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B. DATE Report Downloaded From the Internet: 10/28/99

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E. Distribution Statement A: Approved for Public Release

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Audit



Report

OFFICE OF THE INSPECTOR GENERAL

SUBMARINE TRAINING SIMULATORS AND DEVICES
AT TRIDENT TRAINING FACILITY, KINGS BAY

Report No. 97-063

January 7, 1997

Department of Defense

DTIC QUALITY INSPECTED 4

AQI 00-01-0301

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INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884



Report No. 97-063

January 7, 1997

**MEMORANDUM FOR ASSISTANT SECRETARY OF THE NAVY (FINANCIAL
MANAGEMENT AND COMPTROLLER)**

**SUBJECT: Audit of Submarine Training Simulators and Devices at Trident Training
Facility, Kings Bay (Project No. 5AB-0070.03)**

Introduction

We are providing this audit report for your information and use. This report is one in a series of reports about training simulators and devices from our audit of "Requirements, Planning, Development, Test and Evaluation, and Impact on Readiness of Training Simulators and Devices," Project No. 5AB-0070. This report addresses the effectiveness of Trident submarine training simulators and devices at the Trident Training Facility (TRITRAFAC), Kings Bay, Georgia.

Audit Results

The Trident Training Facility was highly effective for individual and team training. We attributed the exemplary training to the excellent training resources and submarine training simulators and devices at the facility and to the expertise and professionalism of the students and instructors. The Trident Training Facility supports Submarine Force, U.S. Atlantic Fleet, and Submarine Group 10, for coordination of Trident off-crew and refresher training.

Audit Objective

The audit objective was to evaluate the effectiveness of submarine training simulators and devices. The Trident Training Facility was 1 of 30 training programs that we reviewed. We also reviewed the Navy management control program as applicable to the overall audit objective.

Prior Audits and Other Reviews

Since March 1991, training has been the subject of four Inspector General, DoD, reports that were directly related to our audit objective. Enclosure 3 discusses the four prior audit reports.

Audit Background

The mission of the Trident Training Facility is to train personnel in the skills necessary to operate and maintain the Trident II submarine and its systems. The Trident submarines, outfitted with the Trident II missile, are a major part of our country's strategic modernization program. To operate and maintain a ship as complex as a Trident submarine, crew members must be thoroughly familiar with such diverse subjects as digital computers, inertial theory, nuclear engineering principles, navigation, and submarine ship control. Crew members must also have a working knowledge of communications, sonar, damage control, use of testing equipment and procedures, hydraulics, pneumatics, supply procedures, and menu planning.

Personnel are trained in those subject areas at the Trident Training Facility. The facility is composed of two buildings.

- o The main facility is 535,000 square feet in size. The building is the approximate length of an actual Trident II submarine. The main Trident Training Facility building contains all of the components of the Trident submarine under the single roof, with the exceptions of the berthing area, the mess area, and the nuclear reactor. The building is subdivided into 84 laboratories and 83 classrooms.

- o The second building houses the fire fighting facility. The new addition was completed in August 1996 and consists of two separate but connected buildings. The separate buildings are an administrative building and the trainer itself.

The facility has six departments that are described in Enclosure 2.

See Enclosure 1 for a discussion on the scope and methodology, organizations and individuals visited or contacted during the audit, and the management control program.

Discussion

In the austere budget environment in which the Military Departments must operate, the Trident Training Facility is succeeding in doing more without

