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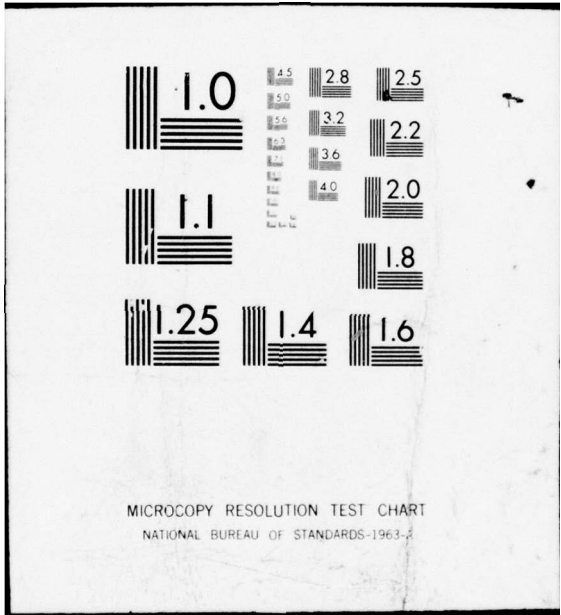
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**SONAR OPERATORS' ATTITUDES
EFFECTS ON INTRODUCTION OF**

SONAR OPERATORS' ATTITUDES AND BELIEFS:
EFFECTS ON INTRODUCTION OF NEW SYSTEMS

Macy L. Abrams
John P. Sheposh
Peter A. Cohen
Leanne E. Young

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MAR 7
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Reviewed by
Robert Penn

Approved by
James J. Regan
Technical Director

Navy Personnel Research and Development Center
San Diego, California 92152

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their orientation toward the system; and (3) general indices, such as satisfaction with leadership or organization, were not related to performance.

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FOREWORD

This research and development was performed under Work Unit 521.021.03.02, Attitudinal Change in the Acceptance of Technological Change. Special thanks go to Dr. Bert King, Organizational Effectiveness Research Programs, Office of Naval Research, for supporting earlier phases of this work. Appreciation is also extended to Paul Magnusson for his suggestions and recommendations.

This effort was part of a larger effort being undertaken to assess the effect a Change Advocate would have on the introduction of a new technological system to the fleet. Previous reports published under this effort were directed at (1) determining the acceptance of and important characteristics for a Change Advocate (Abrams, Sheposh, & Licht, 1974) and (2) making experienced technicians aware of and effects caused by their negative attitudes toward new systems (Abrams, Sheposh, & Licht, 1975). It is anticipated that a better understanding of the factors affecting acceptance of a new system will facilitate implementation of such systems.

J. J. CLARKIN
Commanding Officer

SUMMARY

Problem

A serious problem that often accompanies the introduction of new technological equipment and systems, in both military and civilian settings, is misuse of that equipment. The reasons traditionally advanced for this potential degradation of systems performance include factors such as design, training, and documentation shortcomings. However, the users' attitudes may also play a significant role in nonacceptance of new equipment.

Objectives

The objectives of this effort were to determine (1) the extent to which operators used the various functions and features of a new system properly, (2) the operators' attitudes toward change in general, (3) their evaluations of their own organizations and of various aspects of the new system, and (4) the relationship of these evaluations to their performance on the system.

Approach

In this study, sonar operators were first required to perform an exercise on a new sonar system. The majority of the sonar operators had received formal system operator training. Their attitudes toward the system, their evaluations of features of the organization, and their individual orientations toward changes in general were then assessed.

Results

The overall test results indicated less than optimal performance by the operators on the new system. None of the operators performed all of the operations required to successfully solve the problem posed in the test. As expected, operators who had not attended the training course performed least well, although a wide range of performance was evident even among those operators who had attended the training course. Further, it was found that operators who had performed well both liked the system better and felt it was more necessary than did operators who had performed poorly. Indices of more general concerns of the operators, such as satisfaction with leadership or organization, were not related to performance.

Conclusions

The findings indicate that attitudes and beliefs that are specifically related to the system in question are better indices of performance than such general concerns as evaluations of different organizational aspects or individual proclivities toward change in general.

The hypothesis that an interrelationship exists between system specific attitudes and performance was supported. Thus, in order to facilitate acceptance of a new system, those aspects most directly related to the innovation in question should be emphasized. By providing operators with positive experiences from shipboard exercises on the new system, and with opportunities to realistically assess the limitations of the system, it is expected that favorable, stable attitudes toward the system would be developed, which in turn would enhance performance.

Recommendations

1. Provide operators of newly installed fleet systems with opportunities for positive experiences on the systems through realistic shipboard exercises. Such exercises would also foster realistic expectations toward system limitations.

2. Install or designate a change advocate on board ships receiving new systems. The change advocate's function would be to encourage participation in shipboard exercises, to provide information on potential causes of system misuse, and to help the operator group diagnose the causes of any misuse that occurs.

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INTRODUCTION

Problem

A serious problem that often accompanies the introduction of new technological equipment and systems to the Fleet is its misuse, partial use, and, with respect to some features, nonuse (e.g., Mecherikoff & Mackie, 1970). The reasons traditionally advanced for this potential degradation of systems performance have related to inadequate training programs and materials and inappropriate operation and maintenance documentation. However, the users' attitude toward technological change may also play a significant role in nonacceptance of new equipment or systems.

Background

Because of this problem, the Navy Personnel Research and Development Center has undertaken a large research effort to assess the effect of a Change Advocate in the introduction of a new technological system to the Fleet. Two studies have already been conducted under this research effort. The first (Abrams, Sheposh, & Licht, 1974) investigated (1) acceptance by naval technical personnel of a proposed change advocate role, (2) important characteristics a change advocate must have in the shipboard setting, and (3) whether some technical personnel possessed those characteristics. Results revealed that (1) the change advocate role was deemed important, (2) qualified technicians desired the role, and (3) consensus was obtained for important characteristics of the change advocate role.

The second study (Abrams, Sheposh, & Licht, 1975) was directed at making experienced technicians' aware of the existence of their negative attitudes toward new hardware systems and the adverse effects such attitudes had on the use of such systems. At the same time, care was taken not to discredit other causes of misuse that technicians correctly recognized. In this study, objective evidence, in the form of shipboard observations on a major technological system, was presented to the technicians. Even though the technicians initially blamed implementation problems on external causes rather than on such internal causes as their attitudes, after the presentation, they agreed to a significantly greater degree that attitudes could have a negative effect on implementation.

Purpose

The purpose of the present effort was to assess the behavior and attitudes of sonar operators toward a new sonar system prior to the assignment of a change advocate to their teams and the implementation of a change model. Specifically, the objectives were to assess (1) the extent to which operators used the various functions and features of the new system properly, (2) the operators' evaluations of various aspects of the system, and (3) the relationship of these evaluations to their performance on the system.

