

Request: \$4,000,000

Project Name: Armed Forces Health and Food Supply
Research

Entity Name/Location: Kansas State University, Manhattan, KS

This project allows KSU to conduct threat and vulnerability analysis of foreign disease agents and food processing and handling systems in a biocontainment laboratory using foreign animal, plant, and zoonotic disease and chemical threat agents. The initiative enhances the U.S. military's ability to utilize intelligence successfully to counter and respond effectively to the adverse outcomes resulting from natural exposure to or the deliberate use of serious infectious disease and toxin agents affecting humans, animals or plants.

Request: \$3,000,000

Project Name: Academic Support and Research Compliance for Knowledge Gathering

Entity Name/Location: University of Kansas, Lawrence and Leavenworth, KS

This program allows KU's Office of Professional Military Graduate Education to conduct programs with the Combined Arms Command and Command and General Staff College at Fort Leavenworth, Kansas. Programs include: an Army Wounded Warrior Education Initiative, a Masters in Interagency Studies, a MBA in Supply Chain Management & Logistics, and courses in Iraq Immersion and Cultural Modeling of Water Resources in Afghanistan. Another Masters program and Bowman Expeditions that collect human geography data will begin next year.

Request: \$3,500,000

Project Name: Accelerated Insertion of Advanced Materials and Certification for Military
Aircraft Structure Material Substitution and Repair

Entity Name/Location: Wichita State University; Wichita, KS

Unlike structures that use metallic materials in the manufacturing process, the material properties of a composite are manufactured into the structure as part of the fabrication process. Therefore, it is essential to ensure that critical parameters pertaining to composite materials and their production processes are identified to facilitate adherence to standards in the final engineered part. Presently, each original equipment manufacturer is responsible for this assurance, creating "customized", nonstandard procedures for quality and safety assurance. This program will provide a breakthrough in technology integration and achieve significant cost and cycle-time reductions in new material insertion through (a) data-sharing among multiple users, (b) statistical continuity from one length-scale to another and (c) reduced testing via increased capability and use of numerical/analytical simulation tools. Anticipated benefits include reductions in nonrecurring and recurring program qualification costs and introduction of multiple sources of new advanced material forms.

Request: \$5,500,000

Project Name: Biosecurity Research for Soldier Food Safety

Entity Name/Location: Kansas State University; Manhattan, KS

The U.S. Army Natick Soldier Systems Center's Performance Enhancement and Food Safety Team develops methods and equipment to determine real-time high threat biohazards in soldiers' foods. Collaborative work between Natick and KSU is ongoing to validate technologies developed to date and to determine appropriate food sampling strategies. Future work will focus

on detector development, agent characterization and on the integrated control and database computer infrastructure needed to support detector system arrays.

Request: \$2,000,000

Project Name: Environmental/Geography Research for Army Operations

Entity Name/Location: University of Kansas; Lawrence, KS

This program will allow KU to work with the Army Research Office and Fort Leavenworth, Kansas to develop a program to guide battlefield commanders regarding their impact on local communities. Army brigade commanders in the field perform sewer, water, electricity, academics, and trash (SWEAT) analysis when stability operations start. However, the Army often finds itself with damaged SWEAT because it has not carefully located Army operating bases and support operations, leading to contaminated water supply or disregard for culturally important landmarks. This program will allow commanders to execute stability operations without damaging environmental, municipal, and cultural infrastructure during full spectrum engagements in foreign countries.

Request: \$4,000,000

Project Name: KC-135 Structural Teardown

Entity Name/Location: Wichita State University; Wichita, KS

This program will allow WSU's National Institute for Aviation Research (NIAR) to work with the Air Force to maintain the structural integrity and airworthiness of the KC-135R aircraft. NIAR will perform large section extraction, teardown section disassembly, coatings removal, and nondestructive inspection per the developed C/KC-135 Teardown Analysis Program Protocols. Extending the life of the tanker is critical to the needs of our military's power projection until a replacement tanker comes online.

