

# TOMAHAWK – STRIKE RECONSTRUCTION

## THE CHALLENGE

Following Operation Desert Storm, an independent analysis of air operations, including the first operational employment of Tomahawk Land Attack Missiles (TLAMs), was conducted. The Tomahawk Program Office supported this effort by providing expertise and limited analysis as requested by the independent agency.

Despite this support and involvement, the results were less than satisfactory. The independent analysis did not look at all aspects of the technical performance of the missile and associated hardware, nor did it consider military objectives in the final results. The terminology employed differed from that used by the operational forces, and the study results were difficult to interpret in an operational and system developmental sense.

After the next operational employment of the weapon, a collective of agencies were asked to conduct a technical analysis of the operational firings and evaluate missile performance. From this initial tasking grew a very successful element of the Tomahawk Program: strike reconstruction.

The goal of strike reconstruction is to ensure that the equipment, processes, and procedures provided for the employment of Tomahawk missiles are adequate for current and future operations. CSCI, in assisting in the effort, was challenged with developing a methodology that would facilitate the accomplishment of these goals within the constraints, and to then conduct the analysis within a timely manner with minimal impact on operational forces.

## THE STRATEGY

The failings of the initial independent analysis made clear that if the reconstruction process was to have a positive influence on weapons performance and employment it had to be more responsive, with continual dialog between the reconstruction analyst and operational forces. Lessons learned needed to be promulgated immediately, and analysis had to be flexible enough to respond to ad hoc requirements. To this end, a professional team was assembled that could maintain close liaison with operational forces and strike-planning staffs utilizing the best technology available.

Built from assets available within the program office and Tomahawk community, including team members from CSCI as well as SAIC, the core team possessed substantial knowledge of Tomahawk operations as well as strike planning, Tomahawk mission planning, and shipboard operations. Leveraging this expertise, the team continually reviewed and updated processes and procedures as new equipment and capabilities were introduced to the fleet, eliminating the gaps that existed in the initial strike analysis.

## THE RESULTS

The strike reconstruction process produced a variety of benefits in a number of areas:

- Significant changes were made to the mission planning system in the areas of quality control and target reference points based on errors found during strike analysis efforts.
- Strike analysis also led to the validation of the Extremely High Frequency (EHF) communications requirement. As a result, a process that previously took from 12-24 hours can now be accomplished in as little as 2-4 hours.
- The effort enabled firing ship minimum time lines to be established based on actual results, rather than being derived from standard operating procedures.
- The data analysis was instrumental in providing data points used in the validation of the Checkerboard technique of employment for Tomahawk multiple warhead weapons.
- Strike planning rules-of-thumb were developed for the number of missiles required to conduct a strike based on the data analysis performed during strike reconstruction, leading to the creation of an initial realignment policy.
- A comprehensive study of missile alignment failures was conducted, the findings from which were used to develop a policy that saves missile expenditures. This increased efficiency resulted in dramatic cost savings when applied to studies of previous engagements.

As this wide array of positive returns indicates, the strike reconstruction effort to which CSCI lent its expertise and dedication has been a great success, improving on past mistakes and delivering quantifiable results.