The focus of this study was on the operators' perceptions of their organization, their individual orientation toward change in general, and their specific attitudes and beliefs concerning the new system. Based on current research on

the relationship of attitudes to behavior (cf., Kelman, 1974), it is expected that sonar operators' attitudes and beliefs toward the specific system will be more highly related to their performance on the system than will their perceptions of organizational climate or their orientation toward change in general. It has been shown that the attitudes one holds toward specific components or functions of a shipboard system contribute to implementation problems (Matthews, Whittenberg, Barnes, Check, & Wise, 1965). It is not proposed here, however, that there is a one-to-one correspondence between attitudes and behaviors which reflect acceptance or resistance. Wicker's review (1969), for example, takes note of this lack of correspondence, concluding from the studies reviewed that attitudes in many instances are typically only slightly related to overt behavior.

The position taken in this study is that advanced by Kelman (1974). Attitudes, in Kelman's view, are not an index of action but a determinant, component, and consequent of it. The attitudes a person holds toward a particular object are shaped in part in the course of his interaction with that object. Thus, behavior and attitudes are linked, according to Kelman, "in a continuing reciprocal process each generating the other in an endless chain" (p. 316). This dynamic view of the functioning of attitudes implies that their formation and change is a continuing process. In principle then, attitudes are subject to change whenever an individual is exposed to new experiences and information.

In this study, sonar operators were first required to perform an exercise on the new sonar system. This sonar system had been installed on the ships under study 3 to 9 months prior to data collection. The majority of the sonar operators had received formal system operator training. Their attitudes toward the system, their evaluations of features of the organization, and their individual orientations toward change in general were then assessed. It was anticipated that operators generally would be favorable toward the system since, when an innovation is first introduced, it is generally received as an improvement. In addition, in line with Kelman's dynamic view of attitudes (1974), it was expected that operators whose performance on the exercise was high would evaluate various aspects of the system more positively than those whose performance was low. Finally, it was expected that those evaluations that even specifically related to the system would be more strongly related to performance than would individual orientations toward change or evaluations of wider features of the organization (Ajzen & Fishbein, 1970; Weigel, Vernon, & Tognacci, 1974).

PROCEDURES

Subjects

Subjects were 52 sonar operators comprising the sonar teams from five destroyers. This total comprised 6 chief petty officers, 9 first-class petty officers, 8 second-class petty officers, 23 third-class petty officers, and 6 seamen. However, because of a conflict with command operational commitments, only 41 of the 52 subjects were administered the performance test. Table 1 provides demographic data on the original and final sample.

Table 1
Demographic Data on Study Subjects

Sample	Age	Education	Time in Navy (mos.)	Percent Having Operator's Course
All Operators (<u>N</u> = 52)	24.06	12.08	43.23	65%
Operators who were administered the Operator Test (<u>N</u> = 41)	24.05	12.12	45.88	78%

Construction of the Questionnaires

The questionnaires used in this study are included in Appendix A. The first questionnaire, which consisted of 64 items, dealt with attitudes and feelings about the new sonar system (AN/SQQ-23). The items, which were adapted from a questionnaire developed by Elizur (1970), focused on three general areas: (1) how operators felt about the system itself, (2) how the system influenced aspects of their work, and (3) how operators felt about change in general. Twenty-one of these items measured the operators' degree of acceptance and their level of familiarity with the system on a scale ranging from 1 (strongly agree) to 5 (strongly disagree). These items included statements such as, "In general I view it favorably" or "It does not concern me." Twenty-four items dealt with beliefs and feelings toward various aspects of work, such as the amount of work, variety of work, degree of contacts with others, amount of responsibility, promotion chances, etc. Seven dealt with the resistance to using the AN/SQQ-23. Nine tapped the general orientation toward change. Finally, three assessed the general level of professionalism.

The second questionnaire, which consisted of 107 questions, was included to assess respondents' feelings about the introduction of new equipment in general and about four organizational climate aspects: (1) Leadership Climate, (2) Work Group Climate, (3) Total Organizational Climate, and (4) General Job Satisfaction. All questions pertaining to Organizational Climate were derived from an Organizational Climate Questionnaire developed by James and Jones (1974); Jones, James, and Bruni (1973); and James, Jones, and Hornick (1973).

Operator Test

The operator test consisted of a paper and pencil test designed to assess the operator's knowledge of the system's workings and a two-phase performance test. The paper and pencil test was comprised of 25 multiple-choice items and was group administered to operators on each ship. The first phase of the performance test was given to each operator individually. The operator was seated at the AN/SQQ-23 and was presented with a scenario that described a hypothetical detection problem. This phase was used to evaluate the operator's ability to set up the equipment and to use all controls and displays of the AN/SQQ-23 properly. The operator was first given 3 minutes to set up the equipment. If, at the end of that time, he had not set up properly, the experimenter completed the task so that the test could continue. When the equipment was set, the subject received auditory and visual signals at 15-second intervals. The administration of the test required two experimenters. One fed the signals into the equipment and the other recorded the subject's actions. The operator alternated between the tasks of searching and tracking. The signals required him to choose from a wide range of modes of operation.

The second phase of the performance test was designed to test the operator's ability to use the sonar system for an actual tactical situation. In this segment, two operators were run at the same time. They were both seated in front of the AN/SQQ-23 and alternately performed searching and tracking functions. The signals for this segment were delivered by playing into the system signals that had been prerecorded at sea. Each subject performed a 10-minute searching and a 10-minute tracking function. While subject one searched, subject two tracked and vice-versa. The signals were repeated for both subjects. In all, the paper and pencil test and the two-phase performance test took subjects 1 hour to complete.

Data Gathering Procedures

Data from the sonar teams were collected aboard five destroyers. Two members of the research team briefly described the present study as part of a broader program concerned with the utilization of new systems in the Navy. All subjects were first administered the paper and pencil portion of the operator test in group sessions. Subjects were then run individually on the first phase of the performance test and in pairs on the second phase. Finally, they were asked to complete the two questionnaires.

RESULTS

Operators' Test Results

The mean percentages of correct responses made by the operators on the various segments of the operator test are presented in Table 2. As shown, the test results indicated less than optimal performance on the part of the operators. Of particular interest were the results from the performance test. The percentage of correct responses obtained by the operators for the two performance sections ranged from a low of 0 to a high of 75. Thus, none of the operators used all features of the system correctly.

Table 2

Mean Percentage Correct for Segments of the Operator Test

Segment	Low Performance Operators (<u>N</u> = 10)	Moderate Performance Operators (<u>N</u> = 21)	High Performance Operators (<u>N</u> = 10)	All Operators (<u>N</u> = 41)
Paper and Pencil	43.60	66.67	75.20	63.12
Performance, Phase I	25.05	51.89	68.85	49.47
Performance, Phase II	24.96	53.99	75.57	52.61
Overall	27.80	54.79	72.83	52.61

To examine possible differences in the attitudes and beliefs of the respondents as a function of differences in their performance on the operator test, they were grouped, according to their scores on the two performance segments, into Low (lower quartile), Moderate (midrange), and High (upper quartile) levels of performance. The mean percentage of correct answers made by these three groups is also reported in Table 2. One-way analyses of variance were performed on the data from each of the three sections of the operator test, and significant results were obtained for all three sections. (The F's with 2 and 38 degrees of freedom were 9.45, 49.46, and 28.16 for the paper and pencil and Phases I and II of the performance test, respectively.)

