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THE USE OF EVIDENCE IN INFLUENCING TECHNICIAN ATTITUDES

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This report describes the second study in a larger research effort to assess the effect of a Change Advocate role and a change model in the introduction of a new hardware system. Previous research has shown that specific negative attitudes of technicians negatively affect system utilization. This study focused on a practical means of enhancing experienced technicians' awareness of the existence and adverse effects of their negative attitudes, while not discrediting the existence of other causitive factors which technicians correctly recognize. Objective evidence in the form of shipboard observations on the ASROC system were used to bring about the desired end. (Continued)

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Block 20 Abstract Continued

Forty-nine fleet-experienced technicians served as subjects. All were second-class petty officers and above, and their average active duty time was over 11 years.

The results revealed that technicians initially blamed implementation problems on causes which were external and rejected internal causes such as their attitudes. However, following exposure to the ASROC observations, technicians agreed that their attitudes as well as the external factors had a negative effect on implementation, maintained positive expectations of new hardware systems (with some decrement), and were less positive in their evaluations of the effectiveness of Navy hardware systems. A defense statement, which was designed to temper possible overreaction to the ASROC observations, had little effect.

FOREWORD

This research was performed in support of the Office of Naval Research Organizational Effectiveness Research Program. The research is part of a larger effort in which a model for enhancing change will be applied to the introduction of a major new submarine sonar system.

J. J. CLARKIN
COMMANDING OFFICER

SUMMARY

Problem

Misuse of new hardware systems has been a recurrent problem in the Navy. Parallels in industry and education can be noted, and the use of a Change Advocate has proven helpful in some civilian settings. Research results have shown that specific negative attitudes of users are a major factor in the misuse of a new system. Training Navy Change Advocates will require the development of an effective means of making these experienced technicians aware of the existence and effect of negative technicians' attitudes on the utilization of new systems.

Objective

The objective of this research was to investigate a practical means of selectively influencing experienced technicians' attitudes about the implementation of new systems. Specifically, the goal was to enhance experienced technicians' awareness of the existence and adverse effects of their negative attitudes, while neither discrediting the existence of other causitive factors which technicians correctly recognize, nor eroding expectations of new systems.

Approach

Forty-nine fleet-experienced technicians responded to a questionnaire both before and after being exposed to one of three experimental conditions. The main experimental manipulation was the presentation of objective evidence in the form of records of shipboard observations of misuse and nonuse of the ASROC system during its introduction to the Fleet.

Results

The results indicate that technicians initially endorsed external causes of system misuse while rejecting internal causes such as their own attitudes. However, following exposure to ASROC observations, technicians (1) more readily acknowledged the effects of their own attitudes as well as external factors, (2) maintained positive expectations of new systems (with some decrement), and (3) were less positive in their evaluation of the effectiveness of Navy hardware systems. A defense statement, which was designed to temper possible overreaction to the ASROC observations, produced virtually no effect.

Recommendations

This study was performed to provide input to later stages of a broader research effort. At this time, the results are not interpreted to indicate any recommendations for the operational Navy. The findings have been considered in the construction of a Change Advocate training program.

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INTRODUCTION

Background

This report describes the second study of a larger research effort, which will assess the effect of a Change Advocate role and a change model in the introduction of a new computerized system to the Fleet. This larger effort was undertaken because major new systems often are only partially used, misused, or, with respect to some functions, not used for years after their introduction to the Fleet. Cases of such misuse have been documented (Mecherikoff & Mackie, 1970). The evidence indicates that many factors contribute to this problem. A chief factor is negative specific attitudes held by technicians toward specific system components or functions.

In the first study in this research effort (Abrams, Sheposh, & Licht, 1974), the attitudes of Navy technician team members toward a technician within their team who could potentially fill the Change Advocate role were surveyed. In that study, the role was identified as System Specialist, and was loosely defined as follows:

> "The System Specialist can be the LPO or any experienced second class petty officer or higher. In addition to possessing the typical job skills and knowledges, he should have the ability to do the following types of things:
>
> a. Keep up to date in his knowledge of the new equipment.
>
> b. Show enthusiasm about his role as System Specialist – encourage others to learn about the system.
>
> c. Communicate with people in supporting activities with whom he will discuss technical problems.
>
> d. Work with the team and with officers aboard the ship in working out periodic problems that occur with almost every new equipment.
>
> e. Receive, keep track of, and encourage the use of various shipboard training materials which will be sent to the ship."

Results revealed that the experienced technicians recognized the need for a System Specialist or Change Advocate role, and that technician teams aboard surface ships and submarines included qualified personnel who desired this role.

The present study attacks a major problem that might be encountered in training technicians designated to fulfill the Change Advocate role.

Problem

Most experienced technicians are aware of the lag in the utilization of a new system, and most are aware of many of the probable causes. It is suspected, however, that they tend to acknowledge the existence of external causes (e.g., poor equipment design, poor documentation, etc.) of misuse or nonuse, but they are reluctant to accept the possibility that some of their own attitudes may be a major part of the problem. It is considered highly unlikely that a technician who is designated to perform a change advocate function will recognize either

the existence or the effect of specific negative attitudes toward the new system. Yet, an important part of his role will be to deal with such attitudes. Success in dealing with this problem is necessary if a technician team is to use a new hardware system more objectively and effectively.

This study investigated ways of making experienced technicians aware of the existence and adverse effects of negative attitudes toward system components or functions, while not discrediting the importance of other causative factors which they correctly recognize.

PROCEDURES

Subjects

Forty-nine fleet-experienced technicians served as subjects. The mean amount of active duty time for this group was 11.4 years. Table 1 presents a breakdown of subjects by rating and rate level.

TABLE 1. DISTRIBUTION OF SAMPLE BY RATING AND RATE LEVEL.

Rate Level	Rating ET	EW	FT	OS	ST	TOTAL
E-8	–	–	1	–	1	2
E-7	4	2	–	2	4	12
E-6	9	3	–	6	7	25
E-5	7	–	–	2	1	10
TOTAL						49

The sample was restricted to experienced technicians, second-class petty officers and above, to assure that all had some fleet experience with new hardware systems. All subjects were instructors from three technical schools in the San Diego area. Subjects from each school were randomly assigned to each of three experimental conditions.

Experimental Design

This study incorporated the following elements: (1) directing subjects' attention to new hardware systems, (2) assessing subjects' attitudes and opinions prior to experimental conditions, (pretest), (3) presenting information in one or more experimental conditions, and (4) reassessing subjects' attitudes and opinions to observe the effects of experimental conditions (posttest). Subjects were divided into three experimental groups. These groups were employed in order to observe the relative effects of presenting two different types and sequences of information.

Group I (known as the Control Group) received only a set of cards providing shipboard observations on the ASROC system. Group 2 (Defense First Group) was presented a written defense statement before the ASROC observations, and Group 3 (Defense Last Group) received the defense statement after the ASROC observations.

The experiment was conducted over a 2-day period, and required about 3 hours per group. The first day was devoted to setting the stage by describing three new systems, and administering pretests to all groups. The second day was devoted to presenting information, administering posttests to obtain postmeasures, and debriefing. This was done in part to reduce or eliminate the subject's memory of his pretest response on his posttest response.

