

Consolidated Schedule (PES, LOGWORLD, MOBIS) Representative Projects

Strategic Planning for Technology Programs/Activities

Planning Support and Execution of AEDC Facility Technology Projects

For more than 30 years, we have supported the planning and execution of USAF/AEDC facility technology efforts. These projects have kept AEDC in the forefront of ground environmental testing in the areas of propulsion, aerodynamic, and space systems. Through comprehensive facility technology planning, in partnership with the AEDC USAF staff, the changing and technically challenging aerospace testing needs of the DoD, NASA and industry continue to be met. These facility technology efforts have included both analytical and hardware projects that focus on the future test and development needs of emerging propulsion and aerospace systems. Through these efforts, we have been able to anticipate many aerospace technical advances and their associated testing needs. Examples of areas in which these projects have succeeded include airframe/propulsion integration, airbreathing and rocket propulsion, aircraft/store integration, transonic aerodynamic testing, re-entry vehicle testing, Computational Fluid Dynamics (CFD), and advanced flow diagnostic techniques. Many of these efforts have successfully transitioned to facility Improvement and Modernization (I&M) projects and to Military Construction Projects (MCP).

Concept Development and Requirements Analysis

Precision Guided Weapons

We have supported the evolution of precision guided weapons from the man-in-the-loop laser and TV guided bombs of the 1980s through the current autonomous, launch-and-leave GPS/inertial guided weapons of today. Examples of these current weapons include the Joint Direct Attack Munition (JDAM), the Joint Stand-Off Weapon (JSOW), and the Joint Air-Surface-Standoff Missile (JASSM). Prior to the start of the JDAM acquisition, Jacobs engineers supported the USAF in an in-house concept demonstration program. This concept development program demonstrated the feasibility of the GPS/inertial guidance concept and provided valuable flight test results which supported program approval. The success of the subsequent JDAM Engineering and Manufacturing Development (EMD) and production program provided a firm foundation for the more sophisticated longer range JASSM. Early in Phase 1 (Program Definition and Risk Reduction) of JASSM, Jacobs supported the Analysis Of Alternatives (AOA) study which led to Secretary of Air Force approval to proceed to EMD. Over the 12 years that we have been supporting USAF

munition and air armament acquisitions at Eglin AFB, FL, Jacobs engineers and analysts have conducted several similar analysis. In the 1980s, these were referred to as Cost Operational Effectiveness Analysis (COEA). The current AOAs are more comprehensive and provide a firm basis for DOD Milestone Decision Authority (MDA) officials to review requirements and make decisions on the best alternatives to pursue to satisfy mission needs.

System Design, Engineering, and Integration

Example: Systems Support to NASA's Curiosity Rover in Multiple Locations

Jacobs provided technical program and project management support to NASA on the Curiosity Mars Rover project. Jacobs personnel have provided systems engineering, design, integration, and testing support to the rover project in locations around the country, including Arnold Engineering Development Complex (AEDC); Moffett Field, CA; Johnson Space Center in Houston, TX; and NASA Langley Research Center. Our engineers tested the rover's parachute systems and provided support to NASA personnel in engineering the systems to ensure the rover's safe landing. Other systems supported include the heat shield that protected the rover during atmospheric entry, the pyrovalves of the rover's propulsion systems, and the maintenance of multiple data collection systems. As the rover's two-year mission continues, Jacobs specialists will continue to be involved in the science and operation of the mission, including mission planning, instrument services, data interpretation, and sample preparation and analysis, and will do our part to contribute to NASA's understanding of the rover's findings.

Test and Evaluation

Test and Evaluation Support

We have provided test and evaluation support to DOD, NASA, and industry for more than 40 years. It remains a major part of our business base. Our support services have included all aspects of T&E: test planning (Test and Evaluation Master Plan [TEMP]); test concept and methodology development; test execution; data reduction and analysis; and test reporting. The systems supported have included aircraft, propulsion systems, ordnance and missile systems, commercial and military ground vehicles, space systems, and test and training range systems. In addition, we have also supported T&E of associated subsystems such as fuses, guidance and control systems, terminal seekers, etc. The types of testing have included a wide variety to include flight-testing, wind tunnel, hardware-in-the-loop, and other ground testing.

Integrated Logistics Support

Example: Integrated Logistics Support for the Naval Air Warfare Weapons Center, Weapons Division (NAWWCWD)

We provide a full range of ILS support to the US Navy at China Lake and Pt. Mugu, CA. This support is an important part of the engineering and logistics services that involve the preparation of system specifications, acquisition engineering support for new systems, support of newly acquired and existing U.S. Navy weapon systems, and evaluation of advanced technologies that will transition into existing systems. Examples of the ILS services that we provide are shown in the Integrated Logistics Support Services figure. We tailor our services to match the needs of the customer and the program requirements.