Operators' Profiles

Table 3 presents background data from operators for each of the three performance levels. Several differences between the three groups are evident. Operators in the high performance group (upper quartile) differed significantly on a number of variables from those in the low performance group (lower quartile) with the moderate performance group falling in between. Those in the high performance group were older, had more years of education, were in the Navy for a significantly longer period of time, were significantly more likely to choose the Navy as a career, had significantly higher pay grades, and were significantly more likely to have had formal training on the system than were the operators in the low performance group. These findings indicate that Navy experience is an important factor in differentiating high performance from low ones. They also provide some evidence for the validity of the operator test, in that the level of performance was related to the amount of operator experience.

Table 3
General Background Information for Operators

Item	Performance Groups			F
	Low Performance Operators (N = 10)	Moderate Performance Operators (N = 21)	High Performance Operators (N = 10)	
Age (in years)	21.50	23.81	27.20	3.00
Education (in years)	11.80	12.14	12.40	2.03
Time in Navy (in months)	32.50	62.95	105.40	3.61*
Pay Grade ^a	3.10	2.48	1.60	4.87*
Attended Training Course (%)	20 (N = 2)	95 (N = 20)	100 (N = 10)	33.29**
Chose Navy as Career (%)	00 (N = 0)	33 (N = 7)	50 (N = 5)	3.50*

^a0 = STC 3 = ST3
1 = ST1 4 = SN
2 = ST2 5 = SA

*p < .05
**p < .001

As expected, experience gained from a training course influenced performance on the test. All of the operators in the high performance group received formal training, as compared to only 20 percent of those in the low performance group. It should be noted, however, that the variability in performance on the operator test (45% to 77% correct) was rather large for those operators who had received formal training.

Attitudes and Beliefs as a Function of Performance

Attitudes Toward the System

Of particular interest in the present study was the extent to which attitudes and beliefs toward the AN/SQQ-23 differed between the three performance groups. Table 4 presents the means and F values for the items concerning the operators' receptivity to and degree of involvement with the system. As shown, one-way analyses of variance performed on each item yielded significant differences for four of the items. Operators in the high performance group viewed the system most favorably, followed by the middle and low performance groups, respectively. The remaining items showed a similar trend but did not differ significantly. In general, these findings were in line with our expectations.

Familiarity with the System

The four items that measured the extent to which operators were familiar with the system are listed in Table 5. As shown, high performers reported receiving significantly more training and more information concerning the system than did low performers. Interestingly, operators from the three performance groups all reported being familiar with the system.

Perceived Job Changes with Respect to the System

Respondents were asked to estimate the effects the AN/SQQ-23 had on each of 12 job aspects. In addition, they indicated how much they liked each of the 12 perceived changes. Since only two of the analyses of variance performed on the 24 questions yielded significant effects, data were combined across the three groups. The means for estimated effects and degree of liking are presented in Table 6. The overall means are of interest since they indicate that the operators perceived a moderate increase in the various aspects of their work as a function of the system's introduction and were mildly in favor of these changes. Table 6 also includes the correlations between the perceived effects and the operators' feelings about them. As can be seen, the majority of correlations are significant beyond the .05 level. For most of the job aspects, the greater the increase perceived, the greater the liking. The three exceptions were the amount of work, which yielded a nonsignificant correlation, and extent of overtime and amount of regulations, which were negatively correlated with degree of liking. Thus, for the most part, operators were positively inclined toward job changes that were stimulated by the introduction of the AN/SQQ-23.

Table 4

Operators' Attitudes and Beliefs About the AN/SQQ-23

Item	Mean Response by Performance Group ^a			F
	Low Performance	Moderate Performance	High Performance	
I feel it has significant implications for me	3.40	2.57	2.30	4.39*
In general I view it favorably	2.80	2.09	1.80	4.91*
I like the system	2.80	1.81	1.40	5.16**
I feel the development of the system was necessary	2.60	1.90	1.50	3.64*
It does not concern me	3.50	4.05	4.40	3.05
I have given it little thought	3.40	3.81	3.90	<1
I just can't make up my mind about it	3.80	3.81	4.20	<1
I really do not understand what is involved	3.70	3.80	4.00	<1
It confuses me	3.20	3.57	4.00	1.36
I've made an effort to find out about the system	2.20	2.19	2.00	<1
I am pretty well informed about the system	2.60	2.10	2.00	2.33
I think it is a complex issue	2.60	2.90	2.90	<1

^aRated on a scale ranging from 1 (strongly agree) to 5 (strongly disagree).

Table 5

Operators' Estimates of Familiarity with the AN/SQQ-23

Item	Mean Response by Performance Group ^a			F
	Low Performance	Moderate Performance	High Performance	
Extent to which I feel familiar with operator procedures	2.70	2.57	2.22	.96
Extent to which I feel I have been informed	3.50	2.67	1.90	8.10**
Extent to which I feel I have received training	3.20	2.52	2.10	4.94*
Extent to which I have made an effort to acquire knowledge about the AN/SQQ-23	3.10	2.48	2.40	1.77

^aRated on a scale ranging from 1 (strongly agree) to 5 (strongly disagree).

* $p < .05$

** $p < .01$

Table 6

Mean Estimates of Change and Degree of Liking
as a Function of AN/SQQ-23 Introduction

Job Aspects	Estimated Change ^a	Degree of Liking ^b	<u>r</u>
Amount of work	2.53	2.93	.15
Variety of work	2.49	2.68	.33*
Degree of contact with others	2.73	2.68	.45**
Extent work is determined by regulation	2.76	2.98	-.37*
Work interesting	2.49	2.27	.86**
Amount of responsibility	2.51	2.49	.80**
Degree of accuracy required	2.29	2.49	.56**
Independence in work	2.63	2.56	.76**
Knowledge required for work	2.05	2.36	.51**
Appreciation of work by others	2.83	2.86	.70**
Promotion chances	2.95	3.37	.77**
Extent of overtime	2.76	2.98	-.44**

^aRated on a scale ranging from 1 (increase) to 5 (decrease).

^bRated on a scale ranging from 1 (like very much) to 5 (dislike).

* $p < .05$

** $p < .01$

Perceived Time and Effort Necessary

Operators' estimates of the time and effort necessary for the proper maintenance and operation of the system are presented in Table 7. The pattern of means across groups was similar for all four items with the moderate performance group reporting lower estimates than either the low or high performance groups. However, estimated time required to be confident as an operator was the only item which yielded a significant effect, $F(2,37) = 3.22, p < .05$.

Table 7

Estimated Time and Effort Necessary to Feel Confident
in Operation and Maintenance of the AN/SQQ-23

Item	Mean Response by Group			F
	Low Performance	Moderate Performance	High Performance	
Estimated time before I will feel confident as an operator (in months)	5.80	2.76	4.33	3.22*
Estimated time before I will feel confident as a maintenance man (in months)	23.56	8.79	11.63	2.86
Effort it will take for me to learn to operate the AN/SQQ-23	3.60 ^a	2.90 ^a	3.10 ^a	2.14
Effort it will take for me to learn to maintain the AN/SQQ-23	2.90 ^a	2.05 ^a	2.50 ^a	3.03

^aRated on a scale ranging from 1 (high effort) to 5 (low effort).

