FINAL REPORT

FIELD TEST FT-34

ANNEX E

HUMAN FACTORS

SEPTEMBER 1968

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SYNOPSIS

Field Test FT-34 and its results were subject to a number of human factors which could not be accurately predicted or effectively controlled. Factors which were difficult to control included possible variations in the support of test personnel, differing interpretations of test procedures at different times or locations, and the uncertain applicability of the knowledge and talents that participants brought to the test. Furthermore, unpredictable effects could have arisen from the reactions of test participants to their assigned tasks, the interpersonal relationships that developed during the test, or changes in the attitudes and morale of the participants as the test progressed.

This annex describes the means whereby the possible effects of such factors were investigated, the results obtained from those investigations, and the implications of those results. The means employed were essentially three: (1) The data packages accumulated throughout the test provided certain insights into some of the uncontrolled variables and their effects. These packages have been amply described in annex F, but they also support some of the results in the present annex. (2) All inspectors and test controllers completed rather extensive debriefing questionnaires immediately after completion of their assigned test duties. Those questionnaires provided a reasonable measure of the attitudes of these personnel toward such matters as their fellow participants, the purposes and procedures of the test program, the training program, on-site support, inspection techniques, and factors that contributed to or detracted from the accomplishment of their daily tasks. And (3) each site commander, chief inspector, and team leader completed an individual report which described the activities of those for whom he was responsible and the possible effects on those activities of such factors as personnel qualifications, operating procedures, training, on-site support, and problems encountered.

This annex is based primarily upon the data provided by the debriefing questionnaires and individual reports. Chapter I describes the debriefing procedures. Chapter II presents

detailed responses to 108 multiple-choice and Yes-?-No questions asked in the debriefing questionnaires. Chapter III provides a detailed evaluation of the training program based on rating scales and essay questions in the debriefing questionnaires. Chapter IV presents ratings of 192 factors which may have influenced the inspectors' general belief that real weapons or weapon materials were being processed during the operations at each site. Chapter V presents a summary of responses to 30 open-ended essay questions asked of the inspectors and test controllers during the debriefing. Chapter VI describes the individual reports of the site commanders, chief inspectors, and team leaders. Appendices present detailed comments and recommendations made by the inspectors and test controllers in their responses to the debriefing questionnaire.

The material in these chapters provides considerable insight into the actual experiences and thinking of test participants. More importantly, however, it tends to confirm the validity of assumptions made in interpretation and generalization of the test results. Some of the more important findings and conclusions drawn as to the effects of various human factors on the test are as follows:

1. The participants agreed that the procedures of FT-34 were "about right" in such basic matters as the time allowed for operations at each test site, the workload of each team, distribution of the work among team members, and equipment and support provided for each access level. There is no reason to believe that any of the differences obtained in the field test results are attributable to differences in these areas.

2. The attitudes of test participants toward basic matters, such as a possible treaty of the type predicated for FT-34, test objectives, test conditions, test procedures, or fellow participants, tended to be normally distributed and were probably representative of military officers in general. The median values of measured attitudes were neutral with respect to test objectives. Pre-test and post test attitudes were essentially identical. These attitudes, therefore, probably did not bias the field test results in any measurable way.

3. All teams received the same training except that there were differences in emphasis or detail between the LIMA and MIKE training. The LIMA and MIKE teams differed significantly in their evaluations of the training "when given," but they were equally satisfied with the "fill needs" aspects of the training. Thus, the differences in training probably bore no relationship to any difference noted in the performance of the different teams.

4. Overall, FT-34 was conducted essentially as planned. There were operational problems, but these were not of such a nature as to detract from the accomplishment of test objectives.

5. Support provided to FT-34 personnel and activities was adequate to excellent in all areas. The few problems encountered by inspectors had no appreciable effect on the conduct of the test or its results.

6. Test participant assessments of their own qualifications with respect to their duties in the test program may limit the generalizations concerning the overall field test results. However, those assessments did not differ systematically for the different teams; and no difference in the field test results obtained can be attributed to team-specific differences in qualifications or confidence therein.

7. Finally, nothing was discovered in the debriefings or individual reports to suggest that the basic premises, assumptions, or procedures of the test program were compromised in any significant way at any time during the test.

It is recommended that the type of data presented in this annex be obtained from personnel who participate in future field tests. Questionnaires, similar to those used in FT-34, should be administered prior to and at the completion of field operations in order to assess relevant attitudes, knowledge, and qualifications of the participants.

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I. INTRODUCTION

A. GENERAL

1. Purpose and Scope. The purpose of this annex is to discuss some of the human factors involved in the FT-34 field test and to provide estimates of the influence of these factors on test results. The information presented was derived primarily from debriefing exercises conducted at the end of the field test. Since debriefing information is used extensively in this annex, the debriefing materials and processes are presented in detail.

2. Information Sources. The sources of information used in this annex include data packages from the field test, inspection team leader reports, test site commander reports, chief inspector reports, and debriefing data from inspectors and test control personnel.

B. DEBRIEFINGS

1. General. Early in the planning of the field test procedures, it was recognized that the attitudes of participants could influence test results and that some of the more important findings of the study could be obtained only through careful debriefing of participants. It was decided to investigate attitudinal differences and to solicit other opinions and insights through administering a detailed questionnaire to each test participant immediately after he had completed his other test duties. Preparation of debriefing material was accomplished during the field test so that specific factors which involved test occurrences could be included in the debriefing.

2. Debriefing Description

a. Debriefing Questionnaires. The questionnaire administered to the inspectors was a 55 page booklet, an outline of which is provided in figure E-1. The questions were ordered so that the participant's attention was focused upon successive phases of the test program, in the order in which those phases occurred. Similar sections of the booklet (e.g., E, G, I, and K, or F, H, J, and L in figure E-1) contained about 50-percent duplication of the same questions or items in order to measure attitudinal changes from phase-to-phase. All inspectors received identical questionnaires.

The questionnaires administered to test controllers were assembled from selected portions and items in the basic Inspector Debriefing Booklet, as is shown in the parallel outline in figure E-2. Section E of the Test Controller Debriefing Questionnaire was different for each of the four major sites; that is, in Section E, test controllers at Pantex were asked most of the same questions asked in the Pantex Section of the Inspector Debriefing Booklet, and test controllers at Rocky Flats were asked most of the same questions asked in the Rocky Flats Section of the Inspector Debriefing Booklet, and so on. Except for section E, the Test Controller Debriefing Questionnaires were identical at all sites.

The contents of these questionnaires are essentially duplicated in this annex. To assist the reader, the questions have been arranged to allow ready comparison of similar questions, but the wording of each question and alternative is that used in the original booklet. Most of the questions asked of test controllers were identical to those asked of inspectors, but a few were necessarily worded differently. Most of the differences were minor changes in emphasis or viewpoint. For instance, where inspectors were asked "Did your team ... ?" test controllers were asked "Did the teams under your cognizance ..." and so on. Such differences are ignored in this report, but critical differences in wording are noted, where appropriate, in the text.

b. Administration and Instructions. As each participant became available, he was simply handed a copy of the appropriate questionnaire and was told to complete it in accordance with the instructions therein. Instructions to inspectors and test controllers were essentially identical; they were contained in the Test Director's cover letter and at various places throughout the questionnaire. The essentials of those instructions are presented by excerpts in figure E-3.

FIGURE E-1. Outline of Inspector Debriefing Booklet

FIGURE E-2. Outline of Test Controller Debriefing Questionnaire

FIGURE E-3. Excerpts from Instructions

"Although we have gathered literally reams of data, there are many questions unanswered that only you, as an individual participant, can answer. This booklet is intended to collect some of those answers and to solicit your general, frank, and honest impressions of FT-34 test operations. The booklet is self-contained and consists of..."

"Questions may be answered by circling the appropriate letter or symbol, or by entering a single word or number into the blank.... You may also write in marginal notes or additional comments, as you deem necessary, but please keep them legible, brief, and to the point..."

"Answer each question as quickly as you can. Your first impressions are usually the most appropriate. In most cases, there is no 'right' or 'wrong' answer. What is wanted is your opinion. Please do your own thinking, and do not discuss your answers or comments with others..."

"The questions asked about operations at the different sites are necessarily repetitious. Please read each question carefully; it may be different from a similar question asked earlier; and try to answer the question in terms of the feelings or experiences you had at that particular site... If questions are asked about a higher access than you experienced, answer in terms of what you think would have been the case if you had experienced the higher access."

"...The questions require personal answers and the completed questionnaire will be considered and treated as personal, confidential matter....Information from these questionnaires will not be associated with the name, organization, or service of the submitting test controller in any of the results...of this test program...test controllers are urged to answer every question to the best of their recollection and ability, and to be as frank and candid as possible."

"Your answers and opinions here...may help prepare others for a possible follow-on test or for a treaty which may be entered by the United States Government, so please be thorough."

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Test controller questionnaires were administered by the respective Site Commanders as each site completed its portion of the test program. Thus, the Pantex test controllers completed the questionnaire about 2 weeks before the Rocky Flat test controllers, and so on. In each case, the Site Commander simply passed out the questionnaires with a brief explanation and the order that they be completed by a certain time and returned to the Site Commander. Responses to essay questions were normally typed on site, then the original questionnaires were sent directly to the Test Director, and a copy was sent to Sandia Corporation for analysis. Sixteen test controllers, four at each of four sites, completed the questionnaires. Two of the four Site Commanders also completed the questionnaire, but their results are not reflected in all cases. Test controllers required from 15 to 40 minutes to complete their questionnaires.

The Inspector Debriefing Booklets were administered in four sittings. That part of the LIMA team not involved in the special assay completed the questionnaire prior to the special assay; the remainder of the LIMA team completed the questionnaire at the end of the special assay; and the MIKE teams repeated this procedure. Different representatives of the Test Director administered the questionnaire; but, in each case, the inspectors were handed the questionnaire with a brief ad hoc explanation and were told to follow the instructions therein. During each administration, a technical support representative stood by to answer any questions and to interview each inspector after the questionnaire was completed.

The time required to complete the questionnaires ranged from 25 to 150 minutes, and the interviews averaged about 20 minutes. These interviews were primarily concerned with ensuring that all questions had been answered in a meaningful way. When all members of the group had completed their questionnaires and interviews, they were given a detailed explanation of, and were allowed to asked questions about, aspects of the test heretofore kept from them. The original, completed questionnaires were retained at Test Headquarters and a copy was sent to Sandia Corporation.

c. Analysis of Debriefing Responses

(1) Tabulation. Two separate tabulations were made of responses to the questionnaires—one by Test Headquarters Data Control Group and one at Sandia Corporation. These tabulations were compared to detect tabulation errors, and the results were summarized in the manner shown herein. For all items, the tabulations allowed

comparison of the responses of (1) LIMA versus MIKE teams, (2) two-man versus four-man teams, (3) high-access versus low-access teams, and (4) inspectors as a group versus test controllers as a group, where appropriate. Apparent differences in the responses between each of these paired categories were determined by inspection, and statistical tests of significance were run wherever the differences seemed sizeable.

(2) Statistical Tests. The Kolmogorov-Smirnov two-sample test[1] was used wherever there were three or more intervals of responses, and the Student-t test was used for differences between means.[2] These two tests are very sensitive to any kind of difference between two samples, and are quite simple in concept and quick and easy to run. All calculations were done by hand with the aid of a desk calculator. Computer-operated Fisher Exact Probability[1] tests were also conducted to verify hand-computed statistics and to determine whether any additional differences were significant. The Fisher tests did not reveal any new differences.

In the Kolmogorov-Smirnov test, the two groups of scores were arranged in cumulative frequency distribution having the same intervals; the differences were determined by subtraction for each interval; and the largest difference, D, was compared to a given table of significant differences. For N = 12 in each of two samples, D = 6 was significant at the 0.05 level for the one-tailed test, and D = 7 for the two-tailed test. For N = 24 in each sample, D = 9 for one-tail and D = 10 for two-tail were significant at the 0.05 level. One-tail tests were normally used because the direction of differences was both predicted and known. Where the N's were not equal (e.g., 8 in low- and 16 in high-access groups), the test is inappropriate, but an estimate of significance was obtained by multiplying the responses of the smaller sample by a constant to equate the samples (e.g., 8 x 2 = 16). These estimates seemed accurate enough for the interpretations to be employed.

[1] S. Siegel, Nonparametric Statistics for the Behavioral Sciences, McGraw-Hill Book Co., New York, N. Y., 1956, p. 127 ff.

[2] Q. McNemar, Psychological Studies, John Wiley & Sons, Inc., New York, New York, 1955, Ch. 6 and 7.

Significant differences at the 0.05 level or better were calculated for a few mean differences via the standard Student-t formulas presented below:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{s^2}{N_1} + \frac{s^2}{N_2}}} \quad \text{and} \quad s^2 = \frac{(X - M_1)^2 + (X - M_2)^2}{N_1 + N_2 - 2}$$

where X is a raw score, M and N represent the means and sample sizes of the two respective samples and the significance of t was determined from tables given in the source with degrees of freedom = $N_1 + N_2 - 2$.

Of course, irrespective of differences between groups, the median response of each group to each question is the best indicator of central tendency for small samples; and the median responses themselves indicate the most relevant response to each question. In the following chapters, median responses are identified by underlining, and significant differences are indicated by the abbreviation, SIG, at the top or near the appropriate columns. The level of significance was always $\alpha = 0.05$ or less.

(3) Coding. As suggested by the headings of each page, the responses of the participants were tabulated so that the following comparisons could be made:

The 12 LIMA (L) team members versus the 12 MIKE (M) team members

The 8 members of the two-man teams versus the 16 members of the four-man teams.

The 12 high-access (H) members versus the 12 low-access (L) members

Inspectors (In) as a group versus test controllers (TC) as a group

A dash (-) in an answer column indicates that no response was possible; a zero (0) indicates that a response was possible but did not occur. The notation SIG at the head of two columns or in a note referring to two columns denotes a statistically significant difference, at the 0.05 level, between the two columns.

(4) Precautions. In interpreting these results, one must keep in mind the fact that, as in nearly all such opinion surveys, some participants did not answer all questions or did not answer them in a manner that could be consistently interpreted. On the other hand, some participants provided more than one response to some questions. Where the preferred response was clear, secondary responses were ignored; but where both responses were sensible, both were included in the results and in the subsequent interpretations. This seemed to be a more valid procedure than arbitrary selection, and in no case did more than two individuals in any group provide dual responses. Notes are provided in the text where necessary to guide interpretation. In the absence of other indications, the median response of any group is the best indication of the collective opinion of the group. Medians are underlined where appropriate.

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III. RESPONSES TO DEBRIEFING QUESTIONNAIRE OBJECTIVE QUESTIONS

A. GENERAL

1. Coverage. This chapter contains both the questions asked and the answers obtained to all objective questions (i.e., multiple-choice and Yes-?-No items) in both the basic Inspector Debriefing Booklet and the Test Controller Debriefing Questionnaire. As explained in chapter I, the latter merely duplicated certain of the applicable questions in the former.

2. Organization. The questions are numbered sequentially throughout the chapter but are grouped under 16 subheadings roughly in the order in which the subject matter occurred in the actual field test. In each case, the question is stated just as it appeared to the test participants, and the answers of the participants are tabulated next to the question, in line with the appropriate alternative. In the original questionnaires, participants merely circled the latter (a, b, c, etc.) or symbol (Y, ?, N) representing the selected response.

B. QUESTIONNAIRE RESPONSES

1. Effects of Previous Experience

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(1)	How much did you know about FT-34 before your initial training at Paducah?								
	a. nothing at all	6	4	3	7	6	4	10	9
	b. bar talk only	1	2	1	2	2	1	3	1
	c. magazine and news releases	1	2	1	2	2	1	3	1
	d. prior contact	3	3	2	4	3	3	6	5
	e. home base briefings	2	1	1	2	1	2	3	1
	f. read test plans or annexes	0	0	0	0	0	0	0	1
	g. other: knew veterans of prior tests	1	0	0	1	0	1	1	0

[1] An explanation of the coding used appears on page E-8.

Question No.		Teams L	Teams M	Site 2	Site 4	Access H	Access L	Total In	Total TC
(2)	Field tests have become quite common in recent years. About how many field tests of any kind have you participated in? (Exclude FT-34)	(Total tests per group) 5	5	8	2	4	6	10	9
(3)	How many field tests have you participated in that had anything to do with nuclear weapons? (Exclude FT-34)	(Total tests per group) 5	2	4	3	4	3	7	4
(4)	About how many weeks have you spent in such tests over the past two years? (Include training etc., but exclude FT-34)	(Total weeks per group due mainly to one man). 3	63	63	3	55	11	66	12
(5)	About how many of the shapes, or weapon types monitored did you recognize as types you worked on or knew before FT-34?	(Total shapes per group) 34	31	34	31	47	18	65	--
(6)	How well did you know the weapons referred to in the above answer?			SIG					
	a. not at all	5	3	3	5	3	5	8	2
	b. had only seen them	1	2	0	3	1	2	3	1
	c. had studied reference works	2	2	0	4	3	1	4	1
	d. had worked with these weapons	2	3	4	1	3	2	5	1
	e. knew these weapons intimately	2	3	1	4	3	2	5	0
(7)	What effect, if any, did your prior knowledge have on your votes on real/fake calls?								
	a. sole basis for vote	0	0	0	0	0	0	0	--
	b. weighed heavily	4	3	1	6	4	3	7	--
	c. was considered	2	1	2	1	1	2	3	--
	d. used only in case of doubt	0	0	0	0	0	0	0	--
	e. was ignored, played no part	5	7	4	8	7	5	12	--
(8)	With how many of the weapon types were any other members of your team familiar, through prior (to FT-34) knowledge and/or experience?	(Answers uninterpretable)							
(9)	What effect, if any, did their prior knowledge have on their votes on real/fake calls?			SIG					
	a. sole basis for vote	0	0	0	0	0	0	0	
	b. weighed heavily	6	6	1	11	5	7	12	--
	c. was considered	2	0	1	1	0	2	2	--
	d. used only in case of doubt	1	0	1	0	1	0	1	
	e. was ignored, played no part	3	6	5	4	6	3	9	--

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(10)	What effect, if any, did their prior knowledge have on your vote on real/fake calls?								
				SIG					
	a. sole basis for vote	1	0	1	0	0	1	1	--
	b. weighed heavily	4	6	1	9	4	6	10	--
	c. was considered	4	1	2	3	3	2	5	--
	d. used only in case of doubt	2	0	1	1	2	0	2	--
	e. was ignored, played no part	2	6	4	4	5	3	8	--
(11)	How familiar were you with the type of material seen at Rocky Flats?								
	a. not at all outside FT-34	6	8	5	9	7	7	14	1
	b. had seen similar material	2	1	1	2	1	2	3	0
	c. had studied similar material	3	1	1	3	2	2	4	1
	d. had worked with similar material	1	2	1	2	2	1	3	0
	e. knew such material intimately	0	0	0	0	0	0	0	0
(12)	(Same as #11 for Paducah)								
	a. not at all outside FT-34	4	4	3	5	3	5	8	3
	b. had seen similar material	2	3	0	5	3	2	5	0
	c. had studied similar material	3	1	2	2	0	4	4	0
	d. had worked with similar material	3	3	3	3	5	1	6	1
	e. knew such material intimately	0	1	0	1	1	0	1	0
(13)	(Same as #11 for Oak Ridge)								
	a. not at all outside FT-34	6	7	4	9	7	6	13	1
	b. had seen similar material	1	2	1	2	1	2	3	0
	c. had studied similar material	1	1	1	1	1	1	2	0
	d. had worked with similar material	4	2	2	4	3	3	6	1
	e. knew such material intimately	0	0	0	0	0	0	0	0
(14)	Of the components you saw, about what percent were you sure came from nuclear weapons?	(Asked for Paducah)							
	a. less than 10%	3	2	2	3	0	5	5	--
	b. 10 to 20%	0	0	0	0	0	0	0	--
	c. 20 to 50%	2	4	2	4	5	1	6	--
	d. 50 to 80%	5	5	3	7	5	5	10	--
	e. over 80%	2	1	1	2	2	1	3	--

2. Attitudes Toward the Test Itself

Question No.		Teams L	Teams M	Size 2	Size 4	Success H	Success L	Total In	Total TC
(15)	Prior to undergoing the Paducah training program, how did you feel about being assigned as a participant in this test?								
	a. very pleased	1	4	3	2	2	3	5	6
	b. pleased	2	3	2	3	3	2	5	5
	c. indifferent or unsure	7	4	3	8	6	5	11	2
	d. displeased	2	0	0	2	0	2	2	2
	e. very displeased	0	1	0	1	1	0	1	1
(16)	Which best describes the reason for your initial attitude toward this test? The test was seen as:								
		SIG							
	a. an opportunity	1	7	6	2	5	3	8	9
	b. a diversion or break in routine	4	3	1	6	4	3	7	4
	c. interference with other plans	2	2	2	2	1	3	4	1
	d. undesirable absence from duties	1	0	0	1	1	0	1	2
	e. other: undesirable absence from family	1	1	0	2	1	1	2	1
	f. other: undesirable for career	0	1	0	1	1	0	1	0
(17)	After you had learned what FT-34 was all about, how willing were you to participate as assigned?								
	a. very willing SIG: Column In	6	9	6	9	9	6	15	11
	b. willing vs. In in #15	6	0	1	5	2	4	6	4
	c. neutral or indifferent	0	2	1	1	0	2	2	1
	d. unwilling or reluctant	0	1	0	1	1	0	1	0
	e. very unwilling	0	0	0	0	0	0	0	0
(18)	Which best describes the reason for the above atitude?								
	a. sympathy for test purposes	3	2	1	4	4	1	5	6
	b. interest in test procedures	7	7	6	8	7	7	14	9
	c. no sympathy for test purposes	1	0	0	1	1	0	1	0
	d. disinterest in test procedures	0	0	0	0	0	0	0	1
	e. felt unqualified for role	1	2	0	3	1	2	3	0
	f. other: opportunity to be of service	1	0	0	1	0	1	1	0
	g. other: lost interest	0	2	1	1	1	1	2	0

