Final Report

Emergency Preparedness: Reports and Reflections of Local and County Emergency Managers

by

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This research document reports the findings of a questionnaire survey mailed to a nation-wide sample of local and county Emergency Management Officials (EMOs). The study is intended to provide input regarding similarities and differences among emergency management jurisdictions across the nation. Its broad focus provides detailed information on the current state of emergency and disaster procedures and preparedness programs in the face of natural, technological, and nuclear emergencies. Perceived levels of capabilities and resources, both capital and financial are also explored. Further, results suggest a gap between local concerns and needs, and the topsided view of the Federal government.

The rather lengthy instrument, designed in consultation with FEMA personnel, includes questions adopted from FEMA's Hazard Identification, Capability Assessment, and Multi-Year Development Plan (HICA-MYDP). As such, findings may be useful in both validation and comparison of relevant aspects of previous HICA-MYDP surveys, though this deeper analysis is not presented here. The current findings are presented in descriptive statistical

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analyses, and the instrument uses closed and open-ended questions, including rating scales.

Findings assess respondents' experiences in emergency response, emergency management problems, adoption and maintenance of procedures, techniques, and critical resources. These are based on explicit listings, and are drawn from HICA-MYDP documentation. Results suggest that patterns of adoptions of various procedures and techniques are driven by considerations other than those of problems. There is a relative infrequency of written agreements to procure critical resources, compared to less formal agreements with potential suppliers. And rank order correlations show negative relationships between reported shortfalls in resources and resource availability. A more detailed analysis of these interrelationships in resource management is called for.

This study provides summary analysis of reported jurisdictional capabilities including preparation and planning areas of emergency management, shelters and evacuation, warning procedures, and capabilities to deal with hazardous and radiological materials. Additional findings indicate that there is a tendency for those EMOs who claim that their jurisdictions are better prepared than comparable others to have experienced more disasters and to feel more threatened.

Overall, the majority of EMOs report inadequate capabilities for wartime needs, compared to peacetime needs. And most EMOs view attack preparedness as a worthwhile endeavor. Other findings in the area of nuclear concerns include the following: EMOs would support a combination of evacuation and in-place protection programs. EMOs assess chances of surviving a nuclear attack as "medium." Overall, the higher the perceived target danger of a jurisdiction, the lower the survivability estimate.

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I. INTRODUCTION

The findings presented here are based on responses of 2345 local and county level Emergency Management Officials (EMOs hereafter) to a mail-out questionnaire. The instrument was designed, in consultation with FEDERAL EMERGENCY MANAGEMENT AGENCY personnel (FEMA hereafter), by the researchers, mailed to a nationwide sample of EMOs by FEMA and returned, upon completion, directly to the University Center for Social and Urban Research of the University of Pittsburgh for processing and analysis.

A copy of the questionnaire is provided as Appendix A while Appendix B contains information about the national sample of EMOs to whom, through their State Directors, the questionnaires were specifically sent.

The questionnaire, admittedly a rather lengthy one, contains a great many questions of fact regarding local/county emergency preparedness and response capabilities and it also sought to ascertain some important opinions and viewpoints of the responding EMOs. It focuses on both natural and technological hazards, but it does not neglect, indeed it also emphasizes, issues associated with attack preparedness programs. Facts in this context have to do with claims of the respondents and they rather self-evidently differ from questions pertaining to perceptions, opinions, viewpoints in that they are altogether verifiable by independent observation or other forms of appropriate ascertainment. In turn, perceptions and viewpoints represent expressions of sentiment or attitude that characterizes the particular respondent and thus no independent assessment can shed further light on such responses and their patterns. But the importance and relevance of such subjective judgments, their centrality in the ways in which people construct reality, cannot be really overemphasized. While hardly anyone

would claim that attitudes and opinions translate themselves into specific actions and forms of behavior in some simplistic manner, no one should question the fact that the subjective evaluations in the form of perceptions, opinions, sentiments, viewpoints and attitudes are among the key determinants of actions and thus directly influence, and significantly so, what one does, when and how and why.

