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# FIRE SERVICE INVOLVEMENT
# in
# DISASTER SHELTER INSPECTION

Final Report

for

Federal Emergency Management Agency, Washington, D.C. 20472

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FEMA Award Number EMW-C-0743

FEMA Work Unit Number 6141A

April 1985

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by

Lee M. Feldstein

for

Federal Emergency Management Agency, Washington, D.C. 20472

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The report assesses expansion of the fire service role in disaster shelter inspection. Three alternate levels of fire service involvement are identified. Each represents progressively greater levels of effort, differing by degrees of specialization, time and organizational requirements. They are ~~as follows:~~

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- (1) providing basic information on shelter identification and suitability, and procedures for updating this information;
- (2) inspecting potential shelters for suitability as host area shelters (Congregate Care Facilities); and
- (3) inspecting shelters for their ability to provide adequate blast, fire and radiation protection.

In addition, fire service involvement in shelter inspection is examined with reference to:

- (1) compatibility with FEMA's needs and requirements;
- (2) fire department organization and operations; and
- (3) costs to FEMA and the participating fire department implementing these activities.

The general conclusion is that, properly supported by training, coordination, and administration, the fire service can enhance FEMA's ability to develop and maintain a nationwide shelter system.

## ABSTRACT

"Fire Service Involvement in Disaster Shelter Inspection" assesses the feasibility of expanding fire service activities to assist the Federal Emergency Management Agency (FEMA) in identifying shelters to be used in a disaster.

Three alternate levels of fire service involvement in disaster shelter inspection were formulated and evaluated by the following criteria:

- o compatibility with FEMA's needs and requirements;
- o fire department organization and operations; and,
- o costs to FEMA and the participating fire department implementing these activities.

The three alternatives identified represent progressive levels of effort, differing by degrees of specialization, time and organizational requirements. The alternate levels of involvement were:

- o providing elementary information to identifying potential shelters and to determine the continued suitability by updating this information;
- o inspecting potential shelters for their suitability as host area shelters, or, as FEMA refers to them, Congregate Care Facilities; and,

o inspecting shelters for their ability to provide adequate blast, fire and radiation protection.

Fire departments from metropolitan, urban, suburban and rural communities were surveyed to determine whether the fire service conducts any of these activities. The survey examined the technical and organizational technical considerations associated with the proposed activities, and did not review specific costs.

The general conclusion from the fire department survey was that most departments could become involved in initially identifying candidate disaster shelters and keeping the information on their suitability current. Many department's could conduct also congregate care facility inspections, however, they would require more personnel and administrative capability, and conseqently, this task might strain the resources of some departments, especially, those staffed by volunteers. Fire department inspections of shelters for blast and fire protection was not considered feasible.

Involving the fire service in disaster shelter inspection, at even the lowest level of effort, could expand FEMA's ability to develop and maintain a nationwide shelter system. The costs to FEMA would be essentially for administration, coordination, and training, as well as for any incentives FEMA might choose to provide to participating fire departments. The study did not consider the relative costs - effectiveness of programs.

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## EXECUTIVE SUMMARY

The International Association of Fire Chiefs (IAFC), under contract with the Federal Emergency Management Agency (FEMA), conducted a study to assess the feasibility of the fire service assisting FEMA in its disaster shelter identification program. FEMA wanted to know whether fire department resources and capabilities could be integrated cost-effectively with FEMA's program activities in this important area of emergency management.

Providing shelter to lodge, feed and protect people against the effects of natural and technological hazards as well as nuclear attack, is one of the key components of an emergency management plan. FEMA is developing a data base of available disaster shelters.

The data collection effort consists of identifying two different types of shelters. The National Shelter Survey (NSS) concentrates on in-place protection. It seeks to identify shelters in high risk areas that will shield people who are unwilling to evacuate, key workers providing essential services or, if circumstances do not permit time for evacuation, the residing population. Crisis Relocation Planning (CRP) involves evacuating people to areas of refuge for the duration of the crisis. FEMA has set goals of identifying 1.5 million shelters in host areas and 400,000 in risk areas. As of early 1982, 900,000 shelters have been located in host areas and 100,000 in risk areas.

The task FEMA has set forth for itself is large. State and local civil defense organizations may be able to help, but generally they lack the resources, personnel and capability to assume this additional responsibility without additional funding. The police and the military, including the national guard, may have the requisite personnel and skills, but their existing commitments limit their involvement. Such private organizations as the American Red Cross provide many disasterrelated services, but whether they could even initiate data collection activities on the required scope is in doubt.

The fire service offers an alternative source of assistance. Since it is engaged in related activities, the fire service has the personnel, the access, and, generally, the appropriate training. Many fire departments are involved in such activities as code enforcement and pre-fire planning; they inspect many buildings that FEMA would consider candidates for disaster shelters. Also, the fire service has already an historic and pivotal role in emergency management. Aiding in the development of these data bases on local disaster shelters extends this role, giving the fire service more responsibility and greater access to the tools necessary to manage a major emergency.

## A ROLE FOR THE FIRE SERVICE

The fire service has traditionally been among the first emergency forces to respond to a disaster, whether it be a fire or medical emergency or such non-traditional emergencies as a hazardous materials release, a radiological incident, or a flood

The fire service has assumed this role because it is organized and trained to respond quickly to any emergency and initiate activities to contain and resolve the incident.

Emergency response is only one aspect of the fire service's role in emergency management. Indeed, it is a key component in achieving Comprehensive Emergency Management (CEM) at the community level and, appropriately, is involved in all four phases of emergency activity: mitigation, preparedness, response and recovery.

For example, the fire service is involved in mitigation by developing and enforcing building codes, in preparedness by conducting disaster drills, in response by conducting assessment, and in recovery by disaster documentation.

FEMA is developing a new strategy for achieving CEM called the Integrated Emergency Management System (IEMS), and it is summarized in Figure 1. The concept is based on existing techniques and approaches on emergency management, such as the FIRESCOPE model developed initially for managing wildland fires in California.

The IEMS strategy focuses on developing an all-risk plan that spans all types of emergencies. The essence of this generic all-risk approach is to prepare functionally, that is, to plan around such tasks as direction and control, coordination, hazard assessment, warning, and evacuation and sheltering.

The effective implementation of the IEMS concept is heavily dependent upon the capabilities of community fire departments. They often share key disaster management responsibilities, and are often the primary actor in a disaster.

## Intergrated Emergency Management Concept Summary

Purpose:

To develop generic plans and emergency capabilities that reflect common functions across multi-hazards for mitigation, preparedness, response and recovery from natural, technological, and attack-related hazards.

Objective:

- o Save lives and protect property threatened by hazards.
- o Reduce duplication of efforts and resources.
- o Increase jurisdictions' flexibility in upgrading their capability to handle potential hazards.
- o Provide a greater degree of credibility and practical application to states and locales in their emergency systems.
- o Integrate federal emergency management objectives and support with state and local emergency operational requirements to enhance overall preparedness for all hazards.

Capability Development Process:

- o Prepare hazard vulnerability analysis.
- o Assess existing capabilities versus standards.
- o Develop multi-year plan for addressing capability deficiencies.
- o Prepare generic plan for all hazards.
- o Prepare contingency plan for unique features of specific hazards.
- o Acquire and maintain capability.
- o Evaluate, train, exercise and update plans, facilities and personnel.

Source: Federal Emergency Management Agency

## ALTERNATIVE LEVELS OF FIRE DEPARTMENT INVOLVEMENT

Based on a literature review, interviews with FEMA personnel engaged in shelter management, and fire chiefs, there appear to be two alternative activities in which the fire department could become involved. The activities represent a progressive level of effort, distinguished by degrees of specialization, time requirements, and commitment.

1. Initial identification of Candidate Shelters and Updating of Information. This task essentially involves the inspection of a building to determine its qualification as a candidate NSS/CRP shelter, and subsequent referral of this information to FEMA. The fire department could re-inspect the building to determine whether it is still suitable as a shelter.

The data required for this task could be acquired from a quick review of the building plan and code enforcement records, or from an inspection of the building. Time involved to collect the data would be minimal, and very little prerequisite training or experience would be needed by the data collectors.

Assistance on this level could aid FEMA in both its shelter identification and maintenance activities. FEMA could be provided with a listing of candidate structures for shelters in both risk and host areas within those communities not already

surveyed. For previously surveyed communities, the fire service could provide referral for inspection of any new construction as well as update information on existing shelters.

These tasks would enable FEMA to reallocate resources for more specialized activities. FEMA could reduce its efforts to locate candidate shelters, and many shelter re-inspections could be done on an "as needed" basis instead of repeating the intial surveying effort. This alternative would apply for both NSS and CRP shelters.

2. CRP Shelter Inspection. This task involves collecting basic information to determine whether a structure qualifies as a host area shelter or a Congregate Care Facility, the term given them by FEMA.

The criteria for host area shelters do not emphasize blast and fire protection because its primary purpose is to house the evacuated population; only moderate fallout protection must be provided, and this can be accomplished by merely upgrading the structure during the pre-attack period.

Personnel conducting this inspection must be familiar with building structures, but their knowledge need not be extensive. Most of the FEMA personnel interviewed agreed that almost anyone could be trained. An inspection would take approximately 40 minutes and include such elements as whether a building has a

minimum of 400 square feet available, whether it has a basement, dining facilities, a bed, and what type of roof it has. While it is necessary to assess whether the building can be upgraded for additional fallout protection, this determination does not involve any special skills.

CRP host shelter inspection by the fire service would essentially relieve FEMA of inspecting congregate care facilities in many areas, although FEMA personnel would still be needed for supervision. However, this alternative would be useful only in host areas, because many structures suitable for congregate care facilities in risk areas are probably candidates for NSS shelters as well.

This assistance would replace many of the part-time student shelter technicians with fire department personnel, at least, in their basic data collection role for congregate care facilities. This would allow the technicians and supervisory staff to devote more of their time to specialized tasks.

## ASSESSING FIRE DEPARTMENT CAPABILITY

Two questions must be answered to determine the feasibility of fire service implementation of any of the alternative levels of involvement. First, can the fire service integrate disaster shelter data collection with their other, on-going activities?

This question is important because FEMA requires that its data be collected accurately community-wide, and that all changes in the suitability of existing technical and organizational base capable of executing these tasks The following points need to be considered:

- o Logistics - Does the fire department have the organizational and the logistic capabilities to inspect the community's buildings?

- o Personnel - Does it have the necessary trained personnel for the tasks required? Do they have the experience and training necessary?

- o Record Keeping - Does the fire department have a system capable of cataloging and processing the information? Is the system compatible with FEMA's? Are existing fire department records useful to FEMA?

- o Management - Can the fire department supervise the data collection effort and maintain quality control as well as analyze or package the information for transferring to FEMA?

Also, what costs will the fire department incur from implementing these additional activities? Will additional resources be needed? Estimates on costs are essential for assessing constraints and requirements as well as for developing options for fire service involvement.

## ASSESSING FEASIBILITY OF ALTERNATIVE INVOLVEMENT LEVELS

There is considerable variability among fire departments. The degree of involvement in either task will depend on local conditions, the type of fire department (whether volunteer, career or combination), and on the range of its pre-fire planning and code enforcement programs. In order to draw some inferences on the range of variability as well as the similarities among the departments, 19 fire chiefs were surveyed on whether their department conducted these activities, and if so, how they were organized. The selected fire departments were grouped into the following categories:

| | |
|---|---|
| o Metro | over 250,000 population |
| o Urban | 100 - 250,000 population |
| o Suburban/Ring of SMSA | 10 - 100,000 population |
| o Rural | under 10,000 population |

The general conclusion from the fire chief survey is that most departments could become involved in initially identifying the disaster shelters and keeping the information current. It would, however, strain the resources of some departments, especially those that are fully volunteer. Conducting CRP shelter inspections requires more data processing capability and more skilled personnel. This task would overload many departments, especially, the smaller, volunteer ones, but many other departments could handle it given minor assistance.

Implementing either Alternative 1, Initial Identification and Updating, or Alternative 2, CRP Shelter Inspection can be divided into data collection and information processing phases. The data collection phase involves conducting and managing the inspections. Information processing involves the entering, storing, analysis and reporting of data. The ability to perform each phase depends on two criteria: available personnel and technical capability. The key concerns are whether the work can be integrated into the department's operational structure, and without requiring burdensome, additional costs. It appears that:

- o Nearly all departments can collect data for Alternative 1. The additional skills that are necessary to conduct Alternative 1 would be minimal, as would the time to conduct the inspections.

- o Alternative 2 would put additional strain on the personnel requirements of most departments. Rural volunteer departments would be affected most. While the skills and time involved for Alternative 2 are only slightly greater than Alternative 1, it still is sufficient to tax their capabilities.

- o Another factor is whether fire departments have sufficient ability to manage the program. Management includes a variety of responsibilities; such as ensuring quality control for data collection and reporting to FEMA or local civil defense agencies. While Alternative 2 requires more

data processing capability and the availability of more skilled personnel than Alternative 1, the management requirements for both alternatives are similar at least, to the extent that these costs for Alternative 2 are not that much greater than for Alternative 1.

- Any supervisory and analytical work done for implementing Alternative 2 would require some additional staffing. At minimum, basic supervisory work would be necessary. Few departments indicated they could afford this, and rural departments indicated definitely that they could not. Furthermore, it is probable that only those departments having automated information systems will be able to do any analysis. Alternative 2 does not apply to Metro cities because most buildings will be suitable for NSS shelters as well.

Technical Capability

- All departments have information systems. While data entry for Alternative 1 would be slightly easier, thus less costly than for Alternative 2, the differences are marginal. But the data processing requirements for Alternative 2 are greater and would be very cumbersome for a manual system. In fact, the additional data demands might overload capabilities of a manual system in a suburban/ring or metro city. An automated system would be able to

handle the additional input. Although there would be some costs for additional programming, the costs for data entry would be minimal.

- Most departments could process the information collected for Alternative 1. Flagging problems and referring them to the responsible agency is an additional, but small, task. Some departments, especially volunteer ones, will have some difficulty accomplishing these tasks because of personnel limitations. Otherwise, since most departments already have an established capacity for similar activities, identifying candidate shelters, verifying shelter status and then referring the outcomes to the responsible agency should be easily integrated with their present responsibilities.

Community size and departmental type seem to have less affect on technical and organizational capability than on the costs of the alternative assistance levels. Even so, the responses to the cost considerations were generally all in the moderately feasible range for implementing the Initial Identification and Updating Alternative. The costs for adopting a CRP Shelter Inspection program were perceived by the fire chiefs to be slightly higher.

One metro department official gave consistently more negative responses to both alternatives than any other comparable department. The offical felt that costs would be much higher, and the feasibility of integrating either alternative into its existing operational structure was also lower. This department is much more decentralized than the other metro departments surveyed, and it is typical of a new management approach being adopted by many departments. Each of its stations is self-managing. Each has its own data base, and assigns its own objective and pace. This indicates that decentralization may increase the difficulty of coordinating a departmental data collection program. Data retrieval will become much more cumbersome since only aggregated data is forwarded to the central office.

Ring departments generally gave more favorable responses to both operational and cost concerns than other groups and are good candidates for implementing either or both alternatives. Many of these departments are adequately funded because their communities are newer and expanding (or, at least, were expanding until recently). These factors seem to facilitate the adoption of newer techniques and ideas. Moreover, its work force would be recently hired, younger than average, and consequently, more receptive to non-traditional activities.