3. Attitudes Toward Test Participants

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(19)	After you learned what FT-34 was all about, how well qualified did you think you were for this assignment?								
	a. very well qualified	1	3	2	2	3	1	4	3
	b. adequately qualified	4	4	2	6	4	4	8	10
	c. ambivalent or unsure	5	3	2	6	3	5	8	0
	d. inadequately qualified	2	1	2	1	2	1	3	2
	e. very poorly qualified	0	1	0	1	0	1	1	1
(20)	In general, how well qualified did you feel the inspectors were for their job in this test?								
	a. very well qualified	2	1	1	2	3	0	3	0
	b. adequately qualified	2	5	2	5	3	4	7	7
	c. ambivalent or unsure	4	3	3	4	3	4	7	3
	d. inadequately qualified	3	3	1	5	3	3	6	5
	e. very poorly qualified	1	0	1	0	0	1	1	2
(21)	(Same as #20 for test controllers)								
	a. very well qualified	1	1	1	1	1	1	2	1
	b. adequately qualified	7	5	4	8	8	4	12	12
	c. ambivalent or unsure	2	3	2	3	1	4	5	1
	d. inadequately qualified	2	3	1	4	2	3	5	2
	e. very poorly qualified	0	0	0	0	0	0	0	0
(22)	To what degree were you satisified with the selection of your team?					SIG			
	a. very satisfied	7	6	6	7	10	2	13	--
	b. generally satisfied	2	6	1	7	2	6	8	--
	c. ambivalent or unsure	1	0	0	1	0	1	1	--
	d. generally dissatisfied	2	0	1	1	0	2	2	
	e. very dissatisfied	0	0	0	0	0	0	0	--
(23)	(Same as #22 for your team captain)					SIG		SIG	
	a. very satisfied	7	8	5	10	11	4	15	4
	b. generally satisfied	3	4	3	4	1	6	7	11
	c. ambivalent or unsure	0	0	0	0	0	0	0	1
	d. generally dissatisfied	2	0	0	2	0	2	2	2
	e. very dissatisfied	0	0	0	0	0	0	0	1

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(24)	(Same as #22 for the test controllers)								
	a. very satisfied	2	3	2	3	4	1	5	6
	b. generally satisfied	8	6	4	10	7	7	14	9
	c. ambivalent or unsure	2	1	2	1	1	2	3	0
	d. generally dissatisfied	0	2	0	2	0	2	2	1
	e. very dissatisfied	0	0	0	0	0	0	0	0
(25)	To what degree were you satisfied with the performance of your team?								
						SIG			
	a. very satisfied	4	6	2	8	8	2	10	2
	b. generally satisfied	7	5	5	7	3	9	12	12
	c. ambivalent or unsure	1	1	1	1	1	1	2	3
	d. generally dissatisfied	0	0	0	0	0	0	0	1
	e. very dissatisfied	0	0	0	0	0	0	0	2
(26)	(Same as #25 for the test controllers)								
	a. very satisfied	2	3	2	3	4	1	5	--
	b. generally satisfied	7	7	4	10	7	7	14	--
	c. ambivalent or unsure	2	0	1	1	1	1	2	--
	d. generally dissatisfied	1	2	1	2	0	3	3	--
	e. very dissatisfied	0	0	0	0	0	0	0	--
(27)	Which term best describes the personal relations between members of your team during test operations?								
	a. friendly	11	10	7	14	12	9	21	12
	b. cordial	0	1	1	0	0	1	1	4
	c. cool	0	1	0	1	0	1	1	1
	d. bickering	2	0	0	2	0	2	2	3
	e. hostile	0	0	0	0	0	0	0	0
(28)	(Same as #27 for during off duty hours)								
	a. friendly	12	11	7	16	12	11	23	--
	b. cordial	0	1	1	0	0	1	1	--
	c. cool	0	0	0	0	0	0	0	--
	d. bickering	0	0	0	0	0	0	0	--
	e. hostile	0	0	0	0	0	0	0	--
(29)	Would you rather have been assigned to some other team?								
						SIG			
	a. no, I was satisfied	7	7	5	9	11	3	14	--
	b. no, it wouldn't have helped	0	1	0	1	0	1	1	--
	c. yes, for more interesting access	5	3	3	5	0	8	8	--
	d. yes, for more reasonable workload	0	1	1	0	0	1	1	--
	e. yes, for personal reasons	0	1	0	1	1	0	1	--

4. Adequacy of On-Site Support

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(30)	Which best describes the logistic and administrative support furnished FT-34 personnel at Pantex?								
		SIG							
	a. very good	0	4	2	2	4	0	4	1
	b. adequate	0	5	2	3	1	4	5	3
	c. adequate in most respects	0	1	0	1	0	1	1	0
	d. inadequate in most respects	7	0	3	4	4	3	7	0
	e. grossly inadequate	5	2	1	6	3	4	7	0
(31)	(Same as #30, at Rocky Flats)								
	a. very good — SIG: Column In	6	2	3	5	6	2	8	0
	b. adequate — vs In in #30	3	3	2	4	3	3	6	3
	c. adequate in most respects	3	5	2	6	3	5	8	0
	d. inadequate in most respects	0	2	1	1	0	2	2	0
	e. grossly inadequate	0	0	0	0	0	0	0	0
(32)	(Same as #30, at Paducah)								
	a. very good — SIG: Column In	5	5	4	6	6	4	10	3
	b. adequate — vs. In in #30	5	5	4	6	3	7	10	1
	c. adequate in most respects	2	2	0	4	3	1	4	0
	d. inadequate in most respects	0	0	0	0	0	0	0	0
	e. grossly inadequate	0	0	0	0	0	0	0	0
(33)	(Same as #30, at Oak Ridge)								
	a. very good — SIG: Column In	11	9	8	12	10	10	20	3
	b. adequate — vs. In in #30	1	2	0	3	2	1	3	0
	c. adequate in — and In in #31 most respects (d & e = 0)	0	1	0	1	0	1	1	1
(34)	Allowing for (two or four) access levels and necessary teardown and cleanup operations, how appropriate was the time allowed for Pantex operations?								
	a. much too long	2	0	0	2	1	1	2	0
	b. too long	3	2	3	2	1	4	5	0
	c. about right	7	9	4	12	9	7	16	4
	d. too short	0	1	1	0	1	0	1	0
	e. much too short	0	0	0	0	0	0	0	0
(35)	(Same as #34, for Rocky Flats operations)								
	a. much too long	1	2	0	3	3	0	3	0
	b. too long	1	1	0	2	1	1	2	0
	c. about right	10	7	7	10	6	11	17	3
	d. too short (e = 0)	0	2	1	1	2	0	2	1

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(36)	(Same as #34, for Paducah operations)								
	a. much too long	6	2	2	6	4	4	8	0
	b. too long	2	3	1	4	2	3	5	0
	c. about right	4	6	4	6	5	5	10	4
	d. too short (e = 0)	0	1	1	0	1	0	1	0
(37)	(Same as #34, for Oak Ridge operations)								
	a. much too long	1	1	0	2	2	0	2	0
	b. too long	2	0	1	1	1	1	2	1
	c. about right	9	10	7	12	8	11	19	2
	d. too short (e = 0)	0	1	0	1	1	0	1	1

SIG: Column In vs. In in #36

5. Detection of Classified Information

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(38)	To what degree did you feel qualified to recognize or detect classified information?								
	a. very well qualified	0	0	0	0	0	0	0	--
	b. well qualified	3	4	3	4	5	2	7	--
	c. adequate or unsure	5	4	3	6	5	4	9	--
	d. poorly qualified	4	2	2	4	1	5	6	--
	e. very poorly qualified	0	2	0	2	1	1	2	--
(39)	To what degree did the guidlines in annex D help you identify classified information?								
	a. not at all	2	0	0	2	1	1	2	--
	b. perhaps to a slight degree	0	2	0	2	1	1	2	--
	c. indicated what to look for	5	3	3	5	3	5	8	--
	d. helped evaluate unsure items	6	4	4	6	5	5	10	--
	e. I depended heavily upon them	0	4	2	2	3	1	4	--
(40)	In which spirit did your team apply the guidelines in annex D on classified items?								
				SIG					
	a. depended entirely on guidelines	5	5	1	9	5	5	10	4
	b. used part of given guidelines	1	1	1	1	0	2	2	9
	c. adjusted guides to situation	4	2	4	2	4	2	6	1
	d. supplemented guides considerably	1	0	1	0	0	1	1	1
	e. sought anything possibly classified	1	4	1	4	3	2	5	3

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(41)	How effective do you feel your team was in detecting and listing classified items at Pantex?								
	a. very effective	3	1	0	4	4	0	4	0
	b. reasonably effective	5	7	4	8	6	6	12	2
	c. adequate or unsure	2	2	1	3	1	3	4	0
	d. quite ineffective	2	1	3	0	0	3	3	1
	e. very ineffective	0	1	0	1	1	0	1	1
(42)	(Same as #41, for at Rocky Flats)								
	a. very effective	1	1	0	2	2	0	2	1
	b. reasonably effective	5	5	4	6	6	4	10	0
	c. adequate or unsure	4	3	1	6	2	5	7	1
	d. quite ineffective	2	2	3	1	1	3	4	3
	e. very ineffective	0	1	0	1	1	0	1	0
(43)	(Same as #41, for at Paducah)								
						SIG			
	a. very effective	3	1	0	4	4	0	4	1
	b. reasonably effective	2	6	4	4	6	2	8	2
	c. adequate or unsure	5	4	4	5	1	8	9	2
	d. quite ineffective	1	0	0	1	0	1	1	0
	e. very ineffective	1	1	0	2	1	1	2	0
(44)	(Same as #41, for at Oak Ridge)								
						SIG			
	a. very effective	2	0	0	2	2	0	2	0
	b. reasonably effective	2	8	4	6	7	3	10	0
	c. quite ineffective	5	1	2	4	0	6	6	2
	d. quite ineffective	2	2	2	2	1	3	4	2
	e. very ineffective	1	1	0	2	2	0	2	0

6. Detection of Evasion

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(45)	How qualified did you feel you were to determine whether real weapons were being destroyed and processed?								
	a. very well qualified	0	0	0	0	0	0	0	--
	b. well qualified	4	5	3	6	7	2	9	--
	c. adequate or unsure	1	4	1	4	2	3	5	--
	d. poorly qualified	7	0	3	4	2	5	7	--
	e. very poorly qualified	0	3	1	2	1	2	3	--

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(46)	To what degree did the guidelines in annex D help you determine your conviction?								
				SIG					
	a. not at all	2	2	3	1	3	1	4	--
	b. perhaps to a slight degree	4	4	5	3	3	5	8	--
	c. indicated what to look for	6	6	0	12	6	6	12	--
	d. helped detect evasion attempts	0	0	0	0	0	0	0	--
	e. I depended heavily upon them	0	0	0	0	0	0	0	--
(47)	Which best describes the team's attitude throughout the test concerning evasion?								
	a. suspicious of test in all aspects	5	3	2	6	2	6	8	6
	b. suspicious of undercover aspects only	0	1	0	1	0	1	1	1
	c. cautious about all conclusions	3	7	3	7	7	3	10	7
	d. cautious on real/fake calls only	2	0	2	0	2	0	2	0
	e. didn't try to outguess evasions	2	2	2	2	1	3	4	6
(48)	How effective do you feel your team was in detecting and identifying any evasion practiced at Pantex?								
				SIG					
	a. very effective	2	1	0	3	3	0	3	0
	b. reasonably effective	6	7	3	10	7	6	13	2
	c. adequate or unsure	2	3	3	2	1	4	5	1
	d. quite ineffective	2	0	2	0	0	2	2	1
	e. very ineffective	0	1	0	1	1	0	1	0
(49)	(Same as #48, for at Rocky Flats)								
	a. very effective (SIG: Column In vs. In in #48)	1	0	0	1	1	0	1	0
	b. reasonably effective	2	1	1	2	3	0	3	0
	c. adequate or unsure	1	4	2	3	2	3	5	0
	d. quite ineffective	5	5	3	7	3	7	10	0
	e. very ineffective	3	2	2	3	3	2	5	4
(50)	(Same as #48, for at Paducah)								
	a. very effective	1	0	0	1	1	0	1	1
	b. reasonably effective	2	5	2	5	6	2	8	0
	c. adequate or unsure	4	4	3	5	2	6	8	2
	d. quite ineffective	2	2	2	2	0	4	4	1
	e. very ineffective	3	1	1	3	3	1	4	0
(51)	(Same as #48, for at Oak Ridge)								
	a. very effective	1	1	1	1	2	0	2	0
	b. reasonably effective (SIG: Column In vs In in #48)	2	3	1	4	4	1	5	0
	c. adequate or unsure	3	2	2	3	2	3	5	0
	d. quite ineffective	6	5	4	7	3	8	11	3
	e. very ineffective	0	1	0	1	1	0	1	1

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7. Workload Distribution

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(52)	In general, throughout the test and ignoring scheduled off time, how heavy or demanding was the workload? (TC = "your workload?")								
	a. usually there was too much to do	0	1	1	0	1	0	1	0
	b. often there was too much to do	2	4	3	3	3	3	6	0
	c. the workload was about right	4	2	2	4	3	3	6	10
	d. often there was not enough to do	1	4	1	4	2	3	5	3
	e. usually there was not enough to do	5	1	1	5	3	3	6	3
(53)	Which best describes how the work was distributed among or between team members?								
	a. the work was evenly distributed	8	8	7	9	10	6	16	12
	b. one member did most of the work	2	1	0	3	0	3	3	3
	c. two members did most of the work	2	1	0	3	1	2	3	2
	d. all but one member shared equally	0	1	0	1	1	0	1	1
	e. all but team captain shared equally	0	0	0	0	0	0	0	0
	f. I did most of the work	0	1	1	0	0	1	1	0
(54)	How did the members of the team share responsibility for filling out the data forms?								
	a. they alternated about equally	3	6	4	5	6	3	9	6
	b. one member kept most records	8	1	4	5	4	5	9	11
	c. two members kept most records	0	5	0	5	2	3	5	1
	d. all but one member shared equally	1	0	0	1	0	1	1	0
	e. all but team captain shared equally	0	0	0	0	0	0	0	0
(55)	With regard to the workload which fell to the lot of your team, did you:								
	a. do most of the work?	0	0	0	0	0	0	0	--
	b. do more than your share?	3	3	3	3	2	4	6	--
	c. do your fair and equitable share?	8	7	4	11	10	5	15	--
	d. do less than your share?	1	2	1	2	0	3	3	--
	e. do very little?	0	0	0	0	0	0	0	--
(56)	How much influence did the team captain usually have on the team's results?								
						SIG			
	a. a dominating influence	1	0	0	1	0	1	1	4
	b. a strong influence	6	3	2	7	2	7	9	6
	c. about the same as other members	5	9	4	11	10	4	14	7
	d. less than some other members	0	0	0	0	0	0	0	1
	e. less than all other members	0	0	0	0	0	0	0	0

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Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(57)	About what percent of the team's decisions were reached via each of the following means?	(Averages shown per group)							
	a. unanimous agreement of team __%	80	68	70	76	94	54	74	75
	b. uneven split, a majority rule __%	6	13	0	14	4	15	10	8
	c. even split, captain decided __%	11	0	7	5	1	11	5	2
	d. dictated by team captain __%	3	3	0	4	1	5	3	1
	e. dictated by team expert __%	0	15	22	1	1	15	8	14

8. Operational Conflicts with Training

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(58)	Did the training information conflict with any knowledge or information you had before training?								
	a. no, I had no prior knowledge	1	4	0	5	2	3	5	7
	b. no, not in any significant way	11	7	7	11	9	9	18	8
	c. yes, but only on minor points	1	0	1	0	1	0	1	0
	d. yes, on a few significant points	0	1	0	1	0	1	1	0
	e. yes, on many significant points	0	0	0	0	0	0	0	0
(59)	Which of the following was the most helpful in learning test procedures?								
	a. the Paducah training course	0	3	1	2	2	1	3	4
	b. on-site training sessions	10	10	7	13	9	11	20	6
	c. reading the manuals	1	1	1	1	2	0	2	6
	d. talking with fellow participants	2	0	1	2	1	2	2	0
	e. knowledge gained prior to FT-34	0	0	0	0	0	0	0	0
	f. other: work on site	0	0	0	0	0	0	0	2
(60)	As above, which of the following was the least helpful in learning test procedures?								
								SIG	
	a. the Paducah training course	6	1	2	5	3	4	7	2
	b. on-site training sessions	0	0	0	0	0	0	0	-1
	c. reading the manuals	2	3	2	3	5	0	5	2
	d. talking with fellow participants	2	4	3	3	3	3	6	0
	e. knowledge gained prior to FT-34	3	4	3	4	3	4	7	11
(61)	Did the operations and procedures at Pantex conflict with the training received at Paducah?								
	a. not in any significant way	2	5	1	6	4	3	7	2
	b. yes, but only on minor points	7	5	4	8	8	4	12	0
	c. yes, on a few significant points	2	2	2	2	0	4	4	2
	d. yes, on many significant points	0	0	0	0	0	0	0	0
	e. yes, on many critical points	0	0	0	0	0	0	0	0

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(62)	(Same as #61, for at Rocky Flats)					SIG			
	a. not in any significant way	5	4	1	8	6	3	9	--
	b. yes, but only on minor points	6	3	5	4	6	3	9	--
	c. yes, on a few significant points	1	3	1	3	0	4	4	--
	d. yes, on many significant points (e = 0)	0	2	1	1	0	2	2	--
(63)	(Same as #61, for at Paducah)								
	a. not in any significant way	7	7	6	8	8	6	14	4
	b. yes, but only on minor points	3	3	1	5	1	5	6	0
	c. yes, on a few significant points	1	2	1	2	2	1	3	0
	d. yes, on many significant points	0	0	0	0	0	0	0	0
	e. yes, on many critical points	1	0	0	1	1	0	1	0
(64)	(Same as #61, for at Oak Ridge)								
	a. not in any significant way	9	8	6	11	10	7	17	3
	b. yes, but only on minor points	2	2	1	3	2	2	4	0
	c. yes, on a few significant points	1	2	1	2	0	3	3	0
	d. yes, on many significant points	0	0	0	0	0	0	0	0
	e. yes, on many critical points	0	0	0	0	0	0	0	1

9. Degree of Material Association

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(65)	Do you believe that the two batches of weapon shapes identical? Yes =	6	2	2	6	5	3	8	--
	? =	3	5	2	6	4	4	8	--
	No =	3	5	4	4	3	5	8	--
(66)	To what degree could you associate the material seen at Rocky Flats with weapons seen at Pantex?								
	a. not at all really	8	6	3	11	8	6	14	--
	b. only that it was weapon material	1	4	3	2	3	2	5	--
	c. material was logically related	3	2	2	3	1	4	5	--
	d. material was right type and amount	0	0	0	0	0	0	0	--
	e. could relate almost to the weapon	0	0	0	0	0	0	0	--
(67)	(Same as #66, for seen at Paducah)								
		SIG							
	a. not at all really	2	1	2	1	0	3	3	--
	b. only that it was weapon material	2	1	0	3	2	1	3	--
	c. material was logically related	7	3	5	5	6	4	10	--
	d. material was right type and amount	0	2	0	2	1	1	2	--
	e. could relate almost to the weapon	1	5	1	5	3	3	6	--

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(68)	(Same as #66, for seen at Oak Ridge)								
	a. not at all really	9	7	4	12	7	9	16	--
	b. only that it was weapon material	1	4	4	1	3	2	5	--
	c. material was logically related (d & e = 0)	2	1	0	3	2	1	3	--
(69)	Considering all that had happened, how accurate did you feel the final weight balances were?								
	a. very accurate, considering	0	0	0	0	0	0	0	--
	b. more accurate than expected	3	1	1	3	3	1	4	--
	c. adequate for test purposes	1	1	0	2	0	2	2	--
	d. less accurate than expected	2	7	3	6	5	4	9	--
	e. very inaccurate, even for the circumstances	6	3	4	5	4	5	9	--

10. Amount of Cross-Talk

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(70)	Inspectors on different teams were asked not to talk about test operations. About how much cross-talk do you think there was?								
	a. none at all	3	0	0	2	2	1	3	5
	b. very little	9	9	6	12	10	8	18	8
	c. a moderate amount	0	3	1	2	0	3	3	2
	d. a great deal								
	e. an excessive amount								
(71)	If test controllers gave the teams information or cues that helped with critical decisions, how often did this occur?								
	a. very often	0	0	0	0	0	0	0	0
	b. sometimes	0	0	0	0	0	0	0	0
	c. occasionally	2	1	1	2	0	3	3	0
	d. rarely	5	5	5	5	6	4	10	8
	e. never	5	7	3	9	7	5	12	8
(72)	If the teams received such information or cues from site personnel or observers, how often did this occur?								
	a. very often	0	0	0	0	0	0	0	0
	b. sometimes	0	0	0	0	0	0	0	0
	c. occasionally	0	1	0	1	0	1	1	1
	d. rarely	7	6	7	6	6	7	13	8
	e. never	4	6	2	8	7	3	10	7

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Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(73)	Outside your own team, from whom did you learn the most (however little)?								
	a. a member of another team	2	3	2	3	1	4	5	--
	b. test controller of another team	0	1	0	1	0	1	1	--
	c. the chief inspector	0	1	1	0	0	1	1	--
	d. a technical or security reviewer	0	0	0	0	0	0	0	--
	e. site personnel	9	7	6	10	9	7	16	--
	f. other: no one	1	1	0	2	2	0	2	--
(74)	To what degree were real/fake calls for the second batch based on information learned in the first batch? (Asked for Pantex)								
	a. not at all	2	2	2	2	2	2	4	0
	b. perhaps to a small degree	3	7	5	5	6	4	10	1
	c. to a considerable degree	2	3	0	6	3	2	5	0
	d. to a large degree for like weapons	4	0	1	3	1	3	4	3
	e. almost entirely for like weapons	1	0	0	1	0	1	1	0
(75)	How often did your team delay "fake" calls to await more definitive information at higher access levels? (Asked for Pantex)								
	a. never consciously	10	8	6	12	8	10	18	1
	b. perhaps once or twice	0	3	0	3	2	1	3	1
	c. quite often	2	1	2	1	2	1	3	2
	d. routinely	0	0	0	0	0	0	0	0
	e. in every suspect case	0	0	0	0	0	0	0	0

11. Attitudes Toward Covert Operations

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(76)	What was your usual reaction to operational errors (e.g., errors in weights given, etc.)?								
	a. accepted as unintentional	7	6	5	7	8	5	13	10
	b. saw as a test of alertness	1	0	0	1	1	0	1	0
	c. saw as deliberate harrassment	1	0	0	1	0	1	1	0
	d. saw as an attempt at evasion	3	6	3	6	3	6	9	5
	e. indicated all weights were false	0	0	0	0	0	0	0	1
(77)	What was your usual reaction to unplanned events (e.g., late arrival of material, etc.)?								
	a. pretty much ignored them	1	3	1	3	2	2	4	2
	b. accepted them as part of game	7	6	5	8	7	6	13	8
	c. believed reasonable events	2	3	1	4	2	3	5	5
	d. believed any evasion indication	1	0	1	0	0	1	1	0
	e. saw as deliberate harrassment	1	0	0	1	1	0	1	2

