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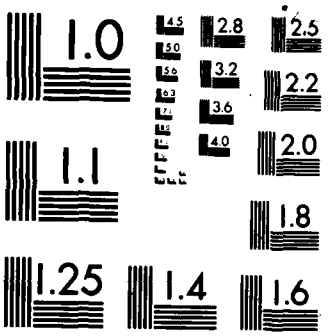

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COMBAT SYSTEM RESEARCH PROGRAM: IMPACT ON ORGANIZATIONAL CLIMATE, LEADERSHIP, AND GROUP PROCESS

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FOREWORD

This study was performed under Advanced Development Subproject ZPN07.22 (Combat System Personnel Training and Management) in support of Project ZPN07, Education and Training Development. It is one of a number of reports evaluating the impact of the Combat System Research program.

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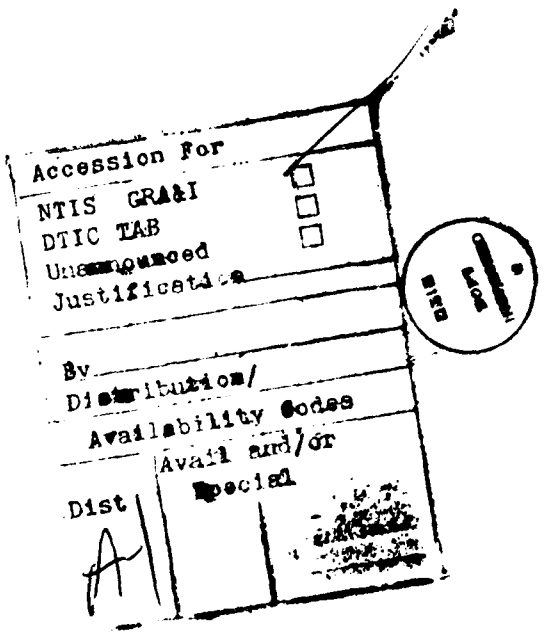
Commanding Officer



SUMMARY

Problem

The Combat System Research program initiated by the Bureau of Naval Personnel lead to the implementation of a pilot organizational structure for the operations and weapons departments on selected DDGs and CGs. The structural change basically reorganized the departments to produce more homogeneous groupings of tasks within the two areas (e.g., all electronics functions were assigned to the weapons department). The implementation phase was followed by a comparison of the pilot and standard structures on a number of indices.

Purpose

The purpose of this study was to compare pilot and standard organizations of weapons and operations departments in terms of leadership, organizational climate, and group processes associated with these functional areas to determine which type of organization is better according to these criteria.

Approach

Four ships with the pilot organizational structure were compared to four control ships with standard weapons and operations organizational structure on (a) organizational climate, (b) leadership, (c) work group processes, (d) satisfaction, and (e) integration of men and mission. The data source was information gathered by Human Resource Management Specialist Teams during Human Resource Availability periods.

Findings

The pilot organization produced better communication and higher integration of men and mission, but was also associated with lower leadership scores. Satisfaction and group processes did not differ for the pilot and standard organizations. The overall impact of the pilot organization may be positive. The apparent negative effects on leadership may occur because the new structural arrangement replaces informal coordination mechanisms with a more formalized coordination which is easier to achieve in departments with homogeneous tasks.

Conclusions and Recommendations

There was no consistent trend to the data, so no strong recommendations are justified.

CONTENTS

INTRODUCTION

Problem

Traditionally, weapons subsystems, such as antisubmarine, antiaircraft, and electronic warfare, have been somewhat independent entities within shipboard organizations. With the introduction of complex computers and automation, these subsystems have been integrated into what is now referred to as the combat system. Management of the personnel responsible for maintaining these subsystems, however, has not been integrated. This could be a factor contributing to the less-than-optimum electronics readiness of Navy ships.

A combat system research program was initiated by the Bureau of Naval Personnel with the publication of the Combat System Personnel Training and Management Plan (CSPT/MP). This plan established a new method of managing maintenance aboard Navy ships (DDGs and CGs) by reorganizing those billets concerned with electronics maintenance within the Operations and Weapons Departments. The development of the "pilot" structure, from the "standard" structure can be described in two steps. First, the responsibility for electronics maintenance, NTDS maintenance, and electronics warfare was transferred from Operations to Weapons, while the responsibility for the deck force moved in the opposite direction. Second, the renovated Weapons Department was divided into three functional areas: battery control, antisubmarine warfare, and electronics warfare. The Weapons Department thus becomes the Combat System Department headed by a Combat System Officer, and a System Test Officer billet is added to provide coordination of tests and readiness of the system. This reorganization was designed to suit organizational structure to the complex, integrated technologies now being used aboard these ships. A more detailed description of this reorganization is provided in Sass and Standlee (1977).

