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Planning Concepts and Decision Criteria for Sheltering and Evacuation in a Nuclear Power Plant Emergency

Atomic Industrial Forum, Inc.

NUCLEAR REGULATORY COMMISSION

Docket No. 50-322-OL-3 Docket No. L-5

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AIF/NESP-031

PLANNING CONCEPTS AND DECISION CRITERIA FOR SHELTERING AND EVACUATION IN A NUCLEAR POWER PLANT EMERGENCY

Prepared for the
National Environmental Studies Project
of the
Atomic Industrial Forum, Inc.

by

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PREFACE

Emergency planning, particularly associated with technological accidents, has received a great deal of attention in recent years from federal and state agencies, the Congress, state-level and county-level officials, the nuclear power community, and the press. Emergency preparedness is presently one of the principal areas of corporate concern for certain nuclear utilities as well as for other industrial segments of the nation's economy. The commitment of nuclear utility licensees to protect the health and safety of the public, coupled with increased regulatory activity in emergency planning, has promoted greater involvement between licensees and the federal sector, represented primarily by NRC and FEMA. The publication of NUREG-0396 (1978) and NUREG-0654 (1980) and the promulgation of Appendix E of 10 CFR 50 (1980; amended 1981) attest to increased federal involvement in emergency planning regulation.

Under current regulations, the management of a nuclear power plant is responsible for notifying cognizant "offsite" personnel (county, state and federal officials and agencies responsible for coping with emergencies) in the event of an accident "onsite" (within the boundaries of the plant site) which has a potential for affecting the public. Emergency plans based upon 10 CFR 50, Appendix E, already exist for all operating and soon-to-operate nuclear power plants; these plans undergo testing periodically through exercises and drills that point out areas of exemplary performance and areas needing additional attention, whether onsite or offsite. Such exercises are cooperative efforts calling for responsible actions on the part of local, county, state, federal and utility personnel. When all of these elements work well together, exercises have been shown to be an effective means of building mutual confidence on the part of all involved. Further, successful exercises help instill in the public a belief that their health and safety are being protected.

In 1983 the National Environmental Studies Project (NESP) committed to sponsoring a study to offer guidance to offsite emergency planners on how to evaluate the options of sheltering or evacuating the public in the event of an accident. Up until now, there has been no document giving advice to offsite decision makers — governors and county executives — and to their technical support staffs (including state or county health officers and emergency planning managers) about what to consider when required to make a timely decision regarding which option to choose following an emergency at a nuclear power plant. The study first examines each of the options, sheltering and evacuation, individually for its effectiveness historically, its risks, costs, and consequences. The two options are then compared to each other to discern the advantages and disadvantages of selecting one over the other for a given situation at a given time. Much attention has been focused on the merits of evacuating large numbers of persons from an area where a nuclear power plant accident has occurred. Considerably less attention has been paid to the advantages of sheltering some or all of those persons. Virtually no guidance has been forthcoming to familiarize the decision maker with the extenuating and sometimes uncontrollable factors, including "political" questions, which enter into his or her decision to publicly announce a protective action recommendation and then ask constituents to take certain actions. More must be considered than purely technical matters when making a protective action recommendation with potentially far-reaching health, social, economic, and political consequences.

A second purpose in sponsoring a report of this type was to provide planning criteria for onsite and offsite personnel to use well in advance of any accident to ensure that appropriate consideration is given to every facet of planning for protection of the public. The questions posed in the checklists in Chapter 2 offer new insight for such planning purposes.

This NESP report does not address the probability that any given accident will or will not occur, nor does it address the radiological consequences of such an accident. These topics have been examined over the past several years by NRC, DOE's national laboratories, and the nuclear industry

under the auspices of IDCOR (the Industry Degraded Core Rulemaking Program). Findings from research about the probability and consequences of severe accidents have been and are being published in the public domain.