The main objectives of the research are straightforward enough: to help to determine the state of emergency preparedness in face of the host of potential hazards that may, and do, threaten and impact our communities; and to establish how the central players, the EMOs, look at salient issues and problems associated with their difficult, and certainly unenviable, assignments. This report provides only basic findings of the inquiry and it lacks, therefore, the kind of analytic insights which can be obtained by more sophisticated analytic approaches, a matter to which subsequent papers will be devoted. There are then several major uses to which these kinds of findings can, and should, be put:

1. For FEMA, the data provide an opportunity to validate some key aspects of FEMA's own Hazard Identification, Capability Assessment, and Multi Year Development Plan information system (HICA-MYDP hereafter) which, in turn, was one of the reasons why this study was undertaken. Thus many questions in the instrument were simply adopted from the prior, 1985, HICA-MYDP instruments. This dimension of validation has, perhaps, two somewhat different aspects though without data from the FEMA studies of the antecedent years, this particular report cannot address them directly as yet. For one, it has to do with the degree to which prior reports map accurately onto the reports (on identical items) acquired in this inquiry. And second, it pertains to the possibility of understanding and interpreting changes in capabilities (or, for that matter, shortfalls) that may have occurred at the local/county levels since the previous HICA-MYDP responses.

2. For FEMA, the study also provides an opportunity to consider both similarities and differences across the nation, and thus be sensitive to their implications, especially with regard to the good number of questions in the instrument which were not part of the HICA-MYDP data collection system, and which, therefore, yield new insights into the problems and thinking of EMOs at the local/county levels, in the actual trenches where hazards have to be coped with. There has existed an important communications gap which generally translates itself into a credibility gap between the local concerns and needs and the Federal Government's topside view, seemed unresponsive to the special characteristics of the heterogenous regions and communities of the nation. This is in no way a problem limited somehow to FEMA and the emergency management domain but it does apply to by far most Federal agencies and programs. Whether these perspectives from out there across the country are justified or not justified by some objective standard may not be easy to determine: but the perception of Washington's misunderstanding of more local concerns and problems exists and is very intense and it exists in the emergency management community as well. The findings of the research, to the extent to which they can sensitize FEMA to the heterogeneity as well as clustering of more local (and as far as local conditions are concerned, generally more knowledgeable) sense of reality, could serve as an important vehicle toward decreasing the distance between Washington and this or that municipality or county, a feeling which is so strongly held and which has been so widespread.

3. The findings, too, may serve as a useful input into FEMA's budget justification and development process in reflecting the extant and varied capabilities, problems and shortfalls across the nation.

4. For local and county EMOs, the results may well be used as a kind of national benchmark against which the capabilities, preparedness levels and programs as well as opinions and attitudes can be surmised.

5. Along these lines, such findings shared among the community of EMOs can provide worthwhile inputs in the process of explaining local and county needs, capabilities and problems to elected local and county officials in light of comparisons with other local and county programs around the country.

6. The data may be, in turn, of value to local and county government officials in their consideration of the emergency management system's needs as such and in comparison with the national patterns of preparedness, problems and attitudes.

7. Indeed, the findings could prove a significant asset in better informing and educating the general public about the difficult tasks of the emergency management organizations and personnel and may lead to a better public and media understanding of both capabilities and shortfalls, thus to enhance public and media awareness.

8. Finally, it goes without saying that the results could prove of some value as an input for the United States Congress as well as the legislatures of the respective States in their consideration of emergency management programs, in their decisions regarding appropriations for emergency management and the allocation of admittedly very scarce financial resources for most relevant and promising programs and efforts.

II. A BRIEF PROFILE OF THE EMOs

The questionnaires, having been mailed by FEMA and to a sampling of nationwide EMOs selected by FEMA, indicate that some 89 different position identifications were used in the addresses to those who, 2345 of them, eventually responded by sending their completed questionnaires to the University of Pittsburgh researchers. Table 1 shows how the EMOs themselves identified their position(s).

