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PERSONNEL STUDIES IN MINE WARFARE

FINAL REPORT

By:

MILTON H. IREDELL
HARRY J. OLDER
WILLIAM S. BARKER
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ANDREW C. HILTON

A RESEARCH PROJECT CONDUCTED FOR THE BUREAU OF
NAVAL PERSONNEL UNDER CONTRACT Nonr 902 (00).
PRA REPORT 54-5 • MAY 1954

PSYCHOLOGICAL RESEARCH ASSOCIATES
1025 CONNECTICUT AVENUE, NORTHWEST
WASHINGTON 6, D. C.

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FINAL REPORT

UNDER CONTRACT NONR 902 (00), PSYCHOLOGICAL RESEARCH ASSOCIATES HAS CONDUCTED A SERIES OF PERSONNEL STUDIES IN THE FIELD OF MINE WARFARE.

BOTH MINING AND IN MINE COUNTERMEASURES WERE INCLUDED.

THE OBJECTIVES OF THESE STUDIES AT THE OUTSET WERE:

- (1) TO OBTAIN AND PRESENT A BILLET ANALYSIS, INCLUDING BILLET DESCRIPTIONS AND BILLET SPECIFICATIONS, FOR OFFICER AND ENLISTED BILLETS IN BOTH THE MINING AND MINE COUNTERMEASURES PHASES OF MINE WARFARE.
- (2) TO PRESENT RECOMMENDATIONS FOR SELECTION STANDARDS FOR VARIOUS MINE WARFARE BILLETS.
- (3) TO PRESENT RECOMMENDATIONS CONCERNING TRAINING IN MINE WARFARE AREA.
- (4) TO PRESENT A PROTOTYPE OF CRITERION PERFORMANCE DEVELOPMENT USING AS THE CONTENT A MINE WARFARE BILLET.
- (5) TO PRESENT A COMPLETE REPORT OF THE METHODOLOGY AND PROCEDURES USED IN ALL OF THE ABOVE.

IN MEETING THE ABOVE OBJECTIVES PSYCHOLOGICAL RESEARCH ASSOCIATES HAS PUBLISHED AND DISTRIBUTED THE FOLLOWING TECHNICAL REPORTS:

PERSONNEL STUDIES IN MINE WARFARE - TECHNICAL REPORT - PART I - PROCEDURES, MANUALS AND FORMS FOR INTERVIEWING, TABULATING AND COMPILING BILLET ANALYSIS INFORMATION. PRA REPORT 53-6, AUGUST 1953, UNCLASSIFIED. (274 $\neq$ xii)

PERSONNEL STUDIES IN MINE WARFARE - APPENDICES TO TECHNICAL REPORT - PART I - PROCEDURES, MANUALS AND FORMS FOR INTERVIEWING, TABULATING AND COMPILING BILLET ANALYSIS INFORMATION. PRA REPORT 53-6, AUGUST 1953, UNCLASSIFIED. (181 $\neq$ 1)

PERSONNEL STUDIES IN MINE WARFARE - TECHNICAL REPORT - PART II - MINE WARFARE BILLET DESCRIPTIONS AND SPECIFICATIONS - VOLUME I - MINE COUNTERMEASURES. PRA REPORT 53-7, NOVEMBER 1953, CONFIDENTIAL. (429 $\neq$ 11)

PERSONNEL STUDIES IN MINE WARFARE - TECHNICAL REPORT - PART II - MINE WARFARE BILLET DESCRIPTIONS AND SPECIFICATIONS - VOLUME II - MINE. PRA REPORT 53-7, NOVEMBER 1953, CONFIDENTIAL. (528 $\neq$ 11)

PERSONNEL STUDIES IN MINE WARFARE - TECHNICAL REPORT -
PART III - SECRET. (15 / IV)

PERSONNEL STUDIES IN MINE WARFARE - TECHNICAL REPORT -
PART IV - RECOMMENDATIONS FOR SELECTION STANDARDS AND TRAINING
FOR MINE WARFARE BILLETS. PRA REPORT 54-3, APRIL 1954, CON-
FIDENTIAL. (66 / IV)

PERSONNEL STUDIES IN MINE WARFARE - TECHNICAL REPORT - PART V -
CRITERION DEVELOPMENT FOR THE MINEMAN BILLET. PRA REPORT
54-4, APRIL 1954, CONFIDENTIAL. (152 / VIII)