The Task Force listed inside the front cover determined the scope of the contractor's effort and monitored the study's progress. The Task Force Chairman would like to acknowledge the persistence of many members without whose hard work and long hours this report would not have come to fruition. The assistance of the NRC and FEMA staffs is appreciated, particularly that of the NRC's Emergency Preparedness Branch, Office of Inspection and Enforcement, who gave the final draft a thorough reading and made many helpful comments. The emergency planning authorities of numerous states, including Maryland, New Jersey, Delaware, Connecticut, Wisconsin, Nebraska, New York, Massachusetts, Illinois, Pennsylvania and Washington reviewed early drafts and, in a number of instances, submitted fresh ideas regarding the arrangement, tone, and applicability of the final report. Also, some industry personnel not formally part of the Task Force contributed willingly of their time and should be thanked for their help. A working group of the AIF Subcommittee on Emergency Preparedness and Siting chaired by Johnny Elliott of Duke Power Company followed the study and acted as a peer review panel for drafts, giving guidance on many technical points. Thanks are due Charles Daverio of Long Island Lighting Company for offering many constructive comments based on practical knowledge gained during the creation of LILCO's Emergency Plan. Tom Tipton and John Siegel of the AIF staff contributed their knowledge of current regulatory issues. R. B. Maxwell and his staff at the Tennessee Valley Authority made technical suggestions about the health physics issues and dose reduction factors covered in the report. Finally, Carl Mazzola of Stone and Webster did a superb job of helping edit the final report and offered his expertise in meteorology at certain critical points.

The Task Force hopes that this report will encourage *all* offsite emergency planners to work together with utility staffs for the common good of protecting the health and safety of the public.

Melinda S. Renner
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4.2 Review of Disaster Research

4.2.1 Individual Decision Processes and Actions

Research on protective response to emergency warnings has covered a range of hazards including floods (Perry, Lindell and Greene, 1981), hurricanes (Baker, 1979) and tornadoes (Sims and Bauman, 1972), as well as hazardous materials accidents (Burton, et al. 1981; Perry, Greene and Mushkatel, 1983) and a nuclear power plant accident (Houts, Lindell, Hu, Cleary, Tokuhata and Flynn, in press). There is a common theme across this literature that can be referred to as a "protective action decision model" (Lindell, 1984) in which the affected individual seeks a balance between two goals: the maintenance of normal activities and the protection of persons and property. In order to maximize protection while minimizing disruption, the individual assesses the characteristics of the hazard and of alternative responses and then uses these assessments in choosing a means of coping with the hazard. According to this model (see Figure 4.1), the relevant characteristics of the hazard are assessed in terms of perceived certainty, severity and immediacy of the impact of the hazard (box 5). When all of these factors are present, evacuation tends to be the resultant decision. When certainty is low, particularly when there appears to be no immediate threat to persons or property, time and effort will be allocated to monitoring the situation, but evacuation is not likely. When the warning recipient considers the threat to have minimal consequences, especially when he does not consider himself to be in the impact area, there is also little likelihood of evacuation.

Possible responses to the hazard are assessed in terms of the perceived efficacy of a protective action in neutralizing the threat to persons or property (box 6). The action considered most likely to succeed

