



SUCCESS STORY

TOPIC NUMBER: N07-034

SBIR INVESTMENT: \$1,448,891

PHASE III FUNDING: \$21,837,367.68



MILITARY TRAINING SYSTEMS ACCEPTANCE TEST & EVALUATION

Automatic Test and Retest (ATRT) was developed through SBIR and provides automated testing and retesting of combat system software and capabilities, saving countless hours while reducing costs for the Navy.

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THE CHALLENGE

As the Navy's dependence on software-intensive systems increases, so does its need for rapid testing and analysis of the systems it must deliver to its deployed aviators. It is not uncommon for a tester to manually execute each function, requiring hundreds of test hours prior to delivery to the warfighter. Despite the advances in development practices and tools, the rate at which training systems were delivered had not accelerated and costs had not been decreasing. Through SBIR, NAVAIR sought a way to apply new technologies and methodologies of automated acceptance testing to the wide variety of complex Navy flight and maintenance training simulators.

THE TECHNOLOGY

Innovative Defense Technologies (IDT) answered this request and leveraged SBIR funds to evolve its Automated Test and Retest (ATRT) suite of software technologies and associated system engineering methodologies. ATRT incorporates a sophisticated digital approach to model-based systems engineering, continuous integration, and test and analysis that is transforming the fielding of mission-critical systems for the Navy. ATRT enables an accelerated and expansive evaluation of system performance, from initial development to post-fielding updates. The technology provides automated testing and retesting of combat system software and their capabilities and provides automation of various means at all stages of the testing lifecycle for both new developments and for incremental capability enhancements.

THE TRANSITION

By leveraging ATRT solutions developed under this SBIR topic and N05-163 (Automated Testing Tools for Rapid Insertion or Adaptation of Combat System Capabilities), IDT has continued its work within the Joint Mission Planning System (JMPS) and other PEO programs. IDT received two Phase III contracts pertaining to ATRT, including over \$15 million from NAVAIR (contract N68335-15-G-0039) that will allow PMA-281 (Strike Planning and Execution Systems) to utilize these tools and methodologies which will lead to higher quality software products across the Navy.

THE NAVAL BENEFIT

Automation with ATRT replaces laborious and tedious testing that can take hundreds of hours, with quick and efficient testing in just minutes. The ability to integrate ATRT with the JMPS in management of the mission planning environments of multiple types of aircraft has resulted in a significant cost, schedule, and technical advantage over conventional methods. The benefits of automated requirements tracking and automated testing across the testing lifecycle result in a more reliable system from improved requirements documentation and tracking. ATRT delivers an average improvement of more than 85% over manual operations in time and labor savings. These savings have been achieved while simultaneously increasing requirements testing coverage. Through more efficient test planning to ensure the broadest requirements coverage per test and by more effectively identifying software problems, the performance of the system software development process is improved. Problems are found and resolved earlier in the development cycle and at lower cost, resulting in higher quality tactical software.

THE FUTURE

ATRT has grown into a suite of technologies enabling rapid integration, testing, and certification. To date, ATRT technologies have been demonstrated across more than 125 projects. The application of ATRT technologies for PMA-281 ranges from verifying Information Assurance Vulnerability Alert (IAVA) software updates in the JMPS to testing trainers and control systems for multiple Navy unmanned aerial vehicles (UAVs).

"As NAVAIR increases its dependence on software-intensive systems in an effort to deliver superior capabilities to the warfighter, there exists a need for more automation in software testing. Through SBIR, ATRT has met this need and has played a vital role in PMA-281's JMPS program."

Dave Gay, Senior APMT&E, PMA-280/281