## INCENTIVES

Technical and organizational obstacles limiting the feasibility of Alternative 1 are data processing and supervisory personnel. These are essentially the same obstacles to implementing

Alternative 2, though on a larger scale, with the exception of the additional personnel needed for data collection.

FEMA might be able to reduce the costs of department involvement for the two alternatives by providing assistance in the following two areas:

1. FEMA could provide the equipment for those departments lacking automated data systems, e.g., mini-computers. This will assist the fire department in generally managing the data processing requirement for Alternative 1 and, perhaps, for Alternative 2. Furthermore, automated data processing may increase the productivity of the fire department, resulting in a general reallocation of resources and in further reductions in the costs associated with implementing the alternatives.

2. Data collection problems stem not from the training and capability of the fire department's personnel, but from their availability. FEMA might consider giving fire departments supplemental funding to cover increased staff costs. The funding can go toward hiring a full-time employee, a retired fire fighter a civilian inspector, or whatever is most effective for that department. The object is to split the costs of conducting the program with the fire department. The fire department would be getting some additional personnel funding, and FEMA would be getting in-kind services that would be more expensive for it to duplicate.

Either option can be used as an incentive to obtain the cooperation of the fire department. Often feasibility can be increased with a shift of priorities. Furthermore, since a significant number of the nation's fire chiefs are also their community's civil defense director, a relationship may already exist between FEMA and the fire department that would facilitate this type of cooperation.

## PROGRAM OPTIONS

Costs for implementing either program can be reduced, depending upon whether the fire department assumes an active or passive role in data analysis. Of course, the costs will vary with the amount of information and the extent of analysis needed, as well as the fire department's current capability to process and analyze that information.

The following are three options FEMA might consider in regard to developing a program to implement either alternative:

1. The fire department would only collect the disaster shelter data and enter it into its information system. FEMA or its representative would then survey the files. This option would lessen data processing and supporting requirements, attenuating associated costs.

2. The fire department would collect and analyze the disaster shelter information. The final product, however, would not necessarily be reprocessed for transferring to FEMA. The data elements and analysis may not be readily compatible for FEMA's use. This would possibly eliminate a time-consuming step in the data analysis stage. There would be additional costs to FEMA as it would have to convert/analyze this information.

3. The third option involves greater participation for local emergency preparedness personnel. They would assume a majority of the supervisory and analytical tasks associated with either alternative. This option might involve greater FEMA funding for state and local emergency agencies.

Each option varies in its costs to the fire department as well as to FEMA. Furthermore, either may prove more effective given the uniqueness of any particular fire department and its coordinating problems with FEMA.

## SECTION ONE

## INTRODUCTION

Given funding limitations for the delivery of public services, the development of "working relationships" between agencies is an important alternative. Community needs are expanding more rapidly than revenue to fund programs to address them. One alternative method for delivering these services is to enlarge the scope and activities of existing organizations to include additional functions. Since different departments often duplicate tasks, the public may be served better if time and resources are saved by consolidating or integrating compatible efforts which do not compromise the efficiency or effectiveness of original service levels. This can be done within communities and between them.

The International Association of Fire Chiefs (IAFC), with support from the Federal Emergency Management Agency (FEMA), conducted a study to assess the feasibility of fire service assistance in FEMA's disaster shelter identification program. FEMA officials wanted to know whether fire service resources could be used for collecting data on disaster shelters and the costs of that data collection.

It would appear that the building inspection activities of the fire service and those needed by FEMA are similar. Many fire departments are knowledgeable about their community's buildings; they conduct organized activities to survey them, train inspectors, and record and analyze the information collected.

## PROBLEM IDENTIFICATION

Sheltering people in response to a natural or man-made disaster is a central component of any crisis management plan. Whether suitable protection is in a high risk area or in host areas suitable for an evacuated population, a plan that does not identify facilities for protection and shelter is inadequate. FEMA is developing local data bases which catalog available shelters in both host and risk areas.

The National Shelter Survey (NSS) concentrates on in-place protection. It seeks to identify shelters in high-risk areas that will shield people unwilling to evacuate, key workers providing essential services, or, if circumstances do not permit time for evacuation, the residing population. Crisis Relocation Planning (CRP) involves evacuating people from the threatened area to one which will host the evacuees throughout the duration of the crisis.

For the past several decades, federal civil defense agencies have identified shelters. FEMA currently administers this program, and has set goals of identifying 1.5 million shelters in host areas and 400,000 in risk areas. By early 1982, 900,000 shelters had been located in host areas and 100,000 in risk areas.

To meet these goals, FEMA must canvass the country to identify candidate shelters and inspect them. FEMA is proceeding well, but is hampered by personnel limitations. Since a dramatic

increase in its shelter inspection force is unlikely, FEMA needs some assistance. State and local civil defense organizations may be able to help, but generally lack the resources, personnel and capability to assume this additional responsibility unless additional funding is made available. The police and military, including the National Guard, do have the requisite personnel and skills, but their existing commitments limit much involvement. Such private organizations as the American Red Cross conduct many disaster-related functions, but whether they could even initiate data collection activities on the required scope is doubtful.

One possible source of assistance in shelter survey is the fire service, the subject of this study. Because it is engaged in similar activities, the fire service has the personnel, access, and, generally, the appropriate training. Many fire departments are involved in such activities as code enforcement and pre-fire planning and already inspect many buildings FEMA would consider candidate shelters. Further, since the fire service already has an historic and pivotal role in emergency management, assisting in the development of data bases for local disaster shelters could be considered merely an extension of its role.

## OBJECTIVE

The primary objective of this study was to examine the feasibility of the nation's fire departments could assist the Federal Emergency Management Agency in identifying, inspecting and cataloguing emergency disaster shelters. The nature of this assistance could vary depending on FEMA's needs, local conditions, and the types of fire department and their activities. The goal was to determine general levels of fire service participation and assess options for fire department participation.

## SCOPE

The analysis only concerns the technical and organizational feasibility of fire department involvement in FEMA's disaster shelter survey program. While implementing any program requires political acceptability and some degree of organizational consensus, these issues are excluded from the criteria for deriving alternatives or their evaluation.

Unfortunately, the distinction between technical feasibility and political acceptability is often only analytical, not operational. Indeed, several of the officials surveyed in this study found it difficult to separate completely the technical requirements for initiating various types of programs from what they saw as incompatible or unwelcomed additional responsibility.

While all comments on acceptability are excluded from the analysis, they have been noted and will be reported in the conclusion. These comments should prove useful if FEMA anticipates promoting fire service involvement in emergency disaster shelter identification and inspection.

The study did not attempt to analyze the effectiveness or efficiency of FEMA's disaster shelter data collection. Indeed, FEMA's organization and objectives are considered "givens," thus the study focused only on the feasibility of the fire service contributing to meeting FEMA's needs. Further, there is little analysis on the problems of FEMA and fire service coordination. Obviously, some consideration was given to this, but more work needs to be done to examine the most cost-effective arrangements.

## CONSTRAINTS

Any alternatives that require initiating new activities within the fire service, for example, additional personnel and reorganization, are not under consideration. The purpose of the study was to determine whether the data collection and analysis efforts of two institutions can be merged to eliminate costly duplication. The major question is whether the current level of fire department resources could be employed in collecting information on disaster shelters, another is whether FEMA could cost-effectively take advantage of fire service data collection efforts.

It would be cost-effective if fire departments could integrate shelter data collection activities with their primary responsibilities. Any additional tasks obviously would result in a need for special effort and additional funding. Fire department involvement would be limited unless FEMA provided the funding for these services.

## METHODOLOGY

### ISSUES

#### FEMA's Needs

The objective of this study was not to determine whether another organization could take over FEMA's shelter data collection program, but whether FEMA could use fire service assistance to achieve its objectives in a more cost effective manner.

#### Fire Department Capabilities

The capability of the fire service to provide assistance depends on fire department type and its current activities. One of the constraints that limits any general analysis of fire service capabilities is the diversity of the fire service and protected communities. The characteristics of the organizations providing fire protection vary as widely as the size and makeup of the areas served. This variability affects the fire department's personnel, level of funding, organization and information collection and processing capabilities.

Fire departments which conduct code enforcement and pre-fire planning, are more capable of initiating a program to identify and inspect disaster shelters than those which do not conduct such activities. Depending on the extent of the fire departments' involvement in these activities, a system to inspect both new and existing buildings already may be in place as well as the technical requirements necessary to support such a program, i.e., trained personnel and data processing capabilities.

Both of these issues need further examination to determine what implications fire department variability poses for participation in shelter management. In order to assess what impact these variables will have on fire departments' technical and organizational capabilities, it is necessary to explore two areas. First, to what extent can disaster shelter inspection activities be integrated into the fire department's operational structure, and, second, what additional costs would these extra tasks incur?

## Information Transfer

A key element of any information collection program is the transfer of data to the organization that will use it. For the purposes of this study, it involves sending information from the fire department to FEMA. Much of this would depend on the technical level of the information collected. Are present communication systems between the fire service and FEMA's shelter data bank compatible? And if not, what additional linkages need to be considered?

Further, what would be the extent of the fire department's role? What type of information could the fire department collect? Would it analyze it? Would it be more effective for FEMA to survey fire department records?

## DATA COLLECTION

Information about FEMA's needs as well as fire service capabilities was required. Managers from both areas were surveyed.

FEMA personnel and contractors managing the disaster shelter program in Washington, D.C., and in the agency's ten regional offices were interviewed to obtain information about the program, suggestions for possible assistance, requirements for conducting tasks and potential problem areas. (see Appendix A).

A selected sample of IAFC member fire chiefs was interviewed. The department sample was representative of geographic region, community size and type of department (i.e., career, volunteer or combination).

In order to control size and type, the departments were grouped into the following categories:

| | |
|---|---|
| Metro Areas | greater than 250K population |
| Urban Areas | 100-250K population |
| Ring of SMSA (or suburban) | 10-100K population |
| Rural Areas | less than 10K population |

The objective of the survey was to obtain sufficient information to draw inferences about general fire department capabilities and characteristics unique to any particular type of department. The survey consisted of the following fire departments:

Metro

Cincinnati, OH
Dallas, TX
San Diego, CA
Wichita, KS

Urban

Kansas City, KS
Shreveport, LA
Wichita Falls, TX

Suburban/Ring

Hurst, TX
Kirkland, WA
Lisle - Woodridge Fire District, IL
Sarasota, FL
Troy, OH
Tualatin Fire Protection District, OR

Rural

Belen, NM
Collegeville, PA
Leesburg, VA
Loudoun County, VA
Williston, ND
Willows, CA

The interviews consisted of two parts. The first part was a descriptive questionnaire administered to obtain information about the fire department, e.g., its size, area served, activities and data processing capabilities. (See Appendix B). Afterward, these officials or their agents/representatives were sent an information package containing brief descriptions of alternative levels of possible fire department involvement and their requirements. A questionaire then was given asking their opinions on the capabilities of their department to conduct certain tasks. (See Appendix C).

In addition to interviewing FEMA representatives and fire officials, the staff interviewed several civil defense officials to determine their present and potential roles in the shelter inspection program. (See Appendix D).

## BACKGROUND

An important effort for preparing the nation to survive a nuclear weapons attack is identifying sufficient protective shelters for the threatened population. The type of shelters and their locations are based on a scenario of the kind of attack most likely to occur and the current strategies for the most effective response.

The first federal civil defense program, the National Fallout Shelter Survey (NFSS), was begun in 1961. It emphasized locating shelters in high-risk areas, i.e., urban areas and military installations. The criteria employed for shelter selection were based primarily on protection from radioactive fallout. After 1973, shelter criteria were expanded to include protection from blast and fire. The program was administered by the Office of Civil Defense, United States Department of Defense.

The location of the civil defense program has since changed. In 1979, it was placed under the "all hazards" emergency management mission of FEMA where the objectives of the shelter identification program and civil defense planning, in general, have expanded beyond in-place protection in the risk areas. The new strategy proposed to identify shelters in less threatened, "host" communities that would house citizens evacuated from the high risk areas.

This strategy, Crisis Relocation Planning (CRP), was founded on the premise that large segments of the population could survive a nuclear attack if moved promptly from threatened areas. The strategy assumes there would be time to evacuate the threatened areas because any attack on the United States would be preceded by a period of 7 to 10 days of tension. The probable targets of an attack would be such counterforce areas as military installations, command and communication centers, missile sites, and the country's large commercial, industrial and population centers. Consequently, it is presumed that large portions of the population might survive the immediate effects of a nuclear attack if relocated to suburban and rural areas.

Shelters, or, designated congregate care facilities, would be needed for those relocated. The shelter criteria, however, are far different from those required in high-risk areas. There is much less emphasis on blast and fire protection. The shelter's primary purpose is to house, and it need only provide moderate fallout protection. Indeed, this protection could be added by merely upgrading the structure in the pre-attack period

Candidate congregate care facilities typically are larger buildings with facilities to support a group of people for a period of time. They include schools, churches and hotels. Private dwellings are not considered. Host area shelters also are valuable for non-attack emergencies because they can be used for any mass evacuation necessitated by such natural or man-made disasters as floods, hurricanes or hazardous materials incidents

Since FEMA officials believe there is greater potential for surviving a nuclear attack with the CRP strategy than with the traditional, in-place protection in risk areas, CRP disaster shelter data collection has become a priority. The agency's objective is to identify and inspect 1.6 million structures by 1986. In early 1982, 980,000 had been completed. This emphasis has led to reduced efforts to collect in-place (National Shelter Survey - NSS) shelter data. Here, the objective is to compile a data base consisting of 400,000 shelters. A data base for 100,00 has been completed.

## A ROLE FOR THE FIRE SERVICE

The fire service traditionally has been the first emergency force to respond to disasters. The emergency first responder concept is fairly broad in referring to "...that first arriving organized responder with the capability and mission to contain, mitigate, and/or resolve the emergency at hand...This encompasses not only the traditional fire and pre-hospital response, but natural disasters, hazardous materials release, radiological incidents and other man-made disasters."[1] The fire service's emergency first responder role is illustrated by its involvement in recent disasters, including the MGM Grand Hotel fire in Las Vegas, the nuclear plant emergency at Three Mile Island and the volcanic eruption of Mount St. Helens.