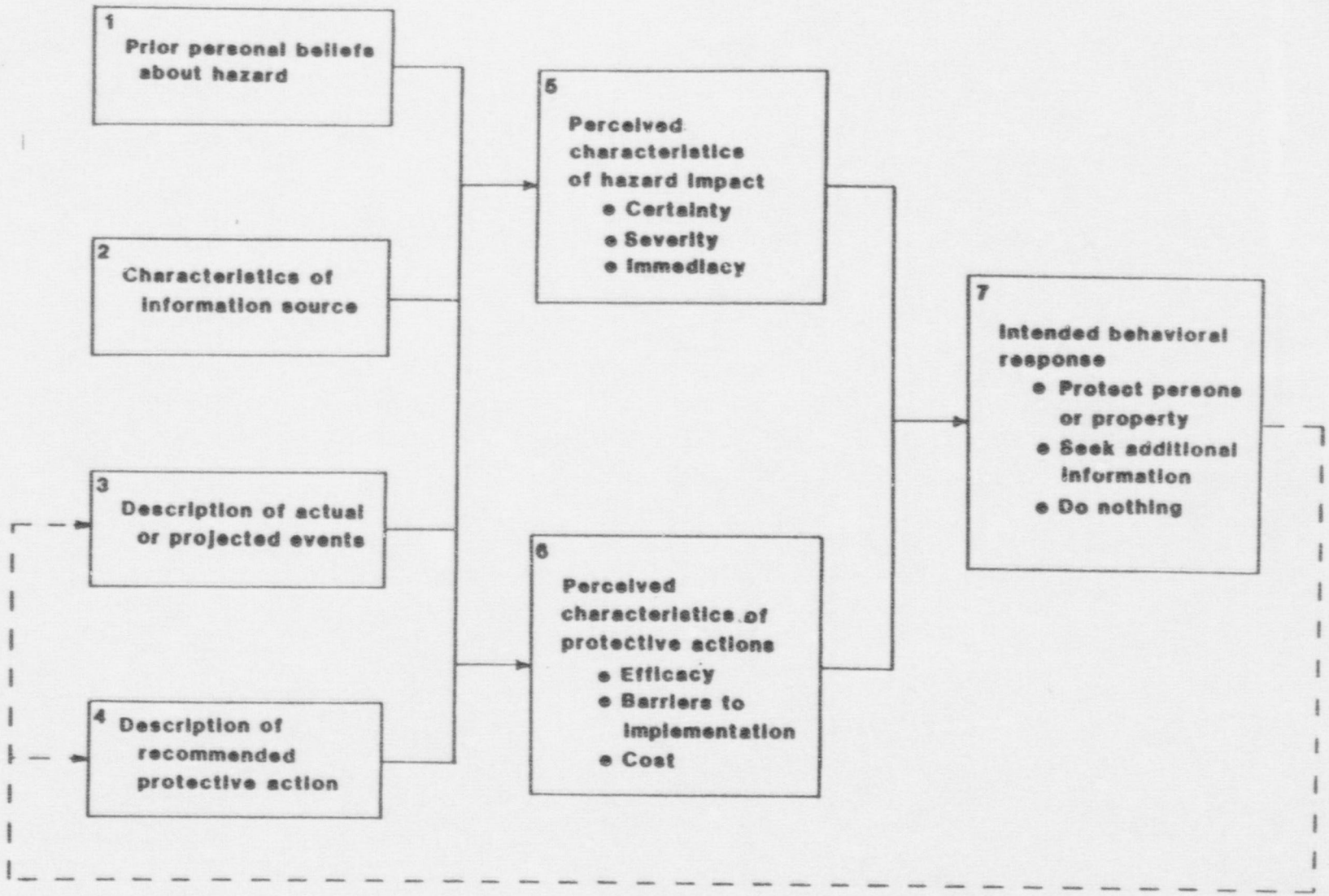

Figure 4.1: Protective action decision model

is the action most likely to be implemented. Regrettably, the action considered most appropriate by experts may not be seen by a threatened individual as the most effective. Spontaneous evacuation immediately prior to tornado impact is probably due to the recognition that sheltering in place during the tornado does not guarantee survival. This observation also holds true for many victims of fires in high rise buildings who have attempted unsuccessfully to evacuate when sheltering in their rooms would likely have saved their lives.

Barriers to implementation (box 6) considered by warning recipients include lack of knowledge of a safe place to go, a safe route of travel, or even, in some cases, a means by which they can transport themselves to safety. In other instances, the separation of family members is considered to be a barrier to evacuation. Until family members can be reunited--or at least until they can establish contact and agree upon a place to meet--evacuation is unlikely to occur.

Categories of cost (box 6) considered in deciding whether or not to evacuate include out of pocket expenses, such as travel costs and temporary living expenses, lost wages, and the possibility of property losses due to the action of the hazard agent or to looters. In many cases, the desire to protect property is a major concern that leads individuals to delay their departure until the last possible moment.

The perceived characteristics of the hazard impact and of the available protective actions are both affected by four sets of factors. First, the perceived characteristics of the hazard impact are determined by the individual's prior beliefs about the hazard (box 1). These, in turn, are modified by the source and content of information about the specific event itself (boxes 2 and 3). Potential sources of information

include friends, relatives and neighbors (unofficial sources), police, fire and other emergency personnel (official sources) and the newsmedia. The most important characteristic of a source is its credibility, which is a function of expertise and trustworthiness. While expertise is characterized by knowledge of correct information about the hazard and an ability to process that information to project future events, trustworthiness refers to a willingness and ability to communicate that information without bias (e.g. Hass, 1981). Perceptions of bias may result from one or the other of two beliefs about the communicator: (a) that he is deliberately withholding information that, if not withheld from the public, would damage his ability to achieve his own goals (unwilling to communicate without bias), or (b) that he is communicating all that he knows, but is not aware of all of the relevant information (unable to communicate without bias). Finally, the content of the message refers to the description of the actual or projected events. When the message content is specific, it reduces the recipient's uncertainty by conveying precise information about the severity and immediacy of impact. It reduces perceived barriers to implementation by describing a feasible protective action (box 4) and a means by which the action can be implemented (e.g., a destination and a route and mode of travel).

