What if...?

We showed you innovative solutions for driving launch, flight and mission success.

Aerospace, Technology and Nuclear

worldwide | jacobs.com
We Are With You

A Partnership a Half-Century in the Making
For over 60 years, Jacobs has delivered sustainable solutions focused on safety and reliability. We have designed and tested space exploration systems from Project Mercury to Orion Exploration Flight Test 1 (EFT-1) with the help of a team of small businesses and universities. We are committed to providing our NASA customers with long-term economical solutions. Whether it is near space or deep space, we are here to help you achieve your exploration goals.

A Turnkey Solution Provider
As NASA’s largest professional and technical services provider, Jacobs contributes proven experience and innovative solutions to many of NASA’s spaceflight programs:
• Exploration Ground Systems (EGS)
• Orion
• Space Launch System (SLS)
• International Space Station (ISS)
• James Webb Space Telescope (JWST)
• Aeronautics

Driven by Our Values
Jacobs is a premier global consulting, design, engineering, construction, operations & maintenance and technical services firm delivering advanced solutions for a more connected, sustainable world. We serve a diverse range of companies and organizations, including industrial, commercial, and government clients across multiple markets and geographies.

Jacobs at a Glance

At a Glance
1947
Founded by Dr. Victor J. Jacobs

77,000
Employees

$15
Billion 2018 Revenue

400+
Locations

40+
Countries

$3
Billion 2018 Client Savings

Industry Sectors Served

Aerospace
Advanced Facilities

Automotive
Aviation

Buildings
Chemicals & Plastics

Consumer Goods & Manufacturing

Defense

Environmental
Industrial

Mining & Minerals
Nuclear

Off & Onshore (Upstream/Downstream)
Pharmaceuticals & Biotechnology

Power & Utilities
Pulp & Paper

Refining (Downstream)
Telecommunications

Transportation
Water & Wastewater

Headquarters
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Jacobs Global Network

Jacobs has a global web of resources and more than 15,000 employees in Aerospace, Technology and Nuclear (ATN), supporting NASA, other government agencies and industry partners around the United States.

- Jacobs Employees supporting NASA: 3,202
- Total NASA Jobs: 5,564
- Total Jacobs ATN Employees: 15,405
- Total Jacobs employees: ~77,000

250,000 hours annually in support to NASA and other Government customers.

We provide high-volume, as-needed support to NASA from Jacobs offices that deliver leading solutions to diverse end markets.

Reachback and Resources

Launching NASA’s Spaceport of the Future

Jacobs supports the Exploration Ground Systems (EGS) program through our Test and Operations Support Contract (TOSC) at Kennedy Space Center (KSC).

Ground and Flight Application Software Team (GFAST)

Jacobs developed an innovative approach for designing and developing the GFAS. Rather than reducing the number of Spacecraft Operations Engineers in favor of a dedicated development team, we delivered a small group of software developers to design tools that are more user-friendly for the Spacecraft Operations Engineers, while simultaneously applying the engineers’ knowledge of the spacecraft directly to the software they will use on launch day. Troubleshooting software issues is much more effective when the users have a deeper understanding of how the software actually works and how the software is to be applied. Once the software is complete, the Spacecraft Operations Engineers will transition into full-time operations roles and begin processing the vehicle and training for launch activities.

(Kennedy Space Center)

Exploration Flight Test 1 (EFT-1)

Jacobs successfully supported the planning, testing, and execution of EFT-1 and contributed to lessons learned and process/procedure enhancements for future operations including testing, recovery, retrieval, and transportation to KSC. We provided pre-launch support (joint integrated simulations in the firing room), integrated recovery and transportation procedures, and at-sea operations.

(Kennedy Space Center)

Space Command and Control System (SCCS)

In October 2017, Jacobs took over responsibility for the Spaceport Command & Control System (SCCS) which was the highest risk at KSC to not meeting the EM-1 launch date. SCCS was developed under an IDIQ Level of Effort task order (NASA led and managed) on the NASA Engineering Support Contract (ESC) at KSC. NASA KSC and EGS transferred the work to TOSC which is a “performance based” contract. Through the application of TOSC management, processes, and accountabilities, SCCS has moved off the critical path for EGS.

(Kennedy Space Center)
Built for Human Exploration Beyond Earth

Jacobs supports the Orion mission through our JSC Engineering Technology and Science (JETS) contract at JSC and our Test Evaluation and Support Team 2 (TEST2) contract at White Sands Test Facility (WSTF).