Response to an emergency is, however, only one aspect of the fire service's role in emergency management. It is involved in all aspects of Comprehensive Emergency Management (CEM). The National Governor's Association (NGA) report in 1978 on Emergency Preparedness defined this term as "...a state's responsibility and capability for managing all types of emergencies and disasters by coordinating the action of numerous agencies. The 'comprehensive' aspect of CEM includes all four phases of disaster or emergency activity: mitigation, preparedness, response and recovery."[2]

The fire service acts in all these capacities. One state system's personnel, observed during the NGA project, were involved in mitigation by developing and enforcing building codes and maintaining equipment. Their preparedness role consisted of developing emergency procedures and exercises, maintaining organizational liaisons and planning and prevention activities. During the emergency, they were involved with emergency medical services, fire suppression, and providing public and technical information. Finally, they assessed capability for recovery.[3]

## SECTION TWO

## DISASTER SHELTER PROGRAM PROFILE

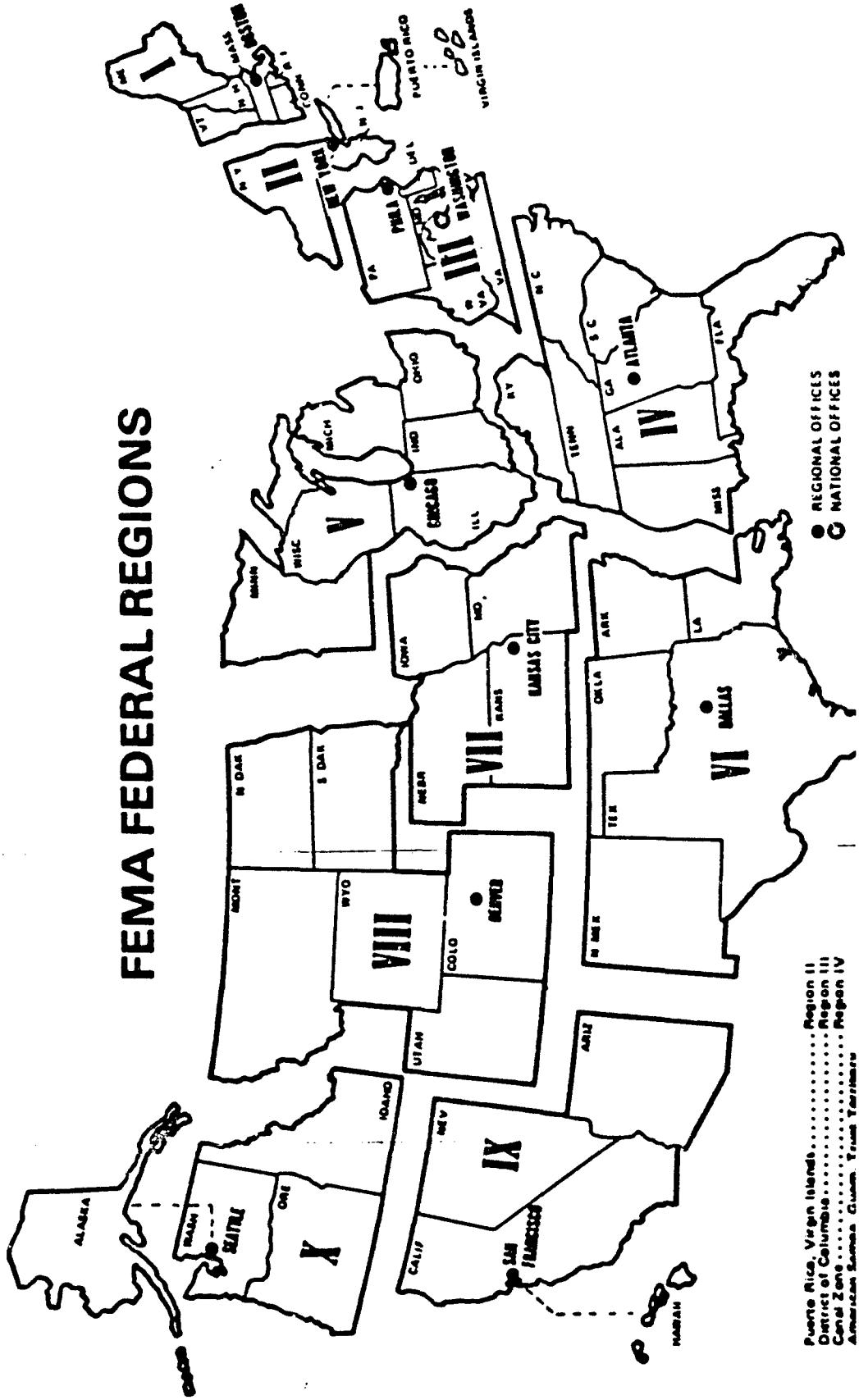
### ORGANIZATION

The disaster shelter program headquarters and its data base are centered in the Washington, D.C. area; the data collection staff is located in FEMA's regional offices. (See map, Figure 1). Each region has its own shelter identification objectives. CRP shelter demand is based on evacuee estimates in crisis relocation plans developed by a planning team in each state. Presently, only 25% of these plans are completed. NSS shelters and in-place protection surveys conducted in risk areas are based on estimates of the needs of the current population.

Generally, all shelter surveys now are conducted by FEMA employees. While some of the initial inspections were conducted by contracting local engineers or architects, it was more cost-effective for the work to be done in-house. There are some exceptions, however, because FEMA still contracts with a few local firms or the state agencies when the work does not warrant sending in the FEMA engineering staff or hiring additional surveyors.

Future plans within FEMA call for the expanding use of contracts with state agencies for most or all of the National Shelter Surveys. The state agencies will hire engineers, architects, technicians and support staff, and regional FEMA employees

FIGURE 1


FEMA FEDERAL REGIONS
REGIONAL OFFICES
NATIONAL OFFICES
Puerto Rico, Virgin Islands.....Region II
District of Columbia.....Region III
Canal Zone.....Region IV
American Samoa, Guam, Trust Territories

will monitor these programs. FEMA still will direct the program by establishing inspection and personnel criteria, and it still will operate the data center.

## DATA COLLECTION OBJECTIVES

As stated previously, disaster shelters are being identified in two general areas: high risk area (including counterforce or military installations, and commercial, industrial and high population centers) and host areas. Each of FEMA's regions has its own objectives which differ according to size, population and number of military sites. Presently, the priorities for shelter inspection are ordered by rank: counterforce, CRP, and then NSS. With the exception of counterforce areas, which already have been inspected, all of the regions are in varying stages of completion. The requirements for CRP, the second in priority, range from 40 to 60% completed. At the present pace, that represents an additional three to four more years of work effort.

Because of the greater priority of CRP, risk area shelter surveying has been permitted to lag. But substantial numbers of shelters were catalogued during the early years of the civil defense shelter program (1961-1970). However, additional information on some of these shelters needs to be collected. Many buildings were surveyed using criteria that stressed fallout protection. Also, shelters often are located in larger, older buildings in urban centers, and no updating has been done to

determine whether they still are suitable, or whether the structures still exist.

Size and population factors have a significant affect on meeting objectives. For instance, regions 3, 5, 9 and 10, on the average, completed 50% of both CRP and NSS shelter surveys. These regions include some of the most populous states, all encompassing larger urban areas. Another factor to consider is that the objectives set by CRP planners are gross estimates. Some areas are densely populated or still growing, therefore, data collection continues.

## PERSONNEL

The regional, full-time staff typically is small, consisting of a few engineers and technicians. It is supplemented by students who work full-time during the summer or part-time throughout the year on a co-operative basis. Hiring students as technicians has been cost-effective. Most are hired on a General Schedule (GS) rating of 3 or 4 ($10,235-$14,937 in 1981). Some of the more experienced students are hired as supervisors, GS 5 rating ($12,854-$16,706 in 1981). All students are classified as Shelter Survey Technicians (SSTs). These salaries compare favorably with those of paid fire fighters, who have in 1983 an annual base salary ranging from $16,000 to $23,000.[4]

All SSTs must meet the following eligibility requirements:

- o United States citizenship;

- o Satisfactory completion of a minimum of one year of an architectural or engineering program, or its equivalent, at a recognized university, college or technical institute;

- o Completion of a 13-session course on disaster shelter surveying which is taught at various universities or through correspondence; and,

- o Successfully passing a shelter survey examination administered and graded by FEMA.[5]

The SST course stresses the practical data collection and analysis requirements needed to conduct a CRP or NSS survey. Little of the instruction is theoretical. Subjects taught in the 13 sessions include the following:

- o Introduction - Background on FEMA, CRP, NSS;

- o A primer on building construction, including descriptions of various types of structures and how to obtain construction design information from existing buildings;

- Blueprint reading;

- Easy II - estimating and analyzing shelter yield to determine radiation protection;

- Ventilation - estimating occupancy levels;

- Blast overpressure - identifying superstructure, materials and window patterns for relative blast study;

- Thermal effects - development of flow charts, estimating fire vulnerability by assessing building types and use;

- CRP - involves upgrading congregate case facilities and fallout protection, an introduction to structural analysis; and,

- Exercises in the use of data input forms and collection guides.

FEMA has had no difficulty finding qualified candidates for SST positions. In fact, the jobs are competitive, and all successful applicants have achieved high scores on the SST examination.

The students selected receive closely supervised, hands-on training during the first weeks of employment. To ensure quality control during this period, all of the students' work (both the inspections and the data forms) are verified. After the training period, students work in pairs and review one another's work. At this point, supervision is loosened somewhat. Quality control still is maintained by reviewing the inspection forms and collecting samples for later verification. Interviews with FEMA officials indicated they are very satisfied with the students.

## PERSONNEL/TASK SPECIALIZATION

The SST category is a para-professional or technician level. Students come to the job with basic skills in mathematics, engineering and construction. Little theory in radiation and shielding analysis or architecture is taught in the course. Consequently, those trainers interviewed felt that people with a basic understanding of building construction could be trained to perform adequately at the SST level. Moreover, SSTs rarely work independently, rather they always report to supervisors who are either architects or engineers and who have been certified as "Fallout Shelter Analysts" by FEMA.

Most FEMA personnel and contractors interviewed believed that CRP data collection did not require any sophisticated skills, although there is a need to use judgement in interpreting and coding data. For instance, it is necessary to calculate the

dimensions of the building, but with the exception of larger, more complex structures, this is done merely by pacing the sides. Another example of the level of skill required is assessing upgradability. This involves deciding whether a building's fallout protection factor can be improved based on such criteria as whether it has a flat roof or an exposed exterior wall for piling dirt.

Fallout analysis may require additional training and a rudimentary understanding of radiation and shielding analysis. To do this analysis, it is important that one is familiar with building construction and able to analyze building design based on a cursory inspection. Blast and fire analysis for NSS shelters requires more extensive training, but is done only in high-risk areas and often, only by senior staff.

## RESOURCE REQUIREMENTS

FEMA regional shelter managers were asked whether they had sufficient resources to achieve their objectives within the specified time frame and whether they thought that present practices for acquiring field personnel were adequate. Most reported that they were understaffed, but that hiring additional generalists really would not resolve the manpower problem. The variability in the responses of the ten regional officials interviewed was slight and appeared related to the region's size, characteristics, and the extent to which objectives were being met.

Two regions reported satisfactory progress in both risk and host areas. However, those behind schedule felt a need for additional personnel, particularly those with special skills. The demand for skilled personnel, however, was consistent regardless of a region's progress in either risk or host area shelter identification.

The division of labor in all regions is designed to use less specialized personnel as much as possible, allowing the engineers and architects to supervise, conduct more technical inspections and manage the program. This, apparently, was thought to be the most cost-effective approach for conducting inspections and also was the rationale for developing the SST category and using students for staff.

The duties of the specialized personnel often appear to be unbalanced. There are fewer architects and engineers in the division now than in the past. FEMA has had a hiring freeze on these positions for the past four years, allowing positions vacated through attrition to remain unfilled. Further, the increased emphasis on completing the identification of host shelters has resulted in the additional hiring of SSTs. Consequently, most of the engineers felt that the majority of their time was devoted to supervising SSTs, a task that was becoming slightly unmanageable. For instance, one region indicated that its permanent staff had to supervise 34 SSTs, whereas a more manageable number would be fewer than 10.

One of the reasons why SST supervision is so time consuming is the need to maintain quality control. Supervisors must review and certify all completed data input forms. One manager interviewed related that supervisor understaffing had created a significant backlog in surveys needing review. Further, it appears problems arise in the proper coding of the data forms, resulting in a need to verify (resurvey) 8% - 10% of all inspections.

## DATA COLLECTION PROCEDURES

Although a CRP inspection can be conducted in approximately an hour, the overall process is time-consuming because fewer buildings qualify as shelters, and qualifying shelter are spread out in rural areas. While the inspection of NSS shelters takes considerably longer, potential candidate structures are more easily idenfitied, and, in urban areas, they are centralized. The time ratio per day for conducting inspections is approximately 5 CRP to 1 NSS.

The process of selecting CRP shelters consists of canvassing an entire county and inspecting all potential sites. Once this is completed, the next county is surveyed. Often, FEMA inspectors must travel throughout the country searching for possible shelters. Occassionally, information on existing buildings is available in building departments, and their plan review records are scanned. However, FEMA officials have found that few blueprints are kept for long periods of time.

Sanborne maps, used by the insurance industry for determining rates, occasionally are consulted. These are color-coded to show such information as hydrant locations, information about basements, and number of floors. The value of Sanborne maps is limited because they were developed only for large and medium-sized cities and only for commercial districts. Moreover, insurance rating schemes have changed, so the maps rarely are maintained.

## SHELTER MAINTENANCE AND UPDATE

After FEMA meets its objectives for risk and host area shelter identification, it expects to switch to a maintenance mode to keep the data base current and verified. However, supporting the maintenance mode is time-consuming because of the number of shelters that must be reinspected and raises the question of whether it is a justifiable use of the permanent staff's time, especially if the procedure for conducting reinspections is to once again canvass an area completely.

The only reinspe ions conducted now are by local civil defense personnel. The feasibility of turning this responsibility over to these agencies completely raises questions that will be addressed later in this document.

In order to assess the requirements for reinspection, it is necessary to determine its importance and characteristics. The opinions of FEMA personnel were mixed, but most thought there was a moderate need to reinspect shelters every 5 to 10 years. It is not an ongoing requirement because much of the protection factor of the building is inherent within its structure. Consequently, unless there are significant changes in the building, its protection value will not change.

One problem noted by several managers was that many of the older shelters are in urban centers and, perhaps, were demolished for urban renewal. FEMA is seldom aware of this occurrence. Further, the buildings' use and occupancy may no longer be the same or compatible with the needs of a shelter. For example, an area in a building intended to shelter people now may be a warehouse or used to store hazardous materials.

## THE ROLE OF THE LOCAL CIVIL DEFENSE AGENCY

FEMA provides up to 50% of the funding for many state and local civil defense agencies. Its role in the disaster shelter program is to maintain the shelter listing for local use and to keep it current. According to FEMA, local civil defense agency personnel receive some training to manage this aspect of the program. The project staff interviewed several local civil defense directors to determine how they perceived their role in this program, and their current activities and capabilities.

The typical local civil defense agency is very small. It is primarily a planning and coordinating organization, instituting linkages among government departments in order to prepare for an emergency. Few have the resources to undertake more than a coordinating role. Even Dallas, which has the largest civil defense agency of all the communities contacted, had only a staff of eight. Several other agencies queried had only one professional.

With respect to the shelter program, it appears that some local civil defense agencies are involved in maintaining the list. Additionally, active local agencies do reinspect the shelters. Yet for many agencies, it appears to be a low priority, and actual inspections are done in a haphazard, "when time is available" fashion.

## PAST EFFORTS TO INVOLVE FIRE DEPARTMENTS

FEMA has attempted to use local fire departments in shelter surveying, but most FEMA officials interviewed did not feel very positive about these experiments. The majority of the efforts involved rural volunteer departments and were a one-time attempt to employ local resources to inspect CRP congregate care facilities. FEMA provided all training and supervision.