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(78)	What was your usual reaction to rumors (e.g., that batches had been mixed, etc.)?								
	a. pretty much ignored them	7/3	9/1	5/0	11/4	9/2	7/2	16/4	-
	b. accepted them as part of game	1	0	1	0	0	1	1	-
	c. believed reasonable rumors	0	0	0	0	0	0	0	-
	d. believed any evasion indication	1	0	0	1	0	1	1	-
	e. saw as deliberate harrassment								
(79)	Do you believe that shipments between Pantex and Rocky Flats were evaded or tampered with in any way? Yes =	2	1	2	1	1	2	3	-
	? =	7/3	3/8	4/2	6/9	6/5	4/6	10/11	-
	No =								
(80)	To what degree do you believe that evasion was practiced during shipment between Pantex and Rocky Flats? (Asked for Rocky Flats)			SIG					
	a. no evasion of any kind	2	7	2	7	5	4	9	2
	b. no deliberate evasion	6/2	1/3	1/4	6/1	3/1	4/4	7/5	0/1
	c. little if any evasion	1	1	1	1	2	0	2	1
	d. convinced there was some evasion	0	0	0	0	0	0	0	0
	e. convinced there was much evasion								
(81)	(Same as #80 for shipment to Paducah)								
	a. no evasion of any kind	2	5	2	5	3	4	7	1
	b. no deliberate evasion	5/3	2/3	1/2	6/4	3/4	4/2	7/6	2/0
	c. little if any evasion	2	3	3	1	2	2	4	3
	d. convinced there was some evasion (e = 0)								
(82)	(Same as #80 for shipment to Oak Ridge)								
	a. no evasion of any kind	0	5	1	4	2	3	5	1
	b. no deliberate evasion	7	2/3	2	7/3	5/3	4/3	9/6	0
	c. little if any evasion	3	3	3	3	3	3	6	0
	d. convinced there was some evasion	1	2	2	1	1	2	3	3/1
	e. convinced there was much evasion	0	0	0	0	0	0	0	1
(83)	Did you believe that the two batches of plutonium material were mixed together at the foundry? (Asked for Rocky Flats)								
	a. no, it was not even suggested	2	1	1	2	1	2	3	3
	b. no, it was merely rumor	0	0	0	0	0	0	0	1
	c. unknown or unsure	5/4	10/1	4/3	11/2	8/2	7/3	15/5	0
	d. yes, but it was unintentional	1	0	0	1	1	0	1	0
	e. yes, it was deliberate evasion								
(84)	Do you believe that there was any evasion in the foundry operation at Rocky Flats? Yes =	3	4	3	4	2	5	7	-
	? =	7/2	7/1	4/1	10/2	8/2	6/1	14/3	-
	No =								
(85)	Do you believe that there was any evasion in the foundry operation at Oak Ridge? Yes =	2	1	1	2	1	2	3	-
	? =	6/4	10/1	6/1	10/4	8/3	8/2	16/5	-
	No =								

12. Usefulness of Specific Techniques

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(86)	With respect to efficiency and accuracy of results, how much advantage to high access teams was the ability to photograph on walkthroughs?								
	a. big advantage to results	5	10	5	10	7	8	15	6
	b. some advantage to results	4	1	3	2	1	4	5	4
	c. only made it more interesting	0	0	0	0	0	0	0	2
	d. only allowed a prettier report	3	0	0	3	3	0	3	3
	e. may have been distracting	0	1	0	1	1	0	1	1
(87)	(Same as #86, re taking of measurements)								
	a. big advantage to results	1	2	0	3	2	1	3	3
	b. some advantage to results	7	9	8	8	7	9	16	8
	c. only made it more interesting	1	0	0	1	1	0	1	2
	d. allowed a more precise report	3	2	1	4	2	3	5	2
	e. may have been distracting	0	0	0	0	0	0	0	2
(88)	(Same as #86, re using a geiger counter)								
	a. big advantage to results	2	5	2	5	2	5	7	1
	b. some advantage to results	10	6	5	11	10	6	16	4
	c. only made it more interesting	0	0	0	0	0	0	0	5
	d. did not show anything important	0	0	0	0	0	0	0	2
	e. may have been distracting	0	1	1	0	0	1	1	4
(89)	(Same as #86, re talking to site personnel)								
	a. big advantage to results	1	1	1	1	0	2	2	-
	b. some advantage to results	7	5	3	9	6	6	12	-
	c. only made it more interesting	3	4	2	5	4	3	7	-
	d. allowed a more personal report	1	1	1	1	2	0	2	-
	e. may have been distracting	0	1	1	0	0	1	1	-
(90)	(Same as #86, re participating in operations)								
	a. big advantage to results	4	6	4	6	6	4	10	-
	b. some advantage to results	5	5	3	7	3	7	10	-
	c. only made it more interesting	3	0	1	2	2	1	3	-
	d. allowed a more personal report	0	1	0	1	1	0	1	-
	e. may have been distracting	0	0	0	0	0	0	0	-

SIG: Column In vs. In in #86

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(91)	Was the requirement that high access teams talk to site personnel only through an "interpreter" reasonable?								
		SIG							
	a. no, and it was not followed	2	1	1	2	2	1	3	-
	b. no, it was forced and unrealistic	3	0	2	1	1	2	3	-
	c. indifferent or unsure	3	3	1	5	2	4	6	-
	d. yes, but it was not followed	1	0	0	1	0	1	1	-
	e. yes, as experimental control	2	1	1	2	2	1	3	-
	f. yes, it was good simulation	1	7	3	5	5	3	8	-
(92)	Did the stringent safety requirements cause you any problems or discomfort at Rocky Flats?								
	a. none at all	8	8	5	11	8	8	16	-
	b. slight discomfort or concern	3	3	3	3	3	3	6	-
	c. it was difficult to concentrate	0	1	0	1	1	0	1	-
	d. it was very nerve-wracking	0	0	0	0	0	0	0	-
	e. it was extremely unnerving	0	0	0	0	0	0	0	-
	f. other: information was difficult to obtain	1	0	0	1	0	1	1	-

13. Attitudes Toward Possible Treaty

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(93)	Initially, what was your opinion of the proposed treaty? (#10 in questionnaire)								
	a. treaty is extremely unrealistic	5	2	1	6	5	2	7	4
	b. treaty is generally undesirable	1	2	1	2	2	1	3	3
	c. indifferent or unsure	1	0	0	1	0	1	1	1
	d. treaty is possibly of political value	4	6	4	6	2	8	10	6
	e. treaty is an eventual necessity	1	3	2	2	3	1	4	3
	f. other: Some effort must be made	1	0	0	1	0	1	1	0
(94)	Now, what is your attitude toward the proposed treaty? (#154 in questionaire)								
	a. treaty is extremely unrealistic	4	2	2	4	5	1	6	2
	b. treaty is generally undesirable	3	3	1	5	3	3	6	2
	c. indifferent or unsure	1	0	0	1	0	1	1	1
	d. treaty is possibly of political value	3	5	4	4	2	6	8	7
	e. treaty is an eventual necessity	1	3	2	2	3	1	4	5
	f. other: better than nothing	1	0	0	1	0	1	1	0

Question No.			Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(95)	Did you believe that conditions could be set up that would provide adequate conviction that weapons were being destroyed, yet protect critical classified data? (#11 in questionnaire)									
	a. yes, of course		1	1	1	1	2	0	2	4
	b. yes, but not ala FT-34		4	1	2	3	2	3	5	2
	c. indifferent or unsure		1	1	0	2	0	2	2	1
	d. not without further study		4	7	4	7	6	5	11	9
	e. not under any conditions		2	2	1	3	2	2	4	2
(96)	Do you now believe ... (same as #95). (Was #155 in questionnaire)									
	a. yes, of course		3	0	2	1	3	0	3	5
	b. yes, but not ala FT-34		2	2	2	2	1	3	4	3
	c. indifferent or unsure		2	0	0	2	1	1	2	2
	d. not without further study		4	7	2	9	4	7	11	5
	e. not under any conditions		2	3	2	3	3	2	5	1
(97)	Having completed your functions for the test, do you now believe that the objectives were sound and well-planned?	Yes =	2	5	2	5	3	4	7	8
		? =	4	5	3	6	5	4	9	3
		No =	6	2	3	5	4	4	8	5
(98)	Do you now think that the test satisfied its objectives, whether well-planned or not?	Yes =	4	3	2	5	2	5	7	4
		? =	6	8	4	10	8	6	14	0
		No =	2	1	2	1	2	1	3	2
(99)	Do you think the test results will provide a reasonable basis and sufficient safeguards for entering a proposed treaty?	Yes =	4	2	2	4	3	3	6	5
		? =	3	4	1	6	3	4	7	6
		No =	5	6	5	6	6	5	11	5

14. Best Access Level for a Treaty

Question No.			Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(100)	Which access level would be BEST for Pantex-type inspections in a real and fair treaty situation?	A_1 =	1	3	1	3	2	2	4	0
		A_2 =	2	1	0	3	0	3	3	0
		A_3 =	2	5	2	5	4	2	6	1
		A_4 =	7	3	5	5	6	4	10	3
(101)	(Same as #100, for Rocky Flats)	Low =	1	1	0	2	0	2	2	2
		High =	11	11	8	14	12	10	22	2
		SIG								
(102)	(Same as #100, for Paducah)	A_1 =	0	3	0	3	1	2	3	0
		A_2 =	1	2	1	2	3	0	3	3
		A_3 =	3	5	2	6	3	5	8	1
		A_4 =	8	2	5	5	5	5	10	0
(103)	(Same as #100, for Oak Ridge)	Low =	1	1	0	2	0	2	2	0
		High =	11	11	8	14	12	10	22	4
	SUM of 100-103, $A_1 + A_2$ = Low	Low =	6	11	2	15	6	11	51	5
	$A_3 + A_4$ = High	High =	42	37	46	33	42	37	237	11

15. Best Team Size for a Treaty

Question No.			Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(104)	What do you think would be the optimum number of team members for Pantex-type operations?	2 =	0	0	0	0	0	0	0	1
		3 =	11	7	7	11	11	7	18	3
		4 =	1	4	1	4	1	4	5	0
		5 =	0	1	0	1	0	1	1	0
(105)	(Same as #104, for Rocky Flats)	1 =	0	1	0	1	1	0	1	0
		2 =	2	5	4	3	3	4	7	2
		3 =	8	4	3	9	6	6	12	3
		4 =	1	2	1	2	1	2	3	1
(106)	(Same as #104, for Paducah)	2 =	6	2	2	6	5	3	8	0
		3 =	5	8	5	8	7	6	13	2
	NOTE: One TC said "8"	4 =	1	1	1	1	0	2	2	1
		5 =	0	1	0	1	0	1	1	0
(107)	(Same as #104, for Oak Ridge)	1 =	0	1	0	1	1	0	1	0
		2 =	4	4	3	5	3	5	8	2
		3 =	6	6	4	8	6	6	12	2
		4 =	1	1	1	1	1	1	2	0
	SUM of 104-107:	1 =	0	2	0	2	2	0	2	0
		2 =	12	11	9	14	11	12	23	5
		3 =	30	25	19	36	30	25	55	10
		4 =	4	8	4	8	3	9	12	2
		5 =	0	2	0	2	0	2	2	0
		8 =	0	0	0	0	0	0	0	1

16. Time Required for Questionnaire

Question No.		Teams L	Teams M	Size 2	Size 4	Access H	Access L	Total In	Total TC
(108)	About how many minutes did you use to complete this questionnaire? (Included both training and conviction factors) (Significant difference at $t_{0.05}$)	Means only; range = 25-150							
		68	60	47	72	59	65	64	-
				SIG					

C. RESULTS OF OBJECTIVE QUESTION RESPONSES

1. Responses to the first question in chapter II show that both inspectors and test controllers knew very little about FT-34 prior to the Paducah training. None had any detailed information.

2. Most participants were test-naive; that is, they had not participated in similar tests before and particularly not in tests having anything to do with nuclear weapons. Only five inspectors and four test controllers had participated in similar tests, and only one inspector and one test controller had extensive test experience. Of the inspectors who had field test experience, several had participated in more than one test.

3. In terms of relevant experience, prior knowledge, and attitudes toward the program, the various teams of inspectors were well balanced, and there did not seem to be any significant differences among the four groups of test controllers.

4. Overall, the inspectors were not familiar with the weapons introduced at Pantex. Eight inspectors did not recognize any weapons, and only two recognized more than four. Less than half of the inspectors had worked with any of the weapons employed.

5. Most of the inspectors felt that prior knowledge played no part in their own votes on real/fake calls, but that prior knowledge heavily influenced the real/fake calls of others.

6. The bulk of inspectors were not at all familiar with the material inspected at Rocky Flats or Oak Ridge. A few had "seen similar material," but only a few had worked with similar material. One in three was unfamiliar with material inspected at Paducah.

7. About half of the inspectors felt "indifferent or unsure" about being assigned to FT-34 prior to training, but most were "very willing" to participate once they knew what it was all about. This was a significant shift. Most test controllers were pleased to be so assigned and were very willing to participate. Inspectors and test controllers saw their assignments as welcome opportunities or breaks in routine and were initially interested in test procedures.

8. Half of the inspectors but few test controllers felt unsure or inadequately qualified for their own assignment; both groups agreed that test controllers in general were "adequately qualified," but they showed

considerable uncertainty over whether the inspectors in general were "adequately qualified."

9. Low-access teams were significantly less satisfied with the selection of their teams, the selection of their team captains, and the performance of their teams than were the high-access teams. But the inspectors and test controllers were "generally satisfied" with the selection and performance of all participants.

10. The personal relations between team members seemed to be "friendly" in nearly all cases, both during test operations and off duty; although three members of low-access teams felt the relations were "cool or bickering" during operations.

11. Most inspectors were satisfied with their team assignments, but more than half of the members of low-access teams would rather have been assigned to higher access teams. This difference was significant.

12. The LIMA teams were emphatic about the inadequacy of logistic and administrative support at Pantex, but the MIKE teams felt this support was "adequate." The inspectors as a whole agreed that such support was much better at Rocky Flats, still better at Paducah, and best at Oak Ridge. These differences were all significant except between Rocky Flats and Paducah.

13. The inspectors agreed that the amount of time allowed for operations at each site was "about right," except for Paducah where it was felt to be "too long." They were most satisfied with Oak Ridge.

14. The inspectors felt their ability to detect classified information was "adequate or unsure" (interviews suggest they were unsure). The classified information guidelines in annex D were not employed in a consistent manner; most used part of the guidelines or adjusted them to the situation, and the four-man teams depended more heavily upon the guidelines than did the two-man teams.

15. About half the inspectors felt their teams were effective in detecting and listing classified items at all sites; the other half were unsure or felt inadequate. Low-access teams felt significantly less effective than high-access teams at both Paducah and Oak Ridge.

16. The inspectors felt they were "adequately" to "poorly" qualified to determine whether real weapons were being destroyed and that the guidelines in annex D were only moderately helpful. Two-man teams depended significantly less upon those guidelines than did the four-man teams.

17. The inspectors and test controllers agreed that the teams were "cautious" about all conclusions regarding evasion; the low-access teams were somewhat more suspicious than high-access teams.

18. The inspectors felt their teams were "reasonably effective" at detecting evasion at Pantex and that their effectiveness was "adequate or unsure" at Paducah and was "quite ineffective" at both Rocky Flats and Oak Ridge. Differences between Pantex and Rocky Flats and Pantex and Oak Ridge were significant. Four-man teams were significantly more confident of their effectiveness at Pantex than the two-man teams were.

19. Inspectors and test controllers agreed that "the workload was about right," throughout the test; although two-man teams tended to feel there was too much to do, and four-man teams that there was too little. This difference was not significant however.

20. Inspectors and test controllers agreed that the work was generally evenly distributed among team members, and most inspectors felt that they had done their fair and equal share. A few felt that they did more than their share. Team members tended to share responsibility for filling out data forms on the MIKE, two man and high-access teams; but one member of the team kept most records on the LIMA, four-man and low-access teams. Test controllers felt that one team member kept most records in most cases.

21. The team captain seemed to have about the same influence on team results as other team members in most cases, but a somewhat stronger influence on LIMA, four-man and low-access teams. The differences were not significant.

22. Inspectors and test controllers agreed that about 74% of the teams' decisions was reached by unanimous agreement, 10% by majority rule, 5% decided by team captain, 3% dictated by team captain, and 8% dictated by a team expert. Even splits were more prevalent among LIMA low-access teams, and team experts were more influential among MIKE, two-man and low-access teams.

23. Inspectors and test controllers agreed that the teams had no prior information or that the training information did not conflict in any significant way with prior knowledge. The on-site training sessions were deemed to be much more helpful than the Paducah course and related training aids. "Talking with fellow participants" and " knowledge gained prior to FT-34" were deemed the least helpful sources of information. The LIMA teams felt the Paducah course was the least helpful source compared to on-site training, the manuals, talking, or prior knowledge. Test controllers differed significantly from inspectors by finding prior knowledge to be the least helpful.

24. Inspectors and test controllers generally felt that the training information conflicted with procedures at Pantex and Rocky Flats, but only on minor points and "not in any significant way" at either Paducah or Oak Ridge. Low-access teams felt there were significantly more conflicts than did high-access teams at Rocky Flats.

25. The inspectors were unsure whether or not the two batches of shapes were identical at Pantex and could not associate the material seen at Rocky Flats with weapons seen at Pantex. Most felt the material at Paducah was logically related to the weapons seen at Pantex, and MIKE teams were significantly more sure of this than LIMA teams. And most could not associate the materials at Oak Ridge with Pantex weapons at all.

26. Most inspectors felt that the final weight balances were less accurate than expected or very inaccurate; only four felt they were more accurate than expected, and interviews suggested that their expectations were low.

27. Inspectors and test controllers agreed that there was "very little" crosstalk between teams and that test controllers, site personnel, or observers "rarely" gave the teams information that helped with critical decisions. It is notable, however, that there was some crosstalk. Inspectors felt they learned the most illicit information from site personnel (67%, and 20% from other teams).

28. Inspectors felt that real/fake calls for the second batch were based on information learned in the first batch "perhaps to a small degree." LIMA and four-man teams felt it might be a considerable or large degree for like weapons. They "never consciously" delayed fake calls to await more information at higher access, and only a quarter of the inspectors said that this happend "once or twice" or "quite often."

29. Inspectors and test controllers agreed that the usual reaction to operational errors (e.g., errors in weights) was to "accept as unintentional"; although about 38% saw such errors as attempted evasion. They also tended to accept "unplanned events" (e.g., late arrival of material) as "part of the game," and tended to "pretty much ignore" rumors.

30. The inspectors were unsure whether shipments were tampered with in any way between Pantex and Rocky Flats; but most felt that there was little or no deliberate evasion in any of the shipments; 41% felt there was little or some evasion in shipments to Paducah, and 39% felt the same about shipments to Oak Ridge. Four-man teams were significantly more sure there was no evasion at Pantex than two-man teams were.

31. Most were unsure whether the two batches had been mixed together at the Rocky Flats foundry: 25% thought they were mixed. Neither team could tell (62%) whether there was any evasion in the foundry operations at either Rocky Flats or Oak Ridge.

32. The bulk of the inspectors (62%) felt that the ability to take photographs during walkthroughs was "a big advantage to results"; and that taking of measurements, using a Geiger counter, talking to site personnel, and participating in operations were of "some advantage to results" (80%, 95%, 58%, and 83%, respectively). Photography was significantly more advantageous than measuring or talking, and the inspectors saw using a Geiger counter as significantly more of an advantage than did the test controllers, who agreed with the inspector ratings of photography and measuring.

33. The inspectors were not agreed on whether the requirement that high-access teams talk to site personnel only through an "interpreter" was reasonable; but the LIMA teams thought it was not or were unsure, whereas the MIKE teams thought it was "good simulation." This difference was significant.

34. About 67% of the inspectors said that the stringent safety requirements at Rocky Flats caused no problems or discomfort, and 25% expressed slight discomfort or concern.

35. The initial and post test attitudes toward the proposed treaty were mixed but did not change significantly. Only one inspector and one test controller were indifferent or unsure, and there was about an even split between positive and negative feelings toward such a treaty. The largest body of agreement (39%) was on "treaty may be of possible political value."

36. There was more agreement on the question: "Do you believe that conditions could be set up that would provide adequate conviction that weapons were being destroyed and yet protect critical classified data?" About 58% said "not without further study," and 15% said "not under any conditions." There were no real differences between initial and post test attitudes here either. Test controllers were slightly less negative than inspectors on the post test question.

37. All participants were essentially undecided on the post test questions regarding the soundness of test objectives, whether the test satisified its objects, and whether the results would contribute to decisions on the proposed treaty. "Yes-?-no" responses were about evenly split in all three cases.

38. The inspectors disagreed on which access level would be BEST for Pantex-type operations in a "real and fair treaty situation" (42%=A_4, 25%=A_3). Ninety-two percent preferred high-access to low-access for Rocky Flats-and Oak Ridge-type operations. Forty-two percent preferred A_4 and 33% preferred A_3 for Paducah-type operations. This question was intended to refer to equal access for both parties to a treaty. It is likely that the inspectors thought more in terms of obtaining than of protecting information.

39. There was more concrete agreement on what could be the "optimum number of team members" for site specific operations. Fifty-seven percent of all inspector responses favored a three-man team, 24% a two-man, and 12% a four-man team. There were no appreciable differences between sites or types of teams. Test controller responses were comparable in all respects.

40. It is interesting to note that individuals on two-man teams required a significantly shorter time to complete the questionnaires than did those on four-man teams; the averages were 47 and 72 minutes. This probably reflects the generally more negative attitudes of two-man team members evidenced elsewhere.

D. EFFECTS OF QUESTIONNAIRE FINDINGS ON FIELD TEST RESULTS

The foregoing results provide considerable insight into the detailed attitudes, opinions, and experiences of the inspectors and test controllers employed in FT-34. Those attitudes, opinions, and experiences can not be related directly to the field test results, however, they do tend to confirm the validity of assumptions made in the interpretation of those results.

1. In the opinion of the participants, the inspector teams were well balanced in both technical knowledge and proficiency. There is no reason to expect that any of the differences obtained in the field test results are attributable to differences in team composition.

2. The participants were generally agreed that the procedures of the field test program were "about right" in such basic matters as the time allowed for operations at each test site, the workload of each team, distribution of the work among team members, and equipment and support provided for each access level. Thus, no differences in the obtained field test results can be related to team specific differences in these areas.

3. The attitudes of the test participants toward such basic matters as a possible treaty of the type predicated for FT-34 test objectives, test conditions, test procedures, or fellow participants tended to be normally distributed and were probably representative of military officers in general. The median values of measured attitudes were neutral with respect to test objectives; pretest and post test attitudes were essentially identical; and these attitudes, therefore, did not bias the field test results in any way.

4. Test participant assessments of their own qualifications with respect to their duties in the test program may limit generalization of the overall field test results, but those assessments did not differ systematically for the different teams and no differences in the obtained field test results can be related to team-specific differences in qualifications or confidence therein.

