

# NAVY Transition Assistance Program

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N07-098 - SURVICE Engineering Company

Fire Integrity in Advanced Ship Structures

## NEED & CUSTOMER REQUIREMENT

**Need:** Composite materials are increasingly being used as structural components. Engineers need cost effective desktop modeling tools to predict the residual structural integrity of non-traditional composite materials during and after a damaging fire. The tool may also be used for post-event investigations and in the evaluation of preventive countermeasures.

**Value to the Warfighter:** Provides naval engineers with a cost effective design tool to optimize the integration of composite and advanced materials, taking into account the impact of structural damage from fire. It can also aid in damage assessment and control for ship-board first responders and maintenance personnel.

**Operational Gap:** Current tools to model composite materials and fire damage reside on high-speed main-frame computers because of the amount of computing power required to process current algorithms. A more cost effective solution to extend this modeling capability to more engineers is to develop a high-performance CFD code that can run on a desktop PC, and produce accurate results in a fraction of the time of traditional/legacy CFD codes.

**Customer Specifications:** Provide a comprehensive assessment addressing the spread of fire, smoke, and reactive gases, heat transfer, and structural analysis; that can be run on a desktop PC. High-performance CFD code that can run interactively, producing accurate results in a fraction of the time of traditional/legacy CFD codes. A graphical user interface (GUI) that enables varying the input parameters and initial conditions, providing the ability to see the effects of changes in real time.

**Technology Description:** An accurate yet fast-running engineering computer model which simulates all the key processes of combustion, predicts the fire growth and spread in a shipboard environment, and predicts the effects of the fire on the ships structure.

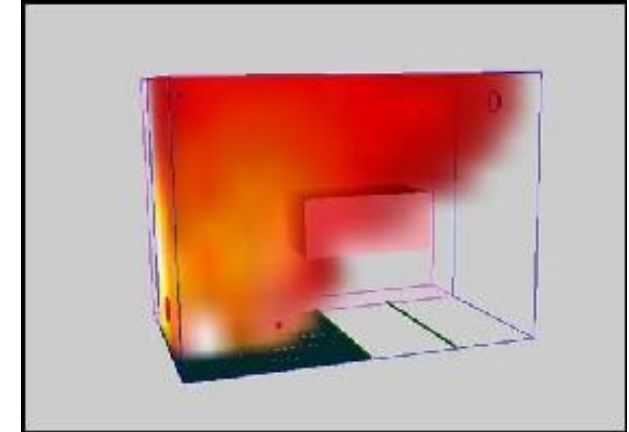
## SPONSORSHIP of original SBIR/STTR Topic

**SYSCOM:** ONR - SBIR

**Transition Target:** DDG-1000  
Zumwalt destroyers

**Original Sponsoring Program:**  
ACAT I - DDX Program, PEO  
SHIPS/PMS500

**TPOC Phone Number:**  
(703) 696-0786



## TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Phase I - Final Report	1	Moderate	Demonstrated elements of concept	Nov 2007
Phase I Option - SDP Task	2	Moderate	Software development plan	Dec 2008
Phase II - 1st Year - Phase II Demonstration Task	4	Moderate	Demonstrated prototype	Jun 2009
Phase II - 2nd Year - Validation Testing Task	6	Moderate	Functional code base with test cases	Jun 2010

**Open contract:** N00014-08-C-0592

## TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

### Other Potential Applications:

DDG-1000 Zumwalt destroyers  
CG(X) Next Generation Cruiser  
CGN(X) Nuclear Guided Missile Cruiser  
Also, current conventional structure fleet of vessels  
Ground vehicle composite armor  
Composite aircraft

### Business Model:

SURVICE Engineering will offer various services ranging from developing custom applications for this code, providing assessments of structures, and licensing the use of developed code.

### Objective:

Seeking relationships with primes and those in the analysis and acquisition communities who have a need for a cost-effective composite structure fire damage modeling solution.

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