FEMA officials reported that many of the surveyors did not collect and code data correctly, resulting in significant duplication of effort for the supervisors. In addition, another

department that originally had agrees to participate, later refused, saying that the survey was too technicial. Generally, FEMA believes it is better to retain engineering or architectural students because of their reliability, degree of training and accountability to FEMA.

FEMA officials also were asked whether they consulted fire department records for building information prior to inspecting an area. Some replied that the information collected by the fire department basically was inappropriate for their needs. Wnen specifically asked whether the data collected by the fire departments for pre-fire planning and building code enforcement inspections might be useful for CRP/NSS shelter surveying, most FEMA regional managers were unaware of the information fire departments collected. One official, however, did mention that, occasionally, fire department records were used to document hazardous materials locations.

## SUMMARY OF FEMA'S NEEDS AND REQUIREMENTS

The following summarize FEMA's needs and requirements:

- Identifying, inspecting and cataloging CRP and NSS shelters is labor intensive. It is a slow, laborious process in which FEMA will have difficulty meeting its objectives on schedule given existing personnel limitations.

- Current funding levels limit any real expansion of activities either in-house or through contracting for outside assistance.

- FEMA may find assistance valuable in two areas: first, specialized personnel to conduct NSS survey and supervise SSTs, and, second, to acquire additional generalist personnel to provide assistance for little, if any, additional cost. This generalist role currently is filled by the SSTs and apparently FEMA can hire as many as it wishes. Indeed, it may have more now than it can supervise effectively.

- FEMA would be able to take advantage of outside assistance only if it were able to fit into a nitch within its division of labor, and if it were less expensive than hiring additional staff.

- FEMA maintains high standards for accurate data collection and entry. This is accomplished partially through very close supervision, which also strains the time of its skilled personnel.

- Certain tasks require specialization, while others can be performed by trained generalists. NSS shelter determination requires special training in radiation, blast and shielding analysis. Such other tasks as CRP shelter surveying require much less specialization.

## SECTION THREE

## RELATED FIRE DEPARTMENT ACTIVITIES

Two fire department activities related to shelter surveying are pre-fire planning and building and fire code enforcement. Both activities involve compiling data on the community's building stock through a series of review and inspection tasks. The technical and organizational requisites for implementing either program include surveying and data collection, record maintenance, program management, training and qualified personnel. Following are brief descriptions of both pre-fire planning and building code enforcement.

### PRE-FIRE PLANNING

The goal of pre-fire planning is to collect information helpful in developing on-scene suppression tactics and strategies. The Fire Protection Handbook defines suppression tactics as:

> ...the method of operations employed by the tactical units (companies, task forces, etc.) to achieve objectives such as rescue, confinement, extinguishment...It defines suppression strategy...as the method employed by the fire ground commander to coordinate the tactical units (engine and ladder) and the management of additional resources, if required, to successfully control the incident or emergency.[6]

In order to formulate suppression strategies and tactics, it is necessary to determine the potential risk inherent in the structure.

The factors affecting risk potential, as identified by the Fire Protection Handbook, consist of the following:

- Life Risk: Who are the occupants? What is their condition, e.g., sleeping, handicapped? Will the occupant load pose a problem?

- Contents: Will the contents of the structure pose a particular problem? Are they extremly combustible? Are they toxic or will they produce dense smoke? What is the approximate fuel load of the contents?

- Construction: What is the age of the building? How structurally sound is it? Was it built with fire resistive materials? Is it compartmentalized? What is its height?

- Built-in Protection: Are there sprinklers, fire doors and compartments?

- Time: Is there an alarm or smoke and fire detection system? Is the system connected to the fire department?

- Suppression Resources: What is the availability of water or other extinguishing agents?[7]

How do you translate "risk potential" into operational objectives? The primary objective of a pre-fire planning inspection is to survey a building to determine the parameters of a potential fire. Formulating a plan involves identifying hazards and particular features and suggesting methods for addressing them, i.e., a workable plan that includes all features that will influence fire fighting tactics, consisting of the following features:

- o A list of all the hazards present, including building features, contents and processes;
- o Access points;
- o Ventilation points;
- o Built-in fire protection (sprinklers, standpipes, others);
- o Water supply - location and limitations;
- o Structural weaknesses, including horizontal and vertical openings, lack of fire stops, and collapse conditions, etc.;
- o Structural strong points - location of fire walls, parapets, etc.;

- Application of a flow rate formula to determine water needs, manpower needs and pumper needs, including a provision for the prompt supply of the needs determined through additional alarms, special calls or mutual aid; and,

- The need for the development of mutual aid protocols (i.e., communications, notification). [8]

After the data has been collected, it is analyzed to determine the most important and usable information (risk potential, strategy and tactics), formulated into a pre-fire plan and disseminated in an operational format that can be used in an emergency.

Sample pre-fire planning forms and explanation sheets from fire departments in Baltimore County and Silver Spring, Maryland are reproduced in Appendices E and F. They indicate the extent and type of information collected, skills required for data collectors and analysts, and record-keeping requirements.

## CODE ENFORCEMENT

Building and fire codes are enacted by local, state and federal governments to regulate the design, construction and maintenance of buildings. A fire department usually is responsible for the fire code, as well as related portions of the building code.

The enforcement of building and fire codes by the fire department is a systematic process which involves interrelated tasks. Adherence to the lawfully mandated standards and regulations is monitored through an active program of review and inspection activities for both new construction and existing buildings. During new construction, these tasks consist of ensuring that a building is located, planned and constructed in accordance with the appropriate regulations. The process consists of the following procedures:

- Site Review. Site review determines whether the prospective project complies with zoning and planning ordinances. Fire service involvement would center on such issues as available water supply, hydrant accessibility, distance from fire lanes, occupant rescue problems and location of hazardous materials.

- Plan Review. Plan review involves examining building designs for compliance with the building, electrical, elevator, mechanical and plumbing codes. Ordinarily, the fire service has no formal, specific duties during this stage. However, operationally, there is a significant relationship between the building and fire codes. Much of the building code is fire-related. Also, a building must be constructed so that, after completion, it is not in violation of the fire code.

- Construction Inspection. Plan review alone is insufficient to ensure that a completed building is in compliance. Often, building plans are negotiated and approved only to be altered later during construction. On-site construction inspection by a code enforcement agency should be conducted as construction progresses, in order to check for features that later would be concealed by further construction.

Monitoring tasks in existing structures involves inspecting all specified structures to ensure that the building and its fire protection systems are maintained, and that the buildings and contents conform to the fire prevention code.[9]

An example of information collected for fire prevention during a code inspections is in Appendix G.

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## SECTION FOUR

## DERIVING ALTERNATIVES

AREAS OF POSSIBLE FIRE DEPARTMENT ASSISTANCE

The following are areas of potential fire department involvement based on the preceding analysis:

### Alternative One:

### Initial Identification of Candidate Shelters

This task involves indicating whether a building could qualify as an NSS and/or CRP shelter and referring this information to shelter inspection agencies. Elementary criteria to select candidate structures would be supplied by FEMA. For example, information about a candidate NSS shelter would include its size, whether it had a basement, and whether it was shielded by other buildings. If a building did not meet such basic criteria, it would be considered only for a candidate congregate care facility.

Inspection requirements: Data sufficient for identifying a potential NSS or CRP shelter could be obtained from a quick review of the building plan or an inspection of the building. Time involved to collect data would be mimimal.

Personnel qualifications: A fundamental understanding of building structure would be sufficient to conduct the initial inspection. Training to inspect, collect and report data

elements possibly could be given in an hour. Little prerequisite training or experience would be required.

## Alternative Two:
## CRP Shelter Inspection

This task involves collecting basic information to determine the suitability of buildings as congregate care facilities. Building must have a minimum of 400 square feet, enough space to shelter a group of people for an extended period of time. Data elements include whether the building has a basement, dining facilities, the type of roof, and beds. It also is necessary to assess whether it can be upgraded for additional fallout protection. (For complete listing of data elements see Data Input Form, Figure 2.)

Inspection Requirements: A one-time, comprehensive inspection that takes approximately 40 minutes is conducted.

Personnel Qualifications: A degree of familiarity with building structure is important, but need not be extensive. Most of the personnel involved in shelter management agreed that nearly anyone could be trained. However, it is important that data coding be accurate. Determining upgradibility does not involve any special skills. Overall, training to conduct CRP shelter inspections might involve up to two hours.

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FEDERAL EMERGENCY MANAGEMENT AGENCY

# NATIONAL SHELTER SURVEY AND CRISIS RELOCATION PLANNING SURVEY

Data Input Form

COUNTY NAME (DO NOT PUNCH)

## IDENT — Section A. Identification

| 1 STANDARD LOCATION | 2 FACILITY NO. | 3 SURVEY OFFICE | 4 UPDATE ACTION | 5 SURVEY TYPE (NSS 1, CRP 2, Both 3) | 6 SURVEY DATE (MO YR) | 7 CHANGE EXISTING RECORD TO | STANDARD LOCATION | FACILITY NO | FOR FEMA USE ONLY: EDIT DATE (MO YR) | PUNCH DATE (MO YR) | WORK UNIT NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|

| 9 BUILDING NAME | 10 BUILDING NO | 11 DIR | 12 STREET NAME | 13 CITY |
|---|---|---|---|---|

| 14 STATE | 15 ZIP CODE | 16 USE | 17 DWL | 18 SF | 19 EUC (NO 0, YES 1) | 20 STORIES | 21 BASEMENT (NO 0, YES 1) | 22 AUX POWER (NO 0, YES 1) | 23 MCD | 24 PLACE | 25 | 26 LATITUDE (DEG MIN SEC) | 27 LONGITUDE (DEG MIN SEC) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## NSS — Section B. National Shelter Survey Data

| 1 FLOORS | 2 BUILDING POP | 3 PV | 4 FIRE | 5 AIR SOURCE (MECH. 1, NATURAL 2, BOTH 3) | 6 SHELTER SIGNS (NONE 0, GOOD 1, POOR 2) |
|---|---|---|---|---|---|

REMARKS

| LOCATION | RELATIVE BLAST SHELTER: 12 PROT. | 13 BLAST SPACES | 14 BASIC | FALLOUT SHELTER: 15 PF CAT. 0 SPACES | 16 PF CAT. 1 SPACES | 17 PF CAT. 2-3 SPACES | 18 PF CAT. 4+ SPACES |
|---|---|---|---|---|---|---|---|
| BASEMENT | | | | | | | |
| 1ST STORY | | | | | | | |
| 2ND STORY AND ABOVE | | | | | | | |

## CRP — Section C. Crisis Relocation Planning Survey Data

1 NEAREST CROSS STREET

| 2 BASEMENTS: AREA (SQ FT) | USE | 3 FIRST FLOOR: AREA (SQ FT) | % USE | 4 2nd FLOOR & ABOVE: TOTAL AREA (SQ FT) | % USE | 5 ROOF: SURFACE AREA (SQ FT) | PERCENTAGE OF ROOF UNDER LONG SPAN ROOF |
|---|---|---|---|---|---|---|---|

| 6 EXTERIOR WALL LENGTH (FEET): FRONT | SIDE | 7 WALL EXPOSURE GROUND TO 1st FLOOR (1/ FEET): SIDE +/- A | SIDE +/- B | SIDE +/- C | SIDE +/- D | 8 BEST PF CAT. (LOWEST STORY): PF 1-0 = 2; 10-19 = 0; 20-39 = 1; 40-99 = 3; 100+ = 4 |
|---|---|---|---|---|---|---|

| 9 AIR CONDITIONING (NO 0, YES 1) | 10 MEDICAL FACILITIES (NO 0, YES 1) | 11 PHARMACY FACILITIES (NO 0, YES 1) | 12 WATER SOURCE (NONE 0, WELL 1, PUBLIC 2, OTHER 3) | 13 DINING FACILITIES: (NONE 0, REST 1, CAFE 2, SNACK BAR 3, OTHER 4) | SEATS | KITCHEN BURNERS | 14 COMMODES | 15 BEDS | 16 UPGRADABILITY (NOT UPGRADABLE 0, BASEMENT ONLY 1, 1st STORY ONLY 2, BSMT & 1st STY 3) | 17 DISTANCE TO SOIL (< 20 YARDS 1, 20-100 YARDS 2, > 100 YARDS 3) |
|---|---|---|---|---|---|---|---|---|---|---|

INSPECTOR | DATE | CHECKED BY | DATE

FEMA Form 85-5, APR 81

Replaces DCPA Form 882 (1/77), which is obsolete.

Figure 2

## Alternative Three:

## NSS Shelter Inspections

This task, in risk areas, involves inspecting a structure to determine the relative protection it offers from blast, fire and radiation. In host areas, only radiation and shielding are analyzed. The inspection is carried out once unless a change in the building causes its protection factor to change.

Inspection Requirements: NSS shelter is more technical than the others. An average building may require three or four hours to complete.

Personnel Qualifications: NSS shelter may involve some theoretical background in engineering and requires a higher degree of technical skill than what is needed for the previous alternatives. All supervisors are engineers or architects certified by FEMA, and all student inspectors must take the 30-hour course administered through FEMA and pass an exam. Data collection requires come computations, necessitating basic mathematical skills.

## Alternative Four:

## Reinspections

This task involves reinspecting NSS and CRP shelters to verify whether the buildings' structures or use have changed, and, if so, whether their suitability as shelters has been

affected. Of a building met the criteria, this information would be referred to FEMA for further investigation.

Inspection Requirements: A quick inspection of the building would readily indicate any changes. Other means of determining a possible change in status could be the issuance of licenses for new construction and changes in occupancy and tax assessments. This information then would be referred to FEMA or other shelter inspection personnel for follow up. Time needed to conduct inspections and collect data is minimal.

Personnel Qualifications: Basic familiarity with building construction is necessary. Training to conduct reinspections can be given in less than one hour.

Because alternatives one and four require similar data and involve similar data collection requirements, they are the easiest to merge into one activity. Further, their consolidation would make shelter surveying an ongoing activity, integrated into the department's building inspection program. Therefore, the Alternatives One and Four can be combined and called <u>Initial Identification and Update</u>.

## MEETING FEMA'S NEEDS AND REQUIREMENTS

### Alternative 1:
### Initial Identification and Update

If the fire service conducted these activities, FEMA could have a current listing of candidate structures for shelters in both risk and host areas for those communities not surveyed by FEMA, as well as an update on the status of communities already surveyed.

These tasks would save FEMA considerable time and resources in identifying and maintaining shelters, thereby eliminating the need to canvass a community to locate candidate shelters. Reinspections could be done on an "as needed" basis instead of repeating the initial surveying effort. This alternative would be useful for both NSS and CRP disaster shelter surveys.

### Alternative 2:
### CRP Host Shelter Inspection

Alternative two essentially would relieve FEMA of inspecting congregate care facilities in many areas, although FEMA personnel still would be needed for supervision. This alternative is useful only in host areas, because many structures suitable for congregate care facilities in risk areas likely are candidates for NSS shelters as well. Consequently, dividing the tasks would result in unnecessary duplication.

Alternative two would replace many current SSTs with fire department personnel in the basic data collection role for congregate care facilities. This would be an improvement over current practices by allowing the more experienced staff more time to conduct specialized tasks.

## Alternative 3:
## NSS Shelter Inspection

This alternative is an extension of fire service involvement in the disaster shelter identification program. The benefits to FEMA include a substantial reduction in its total data collection work.