Table 1
POSITIONS OF THE RESPONDING EMOs

	Percent	
	Position 1	Position 2
CD-EM Director	56.1	0.1
Fire chief	18.2	5.3
Police chief	5.6	1.3
EMS director	2.9	1.9
Public health director	1.1	22.9
Public works director	0.1	0.2
Water-sanitation director	0.1	0.1
Other	15.4	2.6
Response missing	0.6	65.6

The results show that some two thirds of the respondents (65.6 percent) identified only one position they hold (and, of course, a few, 0.6 percent did not refer to their primary position either), but many EMOs appear to have at least two types of responsibilities and assignments. In the taxonomy into which the data were coded (though the researchers a[illegible] retained, in the data file, the specific position identification in terms of the mailing list), so[illegible]e 15.[illegible] percent of the respondents fell into the "other" (positions otherwise

identified) category when reporting their primary job title. This, of course, included many respondents in the roster of some 89 descriptors that were used in the addresses by FEMA - deputy coordinators, directors/deputy directors of ambulance services, city managers, a sprinkling of mayors and the like. For the purposes of this basic presentation of findings, the respondents are not differentiated by their positions though the reader must understand that the category of "other" is quite a heterogeneous one.

By far most, 88.1 percent, of these EMOs are salaried, though 11.0 percent are not. As is shown in Table 2 the county represents the appropriate jurisdictional area for 40.0 percent of them, a city (35.9 percent) or borough or township (10.6 percent) are other self-defined jurisdictional domains. A few respondents, some 5.0 percent of them, had responsibilities across several counties and they appear, in the tabulation, in the "other" designation.

Table 2

JURISDICTIONAL AREAS OF THE EMOs

	Percent
County	40.0
City	35.9
Township/borough	10.6
City and county	7.9
Other	5.0
Jurisdiction not identified	0.5

The median years of service in the emergency management system comes to some 5 1/2 years - but the modal category, the most frequent response, shows service length in excess of 10 years (26.2 percent). The emergency management community

also "renews" itself, there being some 23.1 percent of the respondents with less than two years of experience on the job - 10.1 percent actually having entered the EMO ranks in the prior 12 months only.

As the data of Table 3 show, the bulk of the EMOs represents people in the 35-50 years of age group (45.0 percent) and those who are 50 to 64 years old (34.6 percent). The oldest EMO was born in 1897 and this would make him just about 92 years old in 1989. In turn, the youngest respondent was born in 1966. The median age is about 49 based on responses of those who did identify their birth year: 4.6 percent preferred not to indicate their age.

Table 3

AGE DISTRIBUTION OF THE EMOs

	Percent
Less than 35	8.4
35 but less than 50	45.0
50 but less than 65	34.6
65 or older	7.3
Age not indicated	4.6

While 1.1 percent of the EMOs did not reveal their "highest educational attainment" (as the item was phrased), the study shows that the emergency managers have a great deal of formal education. Indeed, 76.3 percent of them have had at least some college education and 42.6 percent actually completed college or studied at the graduate level as well.

Some 41.1 percent of these EMOs saw service in the nation's Armed Forces. In turn, 22.4 percent of the sample, and 38.7 percent of those who served in the Armed

Forces also reported combat experience. The data of Table 4 provide a crude idea as to the times in the country's recent history when the EMOs were serving in the Armed Forces. Of course, in its (current) form, the table masks service experiences across the various periods, such as in WW II, thereafter, and again in the Korean conflict and so on. The data, of course, permit a detailed analysis along such lines but for the purposes of this overview report this level of detail is not needed since no comparisons will be made, in this paper, between those with military experience and those without it or those with combat experience and others.

Table 4

ARMED FORCES EXPERIENCE OF THE EMOs

	Percent
World War II	12.3
Between WW II and Korea	4.7
Korean war	14.2
Between Korean and Vietnam wars	18.8
Vietnam war	24.7
Post-Vietnam period	6.7

Data on possible service in the National Guard or in the Reserves were, perhaps unfortunately, not sought. What emerges then is a portrait of the EMO as a rather very well educated, mature adult with considerable military, and even combat, experience, who has been, on balance, involved in emergency management efforts for about half a decade and, quite often, has been dealing with thankless tasks associated with disaster preparedness, prevention and mitigation for more than a decade.