* $p < .05$

Perceived Resistance

Possible resistance from the standpoint of those working with the system (operators, maintenance men, and watch supervisors) was measured by three questions (see Table 8). In general, operators felt there was little or no resistance to the acceptance of the AN/SQQ-23. However, a significant effect across performance groups was obtained for the question dealing with operator resistance. High performers felt that operators would resist acceptance of the system to a greater extent than did low performers ($F(2,38) = 4.26, p < .05$).

Table 8

Resistance of the System with Reference
to Work Function

Item	Mean Response by Group ^a			F
	Low Performance	Moderate Performance	High Performance	
Resistance from the standpoint of operator	4.40	3.95	3.30	4.26*
Resistance from the standpoint of maintenance man	3.90	4.00	3.30	2.11
Resistance from the standpoint of watch supervisor	4.10	3.95	3.50	1.01

^aRated on a scale ranging from 1 (high resistance) to 5 (low resistance).

* $p < .05$

Operators also estimated the amount of resistance for self, division chiefs, and officers. No statistically significant differences between groups were obtained. Overall, operators felt that there was nearly no resistance for self ($\bar{x} = 4.40$), chiefs ($\bar{x} = 4.27$), and officers ($\bar{x} = 4.10$).

Attitudes Toward Change in General

In addition to the assessment of attitudes and beliefs specific to the AN/SQQ-23, operators' attitudes toward new equipment in general and toward change in general were assessed and are presented in Table 9. There was essentially no difference between performance groups on attitudes toward new equipment although a trend is apparent; the better the performance of the operator, the greater the acceptance of the equipment (see first item in Table 9). With respect to individuals' acceptance of change, no differences between groups emerged.

Table 9
Operators' Attitudes Toward New Equipment
and Change in General

Item	Mean Response by Group ^a			F
	Low Performance	Moderate Performance	High Performance	
Attitude toward new equipment in general	2.21	2.02	1.76	2.30
I am active in changes	2.30	2.86	2.30	<1
I like things in their places	1.90	2.14	2.40	<1
I often suggest changes	2.20	2.20	2.30	<1
I feel happy most of the time	3.00	2.71	2.70	<1
I don't like to adjust to new situations	3.30	3.24	3.70	<1
My work is a hobby	3.60	3.67	2.50	2.97
My varied life suits my nature	2.00	2.24	2.20	<1
I like changes	2.00	2.55	2.50	1.06
I find it disturbing to change	3.00	3.19	3.56	<1

^aRated on a scale ranging from 1 (agree) to 5 (disagree).

Organizational Climate

Operators' assessment of their organizational climate was also included (see Table 10). Means for the three performance groups were relatively homogenous. Thus, no relationships were evident between operators' level of performance and their evaluations of various aspects of their organization slightly positive and reported that they were mildly dissatisfied.

Table 10

Mean Evaluations of Organizational Climate

	Mean Response by Group ^a			F
	Low Performance	Moderate Performance	High Performance	
Leadership	2.83 ^a	3.10	3.10	<1
Work Group	3.44	3.55	3.79	<1
Total Organization	2.65	2.87	2.83	<1
General Satisfaction	3.10	3.32	3.29	<1

^aRated on a scale from 1 (favorable) to 5 (unfavorable).

Relationship of Individual Items to Performance

Since the operators' responses to a large number of the items appeared to be linearly related to their level of performance, the data for these items were correlated with operator performance on the AN/SQQ-23. The several moderate but significant correlations that were obtained are presented in Table 11. As shown, the majority of the items which were significantly related to performance dealt with operators' acceptance of and involvement with the AN/SQQ-23. These findings provide evidence for our expectations that attitudes specific to the system would be related to performance.

Relationship of Factors to Performance

A factor analysis and varimax rotation were performed on all 52 operators' responses to questions dealing with the AN/SQQ-23. The 14 factors obtained, which are presented in Table 12, account for 100 percent of the total variance. A factor loading of .40 or greater was required for an item to be included for interpretation. A review of the 14 factors indicates that they are all interpretable, and that the majority of the factors are defined by a relatively small number of items each. Factor 1, which incorporated the largest number of items and which accounted for 30 percent of the total variance, can be defined as Positive Involvement. The items reflect (1) interest in the system, (2) familiarity with the system, and (3) acceptance of the system.

Table 11
 Significant Correlations Between
 Individual Items and Performance

Item	Correlation ^a
Extent to which I feel familiar with procedures of operation	-.31
Extent to which I feel I have been informed	-.48
It does not concern me	.39
Necessity of development of the system	-.39
Resistance to the acceptance of the system by operators	-.39
I like the system	-.39
Extent to which I have made an effort to acquire knowledge of the AN/SQQ-23	-.37
I feel it has significant implications for me	-.36
In general I view it favorably	-.36
Extent to which I have received training	-.34

^aHigh agreement with the item produced a low numeric score. Thus, a negative correlation indicates a direct relationship between agreement with an item and high performance.

Table 12

Loadings for Factors Derived from Attitude Questionnaire

Factor	Questionnaire Item	Loading
<u>I - Positive Involvement</u>		
Percent of total variance accounted for - 30%	I really do not understand what is involved	-.87
	I just can't make up my mind about it	-.85
	It does not concern me	-.71
	It confuses me	-.71
	I am pretty well informed about it	.66
	I have given it little thought	-.66
	Extent to which I feel familiar with operator procedures for the system	.63
	In general I view it favorably	.63
	I feel it has significant implications for me	.54
	I like the system	.54
	Extent to which I have made an effort to acquire knowledge of the AN/SQQ-23	.54
	Necessity of development of the system	.51
	Extent to which I have received training	.48
	Extent to which I feel I have been informed	.42
	Positive feelings toward knowledge required for work	.40
<u>II - Sense of Pride In Work</u>		
Percent of total variance accounted for - 14%	Positive feelings toward appreciation of my work by others	.68
	The degree of accuracy required	.62
	Positive attitude toward the degree of accuracy required	.58
	The appreciation of my work by others	.54
	The amount of personal responsibility	.40
<u>III - Demands of the System</u>		
Percent of total variance accounted for - 12%	Knowledge required for work	.70
	The amount of work required	.68
	The variety of work required	.68
	Extent to which overtime is required	.59
	Extent to which work is interesting	.52
	Extent to which the system is complex	.43
	Extent to which I have made an effort to acquire knowledge	.41
	Feelings about the extent to which work is interesting	.40
<u>IV - Resistance to Work Functions of the System</u>		
Percent of total variance accounted for - 7%	Amount of resistance as watch supervisor	.89
	Amount of resistance as operator	.82
	Amount of resistance as maintenance man	.79
<u>V - Promotion</u>		
Percent of total variance accounted for - 6%	Feelings toward promotion chances	.85
	Operator's promotion chances	.82
<u>VI - Resistance of Personnel</u>		
Percent of total variance accounted for - 5%	Resistance to the acceptance of the AN/SQQ-23 by division officers	.90
	Resistance to the acceptance of the AN/SQQ-23 by other officers	.85
	Resistance to the acceptance of the AN/SQQ-23 by division chiefs	.70
	Resistance to the acceptance of the AN/SQQ-23 by yourself	.48
<u>VII - Contact with Others</u>		
Percent of total variance accounted for - 5%	Feelings toward contact with others	.65
	The appreciation of my work by others	.51
	Degree of contacts with others	.48

