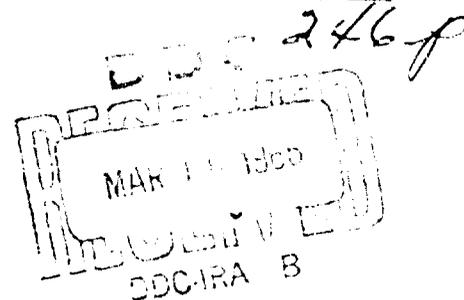


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LABORATORY INVESTIGATIONS OF SHELTER MANAGEMENT FACTORS

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JANUARY 1965

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Pittsburgh, Pennsylvania

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LABORATORY INVESTIGATIONS OF SHELTER MANAGEMENT FACTORS

Prepared for:

OFFICE OF CIVIL DEFENSE
DEPARTMENT OF ARMY - OSA

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January 1965

AMERICAN INSTITUTES FOR RESEARCH
Pittsburgh, Pennsylvania

ABSTRACT

A research program is reported in which several shelter exercises were conducted to investigate the following shelter management factors:

1. Late assumption of command by the shelter manager.
2. The effects of three types of management style under "normal" conditions and under conditions of technical and psycho-social stress. Technical stress was introduced by means of several programmed technical "emergencies" to which the shelter group had to respond. Psycho-social stress was introduced by the use of a planted agitator.
3. The effects of total darkness upon shelter operation.

The results of this program indicated that:

1. The most efficient operation of a shelter occurred when the manager was present from the beginning of the exercise.
2. The effectiveness of operation in the absence of the trained manager depended upon the attitude toward the exercise of the emergent shelter leader, and upon the way in which he employed the in-shelter guidance materials.
3. A management style in which approximately equal attention is given to both technical and non-technical problem areas was much more effective than styles in which more attention is given to one of these areas at the expense of the other.
4. Complete darkness in a shelter was found to be tolerable for 24 hours by a group of volunteers from the research staff of A.I.R. This finding should be viewed, not as a base line, but rather as ceiling. That is, it is very unlikely that a completely "shelter naive group" would behave nearly as calmly and assuredly as this group. Even with subjects such as these, some illumination

was found to be desirable during the performance of critical shelter tasks. For example, it is felt that the utility of the medical kit would be greatly impaired during total darkness, for it would be difficult to identify and discriminate between the various medicines available.

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To acknowledge the individual efforts of each and every person who contributed to the success of this project would be an impossible task. However, there are those who, because of the magnitude of their efforts, deserve particular recognition.

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Finally, and particularly, the hundreds of Pittsburghers who devoted their time, effort, and energies in order that knowledge regarding some critical and practical problems might hopefully be advanced.

TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT	1
ACKNOWLEDGMENTS	111
INTRODUCTION	1
Description of Research Program	1
Observational Techniques	3
Description of Management Styles	5
Procedure for Reporting Results	9
OVER-ALL SUMMARY OF RESEARCH PROGRAM	11
Effects of Late Assumption of Command by Shelter Manager	11
Effects of Management Style	12
Effects of Management Style under Conditions of Technical and Psycho-Social Stress	13
Over-all Consideration of Management Style	12
Additional Findings and Considerations Resulting from the Studies of Management Style	14
Shelter Operation under Conditions of Total Darkness	16
DETAILED DISCUSSION OF RESEARCH PROGRAM	19
Phase I: Effects of Late Assumption of Command by Shelter Manager	19
Study I	19
Study II	22
Study III	27
Comparison of Results of Studies I-III	31
Phase II: Effects of Management Style (Studies IV-IX)	42
Phase III: Effects of Management Style under Conditions of Technical and Psycho-Social Stress (Studies X, XI, and XII)	67
Study X: Management Style 1	75
Study XI: Management Style 2	76
Study XII: Management Style 3	77
Phase IV: The Dark Study	94

APPENDICES

Appendix A: Scenario Used in Studies I, II, and III	103
Appendix B: EBS Messages Used in Studies I, II, and III	105
Appendix C: Scenario Used in Studies IV - IX	113
Appendix D: EBS Messages Used in Studies IV - IX	117
Appendix E: Scenario of Events Used in Studies X, XI, and XII	129
Appendix F: EBS Messages Used in High-stress Studies (Studies X, XI, and XII)	133
Appendix G: Pre- and Post-shelter Questionnaires Used in Studies I - XII	143
Pre-test - Studies I-III	143
Post-test - Studies I-III	157
Pre-test - Studies IV-XII	167
Post-test - Studies IV-XII	173
Appendix H: Pre- and Post-shelter Questionnaires Used in Dark Study	181
Pre-shelter Test	181
Post-shelter Test	185
Appendix I: In-shelter Observation Forms	189
Appendix J: Information Flyer Used in Subject Recruitment	193
Appendix K: Subject Recruitment Procedures	195
Appendix L: Description of Shelter Laboratory	199
Appendix M: Shelter Supplies	205
Appendix N: Handling of Shelterees: Pre- and Post-shelter	207
Handling of Shelterees Scheduled for Regular Shelter Entrance	207
Handling of Shelterees Scheduled for Late Shelter Entrance	211
Handling of All Shelterees After Shelter Exit	217
Appendix O: Vita of Actor Used to Portray Management Styles	219

LIST OF TABLES

		<u>Page</u>
Table I.	Outline of Research Program on Shelter Management Factors	3
Table II.	Technical Activities of Groups and of Manager - Studies I-III	33
Table III.	Psycho-Social Activities of Groups and of Manager - Studies I-III	35
Table IV.	Number of Subjects in Studies I-III Participating in Technical Activity	36
Table V.	Number of Subjects in Studies I-III Participating in Psycho-Social Activity	36
Table VI.	Degree of Subject Participation in Technical Activities (Studies I-III)	37
Table VII.	Degree of Subject Participation in Psycho-Social Activities (Studies I-III)	37
Table VIII.	Questionnaire Summary (Groups I-III)	40
Table IX.	Composition of Subject Groups Used in Investigation of the Effects of Management Style	43
Table X.	Technical Activities as a Function of Management Style	44
Table XI.	Combined Data from Both Replications of Each Management Style	45
Table XII.	Psycho-Social Activities as a Function of Management Styles	47
Table XIII.	Number of Psycho-Social Activities and Number of "Individuals" Present in Each Exercise	48
Table XIV.	Technical and Psycho-Social Activities of Manager	50
Table XV.	Number of Subjects in Studies IV-IX Participating in Technical Activity	51
Table XVI.	Number of Subjects in Studies IV-IX Participating in Psycho-Social Activity	52
Table XVII.	Degree of Subject Participation in Technical Activities	52
Table XVIII.	Degree of Subject Participation in Psycho-Social Activities	52

	<u>Page</u>
Table XIX. Questionnaire Summary (Groups IV-IX)	54
Table XX. Shelteree Improvement on Post-Test (Groups IV-IX) . .	55
Table XXI. Composition of Subject Groups Used in the Investigation of Effects of Management Style Under High Stress	71
Table XXII. Technical Activities as a Function of Management Style	73
Table XXIII. Technical Activities as a Function of Management Style (Activities Including Those of the Manager and the Agitator)	74
Table XXIV. Number of Subjects in Studies X-XII Participating in Technical Activity	83
Table XXV. Number of Subjects in Studies X-XII Participating in Psycho-Social Activity	84
Table XXVI. Degree of Subject Participation in Technical Activities	84
Table XXVII. Degree of Subject Participation in Psycho-Social Activities (Studies X-XII) . . .	84
Table XXVIII. Questionnaire Summary (Groups X, XI, and XII)	86
Table XXIX. Shelteree Improvement on Post-Test (Groups X, XI, and XII)	87
Table XXX. Shelter Feeling - Dark Study	98
Table XXXI. Shelter Discomfort - Dark Study	99

INTRODUCTION

Shelter management appears to be a critical variable in the maintenance of shelter populations. Many sources of data contribute to this general conclusion, including the results of disaster studies, occupancy exercises, and the like. The nature of the relationship, however, is not at all clear. What kinds of leadership have what kinds of effects on shelter populations and their survival chances is as yet a largely unanswered question. The major purpose of the initial program of research in the shelter management laboratory is to open an investigation into this set of relationships.

Description of the Research Program

The research program on management factors consisted of four major phases of investigation. Each of these phases will now be briefly described.

Effects of Late Assumption of Command by Shelter Manager

In this phase of the program, three shelter exercises (Studies I, II, and III) were conducted to determine the effects of late assumption of command by the shelter manager upon the operation of the shelter during the first 24 hours of confinement. These effects were determined by having the assigned shelter manager arrive two and 12 hours after the start of the exercises (Studies II and III, respectively), and comparing the results under these conditions with those occurring in an exercise in which the assigned manager was present from the beginning (Study I).

Effects of Management Style

In this phase of the program, six 48-hour exercises (Studies IV through IX) were conducted to determine the effects of three types of management style upon technical and non-technical activities of 40-person shelter groups. Two exercises were conducted for each of the three management styles. A description of these three management styles is given in a later section of this report.

Effects of Management Style under Conditions of Technical and Psycho-Social Stress

In this phase of the program, three 24-hour exercises (Studies X, XI, and XII) were conducted to determine the effects of the three types of management style upon technical and non-technical operations under conditions of technical and psycho-social stress. The methods employed to produce this stress will be described in a later section of this report.

Shelter Operation under Conditions of Total Darkness

As the last phase of this current research program, one 24-hour exercise was conducted under conditions of total darkness. This study attempted to determine how well a shelter could operate under conditions of zero illumination.

The following table presents an outline of the entire research program.

A description of the Shelter Management Laboratory is provided in Appendix L. The procedures employed for recruiting subjects for the program are described in Appendix K.

Table I
Outline of Research Program on Shelter Management Factors

Experimental Condition	Related Exercises	Duration of Exercises	Size of Shelter Groups
1. Late Assumption of Command	Studies I - III	24 hours	20 people
a. Manager present from start of exercise	Study I	"	"
b. Manager two hours late	Study II	"	"
c. Manager 12 hours late	Study III	"	"
2. Effects of Management Style	Studies IV - IX	48 hours	40 people
a. Style 1	Studies IV and VII	"	"
b. Style 2	Studies V and IX	"	"
c. Style 3	Studies VI and VIII	"	"
3. Effects of Management Style under Conditions of Technical and Psycho-Social Stress	Studies X - XII	24 hours	25 people
a. Style 1	Study X	"	"
b. Style 2	Study XI	"	"
c. Style 3	Study XII	"	"
4. Shelter Operation under Conditions of Total Darkness	The Dark Study	24 hours	15 people

Observational Techniques

In-Shelter Observation

Three observers were on duty at all times during each of the shelter exercises. Each observation team consisted of one member of the senior research staff and two members of the junior research staff. The senior observer kept the descriptive observation log of each study, supervised the activity of the junior observers, and was responsible for the control of the temperature and humidity in the shelter, as well as any programmed inputs to the shelterees, such as EBS messages.

Junior observers reported in-shelter events by use of prepared observation forms. These forms, reproduced in Appendix I, were of three types:

1. Problem Solving form. Used to describe and track the activities of the shelterees in the identification of a technical or psycho-social problem in the shelter, and the selection and execution of a solution to this problem. With reference to the Problem Solving form on page 189, the "activities" recorded as contributing to the solution of a given problem, such as distributing food and water, were:
 - a. Reporting problem (item B on the Problem Solving form).
 - b. Seeking problem-relevant information (item C on the Problem Solving form).
 - c. Acting as source of problem-relevant information (item D on the Problem Solving form).
 - d. Suggesting solutions (item E on the Problem Solving form).
 - e. Directing attempts at solution (item F on the Problem Solving form).
 - f. Selecting solution to be implemented (item G on the Problem Solving form).
 - g. Carrying out (executing) the solution to the problem (item H on the Problem Solving form).

Whenever a person was recorded as doing any one of these things, it was counted as one activity. If the person did the same thing twice, such as suggesting two solutions to the same problem, it was counted as two activities. Similarly, if two people did the same thing, such as two people handing out water cups to the shelterees, it was counted as two activities. Negative activities, such as causing the problem (item A) and hindering solutions and execution of the solutions (item I) were recorded, but the frequency of these was so small that they were not used in the statistical analyses performed, although descriptive account is given of them in the report.

2. Information Input form. Used to describe the behavior of shelterees when receiving the information from EBS messages, during in-shelter training or briefing sessions, or when using in-shelter guidance materials.
3. Team or Unit Selection form. Used to record who was assigned to each task team or living unit and why each assignment was made.

In addition to the observation log and forms, tape recordings were made of critical shelter events.

Pre- and Post-Shelter Observation

Pre- and post-shelter observation of each study group was achieved through the use of brief attitude inventories. These inventories are presented in Appendix G of this report. In addition, the actor-manager was debriefed by a member of the senior research staff at the conclusion of each shelter exercise.

Description of Management Styles

Three types of management style were defined for use in this research program. These three styles will now be described.

Management Style 1

This style is characterized by the following behavioral patterns:

1. The manager is the focal point of all shelter operations, activities and events. Few decisions (and none of any consequence) are made without his personal involvement. A majority of the decisions are made by him directly, based upon the appropriate management guidance. A good example of this style can be provided by a description of how this type of manager would solve the problem of sleeping space in a crowded shelter. He would make a direct decision about how the

people should be arranged most optimally, perhaps based upon some data he would assign someone to prepare. He would not follow the strategy of trying out different arrangements, and then selecting that one which, by majority vote, was deemed to be the most comfortable.

2. In his relations with shelterees, the manager affecting Style 1 would be knowledgeable about psychological support and non-operational activities. He would personally (and rapidly) take the lead in solving actual and potential problems of individual and group adjustment. The essence of this style is that the manager is the behavioral role model for the shelterees.

3. In line with the concept of leadership by personal example, the Style 1 manager would be directly involved in the control and use of all shelter resources. This includes:

- a. Demonstrating supplies for shelterees.
- b. Making decisions regarding the use of supplies.
- c. Repairing damaged articles.
- d. Inventory control.

In a sense, the various task teams are set up to support the manager in carrying out shelter operations.

Management Style 2

The Style 2 manager is completely familiar with all shelter management procedures and principles. He recognizes the importance of both operational and non-operational shelter functions. He is aware of the need for autocratic behavior in some shelter situations, and democratic behavior in others, and is capable of playing both of these roles. Perhaps most important to Style 2 management is the flexible and sensitive application of all management techniques. This means an ability to modify operating procedures as appropriate in response to unique needs of the shelter situation or to valid suggestions offered by shelterees. It also means an ability to reflect the individual and group characteristics of the shelterees in his inter-personal relationships with the shelter population.

The Style 2 leadership involves: (1) setting goals and suggesting several appropriate alternative means, (2) taking a decision reached by the group, or crystallizing a decision out of group interaction, (3) evaluating it in terms of good management guidance, and (4) permitting it to be implemented.

Unlike the role model Style 1, in which the group is directed to become a reflection of the manager, in Style 2 the manager is, where appropriate, an agent of the group.

One important experimental variable that fits with Style 2 is that of voluntary use of supplies. It is important to us and to OCD to know whether subjects would apply self-limitations when given goals and ground rules for supply utilization, but left on their own as far as rationing is concerned. Theoretically, the Style 2 leadership calls for shelterees to voluntarily determine the methods for supply utilization, rather than select a method of voluntary use.

Management Style 3

The Style 3 manager is completely familiar with all shelter management procedures and principles. He recognizes the critical importance of operational shelter functions such as radiological protection, feeding, and medical care. He also recognizes the complexity of the shelter management job, and feels that his efforts should be concentrated on these essential operational functions. He believes that the less important non-operational functions (i.e., recreation, religious, etc.) will take care of themselves if the shelterees express a need for them. He knows that autocratic leadership will get things done more quickly, but realizes the value of the democratic process in dealing with civilians, at least on certain less critical issues. He also knows the correct way to do things in almost every case, but will insist on a particular approach only on critical issues. He believes that for morale purposes people ought to be able to do pretty much what they want on other problems, particularly since he probably will be too busy to give them much attention. This manager's attitude toward personal and social problems in

the shelter is that people will "get along" and solve these problems, and that they are not of sufficient importance to require his attention unless they interfere directly with some critical shelter function.

The important factor in defining this management role is specifying which shelter functions are and are not "critical" to this management type. The more easily classified functions include:

<u>Critical</u>	<u>Non-Critical</u>
Protection against weapon effects	Community management
Food and water supply	Psychological support
Fire protection	Religion and recreation
Medical capability	Service activities (child care, medical support activities, and enhancing shelter appearance)
Technical training	
Ventilation	

A number of other functions would be considered critical only when they became actual safety versus discomfort factors in the shelter. These include sleep, sanitation, and illumination.

In the operational aspects of the shelter experience, those dealing with physical survival and physical well-being, the manager operating under Style 3 is fully knowledgeable, capable, and in many ways like the Style 1 leader. However, this leader type is much less aware of details of non-operational activities, and is unconvinced of their value in a shelter stay. The appropriate expression of Style 3 attitude toward things non-operational is, when asked, "Okay, you can do it, as long as it doesn't interfere with the important things in the shelter."

Only when an adjustment problem threatens or interferes with shelter operation does it become a matter of direct concern for the manager.

To portray these management styles in the research program, a 35-year old graduate student in drama was obtained from the Carnegie Institute of Technology. He was given intensive training in the technical aspects of shelter operation, as well as thorough familiarization

with the management styles prior to the start of the research program.
His professional acting experience is documented in Appendix 0.

Procedure for Reporting Results

The procedure for reporting the results of this research program will be as follows. A summary of the over-all program will be given in which the major conclusions from each of the four phases of the program will be presented. Following this summary, each of the four phases of the program will be discussed in detail.

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OVER-ALL SUMMARY OF RESEARCH PROGRAM

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OVER-ALL SUMMARY OF RESEARCH PROGRAM

Effects of Late Assumption of Command by Shelter Manager

Three 24-hour exercises, each using groups of 19 shelterees plus the actor-manager, were conducted to determine the effects of late assumption of command by the appointed manager. In the first exercise (Study I) the manager was present in the shelter when the shelterees arrived. In the second exercise (Study II) he appeared at the shelter two hours after entry. In the third exercise (Study III) he appeared 12 hours after entry. The actor portrayed management Style I in all three of these exercises.

The results of these three studies indicated the following:

1. The most efficient technical operation of the shelter occurred when the manager was present from the beginning of the exercise.
2. Effectiveness of shelter operations during the absence of the assigned manager appears to depend upon two characteristics of the person who emerges as acting shelter manager. These were:
 - a. His attitude toward the exercise itself. The emergent manager in Study II viewed the exercise as a challenge to his abilities, and was far more effective than the emergent manager in Study III, who viewed the exercise in a much more casual fashion.
 - b. The way in which he utilized in-shelter guidance materials. The superior manager in Study II utilized the guidance materials as a set of instructions regarding how to run the shelter, and followed them to the letter. Within a period of two hours, he had established a relatively perfect shelter organization. In contrast, the emergent manager in Study III ignored or rejected several

of the organizational recommendations made in the in-shelter guidance materials. This resulted in a shelter organization which was totally unprepared to handle five major potential dangers.

3. There were no significant differences between the three groups on post-shelter attitudes. Late assumption of command by the manager apparently produced no detrimental effects as far as attitudes were concerned.

Effects of Management Style

The investigation of the effects of management style was accomplished by means of six 48-hour shelter exercises (Studies IV-IX), each exercise group consisting of 39 shelterees and the shelter manager. Each of the three management styles was replicated twice; that is, two exercises were conducted under each management style.

The results of these studies suggested the following conclusions:

1. Style 1 and Style 3 resulted in an equal level of technical effectiveness and efficiency. Style 2 was markedly inferior to both of the other two styles on these dimensions.
2. With regard to the psycho-social climate of these exercises, Style 1 produced an esprit de corps which was lacking in groups managed by Style 2 or Style 3. Style 2 groups, operating under a management style which emphasized the airing of personal ideas, feelings, and approaches, did not infrequently show signs of intra-group hostility and competitiveness. Style 2 also permitted the trouble-maker and the malcontent to continually air their complaints, often to the annoyance of other members of the group.
3. In post-shelter attitude inventories, groups managed under Style 1 indicated the most favorable "feeling" toward the shelter, while those managed under Style 2 indicated the

least favorable "feeling." Moreover, it was noted with interest that all groups, regardless of style, endorse behaviors most likely to be found in management Style 1 when rating statements dealing with leadership behavior.

Effects of Management Style under Conditions of Technical and Psycho-Social Stress

Three exercises (Studies X, XI, and XII) were conducted to determine the effectiveness of the three management styles when they were employed under shelter conditions of technical and psycho-social stress. Technical stress was introduced by means of several programmed technical "emergencies" to which the shelter group had to respond. Psycho-social stress was introduced by the use of a planted agitator in Studies X and XI; another person played this role in Study XII.

The results of these exercises suggest that Style 1 and Style 3 produce an equal amount of efficiency and of effectiveness in technical operations. The group managed under Style 2 was equally effective or competent, but much less efficient in technical operations. There was also sufficient evidence to suggest that Style 1 was best able to combat the influences of the agitator.

There were no pronounced differences in post-shelter attitudes among the three study groups.

Over-all Consideration of management Style

On the basis of the empirical tests employed, both the 48-hour exercises and the high-stress exercises, management Style 1 appeared to recommend itself as the management strategy of choice. This recommendation is based primarily on the results of observation of in-shelter behavior, although it is supported by certain of the post-shelter attitude measures. This recommendation can be interpreted to mean that the technical competence of the manager plus his close supervision of the

technical activities of a shelter group is necessary but not sufficient in producing optimum shelter operation. Close attention must also be paid to the psycho-social activities of the group, not only to gain additional confidence from the shelterees, but also to effectively "head-off" any subversive activities in the group; i.e., behavior designed to interfere with or overthrow the manager. On the other hand, psycho-social concerns should not be allowed to detract from the close scrutiny of technical operations, as could be seen from the results of the studies in which management Style 2 was employed.

Additional Findings and Considerations Resulting from the Studies of Management Style

A number of additional findings and considerations resulted from the studies of management style, and these will now be presented.

Illness of Children

In the 48-hour studies, a reasonably large number of children under 12 years of age served as subjects. An interesting finding regarding these children can be stated as follows:

1. Unless encouraged and, indeed, sometimes forced to eat the shelter rations, they will tend not to do so -- with the exception of the carbohydrate supplement (in these studies, the lemon drops).
2. If the children are allowed not to eat, they invariably become sick. The symptoms are nausea and slight fever, together with a marked reduction in activity.

This situation was corrected in the later runs of the 48-hour studies after the manager had cautioned the parents to take measures to insure that their children ate their allotted rations. This situation also appears to be reduced if recreational programs for the children are devised by the shelter group.

It is felt that consideration should be given to this effort in management training programs, as well as in any future policies regarding shelter stocking.

Racial Integration in Exercises

In all exercises, apart from Study I and the Dark Study, 10 to 20% of the composition of each study group was composed of Negro volunteers. There were no incidents of racial antagonism in any of the studies. In contrast, Negro volunteers were very well integrated into both the structure and the functioning of all study groups. Negroes served as members of, and leaders of, several task teams. It was not unusual for a Negro to be elected the leader of a living unit, even if the unit were predominantly white. Several Negroes commented on this atmosphere of acceptance that they encountered, and one woman stated that because of this the shelter exercise had been a "high point" in her life.

It is not known if these exercises resulted in any permanent changes in interracial attitudes. It can be suggested, however, that shelter exercises of this sort may well result in an increase in racial and ethnic understanding and acceptance on the part of the participants, by providing a vehicle by which people of different racial and ethnic backgrounds can live and work together, perhaps for the first time in their lives.

Realism and "Playing the Game"

The factors added to the scenario in Studies X, XI, and XII to effect the condition of "high stress" appeared to result in those groups taking the exercises more seriously than did the groups used in the 48-hour studies. Among the shelterees there was much less discussion of the exercise as an "experiment" or "test," and fewer questions to the manager regarding time of emergence, how their payment would be made, etc. Moreover, the high stress groups appeared to enjoy their exercises more than had the other groups. As one observer put it, the EBS

activity, the late arrivals, the looter threat, and the simulated radiation emergency added a "fun reality" to the exercises which enabled the shelterees to view the stays as exercises in simulated survival rather than as 24- or 48-hour confinements. While all of the studies had an educational effect upon the participants, it was felt that Studies X, XI, and XII brought home more effectively the desirability and necessity of civil defense preparedness. The recommendation to be made is that some simulation of disaster events is desirable in fallout shelter investigations. It is obvious that too much simulation would make the exercise appear to be ridiculous. However, the addition of carefully selected events will serve to add a reality to the situation. If this is not done, the shelterees will make their own reality, which can, at worst, reduce to the question of "What does one do to pass the time when confined in a room for X number of hours with Y number of other people?"

Shelter Operation under Conditions of Total Darkness

One additional 24-hour shelter exercise was conducted, its purpose being to test the effectiveness of shelter operation under conditions of total darkness. Fifteen volunteers from A-1-R's research staff served as subjects for this study. The actor employed as manager in all of the previous studies again played this role, but without any attempt to maintain any given management style. No illumination of any sort was permitted or presented to the subjects during this study. Observation was accomplished through the use of infra-red metasopes, and observer comments and descriptions were tape recorded.

The results of this study revealed that darkness was tolerated for a 24-hour period and essential shelter tasks were carried out. It is felt, however, that because of the specialized skill of a number of the subjects, these results represent a ceiling rather than a base line in terms of performance in the dark. Because of this, it is recommended that illumination of some kind be afforded during shelter entry, and

at any time when critical tasks, such as setting up equipment, are being executed. The latter is particularly desirable in the absence of trained or experienced people. It was found that a small but highly useful light source can be produced using parts of the OCD-supplied radiation gear.

DETAILED DISCUSSION OF RESEARCH PROGRAM

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PHASE I: EFFECTS OF LATE ASSUMPTION OF COMMAND BY SHELTER MANAGER

In this phase of the research program, three exercises (Studies I-III) were conducted to determine the effects of late assumption of command by the shelter manager. Each of these studies will now be described.

Study I

Purpose

The major purpose of this study was to establish a data base line to be used in the evaluation of the other two studies in this part of the program of investigation.

Design of Study

The scenario of scheduled events for the 24-hour stay is reproduced in Appendix A of this report. The EBS messages, given by the senior observer over the PA system, are listed in Appendix B. The actor portrayed management Style I, and was present in the shelter when the shelterees entered.

Composition of the Subject Group

The relevant dimensions of the composition of the subject group are shown below:

Mean age in years - 24.2

Educational level - 12.1 (mean years of school attendance)

Occupational level - 2.4 (mean value on Hollingshead scale)

Family groups ----- 4 family groups containing a total of 13 of the 19 shelterees

Individuals ----- 6 shelterees not present as part of a family group

Racial composition - All white

General Description of Shelter Stay

Although this was the first time that the actor-manager had ever conducted or even participated in a shelter exercise, the planned scenario of events occurred quite smoothly. He had no trouble in establishing his authority or obtaining the cooperation of the shelterees. As will be described shortly, he did perceive some difficulty in maintaining this rapport throughout the study. On the whole, the shelterees performed their assigned duties effectively, conscientiously, and with interest. Notable exceptions to this were the assigned head of the recreation team, and one member of the radiological monitoring team, both making the most marginal of contributions toward the execution of their team assignments. Both of these "gaps" in group performance were filled by the voluntary actions of another shelteree, who was at once the most helpful and the most annoying and disorganizing of all of the participants in the study. His strange admixture of role will be more fully examined shortly.

Morale remained quite high throughout the entire shelter stay, although reports of boredom were common during the last hours of the exercise. Clock-watching, complaints about excessive free time, and anticipation of being "let out" occurred with increasing frequency at this point in the study.

Critical Events

No outstanding critical events, either of a positive or a negative nature, occurred in this study.

Outstanding Participants

The most outstanding participant of this study was Mr. S, an 18-year old boy with a highly effective and somewhat dangerous extroverted charm. Mr. S was assigned by the manager to be a member of the recreation team, and then only when he complained about not having been given a team assignment. (It should be noted that Mr. S's skills inventory

on his registration form did not pinpoint him for any particular team assignments, so that the manager's ignoring him during the initial assignments was a defensible action.) At any rate, Mr. S was outstanding in his willingness to volunteer help to all task teams, and particularly to replace the lagging head of recreation in coming up with shelter games and amusements, particularly for the children in the study. He appeared to gain popularity in the group by being popular with the children. This was used as a two-edged sword, however, for he often attempted to "stir up" the children during training sessions and at other times when the shelter manager needed the attention of the group. At one point Mr. N, the head of the largest family represented in the study, had to recall his children from Mr. S's location in the shelter and discipline them for inattention to an ongoing shelter discussion.

To the observers Mr. S appeared to be generally cooperative, although his enthusiasm for seeing the children have fun occasionally got in the way of smooth shelter functioning. The manager reported in his debriefings that this was not the case. On the basis of several very subtle undetected by-plays occurring during the stay, the manager felt that Mr. S was very clearly undercutting his leadership position. He inquired often as to the manager's training - who had trained him? - was he working for A-I-R? - how much was he being paid? - and so on. The manager, acting as instructed, either ignored or avoided answering such questions. Mr. S often quietly raised questions about the nature of the "experiment" with other shelterees. He often tried to get the children to peek through the observation ports, and occasionally made reference to "those guys out there watching us." The net effect of these behaviors was to remind people that they were in an experiment, were at the mercy of the experimenters, and that the manager was most likely in cahoots with these experimenters. The manager felt his position threatened by this effect, but at the same time was hesitant to take any action to correct Mr. S, because Mr. S would back off or become extremely helpful and cooperative as soon as the manager looked

like he was going to exert his authority and discipline him. The manager felt that he would have been in trouble handling the group had the shelter stay lasted much longer than the 24 hours, if Mr. S had continued generating this subtle undercurrent of distrust.

Evaluation of Group Effectiveness

Technically speaking, this group performed at a very adequate level, and would likely have survived a two-week stay. No technical errors were made. All of the team heads, with the exception of recreation, were capable and cooperative individuals. Regarding the psychological environment, it is difficult to project upon the extended effects of Mr. S's activities. The manager, as reported, felt ill-at-ease in the presence of this person, and predicted that he would have had serious trouble had the stay continued. However, the manager may have had an unrecognized ally in Mr. N, who was informally interviewed by a staff member after the study. Mr. N was aware of the attempt by Mr. S to undermine the existing leadership, and was prepared to come to the manager's aid if it ever proved necessary. By declaring Mr. S to be "off-limits" to his children, Mr. N could have removed one of Mr. S's most potent weapons.

