



IMAGE COURTESY | U.S. Navy

Total Quality Systems was recently awarded a \$3.4M U.S. Navy contract to develop and deliver an Intermittent Fault Detection and Isolation System (IFDIS) to support F/A-18 (pictured) Generator Converter Unit (GCU) chassis repair for the Fleet Readiness Center-Southwest (FRCSW), located at North Island Naval Air Station, CA.

# TOTAL QUALITY SYSTEMS, INC.

When an avionics issue arises mid-flight that is observed by the pilot and/or crewmember of an aircraft, the flight debrief results in a maintenance write-up. Later, while accomplishing maintenance, many times there is found to be “no fault” – and issues that were experienced during the flight cannot be verified or remedied. Utah-based Total Quality Systems (TQS) has been developing a solution to this issue since the early 2000s, and its Navy and Air Force customers are reaping the benefits. To date, TQS has helped its government clientele implement product and process improvements that have cut their operating costs by over \$300 million.

## PHASE III SUCCESS

Recently awarded a Phase III IDIQ contract by the U.S. Air Force worth \$36 million and a \$3.4 million contract by the U.S. Navy; to date, 95% of revenue has stemmed from government clients.

## AGENCIES

DOD

## SNAPSHOT

Utah-based Total Quality Systems supports the Air Force's needs by providing sustainment analysis, planning, maintenance, repair, and overhaul, all while providing significant cost savings to its clients.

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TQS was recently awarded a \$3.4 million contract from the Navy to deliver an Intermittent Fault Detection and Isolation System (IFDIS) for use by the fleet on its F/A-18 Generator Converter Unit. This project involves unique electronics and avionics chassis evaluation capacity that provides the ability to detect and precisely isolate intermittent failures found in high value electronic aviation systems. Elusive intermittent faults result in increased maintenance actions for the warfighter, as well as increased costs.

“The way these components in the aircraft work, is that you have these computers and black boxes that all talk to one another through these cobweb-like series of wires,” explains Kirk Schmierer, CEO of Total Quality Systems. “And if any of these wires are broken, which happens frequently due to the constant vibration, short interruptions happen because you are communicating at very high rates. And it’s not just a government problem; this happens throughout the aviation industry.”

TQS’ IFDIS specifically seeks out and isolates the exact location of physical failures of a variety of components – connectors, solder joints, wires, etc. within the computers’ communication paths, making the technology applicable to any electronic systems across various industries. The IFDIS technology began more than ten years ago as an Air Force Small Business Innovation Research (SBIR) Phase I, and later a Phase II project, and culminated in the award of multiple Phase III awards with the Department of Defense.

Another SBIR project supported the development of TQS’ Contingency Acquisition Support Model (cASM), which assists the warfighter in a contingency environment by providing an easy-to-use tool to prepare their requirements for contracts more efficiently and safely. No more driving around dangerous streets in armored vehicles to get a “wet” signature.

Working almost like on-line tax-preparation software, cASM automates the requirements definition and review process and assists in translating a combatant commander's requirements into procurement packages that the contracting office can act upon expeditiously. TQS was recently awarded a Phase III Indefinite Delivery Indefinite Quantity (IDIQ) contract by the Air Force Life Cycle Management Center (AFLCMC) worth \$36 million to continue development and support for the Joint Service cASM application. The management of the contract has recently been transitioned to the Defense Logistics Agency.

"If we had gone through a prime contractor, instead of turning to the SBIR program, it probably wouldn't have worked," added Schmierer. "It's not their focus – generally with big companies, they aren't looking for small business innovation. So we turned seven of these SBIR awards into something, and we became the prime contractor."

Another factor contributing to the success of Total Quality Systems is the company's prime location next to Hill Air Force Base in the state of Utah, which Schmierer believes cultivates an environment of innovation. The Utah Governor's Office of Economic Development has set up seven Procurement Technical Assistance Centers (PTACs) across the state to assist small businesses in commercializing technologies.

"They really look out for the small guy," says Schmierer. "The state of Utah has given us opportunities to access the higher levels of government to advocate, propose, discuss, inform of things we've done, and that is huge. They've offered assistance in finding contracts that need our expertise and capabilities, and they match us with those opportunities, in addition to providing help in preparing large proposals. We've leveraged their expertise and learned how to present ourselves effectively to the high level folks."

TQS has also utilized the University of Utah's NANOFAB facilities to analyze a failure mode that had not been previously detected. The company can access this equipment free of charge through the University. In addition, the company has been instrumental in the Utah Advanced Materials and Manufacturing Initiative (UAMMI), and just recently, the state was one of just 12 selected to compete for \$1 billion in federal funds to enhance the manufacturing base within Utah.

The next five years for TQS will prove to be a busy period, as the company expands outward into the commercial sector. Both IFDIS and cASM are currently being prepped for their commercial debut, and the company is in talks with several large corporations across the country. With potential for its product line expanding nearly as fast as the company's growth, TQS is poised to make a name for itself in the complex realm of advanced systems development and enterprise software systems.



Total Quality Systems' Intermittent Fault Detection and Isolation System (IFDIS)