4.2.2. The Social Context of Individual Decisions

Individual protective actions involve receiving and assessing a warning of some kind, preparing to undertake the selected action (preparing to evacuate or shelter), and taking the action. While the protective action model above addresses the decision processes of the individual, both the individual assessments of the warning information and

the taking of protective actions have social contexts. The social context includes the primary groups to which individuals belong and the formal organizational structure responsible for the health and safety of the population. Primary groups consist of those sets of closest relationships which individuals maintain, referring in particular to the immediate family unit and to other kin, but also including friends and neighbors.

It is well recognized that community protective organizations are mobilized in the face of community emergencies to fulfill functions of warning the population, directing protective actions when necessary, and providing care for temporarily displaced populations. It is less well recognized, perhaps, that the persons for whom these things are being done are not simply responding to the information and guidance being provided by the protective organizations. Social science research on behavior during and after disasters has shown that persons most typically make decisions and take actions as families, not as individuals (Barton, 1969; Mileti, Drabek and Haas, 1975; Drabek and Stephenson, 1971; Perry, Lindell and Greene, 1981; Quarantelli, 1980). In the post-disaster setting, relatives, and to some extent, friends will be the major--and preferred--source of temporary shelter, subsistence needs, and various other kinds of support for those dislocated by the event (Barton, 1969; Mileti, Drabek and Haas, 1975; Drabek and Key, 1983; Bolin, 1982). Protective actions most typically are taken only after the actions of others have been taken into account, and protective actions most typically are undertaken as a group.

With respect to the warning phase, other than environmental cues to the onset of a hazard impact (e.g., funnel clouds in the case of tornadoes), information about the hazard comes primarily from other

persons. Also of considerable significance--and often overlooked--is the fact that attempts are routinely made to confirm existing information and to seek additional information from sources other than the one from which a warning was first received. If a message was originally received from an informal source such as a friend, relative, or neighbor, an attempt is often made to confirm it through contact with public safety officials or through the mass media. Conversely, a warning first received from an official source is frequently discussed with informal sources in order to assess its relevance. Furthermore, persons will contact relatives and friends to ascertain that they have received the warning, thereby extending and reinforcing the warning process. Under normal circumstances persons exchange important information over the phone or in person with others significant in their lives. The major difference during an emergency is that large numbers of persons have a similar piece of information at the same time, thereby contributing to jams of communication channels.

Preparations for the selected protective action, and the eventual action, also are characterized by social interaction rather than by individual self-interest. It is the family that typically is the unit of response to a threat. With few exceptions, it has been found that families separated at the time of initial warning seek to unite and then take action as a unit, or at least to communicate before leaving and agree to meet at another location. At Mississauga, for example, some parents who had gone out on Sunday morning, found that barricades set up in their absence significantly delayed their attempt to return home to evacuate their children. Many had arguments with police or circumvented the barricades (Burton, et al., 1981, pp. 6-14).

The time of day and day of week can affect the extent to which families are likely to be all together and thus the amount of time they are likely to spend in coordinating prior to taking action. Until the details of who is where and who will go where have been worked out, families are reluctant to take an action such as evacuation. The two best documented counterexamples of the rule of families evacuating as a unit were observed in Anchorage following the 1964 earthquake and at Three Mile Island in 1979. In both cases, it is possible that family members disagreed about the degree of threat, with the members judging the threat to be less severe staying behind. Alternatively, it might have been that fears about personal safety were counterbalanced by concerns about property (e.g., beliefs about the threat of looters) or costs of evacuation, such as lost wages.

Once the protective action has been adopted, primary groups continue to structure behavior. For example, groups of friends or two or more families may get together to wait out a hurricane, or to engage in protective actions like sandbagging in a flood. When evacuation is the selected protective action and family members have been gathered, the most typical destination is the home of other relatives or friends outside the danger area.

It must be noted that not all persons in a community will be integrated into families or friendship networks. Furthermore, because of the numbers of persons likely to be affected by a community emergency, and because some of the problems faced are of a technical nature not suited to the capabilities of families, protective functions are shared between primary groups such as families and formal community organizations with special capabilities and responsibilities. In particular these

organizations will be needed to handle what can be called "response-generated demands" (Quarantelli, 1982). As families and individuals respond to information about the threat, appropriate organizational support will be needed to facilitate communication, continue assessment of the emergency, mobilize necessary human and material resources, and coordinate and control the actions of the population as it responds.

