



**Congress of the United States**  
**House of Representatives**  
**Washington, DC 20515**

**Rep. Mike Simpson**  
**FY2010 House Defense Appropriations Member Project Requests**

In accordance with the policies put forth by the House Appropriations Committee, I would like to share with you some information regarding the projects that I have submitted for consideration in the FY2010 House Defense Appropriations Bill.

**Project Name:** 3-D Technology for Advanced Sensor Systems

**Amount Requested:** \$2,000,000

**Account:** Electronics Technology Account in the Department of Defense RDT&E

**Recipient:** Boise State University

**Recipient's Street Address:** 1910 University Drive, Boise, Idaho 83725

**Description:** The 3-D packaging approach offers the promise of a dramatic decrease in the system weight and volume, together with increased system performance. This project will provide funding to continue to develop 3-D processing techniques on silicon and LTCC platforms. These include technologies for die- and wafer-scale bonding and 3-D interconnects. These techniques will be applied to create 3-D integration and packaging solutions applicable to a general category of high performance sensor systems. The military has a need for new three-dimensional (3-D) packaging of electronic systems, particularly sensor systems for portable (i.e., on-soldier) applications. 3-D integration and packaging of sensors will result in smaller electronics with expanded capability, allowing the soldier in the field to be more effective.

**Project Name:** Accelerator-Driven Non-Destructive Testing

**Amount Requested:** \$2,000,000

**Account:** Support Systems Development Account in the Air Force RDT&E

**Recipient:** Idaho State University

**Recipient's Street Address:** 921 South 8<sup>th</sup> Avenue, Stop 8007, Pocatello, Idaho 83209

**Description:** The Idaho Accelerator Center (IAC) will develop a research, education and commercialization program that takes non-destructive testing techniques developed at the IAC and advances their development. The penetrating and non-destructive techniques that are under development include new techniques in positron annihilation spectroscopy with accelerator-based gammabeams, the use of mono-chromatic x-ray beams and the use of photon activation (via photonuclear reactions) for trace element analysis of materials and manufacturing processes. The development of practical non-destructive testing (NDT) techniques will help the U.S. Air Force reduce aircraft downtime necessary for inspection and enhance turn-around times by more quickly identifying needed repairs through spectroscopy and the use of x-ray. The development of practical NDT techniques will be of immense value to the armed forces in four critical areas: quicker return of aircraft to the line by reducing the tear-downs necessary for inspection; non-destructively addressing the enormous 'aging fleet' problem of the U.S.A.F. and the private sector; better economics by replacing parts on an on condition inspections basis instead of a 'life limited' basis; and the ability to successfully apply NDT techniques to composite materials. Currently, no commercialized NDT technique works on composite materials.

**Project Name:** Domestic Manufacturing of 45nm Electronics (DOME)

**Amount Requested:** \$2,000,000

**Account:** Advanced Spacecraft Technology Account in the Air Force RDT&E

**Recipient:** American Semiconductor, Inc

**Recipient's Street Address:** 3100 South Vista Avenue, Suite 230, Boise, Idaho 83705

**Description:** Funding for this program will deploy a new foundry capability to address the most critical electronics sourcing issue faced for secure supply of advanced DoD integrated circuits in 2012 and beyond. DOME is an AFRL-sponsored initiative to implement a 45nm state-of-the-art wafer fabrication capability to meet current and future system requirements for fabrication of specialized integrated circuits in a broadly available foundry capacity to serve DOD. Microelectronics capability for defense applications requires advancement of technology for each generation of new defense system. Defense system requirements are often highly specialized and include capability beyond that of standard commercial devices due to their unique operational environments. An advanced and sustainable defense microelectronics supply solution is required that can provide parts in low volume at reasonable costs and be fabricated on-shore to meet security requirements. This advanced process technology enables higher speed, lower power electronics that are of vital importance to the military and intelligence communities. The DOME program will deliver the capability to manufacture semiconductors at the most advanced technology node currently in production, 45nm, at an American run on-shore facility optimized for DoD/IC business.

**Project Name:** Hybrid Energy Systems Design and Testing

**Amount Requested:** \$2,000,000

**Account:** Military Engineering Advanced Technology Account in the Army RDT&E

**Recipient:** Idaho National Laboratory

**Recipient's Street Address:** 2525 Fremont Avenue, Idaho Falls, Idaho 83415

**Description:** The Hybrid Energy Systems Development and Testing Program will provide the Army transformational technologies that advance Army leadership in global energy security and carbon reduction. Hybrid energy concepts provided through this program could allow the Army to simultaneously address energy supply (electrical grid and fuel supply) security and surety, environmental (CO<sub>2</sub>) footprint reduction, and provide national economic benefit. This project will leverage unique assets at the INL, such as its Hybrid Testing Lab, engineering-scale energy test beds, supercomputing capabilities, and hybrid systems design teams, and nuclear technology designs, to develop, validate, and assess hybrid and other advanced energy system concepts. This program will provide a foundation for Army leadership in clean, smart, secure energy for future defense and non-defense applications.