III. EMERGENCY MANAGEMENT GOALS

The EMOs were asked to rate the relative importance of nine objectives of emergency management programs. The rating scale ran from 0 ("not important at all") to 5 ("extremely important"). It should be clear that the respondents reacted to the statements of objectives as these were stated and as they, themselves, interpreted them and imbued them with more specific meanings. The study, therefore, does not show how the EMOs themselves might have verbalized the key cluster of emergency management goals had they been given the opportunity.

It is unfortunate that in mail-out surveys such an open-ended probe which would have achieved this end is generally not advisable because many respondents tend to look through the instrument before they begin completing it, and any subsequent questions pertaining to the domain of an open-ended probe are likely to affect the response anyway.

Table 5 sums up the results in the form of an importance index. The index is constructed by a simple linear conversion of the rating scale (0 to 5) onto a scale with limits of 0 and 100. This was done by assigning the respective values of 0, 20, 40, 60, 80 and 100 to the 0 to 5 ratings. Thus an index value of zero (0) would be obtained if all respondents had considered a given goal as being "not important at all," and a value of 100 would mean that all agreed that the goal was "extremely important."

Table 5

IMPORTANCE INDICES OF EM GOALS

	Importance Index
Providing information so people can help themselves respond to emergencies	92.4
Providing protection in case of natural disasters	92.0
Assistance to communities hit by disasters	91.7
Warning the public of impending danger	91.4
Protection in case of technological hazards	90.9
Evaluating community disaster plans	87.6
Protection in case of nuclear war	64.0
Protection in case of conventional war	63.5
Contributing to the prevention of nuclear war	57.8

The data in the table show that six of the stated goals were actually considered to be extremely important by the EMOs. Less important, though important enough, appeared to be the concerns over nuclear or conventional war preparedness programs, and the possible deterrent implications of attack preparedness were, indeed, seen as the least crucial objective of emergency management.

Such basic results cannot come as a surprise. Natural and technological hazards are faced by the nation's communities much more frequently and have, therefore, also higher subjective probabilities of reoccurrence than would, at this time, be the likelihood of a nuclear conflict or of a conventional war in which the people of the United States

would be in need of protection. The fact that a nuclear confrontation remains possible, highly improbable though it seems, and its devastating consequences are just about unimaginable so that it entails an enormous disutility (when the likelihood is multiplied by the value, in this instance, the incredibly high negative value) does not alter the greater saliency and relevance of peacetime hazards to EMOs around the country.

In any event, the EMOs perceive a robust interaction between peacetime emergency management capabilities and attack preparedness measures. Indeed, 80.3 percent of them, as is shown in Table 6 believe that programs to deal with peacetime hazards would "probably" or "definitely" help in dealing with a nuclear attack as well, and 75.5 percent see the reverse to hold: programs of attack preparedness would "probably" or "definitely" help in handling peacetime disasters.

Table 6

INTERACTION BETWEEN PEACETIME AND ATTACK PREPAREDNESS PROGRAMS

	Peacetime to wartime	Attack to peacetime
Would definitely help	44.6	30.9
Would probably help	35.7	44.6
Unsure	8.0	8.1
Would probably not help	8.1	12.7
Would definitely not help	2.8	3.1

In no way do the data suggest, or any other data in the inquiry, that the EMOs would simply see a potential nuclear conflict as "just another," if perhaps bigger, disaster. Rather, the results indicate an understanding that many emergency management functions have direct applicability to catastrophic events of whatever kind, and that the

development of capabilities and preparedness programs has an important payoff regardless of the specific character of the hazard. This is, even within the constraints of the data generated in this study, certainly so with respect to the need to be able to inform people how they might best protect themselves, to be able to warn the public of an impending danger and to develop programs to help people in face of a disaster to minimize loss of life, the number and severity of injuries, hazards to health, destruction and damage to property, and degradation of the environment.

In all then,

1. All the goals identified explicitly in the questionnaire were considered as important objectives of emergency management.

2. Objectives having to do with peacetime hazards were seen generally as more important than goals having to do with attack preparedness efforts, whether in relation to nuclear or conventional warfare, and they appeared more important than any possible contribution attack preparedness against nuclear insult might make to make war less likely or, in fact, to preventing it from ever happening.