Request: \$3,500,000

Project Name: Advanced High Energy Density Battery Chemistry for Portable Power

Entity Name/Location: EaglePicher Technologies LLC; Pittsburg, KS

Recently, EaglePicher developed a new hybrid CFx battery chemistry to address the fundamental weaknesses of traditional CFx batteries. This project will focus on advancing the new hybrid CFx technology and working to make it rechargeable. EaglePicher will partner with the Army's Communications-Electronics Research, Development, and Engineering Center to demonstrate this improved battery system. The hybrid chemistry of Copper Manganese oxide -CFx is expected to yield significantly longer service life and lower cost to improve the war fighting effort. The lower heat signature of the new hybrid chemistry will allow higher rate applications compared to standard CFx batteries.

Request: \$2,500,000

Project Name: Superior Weapons Systems through Castings

Entity Name/Location: Bradken Atchison Steel Castings and Machining; Atchison, KS

Superior Weapons Systems Through Castings allows the Army to procure higher performance, lighter weight parts for both legacy and new weapons systems by providing rapid, cost-effective solutions in the procurement of high-quality critical castings used in legacy systems in ongoing operations worldwide. This program will develop materials more suitable for service conditions; enhance the processes and geometries of certain critical parts; improve the casting industry's predictive tools; and redesign existing components to capture the advantages of castings. As a result, this program will ensure more rapid availability of parts for assembling prototypes, as well as spare and replacement parts for fielded units.

Request: \$3,600,000

Project Name: Materials Integrity Management Research

Entity Name/Location: Wichita State University and Miltec Research & Technology; Wichita, KS and Oxford, MS

This program allows Wichita State University, in conjunction with Miltec, to develop enabling technology for Integrated Vehicle Health Management and Condition Based Maintenance. Improving these fields leads to improved reliability and availability of aircraft and reduces the cost of operations. While other institutions have been working on developing better sensors to assess the health of aircraft, this program has been developing the theory and framework for designing systems using new sensors in a way that minimizes the cost of deployment and maximized the probability of successfully detecting structural damage.

Request: \$2,000,000

Project Name: Development of Improved Lighter-Weight IED/EFP Armor Solutions

Entity Name/Location: Leading Technology Composites; Wichita, KS

This program develops vehicle armor solutions for the Army to ultimately reduce the weight and increase the soldier's protection level without severely compromising vehicle payload and maneuverability, while defeating current battlefield threats.

Request: \$3,000,000

Project Name: Contaminated Human Remains Pouch

Entity Name/Location: NanoScale Corporation; Manhattan, KS

The transport of contaminated human remains is important in both combat and humanitarian military actions. However, the current technology has remained largely unchanged for decades. Handlers of contaminated and potentially contaminated human remains face significant biological and chemical threats. During a recent US Army sponsored research program, NanoScale and its partner designed

and manufactured an Enhanced Contaminated Human Remains Pouch (ECHRP), which *decontaminates itself*, allowing not only for safe transport, but the ability to handle remains once a destination is reached. This phase of the program will take the ECHRP to a field approved item.

Request: \$2,000,000

Project Name: Portable Military Radio Communications Test Set

Entity Name/Location: Aeroflex; Wichita, KS

This program combines the features of a bench top radio test set into a lightweight (8.5 pounds), rugged, portable and rechargeable platform. This hand held device allows technicians to perform maintenance checks of radio systems and perform diagnostics or troubleshooting of faulty systems at Field Level. With the additional capability to perform quick testing of antennas and cables, this test set provides the most complete in-vehicle test solution available. As a result, it reduces the number of radios incorrectly removed from vehicles. Currently, the Marine Corps own about 1,100 units and need roughly 1,500 for deployment

Request: \$5,000,000

Project Name: Expeditionary Capabilities Consortium (ECC), Program Executive Officer (PEO) Land Systems, U.S. Marine Corps

Entity Name/Location: Kansas State University and M2 Technologies, Inc.; Manhattan, KS

This request continues and expands the Expeditionary Capabilities Consortium (ECC) at KSU, to meet the top Science and Technology needs of the U.S. Marine Corps Program Executive Office (PEO) Land Systems. The ECC, currently under operation as the Urban Operations Laboratory (UOL) and the Expeditionary Capabilities Laboratory (ECL), will provide expanded capabilities for research, development, and evaluation of key technological enhancements in support of USMC efforts to bridge identified capability gaps and develop expeditionary capabilities required for the modernization of Marine forces.