## Summary

The alternatives proposed for possible fire department involvement represent three progressive levels of effort differing by degree of specialization, time requirements and fire service committment. Each alternative can be conducted alone or as part of a more complex and rigorous activity that encompasses the previous alternative. For example, figure 3 graphically portrays the proposed alternatives.

FIGURE 3

LEVEL OF FIRE SERVICE INVOLVEMENT

| | | Levels Of Effort | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Work | Alternative 1 | X | | |
| Effort | Alternative 2 | X | X | |
| | Alternative 3 | X | X | X |

Within each level, it is necessary to weigh the organizational and technical capabilities of the fire service against the requirements of each alternative as well as the costs incurred both by the fire service and FEMA.

To assess whether a given fire department feasibly can conduct any of these activities, the following factors should be considered:

- o Logistics - Does the fire department have the organization and logistical capabilities to inspect the community's buildings?

- o Personnel - Does it have the necessary personnel for the tasks required and do they have the experience and training necessary.

- Record Keeping - Does the fire department have an information system capable of cataloguing and processing the information? Is its information system compatible with FEMA's? Are the fire department's existing records useful to FEMA?

- Management - Can the fire department supervise the data collection effort and maintain quality control as well as analyze or package the information for transfer to FEMA.

It soon became apparent that Alternative three, "Conducting NSS Shelter Inspections," was not feasible for most fire departments. FEMA has strict qualification standards for personnel conducting NSS inspections. NSS shelter inspections conducted in risk areas are more sophisticated and require more specialization. All NSS inspections must be conducted by either a certified architect or engineer who must sign the data form if an SSt conducts the inspection.

Initial data collected from the fire chief survey indicated that few departments could meet the requirement for conducting NSS shelter inspections. Most fire departments would have to designate personnel to have special training to conduct NSS shelter inspections by taking the SST course or its equivalent. With the exception of fire protection engineers (FPEs), rarely do fire departments employ personnel with these qualifications.

FPEs capable of conducting inspections do not have enough time for additional activities. While may fire departments do have personnel with the experience and training to complete the SST course successfully, few departments can affort the loss of their services while they train and still maintain the current level of service. In addition to the time required for training, the amount of time required to conduct an NSS inspection also is a consideration. Alternative 3 would be a burden to most departments.

The consolidated building/fire department might be an exception. One such department was included in the fire chief survey, and its director concluded that his department had the qualified personnel and, perhaps the time, to conduct all three alternatives. The department's personnel included fire fighters and building department inspectors.

## SECTION FIVE

### ALTERNATIVE IMPLEMENTATION

### ASSESSING FIRE DEPARTMENT CAPABILITY

There is considerable variability among fire departments and the type of pre-fire planning and code enforcement programs they conduct. Often, this depends on the resources available to the department, the community served and the type of department, e.g., career, volunteer or combination.

In order to draw some inferences about the range of variability and on similarities among the departments, 19 fire chiefs were surveyed. They were asked whether their departments conducted these activities, and, if so, how they were organized. The communities were grouped into the following categories:

- o Metro - greater than 250,000 population
- o Urban - 100 - 250,000 population
- o Suburban/Ring of SMSA - 10 - 100,000 population
- o Rural - less than 10,000 population

Two questions must be answered to determine the feasibility of fire service implementation of any of the alternative levels of involvement. First, can the fire service integrate disaster shelter data collection with its ongoing activities? This question is significant because FEMA requires that its data be

collected community-wide, that it be accurate, and that all changes in existing shelters be noted for further action. The feasibility of fire department involvement will depend on their existing technical and organizational capabilities to conduct related activities.

Second, what type of costs will the fire department incur in implementing these additional activities? Will additional resources be needed? Estimates of potential costs are essential to assess constraints and requirements, as well as for developing options for fire service involvement. Also, because FEMA has limited funding available for additional activities, the costs to the fire service for implementing a disaster shelter inspection program must be minimal.

## INTEGRATING DISASTER SHELTER DATA COLLECTION INTO A FIRE DEPARTMENT'S OPERATIONAL STRUCTURE

Following are the considerations for evaluating whether the alternatives are compatible with fire department operational structures:

- What kind of data does the fire department collect?
- What are the logistics of its inspection activities?
- How often are inspections made?
- Who conducts the inspection?
- How is the data processed (including record keeping and analysis)?

## Data Collection Activities

From the project team's limited survey, it was found that all fire departments, regardless of size or type, conduct pre-fire planning inspections. Given available personnel, they also have a code enforcement program. Further, departments that do not perform building code inspections usually delegate the county fire marshal or other local agency to assume inspection responsibility.

All four metropolitan cities surveyed conduct pre-fire planning and code enforcement, and, with few exceptions, the control and procedures of their building inspections are similiar. Urban and ring communities also conduct both activities. Rural communities, however, varied. Some did both, some performed only pre-fire planning, and one did neither. A key factor in the type and depth of these programs appears to be the availability of personnel; that is, having career personnel.

## Pre-fire Planning

With the exception of volunteer departments, the pre-fire planning procedures and practices among all of the other groups are very similar. Pre-fire plans are written for most structures in the community that would be of interest to FEMA, including high-hazard properties, occupancies with the potential for high

life loss, places of public assembly and schools. There are two types of pre-fire planning inspections. An initial plan that is comprehensive and more time consuming, and reinspections, which are performed later to update and verify the file. Some of the properties are reinspected annually. Most departments rank properties by priority or by code requirements, and then only reinspect those in the highest priority categories.

All the metropolitan departments sheduled their pre-fire planning inspections in this manner with the exception of Dallas, which annually reinspected all its 44,000 properties. Otherwise, only a portion of the high-hazard properties were reinspected annually. Further, there was little difference among the metro, urban and ring departments in pre-fire planning inspection schedules.

In rural departments, larger buildings receive a pre-fire planning inspection but the scheduling of reinspection is less formal, sometimes occurring only every two to three years. The exception is when the fire department relies on the county's fire marshal to conduct the reinspections and then, participants indicated they were performed annually.

## Code Enforcement

Among all department, basic code enforcement practices were fairly standard with the exception of three rural volunteer departments that did not have programs.

During new construction, all fire departments had access to, and reviewed, the building design plans. Some had more authority in this process because they were required to sign off on the building permit and certificate of occupancy. Even those lacking this formal authority still felt they had adequate opportunity to review and comment on new construction, or, at a minimum, were aware of the fire safety related matters of all new construction within their community, except private residences.

The sophistication and comprehensiveness of their reviews vary, but all collect information or have access to information on new construction. Further, all departments indicated that they inspect construction sites during construction to check for unauthorized changes in the structure.

Most of the department's personnel did not believe that changes in occupancy or building rehabilitation posed problems. They became aware of these changes by having to review a new certificate of occupancy, building permit, or, eventually, through a fire code compliance survey conducted in the field.

With the exception of the rural group, all departments had an active inspection program for existing buildings. Most departments organize their inspection programs by targeting priority occupancies for inspection or by inspecting all allowable occupancies on a door-to-door, block by block basis. (Fire departments can inspect common areas in multi-family houses, but not private residences).

The frequency of inspections varies somewhat by department. Targeted and high-hazard occupancies may be inspected annually at a minimum, while the inspection of other occupancies is subject to the policies of the individual department and availability of resources. The Cincinnati (Ohio) Fire Department, for example, inspects high priority buildings annually and all other structures, including private residences, every three years.

It is important to note that at least one metro city, San Diego, does not inspect all buildings. Because not all buildings can be inspected adequately, a priority system, consisting of about 1/3 of all inspectable buildings, was instituted. Only those buildings receive annual inspections, This is an extension of the priority ranking system for setting inspection targets. While some buildings may not be reinspected, all are inspected initially as a means of prioritization. The structure may be reinspected if the department is notified of a change of use or occupancy.

Most fire departments can inspect their building stock only because the majority of these inspections are performed by suppression personnel. Further, the typical pre-fire planning inspection of existing buildings is done concurrently with fire code enforcement. Fire inspection specialists, usually in the fire prevention bureau, provide the field personnel with technical assistance as well as conduct more specialized inspections. They have additional training and experience.

Rural departments have fewer resources to conduct inspections. They are staffed primarily by volunteers and are suppression-oriented. Generally, volunteers have less time to train for activities other than suppression. Moreover, there is a general reluctance to assume these "non-traditional" responsibilities.

Rural departments often rely on career personnel, if available, to conduct code enforcement activities. For example, the Williston (North Dakota) Fire Department, which is mostly volunteer, has a full-time fire inspector who, with some assistance from career personnel, does most of the code enforcement and pre-fire inspections. It takes them one-and-a-half-years to conduct all inspections. The Willows (California) Fire Department, which has a combination career and volunteer staff, relies on part-time inspectors and the fire chief to inspect 350 properties for code compliance and 18 buildings for pre-fire planning reinspection. Volunteers occassionally assist in the inspections.

In areas without paid personnel, there often is little organized code enforcement. Pre-fire planning inspections are done infrequently, although an active department may inspect major buildings once every two to three years. A notable exception is Leesburg, Virginia, where the county Office of Emergency Services conducts most building inspections. However, with a professional staff of four to cover 250 square miles, its resources are stretched very thin.

## Record Keeping

The data collected from both pre-fire planning and code enforcement inspections always is reviewed and processed. For pre-fire planning, risk potential needs must be determined and plans for suppression stratagy and tactics formulated. These plans are reviewed continually to incorporate changes noted during later reinspection.

Records of building code compliance are maintained for a variety of purposes, including rescheduling inspections, establishing building profiles, setting priorities and supporting follow-up efforts to secure code compliance if there are any violations. Most departments' files are kept in the fire prevention bureau. Typically, its office is responsible for code enforcement, e.g., supervising inspections and checking quality control, and often coordinates pre-fire planning.

If data compiled furing pre-fire planning inspections and from all phases of building and fire code enforcement were centralized and integrated into one community building inventory data base, FEMA easily could access fire department records. However, centralized data bases are rare.

Automated information systems exist in some departments. Some are just beginning to automate their records-keeping system. All departments surveyed were asked whether their files were

centralized, whether all the data in their building inventory was integrated, and asked to describe the difficulty of retrieving information. Following is a description of record-keeping capabilities of the departmental groups.

Larger metropolitan departments have a greater need to automate their record files because of the size of the communities they serve. They also have access to greater funding than most of the other department. Their size allows them to take advantage of economies of scale.

With the exception of one city, all had automated their information systems to some degree. None, however, had integrated data from both pre-fire planning and code enforcement inspections, although they were planning to do this. It appears that the first data base to be entered into an automated system was building code enforcement inspections, primarily to coordinate scheduling and to facilitate record keeping. Most pre-fire plans were stored in manual systems.

Code enforcement information typically is centralized and kept at the fire prevention bureau. Pre-fire planning data may be centralized, but also may be kept at the districts where it will be used.

The organization of the Dallas (Texas) Fire Department would pose a unique problem for data collection. Fire department management is decentralized. Each district maintains its own data base and is not linked with the central office except for supplying aggregrated data for statistics. If the fire prevention bureau conducts the inspection, the information would be centralized at that office. However, if the district stations conducts the inspection, then the information will remain at the station.

Urban and suburban/ring departments mirror the record keeping practices and capabilities of metro departments. Nearly half of those contacted used manual systems for code enforcement and pre-fire planning data. Typically, code enforcement data is centralized and kept at the fire prevention bureau.

The capabilities of departments with automated data processing, particularly the suburban/ring communities, appeared to equal, and sometimes surpass, those of the metro departments. Wichita Falls, Sarasota, Lisle and Tualatin Fire Districts all have the capability to retrieve code enforcement and pre-fire planning data. Most of the information is centralized and integrated, and all fire chiefs reported that retrieval was not difficult.

Directors of departments with manual systems reported that retrieving data sometimes is difficult. Manual information systems lack the flexibility for ready retrieval of information and manipulating data for purposes other than those originally designed. Information always can be retrieved, but requires cross-checking and familiarity with the system.

One volunteer department had installed a computerized record keeping system but had not yet integrated pre-fire planning and code enforcement data. The fire chief said that all information could be obtained readily, and that the manual system system would not be an obstacle.

The filing systems of the other volunteer departments varied. Two appeared to have haphazard filing systems for pre-fire planning. While they may fulfill their needs, FEMA's retrieval of their data would be difficult. However, in one community, additional information could be acquired from the county fire marshal's office.

The rest of the departments surveyed had manual information systems similar to the other manual systems discussed. All information was centralized.

## DEPARTMENT PROFILE

### SUMMARY

The previous descriptive analyses of fire department activities indicate a surface feasibility for implementing Alternatives 1 and 2. The fire service does have the technical and organizational capability to assist FEMA in its disaster shelter identification program.

The following conclusions generally can be made about fire department capabilities:

- All fire departments have ongoing programs to inspect the major structures in their communities. The types of buildings, inspections and the inspection frequency vary, but, generally, structures that would qualify as shelter candidates are inspected and data about them is collected them.

- Most departments are aware of any new construction and of any changes in use, occupancy or structure in any existing buildings.

- Fire service personnel involved in building inspection receive some training in building construction and inspection techniques. While no specific question about

training was asked, it can be assumed that the inspection force would be trained for the tasks assigned. The depth of the training varies and is a function of the range of their responsibilities.

- All departments maintain a building inventory record keeping system. Some systems, whether manual or automated, have a greater capability for retrieving information than others. Generally, information collected from code enforcement inspections is centralized and kept at the fire prevention bureau. Pre-fire planning inspection information may or may not be centralized. However, the smaller the community, the greater the probability that the data will be stored at one location.

## FIRE DEPARTMENT REQUIREMENTS

Fire department requirements for implementing Alternative 1, Initial Identification and Updating, or Alternative 2, CRP Shelter Inspection, is an important aspect of fire service involvement in shelter survey.

In order to explore this issue further, the fire chiefs initially interviewed also were asked for their opinions about the costs of implementing alternatives based on their individual departments' organizational and technical capabilities. The following considerations were used to assess potential costs for implementing both alternatives:

- o Training Costs - How much specialized training would be required?

- o Information Processing Costs - How burdensome would processing the additional information required for the alternatives be given existing data processing abilities?

- o Time Costs - How burdensome would the increased level of effort by personnel be to conduct any of the activities (including time to conduct activities and time to train)?

- o Administrative Costs - Are the management costs associated with shelter inspection affordable?

Prior to participating in the survey, fire chiefs, or their representatives, received information about the proposed alternatives, including:

- o A brief description of the three alternatives, and their operational and technical requirements; (Alternative 3, NSS shelter inspection, has been eliminated).

- o A National Shelter Survey and Crisis Relocation Planning Survey data input form to provide a basic description of the required data elements for the alternatives; and,

- o Estimates of the time needed to conduct the inspections and the costs to administer the increased work load.

The time estimates were:

1. Additional time to conduct initial identification and to update is not significant. (Alternative 1).

2. Time to conduct CRP shelter inspections is an additional 10-15% of current building inspection requirements. An average building takes about 40 minutes to inspect. (Alternative 2).

3. Estimated administrative costs (supervising program, training and inter-organizational

liaison will be an additional 20% of existing costs to conduct pre-fire and code enforcement activities.

