, economic, social, environmental, legal, and cost implications that are not entirely within the system's ability to manage (FEMA, 1999). It stands to reason that ICS may not be quite as effective in the external arena for the simple reason that external forces differ from incident to incident. And while these entities may be directly impacted by the incident it cannot be assumed they "know exactly where to go and what to do" (Drucker, 1990, p.11). Some of the biggest challenges occur with cooperators who may be unfamiliar with ICS or who may not be receptive to "playing by ICS rules," a point that often appears in the literature. (See, for example, Wenger, et. al., 1990; Kincaid, 1997; Ullman, 1998).

And yet ICS *does* provide means for addressing these potentially problematic external issues, as evidenced by the favorable rating given to the attributes in this tier. While none of the second tier strengths deals exclusively with external forces, each has an external dimension. For example, the use of *Standardized forms* assures that all internal users are "on the same page." But these same forms can have an external function as well, as when the ICS-204 ("Division Assignment List") depicts assignments for law enforcement or relief agencies, or when an ICS-209 ("Incident Status Summary") is provided to the media to show cost and loss information.

Other second tier strengths that are predominately external alignment issues include *Cross-jurisdictional working relationships* and the *Process for transitioning of authority as incident complexity* changes. These can become major external issues, especially in the politically-charged atmosphere of a rapidly escalating major disaster, where numerous jurisdictions can have overlapping authorities. Two other attributes in this tier, the *Coordinated communications plan* and the *Clear decision-making process*, must be aligned both internally and externally. The latter, for example, must be aligned internally through the operational planning process and documented in the Incident Action Plan, but the process must also be accessible to external forces, usually through a unified command structure.

In summary, the second tier strengths clearly contribute to the effectiveness of ICS, though there may be an unavoidable price to pay in the form of additional complications and

workload over and above internal incident demands. It is likely that this somewhat reduced level of system control over these attributes resulted in the slightly lower ratings given by practitioners.

Third Tier Strengths

It is tempting to refer to this lowest-rated tier of attributes as "relative weaknesses," or more accurately from a statistical point of view, as "the weakest of the strengths." But neither of these terms captures the double-edged nature of these attributes. Each of them has positive aspects, as indicated by ratings that are statistically well above the 5.5 midpoint value. And yet there must be valid reasons these five attributes were rated significantly lower that the others. For this reason the author believes that the attributes below offer the best targets for improvement of ICS:

12. *Resource mobilization effectiveness*.

13. *Effectiveness of integrating non-fire government agencies (e.g., law enforcement, public works) into ICS structure*.

14. *Consistency of implementation among various agencies*.

15. *Effectiveness of integrating non-government organizations (e.g., relief agencies, businesses, citizens) into ICS structure*.

16. *Agreement among agencies about who has authority to modify the ICS "rules of the game."*

All five of these attributes are mentioned prominently in the literature as potential problems with ICS. For example, if *Resource mobilization* is not handled effectively, then "overkill mobilization" can cause problems of "convergence and congestion" at the incident site (Wenger, et al., 1990, p. 9). Such a situation can result in further external problems if it is viewed by the public as a bureaucratic boondoggle and waste of tax dollars. But as an Oregon Emergency Management Coordinator points out, "Over mobilization is an implementation issue, and not one directly related to the ICS model itself" (Dimmick, 1990, p. 10). By this view resource mobilization under ICS may be considered a *strength*: admittedly not perfect, but better than the free-for-all alternative that led to the formation of FIRESCOPE.

Two related attributes that are weakly endorsed by the sample population are *Effectiveness of integration into ICS* of both non-fire agencies and non-government organizations. But while ICS has been criticized because "the fire department is in 'charge' and there is little place for others" (Wenger, et al., 1990, p. 9), the sample population had very different reasons for withholding strong endorsement for the effectiveness of integrating others into the ICS structure. A number of comments were offered by respondents that echoed the observation by a representative of the Pennsylvania Emergency Management Agency that most "multi-organizational" coordination problems are "caused by inadequate training rather than

flaws in the system," and that regardless of its shortcomings, ICS is "better suited to the task than any of the other variations of command and control systems previously used" (Long, 1990, p. 9). Few would disagree, however, that the effective integration of non-fire agencies and non-government organizations is a major target for improvement.