5. The usefulness of this type of questionnaire data would be increased if similar questionnaires were used to assess relevant attitudes, knowledge, and qualifications (a) prior to team assignments, (b) after training but prior to field performance, and (c) after field performance. This procedure would help avoid possible biases in team assignments and would allow a more definitive comparison of pretest and post test attitudes. A single questionnaire could serve both (a) and (b), if team assignments could be delayed that long. It is recommended that this procedure be seriously considered for future programs.

III. ATTITUDES TOWARD PADUCAH TRAINING

A. COVERAGE

This chapter presents the opinions and attitudes of FT-34 participants toward the 2-week training course conducted at Test Headquarters prior to field test operations. These opinions were solicited by two means in the debriefing questionnaires: (1) from ratings of given training topics, and (2) inspector responses to three essay questions on the training.

B. TRAINING TOPIC RATINGS

1. Instructions. In section B of the original Debriefing Booklet, inspectors were asked to answer two questions for each of 24 topics covered during the training, and the test controllers answered one of these same questions for the same topics. The ratings form and instructions employed are shown in figure E-4. Participants responded to the form by circling the appropriate symbol in each column for each of the two questions.

2. Results. The Yes-?-No votes were tabulated across LIMA versus MIKE teams, two-man versus four-man teams, and high-access versus low-access teams. The few significant differences noted are listed below:

a. MIKE teams were significantly more favorably disposed than LIMA teams toward the initial training in (1) weapon type and use characteristics and (2) weapon shape and size characteristics. This may have been because the MIKE teams were a little more naive on these subjects than the LIMA teams, and/or because the training was improved for the MIKE team.

b. The MIKE teams were significantly more satisfied with the adequacy of the training than were the LIMA teams (239 to 194 total yeses), possibly for the same reasons as above.

c. There were no significant changes in the responses to individual topics, but there were significantly fewer "yeses" to the second question (fill need) than to the first (adequate when given) for both MIKE and LIMA teams (totals = 239 to 153 and 191 to 157, respectively).

FIGURE E-4. Evaluation of Training Form

To evaluate the two-weeks training at Paducah, please answer the following questions for each training topic listed below. The questions are:

Did the training seem adequate at the time it was given?

Did the training fill your needs in this area throughout the test program?

	Training Topic Area	Seem adequate when given?	Did it fill your needs?
12.	Cloud Gap public relations	Y ? N	Y ? N
14.	Test objectives and decision criteria	Y ? N	Y ? N
16.	Design of the test program	Y ? N	Y ? N
18.	Inspector functions and procedures	Y ? N	Y ? N
20.	Test controller functions and procedures	Y ? N	Y ? N
22.	Reviewer and classifier functions	Y ? N	Y ? N
24.	Weapon type and use characteristics	Y ? N	Y ? N
26.	Weapon shape and size characteristics	Y ? N	Y ? N
28.	Weapon component characteristics	Y ? N	Y ? N
30.	Classified information guidelines	Y ? N	Y ? N
32.	Visual inspection procedures	Y ? N	Y ? N
34.	What to look for in walkthroughs	Y ? N	Y ? N
36.	Taking and use of photographs	Y ? N	Y ? N
38.	Use and handling of data forms	Y ? N	Y ? N
40.	Geiger counter use and operation	Y ? N	Y ? N
42.	Neutron counter use and operation	Y ? N	Y ? N
44.	Spectroscopy use and operation	Y ? N	Y ? N
46.	X-Ray film interpretation	Y ? N	Y ? N
48.	High-explosive and waste disposal	Y ? N	Y ? N
50.	Uranium assay purposes and procedures	Y ? N	Y ? N
52.	Plutonium assay purposes and procedures	Y ? N	Y ? N
54.	Weight balance accounting	Y ? N	Y ? N
56.	Test administration and logistics	Y ? N	Y ? N
58.	Data package handling and review	Y ? N	Y ? N

The MIKE and LIMA teams rated the individual items almost the same in all cases on the "fill needs" question.

d. High-access teams were significantly more favorably disposed than low-access teams toward the degree to which neutron counter use and operation training filled their needs.

e. The low-access teams were significantly less satisfied with the training on both questions than were the high-access teams; this probably reflects the dissatisfaction with their role expressed on other questions in chapter III.

f. There were essentially no differences between two-man and four-man teams in their ratings of these training topics.

3. Training Topic Rating Tabulation. The overall results from the inspectors and test controllers are shown in figure E-5, where the training topics are listed in order of the degree to which they satisfied inspector needs throughout the test program. The order is indicative of the general degree of satisfaction. It may be noted that 50 percent or more of the 24 inspectors thought that every topic was adequately covered at the time the training was given, and that 80 percent or more were satisfied with the coverage of half of the topics. Similarly, 50 percent or more of the inspectors were satisfied that the training filled their needs for all but six of the topics, and 50 percent or more of the test controllers felt the same for all but seven of the topics. It could be argued that the topics for which fewer were satisfied were the more critical, but they were also the more difficult to teach thoroughly in a brief time. Significant differences, at the 0.05 level, are indicated by asterisks between the columns where appropriate.

C. ESSAY QUESTIONS ON TRAINING

In section III-A of the Debriefing Booklet, the 24 inspectors were asked three open-end essay questions on the Paducah training. In the results listed below, each question is stated, in turn, just as it was in the questionnaire; a quantitative tabulation of responses is given; and representative comments of the inspectors are listed. These tabulations and comments were accumulated in accordance with procedures explained in more detail in chapter V. The results seem to be self-explanatory.

FIGURE E-5. Results of Training Topic Ratings

For each training topic, inspectors answered two questions: (1) did the training seem adequate at the time it was given? And (2) did it satisfy your needs throughout the test program? Test controllers answered only the second question. Total scores are shown. Ranks are based on (Y-N)/n, where n is either 24 inspectors or 15 test controllers (one did not answer these questions). Topics are listed in decreasing order in the center column.

Training Topic	Inspectors Adequate Y	?	N		Inspectors Satisfied Y	?	N		Test Cont. Satisfied Y	?	N	Respective Rank Order		
Cloud gap public relations	21	3	0		21	2	1		15	0	0	1+	1	1
Geiger counter use & operation	20	2	2		20	1	3		11	2	2	8+	2	7+
Spectroscopy use & operation	18	4	2		17	6	1		8	6	1	13	3	14+
Weight balance accounting	20	2	2		16	2	6		9	5	1	8+	8+	11
Test administration & logistics	21	0	3		15	6	3		13	2	0	8+	4+	3
Visual inspection procedures	18	2	4		13	6	5		13	1	1	16+	12	4
High explosive & waste disposal	21	3	0		15	6	3		7	7	1	1+	4+	16
Reviewer & classifier functions	20	3	1		15	5	4		10	3	2	4+	6	11
Taking & use of photographs	20	3	1		14	6	4		12	2	1	4+	8+	5+
Data package handling & review	19	3	2		14	6	4		10	0	5	11	8+	17
Neutron counter use & operation	19	5	0		14	6	4		5	9	1	4+	8+	18+
Test control functions/procedures	20	2	2		15	3	6		7	1	7	8+	11	23+
Uranium assay purposes/procedures	18	3	3		14	2	8		4	9	2	15	13	20+
Inspector functions & procedures	20	3	1	*	11	5	8		10	3	2	4+	18+	11
Plutonium assay purposes/proced.	18	4	2		13	3	8		5	7	3	13	14	20+
Test objectives & criteria	16	5	3		11	6	7	*	14	1	0	18+	16	2
What to look for in walkthroughs	17	3	4		11	6	7		12	2	1	18+	16	5+
Design of the test program	17	4	3		10	8	6	*	12	0	3	16+	16	7+
Use & handling of data forms	19	2	3		12	3	9		8	0	7	13	18+	22
Classified information guidelines	17	2	5		10	4	10		7	1	7	20	20	23+
Weapon shape & size characterist.	14	6	4		8	6	10	*	11	1	3	21	22+	11
Weapon type & use characteristics	14	5	5		8	6	10	*	11	1	3	22	22+	11
X-Ray film interpretation	11	8	5		8	7	9		5	9	1	24	21	18+
Weapon component characteristics	12	8	4		7	6	11	*	10	2	3	23	24	14+

NOTE: A significant difference between groups is indicated with an asterisk.

NOTE: A plus sign indicates a rank intermediate between two whole numbers.

1. Question: In your opinion, did the 2 week training session at Paducah adequately prepare you for the inspection operations you later performed? If you consider the training insufficient or inadequate, list how and show why.

Results:		
	Yes	3
	Yes, but	4
	No	17

2. Question: If you had been setting up this training program, how would you have done it differently? What suggestions do you have for altering the training to better conform with field requirements?

Results:		
	See above comments	3
	No change	2
	Train at sites	12
	Personnel selection	3
	Other	4

3. Question: Add any other comments you may have regarding the training.

Results:		
	None	16
	See team leader's report	3
	Other	5

NOTE: Typical responses to essay questions may be found in appendices to this annex.

D. RESULTS OF PADUCAH TRAINING QUESTIONS

1. Most participants were satisfied with most of the training. It may be noted that 50 percent or more of the 24 inspectors thought that every topic was adequately covered at the time the training was given, and 80 percent or more were satisfied with the coverage of half of the topics. Similarly, 50 percent or more of the inspectors were satisfied that the training filled their needs for all but six of the topics, and 50 percent or more of the test controllers felt the same for all but seven of the topics. It could be argued that the topics for which fewer were satisfied were the more critical, but they are also the more difficult to teach thoroughly in a brief time.

2. MIKE teams were significantly more favorably disposed than LIMA teams toward the initial training in (a) weapon type and use characteristics and (b) weapon shape and size characteristics.

3. The MIKE teams were significantly more satisfied with the adequacy of the training when given than were the LIMA teams (239 to 191 total yeses).

4. High-access teams were significantly more favorably disposed than low-access teams toward the degree to which neutron counter use and operation training filled their needs.

5. There were no significant changes in the responses to individual topics, but there were significantly fewer "yeses" to the second question (fill need) than to the first (adequate when given) for both MIKE and LIMA teams (totals = 239 to 153 and 191 to 157, respectively). The MIKE and LIMA teams rated the individual items almost the same in all cases on the "fill needs" question.

6. The low-access teams were significantly less satisfied with the training on both questions than were the high-access teams; this response probably reflects the dissatisfaction with their role expressed by the low-access teams on other questions. There were essentially no differences between two- and four-man teams.

7. Test controllers were significantly more satisfied than inspectors on each of the following topics: test objectives and criteria; design of the test program; weapon shape and size characteristics; weapon type and use characteristics; and weapon component characteristics (none of which were as important to the test control role). And the total number of "yeses" to these topics on the "fill need" question, indicated that the test controllers were significantly more satisfied than inspectors with the training as a whole.

8. In response to essay questions, 71 percent of the inspectors expressed the feeling that the training course did not adequately prepare them for their inspection duties. This seemed to be primarily due to the fact that many of the inspectors felt so inadequately qualified that only much longer, more intensive training would have sufficed.

9. Twelve, or 50 percent, of the inspectors felt that the training would have been better if it had been conducted entirely at the four test sites immediately before each set of site-specific operations. Too much was forgotten between the Paducah training and later site operations.

E. EFFECTS OF TRAINING ON TEST RESULTS

The training doubtlessly influenced the field test results. Those results would have been different if there had been no training or if the training had differed markedly in duration, coverage, or depth. The following conclusions are supported by the data provided in this chapter.

1. All teams received the same training except for slight differences in emphasis or details between the LIMA and MIKE training. Although the LIMA and MIKE teams differed significantly in their evaluations of the training "when given," they were equally satisfied with the "fill needs" aspects of the training. Thus, the differences in training, if any, probably bore no relationship to any difference noted in the performance of the different teams.

2. The low-access and two-man teams were less satisfied with the training than were the high-access and four-man teams. Inasmuch as the teams received the same training, those differences probably reflect dissatisfaction resulting from the more intense workload of the two-man teams or the lack of information available to the low-access teams.

3. The most consistent criticism of the training program, as evidenced in many places in this annex, was that the various portions of the training program should have been conducted at the working sites just prior to application. Although less efficient administratively, this procedure would ensure maximum retention and application of training information; the procedure is recommended for future, similar programs.

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IV. RATINGS OF CONVICTION FACTORS

A. GENERAL

1. Coverage. This chapter presents the results of ratings by the 24 inspectors of 48 conviction factors at each of the four field test sites. The ratings obtained are not necessarily related to specific real/fake calls or to the conviction of the inspectors when they made those calls (which is discussed in annex F). But the ratings do indicate the relative degree to which each of the rated factors contributed to the inspectors' general belief that real weapons or weapon materials were being processed during the operations at each site.

2. Instructions. The ratings were obtained as part of the debriefing questionnaire described in chapter I. The instructions and form for the ratings are shown in figure E-6, which is a reproduction of the form used for Pantex conviction factors. Similar forms were used for the other three sites. The first 12 items in figure E-6 were repeated at all four sites, and the items for Rocky Flats and Oak Ridge were identical. Thus, a total of 192 factors were evaluated or, excluding duplications, 104 unique factors.

B. RESULTS

The ratings of all 24 inspectors were summed algebraically for each of the 192 factors, and the sum was divided by 24 to obtain a mean rating for each factor at each site. The results are provided in figures E-7 to E-10. In each figure, the factors are listed in order of decreasing mean values. Positive-valued items tended to increase conviction; negative-valued items tended to decrease conviction. Thus, the extremes in each list were the most influential in FT-34 and would probably be the most useful to control or manipulate in future similar tests, simulations, or applications. A rating of ± 0.50 or more is significantly different from a zero or indifferent rating.

In a separate analysis, the ratings were summed algebraically across LIMA versus MIKE teams, two-man versus four-man teams, and high-access versus low-access teams. Statistical tests (described in chapter I) were conducted to determine the degree of

FIGURE E-6. Sample Conviction Factor Form

Using the scale at right, circle a number opposite each factor, to indicate the degree to which that factor influenced your belief that real weapons were introduced at Pantex. If low access, indicate the influence you would expect the "Higher Access Factors" to have. (These are questions #91 to 138).

-2 = reduced belief greatly
-1 = reduced belief
0 = neutral, unsure
1 = increased belief
2 = increased belief greatly

Facility Walkthrough Factors		Higher Access Factors	
Type of facility construction	-2-1 0 1 2	Lack of weapon access doors	-2-1 0 1 2
General layout of facility	-2-1 0 1 2	Lack components behind doors	-2-1 0 1 2
General condition of facility	-2-1 0 1 2	Realistic items behind doors	-2-1 0 1 2
Explosion proofing features	-2-1 0 1 2	Marks or labels behind doors	-2-1 0 1 2
Environment control features	-2-1 0 1 2	Component obviously removed	-2-1 0 1 2
Weapon-associated debris	-2-1 0 1 2	Presence of radioactivity	-2-1 0 1 2
Apparent security precautions	-2-1 0 1 2	High geiger counter readings	-2-1 0 1 2
Apparent safety precautions	-2-1 0 1 2	High neutron counter readings	-2-1 0 1 2
Protective clothes or equip.	-2-1 0 1 2	Credible location of readings	-2-1 0 1 2
Standard equipment evident	-2-1 0 1 2	Meaningful gamma spec reading	-2-1 0 1 2
Tools or fixtures evident	-2-1 0 1 2	Analysis of X-ray film	-2-1 0 1 2
Unusual equipment evident	-2-1 0 1 2	Part clarity in X-ray film	-2-1 0 1 2

Weapon Factors		Miscellaneous Factors	
Weapon size/shape relation	-2-1 0 1 2	Taped out weapon features	-2-1 0 1 2
Weapon weight to size ratio	-2-1 0 1 2	Two or more weapons alike	-2-1 0 1 2
Rivet pattern/station breaks	-2-1 0 1 2	Differences btwn like weapons	-2-1 0 1 2
Paint job of weapon	-2-1 0 1 2	Same weapons in second batch	-2-1 0 1 2
Labeling evident on weapon	-2-1 0 1 2	Weapon handling by site pers.	-2-1 0 1 2
Environment protect features	-2-1 0 1 2	Gen. behavior of site pers.	-2-1 0 1 2
Delivery vehicle connections	-2-1 0 1 2	Site product control practice	-2-1 0 1 2
Presence and type of fins	-2-1 0 1 2	Mistakes by site personnel	-2-1 0 1 2
Presence of radome or baroport	-2-1 0 1 2	Behavior of test controller	-2-1 0 1 2
Arming and safing features	-2-1 0 1 2	Deviations fr training info.	-2-1 0 1 2
Evident strike & enable plug	-2-1 0 1 2	Conflicts with CG-34 manuals	-2-1 0 1 2

FIGURE E-7. Ranking of Conviction Factors at Pantex

The inspectors rated 48 factors at each site to indicate the degree to which each factor influenced their belief that real weapons or weapon material was processed. These factors are listed below in order of the decreasing mean values obtained. The rating scale used -2 = reduced belief greatly, -1 = reduced belief, 0 = neutral or unsure, 1 = increased belief, and 2 = increased belief greatly. The extremes of each list were thus the most influential.

Value	Pantex Facility Factors
1.21	Explosion proofing features
1.21	Environmental control features
1.12	Type of facility construction
1.04	Protective clothes or equip.
1.04	Apparent security precautions
.92	Unusual equipment evident
.92	Tools or fixtures evident
.92	General layout of facility
.58	Standard equipment evident
.54	Weapon-associated debris
.42	General condition of facility
.38	Apparent safety precautions
.17	Behavior of test controller
.17	Disposal operations
-.08	Site product control practices
-.17	Conflicts with CG-34 manuals
-.25	Deviations from training info.
-.29	Gen. behavior of site pers.
-.29	Weapon handling by site pers.
-.54	Mistakes by site personnel

Value	Weapon Specific Factors
1.50	Analysis of X-ray film
1.25	Credible location of readings
1.16	Meaningful gamma spec readings
1.16	Part clarity on X-ray film
1.04	Weapon size/shape relation
.96	Arming & safing features
.96	Realistic items behind doors
.88	High neutron counter readings
.83	Structural soundness of weapon
.79	Evident strike & enable plug
.79	Presence of radome or baroport
.71	High geiger counter readings
.71	Presence of radioactivity
.67	Delivery vehicle connections
.67	Presence & type of fins
.62	Environment protect features
.62	Marks or labels behind doors
.58	Weapon weight to size ratio
.42	Rivet pattern/station breaks
.29	Labeling evident on weapon
.08	Two or more weapons alike
.04	Differences between like weapons
.04	Same weapons in second batch
.04	Taped out weapon features
-.25	Lack of weapon access doors
-.33	Paint job of weapon
-1.46	Component obviously removed
-1.50	Lack of components behind doors

FIGURE E-8. Ranking of Conviction Factors at Rocky Flats

Value	Rocky Flats Facility Factors
1.58	Protective clothes or equip.
1.54	Apparent safety precautions
1.29	Environment control features
1.21	Apparent security precautions
1.17	Type of facility construction
1.17	General layout of facility
1.08	Unusual equipment evident
.96	Standard equipment evident
.92	Tools or fixtures evident
.92	General condition of facility
.62	Material handling by site pers.
.62	Gen. behavior of site pers.
.29	Attitude of team members
.21	Explosion proofing features
.17	Weapon associated debris
.12	Attitude of site commander
.08	Mistakes of site personnel
.04	Behavior of test controller
-.08	Deviation from expectations
-.12	Deviations from training info.
-.17	Conflicts with CG-34 manuals

Value	Procedural Factors
1.00	Isotopic values & ratios
.96	Calculation of wt. % Pu
.75	Sample emission spec readings
.75	Sample mass spec readings
.75	Sophisticated equip. usage
.62	Calculations for total wt. Pu
.58	Glove box operations
.58	Geiger counter in walkthrough
.50	Closer view during disposal
.46	Participating in assay tasks
.46	Means of taking samples
.46	Prepare samples for analysis
.42	Appearance of assayed material
.42	Questioning site personnel
.42	Operating complex equipment
.33	Taking photos in walkthroughs
.29	Measuring during walkthroughs
.29	Taking samples in walkthroughs
.29	Number of Pu ingots obtained
.21	Number of assay samples taken
.12	Means of identifying samples
.12	Type material disposed of
.04	Means of disposal
.04	Weight of disposed material
.04	Weight balance accounting
.04	Differences between batches
.04	More consistent workload

FIGURE E-9. Ranking of Conviction Factors at Paducah

Value	Paducah Facility Factors	Value	Material Inspection Factors
.67	Weapon associated debris	1.21	Associate component & weapon
.46	Apparent security precautions	1.17	Recognize component function
.42	Standard equipment evident	1.12	Recognize system of components
.33	Tools and fixtures evident	1.08	Weapon casing recognizability
.29	Apparent safety precautions	1.00	Internal features of casings
.25	Unusual equipment evident	.96	Close examination of casings
.21	Attitude of team members	.96	Complexity of components
.17	Material handling by site pers.	.88	Structural complexity of cases
.12	Behavior of test controller	.83	Electrical component features
.12	General layout of facility	.79	Mechanical component features
.12	Type of facility construction	.67	Materials used in components
.08	Protective clothes or equip.	.62	Variety of components visible
.08	Attitude of site commander	.54	Machining used to build casings
.04	Gen. behavior of site pers.	.50	Use of multiple materials in case
.04	General condition of facility	.42	(Classified item) in case
.00	Mistakes of site personnel	.38	Manner casing parts attached
.00	Environment control features	.38	Number/volume of components
-.04	Explosion proofing features	.29	Bulk of components presented
-.04	Deviations from training info.	.21	Volume of ingots presented
-.04	Conflicts with CG-34 manuals	.08	Type material disposed of
-.17	Deviations from expectations	.04	Type residue containers used
		.00	Size/shape of component boxes
		-.04	Weight of disposed material
		-.08	Weight balance accounting
		-.08	Differences between batches
		-.25	Means of disposal
		-.79	Unaccountable weight

FIGURE E-10. Ranking of Conviction Factors at Oak Ridge

Value	Oak Ridge Facility Factors	Value	Procedural Factors
1.04	Type of facility construction	1.17	Sample mass spec readings
1.04	General layout of facility	1.12	Isotopic values and ratios
1.04	General condition of facility	1.00	Participating in assay tasks
1.04	Environmental control features	1.00	Calculations of wt. % U
.96	Apparent safety precautions	.92	Sample emission spec readings
.83	Unusual equipment evident	.88	Calculations of total wt. U
.75	Apparent safety precautions	.83	Geiger counter in walkthrough
.71	Tools or fixtures evident	.79	Sophisticated equipment usage
.62	Protective clothes or equip.	.75	Operating complex equipment
.54	Standard equipment evident	.67	Closer view during disposal
.46	Weapon associated debris	.54	Number of assay samples taken
.46	Gen. behavior of site pers.	.54	Prepare samples for analysis
.38	Material handling by site pers.	.54	Appearance of assayed material
.38	Attitude of team members	.54	Number of U ingots obtained
.33	Attitude of site commander	.50	Means of identifying samples
.33	Behavior of test controller	.46	Means of taking samples
.29	Explosion proofing features	.46	Taking samples in walkthroughs
.00	Deviation from expectations	.42	Weight of disposed materials
-.04	Conflicts with CG-34 manuals	.38	Taking photos in walkthroughs
-.04	Deviations from training info.	.38	Questioning site personnel
-.12	Mistakes of site personnel	.33	Measuring during walkthroughs
		.25	More consistent workload
		.21	Weight balance accounting
		.21	Glove box installation
		.17	Type of material disposed of
		-.04	Differences between batches
		-.08	Means of disposal

difference between the team ratings; 23 significant differences were detected. The factors on which the teams disagreed are listed in figure E-11. From those differences, one may conclude that:

1. The LIMA teams were very perturbed by the support provided at Pantex and, as a result, were overly grateful for courtesies extended at Oak Ridge.