Acquisition and Lifecycle Management

Technical and Engineering Acquisition Support (TEAS) Contract

Under the Technical and Engineering Acquisition Support (TEAS) contract, we have provided a full range of acquisition engineering and life cycle management support to the Advanced Medium Range Air-Air Missile (AMRAAM) program. This support has been provided continuously since 1987. Early in the program, we supported the design and development effort to include the critical Demonstration and Validation (Dem/Val) program. This Dem/Val program included the first flight test of multiple missiles against multiple targets. This was an extremely complex test involving multiple support aircraft and range resources. After this successful demonstration, we supported the resolution of a number of design and development problems associated with the missile, the missile launcher, and their integration on F-15 and F-16. For example, the original missile and launcher design and mass properties presented potential flutter and structural dynamic risks when integrated on the F-16 and at certain Mach number-altitude combinations. We provided analysis and test support to assist in the resolution of these issues. We later performed as members of Integrated Product Teams (IPTs) to support the evaluation, development, and application of cost-effective manufacturing processes. Our engineers supported the AMRAAM Program Office in the preparation and review of the necessary acquisition documents, including RFPs, SOWs, acquisition plans, Test and Evaluation Master Plans (TEMP), Integrated Logistics Support Plans, ILSPs, manufacturing plans, and other supporting acquisition material. We supported the development of two sources for the production of AMRAAM and provided advisors to several source selections. We also supported the development and application of very comprehensive AMRAAM simulations. These include both analytical and hardware-in-the-loop simulations. We have also supported the transition of AMRAMM to operational status and the development of sustainment and supportability approaches for the system after operational deployment. These include such strategies as a total end-to-end warranty. In summary, we have

supported the AMRAAM through every phase of its life cycle from concept development through operational deployment and sustainment in its operational environment.

Construction Management

Example: Sustainment/Restoration and Modernization Acquisition Task Order Contract (SATOC) for the U.S. Air Force Civil Engineering Support Agency (AFCESA)

Under our SATOC contract, we provide construction and engineering services supporting the sustainment, restoration, and modernization (S/R&M) of real property at various locations worldwide. Services to AFCESA include planning, design, and construction management for facility renovations, including mechanical, electrical, plumbing, fire detection/suppression, structural, and architectural and infrastructure repair and construction including utilities, pavement, and petroleum, oil, and lubricant (POL) systems. Task orders on this contract support existing Air Force facilities and infrastructure for facility renovations including all subsystems (mechanical, electrical, plumbing, fire detection/suppression, etc.) and infrastructure repair and construction.

Deployment Logistics Services

Example: Joint Equipment Assessment Program (JEAP) for the U.S. Marine Corps Logistics Command (MCLC) at Albany, GA and worldwide

Since 2004, Jacobs has provided support to the DOD and the U.S. Marine Corps Logistics Command (MCLC) at Albany, GA, and more than 15 locations worldwide through the Joint/Marine Corps Chemical Biological, Radiological, and Nuclear Defense (CBRN-D), Individual Protective (IP) Equipment Assessment (EA)/Consolidated Storage Program (CSP) contract – also known as JEAP. Under this \$89M contract, Jacobs personnel provide support in program/project management, process improvement, enterprise-level strategic planning, business case analysis, operations, administrative, supply, logistics and technical functions for CBRN-D individual protective equipment (IPE) assessment and calibration, as well as the collection, assessment, storage, and disposal of excess CBRN-D IPE for the Defense Logistics Agency (DLA). We also perform project management and quality assurance (QA) support for worldwide storage and issue facilities for the U.S. Marine Corps CSP, as well as provide technical and program management support throughout the U.S. and abroad in support of the MCLC Project Office for the Mine Resistant Ambush Protected (MRAP) vehicle program. In addition, Jacobs provides on-site supply support/headquarters staff augmentation for the II Marine Expeditionary Force (MEF) Remain Behind Equipment (RBE) Program.

Logistics Training Services

Example: U.S. Army Joint Project Office Mine-Resistant Ambush-Protected (JPO MRAP) Directorate of Training

Jacobs provides oversight support for the Army's Joint Project Office which includes advising on the distribution of training assets, monitoring the impact of training on units as they prepare for pre-deployment, and gathering feedback from instructors, users, and logistics support managers to identify training improvements and provide solutions in a timely and efficient manner. For example, we developed the Army HST concept approved by the Army Resource and Requirements Board (AR2B) and adopted as the Army HST Plan to provide pre-deployment training on the MRAP family of vehicles (FoV). We conduct, validate, verify, and process all Programs of Instruction (POIs) in the Automated Systems Approach to Training (ASAT) format. We also developed a 14-hour "Delta" POI for warfighters who have previously received new equipment training on a variant of the MRAP FoV and revised and staffed Graphic Training Aid (GTA) 07-09-001, MRAP Family of Vehicles Emergency Egress Procedures. GTA was approved by the Army Training Support Center and distributed to training support centers across the Army, incorporating revision for slope analysis and Techniques, Tactics, and Procedures/Lessons Learned to avoid accidents and rollovers. Jacobs also developed, staffed, and received approval for Army-wide distribution of the MRAP Techniques, Tactics, and Procedures Handbook 08-30.

Example: Automotive Asset Management Services for Ford Motor Company, Dearborn, MI

We provide asset management services to automotive customers ranging from operating small independent test cells to developing and managing large test complexes. We work through innovative partnerships with global automakers and suppliers such as Ford Motor Company to apply best practices gained from over 50 years of test facility experience – maximizing operational efficiency and adding value for our clients. We currently partner with Ford to provide asset management for three Michigan test facilities: Driveability Test Facility, Dearborn Proving Ground Wind Tunnels, and Electromagnetic Compatibility Testing Facility. As part of our asset management services, we assist our customers in making a wide range of strategic decisions to optimize the use of capital facilities associated with testing.

We use our expertise and viewpoint as a neutral third-party to identify current and future Ford testing requirements. This in turn enables us to assist Ford in decision-making regarding the next generation of Ford test facilities, upgrades to existing facilities, and the development of operating procedures for these facilities. We apply our engineering expertise to determine return on investment, potential utilization and recapture of engineering costs.