Study II

Purpose

The major purpose of this study was to investigate the effects of the shelter manager's arriving two hours after the start of the exercise.

Design of Study

The schedule of shelter events for this exercise was identical to that used in Study I, with the following exceptions:

rate, using the guidance materials as a checklist of problems and suggested solutions, even though the guidance was not presented in this form, the emergent manager and his deputy directed the shelterees in the execution of the following acts in the order stated:

1. Formation of living units.
2. Completion of registration forms.
3. Setting up of the chemical toilet.
4. Briefing shelterees on the use of the chemical toilet.
5. Assignment of task teams and team heads, supply inventory, set-up of RADEF gear.
6. Setting up food and water supplies.
7. General briefing on the reasons for and the organization of living units and task teams.
8. Meeting of team heads.
9. Briefing of shelterees by team heads.
10. Preparation of first shelter meal.

It was during the serving of this first meal that the shelter manager entered the shelter.

When the manager entered the shelter, the initial response of the group was one of cautious acceptance of his authority. The acting manager told him to stand by the door until he was "decontaminated" by the RADEF team, and requested that he present his credentials to the group. The manager did so to the group's satisfaction, and then directed the "decontamination" activities. When these were completed, he asked the acting shelter manager to give him the shelter records that had been kept so far, together with a "run-down" of the events that had occurred. The acting manager did so, and the transfer of shelter command was completed.

Although he had not been assigned any formal role at the change of command, the man who had emerged as acting shelter manager continued to play a vital role in shelter activities, but along a different dimension. The direction of technical operations had been assumed by the "legitimate" shelter manager, and had thus been removed from the emergent

shelter manager's responsibilities. Rather than withdraw from the operations and become merely another shelteree, he consistently and continually volunteered his services to the execution of technical operations and, in addition, began to play a strong role in providing social support to the manager and to the group as a whole. He became very active in matters of psychological support, such as circulating in the shelter and talking with individuals and in planning games and amusements for the recreation periods. In short, he remained an active participant in shelter events, although the responsibilities and authority of command had been removed from his jurisdiction by the appearance of the "legitimate" shelter manager.

The remainder of the shelter exercise transpired in a manner similar to that of the first study. Morale remained quite high, with some complaints of boredom and considerable anticipation of being "let out" at the completion of the exercise.

Critical Events

Apart from the change of command previously described, only one occurrence of this study bears mention as a critical event. As part of setting up the chemical toilet at the beginning of the study, the acting shelter manager directed that five gallons of the drinking water be poured into the chemical toilet to dilute the disinfectant. While this may have endangered their survival potential over a two-week stay, the mistake was not as much an error of judgment as it was the result of ambiguous instructions on the disinfectant container.

Outstanding Participants

The most outstanding participant in the study was the emergent shelter manager, Mr. R. His role in the shelter was described previously, and can be further seen by reference to the following data:

1. Number of recorded involvements of Mr. R with problems of technical operation of shelter:

- a. Before shelter manager entered
(first two hours of exercise) 19
 - b. After entrance of shelter manager
(remaining 22 hours of stay) 18
2. Number of involvements of Mr. R with problems of social or psychological support (recreation, chatting, maintaining discipline and order, publicly supporting shelter manager):
- a. Before shelter manager entered 0 (no activities of this sort were recorded for any shelterees until after the manager had entered and assumed control of shelter operations)
 - b. After shelter manager entered 10 (next to the shelter manager himself, Mr. R was the most active in this area of all of the shelterees)

Mr. R was a 42-year old high school teacher, and was head of the largest family unit represented in the shelter (wife and six children).

Other active people in the shelter were Mr. and Mrs. W and Mr. S. All three were college students in their early twenties. All three were outstandingly active during the initial two hours before the shelter manager arrived, and their profiles of activity follow closely in kind, but not degree, the activity profile of Mr. R. This is demonstrated in the data shown below.

Shelteree	Number of recorded involvements with problems of technical operations		Number of recorded involvements with problems of social and psychological support	
	Before Entrance of Manager	After Entrance	Before Entrance of Manager	After Entrance
Mr. W	7	7	0	3
Mrs. W	5	5	0	4
Mr. S	8	8	0	5

Initially there was a question as to whether or not Mr. W would emerge as the shelter manager instead of Mr. R, as both were equally active in directing the initial activity in setting up the shelter operations. Mr. W soon deferred to Mr. R's maturity and ability to organize. Mr. R, recognizing the strong support of Mr. W, publicly announced that Mr. W was his deputy manager.

Evaluation of Group Effectiveness

With the exception of the misuse of the water supply, the group was very effective, and had a survival potential likely surpassing that of the first study group, since there was no evidence of potential conflict or agitation regarding the leadership structure as there was in the first study. During his two hours as acting manager, Mr. R produced a near-perfect organization of the shelter. While this was due in part to his own management skills, it was also a result of his careful and consistent use of the in-shelter guidance materials. A list of the materials available can be found in Appendix M. As previously stated, he used them as a checklist of problems to be solved and as a source of possible solutions. Thus, the identification of the problems to be solved and methods of solutions were defined to Mr. R by the guidance materials. The success of the solutions attempted was due to the cooperation of the shelterees, and to his skill of communication and directing.

Study III

Purpose

The major purpose of this study was to investigate the effects of the shelter manager's arriving 12 hours after the start of the exercise.

Design of the Study

The scenario of scheduled events for this exercise was identical to that of Study II. The actor portrayed management Style I, and was admitted to the shelter 12 hours after the start of the exercise.

Composition of the Subject Group

The relevant dimensions of the composition of the subject group are shown below:

Mean age in years - 22.9

Educational level - 10.8 (mean years of school attendance)

Occupational level - 4.5 (mean value on Hollingshead scale)

Family groups ----- 3 family groups containing 10 of the 19 shelterees

Individuals ----- 9

Racial composition - 14 white, 5 Negro (1 family, 3 Individuals)

General Description of the Shelter Stay

The initial attempts at organizing the shelter were split three ways between Mr. B, Mr. A, and Miss L. Mr. B was in his late thirties, while both Mr. A and Miss L were in their early twenties. Although the data records indicate that Mr. B was the most active of the three, Mr. A emerged as shelter manager, and was responsible for making most of the decisions regarding organizational problems, decisions based upon information provided to him by Mr. B and Miss L. Mr. A took a very casual attitude toward the exercise, and his chief activities were setting up the chemical toilet and directing the activities required to distribute food and water. While all three of these people read the shelter guidance materials, the majority of organizational instructions were ignored at the decision of Mr. A. No living units or task teams were assigned. Although Mr. B had set up the RADEF monitoring equipment, Mr. A instructed him to put it aside since "We won't need it for just 24 hours." No security watch was posted for the night - again at Mr. A's direction.

Considerable activity occurred during the night including card playing, reading, and the children playing with the shelter flashlight. When the shelter manager appeared early in the morning, he had to instruct the shelterees to "decontaminate" him, and no one challenged his authority or asked for his credentials. Transfer of command was immediate.

The shelter manager promptly established living units and task team and proceeded to implement the day's activities called for in the scenario. Cooperation was fine, and the remainder of the exercise occurred in routine fashion.

Critical Events

This group made the same error in setting up the chemical toilet as did the group in Study II. Five gallons of drinking water were used to dilute the disinfectant placed in the commode. Again, this was primarily due to the ambiguous instructions on the disinfectant container, rather than a result of poor judgment on the part of the emergent manager. It should be pointed out, however, that the casual attitude of the emergent manager resulted in potentially dangerous omissions in standard shelter operations, such as the lack of formal task organization, the putting aside of the radiation monitoring equipment, the lack of nighttime security arrangements, and the use of the shelter flashlight as a toy, rather than as a source of emergency lighting. This misuse of the flashlight is of particular importance, for in the event of a power failure this would provide the primary source of shelter illumination.

Outstanding Participants

As previously mentioned, the outstanding participants in this study were Mr. B, Mr. A, and Miss L. The profile of their activity over the course of the exercise is shown on the following page.

After the manager entered, all three showed a reduction in rate of involvement with problems of shelter operation, both technical and psychological-social support. This is to be contrasted with the activity profiles

Shelteree	Number of recorded involvements with problems of technical operations		Number of recorded involvements with problems of social and psychological support	
	Before Entrance of Manager (First 12 hours)	After Entrance (Last 12 hours)	Before Entrance of Manager (First 12 hours)	After Entrance (Last 12 hours)
Mr. B	22	4	2	0
Mr. A	14	8	4	0
Miss L	12	6	4	0

of the outstanding participants of Study II, who in all cases compensated for the reduction of involvement with technical problems with an increase in involvement with psychological and social support. The active people in Study II complemented the manager's assumption of responsibilities and direction of technical operations by channeling their energies into the area of psychological and social support of the manager and of the group. No such transfer was apparent in this study.

Evaluation of Group Effectiveness

Before the arrival of the manager, this group was poorly organized and unprepared for anything other than maintaining sanitary conditions and feeding themselves. They would likely have been in severe trouble if they had been faced with any unanticipated emergency requiring teamwork operation, such as some of the events which took place in the "high stress" scenario used in later studies in this research program. Therefore, it is reasonable to state that the survival potential of this group was less than that of the two preceding groups, at least during the period prior to the entrance of the assigned shelter manager.

While Mr. A of this study was far more casual in attitude and far less task-oriented than Mr. R of Study II, it is interesting to consider how much of the difference in extent of organization was due to the difference in the way each of these men used the shelter guidance materials. Mr. R, as previously described, used them as a checklist of problems to

be solved and as a source of solutions to the problems. In other words, he used the guidance materials to decide what was to be done and how it was to be done. Mr. A, in contrast, decided what was to be done by his own evaluation of the situation, and used the guidance materials only as a source of possible solutions to problems he deemed relevant to a successful stay. In short, Mr. A did not recognize his ignorance of the situation and, by relying on his own untrained judgment, committed several potentially dangerous errors of omission.

Comparison of Results of Studies I-III

In-Shelter Organization

The foregoing description of the three studies should be sufficient to highlight the following points. The degree of effectiveness of shelter organization and preparedness in the absence of a trained manager will depend upon:

1. The attitude toward the exercise or situation of the person who emerges as the acting manager.
2. The way in which this person utilizes in-shelter guidance materials.

Mr. R of Study II viewed the exercise as being a serious educational experience, and the absence of the shelter manager as something of a test of the group's ability to organize themselves properly. Finding the guidance materials, he utilized them as a set of instructions regarding how to make the shelter 'work' so to speak, and followed them to the letter. This, together with his skill at putting the guidance recommendations into effect, resulted in the development of a relatively perfect shelter organization within a period of two hours from the start of the exercise.

In contrast, Mr. A of Study III viewed the exercise with a much more casual eye, and implemented solutions to only those problems which

he deemed important to a successful 24-hour stay, which in actuality were setting up the sanitation gear and the food service supplies. As previously described, he either ignored or rejected the recommendations of the guidance regarding team and unit formation, security procedures, and radiological monitoring within the shelter. Whether or not he would have done the same thing under actual conditions remains an academic question. At any rate, his handling of the situation could have potentially resulted in:

1. Extreme confusion regarding individual responsibility in any rapidly unfolding emergency situation, since no task team assignments had been made.
2. Contamination of the shelter by radioactivity "leaks" or the entrance of exposed people who would not have been decontaminated, since the RADEF gear had been "put away."
3. Undetected emergencies such as fire, entrance of looters, etc., during the night, since no security watch was posted.
4. The rendering ineffective of the emergency lighting source available to the shelter by use of the flashlight as a plaything for the children.
5. The taking over of command in the shelter by unauthorized persons. When the manager entered the shelter in Study III, Mr. A and the group took his word that he was indeed the bona-fide assigned manager of that shelter. Mr. R of Study II was not about to do so, and requested a display of identification and credentials.

Technical Activities

This classification is composed of activities directed toward life support functions in the shelter; i.e., food and water, radiation monitoring, safety and security, sanitation, and medical care. The programmed events in these three exercises were such that the actual number of technical problems which had to be solved was fairly constant

across all three studies. Thus, the total number of technical activities executed in solving these problems can be taken as a measure of each group's efficiency in handling the technical operations in the shelter. Table II below displays the total number of technical activities of the group and of the manager for each of the three studies conducted in this phase of the research program.

Table II

Technical Activities of Groups and of Manager - Studies I-III

Study Number	I	II	III
Experimental Condition	Manager present at start of exercise	Manager two hours late	Manager 12 hours late
Total Activities of Group (excluding manager)	71	116	118
Total Activities of Manager	24	35	39

Chi-square tests were performed on these data with the following results:

1. There were significantly less technical activities performed in Study I than in either Studies II or III, excluding manager (p less than .001).
2. There were no significant differences among the three studies with regard to the number of technical activities performed by the manager.

These results suggest that:

1. Late arrival of the assigned manager will result in inefficiency of technical operations in the shelter. The most efficient

technical operation occurred when the manager was present from the beginning of the exercise. Since in all studies being compared the subjects were faced with the same number of technical problems, the number of activities required to solve these problems was taken as a gross indication of technical efficiency. Thus, if fewer technical activities were required to handle problems of this sort by one group than another, the group with the fewer activities was viewed as being more efficient than the other.

2. Late arrival of the manager apparently does not reduce the number of technical activities which he himself performs. Moreover, the data suggest that his rate of performance of technical activities increases as a function of his lateness. This increase in rate is probably due to checking what the shelterees have already done, and making necessary changes.

Psycho-Social Activities

This category is composed of non-technical activities in general. The best over-all description of this category is "activities directed toward the improvement of the non-technical environment for oneself and/or for others." Any form of recreational activity, for example, would be included under this heading. Table III on the following page displays the total number of such activities of the group and the manager for each of the three studies.

Table III

Psycho-Social Activities of Groups and of Manager - Studies I-III

Study Number	I	II	III
Experimental Condition	Manager present at start of exercise	Manager two hours late	Manager 12 hours late
Total Activities of Group (excluding manager)	31	50	21
Total Activities of Manager	6	9	1

Chi-square tests were performed on these data, with the following results:

1. There were significantly more psycho-social activities performed in Study II than were performed in Study III (p less than .01).
2. The manager performed significantly more psycho-social activities in Study II than he did in Study III (p less than .05).

These differences between Studies II and III can be ascribed to the difference in behavior between the outstanding participants, particularly the emergent or acting managers, in these two studies. (See page 30 of this report.) After the assigned manager took control in Study II, all of the outstanding participants of this group compensated for their reduction in involvement in technical activities with an increase in involvement in psycho-social activities. This was particularly true with Mr. R, who had served as acting manager. Moreover, most of Mr. R's psycho-social activities were performed in interaction with the assigned manager, thus increasing the manager's score on this dimension. No such transfer was noted in Study III; in fact, the outstanding

participants in Study III withdrew from both technical and psycho-social activities after the entrance of the assigned manager.

Degree of Participation

This section will investigate the degree of subject participation in both the technical and psycho-social aspects of shelter life. This will be done in two ways. First, tables will be presented revealing the total number of subjects active in the two aspects of shelter life being investigated. Secondly, tables will be presented which reveal how active the participants in these activities were. That is, it will indicate the number of subjects showing little or no activity, and also the number showing relatively high rates of activity.

Table IV

Number of Subjects in Studies I-III Participating in Technical Activity

Study Number	I	II	III
Number of Subjects in Each Group Participating	15	11	14

Table V

Number of Subjects in Studies I-III Participating in Psycho-Social Activity

Study Number	I	II	III
Number of Subjects in Each Group Participating	10	17	8

Table VI

Degree of Subject Participation In Technical Activities
(Studies I-III)

Study Number	I	II	III
Number of Subjects Participating in 0-2 Activities	10	9	9
Number of Subjects Participating in 3 or More Activities	9	10	10

Table VII

Degree of Subject Participation in Psycho-Social Activities
(Studies I-III)

Study Number	I	II	III
Number of Subjects Participating in 0-1 Activities	15	5	13
Number of Subjects Participating in 2 or More Activities	4	14	6

Chi-square tests were performed on these data with the following results:

1. There were no significant differences in the number of subjects involved in technical activities.
2. There were no significant differences in the number of subjects involved in psycho-social activities.
3. There were no significant differences in the number and extent of subject participation in technical activities.

4. Study II had significantly (p less than .05) more subjects participating in more psycho-social activity than Studies I or III.

The only statistically significant difference in this phase of the analysis revealed that Study II had significantly more subjects who were highly active in psycho-social activities than either Studies I or III. It is felt, however, that this difference can be attributed primarily to the behavior of the outstanding participants in Study II, particularly the emergent manager. (See page of this report.) After the assigned manager assumed command of the shelter, Mr. R, the emergent manager, compensated for the reduction in his technical involvement by becoming extremely active in psycho-social behaviors. This same behavior was also shown by Mr. R's chief aides. It is felt, then, that this difference in psycho-social activity is more a result of the particular shelter inhabitants than the late arrival of the trained shelter manager.

Based on the above explanation, the investigators believe that these results can best be interpreted to indicate that there were no significant differences in the number of subjects active or their degree of activity in either the technical or psycho-social activities of the shelter as a result of late arrival by the shelter manager.

Post-Exercise Attitude and "Feeling" Toward Shelter

Copies of the pre- and post-questionnaire administered to Groups I-III can be found in Appendix G. The scales included in the questionnaires dealt with: CD Information, CD Attitude, Shelter Leader Behaviors, and Discomfort. Several semantic differential scales were also included in the questionnaire. These were concerned with shelteree "feeling" toward: the shelter, civil defense, shelter entry, meals, bedtime, and free time. Table VIII contains the results of the attitudinal analysis.

1. Summary of results.

- a. There were no significant differences between pre- and post-test scores on any scale.

- b. There were no significant group differences on post-scale scores.
- c. Mean item scores on all scales indicate that the subjects are on the favorable end of each continuum employed.
- d. The items causing the most discomfort in the Discomfort Scale (mean rating of less than 2) were:

<u>Study I</u>	<u>Study II</u>	<u>Study III</u>
Sleeping difficulty	Sleeping difficulty	Sleeping difficulty
Sleeping facilities	Sleeping facilities	Sleeping facilities
Food	Food	Food
Lack of water for washing	Lack of water for washing	Temperature and humidity
Crowding	Temperature and Humidity	

A most striking finding is the complete lack of significant differences between groups in attitude and "feeling" regarding their shelter stay. The data indicate, at least from an attitudinal viewpoint, that the late arrival of the shelter manager yielded no detrimental effects.

Table VIII

Questionnaire Summary (Groups I-III)

In general, a higher mean indicates a more correct or a more favorable response

\bar{X} = Mean of scale scores within a subtest S.D. = Standard deviation \bar{x} = Mean item scale score within a subtest	Civil Defense Information			Civil Defense Attitude			Shelter Leader Behaviors			Semantic Differential "Shelter Feeling"			Semantic Differential Civil Defense				
	1. 14 Items	2. Correct answer scored 1	3. Range 0-14 of possible scores	1. 20 Items	2. Range of possible scores 20-100	1. 16 Items	2. Range of possible scores 16-80	1. 19 Items	2. Range of possible scores 19-133	1. 19 Items	2. Range of possible scores 19-133	Pre	Post	Pre	Post	Pre	Post
<u>Group 1</u> Style I 17 Subjects Manager present entire time	\bar{X}			69.24	69.00	57.65	58.94	89.29	87.12	92.71	88.71	Pre	Post	Pre	Post	Pre	Post
	S.D.	6.82		8.34	10.52	5.86	7.26	14.06	21.10	16.69	20.65						
	\bar{x}			3.46	3.45	3.60	3.68	4.70	4.59	4.88	4.67						
<u>Group 2</u> Style I 16 Subjects Manager two hours late	\bar{X}			68.06	75.06	58.63	60.38	92.63	90.38	94.75	92.44	Pre	Post	Pre	Post	Pre	Post
	S.D.	5.88		17.01	14.33	4.03	2.98	15.83	36.39	15.74	36.51						
	\bar{x}			3.40	3.75	3.66	3.77	4.88	4.76	4.99	4.87						
<u>Group 3</u> Style I 14 Subjects Manager twelve hours late	\bar{X}			71.00	75.86	57.57	59.79	95.21	97.79	102.21	101.36	Pre	Post	Pre	Post	Pre	Post
	S.D.	6.14		18.16	22.38	8.28	4.46	20.46	4.92	13.18	17.27						
	\bar{x}			3.55	3.79	3.60	3.74	5.01	5.15	5.37	5.33						

Table VIII (Cont.)
Questionnaire Summary (Groups I-III)

In general, a higher mean indicates a more correct or a more favorable response

\bar{X} = Mean of scale scores within a subtest S.D. = Standard deviation \bar{x} = Mean item scale score within a subtest	Semantic Differential Entry	Semantic Differential Meal Time	Semantic Differential Bed Time	Semantic Differential Free Time	Discomfort
	1. 15 Items 2. Range of possible scores 15-105	1. 15 Items, 2. Range of possible scores 15-105	1. 15 Items 2. Range of possible scores 15-105	1. 15 Items 2. Range of possible scores 15-105	1. 22 Items 2. Range of possible scores 22-66
	Post	Post	Post	Post	Post
<u>Group 1</u> Style I 17 Subjects Manager present entire time	\bar{X} 76.47 S.D. 9.80 \bar{x} 5.10	62.12 20.50 4.14	66.12 16.49 4.40	77.12 17.96 5.14	51.23 5.09 2.33
<u>Group 2</u> Style I 16 Subjects Manager two hours late	\bar{X} 72.75 S.D. 23.31 \bar{x} 4.85	76.44 22.58 5.10	78.38 24.00 5.23	85.38 23.41 5.69	50.13 14.20 2.28
<u>Group 3</u> Style I 14 Subjects Manager twelve hours late	\bar{X} 77.21 S.D. 23.70 \bar{x} 5.15	70.71 23.68 4.71	66.36 24.81 4.42	78.21 24.15 5.21	53.86 6.05 2.45

PHASE II: EFFECTS OF MANAGEMENT STYLE (STUDIES IV-IX)

Introduction

The investigation of effects of different management styles constituted the major portion of the current research effort. The investigation was accomplished by means of six 48-hour shelter exercises, each exercise group consisting of 39 shelterees and the shelter manager. The independent variable was the management style portrayed by the actor-manager, while the dependent variables, as in the previous studies, consisted of:

1. In-shelter behavior, in particular:
 - a. Organization for and effectiveness of technical operation of the shelter.
 - b. Organization for and effectiveness of psychological and social support activity.
2. Post-exercise attitudes toward Civil Defense, the exercise itself, the shelter manager, other shelterees, and to the concept of what constitutes effective leadership in a fall-out shelter.

Two exercises were conducted for each of the three previously described management styles, i.e., Style 1, Style 2, and Style 3.

Composition of Subject Groups

The relevant dimensions of the composition of the groups of subjects used in these exercises are shown in the following table.

Table IX

Composition of Subject Groups Used in Investigation
of the Effects of Management Style

Study Number	IV	V	VI	VII	VIII	IX
Management Style	1	2	3	1	3	2
Mean Age in Years	24.19	27.25	25.28	27.00	25.00	27.28
Educational Level*	11.34	11.34	11.83	12.33	11.96	10.93
Occupational Level**	4.78	3.91	3.17	4.13	4.31	4.48
Family Groups	6	5	9	6	5	8
Individuals (People not part of a family group)	16	22	10	16	10	6
Racial Composition						
White	33	32	32	29	31	27
Negro	6	7	7	10	8	12

* Mean number of years school attendance

** Mean value on Hollingshead scale

Design of Studies

The scenario of scheduled events for each of these 48-hour studies is reproduced in Appendix C of this report. The same schedule of events was used in each of the six exercises. The EBS messages, delivered by the Senior Observer over the PA system, are shown in Appendix D. The shelter manager was present when the groups entered the shelter in each of the six exercises.

Results

In-Shelter Technical Activities of Groups. The total number of technical activities, the total number of people involved in these activities, and the mean number of activities per person involved are displayed for each of the six studies in the following tables. It should be kept in mind that any one problem could have involved more than one activity in the development of its solution, and thus the total number of problem-solving activities of the group does not necessarily reflect the total number of problems solved by that group.

Table X

Technical Activities as a Function of Management Style*

Study Number	IV	V	VI	VII	IX	VIII
Management Style	1	2	3	1	2	3
Total Activities	72	185	186	92	104	98
Total People Involved	26	36	30	24	22	25
Mean Activities per Person Involved	2.8	5.1	6.2	3.8	4.7	3.9

* This data does not include the activities of the manager.

The classification "technical problems" is composed of activities directed toward life support functions in the shelter; i.e., food and water, radiation monitoring, safety and security, sanitation, and medical care. The programmed events in these exercises were such that the actual number of technical problems which had to be solved was fairly constant across all groups. For example, a given number of meals were called for and served in each of the six exercises. With this consideration in mind, the data in Table X suggest that the groups operating under

Style 1 management were the most efficient groups in that they performed the necessary technical tasks with the least amount of total problem-solving activity. This effect can be better seen when the data from both replications of each style are combined, as is done in the following table.

Table XI

Combined Data from Both Replications of Each Management Style

Management Style	1	2	3
Data Combined from Studies	(IV and VII)	(V and IX)	(VI and VIII)
Total Activities	164	289	284
Total People Involved	50	58	55
Mean Activities per Person Involved	3.3	4.9	5.1

Chi-square tests performed on these data indicate that significantly less technical activities were executed under Style 1 management (p less than .001). This result suggests that while the number of people who become involved with the execution of technical tasks does not markedly change as a function of management style, the number of activities executed in the performance of these tasks increases markedly under Styles 2 and 3. It should be cautioned, however, that this effect was primarily demonstrated in the first set of replications (Studies IV, V, and VI) -- it did occur in the second set of replications (Studies VII, VIII, and IX) but to a non-significant degree, as indicated by chi-square tests. There was, evidently, an interaction effect between management style and the groups, and the nature of this effect will be discussed in a later section of this report.

Qualitative reports of observers give some indication as to why the described effect occurred. Under Style 1, the manager briefly discussed technical problems, assigned tasks, and made sure that they were carried out with dispatch. Hence, they were accomplished without undue flurry or wasted motion. Under Style 2, he assigned tasks to people but did not closely supervise their activities. As a consequence, a good deal of wasted motion and blundering was generated in the execution of technical tasks. (Indeed, the only potentially dangerous technical errors made in all of the six exercises occurred under Style 2 leadership.) Under Style 3, he assigned and closely supervised technical operations as he did under Style 1. In addition, however, his Style 3 role called for him to both set the example for and to encourage additional activity in the technical area, such as frequent "cleaning up" of the shelter, repeated radiation checks, and careful and extensive record keeping of communications and supplies. Following his lead, the people busied themselves with technical activities, thus inflating the activity counts obtained from Style 3 groups. This fact makes it very difficult to state with any confidence that Style 1 groups were more efficient than Style 3 groups, for the increased technical activity under Style 3 may be solely due to the creation of "busywork" rather than to blundering and wasted motion in executing necessary technical tasks. Indeed, Style 3 groups may well be more efficient and more effective than Style 1 groups under conditions of high technical stress, i.e., under conditions where technical emergencies appear.

Both replications of Style 2 were marked by potentially serious technical errors. In the first replication (Study V), the head of the food team used all the carbohydrate supplements (lemon drops) during the first 24 hours. In the second replication (Study IX), there was a period of some 15 hours during which no radiological monitoring was done by the RADEF team. Both of these errors resulted from the manager leaving the teams "on their own," and not checking on what they were doing.

In-Shelter Psycho-Social Activities of Groups. The category of "psycho-social problems" is awkwardly named, for it refers primarily to the planning, selection, and execution of non-technical activities in general. Thus, included under this category are a range of activities from writing one's initials on the shelter wall to the more selfless activity of inviting an isolated individual to a game of cards. The best over-all description of this category is "activities directed toward the improvement of the non-technical environment for oneself and/or for others."

The following table displays the data regarding psycho-social activities for each of the six exercises.

Table XII

Psycho-Social Activities as a Function of Management Styles*

Study Number	IV	V	VI	VII	IX	VIII
Management Style	1	2	3	1	2	3
Total Activities	96	115	44	70	48	58
Total People Involved	32	35	21	28	25	27
Mean Activities per Person Involved	3.0	3.3	2.1	2.5	1.9	2.1

* This data does not include the activities of the manager.

Chi-square tests indicated that consistently more activities of this nature occurred under Style 1 and Style 2 than did under Style 3 (p less than .01), in the first set of replications (Studies IV, V, and VI). This effect did not appear in the second set of replications (Studies VII, VIII, and IX). This effect is due in part to the Style 3 manager's emphasis on non-involvement with matters of this nature.

The Style 1 manager puts forth the appearance that "when the technical jobs are done, we can and should concern ourselves with recreation and amusement," and he is quite willing to participate in these activities. The Style 3 manager puts forth the appearance that "the technical jobs are really never done, at least for me, anyway -- if you as a group wish to be concerned with these issues, you must do it on your own." The data suggest that the Style 3 groups follow the manager's lead and tend to de-emphasize psycho-social activity, perhaps even replacing it with the technical "busywork" discussed in the previous section. This suggestion must be viewed with a rather jaundiced eye in the light of another factor which will now be described.

A possible confounding factor can be seen when an attempt is made to explain the marked difference in amount of psycho-social activity between the first and second replications of Style 2. Within each set of replications, there appears to be a correlation between amount of such activity and a characteristic of the groups involved. This characteristic has been termed "number of individuals present," and refers to the number of people in the group who are not part of any family represented in the study. In essence, these are people who do not have blood relatives present in the exercise in which they are participating. The following table demonstrates the apparent correlation between the number of such people present and the number of psycho-social activities displayed by each study group.