These procedures are diagrammed in Figure 1 and described below:

1. Presentation on Three New Systems – This presentation was designed to create a setting in which to measure opinions and attitudes about new systems. The presentation referred to the AN/BQQ-5 Sonar System, the S3A Air ASW System, and the Noise Vibration Monitor Analyzer (NVMA). Each new system was briefly described in terms of: (1) why it was developed (e.g. what were the compelling tactical or operational reasons), (2) what features it had for achieving its purpose, and (3) its present status relative to being operational in the Fleet. The presentation was strongly positive in the sense that: (1) assumptions regarding the need for and the ability of the system to meet the need were not questioned, and (2) potential problems were not explored.

2. Questionnaire – Pretest Administration – The questionnaire consisted of two sets of items comprising four types of questions. The first set, consisting of three questions, assessed subjects' expectations of the three systems described in the presentation. The second set consisted of 18 items. Four of them referred to the sufficiency and utilization of Navy hardware systems in general and 13 items measured the degree to which technicians attributed various possible causes (e.g., lack of training, poor design, negative attitudes to problems encountered with new systems). All of the above questionnaire items were rated on a 60-point scale. The final item of the second set required subjects to rank order seven factors which are generally considered to be related to misuse or nonuse of new systems. The questionnaire is presented in Appendix A.

3. ASROC Observations – Shipboard observations of the misuse and nonuse of the ASROC system during destroyer exercises were obtained. These observations had been obtained shortly after ASROC was introduced to the fleet, and they were considered to be adequately documented so that technicians would generally accept them as valid observations of their work environment. With reference to the literature on persuasion, the observations were considered to be statements of evidence (McCroskey, 1972). For this study, a sample of 33 observations was typed on 5" X 7" cards. Each card presented the following information: (1) the ship upon which the observation was made, (2) the situation in which the observation was made, (3) the system component which was misused or not used, (4) the most applicable reason category (e.g., training, design of equipment, attitudes, documentation), and (5) the probable underlying causes (e.g., not enough on-the-job training, controls difficult to operate). Specific attitudes toward new system components were found to be the most frequent underlying causes of misuse or nonuse both in the ASROC observations and 22 of the 33 observations selected for use in this study identified specific attitudes among the underlying causes. Since it was anticipated that technicians were unaware of the relationship between attitudes and nonuse, it was speculated that evidence presented in this form would be effective in enhancing awareness (McCroskey, 1972). To assure that subjects attended to each card as they read it, they were required to summarize the information it contained on a record sheet (see Appendix B).

4. Written Defense and Quiz – The written defnese was developed to provide subjects with a less threatening context in which to view the relationship between specific technician attitudes and the misuse or nonuse of hardware systems. Four major causes of misuse were reviewed: equipment design, training, maintenance, and attitudes. An attempt was made to provide greater understanding of the origins of each cause by explicitly identifying them and discussing them. To determine whether subjects attended to the major points as they read this statement, they were given an "open book" quiz after they finished it. The defense statement and the quiz are found in Appendix C.

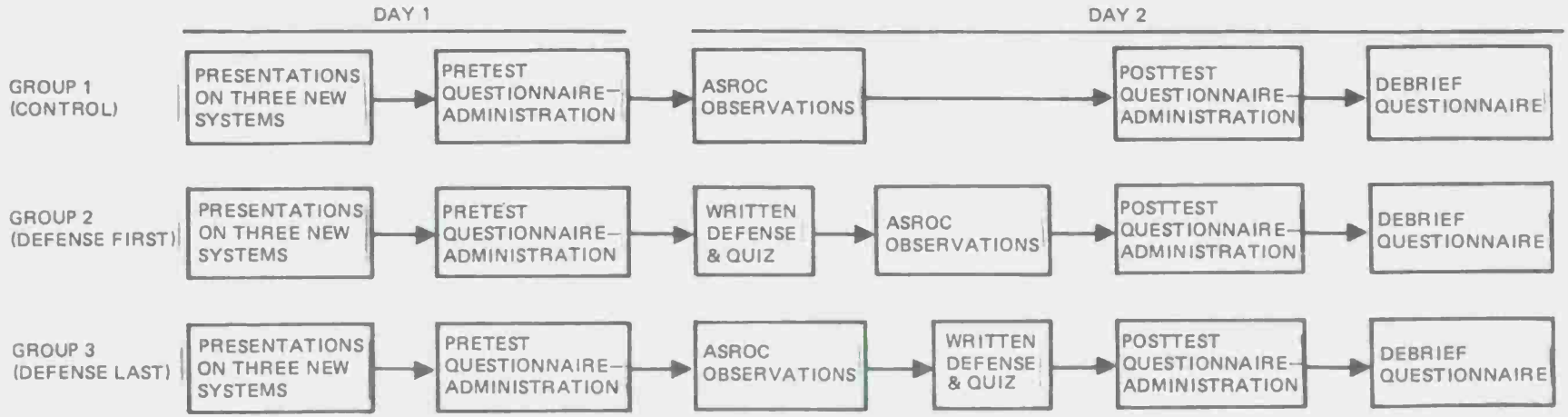

Figure 1. Elements of experimental design.

5. Questionnaire Posttest Administration. The posttest questionnaire was identical to that of the pretest.

6. Debrief Questionnaire – The debrief questionnaire (See Appendix D) provided each subject with an opportunity to report what had occurred from his perspective. It included six direct yes-no type questions and three open-ended questions. Following the completion of the debrief questionnaire, there was a group discussion of reactions to the experiment.

Rationale

In the general research program, of which this study is a part, a change model (Rogers, 1962; Havelock, 1973) is being used as a basic framework in which the Change Advocate will operate. In this model the first stage of the change process is an awareness stage, in which the recipient of the change becomes aware of the change and, particularly, its effect on him. It is important that during this stage the Change Advocate and his team: (1) have a realistic picture of the potential problems which lie ahead as a consequence of the new system, and (2) be open-minded in considering various reasons for misuse.

All of the Change Advocates and many of the team members will be experienced technicians who will enter this initial stage with beliefs based on a combination of their own experiences and truisms which are shared by technicians. It is anticipated that these beliefs, though accurate in many ways, will need to be altered during the awareness stage.

In designing this study, it was anticipated that technicians: (1) would have a generally positive expectation of new systems, (2) would identify those causes which were technical, fairly visible, and external to their team as the primary sources of problems with new systems, and (3) would less readily accept causes which ascribed fault to the technicians' team. The latter two expectations are consistent with the conclusions from research regarding perceptions of causes of behavior (Jones, E., & Nesbitt, R., 1971). These researchers contend that when people seek to explain their own behavior they are inclined to give greater weight to environmental causes as opposed to internal causes.

Major concern in this study was focused on enhancing technicians' awareness of both internal and external causes of implementation problems. Many of the problems that arise with new systems are technical, quite obvious, and not the fault of the technician team. For example, training programs and materials and operator and maintenance documentation have often not been adequate for early users of a new system. Thus, most of the technicians' beliefs in this regard are well grounded. There is, however, considerable evidence that specific technician attitudes also play a role in the misuse or nonuse of individual modes, displays, or subsystems of new hardware systems. Since attitudes are internal to the technicians, it was anticipated that technicians would underestimate their effects. Thus, one primary function of the experimental communication was to increase technicians' acceptance of the effects of attitudes.