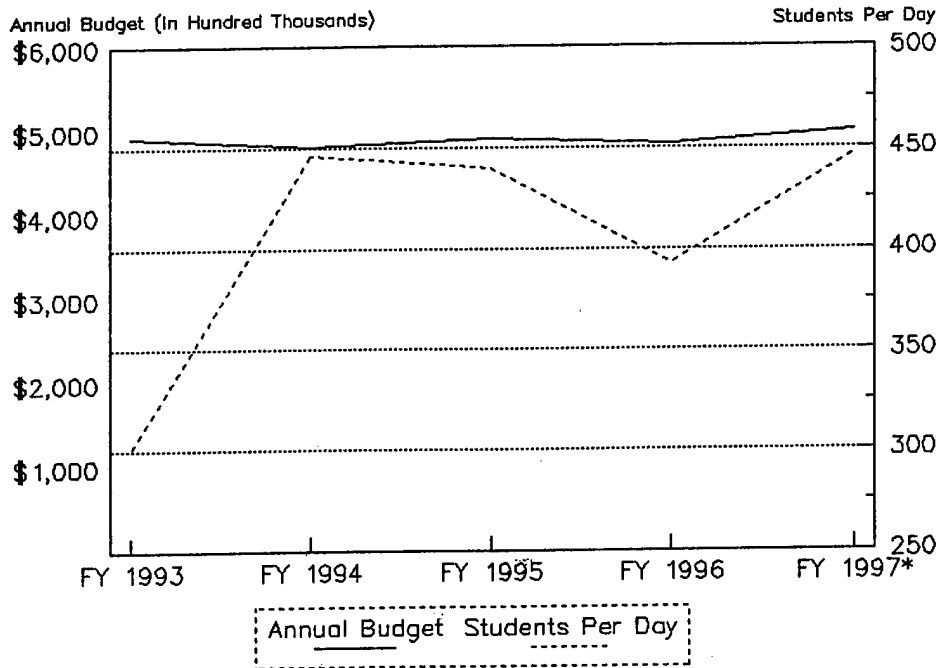
increasing resources. The Trident Training Facility trains officer and enlisted personnel in the basic knowledge and skills required to build competence and proficiency in operating and maintaining submarines. The Trident Training Facility provides basic, advanced, functional, refresher, and team training to submarine crew members and submarine support personnel. The objective of the training is to increase and maintain knowledge and proficiency in specific skills, to furnish specific operationally oriented sensor systems, and to perform such other training and sensor support functions as the Navy may direct. The effectiveness of the training devices is gauged by their ability to teach individual or crew skills that are subsequently transferred to actual tasks performed on the submarine.

Each Trident II submarine is manned with two crews of approximately 150 officers and men. One crew is on board the Trident II submarine, while the second is at Kings Bay, undergoing training at the Trident Training Facility. Basic training for new crew members and advanced training is accomplished by using equipment identical to that on board a Trident submarine. Therefore, when the students are on board the submarine, they have already seen and been trained on the same equipment.

Training

The submarine training process is efficient. The fleet sets the requirements for all systems including the training simulators. The Submarine Training and Trainer Working Groups identify a wide range of new and existing submarine training requirements and programs. All submarine training simulators and devices are coordinated through the Undersea Warfare Manpower and Training Branch, Undersea Warfare Division, Naval Sea Systems Command, Arlington, Virginia, which tasks others to develop the training situation requirement analysis that redefines the objectives and options and the training device coordination paper that develops the cost of the training simulator. The Navy Training Plan is a resource document that identifies the staffing, personnel, and training requirements to support training in accordance with the guidelines of Chief of Navy Operations Instruction 1500.8M.

The following figure shows that while student participation will be increasing in the future, the Trident Training Facility budget is not increasing. Although student participation has increased, the quality and effectiveness of student instruction has not been affected. For example, course supervisors ensure accuracy of curricula and supporting documents, review student comment sheets and analyze the student course assessments, and actively participate in classroom as well as individual training.



*Projected

Trident Training Facility Training Facility Budget Versus Students

Instructors are certified and qualified and have input into the curriculum to keep training up-to-date. The instructors have a high degree of integrity and emphasize that they want the students to succeed and that the students' skills and knowledge could save lives in the future. The instructors' main focus is that the students achieve the knowledge that is required and can perform as a team as well as individually. Students not only learn through textbooks and curricula, but are continually tested and given feedback from the instructors. The effectiveness of training is increased by the prompt and accurate feedback to help students identify error-producing behavior and to reinforce correct responses. Computers simulate various scenarios for student training purposes, and instructors' debriefs are used to evaluate crew and individual performance.

Conclusion

The Trident Training Facility is an excellent example of the successful integration of training simulations and devices into a major weapons system. Not only does the Trident Training Facility successfully train crew members for their initial assignment to a Trident II submarine, but the Navy uses the facility

to reinforce and upgrade the skills of the crew on a continuing basis. We wish to acknowledge the professionalism and expertise of all of the staff at the Trident Training Facility. In addition, we also wish to acknowledge the expertise of those Navy personnel involved in the conceptual planning and development of the unique Trident Training Facility.