4.2.3 Requirements for Organizational Support

Under certain conditions, protective action decisions are made and implemented by the affected individuals without any intervention by public authorities. Perry, et al. (1981), for example, studied a site struck by a flash flood in which levee failure was detected by nearby residents and passed on directly to friends, relatives and neighbors in the risk area. Since the threat area was small and its boundaries easily defined by local residents, evacuation transportation was not a problem. Also, because the risk area was small, most evacuees were able to stay with friends, relatives or neighbors until the emergency was over.

In other cases, there may be a strong need for local authorities to provide support for the warning, evacuation and temporary housing of local residents. Needs in each of these areas can differ significantly across segments of the population. The general public--those with no impediments to warning receipt, no need for evacuation transportation and no requirements for care--needs little more than a specific message defining the threat and the appropriate protective action. The transit dependent--those without private automobiles--may need buses or other mass transit in addition to a specific warning. Special populations, such as invalids, handicapped, school children, prisoners and others, may have

very restrictive requirements associated with their movement. The characteristics of the hazard impact--especially the amount of forewarning, the speed of onset and the scope and duration of impact--are also important factors to consider in anticipating the need for support from public safety agencies. These characteristics can impose significant constraints upon the protective action process.

4.2.3.1 Notification

A requirement for an organized system of hazard detection and notification dissemination emerges when a hazard does not provide environmental cues that the general public can use as a means of forewarning of hazard onset. The hazard detection/notification dissemination system assumes a particularly significant role when the speed of onset of the hazard exceeds the speed at which the affected population can respond. In such cases, the burden of hazard detection must be assumed by specialized agencies who can transmit information to local notification dissemination networks. For natural hazards, this function is performed by the National Hurricane Center, the National Severe Storms Center and other such agencies. In the case of technological hazards, this function is performed by the plant personnel at fixed facilities, or employees of the carrier in a transportation incident. In either case, information about the hazard is passed on to State and/or local public safety officials who then evaluate the threat and disseminate a warning to the population of the risk area. When a hazard is detected in advance, a given notification mechanism or combination of mechanisms can disseminate a specific warning to the entire population of the risk area in a timely manner. The most rapid means of

8.1.2 Perceived Characteristics of Alternative Protective Actions

At present, the data on public perceptions of the characteristics of alternative protective actions are very sparse. There are no data on perceptions of the efficacy of sheltering. With respect to perceptions of evacuation, there is one result reported in the Seasonwein (1983) survey that deals with perceptions of the barriers to implementation. Almost two-thirds of the respondents in this survey rated as a strong argument the assertion that an evacuation of the area surrounding the plant (a densely populated area) "would be impossible in light of the numbers of people to be moved, the existing road network and the lack of protective equipment." Concerns about barriers to implementation of evacuation need not necessarily stimulate compliance with recommendations to shelter. However, Houts, et al. (in press) found that concerns about a later forced evacuation were expressed by some of those who were voluntary evacuees during the TMI accident. Houts and his colleagues inferred from the TMI data that perceived barriers to a mass evacuation (that ultimately was never ordered) helped to stimulate the early, voluntary evacuations.

8.1.3 Intentions to Comply with Official Plans

In contrast to the paucity of data on perceptions of the characteristics of radiation hazard and of the alternative protective actions, data on intentions to comply with recommended protective actions are not difficult to find. Data on behavioral intentions can be somewhat difficult to interpret. The difficulty in interpretation arises from questions about the degree to which a survey interview evokes the behavioral cues that would actually guide an individual's response in an actual emergency. Unless great care is taken in conducting the interview,

behavioral cues that would be important in an actual emergency might be omitted. In a brief telephone survey, for example, respondents' attention would be directed toward only the most salient aspects of the situation rather than to all of the relevant aspects of the situation. Since all three of the available studies (de Pujo, 1982; Seasonwein, 1983; Zeigler and Johnson, 1984) addressing intentions to comply with recommended protective actions were based upon telephone interviews, these surveys and their results should be interpreted with caution. The results of three studies will be presented in some detail below; the implications for a nuclear power plant emergency that can reasonably be drawn from them will be presented in Section 8.1.4.