2. The MIKE teams were probably not as familiar as the LIMA teams with glove box operations and the internal components of weapons.

3. Because of their relative workloads, the two-man teams seemed to be more anxious than the four-man teams; the former probably made more snap judgments and tended to over or under react to unexpected problems or successes.

4. Low-access teams were given an opportunity to exaggerate the probable value of certain high-access advantages. In most cases, their estimates of the value of these advantages was not significantly different from the estimates of the high-access teams. However, low-access teams did seem to overvalue a closer view during disposal and the ability to question site operating personnel.

5. A general lack of interest in the operations performed at Paducah was indicated by a significant difference in mean conviction factor scale values between Pantex and Paducah. The means were 0.68 and 0.40, respectively.

C. EFFECTS OF CONVICTION FACTORS ON TEST RESULTS

The significant differences shown in figure E-11 may account to some degree for differences in the results reported by the various teams. For example, the reaction of the LIMA teams to the manner in which the weapons were handled by Pantex personnel was very negative. In the LIMA team leaders' reports, it was noted that this handling convinced some of the team members that particular weapons were fakes (". . . they wouldn't handle real weapons that way"). Similarly, because they were so positively impressed with glove box operations at Rocky Flats, the MIKE teams may have been more easy to evade during glove box operations

FIGURE E-11. Significant Differences on Conviction Factors

Facility	Factor	LIMA vs. MIKE	
Pantex	Apparent safety precautions	-.33	.83
"	Gen. behavior of site personnel	-1.17	.58
"	Weapon handling by site pers.	-.92	.33
Rocky Flats	Glove box operations	.00	1.17
Paducah	Electrical component features	.58	1.08
"	Mechanical component features	.50	1.08
Oak Ridge	Gen. behavior of site personnel	.83	.08

		Two vs. Four	
Pantex	Weapon weight to size ratio	.25	.75
Rocky Flats	Material handling by site pers.	.12	.88
"	Gen. behavior of site personnel	.12	.88
"	Means of taking samples	-.25	.81
"	Prepare samples for analysis	.00	.69
"	Means of identifying samples	-.50	.43
Paducah	Associate component and weapon	1.62	1.00
"	Recognize component function	1.62	.93
"	Recognize system of components	1.75	.81
"	Unaccountable weight	-1.25	-.56
Oak Ridge	Means of taking samples	-.25	.81
"	Weight of disposed material	-.25	.75
"	Weight balance accounting	-.38	.50

		High vs. Low	
Rocky Flats	Closer view during disposal	.08	.92
"	Questioning site personnel	-.08	.92
Oak Ridge	Closer view during disposal	.25	1.08

than the LIMA teams. Many similar relationships could be hypothesized. However, these relationships cannot be defended very rigorously because the real/fake calls were weapon-specific and the ratings of the conviction factors were not.

Still, the obtained ratings show the relative degree to which these types of factors could influence inspector decisions. These ratings thus provide some insight into the effects of secondary variables in the present study; they indicate which factors might be most effectively manipulated in future studies; and they provide some measure of the effects that such factors might have in a treaty situation.

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V. RESPONSES TO ESSAY QUESTIONS

A. COVERAGE AND INSTRUCTIONS

A summary of the responses of the test participants to the essay questions of the debriefing booklet is presented in this chapter. The instructions for the essay questions included the following:

> This section is intended to obtain a detailed and personal report of your experiences and impressions of this test program. The set of general questions listed below is intended to cue your thinking, but is not meant to be restrictive. You are encouraged to write whatever comments you may deem appropriate, to whatever length, and in whatever form and language is convenient for you . . . You may also refer to and expand upon earlier portions of this booklet.

All test controllers and two site commanders (at Rocky Flats and Paducah) were asked five general questions specific to the sites to which they were assigned. Each inspector was asked nine questions concerning overall impressions, for each of the four sites, and 12 optional questions which were added to the debriefing booklet at the time of debriefing. Only 21 of the inspectors were asked the 12 optional questions.

The questions were all open-ended, and the participants sometimes wrote as much as two or three paragraphs in response to each question. The usual response, however, was two or three sentences, and some questions were answered with a single word. The present chapter provides a numerical summary of the responses to each question and discusses the implications of the results. Edited actual responses are shown in appendices E-2 and E-3. Whereas the summaries show the general trend of opinion, the actual responses better reflect the range and flavor of the answers and present the specific criticisms and recommendations of the participants.

B. QUESTIONS AND RESPONSE SUMMARIES

Each question is shown below just as asked, and numerical summaries show the general trend of the responses. The responses of the inspectors are labeled as "Inspec," and the responses of test controllers and site commanders are labeled "TC/SC." The latter were asked only a few of the questions shown.

1. Question:

Give your impression of the logistic and administra- support furnished FT-34 personnel while you were at (given site). List any inadequacies experienced and note whether they were corrected or how they may be prevented in the future.

Inspec:

	Pan	R. F.	Pad	O. R.	Significant Differences
Excellent	0	0	0	14	At Pantex, LIMA said inadequate, MIKE said adequate.
Very good	0	0	8	4	
Good/adequate	8	17	12	4	
Unclear/unsure	4	5	1	2	At Oak Ridge, LIMA was more enthusiastic than MIKE.
Inadequate	12	2	3	0	

TC/SC:

	Pan	R. F.	Pad	O. R.
Excellent or outstanding	0	1	1	3
Good or very good	1	2	2	1
Adequate	1	2	2	0
Inadequate	2	0	0	0

2. Question:

What were your general impressions of test operations at (given site)? If you were setting up those operations, what would you do differently? Why?

Inspec:

	Pan	R. F.	Pad	O. R.	Significant Differences
Excellent/very good	0	3	0	10	No significant differences; LIMA teams were more bitter than MIKE teams in their criticism of Pantex.
Satisfactory/adequate	6	7	4	7	
Satisfactory, but	4	0	10	7	
Unclear/unsure	2	5	0	0	
Unsatisfactory	12	9	10	0	

3. Question:

Could you relate what you did and saw at (given site) to the Pantex phase of the operation? List and explain any problems in this regard. (Association of Material)

Inspec:

	R. F.	Pad	O. R.	Significant Differences
Yes	7	10	6	At Rocky Flats, MIKE said yes, LIMA said only via shipping containers.
Only via containers	6	2	2	
Yes, but	0	6	0	
Unclear/unsure	2	0	5	
No	9	6	11	

4. Question:

Were there any real differences in the procedures employed or results obtained between the first and second batches? What do you think accounts for observed differences or lack of difference?

Inspec:

	Pan	R. F.	Pad	O. R.
No	13	18	18	22
Unclear/unsure	5	6	2	1
Yes	0	0	4	1
Added access	6	0	0	0

5. Question:

Were the equipment, personnel, procedures, etc. used at (given site) adequate for the job planned? If you were setting up these operations, what would you do differently? Why?

Inspec:

	Pan	R. F.	Pad	O. R.
Yes, no change	13	14	14	18
Except as previously noted	5	4	10	3
Unclear/unsure	2	0	0	0
No, inadequate	4	6	0	3

TC/SC:

	Pan	R. F.	Pad	O. R.
Adequate, yes	4	4	4	3
Adequate, no	0	0	0	1
Unsure, unclear	0	1	1	0
Specific recommendations:	4	4	3	3

6. Question:

What kinds of problems did you experience at (given site) in trying to determine whether you were being evaded. List and explain each significant problem area.

Inspec:

	Pan	R. F.	Pad	O. R.	Significant Differences
No problems	4	4	9	12	At Pantex, MIKE teams were
Lack of access	7	17	0	0	more concerned with their
Inexperience	8	3	4	6	lack of experience than LIMA
Other	5	0	11	6	teams.

7. Question:

What kinds of problems did you experience at (given site) in trying to list and catalogue items of classified information. List and explain each significant problem area.

Inspec:

	Pan	R. F.	Pad	O. R.
No problems	14	15	11	17
Lack of knowledge	5	9	7	6
Other	5	0	6	1

8. Question:

Did you receive any gratuitous information at (given site) which influenced your conviction, your evasion calls, or decisions regarding classified information? If so, what was the source of this information, and what effects did the information have?

Inspec:

	Pan	R. F.	Pad	O. R.
No gratuitous info.	23	16	23	20
Some gratuitous info.	1	8	1	4 (All from MIKE 3)

9. Question:

Do you care to comment in detail on the questionnaire items regarding (given site) or on any other aspects of the (given site) phase of the test?

Inspec:

	Pan	R. F.	Pad	O. R.
No or no answer	11	22	21	19
Yes or other	13	2	3	5

10. Question:

Do you believe that this same FT-34 field test, if conducted at a single facility, would provide significantly different data from the test just completed at four different facilities? Why?

Inspec:

Yes	5
Unclear/unsure	5
No	14

11. Question:

Do you believe that shipments between plants were tampered with in any way? If yes, when and how? How did this belief and the character of those shipments affect your conviction and/or performance?

Inspec:

Yes	2
Unclear/unsure	5 (four were LIMA-4)
No	17

12. Question:

Do you understand why evasion was practiced for the FT-34 field test? Would you include evasion if you were designing the test? What kind of evasion? Why? How?

Inspec:

	Understand	Would Use
Yes	20	19
Unclear/unsure	2	3
No	2	2

TC/SC:

	Pan	R. F	Pad	O. R.
Understand, yes	4	4	5	3
Understand, no	0	0	0	0
Unsure/unclear	0	1	0	1
Would use	4	4	5	3
Would not use	0	1	0	1

17. Question:

In what ways do you think your performance in this test differed from how you would perform, under these same conditions, if the test had been conducted on enemy weapons in enemy territory?

Inspec:

No change	5
Motivation	8
Training	6
Procedural	3
Other	3

18. Question:

What changes would you recommend for inspection on foreign soil? What would you recommend to reduce the chance of being successfully evaded? And what precautions or safeguards would you suggest to inspectors participating in a treaty inspection?

Inspec:

Better qualified inspectors	9
Extensive training	7
Use own facilities	9
Use own standards	6
Other	5

Many made more than one specific suggestion

TC/SC:

Expert personnel required	6
Use our own labs and equipment	6
Use a single facility	4
Use our own standards	4
Other	7

19. Question:

What type of personnel would you recommend as inspectors for treaty purposes? What would a team consist of if you could select skills and people to make up an inspection team?

Inspec:

Chemist/chemical analyst	11
Weapons specialist	10
Metallurgist	5
Nuclear physicist (or eng.)	5
Spectrographer/technician	4
Intelligence personnel	1
Health physics personnel	1
Technical illustrator	1
Security guards	2

NOTE: Not all respondents identified the specialists they would like to have, but those who did, mentioned the specialists at left with the frequencies shown. The numbers are thus the number of times the given specialty was mentioned.

TC/SC:

Nuclear chemists	10
Weapons designers	8
Nuclear physicists	6
Weapons specialists	5
Intelligence specialists	4
Electronics specialists	3
Administrators	3
Other	3
Speak language	3

20. Question:

What did you get out of this test that will be of benefit in future assignments?

Inspec:

Nothing	4
Unclear/unsure	4
Very little	4
General broadening	6
Other benefits	6

21. Question:

What is your attitude toward the three month's temporary duty you just completed as an inspector in field test FT-34? Consider personal, patriotic, and career aspects?

Inspec:	Personal	Career	Patriotic
Positive	8	6	6 (20)
Unsure/unclear	1	5	5 (11)
Negative	5	6	1 (12)
	14	17	12

22. Question:

What would be your attitude toward being assigned as an inspector for demonstrated destruction of nuclear weapons under international treaty, should one be negotiated?

Inspec:

Consider it an honor	8
Not without more training	13
Am not qualified	10
Other	3

NOTE: Many gave dual responses particularly re honor/training and not qualified/training.

23. Question:

Would observation of the entire weapon disassembly process have helped you during this test? How or how much?

Inspec:

Would help?	
Yes	16
Yes, not practical	2
Other	3

How or how much?	
Considerable	4
Information revealed	7
No response	10

24. Question:

Would observation of shipping containers at Pantex (watching lids being closed) have helped? How?

Inspec:

Would help?	
Yes	12
No	9
No response	0

How?	
Improve conviction	8
Other	2
No response	11

SIG: Two-man teams gave no response more frequently than four-man teams

25. Question:

Would you comment on observation of weapon disassembly processes as a substitute for X-ray?

Inspec:

Disassembly better	9
Disassembly better, but	4
Unclear/unsure	2
Both are necessary	2
No comment, no response	4

26. Question:

Did you have any morale problems during the test? Where? How were they solved?

Inspec:

Morale problems?	
Yes	7
No	13
No response	1

Were they solved?	
Yes	4
No	2
Nonapplicable	3
No response	12

27. Question:

Where was your morale highest? Lowest?

Inspec:

	highest	lowest
Pantex	3	7
Rocky Flats	2	3
Paducah	2	4
Oak Ridge	4	0
Unclear/unsure	6	5
No response	4	2

28. Question:

Did you have any personal problems which interfered with your inspection capabilities? If yes, did they get resolved?

Inspec:

Personal problems?		Get resolved?	
Yes	3	Yes	1
No	18	No	1
No response	0	No response	19

29. Question:

What did you expect during this debriefing session?

Inspec:

About that received	6
Didn't know	7
Other	4
No response	4

30. Question:

What would you add to or change for this debriefing session?

Inspec:

Little or no change	7
No response	11
Other	3

C. RESULTS FROM THE ESSAY QUESTIONS

Responses to the essay questions generally confirmed results reported in chapter III but better expressed the specific opinions, problems, and recommendations of individual participants. The following may be deduced from the responses to the above essay questions:

1. Most of the participants felt that the equipment, personnel, and procedures used at each site were adequate or better and that they would not change these matters if they were planning such a test program.

2. About 58 percent of the inspectors felt that the data resulting from FT-34 would not have been significantly different if the test had been conducted at a single facility. However, most of the inspectors noted that although they could relate what they did and saw at Paducah to the Pantex phase of the operation, they could not relate Rocky Flats or Oak Ridge materials to weapons seen at Pantex.

3. Only two inspectors felt that shipments between plants had been tampered with.

4. Most participants said that they understood why evasion was practiced and that they would include similar evasion if they had planned the test.

5. The participants reported that there were no real differences in the procedures employed or the results obtained between the first and second batches at any of the four sites.

6. About 67 percent of the inspectors felt that observation of the entire weapon disassembly process would have helped them during the test. Half thought that observation of shipping containers at Pantex would have helped, and a third said that observation of the complete disassembly would have been more helpful than the X-rays.

7. Inexperience was cited as the main problem in detecting evasion at Pantex; lack of access was more significant at Rocky Flats; the unavilability of prior data packages was the main problem at Paducah; and there were no particular problems in this regard at Oak Ridge.

8. About a quarter of the inspectors felt that lack of knowledge on their part was the main problem in detecting classified information. Only three inspectors said they would have been more confident if they had been asked to call out significant design information rather than classified information.

9. Gratuitous information was denied by nearly all inspectors, but eight reported that such information was received at Rocky Flats and four reported it at Oak Ridge. These latter four, members of the same MIKE team, said the information came from the same test controller. All denied that such information had any effect on the test results.

10. Six of the inspectors felt that they had been subjected to intentional harassment at sometime during the test, and half felt that they had suffered unintentional harassment. None felt that these circumstances had any serious effect on the test results.

11. Seven inspectors stated that they experienced some morale problems during the test, and two said that these problems remained unsolved throughout the test. Morale was lowest at Pantex, next low at Paducah, and highest at Oak Ridge. Three felt that their personal problems may have interfered with their inspection capabilities but that this probably did not detract significantly from the test results.

12. All but five of the inspectors thought their performance would have differed if the test had been conducted on enemy weapons in enemy territory. Most cited the need for increased motivation and for more intensive training.

13. Nearly all participants recommended changes to the test procedures for "inspection on foreign soil." About a third listed the need for each of the following: better qualified inspectors, more extensive training, and the need to use one's own facilities and standards.

14. The participants differed in the type of personnel they would recommend as inspectors for treaty purposes. The four major categories of specialists named were chemists, weapons specialists, metallurgists, and nuclear physicists. Most agreed that all of these should be experts in their fields.

15. A third of the inspectors felt it would be an honor to be assigned as an inspector under treaty conditions. The others said they would not consider it without very extensive training or that they were unqualified for such a role.

16. Half of the inspectors felt that they got little or nothing out of the test that would be of benefit in future assignments. The other half felt that the general broadening, personal satisfaction, personal contacts, and knowledge gained were of benefit.

D. EFFECTS OF ATTITUDES ON TEST RESULTS

The above results tend to confirm the validity of assumptions that were made in interpretation of test results. Specifically, the participants generally agreed (1) that use of four sites rather than a single facility did not materially affect the results, (2) that there were no real differences in procedures or results because two batches of weapons were used, (3) that gratuitous information did not affect the test results, and (4) that certain harassment and morale problems existed but had only minor effects on test conduct and results.

The attitudes and opinions of test participants, as expressed in this chapter, are not believed to have biased the test results to any discernible degree and do not seem to account for any difference or lack of difference in the results reported by the various teams. However, the specific opinions and recommendations of the participants, based as they are upon actual experiences in the test, should be of value both to understanding the results of FT-34 and to generalizing from those results to future tests or applications.

VI. FINAL REPORT OF SITE COMMANDERS, CHIEF INSPECTORS, AND TEAM LEADERS

A. GENERAL

1. Coverage. This chapter discusses the final reports prepared by the four site commanders, the two chief inspectors, and the eight team leaders employed in FT-34. Data for these reports were accumulated throughout the test program, and the reports were submitted to the Test Director at the end of the field exercise. Information provided by these reports was used to confirm operational assignments, scheduling, environments, and related matters in the preparation of chapter II herein and other annexes, particularly annexes D and F. The present chapter describes the organization and content of the reports and presents pertinent information not included in other annexes.

2. Instructions. The subject reports were prepared in accordance with instructions and formats prescribed by memoranda from the Test Director. Instructions to chief inspectors and team leaders included the following:

Introduction. Identify the inspection group and general inspection activities. Give inclusive dates of each.

Personnel. Identify inspectors by teams, names, ranks, and services. Give overall impressions of the adequacy of backgrounds. Comment on assignments.

Operations. Discuss operations in general. Comment on adequacy of annexes, data forms, inspection equipment, procedures, and test control procedures. Discuss items or events which caused most concern to inspectors. Give your impressions of any evasion you think was attempted. Discuss reactions to evasion.

Training. Discuss the adequacy of training. Recommend general areas where training given could have been improved.

Support. Discuss adequacy and suitability of support given by test control and plant personnel.

Problems. Describe any significant problems associated with overall operations. Discuss how problems were solved or give recommendations for solution.

Recommendations. Give any recommendations concerning a field test such as TF-34, a follow-on test, or a treaty inspection. Give supporting reasoning.

Other. Include any other discussions which appear to be pertinent.

The Site Commanders' reports followed similar instructions but with special emphasis on the locations, personnel, and operations specific to the site. The reports varied in length from three to about 20 typewritten pages. The Site Commanders, in particular, added enclosures of plant layouts, schedules, and material describing the socioeconomic setting of the site (e.g., material on the community, hotels, transportation).

B. DESCRIPTION OF RESULTS

The subject reports, individually and collectively, fulfilled their objectives as outlined above. In general, they provided clear and complete detail in all areas as requested. Much of that detail is of little interest here, although it provided good historic data on the actual conduct of the test and allowed a cross check on such matters as personnel qualifications and assignments, scheduling of events, equipment characteristics and applications, clerical services, badges, custodial service, local transportation, hotel accommodations, etc.

Comments regarding personnel qualifications, operational procedures, training and site support generally confirmed and amplified the evaluations and comments of the inspectors and test controllers, as reported in previous chapters of this annex. The specific operational problems encountered were expounded upon in somewhat more detail and with varying emphases, but those problems in general were the same as those cited by the inspectors and test controllers, as presented in appendecies to this annex.

C. RECOMMENDATIONS OF SITE COMMANDERS

The one area in which the subject reports differed materially from information provided elsewhere in this or other annexes was in the specific recommendations stated by the Site Commanders. These

recommendations differed not so much in substance as in the clarity and authority with which they were made, and for those reasons the recommendations seem worthy of repetition here.

1. Recommendations of the Pantex Site Commander. "It is recommended that (in future tests or applications):

a. Test control personnel report for training (on site) at least 3 working days prior to the inspectors.

b. Site personnel report to the site at least 1 week prior to the start of operations.

c. Inspectors be trained to stress what information to seek and what information indicators would mean when discovered.

d. A sample complete data packet be provided in the information used during training.

e. Inspector training contain more practical work with data forms and use of surveillance equipment."

2. Recommendations of the Rocky Flats Site Commander. "It might be well to consider a different approach to the training program . . . It is realized that the centralization of the training effort at Paducah allowed the most efficient use of facilities available and under the existing training program provided for the most efficient utilization of instructors. However, if a similar test were to be run again, I would recommend that the training be conducted on site. Such a program would be contiguous in nature and would eliminate superfluous material from the controllers' schedule."

3. Recommendations of the Paducah Site Commander.

a. "The burial operation was representative of what might happen to the entire residue. However, since the complete material disposal operation . . . could not be shown, it was superfluous and added nothing to the test. It is recommended that, in any future test considerations, this type of operation be eliminated."

b. "Data packages at one site should have been available to inspectors at the next site commensurate with the access level working."