Regarding the assumed positive expectations of new systems, it was felt that a realistic positive expectation of the new system was desirable. Positive expectations which were not tempered by a realistic assessment of potential problems, have often led to negative overreactions when predictable problems have occurred.

The complex question which was investigated in this study might be worded, "What type of communication will be effective in enhancing technicians' awareness of their own potential negative attitudes, while neither altering their realistic recognition of a variety of

technical problems nor destroying realistic positive expectations of the new system?" It was decided that a prime concern would be to present a message which the audience would consider good supportive evidence. This judgment was based upon the results of research in persuasion (McCroskey, 1972; McGuire, 1969), Additionally, the nature of the interactions between the researcher and the Change Advocate trainee and, ultimately, between the Change Advocate and his team ruled out techniques such as fear arousal or an indirect message; the best message would be factual and direct.

The present research focused on an initial message that could be used to make technicians recognize that negative technician attitudes retard the implementation of a new hardware system. The ASROC observations were viewed as being a highly valid type of new evidence, since they documented occasions of misuse or nonuse of a major hardware system in the operational setting, and the data had not been easily available to technicians. One concern in presenting the ASROC observations was that the effect of the 33 observed problems might generalize beyond the goal of documenting the existence and negative effects of negative technician attitudes. For example, research findings (McGuire, 1969; Wyer & Goldberg, 1970) have shown that attitude change toward one issue can cause indirect change toward related issues in order to bring about greater cognitive consistency. Thus, technicians might be swayed to believe that attitudinal effects are so great that other actual causes of misuse are of minimal importance. Further, even if cognitive consistency is not a major factor, the mere recitation of misuses and nonuses of a new system might dampen the technician's positive anticipation of other new systems. Also, the prevalence of reported problems due to negative specific attitudes might distort the technician's realistic evaluations of other sources of misuse or nonuse.

To prevent the observations from producing possible undesired effects, it was decided to prepare the defense statement, or immunization, which might serve to defend against such results. Since it was not known whether the statement would be more effective if it preceded or followed the ASROC observation presentation, the study was designed to determine empirically if there was any difference.

The following questions were of primary concern in this study:

1. Will technicians show a greater recognition of the effect of specific negative attitudes upon the utilization of new systems following exposure to the ASROC observations?

2. Will technicians maintain their initial position regarding external causes of misuse following exposure to the ASROC observations?

3. Will technicians have less positive expectations of new systems following exposures to the ASROC observations?

4. Will technicians have less positive overall evaluations regarding the effectiveness and utilization of new and operational systems following exposure to the ASROC observations?

5. Will the statement of defense alter any of the effects of the ASROC observations, and if so, will the sequence of presentation (i.e., defense statement first versus defense statement last) be important?

RESULTS

Initial Responses of Technicians

The rationale of this study presented three assumptions about the initial attitudes and opinions of the experienced technician population. Results pertaining to these assumptions are presented below. Responses to each pre-posttest item were recorded on a 60-point scale, with lower scores indicating greater acceptance or agreement and higher scores indicating less acceptance or agreement. Any rating above 30 indicated overall disagreement.

Expectations of New Systems

The first assumption was that the technician would in general have positive expectations of new systems. It is recalled that the initial event in this study was an oral presentation on three new systems. The first three items of the questionnaire (Appendix A, Page 30) asked the technicians whether they felt these systems: (1) would be advantageous to ship operations, (2) were necessary, and (3) would meet the objectives for which they were developed.

The mean ratings for these three items were respectively 7.7, 7.5, and 16.6, with associated standard deviations of 8.3, 10.4, and 20.7. These data indicate that virtually all technicians strongly considered the new systems to be both advantageous and necessary, and most of them also anticipated that they would meet their intended objectives.

General Evaluations of Shipboard Equipments

Items 1 through 4 of the second set of questionnaire items (See Appendix A, page 31) pertained to the effectiveness and competent use of new equipments and operational equipments. The mean scores of these items ranged from 20.6 to 22.1, with standard deviations ranging from 12.2 to 12.8. These data indicate that most technicians agreed that both new and operational equipments: (1) serve the purpose for which they were designed, and (2) are used by technicians as intended.

Causes of New Equipments Falling Short of Expectations

Causes Initially Accepted by Technicians. The second assumption of this study was that technicians would initially ascribe problems with new systems to causes which were technical, fairly visible, and external to their team. Items 5 through 17 in the second set specify possible causes of new equipments falling short of expectations. Mean scores indicate overall agreement with 8 items from this set of 13. These items are listed in Table 2 with their associated means and standard deviations.

The means and standard deviations of Items 9 and 13 indicate that a large majority of the technicians were in substantial agreement that problems with new equipments are a consequence of delays in receiving replacement parts and training inadequacies. To a lesser

TABLE 2. DESCRIPTIVE STATISTICS ON EIGHT ITEMS WITH WHICH TECHNICIANS INITIALLY AGREED.

Item #	Item	Mean	S.D.
9	In the event new equipment falls short of expectations, it is because of long delays in obtaining replacement parts for the equipment.	16.1	14.6
13	In the event new equipment falls short of expectations, it is because no training was available or the existing training did not provide necessary skills for adequate performance.	16.8	14.6
6	In the event new equipment falls short of expectations, it is because the new equipment is difficult to maintain and repair.	22.3	16.5
10	In the event new equipment falls short of expectations, it is because of poor and insufficient documentation telling how to operate and maintain the equipment.	23.4	15.9
14	In the event new equipment falls short of expectations, it is because all functions and modes of equipment were not tried out under all operational conditions.	23.4	16.9
5	In the event new equipment falls short of expectations, it is because of frequent breakdowns of the equipment.	25.8	16.9
8	In the event new equipment falls short of expectations, it is because, from maintenance technician's standpoint, the equipment is poorly designed.	27.6	14.9
12	In the event new equipment falls short of expectations, it is because of insufficient preventative maintenance to keep the equipment in working order.	29.4	15.8

degree, most agreed that problems with new equipments are caused by (1) difficulties in equipment maintainability (Item 6), (2) equipment unreliability (Item 5), (3) insufficient operation and maintenance document (Item 10), and (4) failure to try out the equipments under a range of operational conditions (Item 14). Design problems (Item 8) and insufficient preventative maintenance (Item 12) appear to be very mildly endorsed as causes of misuse, but the proximity of the means to the mid-point and the magnitude of the standard deviations indicate that many technicians did not agree with these causes. Of the eight items which are summarized in Table 2, only Item 12, whose mean is closest to 30, presents a cause that can be considered internal to the technician team.

Causes Initially Rejected by Technicians. The mean score of 5 of the 13 items which specified causes for equipments falling short of expectations were above 30, indicating overall disagreement. Table 3 presents these items along with their means and standard deviations. These data indicate that: (1) no items were strongly rejected by most of the technicians, (2) the 4 items with the highest scores (least agreement) identified causes which were internal to the technician team, and (3) relative to the entire set of 13 items, the 3 which were most rejected identified aspects of technicians' attitudes as a cause of problems with new equipments.

