



# Integrated Military Systems

## at Sandia National Laboratories



### Defend and Defeat: A Tradition of National Security Support

The Integrated Military Systems (IMS) program at Sandia National Laboratories develops and demonstrates game-changing systems and technologies to solve warfighters' most challenging, urgent, and high-risk problems—defending the nation and defeating threats to national security. Building on more than six decades of experience supporting national security missions, IMS offers a unique integrated capability of designing, developing, and testing advanced flight systems, as well as revolutionary technologies in the areas such as directed energy, target characterization, robotics, warheads, and explosive systems.

IMS leverages its decades-long experience base, threat and intelligence insight, science-based systems engineering and analysis, advanced technologies, and rapid prototyping to deliver innovative, high-quality products to its customers.

### IMS Program Capabilities

- Precision NG&C for strike GPS-denied environments
- Real-time distributed processing (unmanned ground sensors)
- Electromagnetic launch
- Target lethality engineering
- Unconventional defeat approaches
- Cognitive Modeling
- Complex system rapid prototyping and testing
- Flight system design and integration
- Directed energy systems
- Arming and firing systems
- M&S for system level architectures
- Air delivered unattended ground sensors
- Ultra Short Pulse Laser Systems
- Compact Pulse Power Systems
- Advanced signal processing
- Explosives testing and applications
- Hypersonic flight systems and integration
- Complex mechanical systems design
- Experimental aerodynamics
- Rugged, power efficient embedded systems
- High Power Microwave Systems

#### » Missile and Air Defense



*Demonstrates advanced technologies, delivers responsive technical solutions in anticipation of Missile Defense mission needs, and facilitates the integration and sustainment of operational capability across the broad Missile Defense mission.*

#### » Military Systems & Technologies



*Applying science-based systems engineering, integrated technologies and advanced analytics to enhance military operations, efficiencies, mission effectiveness, and enable data driven decisions.*

#### » Strike Systems & Aerospace Technologies



*Provides rapid-response and agile system-level design, development, and demonstration of advanced strike systems and technologies to address national needs.*

#### » Target Defeat & Asset Protect (TDAP)



*Applies technology advancement and innovative engineering to our warfighters' challenges and develops system solutions for target defeat and asset protect applications.*

# Facilities

**Kauai Test Facility** This integrated rocket launch facility performs tests in support of missile defense and conducts a variety of sounding rocket missions, including weapons research and development; operational training, testing, and evaluation; and technology development.



**Hopkinson Bar Lab (HBL)** The Hopkinson Bar Laboratory has both confined and unconfined split Hopkinson pressure bars that can be used to characterize materials at constant strain rates from  $10^2/s - 10^4/s$ . The bars can also be modified to test various components (accelerometers, oscillators, etc.) in specific impact environments.



**Flight Dynamics Lab (FDL)** The Flight Dynamics Lab supports development and testing of flight control systems for experimental hypersonic test vehicles. Flight hardware subsystems are tested with complementary real time flight software products. Real time hardware-in-the-loop simulation systems are created and applied to functionally verify candidate flight application real time software products.



**HPM/RFA Anechoic Chamber** The High Power Microwave/ Radio Frequency Applications (HPM/RFA) Anechoic Chamber was designed and built for threat-level HPM testing of large platforms.



Currently in use for both HPM source and antenna development, the chamber is large enough to accommodate a military vehicle and has an attached Hi-Bay laboratory.

**Thunder Range** Serving the Department of Energy, Department of Defense and other government customers, Thunder Range focuses on research and development in shock physics and advanced modeling to develop, field and train operators on advanced explosive ordnance disposal and breaching tools and explosive tools for critical national mission.



**Explosives Applications and Containment Training Facility** An explosives test site since 1958, this facility performs explosives testing and acts as a containment training facility for the Nuclear Emergency Support Team/Joint Technical Operations Team (NEST/JTOT) program.



**Test and Assembly Lab (TAL)** With over 10,000 square feet of space including two overhead cranes and a small machine shop, the Test and Assembly Lab is a Hi-Bay facility dedicated to hardware development, fabrication, checkout, and verification of flight and payload systems.



**Explosives and Ballistics Test Complex** This test complex supports explosives and ballistics testing with an emphasis on homemade and improvised explosives characterization, and laser system development.



**Dynamic Explosive Training Site (DETS)** The DETS site provides realistic training venues and scenarios for first responders to exercise their tools and techniques to locate, characterize, and make safe IEDs, radiological dispersal devices, and improvised nuclear devices.



**Mobile Guns Complex** Trailer-mounted recoilless Davis Guns (8", 12" or 16" barrels) and Gas Guns (6" or 16") developed by Sandia to characterize test article performance in engineered or geologic targets. Example Davis Gun and Gas Gun experiments include penetrator, Dart/Probe & subassembly (ex-fuse) performance characterization



**Rocket Systems Development Lab (RSDL)** The Rocket Systems Development Lab, with about 8,800 square feet of floor space, two large rocket systems processing areas, a bonded stores area, a general storage area, and a five-ton overhead bridge crane, is a Hi-Bay facility dedicated to hardware development, fabrication, checkout and verification of rocket systems.



**Explosives Applications Laboratory (EAL)** The Explosives Applications Laboratory facilitates missions related to shaped charge testing and development, conventional warhead testing, explosively configured demilitarization systems, novel explosive and pyrotechnic device testing, and blast and fragment mitigation technologies.



**Electromagnetic Launch Technology and System Integration Test Facility** Integrated capability to develop and test launcher, projectiles, power systems, and components for high magnetic field experiments and electromagnetic launchers.



## Contacts

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