Somewhat related to this is the attribute pertaining to *Consistency of implementation among agencies*, which can be a source of frustration for even the most experienced ICS practitioners. And while this can be a problematic external issue for ICS, practitioners muster lukewarm endorsement of this attribute, probably because they believe that, when it occurs, inconsistent implementation "is a result of inadequate jurisdictional attention to planning, training, and the procedural aspects of incident management" and not the fault of ICS itself (Irwin, 1990, p. 10).

Finally, the lowest-rated of the 16 ICS attributes is the *Agreement among agencies who has authority to modify the "rules of the game."* This is a longstanding issue, and one that has been exacerbated by the rapid spread of ICS throughout and beyond the U.S. over the past 3 decades. The Incident Command System is a work in progress, and as adaptations and changes are made to suit local or agency-specific needs, there is no universally accepted governing authority or clearing house to offer resolution to conflicts and confusions that can arise. Terence Haney, a FIRESCOPE consultant who was involved in the original development of ICS, and later, in the transition of ICS into the National Interagency Incident Management System, focused on this issue in 1990 when he suggested the need for a "national system manager [to] oversee ICS multi-hazard applications, new developments, training, and orientation" (Haney, 1990, p. 12). This represents possibly the most significant improvement target for ICS, and will be discussed further in the "Recommendations" section.

"Opportunities and Threats"

The final research question pertains to identifying the primary opportunities and threats suggested by the practitioners' evaluation of ICS, thus completing the "SWOT analysis" approach presented in the *Executive Planning* course (Goodstein, et al., 1992).

It is the author's opinion that the primary opportunity suggested by this research is to leverage the system's predetermined internal alignment features to provide organizational structure for managing much more than emergency incidents. To illustrate why this may be a natural evolution for ICS, consider how far this systems model has come since it was initially developed for the very specific purpose of managing complex wildfires. Certainly California wildfires provided plenty of opportunities to practice with early versions of the ICS model, but it soon became apparent that the system could work equally well for non-fire disasters, including earthquakes, floods, riots, and hazardous material incidents (FEMA, 1992). Meanwhile, departments like CDF found that it made sense to use this management tool not just for major disasters, but for everyday emergencies as well. Thanks to the system's scalability--that is, its ability to be expanded or contracted as needed to fit the operational requirements of a particular incident--users found that virtually any incident, regardless of size, could be managed using ICS. In some fire departments ICS became more than a tool for managing extraordinary events; it

became an everyday "line of business" (Goodstein, et al., 1992). For a department like CDF, ICS is used from the moment of initial dispatch to an incident. So, for example, if a fire is not controlled during initial attack and requires additional resources, ICS allows the system response to "scale up" and keep pace with the changing needs of an expanding incident without having to switch operational modes.

Peter Senge (1990) writes that one of the most common threats to systems thinking is "The almost total lack of meaningful 'practice' or 'rehearsal'" (p. 258). He writes:

> Imagine trying to build a great theater ensemble or a great symphony orchestra without rehearsal. Imagine a championship sports team without practice. In fact, the process by which such teams learn *is* through continual movement between practice and performance (Senge, 1990, p. 238).

Few systems models have undergone more "practice and performance" than ICS during the past 25 years. The system has been used thousands upon thousands of times; it has been tested, refined, and literally forged in the heat of repeated "trials by fire." While not perfect, ICS is a proven structure for making people productive in working together to accomplish critical tasks during times of crisis.

But remove the crisis nature of the task, and the basic advantages of predetermined internal alignment still apply. The same principles that make this systems model so effective for managing emergencies can also be applied as a system for managing planned non-emergency events and complex projects. For example, ICS has been used successfully by CDF and others to implement numerous major conferences and training exercises, and to assist in managing such planned events as the 1984 Olympics in Los Angeles and the opening of the Ronald Reagan Presidential Library in 1992.

One of the primary reasons that the ICS model works so well is that it is continually "practiced and performed," in the words of Peter Senge (1990, p. 238), and as such, has become an effective, systematic way of operating for departments like CDF. It has evolved from being a management tool for merely *responding* to disaster, to one that also offers great opportunity as a *proactive* management tool for strategic planning and project implementation. This is consistent with Drucker's (1999) recommendation to focus on opportunities by "exploiting success" (p. 82). In this view, if an organization develops a management structure that "fits" the key task of the organization, it may make sense to expand the use of that structure so that it becomes the organization's predominant management paradigm.