Table 12 (Continued)

Factor	Questionnaire Items	Loading
VIII - <u>Control by Regulations</u>		
Percent of total variance accounted for - 4%	Extent to which work is determined by regulations	.81
	Feelings toward the extent to which work is determined by regulations	-.56
IX - <u>Acceptance of New Facets of Work</u>		
Percent of total variance accounted for - 4%	Like amount of work required	.86
	Like variety of work required	.64
	Like amount of responsibility required	.58
	Like work interest	.47
	Work is interesting	.46
	Like extent to which work is determined by regulations	.44
X - <u>Autonomy</u>		
Percent of total variance accounted for - 3%	Independence in my work	.80
	Like the independence in my work	.72
	Amount of responsibility I bear	.45
XI - <u>Unfamiliarity</u>		
Percent of total variance accounted for - 3%	Extent to which I feel informed	.64
	Extent to which I have received training	.47
	Extent to which my work has changed because of the system	.46
	Can't make up my mind about it	.45
	Extent to which I feel familiar with procedures of operation	.43
XII - <u>Overtime</u>		
Percent of total variance accounted for - 3%	Extent to which I like overtime required	.83
XIII - <u>Challenge</u>		
Percent of total variance accounted for - 2%	Effort it will take to learn to maintain the system	.56
	Effort it will take to learn to operate the system	.51
	Personal resistance to the system	.44
	Favorable view of the system in general	.44
	Like the system	.42
	Necessity of development of the system	.41
XIV - <u>Knowledge Required</u>		
Percent of total variance accounted for - 2%	Extent to which I like the knowledge required for work	.52

Individual and multiple correlations were run in order to determine the extent to which the 14 factors were related to operator performance. Table 13 presents correlations for each of the factors and the multiple correlations. Although none of the individual factors was significantly related to performance, the multiple correlation was highly significant ($R = .79$) and accounted for 62 percent of the variance. When the multiple correlation was adjusted for shrinkage, the factors still accounted for a relatively substantial amount of the variance ($R^2 = .44$).

It is also of interest to note that the multiple correlation obtained between the 14 factors and performance for those operators who had training was also substantial and statistically significant ($R = .72$). Finally, the multiple correlation obtained for the paper and pencil test was also significant ($R = .72$).

Relationship of Organizational Climate and Orientation Toward Change to Performance

In contrast, the individual correlations and multiple correlation between operator performance and indices of organizational climate were not significant (none of the individual correlations exceeded .12 and the multiple correlation was .14). Similarly, neither the individual correlations nor the multiple correlation obtained between performance and operators' orientation toward change was statistically significant. Thus, these findings provide some evidence for the contention that attitudes and beliefs that are specifically related to the system in question serve as better indices of performance than do more general concerns such as evaluations of different aspects of the organization or individual proclivities toward change in general.

Table 13

Individual and Multiple Correlations of
Factors with Test Segments

Factors	Performance ($N = 41$)		Paper & Pencil Test ($N = 41$)	
	Simple r	Multiple R	Simple r	Multiple R
Liking of Knowledge Required for Work	.22	.22	.21	.21
Positive Involvement	-.26	.29	-.53	.53
Sense of Pride in Work	.06	.30	-.27	.57
Demands of the System	-.21	.42	.09	.57
Resistance to Work Functions of the System	-.21	.51	-.18	.62
Promotion	.05	.51	-.11	.62
Resistance of Personnel	.10	.51	-.02	.64
Contact with Others	-.10	.52	-.18	.64
Control by Regulations	.07	.55	-.01	.67
Acceptance of New Facets of Work	-.16	.55	-.17	.67
Autonomy	.18	.56	.12	.67
Unfamiliarity	-.14	.75	-.01	.75
Overtime	-.01	.75	.06	.76
Challenge	-.17	.79	.04	.77
	R = .79		R = .77	
	R ² = .62		R ² = .59	
	adjusted R ² = .44		adjusted R ² = .39	

DISCUSSION AND CONCLUSIONS

The first set of findings to be discussed deals with the performance of the sonar operators on a system recently introduced to the Fleet. The performance that was examined required the correct usage of new features and functions of the system. Although the majority of the operators attended the operator training course, none performed all of the operations required to successfully solve the problem posed in the test. As expected, operators who had not attended the training course performed least well, although a wide range of performance was evident for operators who had attended. The findings also revealed that operators with the most sonar experience clearly performed best. This group also showed the highest level of commitment to the Navy, as reflected by their career intentions. The performance results suggest that, while training is essential, other facets of the operator/system interface must be considered for optimal utilization of the system to be realized.

As indicated in the introduction, the attitudes, perceptions, and beliefs of operators with respect to the system and the relationship of these elements to performance were of particular interest. The large number of questions employed in the assessment of these elements was dictated by a concern to include those areas which would be potentially relevant to the operators in their interaction with the system. When the operators' responses to these questions were segregated according to their level of performance, a systematic pattern emerged. While not always statistically significant, the operators' responses to the items revealed that the higher the level of performance, the more positive the orientation toward the system. This was most evident for questions concerned with the acceptance of the AN/SQQ-23. Following their testing session on the system, the attitude questionnaire responses of those operators who had performed well showed that they liked the system better and felt it was more necessary than did operators who performed poorly, while the responses of the middle range group fell in between. The significant correlations obtained from the correlational analysis are a further confirmation of the relationship between performance and system-specific attitudes.

In contrast to the items discussed above, the pattern of outcomes for estimated time and effort required to become familiar with the system and confident in operating it was quite different. Estimates made by operators in the moderate performance group were significantly lower than estimates from either the high or low performance groups. This may reflect either less interest in the system or an over-confidence on the part of moderate performers. If, in fact, a great deal of time and effort is required in order to become proficient in system operation, the somewhat optimistic expectations of the moderate performers would be disconfirmed. There is, then, the distinct possibility that this disconfirmation of expectancies would result in negative attitudes toward the system.

While the individual factor correlations were not significant, the multiple correlation that was obtained between performance on the operator test and the 14 factors was highly significant. This finding clearly provides support for the contention that it is necessary to assess other attitudinal inputs such as attitudes toward the behaviors affected by the system, along with general

attitudes toward the system. Although the factors were obtained from a relatively small sample (N = 51), these findings fit nicely with current empirical and theoretical work on attitudes, such as Wicker's "other variable" approach (1971), which maintains that a variety of attitudes and intrapersonal factors specific to the object must be considered if predictive power is to be enhanced.

In contrast to the rather substantial relationship that was found between system-specific elements and performance, indices of more general concerns of the operators, such as satisfaction with leadership and with the organization, were not in any way related to performance. In this connection, it should be noted that in Mathews' and his coworkers' study of shipboard observations of equipment misuse specific attitudes with respect to the equipment were most often cited as an inferred cause of misuse (Mathews, 1965). Based on present results and on previous work by Ajzen and Fishbein (1970) and Kelman (1974), we can conclude that a relationship between attitudes and behavior is more likely to exist when the attitudes and other intrapersonal elements are of a specific rather than of a general nature.