The new organizational structure was implemented aboard a number of pilot ships for test and evaluation. Recognizing that internal adjustments of the plan would be required, three phases of implementation were scheduled: (1) a small-scale pilot project, (2) an interim evaluation phase, and (3) broad implementation throught the Navy. The purposes of the first two phases was to develop alternatives to older forms of organization and to evaluate their effectiveness before implementation. One way to evaluate the effectiveness and efficiency of alternative organizational structures is to consider their impact on the utilization of human resources.

Purpose

The purpose of this study was to examine the impact of the experimental or pilot organizational structure on indicators of organizational behaviors, which provide an indication of how efficiently human resources are being used (cf., Flamholtz, especially pp. 127-133 and pp. 158-162). This study was not planned as part of the original experimental design, but, as Williams and Standlee (1975) noted: "The present study concerns itself only with maintenance effectiveness as defined herein. No doubt the pilot organizational structure will have other impacts—e.g., on management

relationships, career development, morale of crew, and operational performance—that are only partially related to maintenance effectiveness and merit separate consideration" (p. 13).

One important area which may be affected by the changes in organizational structure is the functioning of the team of personnel in the Combat System area. This report examines evidence concerning this area of possible impact, employing the Human Resource Management Survey (HRMS), a standardized instrument that measures variables theoretically related to both morale and performance (Likert, 1967).

METHOD

Sample

The sample consisted of eight ships--four with the "pilot" organizational structure and four with the "standard" organization of the weapons and operations departments. These ships were selected for study because (1) they had been through a Human Resources Availability (HRAV) period, and (2) respondents' ratings could be identified from survey data. In this report, attention is limited to the responses of personnel in the ratings of DS, ET, EW, FT, GM, IC, ST, and TM because they are more likely to be assigned to operations and weapons departments than to other functional areas. No better means of identifying comparable personnel on the pilot and control ships was available.

The number of respondents per ship ranged from 60 to 130, so stable estimates of the dependent variables were obtained for each ship. Despite the large variation in the number of respondents across ships, the number of respondents in the indicated ratings is between 21 percent and 25 percent of the total number of respondents on each ship. Apparently, the variation in sample size across ships is due to differences in the proportion of crew members surveyed on each ship. Such variations could arise for many reasons when a ship is in port as part of an HRAV, and there is no reason to believe that the differences in number of respondents introduces any serious bias into the findings of this study.

Variables

Independent

The independent variable in the present report is the type of organization structure for weapons and operations departments—pilot or standard.

Dependent

The dependent variables are the components of the Human Resource Management Survey (HRMS), which is administered as the first step of the HRAV process. The scores on the survey fall under four major areas: (1) command (organizational) climate, (2) supervisory leadership, (3) peer leadership, and (4) work group processes. These four areas each include several indices, the content of which is indicated in the Appendix. In addition, there are measures of job satisfaction and integration of men and mission. The latter reflects the extent to which the organization is able to motivate the individual to meet the needs of the organization and the extent to which the organization provides rewards that meet the individual's needs.

The higher the scores on the dependent variables, the better the organization as perceived by personnel within it. No *a priori* predictions about the impact of the Combat System project on these variables can be made, because the alterations in organizational structure are complex and cannot readily be related to prior research (cf., Jones & James, 1975, for a summary of that prior research).

Analysis Procedure

Because of the small number of ships being studied, a Mann-Whitney U test was employed to compare the pilot and standard organization of ships. This nonparametric test is employed to avoid violating the assumptions required for the t test and produces similar information (Siegel, 1956). A significant finding occurs only if the individual pilot ships consistently tend to score higher or lower than the individual standard ships. Thus, a significant finding does not come about because one or two ships have extreme scores on an index.

RESULTS AND DISCUSSION

Table 1 provides a comparison of organizational effectiveness aboard pilot and standard ships, as perceived by electronics maintenance personnel. The pilot structure has a negative impact on leadership, as indicated by the lower scores for supervisor support, supervisor teamwork emphasis, and peer teamwork emphasis, and a positive effect on organizational climate, as indicated by the higher scores for communications flow. There appears to be no effect on work group processes or job satisfaction, a morale indicator. However, pilot structure does produce better integration of men and mission.

Given the nature of the structural reorganization, the results are not surprising. In terms of tasks and personnel training, it has a homogenizing effect in the sense that closely related tasks requiring similar skills and processing functional interdependence are placed under a single command. This is most evident in the Combat System Department which emphasizes electronics-related activities. The operations department is now largely administrative. A side effect of this homogenization is that it is now possible to have department heads who are familiar with the intricacies of the work of all their subordinates.