Table XIII

Number of Psycho-Social Activities and Number of "Individuals" Present in Each Exercise

Study Number	IV	V	VI	VII	IX	VIII
Management Style	1	2	3	1	2	3
Total Number of Psycho-Social Activities	96	115	44	70	48	58
Number of "Individuals" Present	16	22	10	16	6	10

For each set of replications of management style, there is a perfect rank-order correlation between number of "individuals" present and number of psycho-social activities. Whether or not this represents a cause-effect relationship is difficult, if not impossible, to say with any degree of assurance. It might be suggested that the more strangers there are in a group, the greater will be the number of "getting acquainted" activities recorded. This assumption would explain not only the difference between the first and second replications of Style 2, but also the consistent difference between Style 1 and Style 3 groups in amount of psycho-social activity. It also tends to throw any conclusions regarding the effects of management style upon amount of psycho-social activity into the proverbial cocked hat.

Qualitative observation in the form of comments from observers and post-exercise debriefings of the manager suggest that management style did have an effect upon psycho-social "tone" of the exercises. Groups operating under Style 1 seemed to develop an esprit de corps which was notably absent in the other two styles. Style 1 groups appeared to get the jobs done with the least effort and to enjoy themselves while doing so. Style 3 groups, as mentioned before, tended to busy themselves with technical details and to take the exercise in a very serious fashion. Under this style, those who were interested in technical operations enjoyed the exercise; those who were not appeared to be totally bored. Style 2 groups, operating under a management technique which emphasized the airing of personal ideas, feelings, and approaches, did not infrequently show signs of intra-group hostility and competitiveness. Planning sessions and shelter briefing sessions were often marked by bickering and squabbling, sometimes over relatively minor details. Style 2 also permitted the trouble-maker and the malcontent to continually air their gripes and complaints, often to the annoyance of other members of the group.

Manager Effort. The total number of technical and psycho-social activities performed by the manager are displayed in the following table.

Table XIV

Technical and Psycho-Social Activities of Manager

Study Number	IV	V	VI	VII	IX	VIII
Management Style	1	2	3	1	2	3
Technical Activities	21	44	51	24	32	31
Psycho-Social Activities	13	7	1	3	10	2
TOTAL	34	51	52	27	42	33

When the data are combined for each management style; i.e., when the data are combined for Studies IV and VII, V and IX, and VI and VIII, Chi-square tests indicate that:

1. The manager performs significantly fewer technical activities when operating under Style 1 (p less than .01).
2. The manager performs significantly fewer psycho-social activities when operating under Style 3 (p less than .01).

These results indicate that the actor-manager expended less effort in the operation of the shelter under Style 1, and that this was primarily due to less effort in the area of technical activities. Under Style 1, he directs technical efforts, and his training allows him to get technical tasks out of the way with a minimum of wasted effort. Under Style 3, of course, he invented technical jobs to keep himself busy in this area as part of his "image." Under Style 2, while he tried to minimize his involvement with technical problems, he was invariably drawn into them simply because people assigned to the tasks could not figure out what to do, or made several false starts and needed to be straightened out.

In the second set of replications (Studies VII, IX, and VIII), it is pertinent, although somewhat embarrassing, to note the convergence

of technical effort in Style 2 and Style 3 back to the level displayed in both replications of Style 1. After the first replications (Studies IV, V, and VI), the actor-manager stated that he most enjoyed portraying Style 1, and that he felt this style to produce the greatest ease and efficiency of operation. During the second replications of Styles 2 and 3, he admitted that he occasionally had to exert extreme control of himself to keep from slipping into a Style 1 mode of operation. The fact that this tendency was there may well explain the convergence just described, and may further explain, in part, the over-all reduction in activity of the Style 2 and Style 3 groups between their first and second replications.

Degree of Participation. This section will investigate the degree of subject participation in both the technical and psycho-social aspects of shelter life. This will be done in two ways. First, tables will be presented revealing the total number of subjects active in the two aspects of shelter life being investigated. Secondly, tables will be presented which reveal how active the participants in these activities were. That is, they will indicate the number of subjects showing little or no activity, and also the number showing relatively high rates of activity.

Table XV
 Number of Subjects in Studies IV-IX Participating
 in Technical Activity

Management Style	1	2	3
Study Numbers	(IV and VII)	(V and IX)	(VI and VIII)
Number of Subjects in Each Group Participating	50	58	55

Table XVI

Number of Subjects in Studies IV-IX Participating
in Psycho-Social Activity

Management Style	1	2	3
Study Numbers	(IV and VII)	(V and IX)	(VI and VIII)
Number of Subjects in Each Group Participating	60	60	48

Table XVII

Degree of Subject Participation in Technical Activities
(Studies IV-IX)

Management Style	1	2	3
Study Numbers	(IV and VII)	(V and IX)	(VI and VIII)
Number of Subjects Participating in 0-3 Activities	59	48	51
Number of Subjects Participating in 4 or More Activities	19	28	27

Table XVIII

Degree of Subject Participation in Psycho-Social Activities
(Studies IV-IX)

Management Style	1	2	3
Study Numbers	(IV and VII)	(V and IX)	(VI and VIII)
Number of Subjects Participating in 0-2 Activities	48	51	70
Number of Subjects Participating in 3 or More Activities	30	25	8

Chi-square tests were performed on these data with the following results:

1. There were no significant differences in the number of subjects involved in technical activities across management style.
2. There were no significant differences in the number of subjects involved in psycho-social activities across management style.
3. There were no significant differences in the number and extent of subject participation in technical activities across management style.
4. Leadership Style 3 had significantly (p less than .01) fewer subjects contributing many psycho-social activities than management Styles 1 and 2.

The only statistically significant difference in this phase of the analysis revealed that groups under management Style 3, while having approximately the same number of people participating in psycho-social activities as groups under management Styles 1 and 2, had significantly fewer subjects contributing large numbers of these activities than groups under management Styles 1 and 2. It is felt that this difference occurred because the groups participating under management Style 3 imitated their leader's behavior. That is, they placed little value on psycho-social activity, as did their manager.

Post-Shelter Attitudes. Copies of the pre- and post-questionnaires administered to groups IV-IX can be found in Appendix G. The questionnaires dealt with several areas of information and attitudes. These included scales concerned with: Civil Defense Information, Civil Defense Attitude, Shelter Leader Behavior, "Feeling About Shelter," Discomfort, and Shelter Leader Evaluation. The presentation of data will take the form of a short list of findings and a summary of the results for each scale. Tables XIX and XX contain the attitudinal results of Studies IV - IX.

TABLE XIX
Questionnaire Summary (GROUPS IV-IX)

In general, a higher mean indicates a more correct or a more favorable response

	PART 1		PART 2		PART 3		PART 4		PART 5		PART 6	
	Civil Defense Information		Civil Defense Attitude		Shelter Leader Behaviors		Semantic Differential "Shelter Feeling"		Discomfort		Shelter Leader Evaluation	
	1. 6 Items Range 0-6	2. Range 10-50	1. 10 Items Range 10-50	2. Range 10-50	1. 10 Items Range 10-50	2. Range 10-50	1. 15 Items Range 15-105	2. Range 20-80	1. 13 Items Range 13-65	2. Range 20-80	1. 13 Items Range 13-65	2. Range 13-65
\bar{x} = Mean of subtest scores within a group S.D. = Standard deviation \bar{x} = Mean item scale score within a subtest	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Group 4 Style I 32 Subjects	\bar{x} 1.81 S.D. 1.21 \bar{x}	→ 3.69 ^{***} .98	36.69 8.99 3.67	39.84 6.80 3.98	34.13 7.81 3.41	36.51 5.01 3.69	79.22 → 88.44 ^{**} 22.47 5.28	57.31 7.05 2.87	55.63 4.96 4.28	57.31 7.05 2.87	55.63 4.96 4.28	55.63 4.96 4.28
Group 5 Style II 32 Subjects	\bar{x} 2.15 S.D. 1.25 \bar{x}	→ 4.16 ^{***} 1.09	38.34 5.55 3.83	38.41 5.73 3.84	34.97 4.45 3.50	36.28 4.38 3.63	82.41 9.30 5.49	53.84 7.55 2.69	54.31 6.52 4.18	53.84 7.55 2.69	54.31 6.52 4.18	54.31 6.52 4.18
Group 6 Style III 29 Subjects	\bar{x} 2.03 S.D. 1.16 \bar{x}	→ 3.41 ^{***} 1.22	39.10 3.76 3.91	39.55 9.16 3.96	35.10 3.42 3.51	36.52 7.92 3.65	83.41 9.07 5.56	53.00 12.50 2.65	55.03 10.83 4.23	53.00 12.50 2.65	55.03 10.83 4.23	55.03 10.83 4.23
Group 7 Style I 30 Subjects	\bar{x} 2.43 S.D. 1.09 \bar{x}	→ 3.97 ^{***} .91	38.20 5.58 3.82	39.10 4.76 3.91	34.23 3.43 3.42	35.27 3.79 3.53	81.83 21.13 5.46	59.97 10.11 3.00	54.80 5.90 4.22	59.97 10.11 3.00	54.80 5.90 4.22	54.80 5.90 4.22
Group 8 Style III 26 Subjects	\bar{x} 2.00 S.D. 1.18 \bar{x}	→ 4.35 ^{***} 1.27	37.54 7.47 3.75	38.73 8.54 3.87	34.04 7.42 3.40	35.73 7.73 3.57	80.35 9.51 5.36	56.81 13.17 2.84	54.04 11.18 4.16	56.81 13.17 2.84	54.04 11.18 4.16	54.04 11.18 4.16
Group 9 Style II 29 Subjects	\bar{x} 2.45 S.D. 1.38 \bar{x}	→ 4.21 ^{***} 1.09	36.48 2.87 3.65	42.14 ^{***} 4.96 4.21	36.48 2.87 3.65	38.90 3.34 3.89	83.97 13.77 5.60	59.38 8.81 2.98	57.03 5.14 4.39	59.38 8.81 2.98	57.03 5.14 4.39	57.03 5.14 4.39

*** Significant Beyond .01 Level

TABLE XX

SHELTEREE IMPROVEMENT ON POST-TEST (GROUPS IV-IX)

Group and Style	Number and Per Cent	Civil Defense Information	Civil Defense Attitude	Semantic Differential "Shelter Feeling"
<u>Group 4</u> Style I	No. +	24	24	22
	No. 0 or -	7	7	8
	Per Cent +	77	77 ← *	73 ** ←
<u>Group 5</u> Style II	No. +	28	14	11
	No. 0 or -	4	18	19
	Per Cent +	87	43 ←	37 ←
<u>Group 6</u> Style III	No. +	21	19	20
	No. 0 or -	7	9	8
	Per Cent +	72	68	71 *** ←
<u>Group 7</u> Style I	No. +	26	16	21
	No. 0 or -	4	14	7
	Per Cent +	87	53	75 *** ←
<u>Group 8</u> Style III	No. +	21	17	20
	No. 0 or -	4	8	5
	Per Cent +	84	68	80 *** ←
<u>Group 9</u> Style II	No. +	25	18	18
	No. 0 or -	4	11	11
	Per Cent +	86	62	62

No. + = Number of subjects showing increased score on post-test
 No. 0 or - = Number of subjects showing no gain or a lower score on post-test
 Per Cent + = Per cent of total group showing an increased post-test score
 * = Significant beyond .05 level
 *** = Significant beyond .01 level

1. Civil Defense Information.

- a. There was a significant increase in pre - post mean scale scores in all groups.
- b. The percent of subjects in each group showing an increase in post-test scores varied from 72% to 87%. There were, however, no significant differences between groups in the percent of subjects revealing increased post-test scale scores.
- c. There were no significant differences between groups in mean post-test scale scores.

These results indicate that all groups "learned something" as a result of their shelter stay and that differences in leadership style did not result in significant differential learning.

2. Civil Defense Attitude.

- a. The only significant pre - post increase in mean scale score occurred in Study IX (Style 2). All groups, however, revealed pre - post increases in score.
- b. The percent of subjects in each group showing an increase in post-test score ranged from 43% in Study V (Style 2) to 77% in Study IV. This difference between Studies IV and V was the only significant difference (.05 level) between groups in the percent of subjects showing pre - post increases.
- c. There were no significant differences between groups on mean post-test scale scores.
- d. The mean item score in all groups was approximately four on a five-point scale, indicating a favorable attitude toward civil defense.

The only significant differences found between groups involved leadership Style 2, and are found in (a) and (b) above. On the basis of these conflicting findings, it seems unwarranted to attribute any

differential effect to leadership Style 2 in fostering change in attitude toward civil defense. In addition, (c) and (d) indicate that all groups are on the "favorable" end of our continuum, and that there are no significant differences between groups in post-test scale means. The data indicates, then, that all three styles of leadership appear to be effective in fostering and maintaining a favorable attitude toward civil defense.

3. Shelter Leader Behavior.

- a. There were no significant differences in pre - post scale scores for any group.
- b. There were no significant differences between groups in mean post-test scale score.
- c. The mean item score for all groups was 3.7 on a five-point scale. This indicated subject agreement with experimenter keying of appropriate leadership behavior.
- d. All groups agreed that:
 - (1) The shelter leader must be the ultimate authority.
 - (2) Major decisions should not be made by the majority of the group.
 - (3) The shelter leader should be active in all areas of shelter activity.
 - (4) The shelter leader should delegate authority.
 - (5) Shelterees should not burden the shelter leader with their personal problems.
 - (6) The shelter leader should maintain high moral standards.
 - (7) The shelter leader should encourage public discussion.
 - (8) The shelter leader should find out what the shelterees want.

These findings reveal that all groups, regardless of the leadership style to which they were exposed, agreed on certain "ideal shelter leader behaviors." This "ideal shelter leader" appears to more closely approximate the Style 1 leader than the other two leadership styles employed.

4. Semantic Differential - "Shelter Feeling."

- a. The only significant difference between pre - post scale means occurred in Study IV. This indicates that group IV members had a significantly more favorable "feeling" toward the shelter after their shelter experience than before it.
- b. The percentage of shelterees showing improved pre - post scores ranged from 37% in Study V to 80% in Study VIII. Studies IV, VI, VII, and VIII had significantly higher (.01 level) percentages of improvement than Study V. The only study not significantly different from Study V was Study IX. Both Studies V and IX employed leadership Style 2.
- c. Groups IV and VII (leadership Style 1) had significantly higher mean post-scale scores (.01 level) than Study V (leadership Style 2). These were the only significant post-test differences in this scale. This indicates that groups IV and VII had a significantly more favorable "feeling" toward the shelter after their 48-hour shelter experience than did group V.
- d. The mean item scores ranged from 5.25 to 5.94 on a seven-point scale. This indicates a favorable "feeling" toward the shelter stay on the part of all groups.

These findings reveal that all groups had a favorable "feeling" toward the shelter. However, (a), (b), and (c) indicate that shelterees under leadership Styles 1 and 3 tended to respond more favorably than did subjects under leadership Style 2. This was particularly true of Style 1 groups.

5. Discomfort.

- a. There were no significant differences between groups in mean discomfort scale.

- b. The mean item scale scores ranged from 2.65 to 3.00 on a four-point scale. This indicates that the subjects' overall discomfort ranged between "some" and "little" for all groups.
- c. Items causing the most discomfort in all studies were:
 - (1) Lack of water for washing.
 - (2) Sleeping difficulty.
 - (3) Food.
 - (4) Crowding.
- d. Leadership style-related items:
 - (1) Inadequate leadership - item means ranged from 3.64 to 3.96 on a four-point scale.
 - (2) Lack of organization - item means range from 3.50 to 3.97 on a four-point scale.
 - (3) Too much organization - item means ranged from 3.25 to 3.83 on a four-point scale.

These results indicate that the subjects' discomfort on these items in all groups ranged from "little" to "none."

These results indicate:

- a. All groups perceived only minor discomfort.
- b. Those items rated as causing the most discomfort dealt with the physical rather than the psychological environment.
- c. The scale items most closely related to leadership style were rated as causing little or no discomfort by all groups.

It seems, then, that leadership style generated little or no discomfort itself and that there were no differences in the perceived discomfort of shelterees across leadership styles.

6. Shelter Leader Evaluation.

- a. There were no significant differences between groups in mean evaluation score.

- b. The mean item scores ranged from 4.16 to 4.39 on a five-point scale. This indicates that all groups rated their shelter leader as being between "satisfactory" and "outstanding."
- c. The lowest item mean in all groups involved either the managing of free time or planned recreation. Even here, however, the manager's rating was still greater than four.

These results reveal that all groups, regardless of leadership style, rated their leader as performing a highly effective job.

Analysis of Manager Debriefings. This section of the report is based upon a qualitative analysis of the typescripts made from the recorded debriefing comments of the shelter manager in the 48-hour studies. It is important that the analysis of these materials be part of this report, as the shelter manager had the most intimate contact with the shelterees of any of the experimental staff, and consequently could inform us on many details which were unobservable from the outside, in addition to his "feelings" about the experience and his contacts with the group.

The format of the debriefings, due to the shelter manager's insistence, did have some consistency. He always began the debriefings with a general summary of how he felt towards the group and his impressions of its good and bad qualities. This was followed by a description of key events in the shelter stay and any unusual happenings. Finally, he narrated the contents of a diary which he kept during the shelter stay. He explored what he had written down, often in some great detail, and tried to explain why this seemed to be important to him. This was followed by a question and answer period during which the debriefer tried to explore some of the more prominent issues and events of the shelter stay. Debriefing typescripts varied from 30 to 60 pages long (approximately).

They were examined in the following fashion. They were read once through by a senior staff member who then reread and took notes from

them. The notes were taken of every reference to a substantive problem of shelter organization or management. This material was weeded from a lot of other materials concerning individual discussions with shelterees, conjecture about personalities, and other such materials. The second category of material recorded concerned the feeling of the shelter manager about the group, and his reports of his own physical feelings which might have affected his perceptions of the group. Using this method, the typescripts were reduced to from 1-1/2 to 3 pages of abstracted materials. The final analysis was done from these abstracts, with frequent references to the original materials to refresh memory and fill in contextual materials.

The first substantive findings to be discussed will be those related to shelter living in general rather than to shelter management factors. The strongest finding from this analysis has to do with the care of children in shelter situations, and the relationship had nothing to do with leadership style. It stood out both in observation and again in the debriefing tapes. Essentially, the manager reported that when the shelter got hot the children did not eat and became sick, mainly suffering from headache and nausea. This relationship, however, does not appear in the analysis of the typescripts and is replaced with a relationship of multivariate dimension. It combines the elements of eating, special recreation for children, and illness. Heat plays no particular part in this relationship. If there is a special recreational program for children in which physical activity is allowed and encouraged, it will be easier for the children to be urged to consume their food, they will suffer little or no sickness, and the morale of the entire group will be reinforced by a lack of complaining and maladapting children. This relationship is strong throughout all cases and over-rides any heat considerations. On two occasions, the children's program was initiated by individuals who made the children their major concern, and this was the most effective (in terms of preventing sickness) method. It is important to notice that in one of these cases it was reported to be "hot," while in the other the temperature was "okay." In neither case

did illness appear. It does not seem important that the recreation assume a specific form or have one kind of content in preference to another. The single important factor seems to be the presence of activities for children, preferably including some which allow the children to engage in physical activity.

The second major finding, irrespective of management style, is that adult sickness in major dimensions was reported in all but one of the groups. Again, headaches and nausea were the major complaints, and no consistent factors can be related to the adult sickness problem. In the one case where adult sickness did not appear, the shelter was "uncomfortably" cool on a Friday night, and sleeping was poor. This was a group in which an outstanding leader of children was present, and the group was described as having "good morale." This is a significant problem for future research to explore, both for children and adults. Certainly, if child health can be maintained through such simple devices as the creation of teams with responsibility for children, research showing the alternative recreational patterns that are most effective with children could be extremely useful.

Another major finding from these typescripts was the complete lack of any mention of racial or religious friction. Indeed, it was common practice to run an impromptu "non-sectarian" church service on Sunday morning, and it was frequently mentioned in them that everyone was surprised at how well people from all sorts of social backgrounds got along. This is not to presume that there were no potential creators of incidents, but it does identify the extreme care with which inter-racial situations were handled by these subjects under conditions in which these phenomena could reasonably be expected to appear. The only problems which did occur were a couple of cases of mild self-isolation on the part of Negro adults -- there were no problems of any type with children. Considering the crowded condition, complete lack of privacy, and the uncomfortable rations and sleeping conditions (a pad and rug were spread on the shelter floor), this finding has extreme importance for future research.

The fourth major finding of this phase of the data analysis is the appearance in an essentially featureless room of an area which the shelter manager called the "jungle corner." This physical position was most often monopolized by teenagers and was as far away from the shelter manager as it was possible to get. From this base, the teenagers proceeded to make noise, disturb other people, fail to cooperate, and generally behave very poorly. When the manager in other studies put stable families with children in the corner, intentionally, this phenomenon of teenagers banding together and disregarding the control of the shelter manager disappeared, and the "jungle corner" disappeared with it. The concentration of problems in this corner reached such dimensions that in the middle of the set of studies the manager recorded in his debriefings that he dreaded going into the corner. Once the corner was preempted by the shelter manager for a "normal" family, the phenomenon ceased to occur. Also significant was the fact that in those studies where teenagers were allowed to form family units by themselves, there was uniformly some problem in dealing with them; where this was not allowed and the unattached teenagers were divided among the natural families to form living units, the older males seemed to be able to control the teenage behavior without undue problems. The importance of this finding for the writing of guidance materials is obvious and will not be elaborated upon here.

Findings with regard to shelter manager leadership style are far harder to reliably tease out of these kinds of data. At least a few things are clear, however. A preliminary analysis of these data reveals that the shelter manager himself distinctly preferred the Style I leadership pattern, and this itself changed his view of the group activity as he reported it in his debriefings. As a consequence, the following findings must be regarded as at least partially suspect, as indeed they should be in any case since they are based on only six examples.

There can be no doubt that the manager thought that the necessary tasks of making the shelter run were more efficiently performed under

Style 1 leadership, and this was undoubtedly due to his direct participation in making sure that everything ran well. There seems to be no connection, however, between everything running smoothly and indications of group happiness or morale. In fact, there is some indication that letting people figure the equipment out for themselves and make errors while doing it is conducive to good development of subordinate leadership. This point is based on small, but consistent, evidence. There is no evidence to indicate, further, that sloppy performance of the necessary survival tasks rebounded negatively on the group morale.

Interestingly enough, the manager's initial perception of the qualities of the groups seems to be related to the leadership style he was going to play. Since he began the debriefings with a general comment on the quality of each group, and then followed it in detail with more description, it is important to notice that he rated both Style 1 groups as "good" and "pleasant." Both Style 2 groups were classified as having little potential for "good subleadership." And the Style 3 groups were described as being a "pleasant group," and "few objectionable people." In the detailed analysis, however, these divisions do not hold up. For example, in groups identified as having little subleadership, the manager later identifies at least two people whom he calls strong subleaders. In fact, the presence of subleadership is indicated in all groups of the study and does not seem to markedly change from one group to another.

In the Style 2 groups, however, there are definite indications that the manager had a relatively harder time staying "on top" of all of the events in the shelter. In one group, radiological monitoring ceased for 15 hours and the manager only became aware of it later on. In both groups he had problems with the task team heads not doing precisely what the current guidance said that they should have done. In general, in this style, he felt at least partially out of control of the group.

In Style 3 groups the manager seems to have been better accepted by the group members and least subject to what he classified as "hostile" acts from the members than in either of the other two styles. This, although not a dramatic difference, is fairly consistent.

Conclusions

1. Management Style and In-Shelter Behavior.

- a. Style 1 and Style 3 resulted in an equal level of technical effectiveness and efficiency. Style 2 appeared to produce wasted effort and false starts in the area of technical activities. This was reflected by a larger amount of such activity under this style of management. Regarding the technical area then, Style 2 could legitimately be described as inefficient. Two outstanding technical blunders under this management style suggest that this management technique may also be ineffective.
- b. Groups under management Style 3 participated in less psycho-social activity than those under Styles 1 and 2. It should be noted, however, that the number of psycho-social activities per se do not reflect differences in management style as much as they reflect difference in the number of non-related people (i.e., strangers) present in each exercise.
- c. Management style appeared to affect what has been called the psychological "tone" or climate of the exercises. Groups operating under Style 1 appeared to develop an esprit de corps which was notably absent in groups operating under the other two styles. Style 2 groups, operating under a management technique which emphasized the airing of personal feelings, did not infrequently show signs of intra-group hostility and competitiveness. Under Style 3, those who were interested in technical operations enjoyed the exercise; those who were not appeared totally bored.

2. Management Style and Post-Shelter Attitude.

The most striking finding of this phase of the data analysis is the relative lack of differences between styles. Attitudinally, there

appears to be little to choose from among the three management styles for they all yield increased information and positive attitudes. Two points, however, do stand out.

- a. All groups when rating statements dealing with leadership behavior endorse behaviors most likely to be found in management Style 1.
- b. Management Style 1 appears to yield the most favorable "feeling" toward the shelter and Style 2 the least favorable.

3. Over-all Consideration of Management Style.

On the basis of the empirical tests employed, management Style 1 appeared to recommend itself as the management strategy of choice. This recommendation is based primarily on the results of observation of in-shelter behavior, although it is supported by certain of the post-shelter attitude measures. This recommendation can be interpreted to mean that the technical competence of the manager plus his close supervision of the technical activities of a shelter group is necessary but not sufficient in producing optimum shelter operation. Close attention must also be paid to the psycho-social activities of the group, not only to gain additional confidence from the shelterees, but also to effectively "head-off" any subversive activities in the group. On the other hand, psycho-social concerns should not be allowed to detract from the close scrutiny of technical operations, as could be seen from the results of the studies in which management Style 2 was employed.

PHASE III: EFFECTS OF MANAGEMENT STYLE UNDER CONDITIONS OF
TECHNICAL AND PSYCHO-SOCIAL STRESS
(STUDIES X, XI, AND XII)

Introduction

A review of the outcomes of the 48-hour studies by the project staff resulted in the unanimous feeling that the effects of management style had not been fully tested with the scenario of events employed. It was felt that as far as recommending a particular management style was concerned, our data indicated that Style 1 appeared to be the most effective management style investigated. It appeared to result in the most technically efficient shelter, and it also provided a high rate of psycho-social or morale building activity. However, with the exception of Style 2, under which two major technical blunders occurred, all styles seemed to be equally effective in handling both the technical and psycho-social problems which occurred in the exercises. Indeed, the technical operations of the shelter had never really been put to a good test -- once the initial setting up of the task teams had occurred, it was merely the maintenance of life-support activities that the shelter groups were required to do. They had not been presented with any emergencies or "unforeseen" events. Likewise, apart from a few gripers, all of the subject groups had been well-behaved, and thus the ability of the various management styles to handle psycho-social "emergencies" had not been adequately tested. For this reason, the decision was made to run three more studies, these being designed to test the effects of management style under conditions of technical and psycho-social stress.

Design of Studies

The scenario of events used in each of these three 24-hour studies is shown in Appendix E. (It should be pointed out that the 24 hours includes pre- and post-shelter testing. The shelterees actually spent 22 hours in the shelter itself.) The scenario consists of the events scheduled for the first day of a 48-hour exercise, with several factors

added to produce the high stress condition. These added factors will now be described in the order in which they appear in the scenario.

1. Simulated power failure. Seven minutes after shelter entry, the illumination level of the shelter was reduced to approximately one-tenth of its normal level. This occurred during a critical point in the initial organization of the shelter, that being when the manager was giving his first briefing to the shelterees, and was also attempting to have the shelterees fill out registration forms. The lights were returned to full power 23 minutes later.

2. Late arrivals - overcrowding. At 11:30 P. M., one-half hour after the shelterees had retired for the night, #10 EBS message asked them to decide how many extra persons they could admit to the shelter, and to inform the emergency command post of their decision. One hour later, at 12:30 A. M., five additional people were admitted to the shelter. In addition to interrupting sleep, this procedure also produced a condition of overcrowding in that all 25 shelter inhabitants could not lie down at the same time.

3. Looter threat. At 3:45 A. M., #14 EBS warned the shelterees that looters were present in the area, and instructed them to take appropriate precautions. The manager had been previously instructed to call a shelter meeting at this time to discuss the problem.

4. Volunteer selection and removal. At 7:30 A. M., one-half hour after reveille, #17 EBS requested the shelterees to provide volunteers for emergency work outside of the shelter. One hour later, the volunteers were removed from the shelter and were prepared for their role in the next event. Five volunteers were obtained in each study.

5. Dust storm. At 9:45 A. M., the manager was called out of the shelter, supposedly to attend to an emergency in a nearby shelter which had lost its manager. He left, taking the radiological monitoring gear with him. At 10:00 A. M., #18 EBS announced that winds were blowing a heavy concentration of fallout toward the area, and that "some shelters may have to mobilize and be moved." At 10:05 A. M., the

shelterees were told over the shelter phone that they would have to move, and to make preparations for doing so. At 10:20 A. M., a second phone call rescinded the order, and told them to secure their shelter against the oncoming storm.

At 10:30 A. M., the five volunteers who had previously left the shelter at 8:30 returned and attempted to gain admittance. Three volunteers were "injured," and all were "contaminated" by fallout. (All were liberally dusted with expanded mica.) The injuries portrayed consisted of: (1) a severe cut on the temporal portion of the forehead, (2) a long, bruised gash on the ulnar aspect of the forearm, and (3) severe lacerations on the back of both hands. The injuries had been produced by the use of stage make-up.

As soon as the volunteers had been admitted to the shelter, the lights were dimmed to about one-tenth the level of normal illumination, and "fallout" was blown through a ceiling air duct. Thus, the shelterees were faced with handling injured and contaminated people, and fallout filtering in from the "storm" under conditions of poor illumination with no manager present.

At 10:45, the lights were returned to full power, and at 12:00 noon, the shelter manager "returned."

In addition to these specific events, there were two over-all stressors programmed into the scenario. These were:

1. Intensive EBS activity. The frequency of EBS messages had been increased far beyond that used in the previous studies. In addition, the messages attempted to simulate the "real thing," and were shot through with static, background noise, and what might be called "diffuse excitement." The messages had been taped, and their content ranged from direct instructions to the shelter through news broadcasts, to garbled or confused messages containing zero pertinent information. The content of these messages is presented in Appendix F.