TABLE 3. DESCRIPTIVE STATISTICS ON FIVE ITEMS WITH WHICH TECHNICIANS INITIALLY DISAGREED.

Item #	Item	Mean	S.D.
7	In the event new equipment falls short of expectations, it is because, from an operator's standpoint, the equipment is poorly designed.	31.3	15.1
11	In the event new equipment falls short of expectations, it is because of insufficient corrective maintenance when the equipment breaks down.	32.6	12.9
15	In the event new equipment falls short of expectations, it is because of the negative attitudes of operators and technicians toward their work in general.	33.0	17.9
17	In the event new equipment falls short of expectations, it is because of officers' and/or enlisted men's attitudes toward the specific equipment and procedures.	33.3	17.7
16	In the event new equipment falls short of expectations, it is because of the negative attitudes of operators and technicians toward changes in equipment or operating procedures.	33.7	17.3

Rank Order of Seven Causes of Misuse, Partial Use, and Nonuse of New Equipment.

The final item of the second set asked technicians to rank order the following causes of misuse, partial use, or nonuse of new systems: design of equipment, training, documentation, maintenance, supply, general attitudes, and specific attitudes. General attitudes were described as predispositions to reject new ways or systems in general, while specific attitudes referred to the rejection of specific modes, functions, or procedures. The median rank for each cause is listed in Table 4. These data indicate that overall: (1) training deficiencies were considered the prime cause, (2) other causes which were external to the technician team were given intermediate ranks, and (3) the two types of attitudes were ranked lowest as contributing to the problems of misuse.

TABLE 4. INITIAL RANKING OF SEVEN CAUSES OF MISUSE, PARTIAL USE, OR NONUSE OF NEW SYSTEMS.

Cause	Median Rank
Training	1.4
Maintenance	3.8
Design	3.9
Supply	4.1
Documentation	4.6
General Attitudes	4.9
Specific Attitudes	5.7

Changes in Responses Following Experimental Treatments

Expectations of New Systems

A repeated measures analysis of variance (ANOVA) was run on each of the first three items. The main effects were the experimental groups and testing time. Table 5 presents means and standard deviations over all groups and ANOVA summary data on each item. The data in Table 5 indicate that: (1) following each of the treatment conditions, technicians continued to express positive expectations regarding the three new systems, (2) on Items 2 and 3, there were statistically significant shifts toward less positive expectations, but the amount of shift on the 60-point scale was of little practical consequence, and (3) a group by pre-posttest administration interaction occurred on Item 1. This interaction is illustrated in Figure 2, which shows that the Defense First Group rated the new systems as slightly more advantageous following the experimental manipulation, while the Control Group (ASROC Observations Only) and Defense Last Group rated the new systems as slightly less advantageous.

TABLE 5. MEANS AND STANDARD DEVIATIONS OVER GROUPS[1] AND ANOVA SUMMARY DATA FOR ITEMS ON TECHNICIANS' EXPECTATIONS OF NEW SYSTEMS.

Item #	Item	Pretest		Posttest		F Values Obtained in ANOVAS		
		Mean	S.D	Mean	S.D.	Group (2df)	Pre-post (1df)	Interaction (2df)
1	To what extent do you think that the equipment described . . . is advantageous or disadvantageous to ship operations?	7.7	7.0	8.3	7.2	.9	1.0	3.9*
2	Do you think these new equipments described . . . are necessary?	7.5	7.5	10.4	8.5	2.1	7.8**	2.0
3	To what extent do you think these equipments described . . . meet the objectives for which they were developed?	16.6	11.2	20.7	7.7	.3	6.4*	.6

Notes: 1. Means and Standard Deviations are pooled over groups because there were no significant group effects on any item.

* Indicates $p < .05$

** Indicates $p < .01$

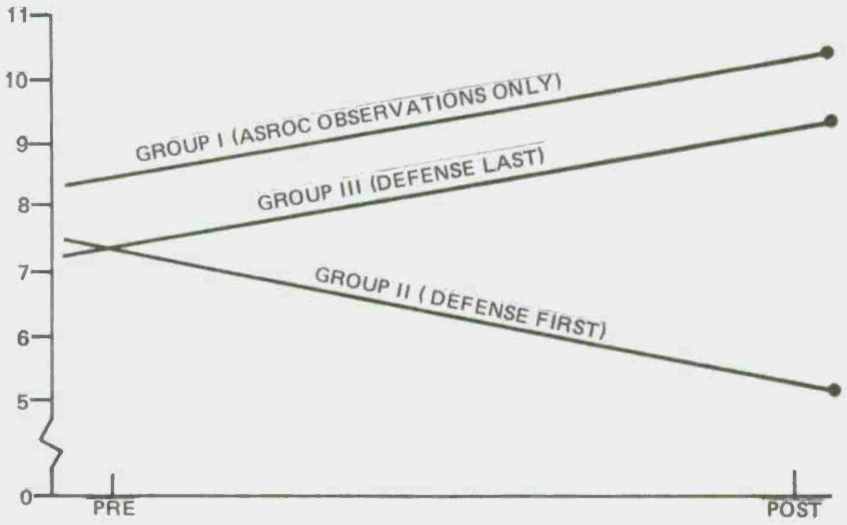

Figure 2. Differential pre-posttest responses to Item 1 of Table 5 by experimental groups.

General Evaluations of Shipboard Equipments

The first four items of the second part of the questionnaire sampled general attitudes toward new and operational systems. Table 6 presents means and standard deviations over all groups and ANOVA summary data of each item. The data in Table 6 indicate that: (1) following all experimental conditions, technicians agreed less with the statements that either existent or new equipments aboard ship are used as intended, (2) none of the experimental conditions influenced technicians' general agreement with the proposition that new equipment serves the purpose for which it was designed, and (3) a group by pre-posttest interaction occurred on Item 1. This interaction, which is illustrated in Figure 3, shows that the level of agreement was maintained by the Defense First Group increased by the Defense Last Group, and decreased by the Control Group. All groups, however, showed moderate agreement on the posttest.

Causes of New Equipments Falling Short of Expectations

Items 5 through 17 presented 13 possible causes of new equipments falling short of expectations. Eight (Items 5, 6, 7, 8, 9, 10, 13, and 14) are categorized as being external and five (Items 11, 12, 15, 16, and 17), internal to the technician team. Table 7 presents means and standard deviations over all groups and ANOVA summary data on each item.

The data in Table 7 indicate that the only significant effects were pretest-posttest, and that there were significant changes on 7 of the 13 items. Posttest results showed that subjects: (1) expressed less agreement with three items (5, 6, and 9) and more agreement with one item (14) which presented causes considered external to the technician team, and (2) expressed significantly greater agreement with all three items (15, 16, 17) that referred to technicians' attitudes as causitive factors. The amount of change was greatest on Items 15, 16, and 17.

TABLE 6. MEANS AND STANDARD DEVIATIONS OVER GROUPS[1] AND ANOVA SUMMARY DATA FOR ITEMS ON GENERAL EVALUATIONS OF SHIPBOARD EQUIPMENTS.