The program descriptions are not complete, thus assumptions are only approximate. The purpose of providing them to the survey participants essentially was for their heuristic value. The descriptions provide fire officials sufficient information to explore the operational requirements for instituting these alternatives and for assessing them against their departments' present resources and organizational capability. Their conclusions are subjective, but are framed within a context of what they, as fire department managers, can or cannot do.

The officials were asked nine questions regarding the technical and organizational aspects of administering either alternative (See Appendix C). Their responses were rated on a relative scale of one to five, where one is not feasible and five is very feasible. In addition to these questions, the officials were asked to rate a list of potential obstacles that summarize the previous questions.

## Data Analysis

Generally, all of the fire departments surveyed had moderate or favorable responses to Alternatives 1 and 2. Most departments, both within and among the groups, including volunteer and

rural departments, concluded that, given the information on the alternatives provided, the limitations and costs of conducting the inspections and providing the n .essary support would be only moderate. Alternative 1 (Initial Identification and Update) averaged in the three to four range, while Alternative 2 (CRP Shelter Inspection) was in the range of three.

There were some exceptions to these favorable responses. While some of these exceptions were based on program considerations, others were based on a misunderstanding of the questions or a resistance to the questioning altogether. This last problem will be discussed later.

## Compatibility of Activities

Fire officials were asked to assess whether the skills and activities required for Alternatives 1 and 2 were similar to those required for present building inspection programs. Specifically, they were asked, "Are the activities and required skills for the following tasks similar to either pre-fire planning or code enforcement inspections?"

The intent of the question was to determine the level of skills in the department, and how much additional training would be needed. When reviewing the questions, two points need to be considered: first, who would conduct the inspections (suppression personnel and/or fire inspectors), and, two, what are the present building inspection responsibilities of these personnel.

Most metro officials rated this query a three to four. They said the skills needed for Alternative 1 already existed in the department and that little additional training would be needed. While there was greater variability in assessing CRP shelter inspection (Alternative 2), most thought the requirements did not exceed the capabilities of those who would be responsible for the inspections. All of the departments have in-service, code enforcement and pre-fire planning inspections.

The metro fire department official consistently gave negative ratings to both alternatives. His ratings were based more on organizational than technical factors. He said the activities required a set of rules and procedures so sufficiently different from present ones that the building inspection program already in place would have to be revised. He also said the present system had no place for additional information.

The responses of suburban/urban departments were similar to those of metro departments in that they indicated that the skills required were moderately similar to those already in the department. This was true for both alternatives. One official commented that because he already was using companies to conduct code inspections, much of the initial effort to conduct either alternative already had been completed.

The ring communities gave the highest rating, five, to Alternative 1 and four to five to Alternative 2. All had suppression company pre-fire planning and code enforcement inspections and all officials commented that additional training either would not be necessary, or would it present a problem.

The responses of rural fire departments were the most varied. Some gave a moderate-to-high rating for both alternatives, while others gave them consistently lower ratings. The structural and operational differences within the group were slight, and would not appear to account for the differences. All are primarily volunteer, and, in fact, one of the "low-rating" departments had several career staff. It is possible that these officials misunderstood the intent of the question and related it to the availability of personnel.

Fire officials then were asked whether either alternative could be integrated into existing programs. "Given your present activities in building inspection, and the availability of personnel and time to conduct inspections, could any of the following activities be integrated into your present program?" The intent of the question was to inquire about their present logistical capabilities.

All groups, with the exception of the rural departments, had similar responses about the skill levels of their personnel. Again, they said that if departments inspect buildings, they need skilled personnel and a system to coordinate and organize the inspections.

Generally, rural departments gave lower ratings to this question, more so for Alternative 2 than Alternative 1. These departments generally conduct fewer annual inspections and most of them are reinspections. Further, they do not always have access to skilled personnel. At times, the logistics of conducting inspections are haphazard.

If fire departments conducted either Alternative 1 or Alternative 2, some training would be necessary. It was estimated that the training time for Alternative 1 would be approximately a half-hour, while Alternative 2 would require up to two hours. Fire representatives were asked whether this training could be integrated into regular training programs if the trainers were provided by FEMA, "If training was provided, could it be integrated into your regular training programs?"

Most departments found the additional training time needed to be of little consequence. Alternative 1 was rated more feasible than Alternative 2.

The exception to this were Dallas, which apparently has less flexibility for altering training programs, and rural departments, which have fewer resources and time for training. Dallas' response centered on the time necessary to implement changes in its program, a problem even with a high priority program. Rural department responses averaged three for Alternative 1, and two to three for Alternative 2. Typically rural departments, especially

volunteer, have fewer resources to commit to training. In addition, motivating volunteer fire fighters to train for these activities can be difficult.

## Information Storage and Processing

Once information is collected for either initial indentification and update, or CRP shelter inspection, it has to be entered into some type of system for storage, processing and analysis. All of the departments have some kind of record keeping system. While information systems differ according to the amount of data stored and the purposes for which they are designed, most fire department data systems are quite similar. Nearly half the departments surveyed already had automated their systems.

Few officials thought Alternative 1 would pose any problems. Most departments in all groups could handle the increased load readily even considering the need for additional forms and coding alterations. The data resembled what already existed in their data base, with the exception of latitudinal and longitudinal determinations. The additional burden on the record keeping capabilities of all departments was thought to be minimal for implementing Alternative 1.

Alternative 2 received slightly lower ratings among all groups, reflecting a qualitative and quantitative difference between the typical data collected and what would be required for

Alternative 2. Nevertheless, most officials still viewed these data processing requirements as moderately practical, not withstanding certain problems.

The departments with automated data processing typically assessed both Alternatives 1 and 2 higher than those with manual systems, indicating the greater flexibility available with such systems. Many officials cautioned that start-up costs and procedures might be greater for automated systems, and if these costs were considered, the rating would be affected accordingly.

In the larger metro areas, where fire departments are operationally and physically decentralized, data retrieval for Alternative 2 could prove difficult and expensive. If Dallas is a good indication of the problems posed by departmental decentralization, the cost of reprogramming could be prohibitive. While the official's response to Alternative 1 was equally negative, it appeared that implementing it would not be more costly or difficult than for any other departments. A method for referring aggregrated data to the central office already is in place, so all that would be required would be to add a few data elements to the reporting system as needed for Alternative 1. Specific information on the buildings would not be needed, a flag indicating a problem area would be sufficient.

## Review and Analysis of Data Collection

The fire officials were asked to "...assess the feasibility of reviewing/analyzing the data and flagging those buildings needing further attention."

The average response among departments for Alternative 1 was that it might be possible. The response for Alternative 2 was less positive. The primary considerations in this assessment were the availability of skilled personnel and whether the department already had personnel who analyzed analyzing information and investigated problems. With the possible exception of several volunteer departments, most departments had an analysis unit in their fire prevention bureaus.

Rural volunteer departments were at the lower end of the spectrum. For many volunteer departments, it appeared that the amount of time needed for Alternative 2 was significant. In many departments, analyzing the data for initial identification and updating might be possible, but applying this question to Alternative 2 yielded a negative response. A good example was Williston, which rated Alternative 1 a five, while giving Alternative 2 a one because of the department's lack of skilled personnel.

Overall department productivity in processing and analyzing information is an important consideration. Automated Data Processing (ADP) proved significant, because those departments with ADP capabilities gave slightly higher ratings. They obviously do this type of monitoring and analysis already, so some additional effort is not very burdensome. In fact, several participants suggested that, unless the information was automated, this task would be difficult and costly to accomplish.

If either Alternative 1 or Alternative 2 were implemented, the program would need to be supervised. Responsibilities would include administering the program, maintaining quality control, evaluating the program and performing intergovernmental relations. The question was asked, "Can existing managerial personnel in the fire department assume these additional tasks? The intent of the question was to determine whether the department had the requisite personnel, and whether they would be able to incorporate either alternative into their existing responsibilities.

There was wide variability within the groups regarding this question. Only one metro department assessed this as being moderately feasible for both alternatives. The supervision would be handled by the fire marshal and fire prevention bureau. The other metro cities rated both alternatives negatively.

There also were wide differences among the suburban/urban departments. Kansas City thought it could supervise either program very easily, while the others thought it was not feasible.

The ratings of ring departments were consistent, averaging three to four for both alternatives, with Alternative 2 not being perceived as causing any more problems than Alternative 1, even with the increased work load. Many respondents stated that since this task is being done already, it is not a major problem to do a little more, and that once it is in the system, the extra effort is minor.

The career rural department could handle either alternative easily, but indicated that it is a question of priority. They would have to reduce the level of other activities, otherwise, personnel limitations would prohibit initiating any of the activities. Officials of the volunteer departments thought that, while Alternative 1 would be slightly feasible (an average rating of three), Alternative 2 was not.

## Summary of Cost Analysis For Implementing The Alternatives

Figures 4 and 5 indicate the costs for implementing the alternatives. Relative feasibility is rated in the following ranges: high requirements, moderate requirements and low requirements.

FIGURE 4

ALTERNATIVE 2

Initial Identification and Updating

Requirement Analysis

| PROGRAM REQUIREMENTS | FIRE DEPARTMENT GROUPS | | | | |
|---|---|---|---|---|---|
| | METRO | URBAN | RING | RURAL VOLUNTEER | RURAL PAID |
| LOGISTICS | LOW | LOW | LOW | MODERATE | MODERATE |
| PERSONNEL | MODERATE | MODERATE | MODERATE | MODERATE | LOW |
| DATA PROCESSING | MODERATE | MODERATE | MODERATE | HIGH | HIGH |
| ADMINISTRATION | MODERATE | MODERATE | MODERATE | LOW | MODERATE |

ALTERNATIVE 2

CPR Host Shelter Inspection

Requirement Analysis

| PROGRAM REQUIREMENTS | FIRE DEPARTMENT GROUPS | | | | |
|---|---|---|---|---|---|
| | METRO | URBAN | RING | RURAL VOLUNTEER | RURAL PAID |
| LOGISTICS | LOW | LOW | LOW | MODERATE | MODERATE |
| PERSONNEL | HIGH | HIGH | MODERATE | HIGH | HIGH |
| DATA PROCESSING | MODERATE | MODERATE | MODERATE | HIGH | HIGH |
| ADMINISTRATION | MODERATE | MODERATE | MODERATE | HIGH | MODERATE |

FIGURE 5

The greatest obstacle for most departments was the limitation on personnel. This is apparent in the cost analysis of the additional time requirements to conduct the inspections and to train the inspectors, as well as in the increased personnel costs to administer either level of involvement.

This is a more significant problem for Alternative 2 than for Alternative 1. Whereas data collection for Alternative 1 requires only a little additional time and effort, Alternative 2 would involve at least 40% more time per inspection. This assessment needs to be viewed within the context that many fire departments have difficulty meeting current objectives. Further, smaller departments in particular may have a staff of only one or two inspectors who do all of the building inspection work.

Adequate training to conduct inspections for either alternative appears to be a marginal problem. Most participants said that their personnel were trained adequately and attuned to construction inspection on the level necessary. The cost for additional training would be minimal. Because CRP shelter inspections are somewhat more difficult, Alternative 2 was rated higher in requirements.

The low costs required for additional training is a good indication of the caliber of the personnel in most fire departments. They are a trained, well disciplined work force, attuned to building construction and maintenance.

The only other problem area identified was record-keeping. While it was not indicated that the additional information would be too burdensome, the departments with automated systems gave record keeping higher ratings than those with manual systems. Manual systems obviously are limited in flexibility and data processing, retrieval and analysis would be time consuming. Because of the amount of data requirements, this is more applicable for Alternative 2 than for Alternative 1. Nevertheless, most officials felt the data was sufficiently compatible, and that data entry and record-keeping would not pose insurmountable problems. There are some costs that would be incurred, e.g., new forms and additional software. However, good software design should accommodate moderate program alterations without significant redesign.

A problem could occur in what actually would be done with the collected information. Data processing requirements and their costs increase depending upon what the fire department will do with the information it collects. These requirements include costs for technical equipment and personnel. It appears that these costs vary relative to fire department responsibilities and its capabilities. The more data processing and analysis activities, the greater the potential cost.

If the information system is not automated, data collection and analysis will be time consuming and will require additional personnel. Few departments with manual systems indicated they

had the personnel to do this additional work. In fact, in some communities, the amount of data collected for CRP shelter inspections might be too unwieldy to for manual manipulation.

If the department has an automated system, it likely has personnel available to enter and manipulate data so additional work is not overly burdensome.

Whether automated or not, it appears that volunteer departments could handle Alternative 1 marginally, but not Alternative 2. They do not have the resources for such discretionary activities.

There does not appear to be significant difficulty in managing either alternative. Again, volunteer departments would have difficulty, but others indicated that there was no difference in Alternative 1 or Alternative 2 in this regard, and that it would not overburden present capabilities. However, there is the personnel factor, and, depending on the number of tasks that need to be completed, i.e., quality control, analysis, evaluation, intergovernmental relations), the costs will increase.

## SECTION SIX

## CONCLUSIONS

One of the difficulties in drawing conclusions about the capabilities of the fire service lies in its variability. The differences in the types of department (career, volunteer or combination), as well as in the size and characteristics of the community served make general comments about the fire service difficult. This variability obviously will affect the type and depth of building inspection activities important for assessing the feasibility of the proposed alternatives. While, all departments conduct pre-fire planning or code enforcement inspections, there activities differ dramatically in their comprehensiveness, frequency, personnel requirements and other programmatic characteristics.

Some of these differences among departments became evident from the differences in the responses of the fire officials to the questionnaire on the costs of implementing the alternatives. While the survey sample was too small to make statistically valid conclusions about fire service characteristics and capability, it, nevertheless, was sufficient to permit inferences about parameters of the feasibility of fire service involvement in disaster shelter identification.

While the organizational and technical components of the departments vary considerably, it can be concluded that the fire

service has the operational foundation to implement Alternative 1 - "Initial Shelter Identification and Updating," along with Alternative 2, "CRP Host Shelter Inspection."

All the departments surveyed conduct building inspections, and all have an organization to coordinate and conduct the inspections, update information and administer the program. They have technical personnel skilled in performing inspections, analyzing the data and supervising the program. Moreover, all departments had some type of record-keeping system.

It appeared that the size and type of department had less effect on technical and organizational capability than on the costs of the alternative assistance levels. Regardless, the responses to the cost considerations of Alternative 1 were, generally, all in the moderately feasible range. The costs for conducting a CRP Host Shelter Inspection program (Alternative 2) were perceived to be slightly higher.

Some of the variation among the departments for both operational structure and cost concerns were noteworthy. For example, one of the reasons for these variances could be termed "management techniques." Dallas' estimates for the incremental costs of involvement were consistently lower than those of other metro departments. The feasibility of integrating either alternative into its existing operational structure also was less. Dallas is more decentralized than the other metro departments surveyed, and

is typical of the management approach being adopted by many departments. Each of Dallas' 48 stations is self-managed, each has its own data base and sets its own objectives and pace. Only aggregrated data useful for statistical purposes is forwarded to the central office. Decentralization of this kind increases the difficulty of coordinating a departmental wide data collection program. Moreover, data retrieval is much more cumbersome.

Ring departments generally gave more favorable responses to both operational and cost concerns than other groups and probably would be better candidates for implementing one or both alternatives. Many of these departments have adequate funding, and many of their communities are newer and expanding (or, recently were expanding). These factors seem to facilitate the adoption of newer techniques and ideas. Moreover, their work forces tended to be recently hired and younger than average, and consequently, more receptive to non-traditional activities.