2. Planted agitator. One member of each of the three test groups was a planted agitator. Two people were used for this role, both of

whom were drama students at the Carnegie Institute of Technology. Both were known by, and had been recommended by, the shelter manager. The first man was used in Studies X and XI. He became ill on the day before Study XII, and was therefore replaced by the second man for this particular exercise. The role assignment given to each of these men was to do whatever they could to undermine the shelter organization and morale. Certain limitations were imposed upon their activity, and these were as follows:

- a. They were instructed to avoid, if at all possible, direct confrontations with the manager. It was thought that this was desirable, since it would avoid the necessity of having to predict what each of the three management styles would say and do in a face-to-face "showdown." While such predictions could have been made, they may well have been biased in favor of one of the styles at the expense of the other two. Rather, the agitator was instructed to work at undermining the shelter organization by raising doubts about the manager's effectiveness through conversation with shelterees.
- b. They were instructed not to insult any shelterees through ridiculing any personal characteristics, and were strongly cautioned against starting any trouble based upon ethnic, religious, or racial differences in the group. They were quite free, however, to play off one sub-group against another, such as encouraging teenagers to sing songs when the rest of the shelter wanted to sleep.
- c. They were instructed to avoid any reference to the exercise as an "experiment," although they were encouraged to attack the Civil Defense system represented by the shelter events. For example, they could complain that the EBS messages were "silly" or useless," but they could not suggest or encourage attempts to get the experimenters to turn them off. Likewise, they could attack proposals to admit the late arrivals as "dangerous" because of potential radiological contamination of the shelter, but not as "unnecessary

because this is only an experiment to see if we will admit them."

- d. They were instructed to be cooperative if assigned tasks to do, but never to volunteer their services.
- e. Finally, they were instructed to back out of the picture when the manager left the shelter before the dust storm. In other words, they were to let the secondary shelter leadership alone during the dust storm "crisis."

Composition of Subject Groups

The relevant dimensions of the composition of the groups of subjects used in these three exercises are shown in the following table.

Table XXI

Composition of Subject Groups Used in the Investigation of Effects of Management Style Under High Stress

Study Number	X	XI	XII
Management Style	1	2	3
Mean Age in Years	22.41	24.83	26.09 (No significant differences)
Educational Level*	10.45	12.35	10.26 (XI significantly greater than X and XII at .05 level)
Occupational Level**	4.18	3.83	4.65 (No significant differences)
Family Groups	4	5	6
Individuals***	6	11	7
Racial Composition			
White	26	24	21
Negro	3	5	8

* Mean number of years in school

** Mean value on Hollingshead scale

*** This refers to people who are not part of a family unit and includes the agitator.

Because of the stress conditions to which these groups were submitted, no children under 12 years of age were permitted to participate in these studies. The only statistically significant difference in the composition of the three groups was that the group used in Study XI had significantly more formal education than the other two groups.

Results

Technical Competence and Efficiency of the Three Study Groups. One indication of the technical competence of the groups can be gained from their handling of the dust storm crisis in the absence of their assigned manager. In general, all three groups were equally competent and equally efficient. In terms of efficiency, all three groups had treated the injured and swept out the "fallout" within one-half hour after the start of the crisis. However, as in the 48-hour studies, technical blunders were more apparent in the group that had been managed in the Style 2 fashion. The acting manager of Study XI sent the returning volunteers, including the injured, back outside of the shelter to clear the "fallout" from their clothes. Under real conditions, the two more seriously injured volunteers (head cut and arm cut) could have bled to death during this time. In addition, this group covered the air vent through which the "fallout" was blowing with a jacket, instead of letting the particles fall on the floor and then sweeping them outside of the shelter. Under real conditions, this action could have shut off the shelter air supply as well as producing a radiological hotbed in the air duct. It should be recognized that these errors may well have been made by this group during the absence of a Style 1 or a Style 3 manager. In other words, the fact that a group makes technical errors in the absence of the trained manager does not necessarily result from the management style employed during his presence.

Another measure of technical efficiency of the groups can be obtained from a number of technical activities executed during the shelter stay. Since all three groups had approximately the same number of

technical problems to solve, and since all three groups were about equal in competence and effectiveness of their solutions, a measure of efficiency would be the number of activities which were executed in solving these problems. These data are presented in the following table and do not include the activities of the manager or the agitator.

Table XXII

Technical Activities as a Function of Management Style

Study Number	X	XI	XII
Management Style	1	2	3
Total Activities	108	148	96
Total People Involved in Executing Activities	22	22	21

Chi-square tests performed upon these data indicated that significantly more technical activities were performed under Style 2. (p less than .01). As with the 48-hour studies, Style 2 management appears to produce the least over-all efficiency of technical operation. When the activities of the agitator and the manager are added, as is done in the following table, the effect remains the same: significantly more technical activities are executed under Style 2 (p less than .05).

Table XXIII

Technical Activities as a Function of Management Style
(Activities Including Those of the Manager and the Agitator)

Study Number	X	XI	XII
Management Style	1	2	3
Total Activities Excluding Manager and Agitator	108	148	96
Activities of Agitator	3	5	11
Activities of Manager	37	36	22
TOTAL	148	189	129

The data suggest, then, that under conditions of high technical stress Style 1 or Style 3 management will produce the greatest efficiency of technical operation, and Style 2 the least efficiency of such operation. It should be emphasized that this refers to over-all technical efficiency -- the same relationship may not hold for any given technical emergency. Indeed, in the case of the dust storm crisis, all three groups were about equally competent and efficient, with the Style 2 group being slightly delinquent in competence.

Psycho-Social Activities of the Three Study Groups. It is difficult, if not entirely impossible, to compare the three management styles on this particular factors, primarily because of the difference in effectiveness of the two agitators in the studies. The first agitator, used in Studies X and XI, was remarkably ineffective in contrast to his colleague, who was employed in Study XII. This difference in effectiveness was due, in part, to the differences in management style under which they were operating, but was more a result of differences in what might be called "attack strategy." The first agitator tried to bring the subjects into conflict with each other and with the manager. Under Style 1 he had no success at all, while under Style 2 he had a fairly minor degree

of success. The second agitator attempted to bring the subjects into conflict with themselves, and was remarkably successful in achieving this effect. His approach was that of raising uncertainty in the subjects' minds as to the effect upon their potential to survive of actions determined by previously learned moral and ethical principles. The basic conflict that he generated by this approach was one between the perceived ethical obligation to admit people to the shelter after the "blast" had occurred (specifically the late arrivals, the returning volunteers, and the returning shelter manager), and the fact that this action could conceivably contaminate the shelter, and lead to the "death" of those who were already there. Before this is more fully discussed, the results of the first two exercises will be presented.

Study X: Management Style I

With the attack strategy he employed, the agitator was completely unable to produce any friction or conflict between the people and the manager, or between the people themselves in Study X. As was apparent in other exercises, employing this management technique, Style I has no blind spots under which "rebellion" can be spawned. The manager impresses the people as being in complete charge of all aspects of the shelter, and, in effect, places them in his hip pocket during the initial shelter briefing. He follows through on this initial impression by being acutely aware of everything that is going on in the shelter at all times. He is an efficient, direct, and no-nonsense organizer, and his people soon develop a great respect for him. It was apparent in observing this group that the same effect was occurring with them as had occurred in other Style I exercises, and that because of this they were paying no attention whatever to the efforts of the agitator to undermine the shelter organization and morale. Indeed, he could not gain their attention long enough to sound out individual feelings in order to find any factor that could be exploited to achieve this end result. The agitator was not disliked, he was merely ignored.

Study XI: Management Style 2

The agitator was able to produce some conflict between individuals, and between the group and the manager in Study XI. These were relatively minor events, but would have been potentially dangerous in a long shelter stay, where the agitator could have continued to nurture and expand their effects. He managed to get two college students into a long-winded and violent argument about evolution, an argument which led to the remaining shelterees siding with one or the other of the two antagonists. This produced a schism in the group which could have been further encouraged over a longer period of time. By reinforcing doubts that some individuals had about the wisdom of the group's decision to admit the late arrivals on the previous evening, he managed to foster a quiet, half-serious, and short-lived plot to overthrow the manager and the existing secondary leadership on the following afternoon. The plot never achieved action because the manager was "tipped off" to it by one of the shelterees. When the manager inquired as to what was going on, the agitator managed to shift the blame to the wrong person, and thus increased the level of low-lying hostility he had managed to create, particularly against the manager, who was beginning to look unsure of himself to some members of the group.

Both the manager and the agitator felt that the success in creating friction in this study was due in part to the characteristics of management Style 2. In their post-shelter debriefings they stated:

MANAGER: "In the middle of my training session at 2:00 this afternoon, the whole subject (admitting late arrivals the night before) came up again, and we got into a big argument about it. Tempers were beginning to flare a tiny bit. I certainly felt that as Style 1 I would have stopped the discussion at this point, but, as Style 2, I let them go on and on. I felt that antagonisms were developing. So, again, I think we have a case here of Style 2 developing or contributing to some friction.... It's my feeling that Style 2, by not seeming as strong as Style 1, and by allowing and almost

encouraging these differences to develop, contributes to this friction."

AGITATOR: "I do think that the leadership style made a great deal of difference, generally. It made a difference in that wherever there was an aggressive personality, it was almost coaxed out or it came out more easily with this style (Style 2) than it did with the style last week (Style 1)."

As with the 48-hour studies, Style 2 was found again to produce an environment where well-intentioned and helpful people will step forward to contribute their energies, but that this effect is completely counter-balanced by the equal thrust of trouble-makers and malcontents. Since these are the people with whom an agitator would work -- at least an agitator using the strategy employed in Study XI -- Style 2 apparently indirectly aids the agitator in achieving his desired goal of creating hostility, dissention, and disorganization.

Study XII: Management Style 3

The different attack strategy used by the agitator in this study has already been generally described. Specifically, this man made his first move on the first evening in the shelter. The question arose as to what the group would do if other people tried to get into the shelter. The manager opened the question for discussion. The group initially agreed that such people should be admitted. Part of this discussion (which lasted for over an hour) is paraphrased below:

MANAGER: So you all agree that any people who come from now on should be admitted?

GROUP: Yes.

AGITATOR: Why?

SHELTEREE: Because it's the ethical thing to do.

AGITATOR: It's ethical for us to survive, isn't it? We got in here before the bomb went off. We're not contaminated. Anybody else would be by now. Look at that radiation meter! Do you want to endanger our lives by letting those people in now?

SHELTEREE: Well, we can decontaminate them, can't we Karl?
(to Manager)

MANAGER: Yes. (Describes how this would be done.)

AGITATOR: But you'd never be sure that they would be "clean." Why take a chance?

SHELTEREE: We have to take that chance. Those people deserve to be spared as much as we do!

AGITATOR: We were here first. We have 20 people in here. That thing on the wall says the occupancy of this shelter is 20 people. We are all safe now. We have a duty to survive and to keep ourselves strong so that we can restore our society after this thing is over. I say don't be silly. Don't take a chance of destroying ourselves now just to try and save those who are already contaminated. They will be contaminated; they'll come in here, get sick, and die anyway!

SHELTEREE: How can you be so sure that they'll be beyond saving?

AGITATOR: I'm not! All I'm saying is let's not take a chance!

SHELTEREE: But radiation sickness is not contagious, is it Karl?

MANAGER: As far as we know, it is not contagious.

AGITATOR: As far as we know ... but we're not sure! I say let's not take any chances! I say we don't let anybody else in!

SHELTEREE: If there was a knock on the door right now, you wouldn't answer it?

AGITATOR: No.

SHELTEREE: Even though it could be someone out there that you know?

AGITATOR: My mother or father could be out there -- I still wouldn't answer the door.

SHELTEREE: There could be someone out there who's worth saving a lot more than you!

AGITATOR: I was here first. If I let him in and he contaminates me, it won't help either of us. I'm safe now -- we're all safe now -- I say let's keep it that way.

SHELTEREE: And I fought in World War II to save the likes of you!

AGITATOR: You also fought to defend my right of free speech.

SHELTEREE: Karl, are we legally obligated to let people in?
(to Manager)

MANAGER: No, we are not legally obligated to do so.

SHELTEREE: Well, what do you think about this?

MANAGER: My job as manager is to provide the technical know-how in operating this shelter. If you want to let others come in, I can show you how to decontaminate them. I don't feel that I should make the decision as to whether we do let others in or not. That is up to you. I'll go along with whatever the group decides.

SHELTEREE: I say let's take a vote. I'm in favor of answering a knock on that door! (Puts hand up ... other hands start going up.)

AGITATOR: WAIT! WAIT! CAN'T YOU SEE WHAT YOU'RE DOING? (Repeats former arguments, emphasizes the uncertainty of remaining uncontaminated if others are admitted.)

SHELTEREE: He may be right. Let's not let anybody in.

SHELTEREE: NO! NO! Let's decide right now how many extra we can take in -- so we'll have enough food and things to go around.

AGITATOR: That's another point! If a knock comes at the door, how many people do you think will be out there?

(SILENCE)

Come on, how many? There could be two, or 22, or 50! Once we open that door, they'll all come in!

SHELTEREE: We could ask how many there are!

AGITATOR: And if I were out there with 50 people, I'd say, "There are five of us," just so you would open the door!

The discussion continued in this vein for another hour. It culminated in a ten to six vote not to admit any additional people to the shelter, and to ignore any knocking on the door. (Four persons abstained from voting, including the manager.)

The fact that this was a tenuous balance in favor of the agitator was seen when #10 EBS requested them to call in the number of additional people they could admit to the shelter. The manager held a brief discussion, during which agreement, in the form of no challenge, was achieved on the position that they could admit five more. One hour later, the five were admitted without incident. The groundwork had been laid, however, for the events of the next day.

The agitator began again the next morning, attacking the decision to admit the late arrivals. His question was, "In the real situation, would this have been the correct thing to do?" The argument was still in process when the manager left at 9:45 A. M., and came to a head when the dust storm crisis began at 10:30, and the returning volunteers knocked on the door. The acting manager tried to get a hurried vote on whether or not to admit people, when the family of one of the volunteers rushed to the door, opened it to see if "Daddy" was there, and found to their momentary horror that he was, and was "wounded" to boot. When this occurred, all of the volunteers rushed into the shelter, even though the shelterees were strongly protesting the action.

It is a tribute to the technical training given them by the Style 3 manager, and to the effectiveness of the acting manager, that the group was able to snap into action in the efficient and effective way that they did. This occurred in spite of the fact that, of all the study groups, they were the least prepared at that particular moment for a technical crisis. They properly treated the injured, decontaminated the exposed, and cleaned up all of the air duct "fallout" within a period of one-half hour.

At this point, the discussion about admitting people began again. The agitator later described this point in his post-shelter debriefing as one of the group recognizing in themselves a peculiar kind of "guilt." By this time, the agitator had convinced them that letting in people from the outside was dangerous to their own survival. Twice they had reached, or nearly reached, a decision not to admit any additional people, and twice they had been unable or unwilling to follow through on this decision. They could have argued the night before and not admitted the late arrivals; they could have secured the door against the returning shelterees, or could have even forced them back outside once they had begun to enter. The fact that they did not do these things was, in one sense, all right, because this was only an experiment. But, what if it had been the real thing? It was decided that this was the time to think and act and follow through as if this were indeed the real thing.

A plan of action was put into effect. This plan contained three points:

1. A guard was stationed at the door.
2. All of the men would sleep near the door.
3. Emergency teams would be developed, each with its own specific task to perform, in the event of further crises.

The decision was made not to admit the manager if he returned, but to try to get him to hand over the RADEF gear.

At 12:05 P. M., the manager knocked on the door and announced his presence. He was told by the guard that he could not come in. The

guard requested the RADEF gear. The manager refused. The guard told him to "Give me the RADEF gear, and I'll let you in." The manager refused, and countered with the suggestion that he use the RADEF gear to prove to the shelterees that he was not contaminated. The guard requested that the manager prove it to him first. The manager did so, and the guard admitted him.

There was some grumbling in the group at this occurrence, but it soon ceased as the manager (as he had done in previous studies) reviewed the dust storm crisis with them, and pointed out errors that they had made in handling it. They were apparently reminded of this man's technical skills and training, and of his resulting importance to them.

A discussion began about the anti-entry attitude of the group toward the manager, and the acting manager tried continuously to justify his decision not to admit the assigned manager if and when he returned. The discussion ended with a unanimous vote to place decisions about admitting people entirely in the hands of the assigned manager.

The results of this particular study serve to highlight the importance and the desirability of the Style 1 approach to management. While technical competence of the manager is mandatory, this study has shown that it alone is not enough. The manager must be trained, and must be willing to take absolute authority and its accompanying responsibility for decisions having a moral and ethical basis, particularly those, like admitting additional people, which can be decided one way on an ethical basis, and another way on a technical basis. If the Style 3 manager of this study had accepted total responsibility when the question first arose, the group would not have been subjected to the harangue, ill-feeling, hostility, and uncertainty engendered by the clever actions of the agitator regarding this one issue.

This does not preclude the fact that the agitator, using this particular attack strategy, would have stuck at some other issue. Again, however, the feeling was that Style 1 would have been the technique most likely to have successfully met this challenge. As the actor-manager expressed it:

"Could I have handled (the agitator) better in Style 1? I think, definitely, I could have. I could have met him on his own grounds much better. I could have topped him; I could have been stronger. Where he's showing lots of energy, well, I have to show more energy. I have to talk louder; I have to go stronger. I have to do everything he does better. And I would, if I had tried. The question is, does Style 1 cost me more? The answer is, I don't know. Obviously, it does in a way, in that you have to put out more energy. But in another way, it repays you, in that you get the energy back from the people. (Recall Study X where the shelterees ignored the agitator.) Style 3 is more restful, but then I don't get emotional payback from the people."

The ultimate test of this notion would lie in an empirical evaluation of the effects of an agitator using this attack strategy in a shelter exercise managed in a Style 1 fashion.

Degree of Participation

This section will investigate the degree of subject participation in both the technical and psycho-social aspects of shelter life. This will be done in two ways. First, tables will be presented revealing the total number of subjects active in the two aspects of shelter life being investigated. Secondly, tables will be presented which reveal how active the participants in these activities were. That is, they will indicate the number of subjects showing little or no activity, and also the number showing relatively high rates of activity.

Table XXIV

Number of Subjects in Studies X-XII Participating
in Technical Activity

Study Number	X	XI	XII
Number of Subjects in Each Group Participating	22	22	21

Table XXV

**Number of Subjects in Studies X-XII Participating
in Psycho-Social Activity**

Study Number	X	XI	XII
Number of Subjects in Each Group Participating	3	9	12

Table XXVI

**Degree of Subject Participation in Technical Activities
(Studies X-XII)**

Study Number	X	XI	XII
Number of Subjects Participating in 0-3 Activities	13	9	13
Number of Subjects Participating in 4 or More Activities	9	14	10

Table XXVII

**Degree of Subject Participation in Psycho-Social Activities
(Studies X-XII)**

Study Number	X	XI	XII
Number of Subjects Participating in 0-2 Activities	21	20	18
Number of Subjects Participating in 3 or More Activities	1	3	3

Chi-square tests were performed on these data with the following results:

1. There were no significant differences in the number of subjects involved in technical activities across management style.
2. There were no significant differences in the number of subjects involved in psycho-social activities across management style.
3. There were no significant differences in the number and extent of subject participation in technical activities across management style.
4. There were no significant differences in the number and extent of subject participation in psycho-social activities across management style.

Post-Shelter Attitudes

Copies of the pre- and post-questionnaires administered to groups X-XII can be found in Appendix G. This is the same instrument that was utilized with groups IV-IX. The presentation of data will take the form of a short list of findings and a summary of the results for each scale. Tables XXVII and XXVIII contain the results of the attitudinal analysis.

TABLE XXVIII

Questionnaire Summary (Groups X, XI, and XII)

In general, a higher mean indicates a more correct or a more favorable response

Mean of sub-test scores within a group S.D. = Standard deviation \bar{x} = Mean item score within a subject	PART I		PART II		PART III		PART IV		PART V		PART VI	
	Civil Defense Information		Civil Defense Attitude		Shelter Leader Behaviors		Semantic Differential "Shelter Feeling"		Discomfort		Shelter Leader Evaluation	
	1. 6 Items	2. Range 0-6	1. 10 Items	2. Range 10-50	1. 10 Items	2. Range 10-50	1. 15 Items	2. Range 15-105	1. 20 Items	2. Range 20-80	1. 13 Items	2. Range 13-65
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
<u>Group 10</u>												
Style I	\bar{x} 1.73	→ 3.73 ^{***}	39.91	40.32	34.82	36.00	86.00	89.95	62.27	51.32		
22 Subjects	S.D. .96	1.29	4.25	4.07	4.82	5.08	8.53	9.04	8.70	7.13		
24 hour high stress	\bar{x}		3.99	4.03	3.48	3.60	5.73	6.00	3.11	3.95		
<u>Group 11</u>												
Style II	\bar{x} 2.48	→ 3.87 ^{**}	37.43	38.87	35.96	36.22	78.57	86.17	60.65	52.09		
23 Subjects	S.D. .97	.90	4.91	4.51	4.93	3.87	18.95	21.13	14.42	6.34		
24 hour high stress	\bar{x}		3.74	3.89	3.60	3.62	5.24	5.74	3.03	4.01		
<u>Group 12</u>												
Style III	\bar{x} 2.13	→ 4.22 ^{***}	37.22	37.96	33.96	34.39	85.57	→ 91.87 [*]	65.04	52.78		
23 Subjects	S.D. 1.12	.83	4.41	5.03	3.33	2.97	9.30	9.62	9.35	4.36		
24 hour high stress	\bar{x}		3.72	3.80	3.40	3.43	5.70	6.12	3.25	4.06		

*** Significant beyond .01 level

* Significant beyond .05 level

TABLE XXIX

SHELTEREE IMPROVEMENT ON POST-TEST (GROUPS X, XI, and XII)

Group and Style	Number and Per Cent	Civil Defense Information	Civil Defense Attitude	Semantic Differential "Shelter Feeling"
<u>Group 10</u> Style I	No. +	22	11	15
	No. 0 or -	2	11	7
	Per Cent +	92	50	68
<u>Group 11</u> Style II	No. +	19	11	17
	No. 0 or -	4	12	5
	Per Cent +	83	48	77
<u>Group 12</u> Style III	No. +	21	11	17
	No. 0 or -	2	12	6
	Per Cent +	91	48	74

- No. + = Number of subjects showing increased score on post-test
 No. 0 or - = Number of subjects showing no gain or a lower score on post-test
 Per Cent + = Per cent of total group showing an increased post-test score

1. Civil Defense Information.

- a. There was a significant increase in pre - post mean scale scores for all groups (.01 level).
- b. All groups reveal a substantial increase in civil defense information. The percent of subjects in each group showing an increase in post-test scores varied from 83% to 92%. There were, however, no significant differences between groups in the percentage of subjects revealing an increase in civil defense information.
- c. There were no significant differences between groups in mean post-test scale score.

These results indicate that all groups "learned something" as a result of their shelter stay, and that differences in leadership style did not result in significant differential learning.

2. Civil Defense Attitude.

- a. There were no significant pre - post increases in mean scale scores. All groups, however, show slight increases.
- b. Approximately 50% of the subjects in each group showed an increase in post-test scores. There were no significant differences between groups in the percent of subjects revealing post-test increases in civil defense attitude.
- c. There were no significant differences between groups on mean post-test score.
- d. The mean item scale score was approximately four on a five-point scale, indicating a favorable attitude toward civil defense.

The data indicate that all three styles of leadership appear to be equally effective in fostering and maintaining a favorable attitude toward civil defense.

3. Shelter Leader Behavior.

- a. There were no significant differences in pre - post scale scores for any group.

- b. There were no significant differences between groups in mean post-test scale scores.
- c. The mean item score for all groups was 3.5 on a five-point scale. This indicated subject agreement with experimenter keying of appropriate leadership behavior.
- d. All groups agreed that:
 - (1) The shelter leader must be the ultimate authority in the shelter.
 - (2) Major decisions should not be made by the majority of the group.
 - (3) The shelter leader should delegate authority.
 - (4) The shelter leader should encourage public discussion of shelter problems.
 - (5) Shelterees should not burden the shelter leader with their personal problems.

These findings reveal that all groups, regardless of the style of leadership to which they were exposed, agreed on certain "ideal shelter leader behaviors." This "ideal shelter leader" appears to more closely approximate the Style I leader than the other two leadership styles employed.

4. Semantic Differential - "Shelter Feeling."

- a. The only significant difference between pre - post scale means occurred in Study XII (.05 level). This indicates that group XII members had a significantly more favorable "feeling" toward the shelter after their shelter experience than before it.
- b. The percent of shelterees showing improved pre - post scores ranged from 68% in Study X to 77% in Study XI. There were, however, no significant differences between groups in the percent of shelterees revealing increased post-test scores.
- c. There were no significant differences between groups in mean post-test scale score.

- d. The mean item scores ranged from 5.74 to 6.12 on a seven-point scale. This indicates a highly favorable "feeling" toward the shelter stay on the part of all groups.

The data indicates that all three styles of leadership appear to be equally effective in fostering and maintaining a favorable "feeling" toward shelter stay.

5. Discomfort.

- a. There were no significant differences between groups in mean discomfort scale scores.
- b. The mean item scale scores ranged from 3.03 to 3.25 on a four-point scale. This indicates that the subjects' overall discomfort ranged between "little" and "none" for all groups.
- c. Items causing the most discomfort in all studies:
 - (1) Sleeping difficulty.
 - (2) Crowding.
 - (3) Lack of water for washing.
- d. Leadership style-related items:
 - (1) Inadequate leadership - item means range from 3.52 to 3.77 on a four-point scale.
 - (2) Lack of organization - item means range from 3.00 to 3.77 on a four-point scale.
 - (3) Too much organization - item means range from 3.68 to 3.74 on a four-point scale.

These findings reveal that the subject discomfort on these items ranged from little to none.

The data gathered from this scale reveal:

1. All groups perceived little or no discomfort.
2. Those items rated as causing the most discomfort dealt with the physical rather than the psychological environment.

3. The scale items most closely related to leadership style were rated as causing little or no discomfort by all groups.

It seems, then, that leadership style generated little or no discomfort itself, and that there were no differences in the perceived discomfort of shelterees across leadership styles.

6. Shelter Leader Evaluation.

- a. There were no significant differences between groups in mean evaluation score.
- b. The mean item scale scores ranged from 3.95 to 4.06 on a five-point scale. This indicates that all groups rated their shelter leader as being effective.

These results reveal that all groups, regardless of leadership style, rated their leader as being highly effective.

Conclusions

1. Management Style and In-Shelter Behavior.

- a. Management Styles 1 and 3 appeared to produce the greatest over-all technical efficiency when employed in conditions of high technical stress. Style 2 appeared to be no different from the other two styles in terms of technical competence or effectiveness of the groups, although, as in the 48-hour studies, technical blunders were more apparent in the Style 2 group.
- b. Management Style 1 appeared to handle much more adequately than Style 2 the attempts of the planned agitator to produce psycho-social conflict in the groups. Because of the difference in attack strategy employed by the agitator in the Style 3 group, comparisons between this management style and the other two are difficult to make regarding effectiveness in handling psycho-social conflict. It was felt, however, that the Style 1 would have been better able

to cope with this agitator than Style 3 appeared to be. Verification of this notion would depend upon further empirical testing.

2. Management Style and Post-Shelter Attitudes. This phase of the data analysis resulted in few significant differences between leadership styles. From an attitudinal viewpoint, there appeared to be little to choose from among the three styles. Each style yielded:

- a. A significant increase in pre - post civil defense information.
- b. An equally favorable "feeling" toward the shelter.
- c. An equally favorable attitude toward civil defense.
- d. A relative lack of discomfort.
- e. A high leader evaluation.

It appears, then, that, based on attitudinal results alone, one would have a difficult time selecting one leadership style over any other in Studies X-XII.

Probably the most interesting result of this phase of the study was finding group XII having the most favorable "feeling" toward the shelter, the lowest discomfort, and highest leader evaluation, for it was this group, from an observational viewpoint at least, that had incurred the greatest psychological discomfort. Here was a group that had, for a time, refused to allow their shelter manager to re-enter the shelter, and then, at the termination of the experiment, rated him higher than either of the other two groups in this phase of the study. It appears that some of their attitudinal positivism is an over-reaction against what they perceived to be inappropriate shelter behavior.

3. Over-all Consideration of Management Style. On the basis of the empirical tests employed, both 48-hour exercises and the high-stress exercises, Management Style 1 appeared to recommend itself as the management strategy of choice. This recommendation is based primarily on the results of observation of in-shelter behavior, although it is supported by certain of the post-shelter attitude measures. This recommendation

can be interpreted to mean that the technical competence of the manager plus his close supervision of the technical activities of a shelter group is necessary but not sufficient in producing optimum shelter operation. Close attention must also be paid to the psycho-social activities of the group, not only to gain additional confidence from the shelterees, but also to effectively "head-off" any subversive activities in the group. On the other hand, psycho-social concerns should not be allowed to detract from the close scrutiny of technical operations, as could be seen from the results of the studies in which management Style 2 was employed.

A Note on Realism and "Playing the Game"

The factors added to the scenario in Studies X, XI, and XII to effect the condition of "high stress" appeared to result in those groups taking the exercises more seriously than did the groups used in the 48-hour studies. Among the shelterees, there was much less discussion of the exercise as an "experiment" or "test," and fewer questions to the manager regarding time of emergence, how their payment would be made, etc. Moreover, the high stress groups appeared to enjoy their exercises more than had the other groups. As one observer put it, the EBS activity, the late arrivals, the looter threat, and the dust storm crises added a "fun reality" to the exercises which enabled the shelterees to view the stays as exercises in simulated survival rather than as 24- or 48-hour confinements. While all of the studies had an educational effect upon the participants, it was felt that Studies X, XI, and XII brought home more effectively the desirability and necessity of civil defense preparedness. The recommendation to be made is that some simulation of disaster events is desirable in fallout shelter investigations. It is obvious that too much simulation would make the exercise appear to be ridiculous. However, the addition of carefully selected events will serve to add a reality to the situation. If this is not done, the shelterees will make their own reality, which can, at worst, reduce to the question of "What does one do to pass the time when confined in a room for X number of hours with Y number of other people?"