4. Recommendations of the Oak Ridge Site Commander.

a. "It is recommended that the forms used for collection of data be designed by or have the approval of personnel familiar with the procedure being used in the test . . . The statistician responsible for the reduction of the data must have it in usable form, but he must make the forms compatible with the test conditions."

b. "It is recommended that more time be spent on the indoctrination of all personnel in the areas of test design, test objectives, and uses of data forms . . . A review of the test data shows that the teams obtained the facts but they did not evaluate the information to any great extent. This indicates that they lost sight of some of the test objectives and design."

c. "It is recommended that a member of each inspection team have the ability to make accurate and detailed drawings of the equipment that is exposed, either while it is in sight or from memory . . . The probability of taking photographs in any host plant is quite low . . . If the artist is capable of sketching . . . there is no way of denying this information."

d. "It is further recommended that each team include a qualified electronics expert . . . The probability of 'spoofing' the electronic equipment in a laboratory, as an evasion technique, is quite high . . . the detection of such a system would require an expert in this field . . ."

D. EFFECTS ON TEST RESULTS

The results, tenor, and content of the reports prepared by the Site Commanders, chief inspectors, and team leaders were generally agreed on the following specific points:

1. FT-34 was conducted essentially as planned. There were operational problems, but these were not of such a nature as to detract from the accomplishment of test objectives.

2. Support provided to FT-34 was adequate to excellent in all areas. There were a few problems at Pantex, but these were unavoidable and, although they discomfited the inspectors at times, they did not affect the test results. Minor equipment breakdowns

and schedule changes occurred at other sites, but these were corrected or compensated for in such a manner as to prevent any effect on test results.

3. Test participants were perhaps less qualified for their role than inspectors one would hope for in a treaty situation, but these personnel performed as expected. They conducted themselves well, and they accomplished the tasks assigned to them.

4. Training at Paducah left much to be desired, largely because of its brevity and lack of practical exercise. This was compensated for by more intense training at each of the sites and by the experience of the first few days of operation. This situation could be corrected by conducting future training at the sites. Although inadequacies in the training were at times troublesome, they did not materially affect the accomplishment of test objectives.

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VII. SUPPLEMENTARY INFORMATION

The three appendices of this annex provide information which augments data found in the body of the annex. The numerical data used for analysis represents a summary or compilation of responses to questions found in the debriefing questionnaires issued to inspector and test control personnel. Because many of the questions required subjective (essay) responses and because of the nature of the debriefing which solicited opinions, numerical tabulations cannot adequately depict the impact of the responses. Numerical results of such an opinion poll are sterile without an accompanying listing of comments which produced the numerical values. For this reason, representative comments which supplement and support numerical values are included in the appendices to provide a more complete summary of all results from the FT-34 debriefings.

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FINAL REPORT
FIELD TEST FT-34

ANNEX E

APPENDIX E1

RESPONSES TO ESSAY QUESTIONS REGARDING TRAINING

SEPTEMBER 1968

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APPENDIX E1

RESPONSES TO ESSAY QUESTIONS REGARDING TRAINING

The essay questions regarding training (chapter IV) are repeated here with typical responses provided by inspectors during debriefing. These responses have been edited and depersonalized, when applicable. Multiple responses have been combined, when appropriate, into a single typical response representative of the multiple answers obtained.

1. Question: In your opinion, did the two-week training session at Paducah adequately prepare you for the inspection operations you later performed? If you consider the training insufficient or inadequate, list how and show why.

   a. The training seemed to be adequate at the time; with further training at each site I felt qualified to do the work and calculations.

   b. In my opinion, the training was very good, and there were only two areas where I felt I needed further training--classification and radiation monitoring.

   c. The training was fine, as far as it went. More practice training in weapons, their components, and X-ray reading could have been given, as well as a course on how to make observations and record data.

   d. The training was adequate for about 50 percent of the team members (those with nuclear weapons backgrounds). Another two to four weeks intensive training would be required for me to be just an adequate inspector.

   e. In general, the information at Paducah was too detailed to remember for two and a half months. Specific discussions were forgotten by the time they were required. Eighty percent of it was a waste of time and should have been accomplished at the sites.

   f. I think we were given too much technical training and not enough training in FT-34--e.g., what to look for, what

results might be significant, types of evasion, dimensions and data on "nominal" weapons, etc.

g. There was too little opportunity for practice and critique. I would have preferred to see real items or mockups; instructors based most of their lectures on theory and allowed too little time for practiced applications.

h. Training on the forms was too sketchy; there was not enough discussion on use and answers required; no indication was given as to where the values would come from or the accuracy required. We should have been given a pack of forms with sample entries and explanations. The session on forms could have been handled easier at each site.

i. There was not adequate discussion of what would constitute evasion; we did not know what the game was all about until we had been at Pantex for a couple of weeks.

j. Weapon and component material was covered too quickly with no reference to use in the field; a complete transcript of the presentation (with photos) would be a minimum. We needed a breakdown (checklist) for components expected with different types of weapons.

k. More hardware training was needed. Team members lacked the knowledge to identify and technically describe components. Additional training on components should have been provided on our return to Paducah; there was time.

l. The time spent on components, though well taught and extremely interesting, was not applicable to our access level. For low access groups a study of external weapon configuration, center of gravity, density, rivet patterns, size and space needed for various components, location of warheads, radiation that could be expected, and how information could be gained would have helped.

m. Training was sufficient for Pantex and insufficient for Rocky Flats; procedure handouts were not followed and

instructions for computing data had to be repeated on site. For Paducah, we should have seen more components and had training on how to relate this to weapons. Training for Oak Ridge was insufficient, but the refresher training was excellent.

n. A few hours spent on figuring how much fissile material it takes to peg a geiger counter six inches away would have influenced some of our decisions.

o. The spectroscopy lectures, although adequate, would have been better at each site. And additional training on volumetric analysis was required upon reaching Rocky Flats and Oak Ridge; the methods were different.

p. Perhaps a year of intensive training would have been sufficient.

2. Question: If you had been setting up this training program, how would you have done it differently? What suggestions do you have for altering the training to better conform with field requirements?

a. See detailed comments to previous question.

b. The training program was very well set up. Under the circumstances of time and test requirements, I would probably have done it the same way.

c. Inspectors could have done a better job if the training for a particular operation had come just before the operation was to be carried out. I would have limited the training sessions at Paducah to administrative procedures and conducted technical training at the sites.

d. Too much time was spent on detail in lab work that was too far in advance; it was mostly forgotten before we arrived at Rocky and Oak Ridge.

e. The training would have been much more effective if it had all been done as it was at Oak Ridge, using the equipment

with actual demonstrations by the site personnel. Specialized training should have been presented at the actual location after an initial walkthrough of the facility.

f. Would have had training headquarters at Sandia Base where actual or mocked up items are available. Training at the sites would save about a week at Paducah, and would add not more than one day at each site.

g. Instructors should be selected for their technical and instructional proficiency, and they should be free to give all possible hints on detection of evasion within their field of endeavor. Walkthroughs or pilot programs should be run by each plant to assure that inspectors are familiar with the procedures and forms, and how data is to be organized. Sample data should be obtained and sample calculations completed.

h. I would have employed civilians thoroughly screened for capabilities. The services did a poor job of supplying talent. Personnel for the team should be highly educated in scientific and engineering fields related to nuclear weapons, and should have extensive experience in the design, development, and test of nuclear weapons. These personnel should train as a team.

i. Since we had two batches to work with, we could have used the first batch for training only, followed up by a review on points where inspectors failed to detect evasion or to find classified information.

j. A reference packet should be prepared giving the inspectors as much information as can be conveniently handled concerning weapon criteria, densities, dimensions, metal assays expected, and other such data as appropriate.

3. Question: Add any other comments you may have regarding the training.

a. Covered in some length in Team Leader's report.

b. Not enough practical training.

c. Training for laboratory work was better because we had a review and practice opportunity before doing the work.

d. The practice inspection of a shape at Paducah was a big help in preparing for the Pantex operation.

e. Despite comments made to earlier questions, much of the training at Paducah was excellent and proved valuable in the course of the test. However, so much more could have been done to assure that the inspectors were qualified.

f. It was foolish not to send each inspector a classified brief or even Annex D so that he would know (prior to Paducah) what was expected of him. I had many books and lab course note books I would have brought to better prepare myself for some of the lab operations. Instead, we had to unrealistically rely on our memories.

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FINAL REPORT
FIELD TEST FT-34

ANNEX E

APPENDIX E2

INSPECTOR RESPONSES TO ESSAY QUESTIONS

SEPTEMBER 1968

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APPENDIX E2

INSPECTOR RESPONSES TO ESSAY QUESTIONS

A. GENERAL

Succeeding paragraphs summarize the results of inspector responses of essay questions in the debriefing questionnaire. For each set of responses, the question asked is listed, a quantitative breakdown of the responses is shown, and representative comments are listed to reflect the range and general characteristics of the responses. There was a great deal of similarity among the responses, but the wording naturally differed from inspector to inspector. In an attempt to preserve the full flavor of the responses, but to avoid an exhaustive listing of the individual comments of all 24 inspectors, the following ground rules were adopted:

1. If two or more inspectors said more or less the same thing, the better phrased comment was listed, just as stated.

2. If they said almost the same thing, the two comments were combined and paraphrased to preserve the apparent intent of both, or all.

3. Simple "yes," "no," "none," etc., responses are reflected in the quantitative breakdown but are not shown under "representative comments."

4. All individual names, shape-specific details, or classified details were removed or paraphrased with such terms as "team member," etc.

5. Long or seemingly unnecessary elaborations were paraphrased and shortened to make the central point more clear.

Otherwise, the "representative comments" listed are the words and ideas of the inspectors themselves. All relevant comments are reflected; comments were omitted only where they had been stated better by others or were inappropriate to the question asked. Thus, the "representative comments" reflect the range, flavor, and general character of the answers, criticisms, and recommendations offered in response to the given question. Significant differences are noted where appropriate.

B. RESPONSES

1. Logistic and Administrative Support

Question: Give your impression of the logistic and administrative support furnished CG-34 personnel while you were at (given site). List any inadequacies experienced and note whether they were corrected or how they may be prevented in the future.

PANTEX - Representative Comments of LIMA Teams

a. Logistics-wise, they were not ready for us; administration-wise, they seemed to think we were a bunch of enlisted recruits.

b. The initial badging was delayed for about two hours with no known reason.

c. The trailers were dirty, without air conditioning, toilet facilities, steps to the trailers, or adequate desks and chairs. These conditions were improved, but the facilities were never really comfortable or convenient.

d. There were no safes in the trailers, and when safes were finally provided, they weren't serviceable.

e. Mail service was poor.

f. The treatment of inspectors identified them as second class citizens, and instilled an animosity that seriously impaired project effectiveness. Mature military officers were treated as juveniles.

g. The chain of command was confused. We weren't sure why we had a Chief Inspector, yet the Site Commander did not have our interests in mind.

h. Inspectors were required to perform administrative tasks that should have been (and at other sites were) performed by enlisted support personnel.

i. It seemed inexcusable that low access teams should just sit and wait in those miserable trailers during scheduled off-days.

j. An administrative decision or movement of the trailers would at least allow personnel (smokers) to relax while they worked or waited in the trailers.

k. The complete and utter emphasis by test controllers on forms preparation destroyed what should have been an excellent exercise.

l. If you ever treat the Russians the way we were treated at Pantex, you would probably only see their backs as they walked out the door.

PANTEX - Representative Comments of MIKE Teams

m. The support was generally adequate.

n. It would have been desirable to have had desk calculators.

o. Pantex environmental conditions were unsanitary and very inconvenient. The use of chemical toilets was a little extreme; they were not emptied often enough, and there was no place to wash your hands.

ROCKY FLATS - Representative Comments

a. Logistic and administrative support was good, deserve special mention.

b. Much better than at Pantex, friendly and cooperative.

c. Desk calculators were not checked and maintained satisfactorily.

d. Ground transportation within the plant was sometimes poor or nonexistent.

e. Off-plant transportation was wholly inadequate. Only two GSA cars were furnished for 13 inspectors who lived in

widely separated locations and who were required for duty at disparate times. Tours, laundry, and eating presented irritating transportation problems. Off-duty personnel could not use GSA vehicles for nonreimbursed personal use. It would have been better to assign one car per team. (13 made similar complaints.)

PADUCAH - Representative Comments

a. In general, the support was outstanding and the personnel were extremely helpful. They put in extra hours to see that we were met at the airport, and provided transportation as soon as we arrived, etc.

b. Logistically, Paducah was fine, but administratively they left a lot to be desired. They tended to do things the difficult way.

c. I used one of my afternoons off to take a GSA vehicle to a local garage to have the exhaust worked on, a defect that was known at the time the vehicle was assigned to us according to one enlisted man.

d. We spent too much time driving around the back way to the work area. One could easily obtain an aerial photo of all we would see in driving the three blocks to the furnace room; and yet we, mostly with Top Secret clearances, could not go through the area.

OAK RIDGE - Representative Comments

a. Support of all types was excellent at this site.

b. The most efficient of all sites visited.

c. The need for a driver other than a team member in the plant was a great inconvenience; better plant arrangements and better screening of personnel would correct this.

d. Support enlisted personnel tended to show less military courtesy than at any other site.

2. Test Operations on Site

Question: What were your general impressions of test operations at (given site)? If you were setting up those operations, what would you do differently? Why?

PANTEX - Representative Comments

a. Test operations at Pantex were the most interesting and the most useful, and were planned and executed in a generally satisfactory manner.

b. They were not prepared for the operation physically and their personnel were not properly briefed. Far too much was found lacking and corrected on the spot via hurried conferences while we waited.

c. Some Pantex personnel thought the whole thing was a big lark, and their bull sessions were at times quite distracting.

d. Too much time was spent on inconsequential things and not enough on significant details. My general impression, unfortunately, was one of monotony and boredom due to the repetitious walkthroughs, form filling, and days off (low access).

e. The operation was sloppy. I would do nothing differently, but would assure that what was done was done correctly.

f. The test operations were frequently unsafe and dangerous. The facility was dirty and was not suited to safely accomplish disassembly operations.

g. There was probably more realism here. We were treated more like spies in a foreign country there than at the other sites.

h. I considered the Pantex operation the one meaningful phase of the test. I would, however, have moved it to Sandia; billeted inspectors in the BOQ; restricted the total time, including training and debriefing, to three weeks; employed

highly competent weapons personnel to perform immediate analyses based on personal observations; and forget about trying to analyze the results next winter back at Washington by wading through mountains of cold data.

i. The Pantex operation should have started with the weapons in shipping crates at a receiving point. From there they would proceed through an unpacking area to the presentation area. The unpacking should be subject to inspection either during or after unpacking to account for containers, etc.

j. I would introduce all weapons at the same time and limit access to A_1 because this would limit the compromise of classified information.

k. Eliminate low access operations for high access teams to eliminate any carryover of impressions from one access level to the next.

l. Schedule the movies at a time other than during actual operations.

m. Improve the lighting. Lighting conditions (and sometimes temperature) were so poor as to jeopardize the test results. The one good thing about the movie makers was that they gave us some light.

n. Insist on better working and office conditions for inspectors.

o. Either weigh all weapons or don't weigh any. Inaccurate weights detracted from the overall presentation.

p. One set of equipment should be set aside for test operational needs. Tools kept disappearing and returning.

q. Let inspectors keep copies of their data packages to allow a little more analytic effort. Memory couldn't hold all the probably useful details.

ROCKY FLATS - Representative Comments

a. Test operations were very good, with little waste or extra time.

b. Operations were awkward because of lab layout, security restrictions, and safety precautions. Unrestricted access to comfort and eating facilities would have helped.

c. The test operations were too closely involved with normal operations at the facility. The general impression was one of confusion and clutter. The glove boxes were so cluttered and the view was blocked by operating site personnel so much of the time that it was impossible to determine whether procedures were being followed or whether evasion was being practiced. It was interesting that the day the General came through, the labs and associated equipment were cleaned up and most of the clutter was removed.

d. There was considerable talk that evasion was being practiced in the glove boxes. This was contrary to my understanding that the site personnel were doing the work only because of the hazards and lack of time to train the teams. These personnel were only extensions of the inspector's hands, and any evasion would then be the same as the inspector evading himself.

e. Confusion existed in the walkthroughs since controllers did not know what inspector limitations were or what was or was not part of CG-34. I would explore the possibility of reducing or eliminating the walkthroughs.

f. The single facility concept could have been extended to elimination of the shipping containers, which had no bearing on the problem except to conceal material from our view.

g. I would eliminate all but the foundry portions at Rocky Flats.

h. Plant personnel talked too much, revealing information.

i. Allow more time and have inspectors do their own work using their own standards and equipment calibrations. One cannot believe the results obtained in a rush by another person using his own solutions and equipment.

PADUCAH - Representative Comments

a. The test operations were adequate and went according to schedule.

b. Operations seemed to be satisfactory, but I really wasn't sure of what was to be accomplished and could not satisfactorily relate the materials.

c. The time allowed was much too long, and could easily have been speeded up by several days by using two buildings--one foundry and a room away from the foundry--so that inspections could be made while foundry operations were in process.

d. The Paducah phase could be cut out entirely. No need to see a pile of scrap material. It would have served the same purpose to have viewed material left from disassembly at Pantex, which was junked for later smelting.

e. Materiel disposal was a waste of time. Observing the burial of one box did not add anything to the test.

f. Operations were okay, but the facility was limited as to the metals it could melt and seemed to be in poor repair (furnaces) and little used.

g. I would increase time allotted for viewing components; our team did not complete this, which was the most useful part of these operations.

h. Give access to the data packages from Pantex, to aid in evaluations. Under a single plant concept, all previously developed information should be available to inspectors at all times during the exercise.

OAK RIDGE - Representative Comments

a. Excellent, no changes. The Oak Ridge labs were the most impressive of all facilities visited. Layout, equipment, personnel, and operation contributed to a generally pleasant experience.

b. Test operations were good, very little wasted time.

c. The schedule should be more flexible; there were lapses in the operation when a team could have been doing something but was not allowed to.

d. I think the schedule was changed much too often and without proper notification of inspector personnel.

e. I would have allowed more time for laboratory operations, and let each team start with mass spectroscopy, the emission spectroscopy, and finish with the chemical analysis.

f. Each person should do a complete analysis of his own. Let inspectors do their own assay in their own facility at their own pace to increase conviction.

g. It may have helped if the training for a particular operation came just before the actual work.

h. Although these operations proved to be of great personal value, I believe that all operations except for the foundry should be eliminated.

3. Association of Materials

Question: Could you relate what you did and saw at (given site) to the Pantex phase of the operation? List and explain any problems in this regard.

ROCKY FLATS - Representative Comments

a. Yes, no problem.

b. Material could be related somewhat; it was the right type and amount.

c. The only relation possible was during the initial walkthrough when we viewed the incoming materials. The containers seemed to come from Pantex and the material analyzed could have come from a nuclear weapon.

d. The walkthroughs seemed fruitless and unmeaningful; there was so much simulation that it was hard to remember what was real, simulated, or what.

e. We did not see the containers loaded or the shipment sealed, nor were we aware of the tare or net weights involved.

f. Due to lack of knowledge, positive association was not possible. I had no idea of how much material to expect from such shapes.

g. I had very little feeling that the operations at Rocky Flats were part of the same test that we were conducting at Pantex.

h. I could not relate this to Pantex at all.

PADUCAH - Representative Comments

a. Yes, I could relate the things at Paducah quite easily to the Pantex phase. It was rewarding to see remains of weapon shapes instead of only shipping containers.

b. Yes, but only through the external shapes seen at both plants.

c. The shape cases and component parts were easy to identify as the same kind of shapes, but I was not sure they were the same ones.

d. I could relate only some of the external weapon shapes, the rest of the material could have come from anywhere so far as I could tell.

e. Yes, shapes were recognizable and some components could be related to some shapes, but the ingots did not seem to fully represent the batches.

f. Yes, but some weapons seemed to be missing; I could only account for about 32 weapons.

g. We were unable to account for some 8000 pounds of material. As it was later determined, this was reduced to 300-400 pounds.

h. Yes, but access A_4 was not given adequate time to be completed. The differences between A_2 and A_3 were not very great, so A_2 was probably unnecessary. Also, no measuring was allowed for high access, a deviation from Pantex procedures.

i. Information was "presented" in such a way as to permit easy evasion. Two apparently identical skin sections were displayed and weighed differently so the weight of the third part could be calculated. Items were placed at the top of a barrel of slag and dross which could easily have been covered with unidentifiable ashes. Electronic components which seemed to be classified were placed at the top of a box, etc.

j. No, the Paducah phase had no bearing on the project. Once the HE and active materials were removed, a weapon no longer exists. Scrap is scrap and proves nothing to the objectives of the project.

k. No, some shipping containers seemed to be similar, but no matter what administration guarantees, it was difficult to relate what we saw at Paducah with what was seen at Pantex.

OAK RIDGE - Representative Comments

a. Yes, through the shipping containers.

b. Not qualified to answer; I really didn't understand the possible relationships.

c. No relation other than the containers were supposedly shipped from Pantex, and there appeared to be about the right amount of uranium.

d. We had not seen the outgoing containers at Pantex and did not know how many containers were used per batch. The

data from Pantex were not available, and one had to rely on memory as to what we had seen there. Therefore it was difficult to make any relation of the two operations.

e. No, the containers seemed to come from Pantex, but even the containers were different in some cases and we couldn't examine their contents.

f. No, because we did not see the material packaged, and we never saw the actual components to be smelted.

4. Differences Between Batches

Question: Were there any real differences in the procedures employed or results obtained between the first and second batches? What do you think accounts for observed differences or lack of difference?

PANTEX - Representative Comments

a. No appreciable difference between batches.

b. There was a slight refinement of procedures employed for the second batch.

c. The use of X-rays was very revealing on the second batch.

d. The shapes seemed to be the same; this was very likely done in order to have a control on evasion--i.e., one set had evasion, the other didn't.

e. No, I think the lack of difference was to see if a team would change its trend of thought.

f. More efficient use of time and familiarization with shapes made Batch two monitoring much easier.

g. In one case, we suspected that the same weapon was displayed in both batches because the paint was the same.

ROCKY FLATS - Representative Comments

a. There was no real difference between the two batches.

b. No differences were observed; this could be due to want of a control batch.

c. Not qualified to answer or really didn't know. I didn't understand enough about what was expected or what was going on to tell.

d. Impossible to evaluate, due to limited observation, lack of reference material, and inadequate time for calculation and evaluation.

e. As at other facilities, the combination LB-1 Final and LB-2 Initial walkthroughs made it virtually impossible to detect any differences between the two operations.

PADUCAH - Representative Comments

a. Not to my knowledge or recollection. The batches may have been the same; so little was seen that both appeared to be identical.

b. More information was obtained because of the higher access, and procedures were refined somewhat between the two batches.

c. No difference. Again, a control was needed for one group to check evasion on the other.

OAK RIDGE - Representative Comments

a. No real difference between the two batches. I suppose this was due to standardization of weapons material or the lack of a control batch.

b. Procedures were the same, though the results varied greatly according to the pour. The first pour samples showed the greatest concentration, with less concentration with each succeeding pour.

c. Yes, there were differences in weights and quality of material. Evasion.