Item #	Item	Pretest		Posttest		F Values Obtained in ANOVAS		
		Mean	S.D.	Mean	S.D.	Group (2df)	Pre-post (1df)	Interaction (2df)
1	In general, shipboard equipment serves the purpose for which it was designed.	20.7	12.5	19.6	8.7	.6	.3	4.5*
2	In general, shipboard equipment is used as intended.	21.9	12.2	28.0	10.9	.2	9.3**	.1
3	In general, new equipment aboard ship serves the purpose for which it was designed.	20.6	12.6	21.0	9.5	.2	.0	2.4
4	In general, new equipment aboard ship is used as intended.	22.1	12.8	27.9	12.5	.2	8.7**	.8

Notes: 1. Means and Standard Deviations are pooled over groups because there was no significant group effects on any item.

* Indicates $p < .05$

** Indicates $p < .01$

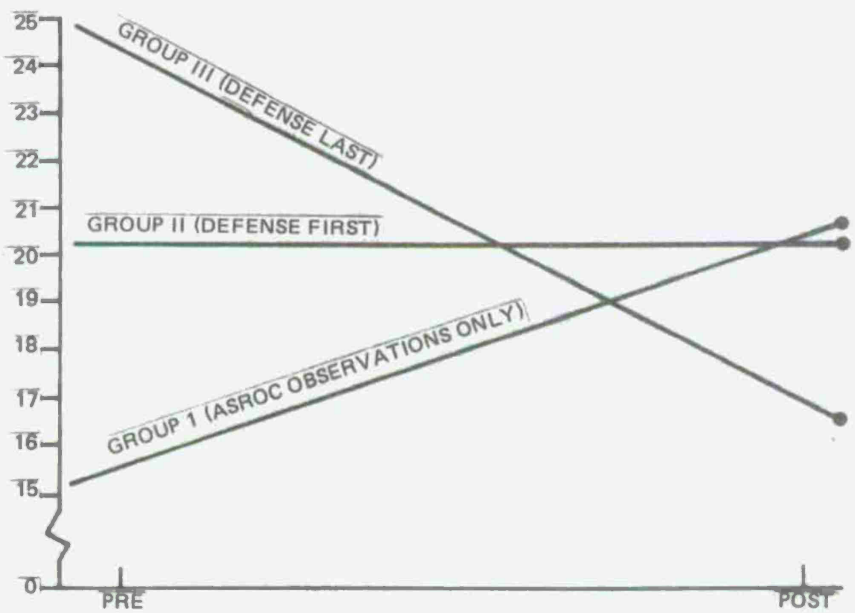

Figure 3. Differential pre-posttest responses to Item 1 of Table 6 by experimental groups.

TABLE 7. MEANS AND STANDARD DEVIATIONS OVER GROUPS[1] AND ANOVA SUMMARY DATA FOR ITEMS ON CAUSES OF NEW EQUIPMENTS FALLING SHORT OF EXPECTATIONS.

Item #	Item	Pretest		Posttest		F Values Obtained in ANOVAS		
		Mean	S.D.	Mean	S.D.	Group (2df)	Pre-post (1df)	Interaction (2df)
5	In the event new equipment falls short of expectations, it is because of frequent breakdowns of the equipment.	25.8	16.9	34.9	13.7	.4	12.2**	1.1
6	In the event . . ., it is because, the new equipment is difficult to maintain and repair.	22.3	16.5	29.4	14.7	2.0	9.8**	2.5
7	In the event . . ., it is because, from an operator's standpoint, the equipment is poorly designed.	31.3	15.1	29.5	13.7	1.9	.7	.6
8	In the event . . ., it is because, from maintenance technicians' standpoint, the equipment is poorly designed.	27.6	14.9	28.2	14.6	1.2	.3	.4
9	In the event . . ., it is because of long delays in obtaining replacement parts for the equipment.	16.1	14.6	21.1	16.4	2.7	6.4*	1.3
10	In the event . . ., it is because of poor and insufficient documentation telling how to operate and maintain the equipment.	23.4	15.9	23.2	15.0	2.4	.0	.2
11	In the event . . ., it is because of insufficient corrective maintenance when the equipment breaks down.	32.6	12.9	30.4	13.9	.6	.6	.9
12	In the event . . ., it is because of insufficient preventative maintenance to keep the equipment in working order.	29.4	15.8	31.2	14.8	.3	.4	.3
13	In the event . . ., it is because no training was available or the existing training did not provide necessary skills for adequate performance.	16.9	14.6	18.5	14.9	1.6	.7	1.4
14	In the event . . ., it is because all functions and modes of equipment were not tried out under all operational conditions.	23.4	16.9	16.6	13.1	.1	7.3**	.7
15	In the event . . ., it is because of the negative attitudes of operators and technicians toward their work in general.	33.0	17.9	24.7	15.0	1.7	12.3**	.2
16	In the event . . ., it is because of the negative attitudes of operators and technicians toward changes in equipment or operating procedures.	33.7	17.3	24.5	14.3	2.5	16.4**	1.7
17	In the event . . ., it is because of officers' and enlisted men's attitudes toward the specific equipment and procedures.	33.3	17.7	22.6	14.1	2.4	14.3**	1.1

Notes: 1. Means and Standard Deviations were pooled over groups because there were no significant group effects on any item.

* Indicates $p < .05$

** Indicates $p < .01$

Changes in Rank Order of Seven Causes of Misuse, Partial Use, or Nonuse of New Equipment

Table 8 compares pretest-posttest rankings over groups for each of the seven causes and presents summary data from the Wilcoxon Sign Rank Tests, which assess the significance of the pretest-posttest changes. The results show that:

- There were statistically significant pretest-posttest changes in the rankings of three causes (maintenance, supply, and specific attitudes),
- The largest change, and the only significant change in the direction of a higher posttest ranking, occurred in specific attitudes, conforming to the changes found on the rating scales.
- The average technician ranked specific attitudes lowest on the pretest and second highest on the posttest.
- Technicians endorsed training most strongly as a major cause on both testing times.
- The average technician rated maintenance and supply problems as less important causes on the posttest than on the pretest. However, this finding should be tempered with the recognition that when specific attitudes were rated higher, something else had to be rated lower.

TABLE 8. MEDIAN RANKINGS OVER GROUPS AND SUMMARY DATA FROM THE WILCOXON SIGN-RANK TESTS ON PRE-POSTTEST RANKINGS OF THE SEVEN CAUSES.

Cause	Ranking		z Score
	Pretest	Posttest	
Training	1.4	1.6	1.29
Maintenance	3.8	4.6	2.81**
Design	3.9	3.6	- .85
Supply	4.1	5.4	3.00**
Documentation	4.6	4.8	.84
General Attitudes	4.9	4.7	-1.90
Specific Attitudes	5.7	3.4	-3.80**

Note: ** Indicates $p < .01$

Debriefing

The debrief questionnaire contained six questions pertaining to changes in subjects' responses from pretest to posttest. The questions and the percentages of agreement are presented in Table 9, which shows the following:

- Fewer Control Group members than either defense group members felt influenced by the ASROC observations.
- Relatively few members of either the Defense First or Defense Last Groups felt influenced by the defense statement.