Request: \$2,000,000

Project Name: Professional Development Education, Army Command and General Staff College (CGSC) Leadership Training

Entity Name/Location: Kansas State University (KSU); Leavenworth, KS

This program was developed jointly between the CGSC and KSU as a faculty development program, in response to the Army's emphasis on well educated officers. Officers and civilians studying at Fort Leavenworth can pursue advanced degrees in Security Studies and Educational Leadership. Faculty are provided by KSU, which confers the degrees. To date, 41 officers and civilians at Ft. Leavenworth have received a Masters and 19 are in various states of the Ph.D. Twenty-four more will receive their Masters in May 2010. All classes and sections are at capacity and there is a long waiting list for admission.

Request: \$5,000,000

Project Name: Next Generation Supercomputing for Code Breaking, Code Making and Cyber Security

Entity Name/Location: University of Kansas; Lawrence, KS

This effort combines KU's superconducting, materials, experimental, and modeling/simulation expertise with Northrop Grumman's systems, materials and superconducting technology expertise. The ability to solve certain DOD intelligence problems which are currently intractable will dramatically enhance DOD's effectiveness against certain threats in the cyber arena. This new approach to addressing these problems will begin the development of Quantum Mechanical device technology that will lead to the next generation of microelectronics. Coupling this with a unique architecture promises to provide a capability to solve certain intelligence problems in minutes that would take an ordinary computer thousands of years.

Request: \$3,000,000

Project Name: Nanocomposites for Lightning Protection of Composite Airframe Structures

Entity Name/Location: Wichita State University; Wichita, KS

This program will seek to advance the development and operation of a nanocomposite based methodology addressing lightning strike protection on composite airframe structures in Department of Defense aircraft applications. Unlike their metal counterparts, composite structures do not readily conduct away the extreme electrical currents and electromagnetic forces generated by lightning strikes. This research focus and funding will work in coordination with the Air Force Research Laboratory (AFRL) at Wright Patterson AFB to advance research into possible commercial applications that may be used in production. Recent advances have shown great promise for the incorporation of this technology into a manufacturing environment.

Request: \$2,000,000

Project Name: Aging Military Aircraft Fleet Support

Entity Name/Location: Wichita State University; Wichita, KS

Most of the aging research being conducted presently is focused on metallic structures. In addition to the ongoing research in aging metallic structures, this program will permit WSU's National Institute for Aviation Research (NIAR) to partner with the Navy and investigate the effects of aging on composite structures as well as composite/metallic hybrid structures. Lessons learned from this research will provide insight into the aging aspects of other composite aircraft structures and influence the use of advanced materials on new aircraft being proposed for military service as well as maintenance of the existing fleet.

Request: \$4,000,000

Project Name: Civil Air Patrol

Entity Name/Location: Cessna Aircraft Company; Wichita, KS

The Civil Air Patrol (CAP) was founded in December 1941 and chartered by Congress in 1946 to provide emergency services, cadet training, and aerospace education. The CAP consists of almost 60,000 volunteers serving in all 50 states. The majority of the fleet consists of older generation aircraft that are expensive to maintain and operate. This program would add to the President's Budget request of \$2.4 million and allows the Civil Air Patrol to better execute their fleet modernization requirements of additional C-172s and C-182s.

Request: \$2,000,000

Project Name: Laser Peening for Friction Stir Welded Aerospace Structures

Entity Name/Location: Wichita State University and Curtiss Wright Metal Improvement Company; Wichita, KS

This program is aimed at deploying advanced aircraft manufacturing of large and cost-effective panel and load structures through the deployment of Friction Stir Welding and Laser Peening. The project will allow Wichita State University and Curtiss-Wright to work together to document the effectiveness of laser peening in reducing fatigue crack growth rates of Friction Stir Welds in aerospace alloys. The initiative will also develop standards for applying laser peening in metal airframe structures, and analyze potential cost and production benefits derived from laser peening technology. The laser peening technology has greatly improved the fatigue resistance of the engines blades of hundreds of military and commercial aircraft.