Given organizations' natural resistance to change, such an approach is not likely to be free of problems. But as Drucker (1999) writes, the key to exploiting success is "to starve the problems and feed the opportunities" (p. 82). The results of this research point to the problems that collectively pose the single biggest threat to the effective use of ICS: *external misalignment*.

The potential problems that can lead to external misalignment are suggested by the third tier strengths. Specifically, implementation failures of these attributes can result in "ICS horror stories" that can damage the system's credibility among entire communities or user groups. Such

failures can occur on incidents characterized by inefficient or wasteful resource mobilization, insensitivity or inadequate attention to the integration of non-fire or non-government entities, uncoordinated decision making processes, confusion regarding agency responsibilities, or anything else that might give the impression of a "bureaucracy run amok." Any of these problems have the potential to threaten the system's integrity whenever ICS is used with uninitiated external entities.

In the author's experience, however, most often such entities become "ICS converts" when they experience how well the system works for managing even the most complex and chaotic incidents. The key at such times is to "starve" the threat of external misalignment by "feeding the opportunity" to build trust among the various entities that are thrust together in times of crisis. When chaos proliferates in times of emergency there is great incentive to put aside differences and pull together. ICS offers the structure within which to do that.

RECOMMENDATIONS

Based on the performance evaluation by California's veteran ICS practitioners, the author offers three recommendations for improving the Incident Command System.

1. Establish a multi-disciplinary national systems management process to ensure the integrity and consistency of implementation of ICS.

The adoption of ICS has spread rapidly and extensively. It is no longer used solely by the fire service, but also by agencies in law enforcement, health care, and public works, among others. The U.S. Coast Guard now uses ICS for environmental responses and search and rescue operations, and the U.S. Department of Energy is adopting ICS for use in responding to nuclear emergencies. As the use of ICS expands throughout the fire service and beyond, to a wide range of disciplines, new users often "customize" ICS to fit their particular needs. While ICS is designed to be adaptable, unilateral changes can potentially compromise the general set of principles that underlie the system. This can lead to conflict and confusion when disparate entities are brought together on major incidents.

The proposed systems management process would most appropriately be coordinated by FEMA and include an oversight board with representation from the various geographical regions and ICS user groups. These should include representatives from a full spectrum of disciplines, including the fire service, law enforcement, medical and health services, public and private utilities, environmental protection, relief organizations, the National Guard, and others as deemed appropriate. One model for this approach is provided by California's Standardized Emergency Management System (State of California, 1995).

A multi-disciplinary national oversight board is long overdue and necessary for providing ongoing policy guidance and direction if ICS is to be an effective national system standard for managing emergencies. A primary function of this board would be to act as a clearinghouse for reviewing and arbitrating any unresolved issues of system standards, compliance, implementation, operation, and training.

2. Develop a strategy for promoting ICS as the standardized model for emergency incident management.

Whereas the preceding recommendation pertains to the quality control of the system itself, the second recommendation pertains to the alignment between the system and "the rest of the world." Whenever ICS is deployed there is an inevitable systems interface between those who are indoctrinated to function within the parameters of the system (ICS users) and those who are not. It is simply a given that the system will have to interact with non-system users, including the myriad agencies, volunteer, and relief organizations that are not indoctrinated to ICS, as well as the general public, the media, and others. This issue of external alignment is further complicated by the fact that it is often impossible to anticipate in advance who these non-system users will be. Major incidents vary widely in their scope and impacts, and it is not always possible to know beforehand what agencies and which personnel will be thrust together, nor the nature of the crises they will confront.

FEMA has begun to address this through its disaster planning and response process. The challenge--and the opportunity--is to do a better job of promoting the generic function-based ICS organization model as *the* national standard implementation tool for FEMA's function-oriented disaster planning and response process. This will require coordination and leadership at the federal level to ensure standardized national guidelines and cross-disciplinary training, a role that would seem to fall most logically to FEMA, which is already providing ICS curriculum and training for fire management through its National Fire Academy. Alignment with non-fire disciplines will not occur easily, however, unless an expanded multi-disciplinary training curriculum is developed to promote ICS as the universal inter-entity management model.