8.1.3.1 Intended Response to Prompt Notification

In the de Pujo (1982) study, respondents were asked what they would do if the sirens were sounded, approximately half (45%) of the respondents said that they would seek further information or instructions, which is, of course, the officially recommended response. Of the remainder, 10% would prepare to evacuate and 19% would begin to evacuate. Many of those who would evacuate spontaneously indicated that they would monitor the situation on their car radios as they evacuated. When respondents were asked in another question if they would generally follow official instructions, approximately half (47%) said they would do so. Most of the rest would make their own plans (23%) or comply with official plans if these matched their personal plans (26%).

8.1.3.2 Compliance with a Recommendation to Shelter

In a study by Zeigler and Johnson (1984) respondents were asked how they would respond to an advisory for all people within 5 miles of the plant to stay indoors. A majority of the respondents within the affected area (52%) said that they would shelter, while a significant minority (40%) said that they would evacuate. In addition, a number of residents outside the affected area said that they would shelter (49% of those 6-10 miles from the plant) or evacuate (40% of those 6-10 miles from the plant).

A somewhat similar response was obtained in the Seasonwein (1983) survey. When asked what they would do if instructed to shelter, the majority (66%) said they would comply with official instructions. Most of the remainder (25%) said they would leave the area. A comparable response was found in the survey conducted by de Pujo (1982). In response to a question similar to the one asked by Seasonwein, 57% said they would shelter if that were the official recommendation and 31% said they would not.

8.1.3.3 Compliance with Evacuation Procedures

In the Seasonwein (1983) survey, respondents were asked whether they would take predesignated routes in an evacuation. Only 31% said that they knew that there was a predesignated evacuation route and only 41% intended to take it. Most of the rest (56%) reported that they would leave the best way they knew how. As was noted in Section 5.1.2.2, 86% of the respondents said that they did not know if they would comply with plans for direct evacuation of school children.

8.1.4 Summary of Expected Response by the Public

As was noted in the previous section, the behavioral intentions studies conducted by de Pujo (1982), Seasonwein (1983) and Zeigler and Johnson (1984) should be interpreted cautiously. This is not to say that the possibility of spontaneous evacuations that is raised by these studies should be rejected. In fact, there are two examples other than TMI in which spontaneous evacuations have been documented. It should be noted that neither of these examples was associated with a nuclear power facility. The first of these was reported by Lindell, et al. (1982) in their study of evacuation times following the Mt. St. Helens eruption. Over 10% of the residents of the Woodland sample evacuated during the May 18, 1980 eruption; no official evacuation warnings were given for this area. For the other case of spontaneous evacuations, the response was more extensive. These took place in the neighborhoods between 4 and 8 kilometers north of the Mississauga train derailment. In that area where, again, no official evacuation recommendation was given, approximately 60% of the residents evacuated. Although a few of them said that they thought they had been given an order to evacuate, most left because of their own perception of the chlorine danger.

The Mt. St. Helens and Mississauga studies indicate that asymmetries in the affected area (due to wind direction) are particularly likely to produce overresponse by the public. If, for example, protective action is recommended within a 2 mile radius and 5 miles downwind, an overresponse is most likely in the 2-5 mile upwind sectors. The magnitude of the overresponse in other areas of the EPZ (e.g., 5-10 miles upwind and downwind) as well as outside the EPZ is difficult to determine, but is probably overstated by the behavioral intentions surveys conducted to

date. In none of the three surveys cited above did the investigators include any information about the efficacy of sheltering--information which would undoubtedly accompany any recommendations made by offsite authorities. In addition, they did not clarify or cite any of the factors that have been found to inhibit evacuation (e.g., concerns about lost pay, looters, etc.).

Three general implications follow from the data reviewed in the previous sections. First, the available data suggest that one can anticipate reasonable levels of compliance with officially recommended protective actions. A majority of the respondents in all three behavioral intentions surveys report that they would shelter if advised to do so. It should be remembered that the level of compliance may be quite issue specific. The intended level of compliance was lower when questions were asked about following posted evacuation routes or about picking up children at schools rather than at reception centers.

The second point is that a significant minority of the residents of the affected area (and in some cases outside the affected area) may not comply with one or more official recommendations. The failures to comply would tend to be more in the direction of overresponse than underresponse. This means that voluntary evacuations would begin earlier and have a broader scope than the officially recommended evacuations. Residents would compare themselves to those for whom protective action is recommended. The closer they are in terms of geographic distance and the more similar they are with respect to geographic proximity or demographic characteristics (e.g., pregnant women and preschool children) to the target group that has received a specific protective action recommendation, the more likely they are to also take that protective action (Houts, et al., in press).