TECHNICAL REPORT - PART I

TECHNICAL REPORT - PART I INCLUDES A DISCUSSION OF THE INITIAL PHASES OF THE RESEARCH WHICH WAS DESIGNED TO ATTAIN SEVERAL OF THE OBJECTIVES GIVEN ON PAGE I OF THE PRESENT REPORT. THE METHODOLOGY PRESENTED IN TECHNICAL REPORT - PART I PRESENTS THE METHODOLOGY USED FOR ALL PHASES OF THIS RESEARCH EXCEPT THE CRITERION DEVELOPMENT. IN ADDITION THE INTERVIEW FORMS AND CONTROL MEASURES ARE GIVEN IN THIS REPORT. ALSO ARE DESCRIBED THE DEVELOPMENT OF THE GROUP INTERVIEW TECHNIQUE, THE BASIC DATA COLLECTING DEVICE WHICH WAS USED FOR ALL STUDIES EXCEPT THE LATTER STAGES OF THE CRITERION DEVELOPMENT, AND THE CONTROL MEASURES WHICH WERE USED IN OBTAINING THE 370 GROUP INTERVIEWS FROM 1145 INTERVIEWEES.

APPENDICES TO TECHNICAL REPORT - PART I

DURING THE COURSE OF THIS PROJECT THE BUREAU OF NAVAL PERSONNEL REQUESTED THAT PSYCHOLOGICAL RESEARCH ASSOCIATES STUDY AND MAKE RECOMMENDATIONS CONCERNING REQUIREMENTS THAT PERSONNEL SHOULD MEET IN ORDER TO BE DESIGNATED "QUALIFIED IN MINE WARFARE". THROUGH THE INTERVIEW PROCEDURE PSYCHOLOGICAL RESEARCH ASSOCIATES HAD ALREADY OBTAINED DATA RELATED TO THIS PROJECT; THIS PROBLEM WAS FURTHER INVESTIGATED AND THE RESULTING RECOMMENDATIONS ARE PRESENTED IN APPENDIX C OF THIS REPORT.

THE INTERVIEW PROCEDURE ALSO PRODUCED CONSIDERABLE DATA WHICH,

WHILE NOT DIRECTLY RELATED TO THE PRIMARY OBJECTIVES OF THIS PROJECT, WERE RELATED TO SEVERAL AREAS OF ADMINISTRATIVE CONCERN WITHIN THE MINE FORCES. THIS INFORMATION, COMPILED AND SUBJECTED TO PRELIMINARY ANALYSIS, IS PRESENTED IN APPENDIX D OF THIS REPORT.

APPENDIX A CONTAINS THE MINE WARFARE PERSONNEL ANALYSIS BILLET DESCRIPTION AND SPECIFICATION FORMS, APPENDIX B CONTAINS THE MINE WARFARE PERSONNEL ANALYSIS MANUAL TO ACCOMPANY BILLET DESCRIPTION AND SPECIFICATION FORMS, AND APPENDIX E CONTAINS THE REVISIONS TO THE OPERATIONAL FORM AND MANUAL.

TECHNICAL REPORT - PART II - VOLUME I

CONTAINED IN THIS VOLUME ARE THE DESCRIPTIONS AND SPECIFICATIONS OF TWELVE MINE WARFARE MINE COUNTERMEASURES BILLETS. THE BILLETS PRESENTED ARE:

- (1) BOATSWAIN'S MATE (BM) ON A MINE SWEEPER (AM).
- (2) ELECTRICIAN'S MATE (EM) ON A MINE SWEEPER (AM).
- (3) MINESWEEPING OFFICER ON A MINE SWEEPER (AM).
- (4) BOATSWAIN'S MATE (BM) ON A MOTOR MINE SWEEPER (AMS).
- (5) ELECTRICIAN'S MATE (EM) ON A MOTOR MINE SWEEPER (AMS).
- (6) MINESWEEPING OFFICER ON A MOTOR MINE SWEEPER (AMS).
- (7) BOATSWAIN'S MATE (BM) ON A HIGH SPEED MINE SWEEPER (DMS).
- (8) ENLISTED MAN AT A MINE DISPOSAL UNIT (MDU).
- (9) OFFICER AT A MINE DISPOSAL UNIT (MDU).
- (10) COMMANDER OF A MINE DIVISION.
- (11) BOATSWAIN'S MATE (BM) ON A MINESWEEPING BOAT (MSB).
- (12) ELECTRICIAN'S MATE (EM) ON A MINESWEEPING BOAT (MSB).