TABLE 9. PERCENTAGE DISTRIBUTION OF RESPONSES TO DEBRIEFING QUESTIONNAIRE ITEMS AND SUMMARY OF FISHERS EXACT TESTS FOR DIFFERENCES BETWEEN THE CONTROL GROUP AND DEFENSE GROUPS[1].

Item		Percentages of Yes Response			Fisher Exact
		Control	Def. First.	Def. Last	
1.	Did the ASROC data cards influence you?	43 (n = 14)[2]	76 (n = 17)	50 (n = 16)	p = .11
2.	Did the defense statement influence you?	–	35 (n = 17)	13 (n = 15)	p = .12[3]
3.	Did you recognize the final questionnaire to be the same one that you answered on the first day of the experiment?	100 (n = 16)	100 (n = 17)	100 (n = 16)	4
3a.	If so, did you feel that you were expected to change your answers in some way?	44 (n = 16)	71 (n = 17)	87 (n = 15)	p = .01
4.	Do you feel that your answers were substantially different on the final questionnaire?	7 (n = 16)	24 (n = 17)	19 (n = 15)	p = .15
5.	If you changed your answers to questionnaire items between the first day and today, was this basically because your views or attitudes changed as a result of the ASROC cards and/or the defense statements?	36 (n = 14)	69 (n = 16)	73 (n = 15)	p = .02

Notes: 1. The defense groups were pooled because of the similarity of their responses.
2. n's vary somewhat from item to item because some subjects failed to answer some items.
3. Fisher Exact between defense groups only because the control group did not respond to this item.
4. Fisher Exact test not conducted because of obvious absence of difference.

- All subjects recognized the questionnaire as being the same on both administrations.
- Less than half (44%) of Control Group members but most members of both defense groups felt that they were expected to change their responses in some way.
- About one-third (36%) of the Control Group acknowledged that any change in their responses was basically a result of the experimental situation, as contrasted with over two-thirds of both defense groups.

The data in Table 9 suggest a possible subtle influence of the defense statement. The only treatment difference between the control and defense conditions was the presentation of the defense statement. A large majority of the members of the defense groups denied that the defense statement had any influence on them, and all experimental groups responded similarly to the questionnaire items. Yet, more subjects who received the defense statement felt that they were expected to change, and more of them acknowledged that any changes were a consequence of the experimental conditions.

DISCUSSION AND CONCLUSIONS

The rationale for this study (pgs. 12 & 13) stated five questions which were of primary concern. These questions pertained to: (1) the technicians' initial assessments of causes of misuse and nonuse of new equipments, (2) the effect of credible information which attacks initial beliefs (ASROC observations) upon later assessment of causes of misuse and nonuse, (3) the effect of the ASROC observations upon expectations of new systems, (4) the effect of the ASROC observations upon technicians' evaluations of the overall effectiveness and utilization of new and operational systems, and, (5) the interaction of the defense statement and ASROC observations. Each of these questions is discussed in this section.

Technicians' Initial Assessments of Causes of Misuse and Nonuse of New Systems

A central assumption of this research was that technicians would blame implementation problems on causes which were external to themselves or their technician team, and would reject internal causes such as their attitudes. The findings supported this assumption. Initially, the three causes which were most strongly rejected referred to technician attitudes, while the seven causes which were most strongly endorsed were external causes. Additionally, in ranking seven listed causes of misuse, the two that identified technicians' attitudes received the lowest mean rank. It is recognized that the attribution of external causes to problems is by no means unique to Navy technicians. Studies with other populations have shown this to be a more general condition (Jones, E. & Nesbitt, R., 1971).

Effect of ASROC Observations on Technicians' Assessment of Causes of Implementation Problems

As stated earlier, the ASROC observations were recorded aboard ship during exercises. The observations provided sufficient technical identifying information for technicians to accept their credibility. Specific negative attitudes toward new systems represented the most frequent cause of problems. The causes of problems were represented in proportion to their observed frequency of occurrence in the ASROC study, and the results indicate that there were significant shifts in the assessments of 7 of 13 listed causes of equipment falling short of expectations. Changes were in the anticipated directions: all three items which identified technician attitudes as causes received greater posttest endorsement, while there was less agreement with three of the four items which identified external causes. The external cause item which received significantly stronger endorsement referred to effects of insufficient opportunity to try out all functions and modes of new equipments under all operational conditions. This cause was cited in a few of the ASROC observations while some of the other external causes were not. This may have led to the greater endorsement.

It is also noteworthy that the pretest means for each of the three attitude items were on the "disagree" side of the scale (i.e., right side of midpoint) but the posttest means were all on the "agree" side. Only one of the other four significant changes crossed the midpoint, and it was an external cause which went from agree to disagree.

Overall, the results strongly indicate that the ASROC observations selectively influenced technicians' assessments of causes of problems with new equipments. These findings are consistent with McCroskey's (1972) conclusion that new evidence is influential in producing immediate attitude change. The target attitude items were most strongly affected; other items were differentially affected. Importantly, technicians did not radically discount external causes following exposure to the ASROC observations. They maintained their general acceptance of the external causes while including their attitudes among the causes.

Effect of ASROC Observations Upon Expectations of New Systems

While identifying causes of misuse and nonuse of new systems, the ASROC observations also presented the technician with an intense reminder that new systems present problems. It was feared that such a message might encourage cynicism or other negative attitudes toward a new system that the technician may be receiving. For example, the message might cause the Change Advocate or the technician team to become overly negative toward their new system. Obviously this effect would defeat the practical value of the message, even if technicians did recognize that some of their attitudes could have negative effects upon the implementation of the new system.

The results revealed that technicians initially expressed positive expectations about the three specific new systems described at the start of the experiment. Statistically, posttest responses were significantly less positive on two of the three pertinent questionnaire items. However, practically, the mean values for all three items were still strongly positive, and a large majority of the responses were still on the positive side of the scale.

Effect of ASROC Observations on Technicians' Evaluation of Overall Effectiveness of Hardware Systems

To check on other possible negative side effects of the observations, respondents were asked for overall evaluations of the effectiveness and utilization of hardware systems. Once again, there was concern that technicians might overreact to the ASROC observations and generalize their dissatisfaction to hardware systems in general.

Posttest results revealed that respondents agreed less with statements that shipboard or new equipments are used as intended. These differences were statistically significant, and in practical terms the change was from moderately strong agreement to slight agreement. Overall, respondents were not swayed from their initially positive evaluation that equipments serve the purpose for which they are designed.

It is difficult to determine whether the change in evaluations regarding the use of equipment represents an overreaction or a more accurate perception of the real world. If it is an overreaction, it is noted that the posttest means were still slightly on the agreement side of the scale.

Effects of Combining the Defense Statement with the ASROC Observations

The defense statement was incorporated into this study because it was anticipated that the ASROC observations might present a message which was too threatening and this

might produce undesired effects. The results which have been discussed reveal that the ASROC observations were quite effective and were not overly threatening. In all of the major effects, the Control Group behaved similarly to the two experimental groups, suggesting that the defense statement had little differential impact.