3. But the EMOs perceive highly significant linkages between peacetime and attack preparedness and while they place, not surprisingly given their primary local or county responsibilities, more emphasis on peacetime hazard management programs, they clearly consider peacetime and attack preparedness efforts as being mutually supportive of each other and in no way at odds with one another.

IV. MAJOR PROBLEMS, SOME APPROACHES TO SOLUTIONS

In Question 35, the EMOs were asked to identify some of the generic problems they may have experienced in the course of an emergency. Fifteen of the most chronic difficulties were explicitly listed by the researchers. The responses range from a low of 14.7 percent (lack of emergency housing) to the high of 55.0 percent (lack of equipment). In Table 7, the basic data are provided across this spectrum of problems.

Table 7

MAJOR EMERGENCY MANAGEMENT PROBLEMS

	Percent
Lack of equipment	55.0
Lack of personnel (numbers,skills)	49.7
Public utilities knocked out	43.0
Warning system failures,limitations	42.3
Public calls jammed communication links	41.4
Lack of emergency finances	36.3
Problems with the media	34.1
Lack of critical information	33.7
Identifying who is in charge	33.2
Unavailability of communications links	33.0
Public failure to respond to warning	30.0
Coordination breakdown	28.3
Problems with volunteers	26.5
Lack of shelters	17.7
Lack of temporary housing	14.7

If media accounts regarding emergency operations under disaster conditions are taken seriously, the conclusion seems inescapable that by far most disasters have been handled well, if not actually very well. That the knowledgeables within the emergency

management community identify, with quite significant percentages, major problems connected with their attempts at coping with emergencies, suggests, of course, that in the absence of such problems their efforts would be further facilitated and enhanced.

No analysis here is attempted to show in full extent how the different problems interact with each other. Nonetheless, it is quite useful to consider the basis pattern of problem identification, that is, the numbers of problems the respondents cited, and to look at some of the ways in which problem identifications interact. A problem index was generated with a range of values from 0 to 15. The index would have a value of 0 for those EMOs who mentioned none of the problems, and it would have a value of 15 had they mentioned all of them. Thus the measure is a simple sum of positive responses (yes, I did experience a particular problem) across the roster. No weights are, or can be, applied to the respective problem though it must be realized that the problem index implicitly assigns the same weight to each one of them whereas in a real sense they certainly do not all present the same difficulties in the emergency management operations. Table 8 contains the distribution of responses for the problem index.

Thus only a few of the EMOs, 4.5 percent, claimed to have experienced none of the problems and relatively few as well, some 10 percent of them, identified 10 or more of the problems. On the average, 5.1 problems were cited by the respondents, certainly enough to be quite worrisome. A comparison of those who experienced none or few of the problems and those who reported many of them would be clearly worthwhile but it lies beyond the scope of this more basic paper.

Table 8

PROBLEM INDEX DATA

Problem index	Percent
15	1.1
14	0.7
13	0.9
12	1.7
11	2.2
10	3.4
9	4.6
8	6.4
7	7.7
6	10.7
5	13.7
4	13.9
3	13.0
2	9.7
1	6.4
0	4.5

When but one problem was cited (Problem index score = 1), more often than others, it referred to public utility outages (14.0 percent of the 6.4 percent with this score), to equipment shortages (12.7 percent), or to lack of personnel (12.0 percent). With an index score of 2 (two problems having been cited), lack of equipment and of personnel tend to be the most likely references (31.7 and 28.2 percent respectively), as do utility outages (19.8 percent) and problems associated with "jammed communications lines" (19.8 percent as well). The same problems form the central pattern for all higher index scores. that is, these are the issues most often mentioned whether or not but a few or many problems are identified by the EMOs. Thus with the score of 5 (five problems identifie

personnel and equipment shortages, utility outages, jammed communication lines tend to be most often referred to and, in this pattern, so do problems driven by a real or perceived lack of finances and warning system failures or malfunctions.

As the respondents identify many problems (the index scores become quite high), the least likely references have to do with lack of sheltering facilities, lack of temporary housing, and the public's response to warnings. Thus, for example, a majority of the EMOs mention lack of shelters as a problem only when the index reaches of value of 14 (of possible maximum of 15), thus indicating that this problem tends to be referred to only after 13 of the other problems will have been cited. And lack of temporary housing, in the way of yet another example, exceeds a majority response only after 11 other problems would be typically identified. A factor analytic routine (with varimax rotation) yields four major factors into which the problem identification items cluster.