Size may be another factor. Many larger cities have more difficulty adopting newer programs simply because the department and city's bureaucracy are larger, resulting in more interested parties involved in the political process.

## ASSESSING THE FEASIBILITY OF ALTERNATIVE LEVELS OF INVOLVEMENT

The work effort needed to implement each alternative can be divided into two areas: data collection and information processing. The data collection effort involves conducting and managing the inspections.. Information processing involves entering, storing, analyzing and reporting data. It appeared that recommendations for implementing either alternative revolved around evaluating each phase by two criteria: available personnel and technical capability. The extent to which the alternatives cannot be integrated into the existing operational structure, and the extent to which unacceptable, additional costs will be incurred from such involvement stem from these factors. The following conclusions should be considered in order to make recommendations:

- Most departments can collect data for Alternative 1. The additional skills and time necessary to conduct the inspections would be minimal.

- Alternative 2 would strain the personnel requirements of most departments, especially rural volunteer departments. While the skills and time involved for Alternative 2 would be only slightly greater than for Alternative 1, they are sufficient to cause difficulty.

- All departments have information systems. While data entry for Alternative 1 would be somewhat easier, and thus, less costly than for Alternative 2, the differences are marginal. However, the data requirements for Alternative 2 are more extensive and would be cumbersome for a manual system. In fact, the additional data demands might overload the capabilities of a manual system in a suburban/urban or metro city. An automated system would be able to handle the additional input, and although there would be some costs for additional programming, the costs for data entry would be minimal.

- Program management is another factor that would affect the success of any activity. This task includes a variety of responsibilities ranging from ensuring quality control for data collection to reporting to FEMA or the local civil defense agency. While Alternative 2 requires more data processing capability and the availability of more skilled personnel than Alternative 1, the management requirements for both alternatives are similar to the extent that the costs for Alternative 2 are not much greater than for Alternative 1.

- Most departments could process the information collected for Alternative 1. Flagging problems and referring them to the responsible agency is an additional, but minor

task. Some departments, especially volunteer, would have some difficulty accomplishing these tasks because of limited personnel. Otherwise, because most departments already do similiar activities, identifying candidate shelters, verifying shelter status and referring the outcomes to the responsible agency should be easily integrated.

- Any supervisory and analytical work necessary to implement Alternative 2 would require additional staffing. At a minimum, basic supervisory work would be necessary. Few departments indicated this was affordable. Rural departments indicated it was not. Further, it is likely that only those departments with automated informations systems would be able to do any analysis. Alternative 2 does not apply to metro cities, because most of their buildings would be suitable for NSS shelters.

## INCENTIVES

Technical and organizational obstacles that limit the feasibility of Alternative 1 are data processing and lack of supervisory personnel. On a larger scale, these essentially are the same obstacles to implementing Alternative 2, with the exception of the additional personnel needed for data collection.

FEMA possibly could reduce the costs of department involvement for these two alternatives by providing assistance in the following areas:

1. FEMA could provide the equipmente, e.g., mini-computers, for the those departments lacking automated data systems. This would assist the fire department in managing the data processing requirements for Alternative 1, and, perhaps, for Alternative 2. Further, automated data processing could increase the productivity of the fire department resulting in a general re-allocation of resources and in further reductions in the costs associated with implementing the alternatives.

2. Data collection problems stem not from the level of skills and capabilities of the fire department's personnel, but from their availability. FEMA might consider giving fire departments additional funding to increase their staffs or to free personnel from other activities. The funding could be used to hire a full-time employee, for example, a retired fire fighter, a civilian inspector, or whomever would be most effective for that department. The object is to split the costs of conducting the program with the fire department. The fire department would be getting some personnel funding and FEMA would be getting in-kind services that would be for more expensive to duplicate.

Either option could be used as an incentive to obtain the fire department's cooperation. Often, feasibility can be increased when priorities are shifted. Further, because a significant number of the nation's fire chiefs also are their community's civil defense director, a relationship that would facilitate this type of cooperation already may exist between FEMA and the fire service.*

Either type of assistance could be the only means for FEMA to obtain the assistance of many fire departments. As local revenues shrink, and public services become more expensive, many fire departments are responding by reducing services and cutting back personnel. This, of course, affects their ability to implement either alternative. It also could increase the costs of conducting any additional activities.

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* It is interesting to note that approximately 30 to 40% of IAFC member fire chiefs are their community's designated civil defense director. This percentage is supported by a 1980 study, conducted by the IAFC for FEMA, which found that at least 25% of the IAFC membership surveyed were, indeed, civil defense directors.[10]

A study by the Urban Institute on the responses of 17 local governments in Massachusetts to smaller budgets that resulted from Proposition 2-½, revealed that the following findings were relevant to assumption of extra responsibilities by the the nation's fire service:

- o While the budgets of public safety agencies were cut less than those of other departments, they did receive "real" reductions.

- o The response was overwhelmingly a reduction of services and elimination of costs. There were new fees and some services were contracted, but there were few innovations or productivity improvements to accompany reductions in service.

- o Reductions in inspection and fire prevention efforts was one of the primary responses.[11]

## Options

The costs of implementing either program could be reduced depending upon whether the fire department's role in data analysis is active or passive. The costs vary depending on the amount of information and extent of analysis needed, as well as the fire department's current capability to process and analyze that information.

Following are three options FEMA could consider in developing a program to implement either alternative:

1. The fire department would collect and enter into its information system the disaster shelter data. FEMA or one of its representative then would survey the files. This option could lessen fire department costs associated with data processing and supporting requirements.

2. The fire department would collect, enter and analyze the disaster shelter information, but would not necessarily reprocess the final product for transfer to FEMA. The data elements and analysis might not be readily compatible for FEMA's use. This could eliminate a time-consuming step in the data analysis stage. There would, however, be additional costs to FEMA because it would have to convert and analyze the information.

3. The third option would require greater participation by local emergency preparedness personnel. They could assume a larger role in the supervisory and analytical tasks associated with either alternative. This option could require that FEMA provide more funding to state and local civil defense agencies. An interesting spin-off of this option is that, because many fire chiefs are their community's emergency management directors, it could result in greater funding for fire departments.

Each option varies in its costs to the fire department as well as to FEMA. Further, given the uniqueness of any particular fire department and its coordination problems with FEMA, either option might be more effective.

## Costs To FEMA

FEMA would incur potentially two types of costs for fire service involvement in disaster shelter inspection. The first type of cost would be for activities associated with administering the program. Because FEMA has a program already in-place, it would not appear that these new activities would require any significant effort. The second cost involves compensating participating fires departments for their costs. This compensation could also be used as an incentive for participating.

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Regardless of the alternate level adopted by FEMA, the following activities will have to be conducted:

- o promote the program and persuade fire departments to participate;
- o provide training;
- o coordinate the activities among all participants; and,
- o supervise fire department inspections.

The most efficient and effective use of FEMA resources likely would be in developing on going disaster shelter inspection programs that could be integrated fully into the other building inspection activities of fire departments, thereby eliminating the need to retrain and repromote the program every time information is needed. This approach might help to avoid the poor results FEMA received on its previous attemps to involve the fire service.

The level of training and supervision FEMA will have to provide will depend on the scope of the fire departments' activities.

Most fire departments have the foundation to undertake either alternate level of involvement. Nevertheless, the more that is demanded of them, the more likely their resources will begin to fall short of the amount needed to complete the task. If FEMA choses to compensate departments for these shortfalls, it will, of course, add to FEMA's overall cost.

Potential compensation could range from reprinting inspection forms, and redesigning data processing systems to providing assistance grants to pay for such costs as inspection personnel and data processing equipment.

## POLITICAL ACCEPTABILITY

The survey did not attempt to amalyze the political acceptability of either alternative. Nevertheless, political acceptability is an important criterion in any decision-making, and, in many respects, colored the responses given by the survey participants. Fire officials, asked to look at the technical and organizational aspects of abstractly setting up a program, had to be convinced that this was only an academic exercise. The staff had more success convincing some officials than others. Further, two important considerations in determining technical and organizational feasibility are the level of priority of the proposed program and whether resources can be shifted to initiate the operation. Many fire officials indicated that if a decision were made by their superiors to inspect shelters, then it could be accomplished. The conclusion that can be drawn from this is that FEMA might need to persuade not only fire officials to participate in this program, but other community officials as well.

While some officials were mildly receptive to the study's objectives, many had negative opinions. They said assisting in disaster shelter inspection was inconsistent with the goals of fire protection and believed that the alternatives proposed were not akin to the fire department's role in emergency management. Moreover, many responded that increasing service to the public merely by assuming another activity or function was not sufficient justification for fire department involvement in this

program. Such functions as building code inspection might be compatible, but shelter inspection clearly was not. One fire official asked whether representatives of such other community agencies as the police and health departments also were being interviewed.

It appeared that departments, or their fire chiefs with a larger perception of their roles as emergency managers were less reluctant to involve themselves in the study. Because evacuation is a necessary function to achieve the goal of comprehensive emergency management, these fire officials may have seen a greater utility in the activity of disaster shelter inspection.

These were unsolicited comments. There was no attempt to collect them methodologically or to analyze them. They are, at best, useful as indicators. Nevertheless, political acceptability could be a serious obstacle to initiating any program, and warrants further study.

## SECTION SEVEN

### REFERENCES


1. Joseph Moreland, "Emergency First Responder," Emergency Management, Winter 1981, p. 11.

2. Comprehensive Emergency Management: A Governor's Guide, National Governor's Association (Washington, D.C.: Government Printing Office, # 008-040-0079-G, 1979), P.11.

3. State Comprehensive Emergency Management, National Governor's Association (Washington, D.C.: Government Printing Office, # 008-040-0080-0, 1979), p. 313.

4. The Municipal Year Book 1984, International City Management Association, (Washington, D.C.: 1984), p. 147.

5. Shelter Survey Technician Course. Student Manual, Federal Emergency Management Agency, Washington, D.C., January 1982, p.3.

6. Fire Protection Handbook, 14th Edition, (Boston: National Fire Protection Association, 1980), p. 9-27.

7. Ibid., pp. 9-27, 28.

8. William E. Clark, Fire Fighting/Principles and Practices. (New York: Dun Donnelly Publishing Corporation, 1974), pp. 250-251.

9. Lee M. Feldstein, "Overview of Code Administration: Recommendations for Action," Code Administration and Enforcement: Trends and Perspectives, Management Information Service Special Report, No. 10, International City Management Association, 1982, pp. 35-40.

10. Michael S. Hildebrand, Disaster Planning Guidelines For Fire Chiefs, Federal Emergency Management Agency, 1980, pp. 7-10.

11. John M. Greines and Harry P. Hatry, Coping with Cutbacks: Initial Agency - Level Responses in 17 Local Governments to Massachusetts' Proposition 2-½, Prepared by the Urban Institute for the United States Department of Housing and Urban Development, 1982, pp. 30-43.

## APPENDIX A

### FEMA Regional Shelter Program Manager Questionnaire

1. Describe present status of CRP/NSS in your region. Plans up until 1985.

2. How will future plans to contract with states for shelter surveying affect meeting objectives?

3. What areas still need to be done? (activities) Are there geographical gaps in the program (host/risk)?

4. Indicate the priority among activities?

5. Do you have sufficient resources to achieve objectives? Are present hiring practices for field personnel adequate for achieving objectives?

6. Assess the importance of reinspecting CRP and NSS shelters to check for changes in use or structure. Circle appropriate value.

| not important | | | | very important |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

7. Indicate the feasibility of incorporating the following alternatives into your CRP/NSS survey program. (consider: overall cost-effectiveness for data collection and shelter identification; data processing; and, supervision and administration)

   Assess the utility of using semi-skilled (non-engineering or architectural) personnel who are attuned to the structural characteristics of buildings for the following tasks:

| | not feasible | | | | easily managed |
|---|---|---|---|---|---|
| CRP | 1 | 2 | 3 | 4 | 5 |
| NSS | 1 | 2 | 3 | 4 | 5 |
| ID | 1 | 2 | 3 | 4 | 5 |

8. Do you think that the information needed for CRP/NSS shelters is essentially similar to the information collected by fire departments during pre-fire planning inspections and building code inspections?

| | not compatible | | | | easily managed |
|---|---|---|---|---|---|
| CRP | 1 | 2 | 3 | 4 | 5 |
| NSS | 1 | 2 | 3 | 4 | 5 |
| ID | 1 | 2 | 3 | 4 | 5 |

9. Is training for shelter inspection and data processing available for fire department personnel?

| | no | perhaps | yes |
|---|---|---|---|
| CRP | 1 | 2 | 3 |
| NSS | 1 | 2 | 3 |
| ID | 1 | 2 | 3 |

10. Assess the feasibility of readily integrating shelter inspection tasks in existing fire department building inspection activities with little additional effort. (consider: the similarity between the skills, procedures and administration)

| | not feasible | | | | easily managed |
|---|---|---|---|---|---|
| CRP | 1 | 2 | 3 | 4 | 5 |
| NSS | 1 | 2 | 3 | 4 | 5 |
| ID | 1 | 2 | 3 | 4 | 5 |

11. Comment on the practicality of ensuring quality control and supervising fire department involvement in CRP/NSS.

12. Would you want the fire department to assume a passive or active role in dat processing and analysis?

Assess the feasibility of the fire department only surveying CRP/NSS, collecting information in their information system - CD/FEMA would have to survey these files.

| not feasible | | | | easily managed |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

The fire department could collect shelter information, process and anlyze making appropriate referrals to CD/FEMA.

| not feasible | | | | easily managed |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

The fire department could maintain the shelter file, integrated in its information system, coordinated with local CD.

| not feasible | | | | easily managed |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

APPENDIX B

Name _____

Department _____

Address _____

_____

Type of Department: paid _____, combination _____,

volunteer _____

Size of area served: population _____

square miles _____

1. Does your community have an emergency disaster plan?

2. Was the fire department involved in its development?

3. To whom does the civil defense director report?

4. Describe formal and informal working relationships between CD an

PRE-FIRE PLANNING

5. What property types are inspected?
   _public assemblies _hospitals, related institution
   _ transient residential properties (hotels, rooming houses)
   _ commercial _ industrial
   _ schools _other, _____

6. Number of properties to be inspected? Are there priorities?

7. % of properties inspected annually?
   # of years for complete inventory inspection?

8. Who performs these inspections?

9. Est. # of hours annually spent on pre-fire planning inspections?

10. How is data from inspections maintained? ( is system automated? Is it centralized or kept at districts)

11. Is your data processing system adequate for your needs? Is it unwieldy (is it difficult to retrieve information) ?

12. Is the data from pre-fire planning inspections integrated with data from fire and building code inspections?

13. Describe supervision of data processing system? Who monitors the system? Checks quality control?

Analyses data? Follow ups on problems?

If pre-fire and code enforcement are not integrated, get same information on code enforcement data systems.

## Code Enforcement

14. Does the fire department review building plans? What property ty

15. Are some building plans missed? Approximate %.

16. What abour rehabs?

17. Is the fire department required to sign-off on building permits?

    On certifcates of occupancies?

18. Does the fire department review requests for changes in occupanc and use? Does it sign-off on new certificates of occupancy?