5. Adequacy of Equipment, Personnel, Etc.

Question: Were the equipment, personnel, procedures, etc. used at (given site) adequate for the job planned? If you were setting up these operations, what would you do differently? Why?

PANTEX - Representative Comments

a. Yes, at least the planned job was accomplished.

b. Austere but okay, thanks to some cool weather.

c. Adequate except for deficiencies previously noted.

d. Not qualified to answer; am not sure of what was really needed.

e. The facility should be completely equipped to accomplish dissassembly, and to include a large shipping and receiving area.

f. Detection equipment was inadequate in quantity and serviceability.

g. Space was at a premium, and existing space could be used more effectively.

h. Combined walkthroughs were a problem; it was difficult to relate tool, containers, etc. changes to the batch. Procedures were complicated when containers for MIKE were present during LIMA's final walkthrough.

i. We were not allowed to view containers prior to their being shipped out. At Rocky, we were asked to detect tampering on items we had never seen.

j. Improvement in X-ray plate reading tables would help.

k. In addition to the Polaroid camera, inspectors should have a between-the-lens reflex camera for taking closeups.

l. A general disregard for nuclear weapon safety and security programs prevailed--e.g., personnel sitting on weapons, no tie down devices, plugs not in safety position, loading HE residue with makeshift dunnage, faulty scales, climbing on equipment, and using a broom to release emergency air on hoist. The entire operation should have had a quality control overseer.

ROCKY FLATS - Representative Comments

a. Adequate except for items previously mentioned.

b. Glove boxes should have had all non-CG-34 equipment and material removed. The boxes were dirty, filled with miscellaneous junk, old samples, etc. which would permit a maximum degree of evasion. Arrangement was such that an observer could not see the test performed. Operators gave the impression that they were playing the Chinese Shell Game.

c. Some of the work was very sloppy. Samples were broken off with wire cutters near open boxes containing other samples which could have been substituted. Drainage rate errors were neglected in volumetric methods; drops remained on the tip. There was a possibility for gross contamination of samples, dishes, etc. which were used within the glove boxes with little cleaning; most were just rinsed or wiped with a Kimwipe. I'd clean up and get rid of sloppy techniques (or technicians).

d. The given written procedures were not always followed, and it is questionable whether procedures were correct. If I had not felt that I might cause a major disruption in the test schedule, I would have asked that many operations be performed at a slower pace.

e. For future tests, inspectors should do their own work in their own facility.

PADUCAH - Representative Comments

a. It was adequate except for previously noted items.

b. The operations were too long; they could be cut by at least 50 percent.

c. Eliminate the mock burial.

OAK RIDGE - Representative Comments

a. Yes, no change. Mr. _____ deserves a medal for tactful, knowledgeable, and willing assistance.

b. The refresher training was excellent.

c. It would have been valuable to have had two mass spectrometers for CG-34.

d. No (without elaboration).

6. Problems with Evasion

Question: What kinds of problems did you experience at (given site) in trying to determine whether you were being evaded? List and explain each significant problem area.

PANTEX - Representative Comments

a. I didn't know enough about nuclear weapons to determine fake weapons. I had never seen weapons before at close range, had never used a geiger or neutron counter on a weapon, had never seen a spectrometer plot, and had not been (adequately) trained in how different sizes and types of weapons and components looked on X-ray plates.

b. Because of limited background and low access, weapons were called real for lack of proof otherwise. I had no specific problems but was generally unsure of calls.

c. The only problem was the lack of data caused by the ground rules. More access permitted better calls; no calls should be based solely on A_1.

d. Even low access teams should have been provided geiger counters.

e. A major problem was considering the shapes foreign and disassociating all prior knowledge and experience in making a real or fake call.

f. The gamma spec acted up occasionally and made some results suspect.

g. The Site Commander had too much to say about how inspectors should accomplish their assigned duties.

h. Several activities by site personnel indicated either sloppy practices or knowledge that the weapons were fake. In one case, an electrician hooked up a common exhaust fan with "hot" wires in immediate proximity to one of the "weapons."

ROCKY FLATS - Representative Comments

a. We felt as if we were being evaded, but couldn't determine any evasion due mainly to ignorance and inexperience with these operations.

b. The inspectors were too isolated from the materials used in assay; the only way we would ensure against evasion would be to do our own work.

c. It was almost impossible to spot even simple evasion because the work was hidden in the glove boxes. Windows were covered with paper; the glove boxes blocked one's view; where weights and measures were critical, the operator seemed to deliberately make it difficult for us to see; and there was so much clutter that we were unsure at times of what was and what was not involved in FT-34. Evasion seemed to be so easily possible that we stopped watching the small things and only watched large operations.

d. In the foundry, materials were passed by conveyer belt through other areas containing similar material, often out of sight of the inspectors. Storage areas were overfull with a myriad of other samples, and the possibility of sleight-of-hand was excessive.

e. The LIMA-4 team did find one case where a technician tried evasion by hiding similarly marked samples against the inside of the glove box. But this sort of evasion was almost impossible to stop.

PADUCAH - Representative Comments

a. I was pretty much lost on that score; I had low access and no experience with such materials. I did not understand what was meant by evasion here.

b. Main problem was trying to recall information collected from previous walkthroughs and inspections. Without detail data on calls, weights, shapes, etc., it was difficult to analyze the situation satisfactorily.

c. Not seeing all the residue at Pantex or the arrival of material, it could not be determined if all shape cases and components arrived or not. Seeing only ingots was not really satisfactory or convincing.

d. Smelting operations were not observed and we could not truthfully say where the ingots came from. We didn't weigh the material before it was put into the furnace, and we had difficulty trying to determine the volume of the metal ingots shown us. It was even more difficult to determine whether these ingots adequately represented the complete batch.

e. I had the feeling that the amount of aluminum smelted was high; and that two of the shapes in Batch 3 were also shown for Batch 4.

f. The total weight was not enough, and the two 50-gallon drums could have been filled with any kind of ashes.

g. It was very difficult to identify components from the viewing distances allowed us.

OAK RIDGE - Representative Comments

a. No problems because we here a high access, skilled team.

b. We all felt we were being evaded, but couldn't actually detect any.

c. We did essentially our own work; believe there were few if any evasions.

d. The main problem was that I didn't know where to look. (Inexperience.)

e. Main problems were lack of knowledge and reference materials; dependence upon plant personnel and equipment; and trying to remember all the ground rules and guaranteed standards.

f. It was difficult to decide whether mistakes made by technicians were actually mistakes or attempted evasion.

g. At Oak Ridge, as at Rocky Flats, the ability of lab personnel far exceeded that of the inspectors. No evasion could be identified but neither could we say none was practiced. They were too fast or too good for me.

h. They could have tampered with the machinery. The technicians never followed handout procedures accurately, and the test controller would not let us verify parameters used during Jarrell Ash operations.

7. Problems with Classified Information

Question: What kinds of problems did you experience at (given site) in trying to list and catalogue items of classified information. List and explain each significant problem area.

PANTEX - Representative Comments

a. No problems, followed annex D.

b. No problems other than those previously covered.

c. The only problem I had was that I didn't know what to look for. I lacked the background to do a good job.

d. Shortage of time was a major problem, coupled with lack of knowledge, the method of presentation, and the volume of paper work.

e. The decision to restrict the "classified' items reported to those listed in annex D was silly. It would have been better to ask for "significant" or "valuable" information and left it to the discretion of the inspectors.

ROCKY FLATS - Representative Comments

a. There were no particular problems; there was very little new classified information introduced at Rocky Flats.

b. I just didn't know what to look for, due to lack of knowledge, experience, and adequate guidelines.

c. We were not sufficiently briefed on classification guidelines specific to the material handled at Rocky Flats.

PADUCAH - Representative Comments

a. I just wasn't as aware as I should have been of what I was looking for. Ignorance and inexperience. I found I needed more training in the shapes and functions of components.

b. Again, the guidelines in annex D were not adequate.

c. We suffered from lack of knowledge as to weapon components and the unavailability of previously submitted data sheets.

d. There was a great mass of detail in the junk piles and not enough time. The task of identifying and cataloging the myriad of items in the time allowed was overwhelming. One was forced to gloss over the entire area and try to pick out significant items or areas. In doing this, one must rely on memory, and this task came about six weeks after we had been given training on the subject items.

OAK RIDGE - Representative Comments

a. No specific problems. Lack of knowledge and available reference materials hurt generally; I just didn't know where to look.

b. Annex D was inadequate, and lack of information on significant classified information was the greatest problem. If assay information was classified, it would have been contaminated in a real situation, so the classification would be removed.

8. Gratuitous Information

Question: Did you receive any gratuitous information at (given site) which influenced your conviction, your evasion calls, or decisions regarding classified information? If so, what was the source of this information, and what effects did the information have?

PANTEX - Representative Comments

a. One member of another team said that weights didn't check out for a weapon he was familiar with; and the Chief Inspector indicated that one of the large shapes had a fake center. As we were low access, this data would not normally be available, so we neglected it.

(NOTE: This seems to be an area where inspectors simply said "none" rather than "tattle" or take the time to express incidents in an acceptable form.)

ROCKY FLATS - Representative Comments

a. No gratuitous information was received that influenced our results.

b. We sometimes overheard comments made by plant personnel.

c. Due to lack of vehicles, high and low access teams rode together, but no significant information was exchanged.

d. Once, our controller said that we were being evaded, but I had seen nothing, so it was ignored.

e. We had been identifying our samples by batch or pour until the lab operator used other symbols which, when he explained them to us, both provided information and helped improve conviction.

PADUCAH - Representative Comments

a. One item was placed with the open end down. By requesting that this item be re-weighed, we were able to view the interior while it was being moved. Although we couldn't identify the item, we were able to get a complete description of the item inside and out.

OAK RIDGE - Representative Comments

a. Yes, several times from the controller, but it had very little effect.

b. Some hints from the controller; all information received was considered, and in some cases the controller's hints stimulated thinking.

c. Other team members indicated that the controller attempted to influence their decisions, but I wasn't particularly bothered.

d. The test controller and I had a definite personality clash. He would try to influence our results by throwing out tidbits of information. He thought we should be getting more information than we did. In analyzing his tidbits, the team decided that he was leading us too far astray; and most of his comments were ignored. This was the first time we felt we were being evaded by a controller.

9. Comments on Questionnaire Items

Question: Do you care to comment in detail on the questionnaire items regarding (given site) or on any other aspects of the (given site) phase of the test?

PANTEX - Representative Comments

a. I'd hate to work there.

b. No, other than Pantex personnel had a miserable attitude toward us.

c. Site personnel handled weapons in a manner that would lead one to believe they were all fakes. I can't believe they would be that careless with real weapons (I hope not). They used the wrong sized fork lift (with regard to exit door clearance), and they didn't know to place boards across the threshold until the latter part of the last batch. The results were that the forklift had considerable trouble and smashed the metal socket in the threshold. This indicated that the personnel weren't very familiar with that particular operation.

d. The changing of the scheduled time allowed for shape inspection from eight to six hours disrupted the teams' operation. This appeared to be a Site Commander decision and was not announced prior to the inspection.

e. The movie taking should have been better coordinated to use the lower access teams; the high access teams had enough to do as it was.

f. The paint jobs created some confusion. Were the weapons repainted to obliterate significant markings and service colors, or merely to simulate colors of a foreign power? Personally I believe the latter.

g. It sometimes seemed that we were being asked to determine if these were real U.S. weapons rather than Russian. Some evasions were seen but not reported because apparent alterations did not preclude the weapon from being a real "foreign" weapon--e.g., the 8-inch shells.

h. At A_2, certain access doors were opened and others were not. After asking for ALL doors to be opened, we would find one unopened; on asking for that door to be opened, sometimes plant personnel would do so, sometimes they would refuse.

i. Major _____ was unbiased and a very good controller, the bright spot in the whole dreary Pantex picture.

ROCKY FLATS - Representative Comments

a. Complete evasion techniques should have been briefed by an outside, knowledgeable person, not by those who developed the procedures and evasive techniques to be used.

PADUCAH - Representative Comments

a. In order to obtain any degree of conviction at Paducah, more of the operation would need to be observed, especially in the smelting operation.

b. The test controller did not seem to understand that our team leader, or the team, had the ability to write whatever it felt to be true of the Paducah operation.

OAK RIDGE - Representative Comments

a. Contractor personnel were very pleasant and patient with us, making the stay the most enjoyable of all the facilities. Also, we got to do something other than sit, stand, and watch.

b. The Oak Ridge system of merely "presenting" the material for disposal was superior to the sham burying practiced at Paducah.

c. One of the controllers appeared to assume the duties of Assistant Site Commander. During the weighing operations, he took charge to the extent that the inspectors were forced to accept his weights and use the scales he wanted, not what the inspectors wanted.

d. The Site Commander and one particular controller gave outstanding, mature support to us in every possible way.

10. Overall and General Questions

a. Question: Do you believe that this same FT-34 field test, if conducted at a single facility, would provide significantly different data from the test just completed at four different facilities? Why?

(1) Very much so, due to improved chronological continuity and much better opportunity to concentrate on basic questions. The inspectors would be better able to follow the operations from start to finish in more logical sequence; information compiled during each step would be available at subsequent steps; and the possibility of evasion in shipment would be irrelevant.

(2) Yes, the data obtained would be of increased validity due to shorter inspector exposure and non-interference with production work.

(3) Yes, the X-rays would give valuable data when compared with the Paducah residue, and there would be no interference with non-FT-34 materials.

(4) I don't know if different data would be produced, but I might tend to trust that data more.

(5) Not if the same method of observation is used; the only way is to allow inspectors to see disassembly and accompany the respective material from the start of the operation to its conclusion.

(6) No, I don't believe a single facility would change the data; because I don't believe that evasion was practiced in shipment. The test simulated a single facility, and I feel this was realistic.

b. Question: Do you believe that shipments between plants were tampered with in any way? If yes, when and how? How did this belief and the character of those shipments affect your conviction and/or performance?

(1) Yes, although specifically how or when is unknown. It lowered conviction.

(2) Yes, I do not believe that all material seen at Pantex was shipped or that all weapons were destroyed. I think material was substituted at the foundry at Paducah. There were too many containers at Rocky Flats, and I don't think that those containers represented the material that should have been in the weapons.

(3) I don't know and have no way of knowing. If the shipping containers were observed empty, filled but unsealed, and then let the inspectors seal and record the seal number, it would have helped conviction.

(4) Don't know. Material was not observed during disassembly, preparation for shipment, or shipping. Conviction was influenced for there was no way of knowing if ANY of the active material ever left Pantex or if any of the weapons were ever torn down.

(5) Only through error. In only one case was there any question; this occurred because a couple of seals were broken on containers shipped to Oak Ridge. I don't believe evasion was involved.

(6) No, we had to accept this statement of project honesty to make the test feasible. This would not occur in a single facility.

c. Question: Do you understand why evasion was practiced for the FT-34 field test? Would you include evasion if you were designing the test? What kind of evasion? Why? How?

(1) Yes. Yes. I would probably have done about the same thing.

(2) Yes. Yes. I would include only evasion which would significantly effect the test results. I would let inspectors act more like real inspectors.

(3) Yes. Yes. I would include in the training of future inspectors a course on possible evasions and means of detection; I would have them exercise their ingenuity in devising or detecting evasion by pitting them against each other.

(4) Yes. Don't know. How much can the U. S. afford to allow our design of weapons to become known to possible enemies?

(5) Unsure. Yes. I think that evasion on the part of the inspectors should also have been part of the problem. We were never searched for hidden cameras, tape recorders, etc. Why not?

(6) Not completely. I would include evasion to protect classified information.

(7) I would (1) adjust weights of weapons so they would not represent the weapons being inspectioned, (2) place a simulated warhead section in some unusual location, and (3) adjust the different machines to produce fake data.

(8) Yes. To determine how deeply the inspectors were observing the available information. I'd not do evasions with the laboratory phases, since I'd expect the inspectors to do their own work.

(9) No. No. I would concentrate on establishing methods to enhance international trust.

(10) No. No. No. (Without explanation.)

d. Question: Do you feel that intentional harassment was practiced at any time during the test? If so, where, how, and with what effects?

(1) Yes, to simulate harassment a foreign inspector would receive--unnecessary escorts, abnormal record keeping, unnecessary restrictions, etc.

(2) Yes, at Rocky Flats, by the operators not letting us see every operation performed.

(3) There must have been because I don't think any operation this small could make so little use of so much time. I am referring to access only by special gates, going 15 miles and spending half a day to accomplish 45 minutes work.

(4) Closest thing to intentional harassment I can think of would be the fiasco on the mass spectrometer during the special assay.

(5) Possible actions did not appear to be intentional and had no effects on team operations.

(6) I don't know. If so, it did not affect my performance.

(7) No intentional harassment was felt. Any errors, delays, etc., were put down as typical government handling.

e. Question: Did any events or circumstances constitute unintentional harassment? If so, where, how, and with what effect?

(1) Yes, as noted above.

(2) Yes, at Pantex. See comments regarding office vans, living conditions, transportation, and control of inspectors during off-duty.

(3) Yes, at Pantex, sloppy weights, poor preparation, and inaccurate information made our work unnecessarily difficult.

(4) Yes, at Pantex, the bus driver left without notice to go to lunch just as we were completing inspection of material for destruction. We had to wait about one hour before we could continue the work.

(5) Yes, at Rocky Flats, the standardization went sour on the first few samples showing how easy it would be to evade. Equipment malfunctions at Rocky.

(6) Yes, at Oak Ridge, test controllers were unnecessarily difficult, the scales were changed between the fine weighing and the gross weighing, and we had sloppy technical help during the special assay.

(7) Most harassment having any great meaning to me was more of a personal nature that came from my lack of qualification for this assignment, difficulty in planning for separation from the Navy, the lack of privacy in which to think out my situation, and the resentment of my team members to any adverse affects that my distraction had on team performance.

f. Question: If (the above two) questions are negative, what might have been the nature and effect of harassment which might have been practiced.

(1) No significant impact; the team anticipated some harassment.

(2) Other than a great deal of frustration, I cannot think of any effects.

(3) Just make it a little more difficult to come up with the answer--slow ups, long work days, poor test controllers, attitude of Site Commander, etc.

(4) Effects would be to lower morale to the point that test results could be adversely affected. Very intense harassment could have made some of the team members quite ineffective.

(5) The security aspects could have been played into significant harassment.

(6) Though the ground rules allowed no conversation with plant personnel, this was flagrantly violated at all sites. Enforcement might have been harassing, especially to low access teams who had nothing to keep them occupied much of the time while they observed slow, routine procedures.

(7) It would make me want to do a better job just to prove that although personally upset, I could still perform my assigned task.

g. Question: Would you have made more calls, or would you have been more confident, if you had been asked to call-out "significant design information" rather than "classified information"? Explain.

(1) Yes, many significant calls could have been based upon the inspector's judgment rather than a pre-made list of acceptable items.

(2) Yes, much information was considered to be valuable from an intelligence standpoint but was not reported because controllers said it was not important or was not listed as classified in the guidelines.

(3) All calls were made by the team leader as I had no weapon experience.

(4) Maybe. Something may seem significant and still not be classified.

(5) Not without very intensive training in weapon design; I am not familiar with weapon design.

(6) Most "significant design information" is classified. In almost all cases, the two were synonymous for this test.

(7) No. Design information was available and was considered in making calls even though it was not specifically asked for.

h. Question: In what ways do you think your performance in this test differed from how you would perform, under these same conditions, if the test had been conducted on enemy weapons in enemy territory?

(1) No change. The team tried to function as if we were in enemy territory.

(2) Improved performance due to increased motivation; I would have stayed more alert and would not have become bored being on a low access level.

(3) I would have been more suspicious, but that's all. The enemy would have to prove their weapons real. I would have trusted nothing.

(4) Would probably take an entirely different approach and attitude toward the test, and would be more suspicious of everything that went on.

(5) My attitude would be more dedicated to the assignment, but how would this overcome my ignorance and inexperience?

(6) I would have made damned sure that I was better prepared. I would have studied our weapons and any information I could get on theirs.

(7) That everything not directly connected with the inspection be removed from the facility. I would insist on performing laboratory operations in a logical order and on being able to analyze standards with g/g, isotopic, and impurities composition known only to myself.

(8) A foreign country will never allow us to use detail procedures and observations to make sure a number of weapons are destroyed. The only sure way is to detonate the item.

(9) The call of evasion would have been in the form of a challenge for proof. We did not have the benefit of confirmation.

(10) Very little, but I would never agree to serve in the access level to which I was limited.

(11) None, because I'm certain I would not be called on to do this job. I do not feel that the inspectors used on FT-34 could be capable of being inspectors on foreign weapons and obtaining the desired results.

i. Question: What changes would you recommend for inspection on foreign soil? What would you recommend to reduce the chance of being successfully evaded? And what precautions or safeguards would you suggest to inspectors participating in a treaty inspection?

(1) Use inspectors who are far better trained in nuclear weapons and foreign technology. Use the most highly qualified people available. Use better qualified people, or technical R&D people.

(2) Insist on better preparation. Go through extensive training on both U.S. and foreign weapon characteristics, design, and physical dimensions, using the latest information available. Use a batch of weapons fabricated to duplicate the enemy's stockpile, and train inspectors on as close to the real thing as possible.

(3) Use a single facility, managed, manned, and equipped with U.S. personnel and equipment, and allow samples to be taken to the parent nation's facilities for observed analysis. Either take our own lab and material or send samples back to the U.S. labs for examination.

(4) Do our own analysis, with our instruments, using our standards. Use your own standards which can be inserted at any time, and smaller geiger counters, neutron counters, etc., to check all other equipment.

(5) Use geiger counter in walkthroughs and a camera to record detail data.

(6) Insist on more time to inspect weapons, and access higher than A_1.

(7) Insist on complete observation of disassembly and smelting of active material, and have inspectors maintain control and identification of samples.

(8) Always be alert. Watch every last portion of the operation and have it guarded by our own security force while the inspectors are away.

(9) Have inspectors know Russian and be able to talk to technicians.

(10) See recommendations in previous sections.

j. Question: What type of personnel would you recommend as inspectors for treaty purposes? What would a team consist of if you could select skills and people to make up an inspection team?

(1) All should be experts in their specific fields with considerable weapons and job experience, and GOOD, general, technical backgrounds.

(2) Military officers would make good inspectors if technically competent.

(3) They should be skilled technicians who have worked with weapon design, development, and analysis; and who are chosen for their knowledge, experience, and scientific detachment.

(4) All should be able to sketch or draw if necessary, as cameras may not be allowed, and able to use cameras if they are allowed.

(5) Intelligence personnel who are trained in foreign operations, observation, and data gathering would be most useful.