The question as to whether attitudes determine performance, or vice-versa, cannot be answered in this study. However, this question is not particularly relevant from the orientation adopted in this study which, as it will be recalled, views the engagement of attitude and behavior as a continuing reciprocal process. Further, it may be that attitude is not only an integral part of behavior, but behavior is an integral part of the formation, testing, and crystalization of attitudes. If so, an effective way of dealing with acceptance of new systems is to begin, as Kelman and Warwick (1973) suggest, "at the level of concrete practices and their situational supports, and to leave attitude change--on which the ultimate stability of the new patterns of behavior may depend--to a later stage" (p. 37). Thus, by providing operators with positive experiences from shipboard exercises and tests on the system and by providing them with opportunities to realistically assess the limitations of the system, favorable, stable attitudes toward the system would be developed. Related to this final point was the finding from one of the earlier studies in this research effort (Abrams, Sheposh, & Licht, 1974), in which technicians in their selection of an ideal change advocate clearly emphasized task-oriented traits such as competence, effectiveness, and knowledge. Thus, the selection of a person for the express purpose of facilitating acceptance of innovation was based on those characteristics and properties most directly related to the innovation in question.

RECOMMENDATIONS

Based on the results of this study, the following recommendations are made:

1. Provide operators of newly installed fleet systems with opportunities for positive experiences on the systems through realistic shipboard exercises. Such exercises would also foster realistic expectations toward system limitations.
2. Install or designate a change advocate on board ships receiving new systems. The change advocate's function would be to encourage participation in shipboard exercises, to provide information on potential causes of system misuse, and to help the operator group diagnose the causes of any misuse that occurs.

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APPENDIX
JOB DIAGNOSTIC SURVEY

A-0

Ship _____
Date _____

JOB DIAGNOSTIC SURVEY

On the following pages you will find several different kinds of questions about your job. There are no "trick" questions. We would appreciate it if you answer each item as honestly and frankly as possible. Your individual answers will be kept completely confidential and no attempt will be made to evaluate you or your ship based on your answers. Please mail your questionnaire in the envelope provided.

Thank you for your cooperation.

Please complete the following information about yourself:

- 1. Rank or Rate/Rating _____
- 2. Time in Rank/Rate _____
- 3. Age _____
- 4. Number of years in the Navy _____
- 5. Educational level - Circle highest year completed -

8 or less	9	10	11	12	1	2	3	4	1	2	3	4
(Grade or High School)					(College)				(Graduate School)			
- 6. Is the Navy your career? ___yes ___no
- 7. Length of time aboard this ship _____
- 8. Length of time operating this system _____

Social Security No. _____

PART I

HOW DO YOU FEEL ABOUT THE AN/SQQ-23 SONAR SYSTEM?

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. I feel that it has significant implications for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. In general I view it favorably	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I really do not understand what is involved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I just can't make up my mind about it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I am pretty well informed about it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I think it is a complex issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I have given it little thought	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. It does not concern me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I've made an effort to find out about this	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. It confuses me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Concerning the AN/SQQ-23, estimate the length of time it would take before you will feel

confident: a. as an operator _____ months

b. as a maintenance man _____ months

12. How would you rate the AN/SQQ-23?

extremely complex complex so-so simple extremely simple

13. How do you like the AN/SQQ-23 System?

like it like it so-so don't like it
 very much it so much don't like it

14. Was the development of the AN/SQQ-23 really necessary?

very necessary necessary so+so not so necessary unnecessary

15. How much effort do you think it will take for you to learn to operate the AN/SQQ-23?

great effort much effort some effort very little effort no effort

16. How much effort do you think it will take for you to learn to maintain the AN/SQQ-23?

great effort much effort some effort very little effort no effort

17. To what extent do you feel you have been informed about the AN/SQQ-23?

very well informed well informed informed poorly informed not informed

To what extent do you think STs are resisting using the AN/SQQ-23 as designed to perform the following functions:

	very much	much	little	nearly none	none
18. watchstanding (operator)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. watch supervisor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To what extent do you think there is resistance to the acceptance of the AN-SQQ-23 by the following:

21. division chiefs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. division officers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. other officers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. To what extent are you familiar with operator procedures for the AN/SQQ-23?

<input type="checkbox"/> completely familiar	<input type="checkbox"/> very familiar	<input type="checkbox"/> familiar	<input type="checkbox"/> familiar	<input type="checkbox"/> not so familiar	<input type="checkbox"/> not familiar
--	--	-----------------------------------	-----------------------------------	--	---------------------------------------

26. To what extent have you received training for the AN/SQQ-23?

very extensive training extensive training some training little training no training

27. Have you made any effort on your own to acquire some knowledge of the AN/SQQ-23?

great effort much effort some effort very little effort no effort

28. To what extent has your work as an ST changed because of the AN/SQQ-23?

great change much change some change very little change no change

The questions below concern aspects of your work which are influenced by the AV/SQQ-25.

Two questions are asked about each aspect, an A-question and a B-question. The A-question concerns the increase or decrease of the aspect; the B-question concerns your liking or disliking of this increase or decrease. For each aspect, you should answer first the A-question as well as the B-question before you continue with the next aspect.

The following aspects of my work are:

My feelings toward this are:

A

B

	greatly increased	no change	decreased	greatly decreased	like it very much	like it much	so-so	don't like it so much	don't like it
29. The amount of work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. The variety of my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. The degree in which I have contacts with other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. The extent to which my work is determined by regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. The extent to which my work is interesting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The following aspects of my work are:

A

B

My feelings toward this are:

	greatly increased	no change	greatly decreased	like it very much	like it so-so	don't like it so much	don't like it
39. The amount of responsibility I bear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. The degree of accuracy required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. The independence in my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. The knowledge required for my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. The appreciation of my work by others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. My promotion chances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. The extent to which I work overtime	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Concerning professionalism in the military, how would you rate the following:

	highly professional	quite professional	average professional	not very professional	unprofessional
53. Yourself as a sailor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. Yourself as an ST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. The majority of your fellow workers as STs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The following statements are concerned with your feelings and reactions to change in general. Please give your personal opinion about these general statements.

	strongly agree	agree	doubtful	don't agree that much	do not agree
56. I am active in changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. I like everything to be in its regular place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. I often suggest changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. I feel happy most of the time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. I do not like to have to adjust myself to new and unusual situations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. My work is a kind of hobby to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	strongly agree	agree	doubtful	don't agree that much	do not agree
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 62. A varied life suits my nature best
- 63. I like changes
- 64. If I am used to doing things in a certain way, I find it disturbing to change to a new method

