SURVICE
ENGINEERING COMPANY

INFRARED (IR)SUSCEPTIBILITY MODELING AND ANALYSIS

BACKGROUND

The SURVICE Engineering Company has a vast and wide-ranging capability in the prediction of infrared (IR) signatures. Our experience and capabilities provide our customers with the ability to make informed design modifications to reduce IR susceptibility and meet reduced susceptibility requirements or mitigate the outcome of likely scenarios encountered with existing platforms.

Our experience ranges from quick first-order approximations of IR susceptibility to detailed system-level approaches (which extend into experimental approaches). We have strong working relationships with combat system engine manufactures, airframe designers, signature code developers, and end-users. And we stay practiced and engaged to produce a quality, well-informed, and detailed IR signature final product.

SURVICE has computational modeling and simulation (M&S) tools that can predict the IR signature from the source thermal loads to the end result of a missile fly-out with probability-of-hit analysis, given the kinematic capabilities of the missile, seeker effectiveness, countermeasure effectiveness, and atmospheric conditions. Our primary IR signature code is the Composite Hardbody and Missile Plume (CHAMP) model. However, we understand the underlying mechanism driving the IR signature product is based upon finite element thermal analysis and computational fluid dynamics analysis, using the Standard Plume Flowfield

(SPF) Model and the Standard Infrared Radiation Model (SIRRM3 and SPURC). The Modeling System for Advanced Investigation of Countermeasures (MOSAIC) is our primary susceptibility code for predicting the likelihood of engagement, the potential for impact, and the effectiveness of countermeasures in deterring a hit.

Finally, SURVICE has extensive propulsion experience and relationships with industry-leading engine manufacturers. We have the ability to conduct low-cost IR testing via industry relationships and translate test results into real-world susceptibility assessment.

RECENT EXAMPLES *Some representative model inputs and outputs are illustrated here.*

IR Signature Prediction

Plume Reduction Test

MOSAIC Hit/Miss Plot

MD530 IR Test

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