(6) There should also be guards to make sure that nothing goes into or out of the facility when the inspectors are not present.

k. Question: What did you get out of this test that will be of benefit in future assignments?

(1) Nothing, or I don't think that I will benefit. I will retire in May 1968.

(2) I have no idea. It is hard to say unless you know all your future assignments.

(3) Very little. Present and anticipated assignments do not deal with lab and technical operations at the level this test was conducted. So-called routine receipt, checkout, disassembly, assembly, and modification of weapons received from DOD is certainly different from this test.

(4) Very little. Knowledge of personnel relations and how NOT to administer a field test (re Pantex).

(5) A broadening of contacts and methods of dealing with various types of persons under different conditions.

(6) Personal satisfaction and a general broadening of background.

(7) A general knowledge of the make up of nuclear weapons, an increase in my knowledge of the world around men, and valuable experience in fields I hadn't worked in.

(8) A chance to see and use equipment I had not used before. General lab experience, more familiarization with mass spec and emission spec analysis, and an interest to stay in the nuclear field.

1. Question: What is your attitude toward the three month's temporary duty you just completed as an inspector in field test FT-34? Consider personal, patriotic, and career aspects?

(1) I thoroughly enjoyed my duty, and value the friendships that developed. Inspection personnel were in most cases very capable and intelligent. I found them interesting and, at the same time, added to my own education.

(2) I thoroughly enjoyed the work, especially in the laboratory. The equipment at Oak Ridge is exceptionally fine, and I considered this a wonderful opportunity to get the experience.

(3) It was a duty I was selected to do and strived to perform to the best of my ability. But no career aspects were considered in my actions.

(4) I will be glad to return to my duty station as I am getting weary of motel rooms; but I feel this assignment will be beneficial to my career.

(5) TDY away from one's service to another organization is detrimental to an officer's career, whereas assignment is not and may be a benefit.

(6) This has been a change of duty, sometimes enjoyable, often informative, but of doubtful contribution to any de-escalation treaty, I was needed much more at my home duty station.

(7) I hope it has been of some value to disarmament, but I have my doubts. I feel that the concept is vital to our national interest, but I am concerned about hasty adoption of a treaty without additional testing.

(8) I don't believe the TDY did me any good. However, I hope it helped to establish procedures for a disarmament treaty. I am mature enough to want a peaceful world for my children, and I am willing to contribute where I can.

(9) I would prefer to have remained at my home station; I recently returned from a one-year tour in Vietnam. I would not volunteer for another round of FT-34, nor would I have volunteered for this duty had I been given a choice.

(10) Almost a waste of time except for a break in routine and an opportunity to work with personnel from other services. For a career aspect, it had no effect as I learned little that I didn't already know.

(11) I feel that I have been used to express the Navy's (negative) attitude toward this project. I enjoyed the travel and the extra money.

m. Question: What would be your attitude toward being assigned as an inspector for demonstrated destruction of nuclear weapons under international treaty, should one be negotiated?

(1) Where do I sign up? I would be more than willing. I would consider such an assignment to be of extreme importance and would hope that the proper training would be given me.

(2) I would consider it a great honor; however, I am not qualified to accept such an assignment, and I would decline it on that basis.

(3) If I could be given the intensive training referred to in response to earlier questions, I would be pleased to be assigned as an inspector.

(4) I have no objections, though I feel that there are many more qualified personnel available for this work, and that the end result would be more valid (if they were used). I would like the honor, but I'm not qualified.

(5) I would be very unhappy, because I am not completely qualified. I would not feel totally qualified without at least several years of weapons experience and experience in the chemical analysis area.

(6) Only in the labs, then only with intensive training, Russian language, etc.

(7) I do not desire this type of assignment.

(8) I plan to retire.

11. Optional Questions

NOTE: The following, informal questions were attached to the basic questionnaire at the time of debriefing. These questions were optional, and not all inspectors responded to them. Only 21 of the 24 inspectors were asked these questions, and many answered simply "yes" or "no."

a. Question: Would observation of the entire weapon disassembly process have helped you during this test? How or how much?

(1) Yes, very definitely. Evasion would be much more difficult and conviction would be higher. This would reveal all information required to make real or fake calls.

(2) The matter of determining real or fake, classified information, conviction, etc., would have been greatly simplified. Evasions would be very difficult if the entire process was observed.

(3) I am sure that it would have been of considerable help; unfortunately, a good deal of classified information would probably also be revealed. I don't know how we could arrange the ground rules for complete disassembly.

(4) Although X-ray gave away too much information, watching complete disassembly would add more to conviction.

(5) It would help keep tabs on shipment of material to other facilities. As it was, there was inadequate continuity and coverage of material after we left Pantex.

(6) Probably; it would have been nice to see.

(7) Looking inside access doors would reveal as much.

b. Question: Would observation of shipping containers at Pantex (watching lids being closed) have helped? How?

(1) Yes, inspectors would have a better idea of what to look for at other facilities. It would help conviction for between-plant shipments.

(2) Yes, inspectors should have this opportunity regardless of access level.

(3) Such observation coupled with a separation of the final and initial walkthroughs of disassembly areas would have

given an indication of the number of components which came from each batch.

(4) It would help establish conviction for between-plant shipments, and assure that the material was packed as advertised.

(5) Would have given me confidence that the fissile materials analyzed actually came from the weapons monitored.

(6) It would have shown the size and actual shape of fissile materials.

(7) This information may have been of value in detecting evasion.

(8) No, probably not, or not really.

c. Question: Would you comment on observation of weapon disassembly processes as a substitute for X-ray?

(1) Observation would be a great advantage over X-rays in most cases. Weapon components would be more readily recognized if they were actually seen rather than try to determine what they were from X-rays.

(2) There would be more conviction from seeing disassembly than there was for X-rays, although I thought X-ray gave away too much information.

(3) It would be more convincing than X-ray, but would also reveal more classified information.

(4) Disassembly much better; X-rays to the untrained eye are almost useless.

(5) Disassembly would be better if we could also measure at times.

(6) No, both are necessary.

d. Question: Did you have any morale problems during the test? Where? How were they solved?

(1) Yes. The team captain had a superiority complex.

(2) Yes, as stated in response to earlier questions.

(3) Yes, at Pantex, but it did not affect my inspection.

(4) Yes, throughout the test. Worst at Pantex.

(5) The greatest morale problem was the absence of knowledge of results or an indication of how well we were doing. This was prevalent at all sites, but naturally increased as the total time on the job increased.

(6) No, because we are military men who have a job to do.

(7) Yes, they were solved; or, they were solved when I departed Pantex.

(8) They will probably be resolved at the final debriefing.

e. Question: Where was your morale highest? Lowest?

(1) The key to the whole test was Pantex, and that's where most of the interest was. Rocky Flats and Oak Ridge were just laboratory exercises.

(2) Highest at Paducah; I had just returned from a trip home.

(3) My morale remained constant.

(4) My morale was good, but I would not want to serve with our team leader again.

f. Question: Did you have any personal problems which interfered with your inspection capabilities? If yes, did they get resolved?

(1) Yes (without explanation).

(2) Yes, resolved after I left Pantex.

(3) My wife had our first child four weeks prior to my leaving home, with no one to help her.

(4) No (not resolved, without explanation).

g. Question: What did you expect during this debriefing session?

(1) Essentially the same as was given, a questionnaire and a talk on evasion.

(2) Didn't really know (what to expect).

(3) Information on results of the test; to find which were real and where we had been evaded.

(4) A reason for the exercise.

h. Question: What would you add to or change for this debriefing session?

(1) No change or I wouldn't change it much. The booklet is worthwhile.

(2) Would have to know what results were wanted. Need a reason for the exercise.

(3) If military types are to be used for future tests, the services should be required to provide personnel with the skills required. It would appear that this was not done in all cases on FT-34.

(4) I would give personnel a fixed time in which to complete the debriefing. I would suggest a day and a half for inspectors, two days for team leaders.

(5) The policy of telling a person he can go home as soon as he completes his debriefing is not conducive to obtaining the most complete and accurate data. This has been a long, hard road, but hurrying at this point wastes a tremendous amount of potentially valuable information.

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FINAL REPORT

ANNEX E

APPENDIX E3

TEST CONTROL RESPONSE TO ESSAY QUESTIONS

SEPTEMBER 1968

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APPENDIX E3

TEST CONTROL RESPONSES TO ESSAY QUESTIONS

A. GENERAL

The following sections list the responses to debriefing essay questions from test control personnel at each test site in FT-34. These responses augment the numerical results shown in chapter VII.

B. RESPONSES

1. Question: Give your impressions of the logistic and administrative support furnished FT-34 personnel while at (site). List any inadequacies experienced and note how they were corrected or how they may be prevented in the future.

   a. Pantex Comments:

      (1) The quality of logistic and administrative support was sufficient to perform the task assigned. There were no inadequacies.

      (2) At the beginning, the plant did not have the area we were to use properly prepared. The following bothered the inspectors: (1) Lighting was inadequate on cloudy days in the corridor. (2) Trailers and furnishings were not ready for LIMA teams. (3) Only one gamma spectrometer was available for batch 1. (4) Problems with the union were at times ridiculous -- e.g., waiting on a bus in 100-degree weather for an hour while a union driver ate lunch. This was an internal problem of the plant.

      (3) The initial set up was slow, but generally the personnel of the plant cooperated extremely well on all matters concerning logistics and administration.

      (4) The two small mirrors furnished to observe material disposal were not adequate. A single, large mirror (4 by 8 feet of stainless polished steel) mounted forward

and above the bunker would have furnished a view of all pads, and photographs could have been taken.

b. Rocky Flats Comments:

(1) Plant personnel were extremely helpful in all areas; deficiencies noted were promptly corrected. The only difficulties encountered were due to breakdowns in communication between the plant "action officer" and the implementing agency. This caused some minor delays.

(2) Security measures were considered over-indulged in that escorts were required for even basic body functions. The clearances of FT-34 personnel should have allowed a greater degree of freedom of movement within lab areas.

(3) There were a few small time losses due to transportation, but the motor pool did the best they could with the equipment available. The cashing of checks was an administrative oversight.

(4) The inspectors became bored during the first week of the test and I feel that this affected their performance.

c. Paducah Comments:

(1) I think the support was excellent. I was particularly impressed by the efficiency, knowledge, good attitude, and ability of the enlisted men and women at Paducah.

(2) The personnel at Paducah were most cooperative and very well qualified. I experienced no difficulties.

(3) Support was very adequate; I have no complaints or suggestions.

(4) Support was adequate, but I do think more information as to what FT-34 is should have been sent us at our home station; time used in getting authorization for private cars could have been saved with a clear cut statement of authorization in the original orders.

d. Oak Ridge Comments:

(1) I felt support was outstanding, and can think of no improvements.

(2) Support was excellent. The biggest irritant was the test forms; there were many times where the forms did not meet the requirements, and there had to be some improvisation in order to include all the necessary data.

(3) Very good. Occasional apparent inadequacies result from failure of inspectors to provide site personnel with timely information of requirements. Car trouble was annoying. Budget car rental support was not always within acceptable limits due to late or forced delivery of credit cards and lack of vehicles to exchange for defective ones.

2. Question: Were the equipment, personnel, procedures, etc. used at (site) adequate for the operations planned? If you were setting up those operations, what would you do differently?

a. Pantex Comments:

(1) Equipment, personnel, and procedures were generally adequate for the operations planned. There were some limitations that appeared unavoidable, such as scale limits during weighing, tools and fixtures that had to be borrowed from FT-34 for other plant operations, and the number of personnel allowed on burn pads during burn operations.

(2) The results at the beginning of the test would have been better if a practice run-through had been conducted during training.

(3) Adequate, but I would assign a particular task to a particular (plant) individual and ensure that he was available to do the task at the time specified.

(4) Personnel were most helpful and willing, but the burn procedure left a lot to be desired. Inspectors needed a better optical facility for viewing, and could have been afforded more creature comforts (e.g., cold water on 100-degree days).

(5) Other procedures improved with our own experience. Inspectors were not really satisfied with the facilities. They would have liked indoor plumbing, opportunity for a coffee break (and some place to get coffee). They resented the lack of facilities, but, except for a few individuals, they accepted the situation and made the most of it. In the future, I would try to satisfy some of their desires.

b. Rocky Flats Comments:

(1) Based on existing conditions, the facilities, etc., were more adequate. But I would remove all equipment not associated with the test; this provided inspectors considerable consternation.

(2) Considering the conditions, everything was satisfactory. If changes were to be made, they would be at the expense of normal plant production.

(3) Yes, however if I were setting it up, the inspectors would do all lab work and keep the samples in their custody at all times.

(4) Some of the walkthroughs could be eliminated. The number on FT-34 tended to confuse the inspectors. In a one facility operation these would be necessary.

c. Paducah Comments:

(1) Operations were adequate; no changes recommended.

(2) Adequate with the exception of burial procedures. I think a "deep water" ocean burial simulated in a lake or pond would have gone over better. Even a serious

lecture on the subject would have been better than the "bury the box in the ditch" routine enacted at Paducah.

(3) Adequate. If I were setting up these operations, I would satellite the Paducah operation on the site chosen for original disassembly and, instead of smelting the aluminum and lead components, if furnaces were not available, I would merely have these components crushed to make it obvious that they were not to be used again.

(4) Adequate. I would assign a controller to a team and have him follow the team for the complete test. In this way, cost savings could be realized and more selectivity practiced in assignment of controllers.

d. Oak Ridge Comments:

(1) Yes. No significant changes can be recommended.

(2) Very satisfactory. I feel that the procedures set down in the annexes and the data forms could have been a little clearer. Lab personnel said they had not seen the forms until the LIMA teams arrived. This required making several minor changes after the inspectors arrived.

(3) The inspector personnel were inadequately trained for their work as seen in the fact that very few of the evasion attempts were detected. They did not have enough experience in the fields that they were asked to participate in, thus making it a rather simple matter to fool them. For this reason, I feel that FT-34 cannot be considered a completely reliable and valid test. The majority of the inspectors did the best they were capable of, which wasn't really too bad; and for this reason I feel quite a bit of good information was obtained from the test.

(4) Since a large amount of training would be necessary to make them equal to the task, I believe that already qualified personnel should be used, and the procedure

should be changed to prevent any chance of teams comparing their results.

(5) Adequate, but I would have designated a spare mass spectrometer for FT-34 use to avoid unnecessary delay and frustration. Also the scheduling as set up in advance for the labs was totally unrealistic with entirely too much built-in miscoordination and frustrating delay.

3. Question: Do you understand why evasion was practiced for the field test? Would you include evasion if you were designing the test? What kind of evasion? Why? How? Etc.

a. Pantex Comments:

(1) I would include at least one shape that did not have any radioactive material in it at all. All other spoofs were real good.

(2) I would not have four fakes with access doors that open and reveal empty space and styrofoam. Why four of the same? Why not load up the back end for a better conviction at the A-2 level? They should still detect it by the Geiger counter. And why have only one shape in both real and fake configurations? I'd much rather see some real and fake configurations of several shapes.

(3) Yes, I understand the theory for evading. In some instances the practicality was not clear to me. I would include evasion but in fewer instances and never on an unsophisticated basis; it must be considered an actual attempt that would have an excellent chance for success in spite of and in front of bona fide experts.

(4) Yes. I would use the same evasion practiced with the addition of special tooling used in the assembly/disassembly of the type of weapons that would lead to calls (beliefs) that weapons were being destroyed that had more fissile material than that actually present.

b. Rocky Flats Comments:

(1) Yes. I would use basically the same as that practiced; however, I believe that scientific personnel would be more apt to detect any and all evasion.

(2) I could not improve on the evasions that were practiced here. They were adequate and realistic in my opinion.

(3) Yes. In future tests evasion should play a larger role and be more sophisticated. Evasion at R. F. was pretty simple and I feel that with proper training the inspectors could have detected all of it.

(4) Yes. I would include no evasion in any test. I feel that any agreement should preclude any evasion and that inspectors should be in charge of all operations.

c. Paducah Comments:

(1) Yes. Evasion should be as subtle as possible (as close to real as possible). I have no recommendations over and above those evasion tactics I was made aware of.

(2) Yes. I would recommend that the operation at Paducah include a steel furnace so that the shapes were not seen again after disassembly or that a crusher be employed so that changes in weights or no changes in weights, after the removal of alleged fissionable material, would not be so obvious.

(3) Yes. Evasion training would be part of the test if I were planning it. I believe that evasion well planned would be impossible to detect at the access level which would probably be agreed upon. And I also believe evasion is hardly worth while, except as a confusion factor, if it can be guaranteed that the required amount of nuclear material is presented.

(4) I believe that evasion was practiced in order to discover if it could be detected, what kinds could be detected easiest or with the most difficulty, and at what access

levels we might reasonably expect to detect it. I most certainly would have included evasion, but I can add nothing to the evasion plan.

d. Oak Ridge Comments:

(1) Yes. Yes. I would have made it evasion that would be practiced in a real situation. I got the feeling that the FT-34 evasion was jury-rigged, hastily conceived, and not very realistic. This does not necessarily mean it was easy to detect.

(2) Yes. The practice of evasion was very important. I think that after analysis of this data, it can conclusively point out to our peace negotiators many pitfalls that they can avoid when reaching an agreement with the Russians.

(3) Yes. I don't think I would include evasion. In a treaty situation it would be relatively unimportant as to whether the fissile material came from actual nuclear weapons or not. The only important thing would be the grade of material.

4. Question: What changes would you recommend for inspection on foreign soil? What would you recommend to reduce the chance of being successfully evaded? And what precautions or safeguards would you suggest to inspectors participating in a treaty inspection?

a. Representative Comments:

(1) It must be remembered that "there are two sides to every treaty." Whatever we demand in the way of conditions will allow the other fellow the same conditions in our country (and vice versa).

(2) The most obvious way is to inspect at the highest level possible, but this is a two-way street and I seriously doubt that the USA could afford this route and maintain present security aspects.

(3) I would recommend thorough expertise on the part of the inspectors. They should not only be scientifically qualified but should possess a thorough background to include practical experience. I would want the most trusted and qualified Americans possible conducting the inspection with equipment they were thoroughly familiar with.

(4) The inspectors should be knowledgeable of how evasion might be attempted. The mind of the inspector is the best guard against evasion, so I would get the best minds. They should be able to speak the same language as the test personnel of a foreign country, in that information may be gleaned just by talking or listening.

(5) The team should consist of specially trained individuals that had the greatest amount of experience in all types of nuclear weapons. They should be briefed on everything known or suspected pertaining to weapons in Russia, China, France, etc. And their training should include thorough study of all of our own weapons and components. They should be trained in counter-evasion and made aware of where and how evasion could be practiced.

(6) All lab work must be done by our people in our facilities either "off-shore" or in our own country, or in self-contained trailers. Even if the USSR performs an analysis of these materials for our inspectors, we should be furnished with samples for our own analysis. An analysis using host equipment and reagents is preposterous; in a real situation the assay would not be done by either of the protagonists but by "neutral" agencies, such as the I. C. C. Perhaps the assay should be done after delivery of material to an international body.

(7) For inspection on foreign soil I would insist on the "single facility concept." There is too much chance for evasion when you move things around.

(8) Inspectors in a foreign country should have diplomatic immunity.

(9) I would definitely have the weapon and all of its associated parts under 24 hour surveillance to insure that it is not being tampered with. It may be hard to get both sides to agree because during several phases weapon design could be revealed. I would want to put my own seals on the doors when I left an area rather than having many people in it after I left.

(10) Have standards that the teams could use with their own Geiger counters and neutron counters or gamma spectrometer. (No standards were available for either of the counters.)

(11) Some type of mark, stamp, etc., could be affixed to equipment for the purpose of keeping track of it for subsequent walkthroughs.

(12) The workday and tour should be fixed. The inspector would do whatever he could in the time allowed, rather than hurrying through to get some free time. I'm not saying that this was a serious problem, but it did happen among the various teams.

(13) Use onion-skin paper and soft lead for picking up serial numbers and proofmarks.

(14) Inspectors must be indoctrinated that this is the enemy they are inspecting and evasion will take place at every phase of the inspection including the overt friendliness of the people encountered. Frequent visits to the inspectors by the best psychiatrist available is a must.

5. Question: What type of personnel would you recommend as inspectors for treaty purposes? What would a team consist of if you could select skills and people to make up an inspection team?

a. Representative Comments:

(1) I would select the most experienced personnel available; the type that work with the equipment and weapons on a daily basis. These type of people would probably be

found at such places as LRL, LASL, Sandia Corp., Oak Ridge Lab., and the Rocky Flats Lab.

(2) For treaty inspectors I would choose people who design and build our nuclear weapons. Experts taken from the weapons activity in this country. Civilians actually working in weapon manufacturing or disassembly and essay.

(3) A chemist for chemical analysis, a metallurgist for familiarity with the foundry and machine shop, and an electronic engineer to detect any evasion in the equipment. All should be patient, thorough, competent, and experienced. I feel this electronic expert was overlooked in this test.

(4) Team personnel should be mature officers from all services. All should receive very thorough schooling in areas that our inspectors only got a glimpse of in their training. They should be experts prior to going and not have to develop after they are on the job (the problem we had in FT-34).

(5) Men with a keen ability to observe details. Those with photographic memories should be used if photos are not allowed.

(6) They must be mature (not to be interpreted as "old"), with a wide range of interests and intellectual curiosity. Maturity, poise, open-mindedness, curiosity, acute observation, and willingness and ability to think should be considered more important than mere technical skill levels.

(7) There should be enough people on the team so that the inspection could be carried on round-the-clock.

(8) I would insist on exhaustive cross-training. They should be exposed to foreign equipment, texts, procedures, etc., in a detailed, thorough training program.

6. Question: Do you have any other comments or suggestions?

   a. Representative Comments:

      (1) Operations at four sites had to influence inspection results. The time involved between Pantex and Paducah left doubt in some inspector minds as to what they had originally seen. The paper work from one site should have been available at the next site.

      (2) Most test controllers and at least part of the inspectors had no nuclear weapons or chemistry background. This type of personnel selection, in a real situation, would defeat the objective of the treaty; only the most highly qualified people should be used. I believe that most military personnel would not be acceptable as inspectors; few have the highly technical background necessary to recognize sophisticated evasion.

      (3) I feel that the use of military personnel with questionable or no qualifications for the work involved biased the data. The test value was further damaged by the fact that indiscriminate assignment by the services resulted in a group with a large percentage of people in adverse personal circumstances or with a very short time left in the service. This resulted in a malcontent, "short timer" attitude.

      (4) The rush to get the inspectors home a day or so sooner may have resulted in a poor data package on their last day.

      (5) This field test is certainly a fine beginning. It would be a mistake to go to the conference table with less than a finished product. Research should continue until mathematical answers are obtained.

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