INTRODUCTION TO THE CONFERENCE

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The theme of this year's conference, "Readiness Through Simulation," is fitting since it emphasizes the vital role that training, and particularly training equipment, plays in a peacetime environment. This theme not only permits us to objectively assess capabilities and shortcomings of the inventory of training equipment, but also enables us to project capabilities of future systems. While previous conferences have placed emphasis on product improvement and training effectiveness of future training systems, I plan to assess the capabilities of training systems already in the inventory which are located at formal schools and fleet activities. This evaluation of the inventory will also focus attention on those factors which could improve the training effectiveness and supportability of these systems.

First, I would like to spend a few moments presenting information on the capabilities which exist in the present inventory. This training capability is achieved through a Navy/Marine Corps inventory of $683 million of training equipment representing 2,844 trainers with an acquisition value of over $1,000 each. I have translated the extensive utilization data which are collected and processed on 290 of the major devices by the Naval Training Equipment Center for the Chief of Naval Operations into another domain; namely, that of equivalent operational training, including the magnitude of threat and number of simulated weapons which are fired in synthetic training exercises.

These training systems were designed to provide individual operator, team, and task force training on one, or a combination of today's complex weapons systems. The training tasks range from cognitive and psychomotor skills through complex decision-making tasks including the collection of intelligence, evaluation of data, and deployment of platforms and weapons to cope with threats. The training systems provide instruction in a controlled environment where learning situations can be manually or automatically adapted to the proficiency level of the trainees. The instantaneous disposition of forces through initialization and reset features of the devices permits economic repetition of difficult and critical tasks.

The 290 devices covered in the utilization reporting system provided 245,055 hours of training in FY 76 with an average availability of 87 percent. In some cases, it has been necessary to run the trainers for two shifts to accommodate the student load.

The aviation trainer inventory consisted of 125 major trainers which provided 140,000 hours of flight simulation for 21 types of aircraft. Flight crews had to cope with over 100,000 emergencies. Thirty-two thousand carrier landings were made. There were 16,000 engagements against 37,000 air targets and over 63,000 air-to-air missiles were fired. A total of 46,000 hours of air ASW missions were flown against 15,000 submarine targets in which 96,000 sonobuoys, 2,000 torpedoes, and 13,000 depth charges were expended.

Moving to the surface ship trainers, the statistics are equally impressive. Eighty-six surface ship trainers steamed for 140,000 hours. All of this time was devoted to tactical AAW, ESM, and ASW training problems. These surface ships were augmented by 54 support ships and 34 fixed-wing aircraft and helicopters. The crews were defending against air and submarine threats. The threats consisted of 34 aircraft and 40 submarines. In these exercises, 45,000 weapons of various types were fired.

Submarine trainers operated for 21,000 hours. During this time there were 25,000 diving and surfacing evolutions. Crews corrected more than 50,000 malfunctions. Attack submarines detected, tracked, and attacked 10,000 target submarines and fired 20,000 torpedoes of various types.

There is another segment of the inventory which is equally important but not as glamorous as the complex trainers. These items are the individual and classroom training aids and devices which are used to support individual self-paced or classroom instruction.

Although the record of training accomplished with the existing inventory is impressive, there are a number of shortcomings which must be addressed. These shortcomings reduce the overall effectiveness of the training programs which are being supported. There are four major problem areas associated with the inventory. One or more of these deficiencies may exist on any one system. The four areas are: (1) systems no longer meet current training objectives, (2) reliability and supportability of training systems,

(3) inventory obsolescence and, (4) training systems in which Operational System Equivalence Ratio (OSER) is less than unity.

I have introduced the term OSER to identify the problem associated with keeping training systems current with their operational counterparts, both with respect to hardware and computer software. This area is usually referred to as the configuration management problem.

The severity of the problems enumerated above is influenced by the age of the inventory and the uniqueness of its composition. To indicate the severity problem, 26 percent of the inventory is over 10 years old and 57 percent is over 5 years old. The inventory that is over 5 years old represents analog and discrete component digital systems technology which is difficult to maintain. The inventory is made up of 1,126 different devices out of a population of 2,844 which further complicates life-cycle support.

The statistics on device utilization are impressive. They point out the success of the training device planning and programming system. It is this demonstrated performance, coupled with the future potential of training systems, that has been a major factor in the rationale which leads to the emphasis being placed on training device acquisition programs today. The value of these systems cannot be properly expressed by their acquisition value. The true value can only be measured by the contribution they make to operational readiness of our forces.

On behalf of the Naval Training Equipment Center, I would now like to extend appreciation for the support and cooperation we have received from both Government agencies and Industry. Thirty papers, covering a wide range of subject matter in the areas of research, development, design and testing of training systems will be presented during the next three days. I would also like to express my sincere appreciation for the time and effort that the authors have contributed in preparing the papers which will be presented. These papers provide the basis for achieving the conference goal; an effective exchange of information and ideas between sponsors, users, operators, and producers of training systems so that operational readiness can be improved through simulation.

ABOUT THE AUTHOR

MR. G. VINCENT AMICO has been Director of Engineering at the Naval Training Equipment Center since 1971. He graduated from New York University with a Bachelor of Aeronautical Engineering in 1941. He was awarded a Masters in Business Administration from Hofstra College in 1954 and a Master of Science in Engineering from Florida Technological University in 1973. Mr. Amico worked on the design of naval aircraft as a stress analyst and project stress engineer with the Curtiss-Wright Corporation from 1941 to 1945. He entered the Armed Forces in 1945 and was assigned to the Static Test Unit of the Structures Laboratory at Wright Field as a structure research engineer. Upon leaving the service in 1947, Mr. Amico joined Republic Aviation Corporation with responsibility for preliminary design of missile and advanced aircraft systems. He joined the Center in the fall of 1948 as a project engineer in the Flight Trainers Branch. Since then he has progressed through the engineering organization, holding positions as Head of the VA-VP OFT Branch; Head of the Aviation Trainers Division; Deputy Director and Chief Engineer of the Special Projects Office and Director of the Sea Warfare Trainers Department. During this time, he was responsible for the development and production of a wide variety of training devices in all warfare areas. Mr. Amico is a member of Tau Beta Pi and Alpha Pi Mu Honorary Engineering Fraternities, American Society of Military Engineers, Society for Experimental Stress Analysis, Research Society of America, Sigma Xi, the American Institute for Aeronautics and Astronautics, and the Armed Forces Communications and Electronics Association. He was past Chairman of the New York section of the Institute of Aerospace Science and the Orange Chapter of the Armed Forces Communications and Electronics Association. Mr. Amico holds two patents and has presented a paper to the Institute of Radio Engineers on Synthetic Training for Space Flight. He co-authored a paper on "The Application of System Dynamics Techniques to the Modeling of the Military Training System" for The Seventh Annual Simulation Symposium.