PHASE IV: THE DARK STUDY

One additional 24-hour shelter exercise was conducted, its purpose being to test the effectiveness of shelter operation under conditions of total darkness. In actual attack conditions, it is quite possible that shelters would be faced with power failures or interruptions, and would encounter extended periods with little or no illumination. While some emergency lighting would likely be available, in the form of matches or an occasional flashlight, these sources would soon be depleted unless they were used only at critical points during an extended period of darkness. This study was designed to determine what these critical points were, in other words, to determine what shelter tasks can and cannot be done with no illumination present.

Design of Study

Fifteen volunteers from A.I.R.'s research staff served as subjects for this study. They spent 22 hours in the shelter under conditions of zero illumination. The actor employed as manager in all of the previous studies again played this role. He attempted to follow a normal 22-hour scenario of events.

No communication between shelterees and the observers was permitted. EBS messages were not employed in this study. No smoking was permitted in the shelter, and no use of matches or lighters was condoned. All watches were removed from the subjects prior to the start of the experiment. Observation was accomplished through the use of infra red meta-scopes, and comments of the observers were recorded on portable tape recorders.

Experience with shelter supplies, a crucial variable in a study of this type, varied with this study group. Some were highly experienced with the equipment, while others had never seen it at all. As much as possible, the unskilled people were used to set up and to operate the shelter supplies.

Results

1. The Effects of Darkness upon In-Shelter Operation.

The results of this study can be summarized as follows:

a. Unskilled people were able to adequately set up and use most of the shelter supplies. This could not be done, however, without frequent and liberal "hints" from the more experienced members of the shelter group. Each piece of equipment needed some experienced person's contribution for its optimum use. Specifically:

- (1) The contents of the sanitation kit are highly confusing to the unskilled person, although the box-with-a-bag-in-it-and-a-seat-on-top assembly of the basic kit can be determined and executed without help. The remaining contents of the kit tend to get set aside and lost without the cautionings of an experienced person.
- (2) The contents of the medicine bottles in the medical kits would remain unknown in the absence of experienced people. The "specialist" in this study correctly discriminated which medicine was which by the shape and size of the bottles. (To avoid any possible mishap, the medicines had been replaced with candies.)
- (3) It was impossible to set up and correctly operate the radiation monitoring gear without help from an experienced person. In wording with the radiation gear, however, it was discovered that a reasonably bright light source can be produced by using this equipment as follows:
 - (a) The back of the dosimeter charger is removed.
 - (b) The dosimeter is then plugged into the charger.
 - (c) The bulb inside the charger will now be illuminated, and will produce a low power light source of an intensity strong enough to read guidance materials, instructions, etc.

- (4) Food and water preparation were done quite adequately by inexperienced people although the sanitary procedures normally used were not able to be implemented in the darkness. Thus, the water was dipped out of the drum, rather than siphoned, and both food and water were handed along the group, rather than distributed from an improvised tray. Experienced people aided in the execution of this task by suggesting ways to keep track of each individual's drinking cup, and by describing what the shelter rations were, so that the person searching for them would know when they were found.

From these results, it seems reasonable to conclude that technical operations of a shelter can occur in total darkness if, and only if, experienced people are present to direct these operations. By experienced people is meant individuals who are familiar with and have used shelter equipment a number of times in the past.

- b. Volunteers realized that they would be spending the entire stay in total darkness, and, while this fact probably resulted in some self-selection by the group, the participants apparently adjusted very well to the darkness, and none requested to leave the shelter before completion of the exercise. The majority reported afterwards that the most frightening time of the exercise was entering the shelter and getting settled. They have suggested that in an actual emergency people would tend not to enter a darkened shelter at all.
- c. Having once gotten "settled" in the shelter, most volunteers showed (and later stated) a marked resistance against moving anywhere else in the shelter. Movement from one's selected spot in the shelter produced a marked loss of spatial orientation, a loss which was most conservatively described as "uncomfortable." While this did not interfere with technical operations in the present study, the potential is there for it to do so under actual conditions.

- d. Some hallucinatory activity was reported by the subjects. This occurred primarily upon awakening from sleep, and was very short-lived.

2. The Effects of Darkness of Pre- and Post-Shelter Attitudes.

The results of the attitude analysis of this phase of the study can be found in Tables XXX and XXXI. The following is a summary of these findings.

a. Shelter feeling.

- (1) There was no significant increase in the mean subtest score.
- (2) Fifty percent of the group showed increased subtest scores on the post-test.
- (3) The mean item score on the post-test was 5.20 on a seven-point scale, indicating that the subjects were on the favorable end of the continuum.

The data indicate that the subjects maintained and even increased slightly in their favorable "feeling" toward the shelter at the end of their shelter stay.

b. Shelter discomfort.

- (1) The mean item pre-test score was 2.89 on a four-point scale, indicating that the subject anticipated "little" to "some" discomfort.
- (2) The items anticipated as being most bothersome (item means 2.50 or less) were:
 - (a) Lighting.
 - (b) Boredom.
 - (c) Sleeping difficulty.
 - (d) Temperature and humidity.
 - (e) Crowding.
- (3) The post-test item mean was 3.26 on a four-point scale, indicating that the subjects reported experiencing "little" or "no" discomfort during their shelter stay.

Table XXX

Shelter Feeling - Dark Study

How do you feel about being in a fallout shelter?		(On a seven-point scale)	
		<u>PRE</u>	<u>POST</u>
1.	(7) GOOD ----- (1) BAD	5.00	4.64
2.	(7) RELAXED ----- (1) TENSE	4.71	5.93
3.	(1) ANGRY ----- (7) FRIENDLY	5.79	6.14
4.	(1) CONFUSED ----- (7) ASSURED	5.50	5.64
5.	(1) ALONE ----- (7) TOGETHER	5.00	5.79
6.	(7) KIND ----- (1) CRUEL	5.29	5.29
7.	(1) AIMLESS ----- (7) DIRECTED	4.07	5.14
8.	(7) STRONG ----- (1) WEAK	5.79	5.79
9.	(7) USEFUL ----- (1) USELESS	5.79	5.57
10.	(7) ACTIVE ----- (1) PASSIVE	4.71	4.43
11.	(1) BORED ----- (7) INTERESTED	6.14	4.64
12.	(7) PLEASED ----- (1) ANNOYED	5.21	5.14
13.	(1) UNCERTAIN ----- (7) SELF-CONFIDENT	5.79	6.00
14.	(7) SERIOUS ----- (1) HUMOROUS	4.79	3.50
15.	(7) HOT ----- (1) COLD	2.79	4.07

Table XXXI

Shelter Discomfort - Dark Study

Rate how much the following factors bothered you.	(On a four-point scale, with one indicating much discomfort and four indicating no discomfort)	
	<u>PRE</u>	<u>POST</u>
1. Behavior of other shelterees	2.71	3.29
2. Boredom	2.07	2.36
3. Sleeping difficulty	2.07	.257
4. Crowding	2.50	2.86
5. Lighting	1.79	3.14
6. Dirt	3.14	3.50
7. Food	3.00	3.00
8. Inability to concentrate	3.14	3.07
9. Inadequate leadership	3.57	3.79
10. Lack of exercise	3.14	3.00
11. Lack of organization	3.21	3.50
12. Lack of privacy	3.07	3.71
13. Lack of water for washing	2.86	3.21
14. Noise	2.93	3.50
15. Odors	3.21	3.57
16. Physical symptoms (headaches)	3.50	3.57
17. Too much organization	2.93	3.36
18. Temperature and humidity	2.36	3.00
19. Toilet facilities	2.86	3.43
20. Being observed and recorded	2.64	3.86

- (4) Twelve of the 14 subjects reported experiencing less discomfort than they had anticipated.
- (5) There was a significant increase in pre - post mean sub-test score (.05 level).
- (6) Of the items selected during pre-testing as possible being most troublesome, only boredom remained under 2.50 on the post-test.

The data reveal that the subjects reported experiencing significantly less discomfort than they had anticipated. At the termination of the experiment, they reported experiencing little or no discomfort.

Conclusions

1. The Effects of Darkness on In-Shelter Activity.

On the basis of these results, it appears that darkness can be lived in for periods of time when critical tasks are not being executed. It further appears that light of some kind would be desirable upon entering the shelter, and during the initial setting up of shelter supplies, the latter particularly in the absence of trained or experienced people. It is of interest to note that a small but highly useful light source can be produced using parts of the OCD-supplied radiation gear.

2. The Effects of Darkness on Shelter Attitudes.

The results revealed that: (1) the subjects maintained and actually improved slightly in their "feeling" toward the shelter, (2) the subjects experienced significantly less (.05 level) discomfort than they had anticipated, and (3) the subjects reported experiencing "little" or "no" discomfort.

These findings should not be taken to indicate that being in a darkened shelter is all "fun and games." What it does indicate, however, is that the subject group, expecting darkness, found shelter existence in the dark to be less uncomfortable than they had anticipated. These

results should be viewed, not as a base line, but rather as a ceiling.
That is, it is very unlikely that a completely "shelver naive" group
would behave nearly as calmly and assured as this group.

APPENDIX A

SCENARIO USED IN STUDIES I, II, AND III

Best Available Copy

SHELTER SCHEDULE

TIME GUIDE	ACTIVITY
	<u>FIRST DAY</u>
7:00 PM	<p>People enter shelter; directed away from entrance. Shelter secured. Manager introduces himself; states his authority. People relocated for blast protection (away from doors; near but not next to walls).</p>
7:10 PM	<p>Manager provides initial briefing. Distribute registration forms; give instructions. Allocate writing resources. FIRST EBS MESSAGE Collect registration forms.</p>
7:30 PM	<p>Divide group into 3 Units -- assign Unit areas, select management area. Have groups select Unit heads. SIMULTANEOUSLY --- Manager reviews registration forms for task team assignment. Distribute colored tape to Unit heads. (A color code was used to identify family units.)</p>
8:00 PM	<p>Select task team heads and members.</p> <ol style="list-style-type: none"> 1. Food and Water 2. Sanitation and Medical 3. Radiological and Safety 4. Administration and Communication 5. Training and Recreation <p>Hold brief meeting with team heads; distribute guidance cards Give teams their initial assignments. Collect potentially useful personal belongings from shelterees. EBS MESSAGE #2</p>
10:00 PM	<p>Free time. Preparation for sleep.</p>
10:15 PM	<p>EBS MESSAGE #3</p>
11:00 PM	<p>Lights out.</p>

TIME GUIDE	ACTIVITY
<u>SECOND DAY</u>	
7:00 AM	Call reveille. Roll up rug. (This was done to avoid dirtying the rug so that it could be slept on again.) Morning toilet.
7:30 AM	Breakfast meal.
8:00 AM	Sick call.
8:15 AM	SIMULTANEOUS free time and brief team meeting followed by brief Unit head meeting. EBS MESSAGE #4
8:30 AM	Hold shelter briefing. <ol style="list-style-type: none"> 1. Review plans for day. 2. Gripe session.
9:00 AM	Hold first training session. <ol style="list-style-type: none"> 1. Radiation and decontamination.
10:00 AM	Call water and cracker break. Declare free time. EBS MESSAGE #5
12:00 Noon	Provide #3 serving of food and water (clean up/relax).
1:00 PM	Hold training session #2. <ol style="list-style-type: none"> 1. Medical aspects of survival. EBS MESSAGE #6
2:00 PM	Declare free time for recreation group to organize planned recreational activity.
2:30 PM	Provide #4 water and cracker break.
3:00 PM	Planned recreation activity. EBS MESSAGE #7
4:00 PM	Declare quiet/free time.
5:00 PM	Provide #5 water and cracker serving/clean up. EBS MESSAGE #8
6:00 PM	Emergence.

APPENDIX B

EBS MESSAGES USED IN STUDIES I, II, AND III

Best Available Copy

INSTRUCTIONS: ANNOUNCE APPROXIMATELY 15 MINUTES AFTER ENTRY

EMERGENCY BROADCAST SYSTEM - MESSAGE #1

Attention! Attention! This is the Emergency Broadcast System. A missile attack has been launched against the United States. Reports about the attack are fragmentary and unconfirmed. The strategic missile bases west of the Mississippi appear to have borne the brunt of the attack. As of this moment there has been no official report of a nuclear detonation in our immediate vicinity. Fallout has begun to descend in the western portions of our city, and is expected in other areas imminently.

Do not communicate with the Emergency Operations Center unless absolutely necessary.

We have just been informed that a message will be delivered to the American people from the emergency national command post in the near future.

INSTRUCTIONS: AFTER ALL TASK TEAM HEADS AND MEMBERS HAVE BEEN SELECTED, ABOUT 8:00 PM.

EMERGENCY BROADCAST SYSTEM - MESSAGE #2

Attention! Attention! This is the Emergency Broadcast System. Stay tuned for an important message.

WAIT 30 SECONDS

This is a Priority One report from the Emergency National Command Post in Washington. The President and his key civilian and military aides have been safely evacuated to the emergency seat of government.

This evening at 6:45 PM the enemy launched an attack against the strategic retaliatory forces of the United States and its NATO allies. Intelligence warning allowed us to launch a portion of our land-based missile force against the enemy's remaining strategic forces. Polaris missiles have also been launched. In addition, our airborne alert and a portion of our ground alert aircraft forces have been sent against the enemy's non-missile strategic forces.

Our damage assessment reports indicate that many of our SAC bases have been destroyed or severely damaged. A number of communities near SAC bases have also suffered great damage. The fallout monitoring network reports that the radiation is heavy on the Western portion of our country and is increasing in the Midwest and Eastern portions of our nation. Although there have been several nuclear detonations in the East, it appears as if these have been the results of errant missiles rather than a planned attack against population centers. The President, who, I repeat, is alive and well, will address the nation as soon as his command duties permit.

This is the end of the Priority One report. Local EBS stations may resume Priority Two broadcasting.

INSTRUCTIONS: AFTER DISCUSSION OF SLEEPING ARRANGEMENTS ABOUT 10:15 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #3

Attention! Attention! This is the Emergency Broadcast System. Fallout began to descend in the Pittsburgh area several hours ago and radiological monitoring reports indicate that radiation levels are dangerously high in many parts of our city. No one should attempt to leave shelters. Repeat. No one should attempt to leave shelters.

Youngstown, Ohio and Erie, Pennsylvania have suffered severe damage as a result of nuclear detonations. As of the moment there have been no nuclear blasts in our immediate area.

The municipal power has been temporarily disrupted in some parts of the city. Power should be restored shortly.

No further official reports on our retaliatory attacks on the enemy homeland are available. Unofficially, the absence of any significant second wave of enemy attack plus the size of our surviving strategic force allows cautious optimism that we will suffer no further major damage from any attack.

Until further word is transmitted by this station, everyone must remain in shelters.

EMERGENCY BROADCAST SYSTEM - MESSAGE #4

Attention! Attention! This is the Emergency Broadcast System. In order to evaluate the damage to Pittsburgh, the Emergency Operations Center requests every shelter to gather the following information and report to its local Emergency Operations Center.

Read the following questions slowly.

1. Is this a fallout or a blast shelter?
2. How many persons are in the shelter?
3. How many of these persons are injured?
4. How many persons are suffering from radiation sickness?
5. What is the condition of your equipment?
6. Is your shelter structure damaged?
7. Do you have adequate electricity?
8. Do you have adequate ventilation?
9. What is the state of your food supplies?
10. What is the state of your water supply?
11. Do you have any illness other than radiation sickness?

As soon as we have received reports from district Control Centers, we will relay such information to you. When emergency missions are possible, disaster teams will be sent to those shelters which need medical supplies and attention, food and water. Attempts will also be made to report specific areas of damage in our city. Please stay tuned for additional announcements.

NOTE: When Karl calls in the answers, this is an opportunity for the senior observer to provide him with information or to ask whether he requires anything.

INSTRUCTIONS: SATURDAY MORNING DURING SNACK, AROUND 10:15 AM

EMERGENCY BROADCAST SYSTEM - MESSAGE #5

Attention! Attention! This is the Emergency Broadcast System. We have hundreds of people in the area who do not have shelter with an adequate protection factor. They must be moved into other shelters in order to survive. Please advise the Emergency Operations Center as to the number of additional people you can take into your shelter.

INSTRUCTIONS: SATURDAY AFTERNOON, DURING TRAINING SESSION, ABOUT 1:00 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #6

Attention! Attention! This is the Emergency Broadcast System. Radiological monitoring teams report that the radiation levels in the Pittsburgh area are still high. However, there is no additional accumulation of radioactive dust. The fallout on the ground is beginning to decay. It is simply a matter of waiting out this decay time before we can undertake further Civil Defense measures. Everyone is to remain inside until further notice. Please do not leave your shelter.

INSTRUCTIONS: SATURDAY AFTERNOON DURING PLANNED RECREATION SESSION, AROUND 3:00 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #7

Attention! Attention! This is the Emergency Broadcast System. Radiological calculations of fallout levels in Pittsburgh indicate that permanent exit from some shelters will be possible in the near future. At the present time, recovery teams are surveying the city to locate and prepare facilities for post-shelter operations.

It is imperative that you do not attempt to leave your shelter without prior notice from the Emergency Operations Center. There are still many dangerous radiological hot spots in the city. Therefore, regardless of the radiological readings in your immediate vicinity, wait for official notification from your government in the Emergency Operations Center.

INSTRUCTIONS: SATURDAY AFTERNOON - JUST BEFORE EXIT

EMERGENCY OPERATIONS CENTER MESSAGE #8

IMPORTANT: THIS IS A PHONED-IN MESSAGE ON THE INTERCOM AND NOT
DELIVERED OVER THE MIKE.

Message to the Shelter Manager that his shelter may be declared open and that he can release his shelterees, after they get the shelter all cleaned up and ready for World War IV.

Provide Karl with necessary information as to where and when shelterees should go.

1. Wear jumpers.
2. Take all belongings with them.

APPENDIX C
SCENARIO USED IN STUDIES IV - IX

Best Available Copy

SHELTER SCENARIO FOR 48-HOUR STUDIES

Time Guide	Activity
7:00 PM	Shelter filled. Assumption of command by manager. Closing of shelter. Shelterees assume blast positions.
7:15 PM	Manager provides initial briefing. Has shelterees provide skill data on pieces of paper. Selects administrative aide to assist him. Selects <u>temporary</u> volunteer team heads to review supplies and procedures.
<hr style="border: none; border-top: 1px solid black; margin: 5px 0;"/> EBS #1 <hr style="border: none; border-top: 1px solid black; margin: 5px 0;"/>	
7:30 PM	Division of shelter into 5 Units and election of Unit heads. Assigns Unit areas. Holds brief meeting with Unit heads. (a) distribute tape (b) describe responsibilities (c) private property
7:45 PM	Registration forms. Sets up sanitation kit.
8:00 PM	Selection of permanent task team heads. Selection of team members.
<hr style="border: none; border-top: 1px solid black; margin: 5px 0;"/> EBS #2 <hr style="border: none; border-top: 1px solid black; margin: 5px 0;"/>	
8:20 PM	Task team meetings: distributes guidance cards.
8:45 PM	Shelteree briefing: collect private belongings review schedule
9:00 PM	Water and cracker serving
9:30 PM	Free time
10:15 PM	Discussion of sleeping arrangements and preparation for sleep
<hr style="border: none; border-top: 1px solid black; margin: 5px 0;"/> EBS #3 <hr style="border: none; border-top: 1px solid black; margin: 5px 0;"/>	
11:00 PM	Lights out.

SHELTER SCHEDULE

Second Day

Time Guide	Activity
7:00 AM	Reveille Morning toilet
7:30 AM	Breakfast meal
EBS #4 8:00 AM	Sick call
8:15 AM	Team head meeting Unit head meeting
8:30 AM	Shelter briefing
9:00 AM	Training session #1 Radiation and decontamination
10:00 AM	Water and cracker break
EBS #5	
10:30 AM	Planned recreation session
11:30 AM	Quiet time - Lights out
12:00 Noon	Lunch meal
12:30 PM	Training session #2 RADEF practical exercise: by Units
EBS #6	
1:30 PM	Free time
2:00 PM	Water and cracker break
2:30 PM	Training session #3 Post-shelter survival and adjustment
3:30 PM	Planned recreation session
EBS #7	
4:30 PM	Quiet time - Lights out
5:00 PM	Supper meal
5:30 PM	Shelter briefing
6:00 PM	Free time

SHELTER SCHEDULE

Second Day (cont'd.)

Time Guide	Activity
6:30 PM	Training session #4 First aid and medical self-help
7:30 PM	Preparation for "show"
8:30 PM	Planned recreational activity (shelter show)
9:30 PM	Free time
10:30 PM	Prepare for sleep
11:00 PM	Lights out

EBS #8

SHELTER SCHEDULE

Third Day

Time Guide	Activity
7:00 AM	Reveille Morning toilet
7:30 AM	Breakfast meal
8:00 AM	Sick call
8:15 AM	Team head meeting Unit head meeting
8:30 AM	Shelter meeting Briefing Religious services, if requested
9:30 AM	Free time
10:00 AM	Water and cracker break
10:30 AM	Training session #5 In-shelter living
11:30 AM	Quiet time - Lights out
12:00 Noon	Lunch meal
12:30 PM	Training session #6 First aid practical exercise
1:30 PM	Free time
2:00 PM	Water and cracker break
2:30 PM	Planned recreational activity
3:30 PM	Shelter briefing
4:00 PM	Quiet time - Lights out
4:30 PM	Supper meal and preparation for exit
5:00 PM	Exit

APPENDIX D

EBS MESSAGES USED IN STUDIES IV - IX

Best Available Copy

INSTRUCTIONS: ANNOUNCE APPROXIMATELY 15 MINUTES AFTER ENTRY

EMERGENCY BROADCAST SYSTEM - MESSAGE #1

Attention! Attention! this is the Emergency Broadcast System.
A missile attack has been launched against the United States. Reports about the attack are fragmentary and unconfirmed. The strategic missile bases west of the Mississippi appear to have borne the brunt of the attack. As of this moment there has been no official report of a nuclear detonation in our immediate vicinity. Fallout has begun to descend in the western portions of our city, and is expected in other areas imminently.

Do not communicate with the Emergency Operations Center unless absolutely necessary.

We have just been informed that a message will be delivered to the American people from the emergency national command post in the near future.

INSTRUCTIONS: AFTER ALL TASK TEAM HEADS & MEMBERS HAVE BEEN SELECTED, ABOUT 8:00 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #2

Attention! Attention! This is the Emergency Broadcast System. Stay tuned for an important message.

WAIT 30 SECONDS

This is a Priority I report from the Emergency National Command Post in Washington. The President and his key civilian and military aids have been safely evacuated to the emergency seat of government.

This evening at 6:45 PM the enemy launched an attack against the strategic retaliatory forces of the United States and its NATO allies. Intelligence warning allowed us to launch a portion of our land based missile force against the enemy's remaining strategic forces. Polaris missiles have also been launched. In addition, our air-borne alert and a portion of our ground alert aircraft forces have been sent against the enemy's non-missile strategic forces.

Our damage assessment reports indicate that many of our SAC bases have been destroyed or severely damaged. A number of communities near SAC bases have also suffered great damage. The fallout monitoring network reports that radiation is heavy in the Western portion of our country and is increasing in the Midwest and Eastern portions of our nation. Although there have been several nuclear detonations in the East, it appears as if these have been the results of errant missiles rather than a planned attack against population centers. The President, who, I repeat, is alive and well, will address the nation as soon as his command duties permit.

This is the end of the Priority I report. Local EBS stations may resume Priority II broadcasting.

INSTRUCTIONS: AFTER DISCUSSION OF SLEEPING ARRANGEMENTS ABOUT 10:15 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #3

Attention! Attention! This is the Emergency Broadcast System. Fallout began to descend in the Pittsburgh area several hours ago and radiological monitoring reports indicate that radiation levels are dangerously high in many parts of our city. No one should attempt to leave shelters. Repeat. No one should attempt to leave shelters.

Youngstown, Ohio and Erie, Pennsylvania have suffered severe damage as a result of nuclear detonations. As of the moment there have been no nuclear blasts in our immediate area.

The municipal power has been temporarily disrupted in some parts of the city. Power should be restored shortly.

No further official reports on our retaliatory attacks on the enemy homeland are available. Unofficially, the absence of any significant second wave of enemy attack plus the size of our surviving strategic force allows cautious optimism that we will suffer no further major damage from any attack.

Until further word is transmitted by this station, everyone must remain in shelters.

INSTRUCTIONS: SATURDAY MORNING AFTER SICK CALL ABOUT 8:00 AM

EMERGENCY BROADCAST SYSTEM - MESSAGE #4

Attention! Attention! This is the Emergency Broadcast System. In order to evaluate the damage to Pittsburgh, the Emergency Operations Center requests every shelter to gather the following information and report to its local Emergency Operations Center.

READ THE FOLLOWING QUESTIONS SLOWLY

1. Is this a fallout or blast shelter?
2. How many persons are in the shelter?
3. How many of these persons are injured?
4. How many persons are suffering from radiation sickness?
5. What is the condition of your equipment?
6. Is your shelter structure damaged?
7. Do you have adequate electricity?
8. Do you have adequate ventilation?
9. What is the state of your food supplies?
10. What is the state of your water supply?
11. Do you have any illness other than radiation sickness?

As soon as we have received reports from district Control Centers, we will relay such information on to you. When emergency missions are possible, disaster teams will be sent to those shelters which need medical supplies and attention, food, and water. Attempts will also be made to report specific areas of damage in our city. Please stay tuned for additional announcements.

NOTE: When Karl calls in the answers, this is an opportunity for the Senior Observer to provide him with information or to ask whether he requires anything.

INSTRUCTIONS: SATURDAY MORNING DURING SNACK, AROUND 10:15 AM

EMERGENCY BROADCAST SYSTEM - MESSAGE #5

Attention! Attention! This is the Emergency Broadcast System. We have hundreds of people in the area who do not have shelter with an adequate protection factor. They must be moved into other shelters in order to survive. Please advise the Emergency Operations Center as to the number of additional people you can take into your shelter.

INSTRUCTIONS: SATURDAY AFTERNOON, DURING FREE TIME, ABOUT 12:45 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #6

Attention! Attention! This is the Emergency Broadcast System. Radiological monitoring teams report that the radiation levels in the Pittsburgh area are still high. However, there is no additional accumulation of radio-active dust. The fallout on the ground is beginning to decay. It is simply a matter of waiting out this decay time before we can undertake further Civil Defense measures. Everyone is to remain inside until further notice. Please do not leave your shelter.

INSTRUCTIONS: SATURDAY AFTERNOON, DURING PLANNED RECREATION SESSION, ABOUT 4:00 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #7

Attention! Attention! This is the Emergency Broadcast System. Some people have left shelters and are sick from radiation. If these people try to gain entrance to your shelter, decontaminate them in an outer room. Symptoms of radiation sickness are nausea, diarrhea, inflammation of the mouth and throat, and fever. Radiation sickness is not contagious.

Although radiation levels in the city have decayed somewhat, it is still dangerous to those outside shelter. No additional fallout is expected in this area. Do not leave shelter. I repeat: Do not leave shelter.

INSTRUCTIONS: DURING FREE TIME, ABOUT 9:45 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #8

Attention! Attention! This is the Emergency Broadcast System. Reports have been received that there are bands of looters wandering about the city. Attempts have been made to loot shelters in this area. Be alert to this situation and act accordingly. Security police will begin patrolling the area as soon as the radiation level permits.

INSTRUCTIONS: SUNDAY MORNING DURING LUNCH MEAL, ABOUT 12:15 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #9

Attention! Attention! This is the Emergency Broadcast System. Emergency teams have been established and have begun to operate in various sections of Pittsburgh. There is a shortage of able-bodied men to serve on work details in Shadyside, East Liberty, Bloomfield, and Morningside. Will all shelters submit to the Emergency Operations Center the names of able-bodied volunteers who may be asked to leave shelter before radiation levels are completely safe for permanent exit. Phone the names into the Emergency Operations Center. Further information will be provided as to when and where the rescue volunteers will report.

INSTRUCTIONS: SUNDAY AFTERNOON DURING PLANNED RECREATION SESSION, AROUND 3:00 PM

EMERGENCY BROADCAST SYSTEM - MESSAGE #10

Attention! Attention! This is the Emergency Broadcast System. Radiological calculations of fallout levels in Pittsburgh indicate that permanent exit from some shelters will be possible in the near future. At the present time, recovery teams are surveying the city to locate and prepare facilities for post-shelter operations.

It is imperative that you do not attempt to leave your shelter without prior notice from the Emergency Operations Center. There are still many dangerous radiological hot-spots in the city. Therefore, regardless of the radiological readings in your immediate vicinity, wait for official notification from your Government in the Emergency Operations Center.

INSTRUCTIONS: SUNDAY AFTERNOON - JUST BEFORE EXIT

EMERGENCY OPERATIONS CENTER MESSAGE #11

IMPORTANT: THIS IS A PHONED IN MESSAGE ON THE INTERCOM AND NOT DELIVERED
OVER THE MIKE.

Message to the Shelter Manager that his shelter may be declared open
and that he can release his shelterees, after they get the shelter all
cleaned up and ready for World War IV.

Provide Karl with necessary information as to where and when shelterees
should go.