The homogenization of work activities may improve communications by placing people with interrelated tasks under a single command. This will improve communications, as within-department communications are easier to carry out than across-department communications. At the same time, putting people in departments that emphasize their skills can provide a basis for perceiving greater man-mission integration, because skill utilization and development is probably a critical aspect of individual needs. In a department which emphasizes his specialty, an individual can develop personally while meeting the needs of the department more effectively as a result.

Although it is not significant, there is a trend in the data suggesting that the improvement in integration is accompanied by an increase in motivation. Perhaps this trend is confined to certain groups which could be identified with further study. Although such study is beyond the scope of this report, the topic is one that should receive attention in any further research on the impact of Combat System organization or any similar structural changes.

The significant findings showing negative effects on teamwork emphasis and superior support may reflect a reduction in the need for interdepartmental coordination due to the redistribution of functions. The clarification of function may reduce the need for teamwork between departments by reducing overlap in tasks. Within a department, teamwork emphasis may be lessened, because the department head can coordinate more effectively tasks which are interrelated and familiar. In short, a more efficient organizational design may reduce teamwork emphasis by reducing the need for informal "teamwork" coordination activities.

The remaining finding is a decrease in "supervisor support." This may arise because the reallocation of tasks produces a situation in which the departmental supervisors are more likely to be expert in the skills required of their department. Under these circumstances, when a subordinate has a problem, there will be less need to simply be "supportive," because the supervisor can actually provide technical expertise to solve the problem. Thus, the finding may not be a negative one.

Table 1

Comparison of Organizational Functioning as Perceived by Electronics Maintenance Personnel in Pilot and Standard Organization of Operations and Weapons Departments

Dependent Variable	Combat Systems Mean	Combat Systems S. D.	Standard Mean	Standard S. D.	Significance Level
Command Climate					
Communications Flow	2.92	.098	2.74	1.33	.029
Motivation	2.73	.103	2.62	.178	.100
Human Resources Emphasis	2.46	.083	2.35	.117	----
Supervisory Leadership					
Supervisor Support	3.59	.082	3.70	.093	.014
Supervisor Teamwork Emphasis	3.01	.092	3.16	.116	.029
Supervisor Goal Emphasis	3.49	.144	3.53	.178	----
Supervisor Work Facilitation	3.00	.123	3.03	.139	----
Peer Leadership					
Peer Support	3.73	.105	3.72	.041	----
Peer Teamwork Emphasis	2.98	.087	3.11	.030	.014
Peer Work Facilitation	2.85	.101	2.88	.082	----
Peer Problem Solving	3.37	.084	3.39	.093	----
Work Group Processes					
Work Group Coordination	3.32	.076	3.37	.090	----
Work Group Readiness	3.55	.170	3.67	.222	----
Work Group Discipline	3.37	.032	3.29	.252	----
Satisfaction	3.15	.105	3.15	.064	----
Integration of Men and Mission	1.94	.176	1.67	.148	.014

Note: The significance levels are based on a comparison of the combat system and standard organizations using the Mann-Whitney U test (Siegel, 1956).

CONCLUSIONS

Although the explanations provided in the previous section emphasize possible positive effects of the organizational change, they are only speculative. Other explanations may be possible which suggest a negative overall impact. Considering that the results are confined to 6 of 16 variables and the mixed nature of the findings, it must be concluded that there is no consistent trend to the findings.

RECOMMENDATIONS

No recommendations are made because the evidence presented in this stu is not central to the evaluation of the Combat System concept. Rather, th study was undertaken after the fact to take advantage of data collected fc other purposes. As such, it merely expanded the scope of the evaluation o the Combat System concept and possibly identified some unanticipated effect of the change in organizational structure.

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APPENDIX A

BRIEF DESCRIPTIONS OF THE DEPENDENT VARIABLES

DEPENDENT VARIABLES

1. Command Climate

a. Communications Flow. Command leadership understands the work and problems of the command. Information flows freely through the chain of command, from the work groups to a listening and responsive leadership and to the work groups concerning plans and problems facing the command.

b. Motivation. The command motivates personnel to contribute their best efforts through rewards for good performance and through career enhancing duties.

c. Human Resource Emphasis. The command shows concern for human resources in the way it organizes its personnel to achieve its mission. Personnel within the command perceive that the organization and assignment of work sensibly considers the human element.

2. Supervisory Leadership

a. Supervisory Support. Leaders behave in a way which increases the work group member's feelings of worth and dignity.

b. Supervisory Teamwork Emphasis. Supervisors encourage subordinates to develop close, cooperative working relationships with those working for them.

c. Supervisory Goal Emphasis. High standards of performance are set, maintained, and encouraged by supervisors.

d. Supervisory Work Facilitation. Supervisors help those who work for them to improve performance. Subordinates and supervisors work together to solve problems which hinder task completion and performance.