Part II

Job Diagnostic Survey

1. In general, the equipment you work with serves the purpose for which it was designed.
 - a. Strongly agree
 - b. Agree
 - c. Not sure
 - d. Disagree
 - e. Strongly disagree
2. In general, the equipment you work with is used as intended.
 - a. Strongly agree
 - b. Agree
 - c. Not sure
 - d. Disagree
 - e. Strongly disagree
3. In general, new equipment that you work with serves the purpose for which it was designed.
 - a. Strongly agree
 - b. Agree
 - c. Not sure
 - d. Disagree
 - e. Strongly disagree
4. In general, new equipment that you work with is used as intended.
 - a. Strongly agree
 - b. Agree
 - c. Not sure
 - d. Disagree
 - e. Strongly disagree
5. How well does your supervisor recognize and reward good performance by his people?
 - a. He is not a good supervisor in this respect
 - b. He recognizes good work but does little in the way of rewarding
 - c. He recognizes and rewards good work
 - d. He is very appreciative and eager to reward good work
6. In my work group, a crew member is almost always certain to hear about mistakes, but seldom hears about his successes.
 - a. Strongly agree
 - b. Agree
 - c. Not sure
 - d. Disagree
 - e. Strongly disagree
7. To what extent is your immediate supervisor willing to listen to your problems?
 - a. Not at all
 - b. To a small extent
 - c. To some extent
 - d. To a great extent
 - e. To a very great extent
8. To what extent is your supervisor friendly and easy to approach?
 - a. Not at all
 - b. To a small extent
 - c. To some extent
 - d. To a great extent
 - e. To a very great extent
9. To what extent is your supervisor attentive to what you say?
 - a. Not at all
 - b. To a small extent
 - c. To some extent
 - d. To a great extent
 - e. To a very great extent
10. To what extent does your supervisor emphasize high standards of performance?
 - a. Not at all
 - b. To a small extent
 - c. To some extent
 - d. To a great extent
 - e. To a very great extent
11. To what extent does your supervisor set an example by working hard himself?
 - a. Not at all
 - b. To a small extent
 - c. To some extent
 - d. To a great extent
 - e. To a very great extent
12. To what extent does your supervisor encourage people to give their best effort?
 - a. Not at all
 - b. To a small extent
 - c. To some extent
 - d. To a great extent
 - e. To a very great extent

13. Personnel are encouraged to work for promotion.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
14. To what extent does your supervisor encourage you and your co-workers to think and act for yourselves?
- Not at all
 - To a small extent
 - To some extent
 - To a great extent
 - To a very great extent
15. To what extent does your supervisor offer new ideas for job-related problems?
- Not at all
 - To a small extent
 - To some extent
 - To a great extent
 - To a very great extent
16. To what degree does your supervisor provide the help you need to schedule your work ahead of time?
- None
 - A minimum amount
 - A moderate amount
 - A considerable amount
 - A maximum amount
17. To what extent does your supervisor show you how to improve your performance?
- Not at all
 - To a small extent
 - To some extent
 - To a great extent
 - To a very great extent
18. How would you describe the amount of responsibility delegated by your supervisor?
- None
 - A minimum amount
 - A moderate amount
 - A considerable amount
 - A maximum amount
19. How often does your supervisor hold group meetings where he and the people who work for him really discuss things?
- Never
 - Rarely
 - Sometimes
 - Rather often
 - Nearly all the time
20. Generally, how are decisions made in your work group?
- By the supervisor alone
 - By the supervisor with the advice from the workers
 - By the supervisor and workers involved
 - By the whole group
21. To what extent does your supervisor encourage the people who work for him as a team?
- Not at all
 - To a small extent
 - To some extent
 - To a great extent
 - To a very great extent
22. To what extent does your supervisor encourage the people who work for him to exchange ideas and opinions?
- Not at all
 - To a small extent
 - To some extent
 - To a great extent
 - To a very great extent
23. Overall, how good a job do you feel is being done by your immediate supervisor?
- Very good
 - Good
 - Fair
 - Poor
 - Very poor
24. Does the way your work group is organized help or hurt the efficient conduct of the work?
- Helps a lot
 - Helps somewhat
 - Neither helps nor hurts
 - Hurts somewhat
 - Hurts a lot
25. How often are requirements changed after you begin working on a task because of poor initial planning or lack of coordination?
- Often
 - Occasionally
 - Seldom
 - Very rarely
 - Never

26. How successful is your division head in his dealing with higher levels of command?
- Below average
 - About average
 - Definitely about average
 - Very good
 - Outstanding
27. How successful is your immediate supervisor in dealing with higher levels of command?
- Outstandingly successful
 - Very successful
 - Definitely above average success
 - About average success
 - Below average success
28. The crew members generally trust their Chief Petty Officers.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
29. The crew members generally trust their Officers.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
30. Everything is checked; individual judgment is not trusted.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
31. Verbal reports are never accepted; everything has to be in writing.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
32. People act as though everyone must be watched or they will slack off.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
33. Aboard this ship crew members are treated with respect.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
34. To what extent do things aboard this ship have to be done by the book?
- Everything is done by the book!
 - Almost everything is done by the book
 - A good deal of the activity aboard this ship is done according to the book
 - Only some things are done by the book
 - Practically nothing aboard this ship is done by the book
35. A spirit of cooperation is evident in my work group.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
36. How much friction is there in your work group?
- A great deal
 - Quite a bit
 - Some
 - Little
 - Very little
37. The people I work with cooperate to get the job done.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
38. Assistance from my co-workers in carrying out difficult jobs is:
- Non-existent
 - Limited
 - Fairly good
 - Quite good
 - Outstanding

39. To what extent does a friendly atmosphere prevail among most of the members of your work group?
- To a very small extent
 - To a small extent
 - To some extent
 - To a considerable extent
40. Members of my work group trust each other.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
41. Communication is good in my work group.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
42. How does your work group compare to all other work groups in your division in terms of productivity?
- It is one of the most productive work groups in the division
 - It is considerably above average in productivity
 - It is somewhat above average in productivity
 - My work group has about average productivity
 - My work group is somewhat below average in productivity
43. How would you rate the quality of work produced in your work group?
- Very poor
 - Poor
 - Fair
 - Good
 - Very good
44. How does your division compare to all other divisions on this ship in terms of productivity?
- It is one of the most productive divisions (top 5%)
 - It is considerably above average in productivity (top 20%)
 - It is somewhat above average in productivity (top 40%)
 - My division has about average productivity for the ship
 - My division is somewhat below average in productivity
45. Most of the personnel in my division would not want to change to another division.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
46. Most of the officers aboard this ship feel that my division is:
- Somewhat below average
 - About average
 - Somewhat above average
 - Definitely above average
 - Outstanding
47. Most members of my work group take pride in their jobs.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
48. Most of the crew members in my division think our division is the best on the ship.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
49. The crew is encouraged to ask questions about the ship's affairs.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
50. To what extent are ideas and suggestions paid attention to?
- There seems to be a disregard for ideas and suggestions made by crew members
 - Few ideas and suggestions are considered
 - It is not unusual for some ideas and suggestions made by crew members to reach the top
 - Ideas and suggestions are considered regardless of their source