1. Wear jumpers.
2. Take all belongings with them.

APPENDIX E

SCENARIO OF EVENTS USED IN STUDIES X, XI, AND XII

Best Available Copy

SHELTER SCENARIO FOR HIGH-STRESS 24 HOUR STUDIES

Time Guide	Activity
<p><u>7:00 PM</u> EBS #1 (<u>7:00 PM</u>)</p>	<p>Shelter filled. Assumption of command by manager. Closing of shelter. Shelterees assume blast positions.</p>
<p>Lights Dimmed (<u>7:07 PM</u>)</p>	
<p>EBS #2 (<u>7:10 PM</u>)</p>	
<p>EBS #3 (<u>7:15 PM</u>)</p>	<p>Manager provide initial briefing. Has shelterees provide skill data on pieces of paper. Selects administrative aide to assist him. Selects <u>temporary</u> volunteer team heads to review supplies and procedures.</p>
<p>Lights on to Full Power (<u>7:30 PM</u>)</p>	<p>Division of shelter into 3 Units & election of Unit heads. Assigns Unit areas. Holds brief meeting with Unit heads. (a) distribute tape (b) describe responsibilities (c) private property</p>
<p><u>7:45 PM</u></p>	<p>Registration forms. Sets up sanitation kit.</p>
<p>EBS #4 (<u>8:00 PM</u>)</p>	<p>Selection of permanent task team heads. Selection of team members.</p>
<p><u>8:20 PM</u></p>	<p>Task team meetings: distributes guidance cards.</p>
<p>EBS #5 (<u>8:30 PM</u>)</p>	
<p><u>8:45 PM</u></p>	<p>Shelteree briefing: Collect private belongings. review schedule.</p>
<p>EBS #6 (<u>8:50 PM</u>)</p>	
<p><u>9:00 PM</u></p>	<p>Water & cracker serving.</p>
<p>EBS # 7 (<u>9:30 PM</u>)</p>	<p>Free time.</p>
<p>EBS # 8 (<u>10:15 PM</u>)</p>	<p>Discussion of sleeping arrangements & preparation for sleep.</p>
<p>EBS # 9 (<u>10:30 PM</u>)</p>	
<p><u>11:00 PM</u></p>	<p>Lights out.</p>

NIGHT ACTIVITIES

11:00 PM	Lights Out
11:30 PM	EBS #10
12:30 AM	Extra People Admitted
1:30 AM	EBS #11
2:15 AM	EBS #12
3:00 AM	EBS #13
3:45 AM	EBS #14
4:15 AM	EBS #15
6:00 AM	EBS #16

SHELTER SCHEDULE

Second Day

Time Guide	Activity
<u>7:00 AM</u>	Reveille Morning toilet
EBS #17 (<u>7:30 AM</u>)	Breakfast meal
<u>8:00 AM</u>	Sick call
<u>8:15 AM</u>	Team head meeting Unit head meeting
Volunteers go Out (<u>8:30 AM</u>)	Shelter Briefing
<u>9:00 AM</u>	Training session #1 Radiation & decontamination
Karl Out at (<u>9:45 AM</u>) with Radeb gear.	
EBS #18 (<u>10:00 AM</u>)	Water & Cracker break
Call to tell them to Mobilize (<u>10:05 AM</u>)	
Call to tell them No Go (<u>10:20 AM</u>)	
Dust Storm and return of contaminated volunteers; Lights dimmed (<u>10:30 AM</u>)	
Lights to full power (<u>10:45 AM</u>)	
Karl comes back in (<u>12:00 Noon</u>)	
<u>12:30 PM</u>	Free time
<u>1:00 PM</u>	Lunch Meal
<u>1:30 PM</u>	Quiet time (Lights out)
<u>2:00 PM</u>	Training session #2 Post-shelter survival and adjustment
EBS #19 (<u>3:00 PM</u>)	Cracker break
<u>3:30 PM</u>	Planned recreation
<u>4:30 PM</u>	Free Time
<u>5:00 PM</u>	Emergence

APPENDIX F

EBS MESSAGES USED IN HIGH-STRESS STUDIES

(STUDIES X, XI, AND XII)

Best Available Copy

FILL REEL UNTIL SCOTCH TAPE TOUCHES OUTER EDGE
OF REEL. TURN COUNTER TO 000, THEN PROCEED.

EMERGENCY BROADCAST SYSTEM SCRIPT

EBS #1 TO BE PRESENTED Friday, 7:00 PM RUNNING TIME 2:50

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Take shelter immediately. Take shelter immediately. This is not a drill. Repeat: This is not a drill. An enemy attack is being launched against the United States. Take shelter immediately and stay tuned to this frequency for further instructions.

THE ABOVE MESSAGE IS TO BE REPEATED THREE TIMES, WITH 15-SECOND INTERVALS.

TURN OFF AT 033 TAPE COUNT.

EBS #2 TO BE PRESENTED Friday, 7:10 PM RUNNING TIME 0:40

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. We have just been informed that the city is now on the emergency power system. Please inform the control center if your shelter is without lights. Repeat: The city is now on the emergency power system. Please inform the control center if your shelter is without lights. We also have we also have word here that there has been no confirmed report of a missile strike in this area. There has been no confirmed report of a missile strike in this area.

TURN OFF AT 043 TAPE COUNT.

EBS #3 TO BE PRESENTED Friday, 7:15 PM RUNNING TIME 0:50

CONTENT

(Phone is heard ringing in background.)

ATTENTION. ATTENTION. This is the Emergency Broadcast System. A missile attack has been launched against the United States. Reports about the attack are fragmentary and unconfirmed. The strategic missile bases west of the Mississippi appear to have borne the brunt of the attack. As of this moment there has been no official report of a nuclear detonation in our immediate vicinity. Fallout has begun to descend on the western portions of our city and is expected in other areas imminently. Do not communicate with the emergency operations center unless absolutely necessary.

TURN OFF AT 054 TAPE COUNT.

EBS #4 TO BE PRESENTED Friday, 8:00 PM RUNNING TIME 3:00

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Stay tuned for an important message. (DISTANT VOICE: Okay, stand by now. We've got a remote from Washington.) Static ----- Noise. Another voice: This is a report from the emergency national command post in Washington. The President and his key civilian and military aides have been safely evacuated to the emergency seat of government. This evening at 6:35 PM the enemy launched an attack against the strategic retaliatory forces of the United States and its NATO allies. An intelligence warning allowed us to launch a portion of our land-based missile force against the enemy's remaining strategic forces. Polaris missiles have also been launched. In addition, our airborne alert and a portion of our ground alert aircraft forces have been sent against

the enemy's non-missile strategic forces. Our damage assessment reports indicate that many of our SAC bases have been destroyed or severely damaged. A number of communities near SAC bases have also suffered great damage. The fallout monitoring network reports that radiation is heavy in the western portion of our country and is increasing in the midwest and eastern portions of our nation. Although there have been several nuclear detonations in the east, it appears as if these have been the result of errant missiles, rather than a planned attack against population centers. The President, whom, I repeat is alive and well, will address the nation as soon as his command duties permit. This is the end of the Priority One report. Local EBS stations may resume Priority Two broadcasting.

TURN OFF AT 081 TAPE COUNT.

EBS #5 TO BE PRESENTED Friday, 8:30 PM RUNNING TIME 0:25

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Short wave monitoring has disclosed that our air strike forces are currently launching attacks on the enemy homeland. These forces are utilizing a new..... what? What do you mean it's not for release? (Another voice: Priority One. Now.. for heaven's sake! Announcer: Well what the hell.....?) THIS MATERIAL CUT OUT.

TURN OFF AT 087 TAPE COUNT.

EBS #6 TO BE PRESENTED Friday, 8:50 PM RUNNING TIME 1:15

CONTENT

Has this one been cleared?

ATTENTION. ATTENTION. This is the Emergency Broadcast System. We have just received word that the President has been evacuated to sea in the floating Whitehouse. The location of this ship is unknown. The floating Whitehouse is a battlecruiser, fully equipped for command and control functions. Our government has survived the attack. I repeat, our government has survived the attack.

TURN OFF AT 094 TAPE COUNT.

EBS #7 TO BE PRESENTED Friday, 9:30 PM RUNNING TIME 1:20

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. We have just been informed that a message is to be delivered from the governor's office in Harrisburg. Please stand by.

This is a report from the governor's office in Harrisburg. The state of conditions in Pennsylvania is serious, but not critical. Erie has been severely damaged by what is believed to have been a stray missile. No other cities have reported being hit, but the fallout level is rapidly increasing, particularly in western Pennsylvania. Apparently neighboring states have borne the brunt of the attack, particularly those in the western portions of the country. All citizens should seek shelter immediately. Do not attempt to evacuate your area until you are instructed to do so. Local law enforcement personnel should remain in their respective areas. State police have been assigned to more critical areas, and additional state aid will become available and be assigned when fallout levels permit.

TURN OFF AT 110 TAPE COUNT.

EBS #8 TO BE PRESENTED Friday, 10:15 PM RUNNING TIME 1:15

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Fallout began to descend on the Pittsburgh area several hours ago and radiological monitoring reports indicate that radiation levels are dangerously high in many parts of our city. No one should attempt to leave shelters. Repeat: No one should attempt to leave shelters. Youngstown, Ohio and Erie, Pennsylvania have suffered severe damage as a result of nuclear detonations. As of the moment there have been no nuclear blasts in our immediate area. The municipal power has been temporarily disrupted in some parts of the city. Power should be restored shortly. No further official reports on our retaliatory attacks on the enemy homeland are available. Unofficially, the absence of any significant second wave of enemy attack, plus the size of our surviving strategic force, allows cautious optimism that we will suffer no further major damage from any attack. Until further word is transmitted by this station, everyone must remain in shelters.

TURN OFF AT 127 TAPE COUNT.

EBS #9 TO BE PRESENTED Friday, 10:30 PM RUNNING TIME 1:45

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. In order to evaluate the damage to Pittsburgh, the emergency operations center requests every shelter to gather the following information and to report it to the local emergency operations center. Is this a fallout or a blast shelter? How many persons are in the shelter? How many of these persons are injured? How many persons are suffering from radiation sickness? What is the condition of your equipment? Is your shelter structure damaged? Do you have adequate electricity? Do you have adequate ventilation? What is the state of your food supplies?

What is the state of your water supply? Do you have any illness other than radiation sickness? As soon as we have received reports from district control centers we will relay such information on to you. When emergency missions are possible, disaster teams will be sent to those shelters which need medical supplies, food and water. Attempts will also be made to report specific areas of damage in our city. Please stay tuned for additional announcements.

TURN OFF AT 151 TAPE COUNT.

EBS #10 TO BE PRESENTED Friday, 11:30 PM RUNNING TIME 0:35

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. We have hundreds of people in the area who do not have shelter with an adequate protection factor. They must be moved to other shelters in order to survive. Please advise the emergency operations center as to the number of additional people you can take into your shelter. This is imperative. Please inform the emergency operations center as to the number of additional people you can take into your shelter.

TURN OFF AT 172 TAPE COUNT.

EBS #11 TO BE PRESENTED Saturday, 1:30 AM RUNNING TIME 0:30

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Radiological monitoring teams report that the radiation levels in the Pittsburgh area are still high. However, there is no additional accumulation of radioactive dust. The fallout on the ground is beginning to decay. It is simply a matter of waiting out this decay time before we can undertake further civil defense measures. Everyone is to remain inside until further notice. Please do not leave your shelters.

TURN OFF AT 183 TAPE COUNT.

EBS #12 TO BE PRESENTED Saturday, 2:15 AM RUNNING TIME 0:25

CONTENT

ACCIDENTALLY OVERHEAR A SHORT WAVE BROADCAST. "Hello Tower.... to checkpoint two...." Static and short wave noise.

TURN OFF AT 193 TAPE COUNT.

EBS #13 TO BE PRESENTED Saturday, 3:00 AM RUNNING TIME 1:05

CONTENT

LOUD STATIC AND SHORT WAVE NOISE.

ATTENTION. ATTENTION. This is the Emergency Broadcast System.

TURN OFF AT 208 TAPE COUNT.

EBS #14 TO BE PRESENTED Saturday, 3:45 AM RUNNING TIME 1:20

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Reports have been received that there are bands of looters wandering about the city. Attempts have been made to loot shelters in this area. Be alert to this situation and act accordingly. Security police will begin patrolling the area as soon as the radiation level permits.

TURN OFF AT 222 TAPE COUNT.

EBS #15 TO BE PRESENTED Saturday, 4:15 AM RUNNING TIME 0:35

CONTENT

ACCIDENTALLY OVERHEAR SAC PLANE MESSAGE. Sounds like:

"Angels 46 --- Same heading --- Roger, Angels 52 --- Fuel 30 ---"

Much static.

TURN OFF AT 231 TAPE COUNT.

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Stay tuned for an important message. Okay, stand by to switch.

MUCH STATIC -----"Please stand by."

This is a Priority One report from the emergency national command post in Washington. It appears that the enemy attack is over. There have been no further reports of missile strikes since early last evening. Radio monitoring indicates no further enemy air activity. Damage assessment reports indicate that the brunt of this attack was borne by western states. Many of our SAC bases have been destroyed or severely damaged. Communities near SAC bases have also been severely damaged. The central and eastern portions of the country have escaped extensive damage although stray missiles have struck some of the smaller population centers. Fallout is moving across the country in an easterly direction, carried on westerly winds. All citizens should remain in shelters until instructed otherwise by local civil defense commands. The President and key members of his cabinet are still aboard the U. S. S. Northampton. The President will address the American people as soon as his command duties permit. This is the end of the priority..... this is the end of the Priority One report. Local EBS stations may resume priority two broadcasting.

TURN OFF AT 261 TAPE COUNT.

EBS #17 TO BE PRESENTED Saturday, 7:30 AM RUNNING TIME 0:45

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Emergency teams have been established and have begun to operate in various sections of Pittsburgh. There is a shortage of able-bodied men to serve on work details in Shadyside, East Liberty, Bloomfield, and Morningside. Will all shelters submit to the emergency operations center the names of able-bodied volunteers who may be asked to leave shelters before radiation levels are completely safe for permanent exit. Phone the names into the emergency operations center. Further information will be provided as to when and where the rescue volunteers will report.

TURN OFF AT 276 TAPE COUNT.

EBS #18 TO BE PRESENTED Saturday, 10:00 AM RUNNING TIME 1:30

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Weather monitoring teams report that there is a severe storm approaching the Pittsburgh area. What's that? It appears that this storm is bearing with it a radioactive dust cloud and we expect the levels of radiation to increase severely. Some shelters do not have adequate protection facilities against this cloud. There is a possibility that some shelters will have to mobilize and be moved. (PAUSE) We will contact these shelters by phone within the next few minutes. Please do not call the emergency operations center. If your shelter is one of these that has to be mobilized and be moved, we will contact you. Please stand by.

TURN OFF AT 304 TAPE COUNT.

EBS #19 TO BE PRESENTED Saturday, 3:00 PM RUNNING TIME 1:00

CONTENT

ATTENTION. ATTENTION. This is the Emergency Broadcast System. Radiological calculations of fallout levels in Pittsburgh indicate that permanent exit from some shelters will be possible in the near future. At the present time recovery teams are surveying the city to locate and to prepare facilities for post-shelter operations. It is imperative that you do not attempt to leave your shelter without prior notice from the emergency operations center. There are still many dangerous radiological "hot spots" in the city. Therefore, regardless of the radiological readings in your immediate vicinity, wait for official notification from your government in the emergency operations center.

TURN OFF AT 322 TAPE COUNT.

THE END

PRE-TEST - STUDIES I-III

APPENDIX G

PRE- AND POST-SHELTER QUESTIONNAIRES USED IN STUDIES I - XII

Best Available Copy

Name _____

CIVIL DEFENSE INFORMATION TEST

Some of the following statements are true, and some are false.
Circle the appropriate answer. If you do not know the correct answer,
please circle "Don't Know".

Statements of Fact

- | | | | |
|---|------|-------|------------|
| 1. If you get exposed to radiation at all, you are sure to die. | True | False | Don't Know |
| 2. Fallout from just one bomb may cover thousands of square miles. | True | False | Don't Know |
| 3. There is a new pill you can take that will protect you against radioactive fallout. | True | False | Don't Know |
| 4. If someone has radiation sickness, you should avoid getting near him so you won't catch it yourself. | True | False | Don't Know |
| 5. An atomic war would contaminate the water supply and almost everyone would die before the water was fit to drink again. | True | False | Don't Know |
| 6. An atomic war would destroy all food and ways of producing food, so you would die soon--even if you were protected by a shelter. | True | False | Don't Know |
| 7. A plastic suit with filtering mask is plenty of protection against fallout. | True | False | Don't Know |
| 8. Most fallout rapidly loses its power to harm people. | True | False | Don't Know |
| 9. After a nuclear attack, if you filter the dust out of the air, the air will be safe to breathe. | True | False | Don't Know |
| 10. The radioactivity after an attack would make the earth, or some areas of it, impossible to live in for years or even centuries. | True | False | Don't Know |

BE SURE TO FILL IN OTHER SIDE OF THIS PAGE.

- | | | | |
|--|------|-------|------------|
| 11. If we are attacked, great weather storms from the explosions would sweep the nation. | True | False | Don't Know |
| 12. A fallout shelter should have an air tight door to guard against radiation. | True | False | Don't Know |
| 13. Any adequate family shelter would cost at least three hundred dollars. | True | False | Don't Know |
| 14. You can not see fallout. | True | False | Don't Know |

Name _____

CIVIL DEFENSE ATTITUDE QUESTIONNAIRE

Please express your opinion about each of the following statements by placing a check-mark on the scale.

1. The communists' fear of total destruction will prevent their launching an all-out attack on the United States.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

2. Every individual should contribute both time and money to help develop civil defense protection.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

3. Congress should appropriate less money to civil defense, and more to building missiles.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

4. Civil defense volunteers are making as great a contribution to national survival as is the military.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

5. There is no good way to avoid the panic which is bound to take place after a nuclear attack.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

6. If we ever do have a nuclear war, things will be completely hopeless.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

7. Civil defense training courses should be paid for by the Federal government to train individuals in all communities on emergency and disaster operations for a nuclear attack.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

8. A nuclear attack would probably result in only a temporary lack of organization at local, State, and Federal levels, after which these governments would be able to resume firm control of the situation.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

9. There is relatively little the individual can do to prepare for his own survival in the case of nuclear attack.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

10. Before the government puts more money into civil defense protection, we should wait until the danger of nuclear attack is greater.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

11. Civil defense training courses, paid for by the Federal government and local school taxes, should be required in every grade school and high school.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

12. State government should require the construction of fallout shelters, paid for by the owners, in all new private construction, and eventually, the construction of shelters in existing buildings, paid for by the owners.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

Name _____

13. All the talk and publicity about the possibility of war and the need for civil defense is unnecessary and undesirable.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

14. There are definite steps the individual can take after an attack to help reduce the panic which could take place.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

15. Every family should keep its automobile provisioned with supplies for evacuation and temporary isolation.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

16. Future warfare will be limited to local, nonatomic wars like the Korean action.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

17. An active civil defense program will actually help to prevent attack by an enemy.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

18. Despite the enormous costs involved and the large increases in taxes which would be required, the Federal government should begin nationwide construction of blast shelters which offer protection from heat and explosion as well as fallout protection.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

19. Civil defense really can't do much to insure national survival in an all-out nuclear war.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

20. The likelihood of a nuclear attack is not great enough to warrant spending a lot more money on civil defense.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

Name _____

SHELTER LEADER SCALE

Please express your opinion about each of the following statements by placing a check-mark on the scale.

1. The only thing a shelter leader really needs to know is how to protect people from radiation.

_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

2. The shelter leader must be the ultimate authority in the shelter.

_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

3. The shelter leader must enforce decisions made by the majority of the group.

_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

4. The shelter leader should actively participate in all shelter activities.

_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

5. The shelter leader should make the group do what is best for survival.

_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

6. The shelter leader should delegate authority to some other shelterees.

_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

7. The shelter leader has an obligation to always interpret information coming into the shelter from radios, telephones, etc., and information from the radiation monitors.

_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

8. The shelter leader should be the final say in any disputes arising between people or groups of people in the shelter.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

9. The shelter leader should encourage the shelterees to tell him their personal problems.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

10. The shelter leader should make a daily schedule of activities and try to stick to it.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

11. The shelter leader should not tell the shelterees anything which might frighten or upset them.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

12. The most important part of the job of the shelter leader is to set a good example for the shelterees to maintain moral and social standards.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

13. The shelter leader should encourage public discussion of shelter problems.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

14. The shelter leader really doesn't need any special training since there will always be someone in the shelter who can lead people in the emergency.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

Name _____

15. The shelter leader should take responsibility for encouraging religious activities in the shelter.

Strongly / Agree / Neither agree / Disagree / Strongly
agree nor disagree disagree

16. The shelter leader should always find out what the shelterees want.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

INSTRUCTIONS

On the next pages you will be asked to express your opinion on different topics in a somewhat novel way. At the top of each page you will find what you are to rate and a number of different scales beneath. Work at a fairly high speed. Do not worry or puzzle over individual items. On the other hand, please do not be careless because we want your true feelings.

Here is how you are to use these scales:

If you feel the concept listed at the top is very much like the adjective at one end of the scale, you should place your check-mark as follows:

fair _____ : _____ : _____ : _____ : _____ : _____ : _____ : _____ unfair

or

fair _____ : _____ : _____ : _____ : _____ : _____ : X : _____ unfair

If you feel the concept is quite a bit like the adjective at one or the other end of the scale (but not extremely) you should place your check-mark as follows:

fair _____ : X : _____ : _____ : _____ : _____ : _____ : _____ unfair

or

fair _____ : _____ : _____ : _____ : _____ : X : _____ : _____ unfair

If you feel the concept is only slightly like the word at one end of the scale (but not really neutral), you should place your check-mark as follows:

fair _____ : _____ : X : _____ : _____ : _____ : _____ : _____ unfair

or

fair _____ : _____ : _____ : _____ : X : _____ : _____ : _____ unfair

The direction which you check, of course, depends upon which of the two ends of the scale seem most characteristic of your opinion.

If you consider your reaction neutral (or if the scale is completely irrelevant), then you should place your check-mark in the middle space:

fair _____ : _____ : _____ : X : _____ : _____ : _____ : _____ unfair

Describe how you feel about fallout shelters.

dark 1 : _____ : _____ : _____ : _____ : _____ : 7 light

noisy 1 : _____ : _____ : _____ : _____ : _____ : 7 quiet

weak 1 : _____ : _____ : _____ : _____ : _____ : 7 strong

active 7 : _____ : _____ : _____ : _____ : _____ : 1 passive

small 1 : _____ : _____ : _____ : _____ : _____ : 7 large

cold 1 : _____ : _____ : _____ : _____ : _____ : 7 hot

good 7 : _____ : _____ : _____ : _____ : _____ : 1 bad

tense 1 : _____ : _____ : _____ : _____ : _____ : 7 relaxed

fresh 7 : _____ : _____ : _____ : _____ : _____ : 1 stale

dirty 1 : _____ : _____ : _____ : _____ : _____ : 7 clean

stupid 1 : _____ : _____ : _____ : _____ : _____ : 7 smart

kind 7 : _____ : _____ : _____ : _____ : _____ : 1 cruel

warm 7 : _____ : _____ : _____ : _____ : _____ : 1 cold

hostile 1 : _____ : _____ : _____ : _____ : _____ : 7 friendly

pretty 7 : _____ : _____ : _____ : _____ : _____ : 1 ugly

rough 1 : _____ : _____ : _____ : _____ : _____ : 7 smooth

wet 1 : _____ : _____ : _____ : _____ : _____ : 7 dry

aimless 1 : _____ : _____ : _____ : _____ : _____ : 7 directed

useful 7 : _____ : _____ : _____ : _____ : _____ : 1 useless

CIVIL DEFENSE

Describe how you feel about civil defense.

dark 1 : _____ : _____ : _____ : _____ : _____ : 7 light

noisy 1 : _____ : _____ : _____ : _____ : _____ : 7 quiet

weak 1 : _____ : _____ : _____ : _____ : _____ : 7 strong

active 7 : _____ : _____ : _____ : _____ : _____ : 1 passive

small 1 : _____ : _____ : _____ : _____ : _____ : 7 large

cold 1 : _____ : _____ : _____ : _____ : _____ : 7 hot

good 7 : _____ : _____ : _____ : _____ : _____ : 1 bad

tense 1 : _____ : _____ : _____ : _____ : _____ : 7 relaxed

fresh 7 : _____ : _____ : _____ : _____ : _____ : 1 stale

dirty 1 : _____ : _____ : _____ : _____ : _____ : 7 clean

stupid 1 : _____ : _____ : _____ : _____ : _____ : 7 smart

kind 7 : _____ : _____ : _____ : _____ : _____ : 1 cruel

warm 7 : _____ : _____ : _____ : _____ : _____ : 1 cold

hostile 1 : _____ : _____ : _____ : _____ : _____ : 7 friendly

pretty 7 : _____ : _____ : _____ : _____ : _____ : 1 ugly

rough 1 : _____ : _____ : _____ : _____ : _____ : 7 smooth

wet 1 : _____ : _____ : _____ : _____ : _____ : 7 dry

aimless 1 : _____ : _____ : _____ : _____ : _____ : 7 directed

useful 7 : _____ : _____ : _____ : _____ : _____ : 1 useless

POST-TEST - STUDIES I-III

INSTRUCTIONS

On each of the next four pages you will find a different time of day or an event during the shelter stay listed and the top of the page and beneath it a set of scales. You are to rate each time period on each of the scales in order stating how you felt at the specific time. In answering this questionnaire, please make your judgments on the basis of how you yourself felt at the time described. Work at a fairly high speed. Do not worry or puzzle over individual items. On the other hand, please do not be careless because we want your true feelings.

Here is how you are to use these scales:

If you think you felt very much like the adjective at one end of the scale at the time shown at the top of the page, you should place your checkmark as follows:

fair X : _____ : _____ : _____ : _____ : _____ : _____ unfair

or

fair _____ : _____ : _____ : _____ : _____ : _____ : X unfair

If you think you felt quite a bit like the adjective at one or the other end of the scale (but not extremely), you should place your checkmark as follows:

fair _____ : X : _____ : _____ : _____ : _____ : _____ unfair

or

fair _____ : _____ : _____ : _____ : _____ : X : _____ unfair

If you felt only slightly like the adjective at one or the other end of the scale (but not really neutral), you should place your checkmark as follows:

fair _____ : _____ : X : _____ : _____ : _____ : _____ : _____ unfair

OR

fair _____ : _____ : _____ : _____ : / : _____ : _____ : _____ unfair

The direction which you check, or course, depends upon which of the two ends of the scale seem most characteristic of your mood or reaction at that time.

If you consider your reaction neutral (or if the scale is completely irrelevant), then you should place your check-mark in the middle space:

fair _____ : _____ : _____ : X : _____ : _____ : _____ : _____ unfair

IMPORTANT: (1) Place your check-marks in the middle of the spaces, not on the boundaries.

fair _____ : _____ : _____ : _____ : THIS : NOT THIS : _____ : _____ unfair

(2) Be sure you check every scale--do not omit any.

(3) Never put more than one check-mark on a single scale.

(4) Do not look back and forth through the items. Do not try to remember how you checked similar items earlier in the questionnaire. Make each item a separate and independent judgment.

SHELTER ENTRY

Describe how you felt when you first entered the shelter.

good 7 : _____ : _____ : _____ : _____ : _____ : 1 badrelaxed 7 : _____ : _____ : _____ : _____ : _____ : 1 tensehostile
angry 1 : _____ : _____ : _____ : _____ : _____ : 7 friendlyconfused 1 : _____ : _____ : _____ : _____ : _____ : 7 assuredalone 1 : _____ : _____ : _____ : _____ : _____ : 7 togetherkind 7 : _____ : _____ : _____ : _____ : _____ : 1 cruelaimless 1 : _____ : _____ : _____ : _____ : _____ : 7 directedstrong 7 : _____ : _____ : _____ : _____ : _____ : 1 weakuseful 7 : _____ : _____ : _____ : _____ : _____ : 1 uselessactive 7 : _____ : _____ : _____ : _____ : _____ : 1 passivebored 1 : _____ : _____ : _____ : _____ : _____ : 7 interestedpleased 7 : _____ : _____ : _____ : _____ : _____ : 1 annoyeduncertain 1 : _____ : _____ : _____ : _____ : _____ : 7 self-confidentserious 7 : _____ : _____ : _____ : _____ : _____ : 1 humoroushot 7 : _____ : _____ : _____ : _____ : _____ : 1 cold

HEALTIMES

Describe how you felt in the shelter during most of the meals.

good 7 : _____ : _____ : _____ : _____ : _____ : _____ : 1 badrelaxed 7 : _____ : _____ : _____ : _____ : _____ : _____ : 1 tensehostile 1 : _____ : _____ : _____ : _____ : _____ : _____ : 7 friendly
angryconfused 1 : _____ : _____ : _____ : _____ : _____ : _____ : 7 assuredalone 1 : _____ : _____ : _____ : _____ : _____ : _____ : 7 togetherkind 7 : _____ : _____ : _____ : _____ : _____ : _____ : 1 cruelaimless 1 : _____ : _____ : _____ : _____ : _____ : _____ : 7 directedstrong 7 : _____ : _____ : _____ : _____ : _____ : _____ : 1 weakuseful 7 : _____ : _____ : _____ : _____ : _____ : _____ : 1 uselessactive 7 : _____ : _____ : _____ : _____ : _____ : _____ : 1 passivebored 1 : _____ : _____ : _____ : _____ : _____ : _____ : 7 interestedpleased 7 : _____ : _____ : _____ : _____ : _____ : _____ : 1 annoyeduncertain 1 : _____ : _____ : _____ : _____ : _____ : _____ : 7 self-confidentserious 7 : _____ : _____ : _____ : _____ : _____ : _____ : 1 humoroushot 7 : _____ : _____ : _____ : _____ : _____ : _____ : 1 cold

NAME _____

BEDTIME

Describe how you felt in the shelter around bedtime and before you went to sleep.

good 7 : _____ : _____ : _____ : _____ : _____ : 1 bad

relaxed 7 : _____ : _____ : _____ : _____ : _____ : 1 tense

hostile 1 : _____ : _____ : _____ : _____ : _____ : 7 friendly
angry

confused 1 : _____ : _____ : _____ : _____ : _____ : 7 assured

alone 1 : _____ : _____ : _____ : _____ : _____ : 7 together

kind 7 : _____ : _____ : _____ : _____ : _____ : 1 cruel

aimless 1 : _____ : _____ : _____ : _____ : _____ : 7 directed

strong 7 : _____ : _____ : _____ : _____ : _____ : 1 weak

useful 7 : _____ : _____ : _____ : _____ : _____ : 1 useless

active 7 : _____ : _____ : _____ : _____ : _____ : 1 passive

bored 1 : _____ : _____ : _____ : _____ : _____ : 7 interested

pleased 7 : _____ : _____ : _____ : _____ : _____ : 1 annoyed

uncertain 1 : _____ : _____ : _____ : _____ : _____ : 7 self-confident

serious 7 : _____ : _____ : _____ : _____ : _____ : 1 humorous

hot 7 : _____ : _____ : _____ : _____ : _____ : 1 cold

FREE-TIME

Describe how you felt in the shelter when you were left on your own as when free-time was declared.

good 7 : _____ : _____ : _____ : _____ : _____ : 1 bad

relaxed 7 : _____ : _____ : _____ : _____ : _____ : 1 tense

hostile 1 : _____ : _____ : _____ : _____ : _____ : 7 friendly
angry

confused 1 : _____ : _____ : _____ : _____ : _____ : 7 assured

alone 1 : _____ : _____ : _____ : _____ : _____ : 7 together

kind 7 : _____ : _____ : _____ : _____ : _____ : 1 cruel

aimless 1 : _____ : _____ : _____ : _____ : _____ : 7 directed

strong 7 : _____ : _____ : _____ : _____ : _____ : 1 weak

useful 7 : _____ : _____ : _____ : _____ : _____ : 1 useless

active 7 : _____ : _____ : _____ : _____ : _____ : 1 passive

bored 1 : _____ : _____ : _____ : _____ : _____ : 7 interested

pleased 7 : _____ : _____ : _____ : _____ : _____ : 1 annoyed

uncertain 1 : _____ : _____ : _____ : _____ : _____ : 7 self-confident

serious 7 : _____ : _____ : _____ : _____ : _____ : 1 humorous

hot 7 : _____ : _____ : _____ : _____ : _____ : 1 cold

Please rate each of the following factors by circling whether it bothered you MUCH (you could hardly stand it), SOME (annoying, but not too bad), LITTLE (you really don't think it was too bad).