3. Institutionalize an ongoing systems evaluation process.

Earlier in this paper the observation was made that the overwhelming sentiment among veteran practitioners is that "ICS works." Perhaps the best evidence of this is the system's rapid and widespread adoption over the past 25 years.

And yet how do we know what works and what doesn't, and what improvements need to be made? As new disciplines adopt the ICS approach, how do we know what adaptations need to be made to make ICS a truly universal system for emergency management? Is such a universal system even practical? And how do we know which problems encountered by ICS users are *system* problems, and thus need to be addressed through further refinement or redesign, and which of these problems are inherent in the chaotic nature of emergency management?

These and many other questions have no easy answers, but one thing seems evident: they need to be addressed systematically by those familiar with the system. ICS has been developed and applied methodically over the years, but a missing ingredient to this methodology has been a systematic evaluation. Such an evaluation is long overdue.

The Incident Command System cannot afford to "fly blind" into a new century of emergency management. It is not a perfect system and it is not a panacea. But in the author's opinion, too much progress has been made to even consider starting over. In fact, the biggest

problem confronting ICS at the dawn of the twenty-first century may be a "surfeit of success," which has resulted in so many adaptations and innovations that the system threatens to take on an unwieldy life of its own. Without systematic, ongoing evaluation in conjunction with the other recommendations for managing and promoting ICS as a universal model, the opportunity may be missed to institutionalize positive changes and necessary modifications that will ensure the continuance of ICS as "the model tool" for emergency management.

REFERENCES

Brewster, P. (1990, May). Clearer understanding of ICS proves value for emergency management. *Hazard Monthly*, pp. 7-9.

Chase, R.A. (1980). *FIRESCOPE: A new concept in multiagency fire suppression coordination*. General Technical Report PSW-40. Berkeley, CA: USDA Forest Service Pacific Southwest Experiment Station.

Dimmick, M. (1990, May). ICS: Making criticism constructive. *Hazard Monthly*, pp. 7-10.

Drucker, P.F. (1999). *Management challenges for the 21st century*. New York: Harper-Collins.

Federal Emergency Management Agency [FEMA], National Emergency Training Center, Emergency Management Institute. (1987). *Exemplary practices in emergency management: the California FIRESCOPE program.* Monograph Series No 1. Emmitsburg, MD: Federal Emergency Management Agency, National Emergency Training Center, Emergency Management Institute.

Federal Emergency Management Agency [FEMA], National Emergency Training Center, Emergency Management Institute. (1992, May). *Overview of the Incident Command System*. Student Manual SM 305.7. Emmitsburg, MD: Federal Emergency Management Agency, National Emergency Training Center, Emergency Management Institute.

Federal Emergency Management Agency [FEMA], U.S. Fire Administration. (1996, May). *Strategic management of change*. Student Manual NFA-SMOC-SM. Emmitsburg, MD: Federal Emergency Management Agency, U.S. Fire Administration, National Fire Academy.

Federal Emergency Management Agency [FEMA], National Emergency Training Center, Emergency Management Institute. (1999, February). *Incident Command System curriculum*. [CD-ROM]. Student Manual G196. Emmitsburg, MD: Federal Emergency Management Agency, National Emergency Training Center, Emergency Management Institute.

Goldfarb, T. (1997, January). Putting the Incident Command System into perspective. *Fire Engineering*, pp. 64-72.

Goodstein, L.D., Nolan, T.M., & Pfeiffer, J.W. (1992). *Applied strategic planning: An overview*. San Francisco, CA: Jossey-Bass.

Haney, T. (1990, May). ICS: Aquestion of implementation. *Hazard Monthly*, pp. 7-12.

Irwin, R.L. (1990, June). Challenging the critics of ICS. *Hazard Monthly*, pp. 9-10.

Kincaid, K. (1997). *Partnering with business in incident management*. Executive Fire Officer Program Research Paper, Emmitsburg, MD: National Fire Academy.

Lilienfeld, R. (1978). *The rise of systems theory*. New York: John Wiley & Sons.

Long, C.R. (1990, June). [Letter to the Editor, untitled]. *Hazard Monthly*, p 8.