Management Comments

We provided a draft of this report on November 4, 1996. Because this report contains no findings or recommendations, written comments are not required, and none were received. Therefore, we are publishing this report in final form.

We appreciate the courtesies extended to the audit staff. For additional information on this report, please contact Mr. Raymond A. Spencer, Audit Program Director, at (703) 604-9071 (DSN 664-9071) or Mr. David F. Vincent, Audit Project Manager, at (703) 604-9058 (DSN 664-9058). Enclosure 4 lists the distribution of this report. The audit team members are listed inside the back cover.



Robert J. Lieberman
Assistant Inspector General
for Auditing

Enclosures

Audit Process

Scope and Methodology

We reviewed requirements documents, obtained cost data for training systems, and interviewed instructors, students, and officials involved with submarine training simulator and device acquisitions.

Audit Period and Standards

We performed this economy and efficiency audit from September 1995 through October 1996 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We included tests of management controls considered necessary. We did not use computer-processed data or statistical sampling procedures for this audit.

Organizations and Individuals Visited or Contacted

We visited or contacted individuals and organizations within the DoD. Further details are available on request.

Management Control Program

Requirement for Management Control Review. DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987,* requires DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of Review of the Management Control Program. We limited our review because of relevant coverage in Inspector General, DoD, Report No. 96-028, "Implementation of the DoD Management Control Program for Major Defense Acquisition Programs," November 28, 1995. The report discusses the effectiveness of the management control program that the Defense Acquisition Executive and the Component Acquisition Executives used for major Defense acquisition programs. The report concludes that the acquisition community had not effectively integrated DoD Management Control Program requirements into its management assessment and reporting processes. As a result of the report recommendations, the Under Secretary of Defense for Acquisition and Technology integrated DoD Directive 5010.38 requirements into the March 15, 1996, revision to DoD Directive 5000.1, "Defense Acquisition," and DoD Regulation 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPS) and Major Automated Information

*DoD Directive 5010.38 has been revised as "Management Control (MC) Program," August 26, 1996. The audit was performed under the April 1987 version of the directive.

Audit Process

System (MAIS) Acquisition Programs." Acquisition managers are now to use program cost, schedule, and performance parameters as control objectives to implement the DoD Directive 5010.38 requirements. The managers are to identify material weaknesses through deviations from approved acquisition program baselines and exit criteria in the "Defense Acquisition Executive Summary" report. Consequently, we limited our review to the adequacy of management controls related to the acquisition of submarine training simulators and devices.

Adequacy of Management Controls. Management controls applicable to the acquisition of submarine training simulators and devices were deemed to be adequate in that we identified no material management control weaknesses.

Trident Training Facility Departments

The Trident Training Facility has six Departments.

o The Training Support Department offers training in areas of interest to all Navy ratings, such as instructor training and the Navy Leadership Development Program. The department provides guidance and quality control in all areas of instruction. In addition, the Training Support Department develops and implements new curricula, and it also monitors contractor-developed materials to make certain that all required specifications concerning the quality of materials are met.

o The Tactics Training Department provides training in the knowledge and skills required to build and maintain competency and proficiency in the tactical employment of the Trident Defensive Weapons Ordnance System, Fire Control System, and Sensor System.

o The Engineering Training Department provides follow-on operational and maintenance training in propulsion and auxiliary support equipment of the Trident submarine. Nuclear-trained personnel receive the advanced theory and skills needed to support propulsion and electrical plan operation and maintenance. Auxiliary support training equips machinists' mates to maintain hydraulics, high pressure air, life support, and air conditioning and refrigeration systems.

o The Strategic Weapons Systems Training Department provides replacement training and team refresher training to personnel responsible for the operation and maintenance of the Trident II Submarine-Launched Ballistic Missiles System. In preparation for assignment to a submarine crew, prospective Trident submarine commanding officers, executive officers, strategic weapons officers, navigation officers, missile technicians, and navigation electronic technicians are trained in strategic weapons and navigation operation and maintenance in that department. To prepare for their next patrol, Strategic Weapons teams and Navigation teams are trained and exercised. The teams practice missile launch procedures, exercise navigation operations, and simulate equipment malfunctions during highly realistic scenarios in trainers that are identical to the equipment found on board Trident submarines.

o The Combat Systems Training Department provides theoretical and operational courses to train officer and enlisted personnel in the basic knowledge and skills required to build and maintain competence and proficiency in the operation and maintenance of the following systems: sonar, communication, fire control, ordnance and weapon handling, electronic support measures, and tactical navigational.