	1	2	3
a. Behavior of other shelterees	MUCH	SOME	LITTLE
b. Boredom	MUCH	SOME	LITTLE
c. Sleeping difficulty	MUCH	SOME	LITTLE
d. Sleeping facilities	MUCH	SOME	LITTLE
e. Concern about outside world	MUCH	SOME	LITTLE
f. Crowding	MUCH	SOME	LITTLE
g. Day lighting	MUCH	SOME	LITTLE
h. Dirt	MUCH	SOME	LITTLE
i. Food	MUCH	SOME	LITTLE
j. Inability to concentrate	MUCH	SOME	LITTLE
k. Inadequate leadership	MUCH	SOME	LITTLE
l. Lack of exercise	MUCH	SOME	LITTLE
m. Lack of organization	MUCH	SOME	LITTLE
n. Lack of privacy	MUCH	SOME	LITTLE
o. Lack of water for washing	MUCH	SOME	LITTLE
p. Noise	MUCH	SOME	LITTLE
q. Odors	MUCH	SOME	LITTLE
r. Physical symptoms (headaches, constipation, etc.)	MUCH	SOME	LITTLE
s. Too much organization	MUCH	SOME	LITTLE
t. Temperature and humidity	MUCH	SOME	LITTLE
u. Toilet facilities	MUCH	SOME	LITTLE
v. Being observed through window and microphones	MUCH	SOME	LITTLE

Indicate below (by code letter) the rank order of discomfort or difficulty caused you by each of the above factors. You may find it helpful to cross out factors when you have ranked them.

Which factor bothered you most? _____ 1

Which factor bothered you second most? _____ 2

Which factor bothered you third most? _____ 3

Which factor bothered you fourth most? _____ 4

Which factor bothered you fifth most? _____ 5

Which five factors bothered you least? _____

If you were to be confined in a shelter during an actual nuclear attack:

a. Which member of this group would you most want to have as shelter leader?

1st choice: _____; 2nd choice: _____. Why?

b. Which three persons of this group would you prefer to have with you in addition to the two persons named above and members of your family? 1. _____; 2. _____

3. _____. Why? _____

c. Which three members of this group would you least want to have with you? 1. _____; 2. _____;

3. _____. Why? _____

During your stay in the shelter:

a. Who do you feel was the real leader? _____

What qualities made this person a leader? _____

b. Who else served as leader? _____ Explain. _____

c. Which persons did you spend the most time with? 1. _____

2. _____ 3. _____ Why? _____

d. Did anyone interfere with the group working together?

(Circle one: yes no) Who? 1. _____

2. _____ Explain _____

On the basis of your experience in the simulated shelter, what changes would you suggest for a real shelter:

The remainder of the post-test questionnaire contained the following scales: Civil Defense Attitude, Shelter Leader Behavior, Semantic Differential, "Shelter Feeling," and Semantic Differential Civil Defense. These scales can be found in the pre-test questionnaire and hence will not be repeated here.

PRE-TEST - STUDIES IV-XII

SHELTER QUESTIONNAIRE

PART I.

Some of the following statements are true, and some are false. Circle the appropriate answer. If you do not know the correct answer, please circle "Don't Know".

- | | | | |
|---|------|-------|------------|
| 1. Fallout from just one bomb may cover thousands of square miles. | True | False | Don't Know |
| 2. If someone has radiation sickness, you should avoid getting near him so you won't catch it yourself. | True | False | Don't Know |
| 3. An nuclear war would contaminate the water supply and almost everyone would die before the water was fit to drink again. | True | False | Don't Know |
| 4. After a nuclear attack, if you filter the dust out of the air, the air will be safe to breathe. | True | False | Don't Know |
| 5. A fallout shelter should have an air tight door to guard against radiation. | True | False | Don't Know |
| 6. You can not see fallout. | True | False | Don't Know |

PART II.

Please express your opinion about each of the following statements by placing a check-mark on the scale.

1. Every individual should contribute both time and money to help develop civil defense protection.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

2. Congress should appropriate less money to civil defense than it now does.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

3. Civil defense volunteers are making a great contribution to national survival.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

4. There are ways to avoid the panic which is bound to take place after a nuclear attack.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

5. There is relatively little the individual can do to prepare for his own survival in the case of nuclear attack.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

6. Some civil defense training should be required in every grade and high school.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

7. Fallout shelters should be required in all new buildings.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

8. An active civil defense program may help to prevent attack by an enemy.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

9. The Federal government should begin nationwide construction of blast shelters which offer protection from heat and explosion as well as fallout protection, despite the higher costs.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

10. Civil defense really can't do much to insure national survival in an all-out nuclear war.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

PART III.

Please express your opinion about each of the following statements by placing a check-mark on the scale.

1. The only training a shelter leader really needs is in how to protect people from radiation.

_____/_____/_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

2. The shelter leader must be the ultimate authority in the shelter.

_____/_____/_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

3. Major decisions in shelter should be made by the majority of the group.

_____/_____/_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

4. The shelter leader should actively participate in all shelter activities.

_____/_____/_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

5. The shelter leader should delegate authority to other shelterees.

_____/_____/_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

6. The shelter leader should encourage the shelterees to tell him their personal problems.

_____/_____/_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

7. It is important that the shelter leader stick to plans and schedules.

_____/_____/_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

8. The most important part of the job of the shelter leader is to set a good example for the shelterees to maintain moral and social standards.

_____/_____/_____/_____/_____/_____/_____
Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

9. The shelter leader should encourage public discussion of shelter problems.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

10. The shelter leader should always find out what the shelterees want.

Strongly / Agree / Neither agree / Disagree / Strongly /
agree nor disagree disagree

PART IV.

Here is how you are to use these scales:

If you think you feel very much like the adjective at one end of the scale at the time shown at the top of the page, you should place your checkmark as follows:

fair X : _____ : _____ : _____ : _____ : _____ : _____ unfair

or

fair _____ : _____ : _____ : _____ : _____ : _____ : X unfair

If you think you feel quite a bit like the adjective at one or the other end of the scale (but not extremely), you should place your checkmark as follows:

fair _____ : X : _____ : _____ : _____ : _____ : _____ unfair

or

fair _____ : _____ : _____ : _____ : X : _____ : _____ unfair

If you feel only slightly like the adjective at one or the other end of the scale (but not really neutral), you should place your checkmark as follows:

fair _____ : _____ : X : _____ : _____ : _____ : _____ unfair

or

fair _____ : _____ : _____ : _____ : X : _____ : _____ unfair

The direction which you check, of course, depends upon which of the two ends of the scale seem most characteristic of your mood or reaction at this time.

If you consider your reaction neutral (or if the scale is completely irrelevant), then you should place your check-mark in the middle space:

fair _____ : _____ : _____ : X : _____ : _____ : _____ unfair

IMPORTANT: (1) Place your check-marks in the middle of the spaces, not on the boundaries.

fair _____ : _____ : _____ : _____ : ^{THIS} X : _____ : ^{NOT THIS} X _____ unfair

- (2) Be sure you check every scale--do not omit any.
- (3) Never put more than one check-mark on a single scale.
- (4) Do not look back and forth through the items. Do not try to remember how you checked similar items earlier in the questionnaire. Make each item a separate and independent judgment.

How do you feel now about being in a fallout shelter?

good	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	bad
relaxed	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	tense
angry	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	friendly
confused	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	assured
alone	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	together
kind	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	cruel
aimless	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	directed
strong	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	weak
useful	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	useless
active	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	passive
bored	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	Interested
pleased	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	annoyed
uncertain	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	self-confident
serious	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	humorous
hot	_____	:	_____	:	_____	:	_____	:	_____	:	_____	:	_____	cold

POST-TEST - STUDIES IV-XII

Parts I through IV of the post-test questionnaire are exactly the same as those found in the pre-test and hence will not be repeated here.

PART V

Please rate each of the following factors by circling whether it bothered you MUCH (you could hardly stand it), SOME (annoying, but not too bad), LITTLE (you really don't think it was too bad), NONE (it did not bother you at all).

a. Behavior of other shelterees	NONE	MUCH	SOME	LITTLE
b. Boredom	NONE	MUCH	SOME	LITTLE
c. Sleeping difficulty	NONE	MUCH	SOME	LITTLE
d. Crowding	NONE	MUCH	SOME	LITTLE
e. Lighting	NONE	MUCH	SOME	LITTLE
f. Dirt	NONE	MUCH	SOME	LITTLE
g. Food	NONE	MUCH	SOME	LITTLE
h. Inability to concentrate	NONE	MUCH	SOME	LITTLE
i. Inadequate leadership	NONE	MUCH	SOME	LITTLE
j. Lack of exercise	NONE	MUCH	SOME	LITTLE
k. Lack of organization	NONE	MUCH	SOME	LITTLE
l. Lack of privacy	NONE	MUCH	SOME	LITTLE
m. Lack of water for washing	NONE	MUCH	SOME	LITTLE
n. Noise	NONE	MUCH	SOME	LITTLE
o. Odors	NONE	MUCH	SOME	LITTLE
p. Physical symptoms (headaches, constipation, etc.)	NONE	MUCH	SOME	LITTLE
q. Too much organization	NONE	MUCH	SOME	LITTLE
r. Temperature and humidity	NONE	MUCH	SOME	LITTLE
s. Toilet facilities	NONE	MUCH	SOME	LITTLE
t. Being observed through window and microphones	NONE	MUCH	SOME	LITTLE

PART VI

1. If you were to be confined in a shelter during an actual nuclear attack, what member of this group would you most want to have as shelter leader (include the shelter manager in your consideration)?

2. If you were to be confined in a shelter during an actual nuclear attack, which persons of this group would you prefer to have with you in addition to the person(s) named in question one and members of your family (include the shelter manager in your consideration)?

3. If you were to be confined in a shelter during an actual nuclear attack, which members of this group would you least want to have with you (include the shelter manager in your consideration)?

PART VII

During your stay in the shelter:

1. Who do you feel was the real leader? _____
What qualities made this person a leader? _____

2. Who else served as leader? _____ Explain. _____

3. Which persons did you spend the most time with?

4. Did anyone interfere with the group working together?
(Circle one: Yes No) Who?

PART VIII

On the basis of your experience in the simulated shelter, what changes would you suggest for a real shelter?

PART IX

On this form are some questions about your reactions to the way the Shelter Manager performed his duties. Please check the place on the scale that most closely represents your opinion. Note that we are not interested here in whether or not you liked the activity (for example, whether you could eat the crackers, or use the toilet). We want your opinion about how the Manager did his job with regard to the crackers, the toilet, etc.

1. As far as ASSUMING COMMAND AND GETTING THINGS STARTED are concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

2. As far as MANAGING FOOD AND WATER SUPPLIES is concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

3. As far as MANAGING FREE TIME is concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

4. As far as SUPERVISING TOILET FACILITIES AND CLEANLINESS is concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

5. As far as RUNNING TRAINING SESSIONS is concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

6. As far as KEEPING PEACE AND QUIET IN THE SHELTER is concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

7. As far as KEEPING UP SHELTEREE MORALE AND INTEREST is concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

8. As far as HANDLING SLEEPING ARRANGEMENTS is concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

9. As far as PLANNED RECREATION PERIODS is concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

10. As far as GETTING PREPARED FOR SHELTER EXIT is concerned, the Manager was:

Outstanding	Satisfactory But Not Outstanding	Average, Neither Good Nor Bad	Unsatisfactory But Not Poor	Poor
-------------	----------------------------------	-------------------------------	-----------------------------	------

11. If you checked that the Manager was "unsatisfactory" or "poor" for any of the above questions, briefly state what reasons led you to this conclusion.

Question Number

Reasons for Unsatisfactory Evaluation

12. How would you summarize your general over-all impression of the Shelter Manager on Friday?

Did an out- standing job	Did a satisfactory but not outstanding job	Did an average job, neither good nor bad	Did an un- satisfactory but not poor job	Did a poor job
-----------------------------	--	--	---	----------------------

13. How would you summarize your general over-all impression of the Shelter Manager on Sunday?

Did an out- standing job	Did a satisfactory but not outstanding job	Did an average job, neither good nor bad	Did an un- satisfactory but not poor job	Did a poor job
-----------------------------	--	--	---	----------------------

14. If you reported any change between your impressions on Friday and those on Sunday, briefly state the reasons that led you to change your opinion.

APPENDIX H

PRE- AND POST-SHELTER QUESTIONNAIRES USED IN DARK STUDY

Best Available Copy

PRE-SHELTER TEST

SHELTER QUESTIONNAIRE

PART I

Here is how you are to use these scales:

If you think you feel very much like the adjective at one end of the scale at the time shown at the top of the page, you should place your checkmark as follows:

Fair X / ___ / ___ / ___ / ___ / ___ / ___ / ___ Unfair

or

Fair ___ / ___ / ___ / ___ / ___ / ___ / X / ___ Unfair

If you think you feel quite a bit like the adjective at one or the other end of the scale (but not extremely), you should place your checkmark as follows:

Fair ___ / X / ___ / ___ / ___ / ___ / ___ / ___ Unfair

or

Fair ___ / ___ / ___ / ___ / ___ / X / ___ / ___ Unfair

If you feel only slightly like the adjective at one or the other end of the scale (but not really neutral), you should place your checkmark as follows:

Fair ___ / ___ / X / ___ / ___ / ___ / ___ / ___ Unfair

or

Fair ___ / ___ / ___ / ___ / X / ___ / ___ / ___ Unfair

The direction which you check, of course, depends upon which of the two ends of the scale seem most characteristic of your mood or reaction at this time.

If you consider your reaction neutral (or if the scale is completely irrelevant), then you should place your checkmark in the middle space:

Fair ___ / ___ / ___ / X / ___ / ___ / ___ / ___ Unfair

IMPORTANT: (1) Place your checkmarks in the middle of the spaces, not on the boundaries:

Fair ___ / ___ / ___ / ___ / X / ___ / ~~X~~ / ___ Unfair

THIS NOT THIS

- (2) Be sure you check every scale - do not omit any.
- (3) Never put more than one checkmark on a single scale.
- (4) Do not look back and forth through the items. Do not try to remember how you checked similar items earlier in the questionnaire. Make each item a separate and independent judgment.

How do you feel now about being in a darkened fallout shelter?

good _____/_____/_____/_____/_____/_____/_____/_____ bad

relaxed _____/_____/_____/_____/_____/_____/_____/_____ tense

angry _____/_____/_____/_____/_____/_____/_____/_____ friendly

confused _____/_____/_____/_____/_____/_____/_____/_____ assured

alone _____/_____/_____/_____/_____/_____/_____/_____ together

kind _____/_____/_____/_____/_____/_____/_____/_____ cruel

aimless _____/_____/_____/_____/_____/_____/_____/_____ directed

strong _____/_____/_____/_____/_____/_____/_____/_____ weak

useful _____/_____/_____/_____/_____/_____/_____/_____ useless

active _____/_____/_____/_____/_____/_____/_____/_____ passive

bored _____/_____/_____/_____/_____/_____/_____/_____ interested

pleased _____/_____/_____/_____/_____/_____/_____/_____ annoyed

uncertain _____/_____/_____/_____/_____/_____/_____/_____ self-confident

serious _____/_____/_____/_____/_____/_____/_____/_____ humorous

hot _____/_____/_____/_____/_____/_____/_____/_____ cold

PART II

Please rate how much you believe each of the following factors will bother you.

a. Behavior of other shelterees	NONE	MUCH	SOME	LITTLE
b. Boredom	NONE	MUCH	SOME	LITTLE
c. Sleeping difficulty	NONE	MUCH	SOME	LITTLE
d. Crowding	NONE	MUCH	SOME	LITTLE
e. Lighting	NONE	MUCH	SOME	LITTLE
f. Dirt	NONE	MUCH	SOME	LITTLE
g. Food	NONE	MUCH	SOME	LITTLE

h. Inability to concentrate	NONE	MUCH	SOME	LITTLE
i. Inadequate leadership	NONE	MUCH	SOME	LITTLE
j. Lack of exercise	NONE	MUCH	SOME	LITTLE
k. Lack of organization	NONE	MUCH	SOME	LITTLE
l. Lack of privacy	NONE	MUCH	SOME	LITTLE
m. Lack of water for washing	NONE	MUCH	SOME	LITTLE
n. Noise	NONE	MUCH	SOME	LITTLE
o. Odors	NONE	MUCH	SOME	LITTLE
p. Physical symptoms (headaches, constipation, etc.)	NONE	MUCH	SOME	LITTLE
q. Too much organization	NONE	MUCH	SOME	LITTLE
r. Temperature and humidity	NONE	MUCH	SOME	LITTLE
s. Toilet facilities	NONE	MUCH	SOME	LITTLE
t. Being observed through window and microphones	NONE	MUCH	SOME	LITTLE

PART III

Are there any aspects of this study, not mentioned above, that you feel apprehensive about? If so, list these below.

POST-SHELTER TEST

Parts I and II of the post-test questionnaire are exactly the same as those found in the pre-questionnaire, therefore they will not be repeated here.

APPENDIX I
IN-SHELTER OBSERVATION FORMS

Best Available Copy

PROBLEM SOLVING
STANDARD OBSERVATION FORM

Time Recorded: Begin: _____ End: _____ Observer: _____

Point in Scenario: _____

1. Category of Problem. Check one: Physical Environment _____ Psychological Environment _____

2. Problem Solving Routine.

Identify by number the people involved in the following steps (where applicable).

IDENTIFYING

A. Causing Problem: _____

B. Reporting Problem: _____ To Whom: _____

C. Seeking Problem-Relevant Information: _____

From Whom: _____

Specify If and What Shelter Guidance Materials Were Used: _____

PLANNING

D. Acting as Source of Problem-Relevant Information: _____

E. Suggesting Solutions: _____

To Whom: _____

F. Directing or Guiding Attempts At Solution: _____

G. Selecting Solution to be Implemented: _____

H. Implementing Solution as Director of Activity (Leader): _____

Carrying Out Activity: _____

EXECUTING

Additional Help Requested Of: _____

Additional Help Volunteered By: _____

I. Interfering with Problem Solving Process By:

Hindering Planning Phase: _____

HARRASSING

Hindering Execution Phase: _____

NON-
PARTICIPANT
ACTIVITY

J. Of Those Who Did Not Participate in the Above Processes, What were the Major Proportion Doing at the Time: (Check One)

Attending to the Event (Watching and Listening): _____

Apparently Not Concerned with Event: _____

Apparently Unaware of Event: _____

DO THIS WHEN OTHER PARTS OF FORM ARE COMPLETED

Briefly Describe:

1. Nature of Problem: _____

2. Solution Attempted: _____

PROBLEM
CONTENT

3. Effectiveness of Solution:

Ineffective: _____ Reasonably Effective: _____ Highly Effective: _____

4. Sources of Information Used in Problem Solving Program:
(Check any Appropriate)

Shelter Manager: _____ Content of Training Sessions: _____

Content of Briefings: _____ Counselor Messages: _____

Other: _____

Shelter Guidance Materials (Specify): _____

INFORMATION INPUT FORM

THIS FORM IS TO BE USED DURING: BRIEFINGS TRAINING SESSIONS CONELRAD MESSAGES or USE OF TRAINING MATERIALS IF POSSIBLE, THESE EVENTS SHOULD BE TAPE-RECORDED FOR LATER CHECK OF CONTENT.

Time Recorded: Begin: _____ End: _____ Observer: _____

Point in Scenario: _____

1. Check Appropriate: Briefing: _____ Training Session: _____ Conelrad: _____

2. Topic or Topics Covered: _____

3. In the Cases of BRIEFING or TRAINING, Identify Who is Presenting the Information and Who is Receiving the Information.

Presenting Information: _____ Receiving Information: _____

4. Reaction of Group (To Be Used for BRIEFINGS, TRAINING PERIODS, and CONELRAD).

Identify by Number Those Who:

A. Seek Clarification of Points Made: _____

AID _____

TRANS- MISSION B. Elaborate Upon Points Made: _____

FLOW C. Provide Additional Relevant Information: _____

D. Raise Questions about Relevant Points Not Covered: _____

HINDER E. Raise Totally Irrelevant Questions: _____

TRANS- MISSION F. Ridicule, Abuse, or Heckle Speakers or Question Raisers: _____

FLOW G. Ridicule Content of Information (Publicly): _____

H. Display Marked Inattention: _____

IN-SHELTER TRAINING MATERIALS TO BE USED FOR RECORDING INFORMATION BEING TAKEN FROM IN-SHELTER TRAINING MATERIALS (i.e., Guide, First Aid Manual, etc.)

What Material is Being Used: _____

Who is Reading Material: _____

TEAM OR UNIT SELECTION

1. Check one: TASK TEAM _____ 2. TEAM NAME _____
 LIVING UNIT _____

2. TEAM OR UNIT LEADER SELECTION

a. Who _____ b. How (check one) c. Personal Reaction to Assignment

Manager appointed _____
 Volunteered-"took over" _____ + _____ - _____
 Volunteered--elected _____
 Nominated-elected _____
 Other _____ (describe) _____

3. What were information or credentials offered to support selection of this person as leader?

4. TEAM OR UNIT MEMBER SELECTION

WHO	HOW MA-manager appt. LS-leader selected MS-member selected V-volunteered	WHY	PERSONAL REACTION TO ASSIGNMENT	
			+	-
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

APPENDIX J
INFORMATION FLYER USED IN SUBJECT RECRUITMENT

Best Available Copy

SHELTER MANAGEMENT LABORATORY
of the
AMERICAN INSTITUTE FOR RESEARCH
410 Amberson Avenue, Pittsburgh, Pennsylvania 15232
under contract to the Office of Civil Defense.

SUBJECTS REQUIRED FOR CIVIL DEFENSE RESEARCH STUDY

The American Institute for Research is conducting a new series of experimental studies on management of public fallout shelters. The studies include testing supplies and facilities necessary for survival, and evaluating procedures for organizing and operating community shelters. The Institute is seeking men, women, and children as volunteers for this research program.

WHEN WILL THE STUDIES TAKE PLACE?

The research program will be carried out on weekends only, from June 13 until the middle of September. Each volunteer will participate on only one weekend.

HOW MUCH TIME IS INVOLVED?

For some studies, volunteers will be in the shelter laboratory for only 24 hours or so, from Friday evening to Saturday evening. Other studies will last approximately 48 hours, from Friday evening to Sunday evening.

WHAT ARE SUBJECTS EXPECTED TO DO IN THE SHELTER?

Participants in these studies will learn to use the facilities and apply the procedures that would be put into use in community fallout shelters in the event of an actual disaster. The food, water, and sanitation supplies that are stocked in public shelters by the Federal government will be used exclusively. A number of comforts to which we have become accustomed will be absent from the shelter laboratory. However, all requirements for a person's health and safety will be met. Only tasks and activities associated with the organization and operation of a fallout shelter will be carried out and studied.

WHAT ARE THE BENEFITS OF PARTICIPATION?

1. The results of these studies will be used to help guide the public shelter program. Participants are contributing to our national security.
2. These studies will add to the ever-growing body of scientific knowledge about the behavior of people under a variety of conditions.
3. For many people, participation in the shelter laboratory will offer a new and different experience, from which they can learn more about themselves and their fellow men.
4. Subjects who remain for the agreed upon length of time will receive an honorarium of \$ 15.00 for a 24 hour study, and \$ 30.00 for a 48 hour study.
5. All volunteers will receive a free medical examination.

HOW DO I APPLY?

Fill out and mail the attached form, or call the American Institute for Research, (412) 681 - 3000, and ask for the Shelter Research Laboratory. You will be contacted shortly and given more information about the project and what you are to do.

APPENDIX K
SUBJECT RECRUITMENT PROCEDURES

Best Available Copy

SUBJECT RECRUITMENT PROCEDURES

Subjects for the study of shelter management factors were recruited primarily through Pittsburgh's Public High Schools and news papers. An article appearing in the Sunday edition of the Pittsburgh Press on May 20, 1964, and want-ads in the Pittsburgh Post-Gazette in June and July accounted for roughly 70 per cent of the inquiries for further information received by the project staff. Subjects gathered from these sources represented mainly lone, single adults, groups of single adults, married couples, and family groups. Excellent cooperation from the school board resulted in good contacts with several public high schools. Lone teen-agers and family groups were recruited from these sources. In addition, contacts with the University of Pittsburgh's Student Placement Service accounted for a small, but important percentage of the over-all subject population. Almost all of the college student subjects, both single, lone, and couples, came from this source.

Inquiries for further information provided a means of measuring the success and direction of the subject recruiting effort. It was discovered, for example, that the percentage of response was too high in lone teen-agers and too low in couples and family groups. As a result, more stress was given to newspaper advertising and less to school contacts.

All persons inquiring were sent information flyers with applications attached. (See Appendix J). Separate applications were sent for each member of a family or group.

Over 3000 applications were distributed and more than 1500 of them were returned. The subject pool, therefore, contained greater than five times the number of persons actually used in all shelter stays.

Completed and returned applications were classified in terms of availability, socio-economic level, sex, age, race, and whether the applicant wished to participate alone or as a member of a group of applicants. Socio-economic level was determined by means of A. B. Hollingshead's Two-Factor Index of Social Position (Yale University). The Index scales and weighs education and occupation (occupation being given the heavier weight) as two separate factors

to obtain a single score. The subject was then placed in one of five classes. For the purpose of this study classes I and II of the Index were considered "Upper class" and the remaining three "Lower class."

Upon being classified, potential subjects were tentatively assigned to a shelter stay.

In order to qualify for the study a potential subject was required to attend a psycho-medical examination. An exam was held several days prior to each shelter stay at the University of Pittsburgh's Falk Clinic, and was carried out by project personnel in cooperation with the Clinic's medical staff. The medical consisted of a comprehensive physical check, a urinalysis, hematology, and a chest x-ray. Enough information was gathered to assure that no medical condition existed which would constitute a health hazard in the shelter.

A rough measure was also taken of each subject's mental health by means of a psychological interview and a personality test. The interview was a brief, informal session conducted by a member of the project staff. It was primarily an attempt to spot any blatant character abnormality or psycho-neurotic condition which might prove to be a danger to the other shelterees or the individual himself under the stress of shelter life. However, no attempt was made to probe in depth.

The instrument selected for the personality testing was The Institute for Performance and Ability Testing's Sixteen Personality Factor Questionnaire, Form A. The "16 PF" is an easily administered relatively "painless" test which isolates sixteen distinct, primary personality factors including emotional stability, withdrawal tendency, general ability, and dominance. It was useful in providing personality information in greater depth than was possible with the interview alone, and because of the ease with which it could be scored, it gave a valuable "on the spot" evaluation of problem cases.

A subject found unsatisfactory from a medical or psychological standpoint was excluded from further consideration, and, if the difficulty was of a medical nature, he was notified and a letter sent to his personal physician. The number of potential subjects rejected, however, was not great. Six subjects failed to pass this preliminary screening.

The success of the examination procedure can be judged by the fact that over all the shelter stays, only one subject had to be removed from the shelter as constituting a threat to the health or safety of the other subjects.

When the results of all tests were known, the subject list for a stay was finalized. Final approval of a subject for participation in any given shelter stay was based on (1) successful completion of the psycho-medical examination and (2) group composition requirements for that stay. Subjects who obtained final approval were notified by mail and were normally contacted by phone to confirm their participation a day or two before shelter entry.

Late in October all unused subjects were sent a letter informing them that their services would not be needed and thanking them for their interest.