Maloney, J.E., & Potter, M.O. (1974). *The fire management system: Preliminary results and design concepts.* Ottawa, Ontario: Forest Fire Research Institute.

McCoy, L.C. (1990, June). ICS works when used correctly. *Hazard Monthly*, pp. 9-11.

Rubin, D.L. (1997). The Incident Command System: Myths, rumors and unnatural acts. *Fire Chief*, 41, 63-68.

Senge, P.M. (1990). *The fifth discipline*. New York: Doubleday.

State of California (1995). *SEMS guidelines: Standardized emergency management system*. Sacramento, CA: Governor's Office of Emergency Services.

Stone, N. (Ed.) (1998). *Peter Drucker on the profession of management*. Boston: Harvard Business Review Books.

Ullman, M.L. (1998). *Integration of the Incident Management System between the police and fire departments of the city of Goodyear, Arizona*. Executive Fire Officer Program Research Paper, Emmitsburg, MD: National Fire Academy.

Wenger, D., Quatrantelli, E.L., and Dynes, R.R. (1990, May). Is the Incident Command System a plan for all seasons and emergency situations? *Hazard Monthly*, pp. 8-12.

Wonnacott R.J., & Wonnacott, T.H. (1985). *Introductory statistics*. New York: John Wiley and Sons.

Appendix A
ICS Questionnaire

(should take no more than 10 minutes)

I am doing a research project for the National Fire Academy that evaluates the Incident Command System from the point of view of veteran ICS practitioners. If you would like your input included in this research, please complete the survey below.

Just type in your answer after each question. When you're done, **REPLY** to dana_cole@fire.ca.gov.

Thanks in advance for your participation.

Dana Cole, CDF.
(707) 963-3601 ext. 108
email: dana_cole@fire.ca.gov

Directions:

Type the appropriate number after each question.

1. How many years of experience do you have in the fire service?

2. How many years of experience do you have using the Incident Command System? (approximate if you're not sure)

3. How many years of experience do you have as a member of a major incident command/management team? (if none, enter "0")

4. In your career, approximately how many incidents with duration of 3 or more consecutive operational periods have you been assigned to as a team member at the Command & General Staff level?

5. How many of these incidents were non-emergencies (conference, project, etc)?

6. Please read the following scenario and then rate the listed features of ICS.

SCENARIO: Imagine that you are contacted by a health care administrator with whom you have worked on a major disaster. She saw ICS applied and is considering adopting an ICS approach for managing major medical emergencies at her company's hospitals. She knows you have years of experience working with ICS, and she wants to discuss your perception of its weaknesses and strengths.

Directions:

Rate **each** of items A-P below on a scale of 1 to 10 to indicate its relative WEAKNESS or STRENGTH as a feature of ICS. (For example, a score of 2 is a more significant weakness than a score of 3; an 8 indicates a more significant strength than a 7)

Remember, there are no right or wrong answers. I am just looking for your honest opinion.

1 2 3 4 5 6 7 8 9 10

WEAKNESS STRENGTH

A. Uniform terminology for identifying resources and organizational functions.
B. Resource mobilization effectiveness.
C. Modular organization structure that is expanded or contracted as needed.
D. Consistency of implementation among various agencies.
E. Communications plan that is coordinated among responding agencies.
F. Incident Action Plans that are updated for each operational period.
G. Agreement among agencies about who has authority to modify the ICS "rules of the game."
H. Manageable span-of-control.
I. Clear decision-making process.
J. Cross-jurisdictional and cross-functional working relationships when ICS is used.
K. Standardized forms used for all incidents.
L. Predefined hierarchy, including chain-of-command and delineated responsibilities for every position.
M. Ample flexibility and authority are given to staff for accomplishing incident objectives.
N. Process for transitioning command authority from one level of government to another as incident complexity changes.
O. Effectiveness of integrating non-fire government agencies (e.g., law enforcement, public works) into ICS structure.
P. Effectiveness of integrating non-government organizations (e.g., relief organizations, private citizens, and businesses) into ICS structure.

THANK YOU! Please feel free to add any comments below.

When you are finished, merely click the **REPLY** button on your email menu bar.

Note: If this was forwarded to you by someone other than Dana Cole, please send to: dana_cole@fire.ca.gov

(v. 1)