Four statistically significant effects were reported in the results. The first two were group by pretest-posttest interactions, which indicated that, relative to the defense groups, the Control Group became slightly less positive in (1) its anticipation of the effectiveness of the three systems described, and (2) its agreement with the item that shipboard equipment serves the purpose for which it is designed. While both of these interactions are somewhat as anticipated with respect to the Control Group, differences between the defense groups are not easily explicable. The fact that interactions were observed on only 2 of 20 items suggests caution in placing meaning to these specific findings.

The second set of statistically significant findings is perhaps more meaningful. The debriefing questionnaire contained six yes-no items, which pertained to subjects' perceptions of any changes that had taken place. There were no differences between answers given by the defense groups and the ASROC observation only group on two items. The first item was answered only by defense group members. On the second item, there was no difference between groups because all subjects in all groups recognized that the same questionnaire had been administered on two occasions. On the remaining four questions, fewer Control Group members than defense group members indicated that they had changed responses or that they were expected to change. On two of these four items, the changes were statistically significant.

The interpretation of debriefing findings is difficult. First, the preceding results indicate that Control Group members changed their responses as much as defense group members – and indeed, all groups did change. Two possible explanations of the apparently contradictory findings are: (1) members of the control group were less aware of their changes, and (2) members of the control group were less willing to admit that they had changed their responses. If the first explanation is correct, this would suggest that the defense statement made subjects more aware of the change in attitude that was occurring. If the second is correct, it implies that the defense statement provided a rationale in which one could admit the change more openly. In either event, the major effect of the defense statement was to facilitate the subject to accurately report that his responses had systematically changed.

Since the data did not indicate significant differences between the two defense conditions, it is concluded that the sequence of the defense statement relative to the ASROC observations was of no consequence.

Summary of Major Conclusions

This study was concerned with influencing technicians' beliefs or attitudes relative to technical matters. Specifically, an attempt was made to enhance technician's awareness and acceptance of the negative effects of some of his own attitudes. The results of this study indicate that providing evidence in the form of documented shipboard observations is an effective means of communications. While the effect of the communication may be short term, it will provide a necessary reorientation for further training. It is also important to note that the effects of the communication were specific. Target attitudes were changed substantially, while other attitudes were less influenced. Finally, it was neither necessary nor particularly beneficial to amplify this evidence with a statement designed to provide context and alleviate any threat which technicians may have experienced as a consequence of exposure to the shipboard observations.

RECOMMENDATIONS

This study was performed to provide input to later stages of a broader research effort. At this time, the results are not interpreted to indicate any recommendations for the operational Navy. The findings have been considered in the construction of a Change Advocate training program.

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APPENDIX A

DATA GATHERING QUESTIONNAIRE

ALL responses to this questionnaire are CONFIDENTIAL. No one other than the research staff will have access to this material.

Name_____

Rank_____

Years in Reserves_____

Years in Active Duty_____

Time since release from active duty: _____ years _____ months

INSTRUCTIONS: Please indicate the degree to which you agree or disagree on the following scales. Do this by placing a line through the scale at that point that represents your level of agreement.

SET 1

1. To what extent do you think that the equipment described by Chief McCoy (BQQ-5, NVMA, S3A) is advantageous or disadvantageous to ship operations?

. . . . . .

advantageous disadvantageous

2. Do you think these new equipments described by Chief McCoy (BQQ-5, NVMA, S3A) are necessary?

. . . . . .

very necessary not at all necessary

3. To what extent do you think these equipments described by Chief McCoy (BQQ-5, NVMA, S3A) meet the objectives for which they were developed?

. . . . . .

entirely not at all

SET 2

1. In general, shipboard equipment serves the purpose for which it was designed.

. . . . . .

agree disagree

2. In general, shipboard equipment is used as intended.

. . . . . .

agree disagree

3. In general, new equipment aboard ship serves the purpose for which it was designed.

. . . . . .

agree disagree

4. In general, new equipment aboard ship is used as intended.

. . . . . .

agree disagree

5. In the event new equipment falls short of expectations, it is because of frequent breakdowns of the equipment.

. . . . . .

agree disagree

6. In the event new equipment falls short of expectations, it is because the new equipment is difficult to maintain and repair.

. . . . . .

agree disagree

7. In the event new equipment falls short of expectations, it is because, from an operator's standpoint, the equipment is poorly designed.

. . . . . .

agree disagree

8. In the event new equipment falls short of expectations, it is because, from maintenance technicians' standpoint, the equipment is poorly designed.

. . . . . .

agree disagree

9. In the event new equipment falls short of expectations, it is because of long delays in obtaining replacement parts for the equipment.

. . . . . .

agree disagree

10. In the event new equipment falls short of expectations, it is because of poor and insufficient documentation telling how to operate and maintain the equipment.

. . . . . .

agree disagree

11. In the event new equipment falls short of expectations, it is because of insufficient corrective maintenance when the equipment breaks down.

. . . . . .

agree disagree

12. In the event new equipment falls short of expectations, it is because of insufficient preventative maintenance to keep the equipment in working order.

. . . . . .

agree disagree

13. In the event new equipment falls short of expectations, it is because no training was available or the existing training did not provide necessary skills for adequate performance.

. . . . . .

agree disagree

14. In the event new equipment falls short of expectations, it is because all functions and modes of equipment were not tried out under all operational conditions.

. . . . . .

agree disagree

15. In the event new equipment falls short of expectations, it is because of the negative attitudes of operators and technicians toward their work in general.

. . . . . .

agree disagree

16. In the event new equipment falls short of expectations, it is because of the negative attitudes of operators and technicians towards changes in equipment or operating procedures.

. . . . . .

agree disagree

17. In the event new equipment falls short of expectations, it is because of officers' and/or enlisted men's attitudes toward the specific equipment and procedures.

. . . . . .

agree disagree

18. Please indicate in terms of order of importance the contribution of each of the following factors to the rate of misuse, partial use or nonuse of new equipment. Do this by ranking these factors from 1 to 7 with 1 being the most important and 7 with 1 being the most important and 7 being the least important.

design of equipment_____

training _____

documentation _____

maintenance_____

supply_____

general attitudes _____

specific attitudes _____

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APPENDIX B

ASROC DATA RECORD SHEET

RECORD SHEET

NATURE OF PROBLEM				REASON FOR PROBLEM											
CARD NUMBER	NON-USE	PARTIAL USE	MIS. USE	ATTI-TUDE SPECIFIC	ATTI-TUDE GENERAL	TRAIN-ING	EXER-CISE	DESIGN	HUMAN ENGI-NEERING	DOCU-MENTS	MAN-POWER	PRIOR-ITIES	SUPPLY	CORREC-TIVE MAINTE-NANCE	PREVEN-TIVE MAINTE-NANCE
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															

RECORD SHEET

NATURE OF PROBLEM				REASON FOR PROBLEM											
CARD NUMBER	NON-USE	PARTIAL USE	MIS-USE	ATTITUDE SPECIFIC	ATTITUDE GENERAL	TRAINING	EXERCISE	DESIGN	HUMAN ENGINEERING	DOCUMENTS	MANPOWER	PRIORITIES	SUPPLY	CORRECTIVE MAINTENANCE	PREVENTIVE MAINTENANCE
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															
31															
32															
33															

APPENDIX C

WRITTEN DEFENSE STATEMENT AND QUIZ

The first problem area we will call design. One frequent evidence of a design problem is that the equipment does not perform to the anticipated standards. For example, the range and bearing accuracy of solutions of a new fire control system may turn out to be less accurate at sea than the equipment design anticipated.