Factor I may well be seen as an Organizational Problem Factor. The items with highest loadings (above .4) include:

* Identifying who is in charge (loading of .794)
* Problems in activities/operations coordination (.784)
* Unavailability of communications links (.500)

The second factor might be viewed as an Impact Problem Factor:

* Jammed communications lines (.678)
* Utility outages (.618)
* Public response to warning (.590)
* Problems with the media (.550)
* Lack of critical information (.407)

Perhaps a more fortuitous term than Impact Problem Factor is applicable to this Factor II. But there seems to be strong suggestion here that these are the kinds of problems which tend to be especially vexing in the immediate aftermath of a disaster rather than presenting major difficulties in the warning phase.

Factor III has to do, in a rather generic sense, with Operations Problems:

* Lack of equipment (.797)

* Lack of personnel (.690)

* Warning system malfunctions and failures (.420)

* Lack of finances (.417)

The last factor, Factor IV, is driven by Public Protection Problems:

* Lack of temporary housing (.803)

* Lack of public shelters (.792)

* Lack of finances (.471)

A further look at the date of Table 7 will immediately indicate that Factors II and III. contain the most frequently mentioned problems, while items with high correlations with (loadings on) Factors I and IV are among problems cited by relatively fewer respondents, and the data on the patterns of the Problem Index lead to the same conclusion.

Thirteen questions (Questions 68 through 80) addressed some basic procedures and approaches which the EMOs may have adopted. Many of these provide partial possible solutions to some of the problems that were identified as plaguing eergency management activities. These items, in turn, have their origin in the HICA-MYDP questionnaires.The respondents were asked to say whether they adopted the particular procedures and techniques and, having adopted them, maintained them, whether they,

perhaps, adopted but not maintained them, or not adopted them at all. Since the questions may not have been applicable for all respondents in that they did not relate to their kind of work or scope of responsibilities, a provision was made for such respondents to so state.

The data of Table 9 reveal sharp differences in the adoption and maintenance of some of these practices. In fact, 76.3 percent of the EMOs adopted and maintained procedures to coordinate with hospitals and ambulances the reception and distribution of casualties while only 18.4 percent "trained citizen members of Block Watch or other neighborhood-based groups for emergency self-help." The differences in the adoption rates are most probably driven both by perceived needs and opportunities, but the study contains no data on the basis of which it would be possible to determine the reasons behind the variable adoption rates.

The data, across each row, do not add up to 100 percent. The complement, the information explicitly not shown, has to do with respondents who reported that the particular technique or procedure was not applicable to their work.

Table 9

ADOPTION OF SOME PREPAREDNESS TECHNIQUES

	Adopted Maintain	Adopted Not Maint.	Not adopted
Procedures with hospital and ambulance managers for coordinating reception of casualties in a major emergency	76.3	9.7	9.2
A system designating staff who will provide needed command post services in a multi-agency response	73.7	11.1	12.1
Location and staff responsible for a "media information center"	67.8	14.7	14.3
Designated voluntary groups or agency responsible for housing evacuees	66.4	10.3	16.0
Agreements with RACES or other radio amateurs	58.4	14.6	21.5
Developed methods and staff trained to make evacuation warnings (other than sirens)	54.1	15.6	25.0
Designated vehicles and drivers to carry transit-dependent or mobility impaired persons	51.0	14.7	28.1
Open purchase orders or other ways to make and document needed emergency expenditures	46.4	10.8	35.7

Communication links to a major radio/TV station	43.7	7.7	43.7
Designated, trained staff to organize untrained volunteers	28.7	18.2	47.5
Established equipment rate and use agreements with contractors/industry	25.3	14.3	49.0
Install rotary phone connections and set up staff procedures to operate a citizen emergency phone bank (other than 911)	25.0	6.6	60.0
Trained citizen members of Block Watch or other neighborhood based group for emergency self-help	18.4	10.9	58.7

Somewhat paralleling the Problem index, an Adoption index was generated with a possible range of values between 0 and 13. The index would be 0 for those EMOs who did not adopt and maintain any of the techniques about which they were explicitly asked, and the index value would, of course, be 13 for those who adopted and maintained all the procedures and techniques about which they were asked. On the average, the EMOs reported having adopted and maintained 6 practices,1 reported 13 practices, though 5.2 percent of them did not adopt and maintain any one of them. In turn, 18.5 percent of the EMOs adopted and maintained at least 10 of the techniques.