Request: \$5,000,000

Project Name: USMC UC-12 Replacement Aircraft (UC-12W)

Entity Name/Location: Hawker Beechcraft Corporation; Wichita, KS

This program would allow the Marine Corps to procure 1 of the remaining 5 aircraft required to complete the 11 aircraft UC-12 replacement aircraft program. These aircraft fill a wartime requirement for urgent intra-theater transport of high priority cargo and passengers and is on the Marine Corps' Unfunded Priority List.

Request: \$6,000,000

Project Name: B-52 Satellite Communications (SATCOM)

Entity Name/Location: The Boeing Company; Wichita, KS

The B-52 mission is dependent on Ultra High Frequency (UHF) satellite bandwidth for voice and data communications. Existing UHF satellite infrastructure is nearing the end of its service life and will be replaced with the Mobile User Objective System (MUOS) satellite array. The B-52 communication system must be modified for compatibility with MUOS satellites to ensure viability of voice and data link capabilities critical to the aircraft's global strike mission requirements. This project would allow timely re-engineering of the B-52 UHF communications systems to preserve beyond-line-of-sight voice and data link capability and avoid loss of communications due to the legacy system's end of service life

in 2014.

Request: \$3,700,000

Project Name: Deicers

Entity Name/Location: Global Ground Support; Olathe, KS

This program would allow the Air Force to procure a total of 10 GL1800 and two ER2875 Truck Mounted Aircraft Deicers. The President's Budget provides \$3 million for 5 deicers, a significant shortfall to the requirement of 173. The USAF is in process of replacing older systems in order to comply with FAA guidelines and to meet the Air Force's Deicing Pollution Prevention Technology Roadmap. Replacement requirements are based on excessive maintainability and sustainability of older systems as well as increased performance of the newer systems.

Request: \$2,000,000

Project Name: Composite Small Main Rotor Blades

Entity Name/Location: Kaman Aerostructures; Wichita, KS

This project will replace the main rotor blade on the A/MH-6 Little Bird Helicopter with Composite Small Main Rotor Blades. This will make the A/MH-6 more survivable in hostile environments, expand the aircraft's flight envelope and reduce cost required to support the legacy blade, overall affording combat operators greater mission success.

Request: \$3,000,000

Project Name: C-130 Noise Cancellation System

Entity Name/Location: Global Aviation Technologies; Wichita, KS

The C-130 Active Noise Cancellation System (ANCS) is a commercial off-the-shelf product that reduces crew fatigue and associated hearing loss by greatly reducing noise levels in the C-130 cockpit. ANCS significantly reduces propeller noise enabling flight crews to sustain performance levels for longer periods, as well as enhancing safety in the high-density air traffic terminal phase, by permitting more effective crew coordination.

Request: \$5,000,000

Project Name: Long Range Hypersonic Interceptor

Entity Name/Location: Iron Tree Research; Lansing, KS

This project will continue development of the Long-Range Hypersonic Interceptor (LRHI), providing the U.S. military the capability to rapidly engage ballistic missiles at 500+ nautical miles, from the ground, sea, or air, at speeds of Mach 8+. LRHI will be able to intercept an airborne threat target quickly and at long range. Funding will allow the program to assess the concepts of operations and system requirements for an interceptor that would be necessary to defeat such a threat. Alternatives will leverage new

emerging technologies (e.g. high mach propulsion, seeker and cooling technologies, thermal protection systems, materials, and guidance and control algorithms) where appropriate to meet the operational need.

Request: \$5,000,000

Project Name: AT-6B Capabilities Demonstration for the Air National Guard

Entity Name/Location: Hawker Beechcraft; Wichita, KS

The requested increase in funding, when combined with industry's investment in building the first two AT-6B Testbed/Demonstrator Aircraft, will support demonstration and certification of enhanced performance, advanced weapons, advanced sensors, and austere field operating capabilities. These initiatives build on previous ANG demonstration efforts that includes Helmet Mounted Cueing Systems, GPS-guided smart weapons, intelligence, surveillance, and reconnaissance (ISR), and other advanced capabilities relevant to potential ANG missions.