**Project Name:** Hybrid Power Generating System

**Amount Requested:** \$2,000,000

**Account:** Advanced Electronics Technologies Account in the Department of Defense RDT&E

**Recipient:** M2E Power, Inc.

**Recipient's Street Address:** 845 West McGregor Court, Suite 150, Boise, Idaho 83705

**Description:** Research at the Idaho National Laboratory resulted in a breakthrough technology using compressed magnetic fields which can generate power. M2E Power is expanding on this research to develop high density generators based on breakthrough configurations of permanent magnetic material, coil designs and advanced power electronics. With further development efforts, M2E Power's technologies will enable lightweight, compact power sources and highly power-dense components that will significantly reduce the logistics burden, while increasing the survivability and lethality of the warfighter. The continued research, development, testing and validation of the technology should result in mission extension for dismounted soldiers and considerable savings by reducing the reliance on disposable batteries. In addition, the technology will substantially increase the overall efficiency of motors, generators and propulsion systems used defense-wide.

**Project Name:** Integrated Passive Electronic Components

**Amount Requested:** \$1,700,000

**Account:** Advanced Spacecraft Technology in the Air Force RDT&E

**Recipient:** University of Idaho

**Recipient's Street Address:** 820 Idaho Ave., Morrill Hall 109, Moscow, ID 83844

**Description:** Spacecraft are critical for coordinating modern military operations, particularly for intelligence gathering, battle-space communications, resource deployment (e.g. Global Positioning System), and targeting. More accurate and timely information enables more effective deployment, but requires enhanced sensing, communications and computing, which require more power. Limited energy sources and cooling capacity aboard spacecraft restrict increased processing capability. Power consumption has become a limiting factor in the performance electronic and computing technologies. Microchip designers have addressed rising power consumption by reducing the voltage levels of the power delivered to the chips, with excellent results. However, this creates a new problem of how to deliver clean low-voltage power to the chips. This research will develop the technologies to enable low-voltage power regulation to be integrated onto the same piece of silicon that holds the computing circuits, thus making ultra-low-power microelectronics practical. The key to this technology is integrated passive components. In addition, this research will produce a new range of component options for analog circuit designers, enabling greater ability to program and increasing flexibility of on-board electronic systems.

**Project Name:** Material, design, fabrication solutions for Advanced SEAL Delivery System external structural components

**Amount Requested:** \$2,000,000

**Account:** Operations Advanced Seal Delivery System (ASDS) Development in the Department of Defense Research, Development, Test and Evaluation (RDT&E)

**Recipient:** Premier Technology Inc.

**Recipient's Street Address:** 1858 West Bridge Street, Blackfoot, Idaho 83221.

**Description:** Premier Technology Inc. will work with the Idaho National Lab, Navy PEO Submarine (PMS 399), US Special Operations Command, Naval Special Warfare Command and the Navy Office of Naval Research to provide material, design and fabrication solutions for ASDS external structural components allowing those components to withstand severe hydrodynamic, hydrostatic and shock loading while maintaining significant resistance to corrosion in situations where the ASDS is attached to the submerged host submarine operating at high speeds. Candidate components include the host submarine pylon assembly, ASDS lower hatch (buttress threads) and ASDS shaft line components. The goal of this project is to assist the US Navy in bringing ASDS to its fullest operational capability by addressing challenges that it faces in key material issues.

**Project Name:** Radiation Hardened Cryogenic Read Out Integrated Circuits

**Amount Requested:** \$2,000,000

**Account:** Defense Production Act Purchases in Department of Defense Procurement

**Recipient:** ON Semiconductor, Inc.

**Recipient's Street Address:** 2300 Buckskin Road, Pocatello, Idaho 83201

**Description:** Readout integrated circuits (ROIC) are the foundation of thermal imaging systems. These systems have forever changed modern warfare and surveillance. The United States Air Force and the Missile Defense Agency have been investigating ways to improve manufacturing capabilities and improve cryogenic and radiation performance of these circuits. The thermal imagers of the future will operate in harsh environmental conditions for longer periods of time and will have increased resolution (through increased pixel count) than the detectors of today. Maintaining a domestic source of this technology as well as working to enhance the manufacturing capabilities of this critical technology are as equally important as increasing the yield. The DPA Title III Readout Integrated Circuit (ROIC) program will continue the improvement efforts to develop technology that includes a larger stitched die, smaller feature size (< 0.35um), improved yields, and reduced cycle times will enable a domestic US source for ROIC manufacturing to meet our national defense needs.

I appreciate the opportunity to provide a list of the projects I have requested in the FY2010 Defense Appropriations bill on behalf of Idaho and provide an explanation of my support for them.