Table 10

ADOPTION INDEX

Adoption Index	Percent
13	1.0
12	3.5
11	6.1
10	8.1
9	10.8
8	11.0
7	11.3
6	10.9
5	7.4
4	7.1
3	6.4
2	6.1
1	5.1
0	5.2

Further analysis, also not reported in this more basic document, will shed light on the similarities and differences between those who adopted none or few of the techniques and those who adopted and maintained many of them as well as on the pattern of having adopted some of the approaches though not others, and for having not maintained some of the techniques even though they had been previously adopted.

When only one of the techniques is adopted and maintained (Index score=1, characterizing 5.1 percent of the respondents), it te ds to be predominantly some appropriate arrangement and linkage with hospital and ambulance services (41.0 percent of those with the Adoption Index score=1). With two adoptions, this techniques is most often coupled with the establishment of some "media information center" or with the development of agreements with RACES, CB or other radio amateurs And an Index

score of 3 (three techniques adopted and maintained) represents most generally the prior items (mentioned above with "lower" scores) along with the practice of designating some voluntary group to be responsible for citizen housing and designating staff to provide needed command services in multi-agency response operations.

Approaches least likely to have been adopted and maintained - those which tend to be adopted only after many other techniques include:

* Establishing rotary phone connections and staff procedures to operate a citizen emergency information phone bank - a practice which is adopted by a majority of EMOs only after 9 of the other 13 techniques are adopted.

* Training of citizen groups (Block Watch or other neighborhood-based groups) in emergency self-help: a majority adopts this approach only after 10 of the techniques will have been adopted.

* Designating a staff member to be responsible for organizing untrained volunteers - also adopted by a majority only given the adoption of 9 of the other techniques.

A more detailed study of Table 9 does suggest that some of the practices and techniques have a bearing on the problems which the EMOs identified. For example, agreements with RACES or radio amateurs, protected phone line links or dedicated channels to a major radio or TV station facilitates the dissemination of information, including warning information, to the general public and thereby decreases the problem experienced with warning systems failure as well as, perhaps, enhancing appropriate public response to an emergency. The establishment of a public emergency phone data bank may well decrease the well documented severity of problems associated with the saturation of communications links due to calls from anxious citizenry. The setting up of a "media information center" is one of the more effective ways to minimize, if not avoid, problems with the media. The establishment of procedures and the designation of staff

members to provide command post services in a multi-agency disaster response can go, at least, some way toward alleviating problems having to do with coordination breakdowns and with determining who "is in charge." Designating and training some staff member(s) to help organize efforts of citizen volunteers who show up with the intent to help can certainly decrease problems with volunteers which the EMOs reported.

Thus one might reasonably expect that problems and approaches which promise some solution should be related to each other: either in the sense that experiences with problems would serve as an inducement to adopt and maintain techniques and procedures which could alleviate the problems, or in the sense that the adoption and maintenance of some of the management techniques would lead to fewer problem experiences. The cause-effect relationship might run either way and it cannot be ex ante surmised whether problems lead to solutions (the more problems the higher the adoption/maintenance rate) or whether adoption/maintenance of certain techniques leads to fewer reports of problems (the greater the adoption the fewer the problems experienced). It turns out, however, that there is an essentially zero correlation (actually it amounts to $r = -.014$!) between the Problem and Adoption indices. One may conclude that this suggests that the adoption/maintenance of techniques pattern has been driven by considerations other than those of problems which the EMOs experience in their emergency activities.

No further analysis is carried out here of the rather important problems which concern techniques and practices which the EMOs claim to have adopted at some time but have not maintained. The issue, perhaps, merits special consideration for which a summary paper does not represent the most suitable vehicle.