In such situations we must recognize that complex systems require the interaction of many scientific disciplines such as physicists, mathematicians, and engineering psychologists; and communications problems sometimes arise. Factors which optimize one type of goal often do so at the expense of another. Sometimes the effect of these problems and trade-offs are apparent only after the new system reaches the fleet.

It must also be recognized that complex systems are designed to operate in a large variety of situations. For example, systems which transmit or receive signals through the ocean or the atmosphere must operate under a large variety of water or atmospheric conditions. It is virtually impossible for a number of reasons, including cost, to simulate all of these conditions in advance. Thus, some of the problems become apparent only when the system is used in the fleet under the specific conditions.

If we recognize that these types of problems frequently arise, we can anticipate them and try to help iron them out as they arise. An effective action when such problems arise is to feed the information regarding the problem back to appropriate authorities in the Naval Sea Systems Command and to contractor representatives. Such feedback can lead to modifications of the system.

From a human engineering standpoint, when design is poor, operator and maintenance tasks are made more difficult. These types of problems have been less evident recently, but two causes of these problems have been: (1) structural characteristics of the ship impose difficult constraints on equipment design, and (2) inadequate knowledge of shipboard conditions on the part of design engineers. An example of this occurred a few years ago when the Navy procured a dual trace oscilloscope which was too large to carry to the various compartments in which it was to be used. Often modifications have been made to equipments after information got back to the appropriate naval authorities.

A second problem area we will call training. In the past, adequate training materials typically have not accompanied new equipments. For example, equipments have reached the fleet before either shore-based or shipboard training programs were available. The Navy is now making a renewed and concerted effort to correct this problem; for example, the planning of training begins from three to five years before a new system enters the fleet. The complexity of many new systems, however, make it difficult to anticipate the full scope of situations for which training will be required.

There are effective actions, however, that can be taken when training deficiencies are encountered. First, immediate statements of training needs to type commanders can result in requirements being placed upon training commands. Specific training courses come into being because of stated fleet needs. Once again, it is necessary that the people with the problem communicate the problems effectively to the people with the responsibility and authority to do something.

A third problem area is maintenance. Since World War II we have experienced the most rapid technological change in the history of man. New equipments have incorporated many state-of-the-art techniques, which were unknown five years earlier. Under such conditions it can, and must, be expected that on occasion some features will have bugs – sometimes many bugs. Just think how many bugs often occur when an automobile manufacturer makes a relatively minor change in the design of a car one year. These bugs do, however, place a burden upon maintenance.

As you may know, many new equipments now feature automated trouble-shooting which should enable the rapid identification of 90% to 95% of the malfunctions, which are then corrected by replacing a card. While even this feature may still be in the debugging stage, it offers great hope.

As with other types of problems, when information regarding recurrent problems is properly reported, it can result in equipment modifications.

Another type of problem in the area of maintenance has been logistics. Time required to obtain replacement parts has been excessive. The reasons for this are many. First, a large supply of parts for a major system can be very expensive. Also, sometimes it is difficult to anticipate which parts will be needed in what quantity. With experience this problem is often alleviated, but once again initial problems must be dealt with patiently and effectively.

The last major problem area we are calling attitudes, and there are two types of attitudes that we will discuss. The first is general attitudes toward change itself, and the second is specific attitudes about features or functions of the new equipment itself.

Regarding general attitudes, people are often either overly resistant to change or overly optimistic about the immediate payoff of change. In either case, a new system will not receive a fair chance. The person who seeks reasons to reject new systems will find them. There will be problems such as those just discussed. The person who is overly optimistic often becomes disillusioned when problems arise, and he then rejects a potentially good system. The necessary attitude toward new systems is to look at each system individually and recognize whom to communicate problems to and how to do it effectively in the Navy setting.

Regarding specific attitudes, we find people who dislike or resist specific features or functions of new systems. For example, many sonar technicians avoided using the PPI scope when it was first available on sonar sets because they trusted their ears more. Such specific attitudes often result in misuse or nonuse of the system, and a less than adequate test of the system. Often these attitudes have understandably arisen because: (1) men have not been given adequate information about the new feature or function, (2) the new feature or function has not appeared to provide improved performance over the old way, (3) the new feature or function requires a new set of skills and knowledges, and (4) the new feature or function negatively effects or calls into question the technicians status. Such specific attitudes must be acknowledged. Technicians do not develop negative attitudes because they like to. Once the attitudes and reasons for misuse or nonuse are understood, problems can usually be corrected. In some cases, adequate information is all that is required; in other situations positive experiences with the new feature or procedure will solve the problem.

In conclusion, it is essential that the Navy continually modernize and increase its capabilities. This necessitates change and in some instances major changes. While problems associated with change cannot be completely avoided, there are avenues which can be employed to reduce the magnitude of the problem.

Name_____

1. List the four general problem areas discussed in this presentation. (pages 37 & 38)

   a._____

   b._____

   c._____

   d._____

2. List two reasons why new equipments sometimes do not perform up to anticipated standards. (page 37)

   a._____

   _____

   b._____

   _____

3. List two reasons why equipment design makes it difficult to operate or maintain some new equipments. (page 38)

   a._____

   _____

   b._____

   _____

4. What is the Navy doing to prevent new equipments from arriving in the fleet without adequate training? (page 37)

   _____

   _____

5. List two major reasons for maintenance problems with new equipments. (page 38)

   a._____

   _____

   b._____

   _____

6. List two general attitudes that interfere with a new system getting a fair tryout. (page 38)

a. _____

_____

b. _____

_____

7. List four reasons which account for negative specific attitudes about specific features and functions of new equipments. (page 38)

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

8. Which of the following statements best describes the way that this paper suggests that a technician should react to problems with a new system? (pages 37 & 38)

_____a. Be patient and wait until the problem is solved.

_____b. Avoid using the system, or features of the system that cause problems, and the Navy will see that the system is no good.

_____c. Attempt to report all problems through proper channels to proper authorities and have confidence that necessary changes will be made in the future.

_____d. Try to solve the problems yourself and you will be surprised how often you will succeed.

APPENDIX D

DEBRIEF QUESTIONNAIRE

DEBRIEF QUESTIONNAIRE

1. Did the ASROC data cards influence you? ____Yes ____No
   If so, how?

   _____

   _____

   _____

2. Did the defense statement influence you? ____Yes ____No
   If so, how?

   _____

   _____

   _____

3. Did you recognize the final questionnaire to be the same one that you answered on the first day of the experiment? ____Yes ____No

   a. If so, did you feel that you were expected to change your answers in some way?
      ____ Yes ____ No

   b. If you thought that you were expected to change your answers, what do you think you were expected to indicate?

      _____

      _____

      _____

4. Do you feel that your answers were substantially different on the final questionnaire?
   ____Yes ____No

5. If you changed your answers to questionnaire items between the first day and today, was this basically because your views or attitudes changed as a result of the ASROC data cards and/or the defense statements? ____Yes ____No

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