APPENDIX L
DESCRIPTION OF SHELTER LABORATORY

Best Available Copy

DESCRIPTION OF THE LABORATORY

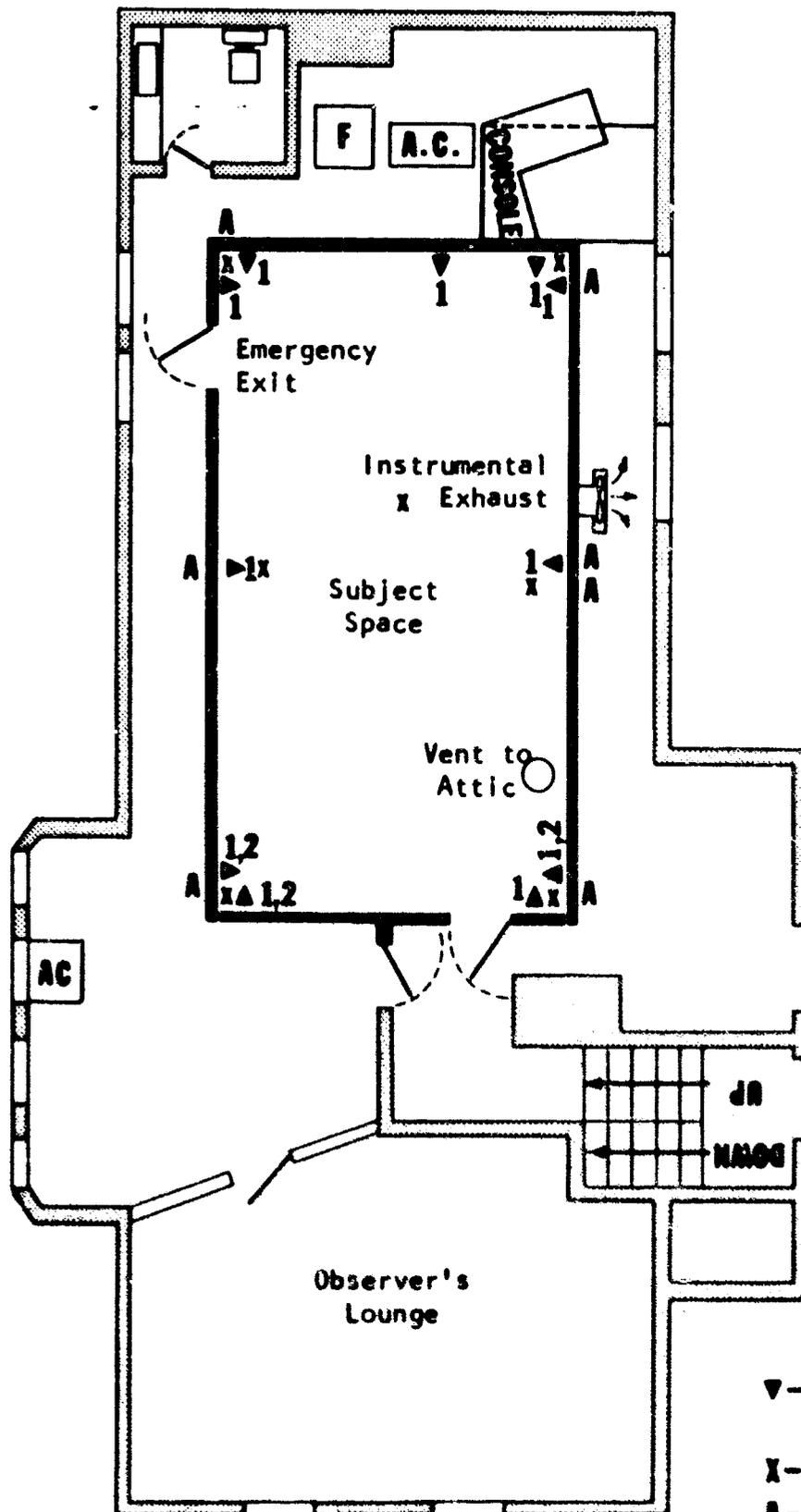
The shelter management laboratory was constructed as a room-within-a-room, with the inner subject space completely surrounded by an observation corridor. Two sizes of subject space were used: The large, 14 by 28 feet, accommodated 40 persons, and the small, 14 by 14 feet, allowed room for 20. Each permitted approximately 10 square feet per person, in addition to a completely enclosed toilet area, 3 by 4 feet. OCD stocks for food, water, sanitation, medicine, and radiation monitoring were stocked in one corner of the subject area in quantities appropriate to the study.

The walls which separated the subject space from the observation area were 2 by 4 studding faced on the subjects' side with plasterboard and on the observers' side with Masonite. These walls were soundproofed with rock wool batts stapled between the studding.

A total of fourteen one-way viewing ports, each 18 by 24 inches were built into the walls. Most of these ports were placed at corners, since this arrangement permitted an observer to view all parts of the subject space from one position. Four ports distributed around the subject space were elevated, so an observer might stand on a platform and look down into the subject area from a height of 9 feet, thus preventing one subject from blocking the observer's view of another.

The chief observer's post initially contained an observer's stool anchored to a 3 by 3 foot pedestal and raised to allow comfortable seated observation through an elevated port. This structure was found inconvenient and later removed in favor of a larger, lower platform with a control console featuring a central grouping of observation, monitoring, recording, shelter lighting, air conditioning, and inter-observer communications equipment. The new post provided greatly increased writing and record storage area as well as space for an additional tape recorder.

SHELTER MANAGEMENT LABORATORY



- ▼ - Observation Port (1 indicates port at 50", 2 indicates port at 76")
- X - Microphone
- A - Amplifier
- F - Furnace
- AC - Airconditioner

Six microphones were distributed around the perimeter of the subject space and one was mounted near the center of the ceiling. By means of patch panels at each observation point, each observer could stereophonically monitor any two microphones, at any desired volume. The chief observer had extra patching facilities available and could make tape recordings while continuing to monitor the subjects.

Adjacent to the sound monitoring panel at each observer point a handset-type intercom unit was installed. This permitted observers to communicate with each other with reduced delay and without withdrawing themselves from their monitoring function. Originally one intercom extension was located in a lounge for observers (which is adjacent to the laboratory facility) so off-duty personnel might be efficiently contacted or recalled. This unit was later removed and placed in the shelter to permit direct contact between the chief observer and the shelter manager.

A water-cooled, three-ton air conditioner supplied cool, de-humidified air to the shelter. The vents were placed so as to minimize the subjects' perception of drafts and the shelter air temperature was controlled manually to assure the maintenance of normal room temperature (68 to 72 degrees). Late in the summer a 3/4 ton, window mounted air conditioner was installed to supplement the cooling output of the larger unit.

Initially, the subjects' light was supplied by 12-40 watt fluorescent tubes in three fixtures with the subject space at its maximum size (400 square feet), and 4-40 watt tubes in one fixture when the subject space was 200 square feet. During the last quarter, however, the single fixture in the small subject space was replaced by 5 incandescent fixtures producing a total of 600 watts and controlling rheostat installed at the senior observer's post so that light in the small shelter could be continuously varied to complete darkness. The wiring for the shelter lights was also redesigned to permit the senior observer to cut the light switch within the shelter completely out of the circuit, thus preventing the shelterees from controlling their own lights.

Twelve infrared light sources were constructed, each using one 60 or 75 watt incandescent bulb and a 5-1/2 inch diameter infrared filter (Edmond Scientific 60033). Eight were mounted in the ceiling of the small shelter

and four in the observation area to improve observation with the infrared viewing devices. These fixtures emitted no visible light and could be used with, or independently of, the two 7-1/2 watt safety lights which normally were the sole source of both visible and infrared lights when the regular shelter lights were off.

To reduce the subjects' awareness of the monitoring procedures, care was taken to eliminate extraneous sounds and lights which could be attributed to the observers. Supplies and equipment for the laboratory were always selected with an eye toward silent operation. Padding and carpeting were installed in the observation area to silence footsteps. In addition, observers were required to wear tennis shoes. Sources of uncontrollable light were blocked and sealed until absolute darkness was achieved in the shelter and observation area, and opaque, close fit, sliding curtains were later installed on all observation ports.

The air conditioners and return air blower, in addition to maintaining comfortable atmosphere in the subject space, produced a constant masking (white) noise which further reduced the chance of observer noise being heard by subjects.

To insure the safety of the shelterees, air samples were analyzed during shelter occupancy. Measures of temperature, humidity, CO, and CO₂ level were made at the return air blower, the system which draws air from the ceiling of the shelter into the observation area.

Monitoring Equipment Specifications

Seven Electrovoice 664 cardioid dynamic microphones were mounted above the ceiling and aimed downward through five-inch holes masked with grill cloth reinforced by wire mesh.

Each of these microphones, wired for high impedance, fed its signal to a separate Bogen #CHB-10, 10 watt public address amplifier through a 3 to 8 foot shielded cable.

To minimize line loss, two pairs of signal carrying leads were taken from the 8 ohm output of each amplifier and each extended half-way around the outside of the wall separating the observation and subject spaces. At each observation post seven signal pairs terminated in seven jacks which were layed out on a panel in such a way that any given jack reflected the position of the microphone associated with it.

Two selector plugs on short leads determined which jacks were being monitored. The leads from these two plugs carried the signal to a pair of L pads so each observer could control his own listening level without disturbing the "master" volume control on an amplifier. The L pads were terminated in a pair of jacks for the observers' binaural 8 ohm earphones. Several types of earphones were provided to offer variety and to suit the personal tastes of the observers. These were: 1 pair Koss PH-30, 1 pair Lafayette F-767, and 1 pair Jensen HS-1 (all the foam-padded, ear-covering style), and two pairs Lafayette MS-431 (stethoscope style).

The shelter monitoring capability was significantly improved during the last quarter by the addition of a small, low powered wireless FM microphone (Olson RA 626) and an FM receiver (Olson RA 644). The concealed microphone-transmitter unit was worn by the shelter manager and the receiver installed in the chief observer's post where provision was made to tape record from it. The system was used to audit team and unit head briefings as well as other low-level conversations difficult to monitor with the existing equipment.

APPENDIX M
SHELTER SUPPLIES

Best Available Copy

SHELTER SUPPLIES

1. Two 17.5 gallon CD water storage drums, filled and purified.
2. Four cases of CD all-purpose survival ration crackers.
3. Two type SK III sanitation kits.
4. One medical kit, type A.
5. One radiation kit, type CDV-777-1.
6. One package carbohydrate supplement (lemon drops).*
7. Shelter registration forms.*
8. Several packages cloth tape.*
9. Two dozen pencils.
10. One each of the following books:
 - a. "Shelter Manager's Handbook"
 - b. "Medical Care in Shelters"
 - c. "Handbook for Radiological Monitors"
 - d. "Fallout Protection"
 - e. "Personal and Family Survival"
 - f. "Hurricane Carla"
 - g. "Holy Bible"
11. Four empty tobacco cans with lids for use as ash trays.
12. One flashlight.
13. One rug and pad providing almost full floor coverage. (The rug and pad were unrolled for sleeping only.)
14. One small metal waste basket.

* Actual amount depending on group size

APPENDIX N

HANDLING OF SHELTEREES: PRE- AND POST-SHELTER

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**HANDLING OF SHELTEREES SCHEDULED FOR
REGULAR SHELTER ENTRANCE**

REGULAR SHELTER ENTRANCE

1. As subjects and alternates arrive, their names are checked off, the subjects are issued numbered pinnies, and everyone is seated at tables.
2. Nurse begins pre-entry check.
3. One-half hour is given for the group to assemble; at the end of that time alternates are substituted for subjects who have not arrived.
4. Fifteen minute pre-test is given.
5. Plastic bags are distributed for valuable storage.
6. Formal statement is read.
7. Subjects form a line and place bags containing valuables in a safe while passing upstairs to the shelter.

FORMAL STATEMENT - NORMAL CONDITION

You are about to enter a simulated fallout shelter for an extended period of time. You know that this is an experiment and that, although the situation may in some respects be stressful, there will be no actual danger. If a person needs to leave the shelter, he will be allowed to do so, but, of course, he may not return. The research staff may be contacted by the emergency phone in the shelter, but this phone should be used only in an extreme emergency.

Please do not take lightly the fact that you will be allowed to leave the shelter if you feel that you cannot take the stress involved. If you insist on leaving for a reason which the research staff feels is inappropriate, you will, of course, forfeit the honorarium which is being offered for your participation. Beyond this, however, we feel that you have a moral obligation to remain in the shelter as long as no actual physical or psychological danger exists. Remember, in the real situation your life and perhaps the lives of others will depend on whether you can exercise enough self-control to remain in the shelter. We assume that you volunteered for this study in good faith, that you consider your participation a patriotic service, and that you have every intention of remaining in the shelter until completion of the test. If there is anyone here who has any serious doubts about his ability or willingness to remain in the shelter for the required length of time, please let us know now, so that we will not have to interrupt the study once it gets under way.

As you have been told, you will be under constant observation by members of the research staff while in the shelter. Remember that this observation is for your own protection, as well as for collecting experimental data. It is very important that you do not attempt to interfere with the observation by the research staff. Such behavior will only serve to reduce the safety factor and disrupt a very crucial and expensive aspect of the experiment.

As you know, the primary purpose of this experiment is to determine how a group of American people will react when faced with the problem of living in a fallout shelter during a nuclear attack upon this country.

We can learn a great deal if you people respond as if you have been forced into a Pittsburgh fallout shelter by an enemy attack which, if sparing your lives at all, will destroy and contaminate large portions of this community.

Let us assume that you are in the Shadyside area when the air raid sirens sound the alert signal, indicating that there is danger of an immediate attack. The nearest shelter is within this building. You know that recently fallout shelters have been marked and stocked in the Pittsburgh area. These are not blast shelters and will offer little protection from the detonation of a large weapon in the immediate area. You can only take the steps required for maximum blast protection, and hope that a nuclear weapon is not detonated too close. If you survive the initial blast, you must remain in the shelter until the radiation in this area has reached a safe level.

You will face many problems while remaining in such a shelter. You have to organize yourselves for:

First - Control and utilization of your shelter supplies

Second - Monitoring of the radiation level

Third - Maintaining a safe and clean environment in the shelter

Fourth - Handling emergencies of a medical nature

Fifth - Preparing yourself for emergence from the shelter into a changed world.

If the trained Shelter Manager assigned to your shelter has been able to reach his post, he will make himself known to you, and you will be able to benefit from his training and experience. Otherwise, you are on your own. In this case, your best bet will be to utilize the Shelter Guidance Materials that are supplied in the fallout shelter. This will help you plan and organize for the problems you will face.

**HANDLING OF SHELTEREES SCHEDULED FOR
LATE SHELTER ENTRANCE**

LATE SHELTER ENTRANCE

1. After subjects assemble, they are read the "Address to Late Arrivals."
2. The nurse performs the health check.
3. Magazines are provided.
4. After a delay, the numbered pinnies are distributed.
5. Approximately 1-1/2 hours after arrival, coffee or cokes are served.
6. One-half hour before shelter entrance, the subjects are given the pre-test.
7. Bags are distributed and the bags containing valuables are placed in the safe.
8. The formal statement is read.
9. The subjects are escorted to the door of the shelter where the experimenter knocks loudly once and retires to leave the shelterees alone before the door.

ADDRESS TO LATE ARRIVALS

Tonight's shelter study is already underway. The other shelterees arrived several hours ago and have been in the shelter for some time. We asked you here at 10:00 so that you could avoid trying to find us late at night, but you will actually enter the shelter at about 12:30. Until then you will remain here.

Right now our nurse will check you over and later I'll be back with a questionnaire for each of you to fill out and I'll give you some further instructions.

FORMAL STATEMENT - LATE ARRIVAL CONDITION

You are about to enter a simulated fallout shelter for an extended period of time. You know that this is an experiment and that, although the situation may in some respects be stressful, there will be no actual danger. If a person needs to leave the shelter, he will be allowed to do so, but, of course, he may not return. The research staff may be contacted by the emergency phone in the shelter, but this phone should be used only in an extreme emergency.

Please do not take lightly the fact that you will be allowed to leave the shelter if you feel that you cannot take the stress involved. If you insist on leaving for a reason which the research staff feels is inappropriate, you will, of course, forfeit the honorarium which is being offered for your participation. Beyond this, however, we feel that you have a moral obligation to remain in the shelter as long as no actual physical or psychological danger exists. Remember, in the real situation your life and perhaps the lives of others will depend on whether you can exercise enough self-control to remain in the shelter. We assume that you volunteered for this study in good faith, that you consider your participation a patriotic service, and that you have every intention of remaining in the shelter until completion of the test. If there is anyone here who has any serious doubts about his ability or willingness to remain in the shelter for the required length of time, please let us know now, so that we will not have to interrupt the study once you enter.

As you have been told, you will be under constant observation by members of the research staff while in the shelter. Remember that this observation is for your own protection, as well as for collecting experimental data. It is very important that you do not attempt to interfere with the observation by the research staff. Such behavior will serve only to reduce the safety factor and disrupt a very crucial and expensive aspect of the experiment.

As you know, the primary purpose of this experiment is to determine how a group of American people will react when faced with the problem of living in a fallout shelter during a nuclear attack upon this country. We can learn a great deal if you people respond as if you have been forced into a

Pittsburgh fallout shelter by an enemy attack which, if sparing your lives at all, will destroy and contaminate large portions of this community.

Assume that you heard the air raid sirens sound the alert signal several hours ago. At that time other people began taking shelter, but until now you have been unable to enter one. You found that the nearest useable shelter is within this building. You know that recently fallout shelters have been marked and stocked in the Pittsburgh area. These are not blast shelters and will offer little protection from the detonation of a large weapon in the immediate area. You can only take the steps required for maximum blast protection, and hope that a nuclear weapon is not detonated too close. If you survive the initial blast, you must remain in the shelter until the radiation in this area has reached a safe level.

You will face many problems while remaining in such a shelter. You have to organize yourselves for:

- First - Control and utilization of your shelter supplies
- Second - Monitoring of the radiation level
- Third - Maintaining a safe and clean environment in the shelter
- Fourth - Handling emergencies of a medical nature
- Fifth - Preparing yourself for emergence from the shelter into a changed world.

If the trained Shelter Manager assigned to your shelter has been able to reach his post, he will make himself known to you, and you will be able to benefit from his training and experience. Otherwise, you are on your own. In this case, your best bet will be to utilize the Shelter Guidance Materials that are supplied in the fallout shelter. This will help you plan and organize for the problems you will face.

HANDLING OF ALL SHELTEREES AFTER SHELTER EXIT

AFTER SHELTER EXIT

1. All subjects return to the testing room and are given the 15 minute post-test.
2. Pinnies are removed and collected after everyone has completed the test.
3. Subjects are requested not to talk about the experience in the shelter.
4. Subjects are paid, sign a receipt, claim their valuables, and are free to leave.

APPENDIX 0

VITA OF ACTOR USED TO PORTRAY MANAGEMENT STYLES

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VITA OF ACTOR

General Experience

I was graduated Summa Cum Laude and Phi Beta Kappa from the University of Oregon in 1954 and received by M.A. from the Johns Hopkins University in 1957. I taught at the International School in the Hague, Holland, from 1957 to 1958, at the University of Nebraska as an instructor in speech and drama from 1958 to 1959, and at Gettysburg College as an instructor in English and director of the drama from 1960 to 1962. Beginning with this summer, I am now on the faculty of the Winchester-Thurston School in Pittsburgh. I was a Gilman Fellow at The Johns Hopkins University and a NBC - RCA Fellow in drama and Mellon Fellow at Carnegie Institute of Technology. Two of my stories have been published: one in The Atlantic Monthly, and the other in The Pacific Spectator. While at Oregon I was selected to represent the West Coast for the two debaters to tour England for the United States and was on the Northwestern championship debate team that went to the National Debate Finals at West Point. I represented the state of Oregon in the regional national finals of the Rhodes competition. I was also the cadet colonel of the R.O.T.C. at Oregon.

Theatre Experience:

Recent Roles Played:

Milton Loftis in Lie Down in the Darkness

Ferapont in The Three Sisters

Cadmus in The Bacchae

Tarlton in Misalliance

Desmond in The Happy Time

Major Roles from the Past:

Bothwell in Mary Queen of Scots
Hotspur in Henry IV, Part I
Marlow in She Stoops to Conquer
Krapp in Krapp's Last Tape
Cornelius in The Matchmaker

Plays Recently Directed:

Ibsen, Hedda Gabbler
Wilder, The Matchmaker
O'Casey, The End of the Beginning
Beckett, Krapp's Last Tape
Ionesco, The Chairs
Goldsmith, She Stoops to Conquer
Strindberg, Miss Julie
Sartre, No Exit
Wilder, Our Town

General Information:

I was director of the East End Players of Provincetown, Mass. I have also acted with the Horse-Head Theatre of Estes Park, Colo., and a number of university and summer theatres. I am currently taking acting training at Carnegie Institute of Technology.

**SUMMARY
OF
RESEARCH REPORT**

**LABORATORY INVESTIGATIONS OF
SHELTER MANAGEMENT FACTORS**

January 1965

OCD REVIEW NOTICE

This report has been reviewed in the Office of Civil Defense and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Office of Civil Defense.

CONTRACT NO. OCD-PS-64-57
SUBTASK 1519A

Institute for Performance Technology
AMERICAN INSTITUTES FOR RESEARCH
Pittsburgh, Pennsylvania

Summary Prepared By:
American Institutes for Research
January 1965

I. INTRODUCTION AND PURPOSE OF THE STUDY

Shelter management appears to be a critical variable in the maintenance of shelter populations. Many sources of data contribute to this general conclusion. These include the results of disaster studies, occupancy exercises, and the like. The nature of the relationship, however, is not at all clear. What types of leadership have what kinds of effects on shelter populations and their survival chances is as yet a largely unanswered question. The major purpose of the initial program of research in the shelter management laboratory is to open an investigation into this set of relationships.

II. SCOPE OF THE STUDY

The research program on management factors consisted of four major phases of investigation.

A. Effects of Late Assumption of Command by Shelter Manager

In this phase of the program, three shelter exercises (Studies I, II, and III) were conducted to determine the effects of late assumption of command by the shelter manager upon the operation of the shelter during the first 24 hours of confinement. These effects were determined by having the assigned shelter manager arrive two and twelve hours after the start of the exercises (Studies II and III respectively), and comparing the results under these conditions with those occurring in an exercise in which the assigned manager was present from the beginning (Study I).

B. Effects of Management Style

In this phase of the program, six 48-hour exercises (Studies IV through IX) were conducted to determine the effects of three types of management style upon the technical and non-technical activities of 40-person shelter groups. Two exercises were conducted for each of the three management styles. A brief description of these styles follows.

Management Style 1. This style is characterized by the following behavioral patterns: (a) the manager is the focal point of all shelter operations, activities, and events, (b) few decisions (and none of any consequence) are made without his personal involvement, (c) in his relations with shelterees, the Style 1 leader would be knowledgeable about psychological support and non-operational activities (i.e., recreation, religion, etc.), he would personally (and rapidly) take the lead in solving actual and potential problems of individual and group adjustment, and (d) the essence of this style is that the manager is the behavioral role model for the shelterees.

Management Style 2. Style 2 leadership involves: (a) setting goals and suggesting several appropriate alternative means, (b) taking a decision reached by the group, or crystallizing a decision out of group interaction, (c) evaluating the decision in terms of good management guidance, and (d) permitting it to be implemented. Unlike Style 1, in which the group is directed to become a reflection of the manager, in Style 2, the manager is, where appropriate, an agent of the group.

Management Style 3. The Style 3 manager is: (a) completely familiar with all shelter management procedures and principles, (b) he recognizes the critical importance of operational shelter functions, such as radiological protection, feeding, and medical care, (c) he believes, however, that the less important non-operational functions will take care of themselves if the shelterees express a need for them, and (d) this manager's attitude toward personal and social problems in the shelter is that people will "get along" and solve these problems, and that they are not of sufficient importance to require his attention unless they interfere directly with some critical shelter function.

C. Effects of Management Style Under Conditions of Technical and Psycho-Social Stress

In this phase of the program, three 24-hour exercises (Studies X, XI, and XII) were conducted to determine the effects of the three types of management style upon technical and non-technical operations under conditions of technical and psycho-social stress. Technical stress was introduced by means of several programmed technical "emergencies" to which the shelter group had to respond. Psycho-social stress was introduced by the use of a planted agitator.

D. Shelter Operation Under Conditions of Total Darkness

As the last phase of this current research program, one 24-hour exercise was conducted under conditions of total darkness. This study attempted to determine how well a shelter could operate under conditions of zero illumination.

The following table presents an outline of the entire research program.

Table 1: Outline of Research Program on Shelter Management Factors

Experimental Condition	Related Exercises	Duration of Exercises	Size of Shelter Groups
1. Late Assumption of Command	Studies I-III	24 hours	20 people
a. Manager present from start of exercise	Study I	"	"
b. Manager 2 hours late	Study II	"	"
c. Manager 12 hours late	Study III	"	"
2. Effects of Management Style	Studies IV-IX	48 hours	40 people
a. Style 1	Studies IV and VII	"	"
b. Style 2	Studies V and IX	"	"
c. Style 3	Studies VI and VIII	"	"
3. Effects of Management Style Under Conditions of Technical and Psycho-Social Stress	Studies X-XII	24 hours	25 people
a. Style 1	Study X	"	"
b. Style 2	Study XI	"	"
c. Style 3	Study XII	"	"
4. Shelter Operation Under Conditions of Total Darkness	The Dark Study	24 hours	15 people

III. APPROACH

A scenario of scheduled events was developed for each phase of the investigation. Observational techniques were then developed to record subject behavior. These are described below.

A. In-Shelter Observation

Three observers were on duty at all times during each of the shelter exercises. Each observation team consisted of one member of the senior research staff and two members of the junior research staff. The senior observer kept the descriptive observation log of each study, supervised the activity of the junior observers, and was responsible for the control of temperature and humidity in the shelter, as well as any programmed inputs to the shelterees.

Junior observers reported in-shelter events by use of prepared observation forms. These forms, reproduced in Appendix I, were of three types:

1. Problem Solving Form. Used to describe and track the activities of the shelterees in the identification of a technical or psycho-social problem in the shelter, and the selection and execution of a solution to this problem.

2. Information Input Form. Used to describe the behavior of shelterees when receiving information inputs, during in-shelter training or briefing sessions, or when using in-shelter guidance materials.

3. Team or Unit Selection Form. Used to record who was assigned to each task team or living unit and why each assignment was made.

In addition to the observation log and forms, tape recordings were made of critical shelter events.

B. Pre- and Post-Shelter Observation

Pre- and post-shelter observation of each study group was achieved through the use of brief attitude inventories. These inventories are presented in Appendix E of this report. In addition, the actor-manager was debriefed by a member of the senior research staff at the conclusion of each shelter exercise.

IV. RESULTS

A. Effects of Late Assumption of Command by Shelter Manager

Three 24-hour exercises, each using groups of 19 shelterees plus the actor-manager, were conducted to determine the effects of late assumption of command by the appointed manager. In the first exercise (Study I), the manager was present in the shelter when the shelterees arrived. In the second exercise (Study II), he appeared at the shelter two hours after entry. In the third exercise (Study III), he appeared twelve hours after entry. The actor portrayed management Style I in all three of these exercises.

The results of these three studies indicated the following:

1. The most efficient technical operation of the shelter occurred when the manager was present from the beginning of the exercise.
2. Effectiveness of shelter operations during the absence of the assigned manager appears to depend upon two characteristics of the person who emerges as acting shelter manager. These were:
 - a. His attitude toward the exercise itself. The emergent manager in Study II viewed the exercise as a challenge to his abilities, and was far more effective than the emergent manager in Study III, who viewed the exercise in a much more casual fashion.
 - b. The way in which he utilized in-shelter guidance materials. The superior manager in Study II utilized the guidance materials as a set of instructions regarding how to run the shelter, and followed them to the letter. Within a period of two hours, he had established a relatively perfect shelter organization. In contrast, the emergent manager in Study III ignored or rejected several of the organizational recommendations made in the in-shelter guidance materials. This resulted in a shelter organization which was totally unprepared to handle five major potential dangers.

3. There were no significant differences between the three groups on post-shelter attitudes. Late assumption of command by the manager apparently produced no detrimental effects as far as attitudes were concerned.

B. Effects of Management Style

The investigation of the effects of management style was accomplished by means of six 48-hour shelter exercises (Studies IV-IX), each exercise group consisted of 39 shelterees and the shelter manager. Each of the three management styles was replicated twice, that is, two exercises were conducted under each management style.

The results of these studies suggested the following conclusions:

1. Style 1 and Style 3 resulted in an equal level of technical effectiveness and efficiency. Style 2 was markedly inferior to both of the other two styles on these dimensions.
2. With regard to the psycho-social climate of these exercises, Style 1 produced an esprit de corps which was lacking in groups managed by Style 2 or Style 3. Style 2 groups, operating under a management style which emphasized the airing of personal ideas, feelings, and approaches, did not infrequently show signs of intra-group hostility and competitiveness. Style 2 also permitted the trouble-maker and the malcontent to continually air their complaints, often to the annoyance of other members of the group.
3. In post-shelter attitude inventories, groups managed under Style 1 indicated the most favorable "feeling" toward the shelter, while those managed under Style 2 indicated the least favorable "feeling." Moreover, it was noted with interest that all groups, regardless of style, endorse behaviors most likely to be found in management Style 1 when rating statements dealing with leadership behavior.

C. Effects of Management Style Under Conditions of Technical and Psycho-Social Stress

Three exercises (Studies X, XI, and XII) were conducted to determine the effectiveness of the three management styles when they were employed under shelter conditions of technical and psycho-social stress. Technical stress was introduced by means of several programmed technical "emergencies" to which the shelter group had to respond. Psycho-social stress was introduced by the use of a planted agitator in Studies X and XI; another person played this role in Study XII.

The results of these exercises suggest that Style 1 and Style 3 produce an equal amount of efficiency and of effectiveness in technical operations. The group managed under Style 2 was equally effective or competent, but much less efficient in technical operations, i.e., a much larger number of technical activities was required to achieve a comparable level of efficiency. There was also sufficient evidence to suggest that Style 1 was best able to combat the influences of the agitator.

There were no pronounced differences in post-shelter attitudes among the three study groups.

D. Shelter Operations Under Conditions of Total Darkness

The investigation of the effect of total darkness on shelter performance was accomplished by means of a 24-hour shelter exercise involving fifteen volunteers from A.I.R.'s research staff and the actor employed as manager in all of the previous studies. He again played this role, but without any attempt to maintain any given management style.

The results of this phase of the research program revealed that darkness was tolerated for a 24-hour period and essential shelter tasks were carried out. It is felt, however, that because of the specialized skill of a number of the subjects, that these results represent a ceiling rather than a base line in terms of performance in the dark. Because of this, it is recommended that illumination of some kind be afforded during shelter entry, and at any time when critical tasks, such as setting up equipment, are being executed. The latter is particularly desirable in the absence of trained or experienced people. It was found that a small but highly useful light source can be produced using parts of the OGD-supplied radiation gear.

V. CONCLUSIONS

On the basis of the empirical tests employed, both the 48-hour exercises and the high-stress exercises, management Style 1 appeared to recommend itself as the management strategy of choice. This recommendation is based primarily on the results of observation of in-shelter behavior, although it is supported by certain of the post-shelter attitude measures. This recommendation can be interpreted to mean that the technical competence of the manager plus his close supervision of the technical activities of a shelter group is necessary but not sufficient in producing optimum shelter operation. Close attention must also be paid to the psycho-social activities of the group, not only to gain additional confidence from the shelterees, but also to effectively "head-off" any subversive activities in the group, i.e., behavior designed to interfere with or overthrow the manager. On the other hand, psycho-social concerns should not be allowed to detract from the close scrutiny of technical operations, as could be seen from the results of the studies in which management Style 2 was employed.