

Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2016-746

Topic # N10A-T011

Prediction of the Full-Scale Cook-off Response Based on Small-Scale Testing

BlazeTech Corp.

WHO

SYSCOM: NAVAIR

Sponsoring Program: PMA 242

Transition Target: PMA 242

TPOC:

(301)744-4854

Other transition opportunities:

NAVSEA

Ordnance manufacturers

JIMTP

ARDEC

AMRDEC

Notes:

JIMTP: Joint Insensitive Munitions Technology Program

ARDEC: Armaments Research, Development and Engineering Command

AMRDEC: Aviation and Missile Research, Development and Engineering Command

USS Forrestal Fire 1967



Photo courtesy of US Navy, Photo # 1124794

WHAT

Operational Need and Improvement:

Develop an innovative methodology that provides a modeling and simulation capability sufficient to predict the response of full-scale weapons systems to fast cook-off (FCO) and slow cook-off (SCO) to meet Insensitive Munitions (IM) requirements.

Specifications Required:

The expected output is a fully functional computational protocol which will utilize small-scale experimental data to predict a full-scale cook-off response. The focus of this effort is on development of a protocol for solving a complex system level response to a thermal threat which will result in the prediction of the reaction violence of the system.

Technology Developed:

Using modeling and simulation, BlazeTech will develop a computational protocol that will successfully predict a full scale cookoff based on small scale laboratory experiments.

Warfighter Value:

- * Improved safety to the warfighter
- * Reduced testing costs

WHEN

Contract Number: N68335-16-C-0038 **Ending on:** May 15, 2017

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|--|------------|--|------------|--------------|
| Develop cookoff model architecture | Low | Can predict both fast and slow cookoff | 4 | January 2014 |
| Develop system level effects model | Low | Match data from historical accidents | 4 | July 2015 |
| Develop model for PBX N-111 | Low | Match known results | 5 | May 2017 |
| Evaluate mitigation strategies using model | Med | Match future tests planned by JIMTP | 5 | May 2018 |

HOW

Projected Business Model:

BlazeTech will license the predictive tools to propellant and explosive formulators as well as munitions designers.

Company Objectives:

BlazeTech will continue to be at the forefront of developing modeling and simulation solutions for insensitive munitions.

BlazeTech will continue developing novel hardware and software solutions providing cost-effective solutions for:

- * Fire and Explosions
- * Environmental Safety
- * Aircraft Survivability
- * Risk Assessment

Potential Commercial Applications:

Ordnance manufacturers

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