Enclosure 2
(Page 1 of 2)

Trident Training Facility Departments

o The Command Support Department is composed of six divisions: Administrative Services/Personnel, Supply/Fiscal, Security, Facilities Management, Safety, and Information Systems. The Administrative Services/Personnel division maintains liaison with Naval Submarine Base Kings Bay in areas of civilian personnel management, and the division administers the training management system. The Supply/Fiscal division is responsible for financial management and provides general material support, including receiving, storing, issuing, and transferring material. The Security division is responsible for facility maintenance, physical loss prevention, transportation, and fire safety. The Facilities Management division is responsible for the operation and maintenance of the facilities assigned to the command and represents the command in all environmental areas as the environmental coordinator. The Safety division supports a command-wide Safety and Occupational Health Program, which conforms with all applicable higher authority rules, regulations, and standards. The Information Systems division is responsible for the coordination and efficient operation of each automated data processing system within the command.

Summary of Prior Audits and Other Reviews

Inspector General, DoD, Report No. 93-060, "Duplication/Proliferation of Weapon Systems' Modeling and Simulation Efforts Within DoD," March 1, 1993, states that model and simulation projects are being procured and developed within the DoD without adequate coordination and control. The report recommended that the Under Secretary of Defense for Acquisition (now the Under Secretary of Defense for Acquisition and Technology) develop policies and responsibilities related to investment, internal development, interoperability standards, modification of existing assets, and maintenance of catalogues. The Under Secretary of Defense for Acquisition concurred with all recommendations and took the recommended actions.

Inspector General, DoD, Report No. 92-125, "DoD Management of Electronic Warfare Threat Simulators for Training," July 15, 1992, states that the Air Force Tactical Air Command lacks required electronic warfare threat simulator assets, and the Military Departments are risking unnecessary duplication by developing separate electronic warfare threat simulators for training. Also, the fire-suppression contract at the Dare County Bombing Range, North Carolina, is not cost-effective. The report recommends consolidating all funding for test and training into an Office of the Secretary of Defense program element and requiring that the Services get written concept approval for threat simulator projects with a value of \$5 million or more before requested projects and funding are entered into the Program Objective Memorandum or budget. Both the Air Force and Director, Defense, Research, and Engineering (Test and Evaluation), partially concurred with the report and described planned or completed actions that should correct the identified deficiencies.

Inspector General, DoD, Report No. 92-002, "Operation and Modification of Flight Simulator Training Devices," October 9, 1991, states that flight simulators and their parent aircraft were not being modified concurrently as required because of late identification of needed modifications and uneven funding of training systems covering the parent aircraft. Also, the Services were not evaluating the effectiveness of training. The report makes no recommendations because the Military Departments acknowledged awareness of those problems.

Summary of Prior Audits and Other Reviews

Inspector General, DoD, Report No. 91-063, "Use of the Baseline Concept in Managing Major Weapon System Acquisitions," March 18, 1991, states that the baselines for major systems did not include training requirements. The report recommends that the Under Secretary of Defense for Acquisition establish a requirement in the new DoD Manual 5000.2-M, "Defense Acquisition Management Documentation and Reports," for program managers to establish milestones for initial training and initial provisioning in the quarterly "Defense Acquisition Executive Summary" reports for major weapon system programs in the production phase of acquisition. The Director, Acquisition Policy and Program Integration Office of the Under Secretary of Defense for Acquisition, concurred with the recommendation.

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Audit Team Members

The Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report.

Patricia A. Brannin
Raymond A. Spencer
David F. Vincent
Barbara A. Moody
W. Earl Van Field
Sandra S. Morrell