Third, none of the data indicate that panic is a condition that is likely to occur if the offsite response to an accident is managed properly. The available data do indicate that a reactor accident would be perceived to put residents in severe danger and it is perceived that this danger could be rapid. This is similar, but not identical to the first of the four conditions required for panic. The critical difference here is between the perception of "rapid" and "immediate" danger. To the degree that the situation is portrayed as serious, not desperate, and requiring timely, but not instantaneous response, the likelihood of panic will be low. A similar situation holds for the second and third conditions, limited escape routes that are about to close. Evacuation of individual sectors, or even groups of sectors, in sequence would tend to decrease public perceptions of escape routes closing due to overloading. The strategy of phased evacuation was clearly very effective at Mississauga and would be especially appropriate for other sites with high population densities. The last condition for panic, lack of information, can be avoided by providing local residents with an accurate assessment of the situation that is updated frequently (as often as one or more times per hour). The offsite emergency management effort would almost surely be hampered if rumors or misperceptions stimulated local residents to inappropriate action because of a lack of timely and accurate information about the severity or immediacy of the hazard or availability of evacuation routes.

8.2 Expected Response Time Components for Specific Emergency Scenarios

This section will address the expected levels of timeliness and compliance with protective action recommendations for the general public.

emergency. When an emergency arises, however, the public needs much of this potentially ignored information.

A suitable response to this situation requires an understanding of two principles. First, planners must recognize that it is important to persist in disseminating emergency public information. Although some residents do not read or retain this information, there are many that do. It is better that some of the public be informed than that none of them be informed. Moreover, those who have read and retained the information may, themselves, be a valuable source of that information to their friends, relatives and neighbors in any emergency. Second, planners must recognize that emergency information may not be read or retained by some individuals because it is perceived to have no relevance to people's normal activities.

9.2 The Sources of Emergency Information

The discussion of a source's characteristics presented in Section 4.2.1 described the roles of expertise and trustworthiness in determining the credibility of an information source. That section noted that, typically, multiple sources of information are consulted in an emergency. This has three implications for attempts by any emergency personnel to communicate with the public. First, unofficial sources (friends, relatives and neighbors) are likely to be considered to be low in expertise and of mixed trustworthiness. They would be expected to have a limited perspective (knowledge bias) but be willing to communicate what information they did possess honestly. It is likely that different members of this group would have different--possibly conflicting--information and recommendations.

A second implication is that the news media, partially because of the role that they see for themselves as seeking out the "whole" story, deliberately seek a diversity of information and opinion from a wide range of sources. Even if all were basing their assessments on exactly the same information (a rather improbable situation in any emergency), differences of opinion can be expected to emerge. Public response to sources interviewed directly by the media will vary with each source's position. University professors, for example, are often sought out as independent experts because, in addition to their expertise, they are considered to be willing to communicate information without bias, although they may have knowledge bias that is caused by overspecialization. Media commentators may be considered credible sources if, although not experts in their own right, they are considered to be able to elicit several points of view and come to a reasoned judgment of the situation. In addition, an esteemed media personality could become a link with the outside for a sheltered person and could therefore play a significant role in helping to allay the fears of those being sheltered in any emergency.

A third implication is that official sources--corporate personnel and governmental officials at the federal, state and local levels--tend, as a group, to have complementary aspects of credibility. Corporate personnel are likely to be considered knowledgeable about the status of their facility, but may not be considered trustworthy because of a perception of knowledge bias and, more importantly, a perceived lack of willingness to reveal the true extent of a given situation. Therefore, as a "composite" source, a group made up of corporate, local, state and federal personnel would have increased credibility if their information notices and protective action recommendations were consistent with each other.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 26, 1987

MEMORANDUM FOR: John Milligan
Technassociates

FROM: Emile L. Julian, Acting Chief
Docketing and Service Branch

SUBJECT: SHOREHAM EXHIBITS

Any documents filed on the open record in the SHOREHAM proceeding and made a part of the official hearing record as an exhibit is considered exempt from the provisions of the United States Copyright Act, unless it was originally filed under seal with the court expressly because of copyright concerns.

All of the documents sent to TI for processing fall within the exempt classification.