3. Peer Leadership

a. Peer Support. Work group members behave toward each other in a manner which enhances each member's feelings of personal worth.

b. Peer Teamwork. The behavior of work group members encourages the development of close, cooperative working relationships. Work group members maintain and encourage high standards of performance.

c. Peer Work Facilitation. Work group members help each other improve performance. The work group works together to solve problems which hinder performance and task completion.

d. Peer Problem Solving. Work group members work well in solving problems.

4. Work Group Processes

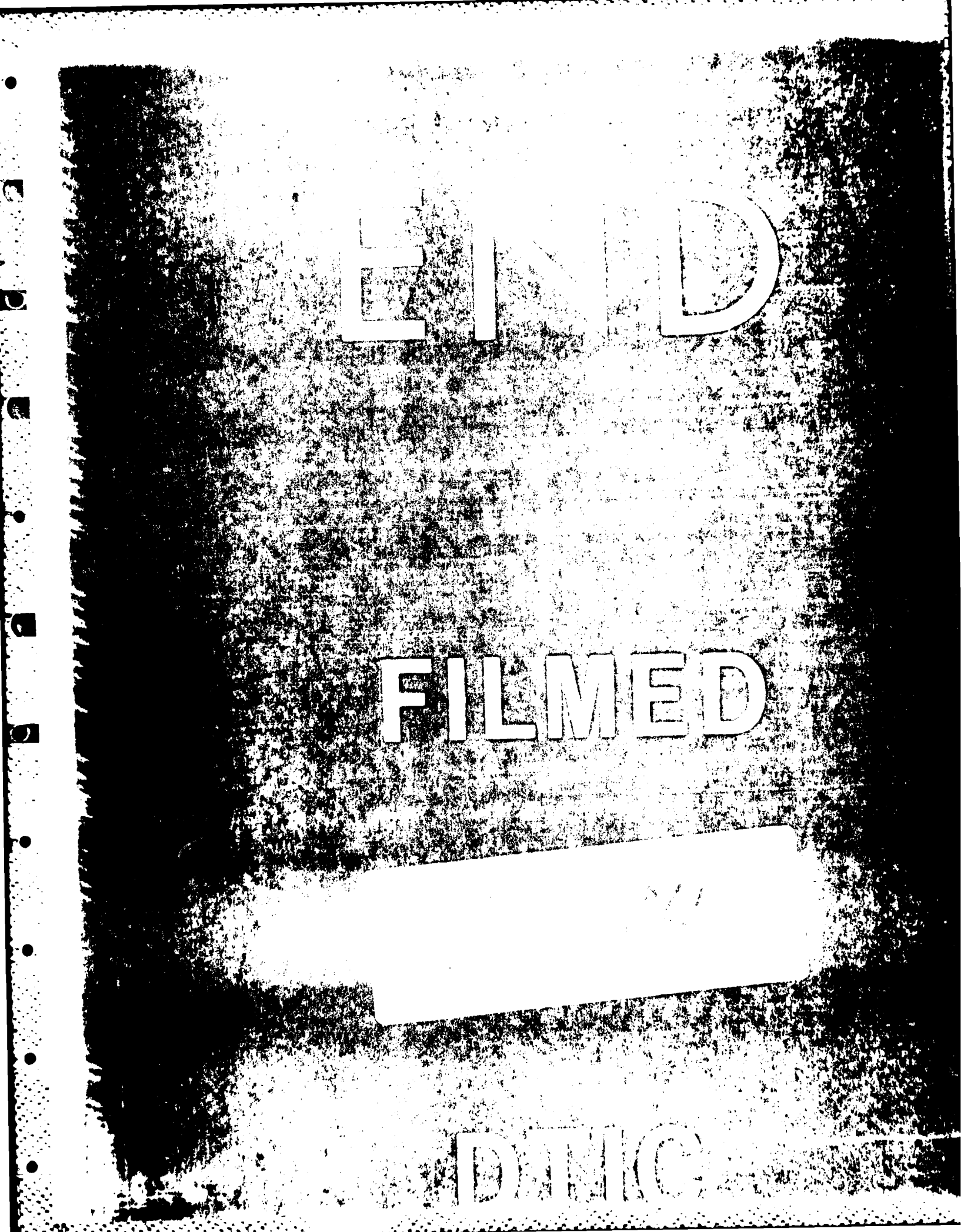
a. Work Group Coordination. Work group members plan, coordinate, and support each other effectively.

b. Work Group Readiness. The work group is able to adapt to emergency situations and meet its mission.

c. Work Group Discipline. Work group members maintain Navy standards of etiquette and discipline.

5. Satisfaction. Personnel within the command are satisfied with their supervisors, the command, other work group members, their job, and their present and future progress in the Navy.

6. Integration of Men and Mission. The command is seen as effective in getting people to meet the command's objectives as well as meeting individual needs.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