51. To what extent do you think there is resistance to meaningful change aboard this ship?
- Change is openly received; there is no resistance
 - There is a minimal resistance to change
 - Change is resisted often
 - The policies aboard this ship reflect strong resistance to change; there seems to be a "dont rock the boat" attitude
52. Policies encourage openness in communication; no one has to fear the consequences for expressing his opinions.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
53. To what extent is communication hindered by following chain of command rules?
- Not at all
 - To a very small extent
 - Very little
 - Somewhat
 - To a considerable extent
54. Nobody ever knows what's going on in my division because we are not kept informed.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
55. Aboard this ship about the only source of information on important matters is the grapevine (rumor).
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
56. Are you given advance information about changes (policies, procedures, ship movements, etc.) which might affect you?
- Very frequently taken by surprise
 - Frequently taken by surprise
 - Sometimes surprised by things we should have known
 - Usually know about things ahead of time
 - Always know about things ahead of time
57. When changes are made in your work, are you usually told why?
- Almost always
 - Usually
 - Sometimes
 - Rarely
 - Almost never
58. Generally there are friendly and cooperative relationships between the different divisions on this ship.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
59. There is poor communication between divisions aboard this ship.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
60. To what extent do you feel there is conflict (rivalry and hostility) between your division and other divisions aboard ship?
- To a very great extent
 - To a great extent
 - To some extent
 - To a small extent
 - To a very small extent
61. Things aboard this ship seem to happen contrary to rules and regulations.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
62. Things are planned so that everyone is getting in each other's way.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
63. How often are the objectives, goals or policies of this ship changed?
- Very often
 - Often
 - Occasionally
 - Seldom
 - Very rarely or never

64. How often are the objectives, goals, or policies of your division in conflict with those of the ship?
- Often
 - Occasionally
 - Seldom
 - Rarely
 - Never
65. The things that are seen as most important on this ship are not related to overall ship effectiveness.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
66. How clearly defined are the objectives of your ship?
- Sometimes obscure or poorly defined
 - Generally adequately defined
 - Better than most
 - Exceptionally well defined
67. The channels of authority aboard this ship are generally:
- Undefined
 - Poorly defined
 - Somewhat defined
 - Generally clear
 - Very clear
68. To what extent is it possible to get accurate information on the policies and objectives of this ship?
- Not at all
 - To a very small extent
 - To a small extent
 - To some extent
 - To a great extent
69. How do you regard the discipline aboard this ship?
- Totally inconsistent
 - Inconsistent most of the time
 - Consistent most of the time
 - Completely consistent
70. How often are people in other rates allowed special privileges that individuals in your rate do not receive?
- Frequently
 - Sometimes
 - Rarely
 - All people are treated equally
71. How consistently are ship's policies applied to all the crew?
- Totally inconsistent
 - Inconsistent most of the time
 - Consistent most of the time
 - Completely consistent; all are treated the same
72. The opportunities for promotion on this ship compared to those in other duty stations are:
- Much lower
 - Slightly lower
 - About the same
 - Slightly higher
 - Much higher
73. Does this ship perform an important function in the Navy?
- Yes, for the most part
 - Uncertain
 - No, for the most part
74. Most crew members are proud of their ship.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
75. To what extent is duty aboard this ship beneficial to your career?
- Not at all
 - To a very small extent
 - To a small extent
 - To some extent
 - To a considerable extent
76. I would rather stay on this ship than transfer to another.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
77. Working conditions on this ship are better than on other ships.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree

78. How do you feel about recommending the Navy to a prospective recruit?
- I would not recommend the Navy under any circumstances
 - I would probably recommend the Navy under certain circumstances
 - I would recommend the Navy to most recruits
79. I have more opportunities for growth and advancement in the Navy than in civilian life.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
80. Most individuals see a good future for themselves in the Navy.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
81. I think that the Navy has a good image to outsiders.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
82. In comparison with people in similar jobs in civilian organizations, I feel my pay is:
- Much higher
 - Slightly higher
 - About the same
 - Slightly lower
 - Much lower
83. To what extent does your ship strive to do a better job than other ships of the same type?
- Not at all
 - To a small extent
 - To some extent
 - To a great extent
 - To a very great extent
84. On the basis of your experience and information, how would you rate your ship on effectiveness?
- Very poor
 - Poor
 - Fair
 - Good
 - Very good
85. Aboard this ship, most of the jobs are set up so that they involve a great deal of wasted effort.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
86. The methods of my work are kept up-to-date.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
87. How effective is your ship in working under pressure?
- Does very poorly under pressure
 - Tends to become somewhat disorganized
 - Works steadily under pressure
 - Increases effort
 - Stimulated, does best work
88. How important is being liked in getting a promotion?
- Not very important
 - Somewhat important
 - Quite important
 - Highly important
 - Of vital importance
89. How much do "politics" count in getting a promotion?
- Are about the only way
 - Usually a powerful cause
 - Sometimes are the determiner
 - Have some slight influence
 - Have no appreciable effect
90. Experience and dedication are financially rewarded in the Navy.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
91. Opportunities for promotion in my rate compared to those in other rates are:
- Much higher
 - Slightly higher
 - About the same
 - Slightly lower
 - Much lower

92. To what extent does your organization emphasize personal growth and development?
- Not at all
 - To a very small extent
 - To a small extent
 - To some extent
 - To a considerable extent
93. How often do management personnel aboard your ship make an honest effort to reward outstanding work?
- Very frequently
 - Frequently
 - Sometimes
 - Seldom
 - Practically never
94. In my job, opportunities to learn worthwhile new skills and knowledge are:
- Non-existent
 - Limited
 - Fairly good
 - Quite good
 - Outstanding
95. In the Navy there are plenty of opportunities for training and advancement for those who work for it.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
96. Opportunities for advanced training on this ship are:
- Non-existent
 - Limited
 - Fairly good
 - Quite good
 - Outstanding
97. Petty Officers generally know what is going on in their work groups.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
98. Do you feel that people at division and command levels of the ship are aware of the problems and needs at your level?
- No, they are quite unaware
 - They are generally uninformed due to poor communications or lack of interest
 - They hear about my level only when the information is quite important
 - People at higher levels have a fairly good knowledge of other levels
 - Yes, they have a very good understanding of the problems and need at my level.
99. Officers keep well informed about the needs and problems of the crew.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
100. Considering everything, how satisfied are you with your present job?
- Very dissatisfied
 - Dissatisfied
 - Indifferent
 - Satisfied
 - Very satisfied
101. How often do you wish you could quit your present job?
- About all the time
 - Very often
 - Somewhat often
 - Seldom
 - Never
102. Generally speaking, how satisfied are you with the kind of work you have to do on your job?
- Very dissatisfied
 - Dissatisfied
 - Indifferent
 - Satisfied
 - Very satisfied
103. Considering everything, how would you rate your overall satisfaction in the Navy at the present time?
- Very dissatisfied
 - Dissatisfied
 - Indifferent
 - Satisfied
 - Very satisfied

104. When I do my job well, it gives me a feeling of accomplishment.
- a. Strongly agree
 - b. Agree
 - c. Indifferent
 - d. Disagree
 - e. Strongly disagree
105. When I do my job well, it contributes to my personal growth and development.
- a. Strongly agree
 - b. Agree
 - c. Indifferent
 - d. Disagree
 - e. Strongly disagree
106. I feel a great sense of personal satisfaction when I do my job well.
- a. Strongly agree
 - b. Agree
 - c. Indifferent
 - d. Disagree
 - e. Strongly disagree
107. Doing my job well increases my feeling of self-esteem.
- a. Strongly agree
 - b. Agree
 - c. Indifferent
 - d. Disagree
 - e. Strongly disagree

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