19. Are changes in ocuupancy and use missed?

20. Are existing buildings inspected for fire code compliance? What property types?

21. How is your inspection program organized?
    - __ specialized and targeted inspections
    - __ in response to a compliant
    - __ spot checks
    - __ inspection of all buildings allowable (door to door)

22. Average time to inspect a building? School __ Theatre___ Commercial ____(distinquish between inspection and spot check or

23. # of buildings to be inspected? _____
    How long until all buildings are inspected? (annual, 2 yrs., 3 yr never)

24. Estimate number of man-hours annually spent on code enforcement inspections?

25. What personnel are responsible for code inspections? Civilians___ company personnel_____ bureau inspectors_____

    If more than one, describe division of duties.

26. If your objective is to inspect all buidlings, how do you ensure complete inventory inspection? What about new buildings and occupanc

APPENDIX C

Use scale from 1 to 5, 1 being not feasible and 5 being very feasible

6/25/82

Fire Chief Questionaire - Phase 2

1. Are the time estimates more or less correct?

2. ARe the activities and required skills for the following tasks similar to either pre-fire planning or code inspections?
I.D. and update_____
CRP_____
NSS_____

3.Given your present activities in bldg inspection and the availbilit of personnel and time to conduct inspections, could any of the following activities be integrated into your present program?
I.D._____
CRP_____
NSS_____

4. If training was provided, could it be integrated in regular traini programs? (availability of time for training inspectors)
I.D. and update_____
CRP_____
NSS_____

5. Is the data collected from the following tasks compatible with existing information system? Consider both data entry (forms) and processing.
I.D. and updating_____
CRP_____
NSS_____

6.Assess the feasibility of reviewing/analyzing the data and flagging those buildings needing further attention.
ID AND UPDATING_____
CRP_____
NSS_____

7.Would supervisory personnel be able to assume the additional tasks to supervise and monitor program?
ID AND UPDATING_____
CRP_____
NSS_____

8. Assess the degree of difficulty limiting fire department participat
for the following categories.

Personnel limitations_____

Adequate training_____
Administraive costs_____

Data processing_____

Logistics_____

Interdepartmental relationships_____

9. Would many of the obstacles toward implementing a shelter inspectio
program in your department be overcome if supplemental funding for
program costs would be available, i.e., subsidizing capital costs, suc
as data processing equipment, or subsidizing the salary of an inspecto

ID AND UPDATING_____
CRP_____
NSS_____

APPENDIX D
CIVIL DEFENSE DIRECTOR

CD QUESTIONNAIRE

1. General discription of CD program: activities, personnel, funding, etc.

2. Describe formal working relationship with FEMA.

   A) Ask about reporting requirements, joint membership on task forces, etc. What type of activities are they involved with jointly?

3. Does the CD play an active role in administration of shelter surveys?

   * I.D.
   * Updating
   * CRP
   * NSS

   A) If yes, extent of activities and limitations on program. How is CD data collected, stored, communicated to FEMA regional office, and analyzed?

   B) If no, then can they collect information on buildings from other departments?

4. Is there an information sharing system between your office and the regional FEMA office? If so, what format is data stored and transmitted?

5. Describe formal working relationship with FD.

6. Can you see a role for the fire department in collection of data for the CRP and NSS programs? Comment on the practicality of ensuring quality control and supervising fire department involvement in both inspection programs.

7. Does your office currently possess the capability to collect data from the fire department and then transmit the data to the FEMA regional office?

   A) If not, what problems would need to be addressed in program and data format design before both data bases would be compatable?

   B) Could they survey FD building inspection records?

   C) Would they want the FD to analyze data?

8. If the fire department became an actor in data collection for the CRP/NSS programs; what organizational structure whould you recommend between your office, FEMA, and the fire department to perform and meet current FEMA program objectives?

APPENDIX E

BALTIMORE COUNTY FIRE DEPARTMENT
HI-RISE AND SPECIAL HAZARD SURVEY REPORT

1. NAME OF BUILDING: _____

2. ADDRESS: _____

3. OCCUPANCY: _____

OCCUPIED DURING THE HOURS OF: _____

4. MANAGER: _____ ADDRESS: _____

PHONE: DAY _____ NIGHT _____

5. GENERAL INFORMATION: TYPE OF SECURITY _____

LOCATION OF PRIMARY FIRE DEPT. WATER SUPPLY _____

No. OF UNITS ____ TOTAL BUILDING POPULATION: DAY ____ NIGHT ____

ANY INVALIDS IN BUILDING? ____ ALL ROOMS MARKED WITH INVALID "I" _____

EXCEPTIONS _____ EVACUATION PLAN _____

---

INTERIOR COMMUNICATIONS _____

CONSTRUCTION: FIRE RESISTIVE ____ C.B./BRICK-WOOD JOIST ____ FRAME ____ METALCLAD ____

OUTSIDE WALLS-BRICK ____ STONE ____ C.B. ____ WOOD ____ METAL ____ OTHER _____

ROOF- TAR/GRAVEL ____ METAL ____ CONCRETE ____ SHINGLE ____ OTHER _____

NUMBER OF FLOORS - BASEMENT(S) ____ ABOVE GROUND ____ PENTHOUSE ____

CONSTRUCTION OF FLOORS- WOOD ____ CONCRETE ____ OTHER _____

FIRE WALLS- CONSTRUCTED OF _____ OPENINGS PROTECTED BY _____

7. ENTRY/ACCESS TO BUILDING: (FORCIBLE/APPARATUS)

FRONT _____ / _____

SIDE 1 _____ / _____

REAR _____ / _____

SIDE 2 _____ / _____

INTERIOR STAIRS ____ OPEN ____ CLOSED ____ DOORS AT LANDING ____ LOCKED? _____

ELEVATOR(S): MANUFACTOR _____ EMERGENCY TEL. No. _____

SERVE FLOORS ____ TO ____ TYPE OF DOOR CLOSING DEVISE _____

LOCATION OF EMERGENCY KEY _____ FIREMEN'S CALL _____

OPENING FROM SHAFT TO ROOF _____ TYPE _____

8. SPRINKLER SYSTEM: WET___ DRY___ OTHER_____ COVERS FLOORS_____

SPECIAL AREAS_____

LOCATION OF F.D. CONNECTION_____

DISTANCE FROM WATER_____

LOCATION OF ALARM VALVE/MAIN RISER_____

9. STAND PIPE SYSTEM: WET___ DRY___ COVERS FLOORS_____

LOCATIONS OF HOSE CONNECTION_____

LOCATION OF F.D. CONNECTION_____

DISTANCE FROM WATER_____ LOCATION OF CONTROL VALVE_____

10. LOCAL ALARM SYSTEM: TYPE_____ HOW RESET_____

LOCATION OF ANNUNCIATOR_____ CONNECTED TO F.D. BY_____

11. EXPOSURES: SIDE 1_____ LADDER COVERAGE_____

REAR_____ LADDER COVERAGE_____

SIDE 2_____ LADDER COVERAGE_____

FRONT_____ LADDER COVERAGE_____

**********SEE PRE-PLAN MAP FOR FURTHER INFORMATION**********

12. VENTILATION POSSIBILITIES: TYPE OF WINDOWS_____

AIR HANDLING SYSTEM- AUTOMATIC____ MANUAL_____

ROOF OPENINGS_____ HALLWALL VENTING_____

13. LOCATION OF UTILITY SHUT OFFS: GAS_____ WATER_____

ELECTRIC_____ AIR CONDITIONING_____

INDIVIDUAL UNITS_____ OTHER

14. USE/STORAGE OF HAZARDOUS MATERIALS: TYPE_____

LOCATION_____ SEE HAZARDOUS DATA SHEET_____

FIREFIGHTING METHODS/AGENT_____

15. INCINERATOR/COMPACTOR ROOM: LOCATION_____

CHUTS SPRINKLERED___ ROOM SPRINKLERED___ INCINERATOR FIRED BY_____

SPRINKLER SHUT OFF VALVES LOCATED_____

16. STORAGE ROOMS: INDIVIDUAL LOCKERS____ OPEN STORAGE____ CONSTRUCTION_____

ENTRANCE DOOR LOCKED_____ SPRINKLERED?____ LOCATION ON FLOOR_____

BALTIMORE COUNTY FIRE DEPARTMENT

HAZARDOUS MATERIAL DATA SHEET

1. FIRM NAME _____

2. ADDRESS _____

3. NAME OF MATERIAL (S) _____ TRADE NAME _____

_____ TRADE NAME _____

_____ TRADE NAME _____

4. TYPE OF MATERIAL:

SOLID___ GAS___ LIQUID___ CLASS___ FLASH POINT___ SPEC. GRAV.___

VAPOR DENSITY_____ I.C.C. LABEL COLOR_____

FLAMMABLE___ OXIDIZING___ ACID___ CAUSTIC___ POISON___

EXPLOSIVE___ RADIOACTIVE___ VOLATILE___

5. STORAGE: (Type of container normally used)

DRUMS___ BULK TANK___ BAGS___ BARRELS___ CARBOYS___ BOXED___ OTHER___

WHERE STORED _____

QUANTITY _____

6. IF USED ON PREMISES: (Describe re-packaging, manufacturing process,)

USE _____

METHOD OF CONVEYANCE FROM STORAGE TO AREA USED:

MANUAL___ CONVEYOR BELT___ CHUTE___ PIPED___ OTHER___

7. FIRE AND EXPLOSION HAZARDS:

SENSITIVE TO: HEAT___ SHOCK___ WATER___ OTHER___

8. TOXIC HAZARDS:

IRRITANT___ RESPIRATORY___ ABSORBED THROUGH SKIN___ OTHER___

9. SPECIAL COMMENTS AND FIRE FIGHTING TECHNIQUES:

_____

_____

_____

_____

_____

APPENDIX F

SILVER SPRING FIRE DEPARTMENT

NUP SHEET GUIDE

GUIDE SHEET FOR COMPLETION OF SUMMARY FORM

At the top right of the page list:
a. Address
b. Name of Occupancy
c. Type of Occupancy
d. Persons to Contact & Home Phone Numbers

The items listed below are to serve only as a guide. It may not be necessary to provide information on the subject if no apparent problem is found, or when information would not be of any assistance.

2 - SPECIAL HAZARDS - Structural faults, cracked walls, over-loading, hazardous materials, location, amount, 704-M index, man traps.

3 - ENTRY & ACCESS - Recommended entry, locked, how to force, stair location, access to roof, basement, storage, utilities.

4 - SPECIAL APPARATUS ASSIGNMENT - Recommend creation of revision of present assignment.

5 - LIFE SAFETY - Need for evacuation, how, people concentrated, trapped, exit travel restrictions, operational restrictions, outside, inside.

6 - EXPOSURE - Buildings and/or material next to or in vicinity, distance, type construction, combustibility, type occupancy.

7 - CONFINEMENT - Possible fire and smoke travel, fire fighting openings, building protection, fire walls, automatic dampers, doors.

8 - PROTECTION SYSTEMS - Location valves and switches-sprinkler, fire pump, standpipe, interior alarm, emergency lighting.

9 - VENTILATION - Equipment, controls location, building features - wall and roof openings.

10 - OCCUPANCY & FUEL LOAD - Location, type or class, amount, concentrated combustibles.

11 - WATER SUPPLY - Location of FD outside connections, valves, adverse hydrant conditions, distance, small mains, auxiliary sources.

12 - SALVAGE - High value area, stock susceptible to smoke/water damage, water removal methods, drains and sumps.

13 - UTILITIES - Location of valves and controls - interior and exterior - gas, electric, water.

14 - UTILITIES - Location of heat/AC controls and switches, elevator keys, trash room.

15 - CONSTRUCTION - Building specifications, type construction, class type, roof, floors, false ceilings, shafts, how to enter, fire wall location.

FIELD WORK MAY BE MADE ON FORM USING PENCIL OR INK. A FINAL TYPED FORM SHALL BE SUBMITTED TO F.S. Office.

DATE AND INITIAL FRONT AFTER EACH INSPECTION

APPENDIX G

CITY OF MIAMI FIRE DEPARTMENT
FIRE CODE INSPECTION GUIDE

TYPE INSPECTION: F.C.S.P.( ) C.R.( ) R( ) COMP.( ) OTHER( ) DATE:_____

BUILDING ADDRESS:_____ EXACT USE:_____

OCCUPANCY: GROUP_____ 901 _____ TYPE CONST._____ # FLOORS_____ # UNITS_____

OWNER NAME: _____ ADDRESS:_____ PHONE:_____

AGENT/MGR. NAME:_____ ADDRESS:_____ PHONE:_____

PERSON CONTACTED:_____ TITLE:_____

MEANS OF EGRESS:

1 ( ) Keep required exit doors unlocked when building is occupied. 19-169(d), 19-173
2 ( ) Remove obstructions from means of egress. 19-169(a)(b), 19-42(5)
3 ( ) Keep stairway/fire escape doors closed. 19-172, 19-30(e)(f)(g)
4 ( ) Stairway door(s) swing in wrong direction. 19-28(d)
5 ( ) Provide adequate lighting for means of egress. 19-171
6 ( ) Provide/illuminate exit/directional signs. 19-170(b)(c)
7 ( ) Provide fire exit plans as required (Group "R", transient accomodations, three or more floors). 19-170(d)
8 ( ) Provide key for Fire Department Emergency Service Elevator. 19-193

GENERAL HAZARDS:

9 ( ) Remove excessive combustible storage from meter room/trash chute room/basement. 19-42(3)
10 ( ) Remove excessive combustible trash from exterior of building. 19-538

SPECIAL HAZARDS:

11 ( ) Protect community kitchen. 19-42(6), 19-173
12 ( ) Class 1-A and/or 1-B flammable liquid storage beyond 1 gallon limit. 19-260(1)
13 ( ) Remove flammable liquid storage from means of egress. 19-283(a)
14 ( ) Maintenance supply storage (Flammable Liquid) non-conforming. 19-283(b)(2)

FIRE ALARM SYSTEM:

15 ( ) Fire alarm system required. 19-196(5)(a)(b)
16 ( ) Submit fire alarm test report to Fire Marshal. 19-193, 19-6

VERTICAL SEPARATION:

17 ( ) Enclose stairway/provide separation between floors. 19-29(a)
18 ( ) Utility shafts or other vertical openings not sealed. 19-30(a), 19-42(6)
19 ( ) Install/repair self closer/positive latching device on stairway/trash/chute/linen chute doors. 19-30(f), 19-42(6)

HORIZONTAL SEPARATION:

20 ( ) Provide conforming horizontal separation. 19-29(b)

GAS SERVICE:

21 ( ) Provide/mark/protect branch line control valve. 19-439(1)(2)
22 ( ) Lock unused branch line/meter in closed position. 19-439(2)(a)(b)
23 ( ) L.P.G. installation non-conforming. 19-42(2)

SPRINKLER STANDPIPE SYSTEM:

24 ( ) Sprinkler and/or standpipe system needs maintenance. 19-193

ELECTRICAL:

25 ( ) Extension cord violations. 19-626

PORTABLE FIRE EXTINGUISHERS:

26 ( ) Provide _____ fire extinguishers. 19-606
27 ( ) Have fire extinguishers inspected/maintained. 19-605

STAPLE NOTICE OF VIOLATION HERE