

INTRODUCTION TO THE CONFERENCE

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The theme of this year's conference, "New Horizons for Simulation," permits us to assess the progress which has been made over the last decade and to forecast the advancement which will be made within the next decade. I would like to briefly cover both the mid- and long-range horizons for simulation technology as it applies to training.

The mid-range horizon will be influenced by the continued advancements being made in the computer field and will center around the development of training systems. These training systems will encompass a wide range of instructional media, primarily computer based or controlled systems, to support major weapon systems. In consonance with this concept, there will be an increase in the use of computer controlled and managed instructional systems. These systems will provide the self-pacing, adaptive and self-evaluating features of the learning process that are geared to the behavioral requirements of the operational systems. Reductions in instructor requirements will be an important feature of these systems.

As the complexity of operational equipment increases through the use of onboard computers with their associated control and display systems, the cost of the operational equipment necessary to support operator and team trainings at multiple sites becomes prohibitive. This cost factor alone will lead to training equipment which can be directly interfaced with the operational system in a matter of hours. The pierside concept for surface ships has already been proved by programs which have been undertaken during the last few years.

The mid-range horizon will also include the development of multi-window, multi-channel computer image generation systems not only for aircraft, but also for surface ships and land based vehicles.

The high cost associated with using operational equipment to support all phases of specialized maintenance training will lead to the use of effective combinations of courseware and simulation hardware for many portions of the curriculum. These maintenance training systems will provide more effective training at a substantially lower cost.

The longer range horizon envisions systems that will be developed in the latter part of the next decade. The direction now being established for the mid-range will continue. The training system approach will have been fully implemented for new weapon systems. These training/instructional centers will employ fully automated curricula under the control of a multi-computer complex capable of monitoring performance against established standards for maintainers, operators and combat teams. These same training concepts will also be applied to operational subsystems with critical and complex training tasks.

The pierside design will move closer to the embedded training system concept. The increased use of computers in operational systems will simplify the connection of the environmental generator and instructor controls to the operational system. This connection may reside within the program of the operational computer or in a satellite computer. Advances in simulation and computer technology will make almost every vehicle serve its own training needs. Through data links, the combat teams in a number of vehicles can be trained to react to various multi-threat scenarios.

High-performance, wide-angle, visual systems using computer-generated imagery will find wide application in many training areas where visual perception is a critical pilot/operator function. Major advancements will be in the areas of display technology.

Specialized maintenance training facilities that integrate the operational equipment maintenance manual/technical data, parts identification and supply functions with the diagnostic/corrective maintenance procedures will rely heavily on simulation technology and computer based integrated courseware.

The major advancements which have been forecast rely heavily on the continuation of current trends in computer development, namely increased capacity/speed at a reduced cost. The Achilles' heel associated with these projections is in the area of software engineering. To date, software engineering problems have plagued every major trainer development. Although the problem is universally recognized, less than satisfactory measures have been taken to remove or alleviate the problem. If this deficiency is not corrected, the bright horizon for training systems will be dark and clouded.

The new horizon for simulation is indeed bright. Its principal feature will be the effective integration of hardware and courseware into training systems. These training systems will encompass a wide range of curriculum and media to satisfy a variety of operator/maintainer training objectives. Both initial and refresher training needs will be accommodated. This conference will permit us to examine that horizon, discuss alternative solutions, and develop an optimum training strategy; a strategy to improve operational readiness as its cornerstone.

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.