THE DESCRIPTIONS PRESENTED IN THIS VOLUME ARE BROKEN DOWN BY BIL-
LET AND AS WELL BY ACTIVITY. THE SPECIFICATIONS ARE PRESENTED ON A BIL-
LET AND ACTIVITY BASIS AND INCLUDES THE FOLLOWING:

I. RATE AND PAY GRADE:

CURRENT:
RECOMMENDED:
POSSIBLE:

II. EDUCATION:

CIVILIAN:
NAVY:

III. ESSENTIAL KNOWLEDGE AND SKILLS:

LEVEL:
MANUALS:
CHECK-OFF LISTS:
TOOLS:

IV. PHYSICAL REQUIREMENTS:

TALKING:
SEEING:
HEARING:
EFFORT:

V. SUPERVISION:

TYPE:
BY:

VI. DANGERS - EFFECT OF ERRORS:

MATERIAL LOSS:
PERSONAL INJURY:
SAFETY PRECAUTIONS:

TECHNICAL REPORT - PART II - VOLUME II

CONTAINED IN THIS VOLUME ARE THE DESCRIPTIONS AND SPECIFICATIONS
OF SIX MINE WARFARE MINING BILLETS. THE BILLETS PRESENTED ARE:

- (1) MINING OFFICER OF AN AVIATION SQUADRON.
- (2) MINING OFFICER ON BOARD A LIGHT MINE LAYER (DM).

- (3) OFFICER IN CHARGE OF A J II UNIT.
- (4) MINE FORCE TYPE COMMANDER STAFF OFFICER.
- (5) MINING OFFICER AT A NAVAL ORDNANCE FACILITY.
- (6) ALL MINEMEN (MN) PERFORMING MINING DUTIES.

AS IN VOLUME II, THE DESCRIPTIONS PRESENTED IN THIS VOLUME ARE BROKEN DOWN BY BILLET AND BY ACTIVITY. THE SPECIFICATIONS ARE PRESENTED ON A BILLET AND ACTIVITY BASIS AND INCLUDE THE SAME CATEGORIES AS IN VOLUME I.

TECHNICAL REPORT - PART III

THIS REPORT HAS THE CLASSIFICATION OF SECRET AND CANNOT BE COMMENTED UPON IN THIS REPORT.

TECHNICAL REPORT - PART IV

TECHNICAL REPORT - PART IV IS DIVIDED INTO TWO PARTS, VIZ., (A) TRAINING METHODS AS DETERMINED FROM THE INTERVIEWS, AND (B) RECOMMENDATIONS REGARDING SELECTION STANDARDS FOR MINE WARFARE BILLETS. TRAINING RECOMMENDATIONS INCLUDE OBSERVATIONS OBTAINED BY PSYCHOLOGICAL RESEARCH ASSOCIATES' STAFF DURING THE COURSE OF THE RESEARCH, AND INTERVIEWEES' RESPONSES TO THE TRAINING SECTIONS OF THE MINE WARFARE PERSONNEL ANALYSIS BILLET DESCRIPTION AND SPECIFICATION FORMS. FOR EACH ACTIVITY OF EACH BILLET A TABLE IN THIS REPORT PRESENTS THE FOLLOWING TRAINING RECOMMENDATIONS:

- (A) THE TYPE OF NAVY TRAINING NEEDED FOR THIS ACTIVITY.
- (B) THE BEST METHOD OF TRAINING FOR THIS ACTIVITY.
- (C) THE SECOND BEST METHOD OF TRAINING FOR THIS ACTIVITY.
- (D) AT WHAT PERIOD IN THE CAREER OF THE MAN THE TRAINING SHOULD BE GIVEN.

SUGGESTIONS TOWARD CHANGING AND SETTING UP ADDITIONAL SELECTION STANDARDS ARE PRESENTED IN THE SECOND PART OF THIS REPORT.

TECHNICAL REPORT - PART V

THIS REPORT DESCRIBES THE DEVELOPMENT OF A BILLET CRITERION MEASURE, AND ITS ADMINISTRATION TO 111 MINEMEN. THE MEASURE WAS DEVELOPED FROM BILLET DESCRIPTIONS GATHERED IN PREVIOUS RESEARCH WITH THE HELP OF SUBJECT MATTER EXPERTS. IN ITS FINAL FORM IT CONTAINED NINE STATIONS, EACH OF WHICH PROVIDED AN EVALUATION OF HOW WELL A MINEMAN COULD PERFORM ON AND HOW MUCH HE KNEW ABOUT CERTAIN MINE COMPONENTS.

IT IS FELT THAT THE MEASURE CAN BE USED BY THE NAVY AS A STANDARD AGAINST WHICH TO EVALUATE SUCH THINGS AS CLASS-ROOM PROCEDURES, AND PENCIL AND PAPER TESTS OF JOB PROFICIENCY. THE USE OF THE CRITERION AS A MEASURE TO DETERMINE TRAINING DEFICIENCIES IS ALSO POSSIBLE. PERSONNEL MANAGEMENT PROCEDURES WITHIN AN OPERATIONAL UNIT MAY BE IMPROVED THROUGH EVALUATION OF TRAINED MEN ALREADY ON THE JOB.

IN ADDITION, IT IS BELIEVED, THAT THIS REPORT CAN SERVE AS A "HANDBOOK" FOR THE NAVY'S USE IN CONSTRUCTING PERFORMANCE CRITERION MEASURES FOR OTHER BILLETS.

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