Orion Capsule Parachute Assembly System and Commercial Crew Parachute Airdrop Test

NASA’s Orion Multi-Purpose Crew Vehicle (MPCV) Capsule Parachute Assembly System (CPAS) project provides the parachute system for the Orion MPCV for nominal and abort landings on Earth. CPAS is one of the highest technical risks to the Orion Program since failure of the parachute system to properly deploy could result in loss-of-life. The Jacobs CPAS team has been responsible for the design, development, testing, evaluation, and certification effort of the parachute system since the project began in 2006. Jacobs has been recognized by JSC and the Orion Program for implementing innovative approaches to reduce costs and maintain project schedules. For example, we identified and utilized shared resources between the CPAS and the Commercial Crew Parachute Airdrop Test (CCPAT) to minimize costs to both projects. We made recommendations for shared use of hardware and facilities, and coordinated work and travel to Yuma to track and minimize costs as much as possible. Through the cross-utilization of resources we have saved the customer over $150k to date. In addition, shared travel has saved ~$30k to CCPAT to date and shared facilities in Yuma is saving both programs approximately $20k per month.

(Johnson Space Center)

Orion & the European Space Agency Service Module Testing

At White Sands Test Facility (WSTF), Jacobs is supporting an unusually high workload (367 propulsion tests in FY18 vs. 262 in FY17) including multiple high visibility projects. This includes propulsion testing for the Missile Defense Agency Redesigned II Vehicle and Boeing Commercial Crew Service Module and included Thrusters, as well as Hypervelocity Impact Testing for ISS, Orion, ESA, and the Commercial Crew Program. Jacobs personnel received praise from WSTF and the Orion Program for meeting critical schedule milestones on the ESA Service Module testing. Jacobs was able to meet program needs by accelerating critical path and higher risk build-up activities by adjusting schedules and working overtime to support the Orion Program while also supporting propulsion on the ESA Service Module, keeping both programs on track. Additionally, ESANASA was fast-tracked for propulsion testing was found to have high iron and water content and was deemed unusable for testing. Jacobs fabricated, assembled, and deployed a Molecular Sieve capability to remove contaminants providing NASA a $2.5M cost avoidance.

(Johnson Space Center)

Space Launch System

Building the Power to Explore Deep Space

Jacobs provides systems engineering and integration to the SLS Program through our Engineering Services and Science Capability Augmentation (ESSCA)* contract at Marshall Space Flight Center (MSFC).

SLS Flight Computer Hardware

We participated in a collaborative NASA/ESSSA/SLS prime contractor trade study to determine if the current SLS Flight computer hardware could accommodate the requirements of the SLS Block 1B vehicle design. Results determined that the existing flight computers could be used without modification, which would save SLS an estimated $40M that otherwise would have been incurred if the hardware had to be modified. The Avionics Hardware Subsystem Manager (ahs) lauded our support: “Two ESSSA team members were invaluable in our efforts to re-use this assessment. Without their knowledge of the hardware, software, and firmware systems… we would not have reached the successful conclusions of the assessment and certainly not this quickly.”

(Marshall Space Flight Center)

SLS Engine Section Transporter

In late 2015, NASA identified a need for a piece of critical Ground Support Equipment to transport the SLS Engine Section Structural Test Article (STA). Jacobs personnel were selected to design and manufacture the Engine Section Transporter (EST). On February 2nd, 2016, Jacobs received an emergency Task Order Request for a design and analysis package for the EST. The transporter required a cargo platform of 20’x30’, a rated load carrying capacity of 60 tons or greater, and the ability for trucking over commercial roadways. It was critical that the EST be delivered to the NASA Michoud Assembly Facility (MAF) by July 11, 2016, in order for SLS to stay on schedule. The Task Order was approved by NASA and released on February 4, 2016. Deliverables included: 30% design review (PDR), 80% design review (CDR), and final package (stress analysis, drawings, parts list, proof load drawing). Jacobs used our reachback capability to engage our Technology Group to support the EST on February 10, 2016. PDR was successfully completed on February 25, 2016, just 15 days after work began. The CDR was completed successfully less than one month later, and the final design and analysis package was delivered and accepted on April 1 – just 8 weeks after receiving the request. The EST was delivered to MAF on schedule on July 11. Through a combination of Jacobs expertise and our agile reachback approach, we delivered the EST on schedule and at an estimated cost savings of approximately $175k from the original estimates.

(Marshall Space Flight Center)

SLS Adaptive Augmenting Controller System

When it was discovered that testing of the SLS Adaptive Augmenting Controller System would require the vehicle math model to be subjected to failures outside of normal testing bounds, we developed and implemented a new capability that modified specific values and code within the SLS Adaptive Augmenting Controller System (MAVERC) time domain simulation tool to efficiently make these edits. This new capability enabled the team to reuse already-implemented case files without intervention from one version to the next. It also served as the basis for a regression testing capability that is now auto-executed every time a new MAVERC release is made. This improved Configuration Management of the MAVERC simulation and the design of the SLS GN&C and supporting systems, and has resulted in savings of ~$38k per year.

*(Marshall Space Flight Center)
International Space Station

Supporting Payload Development and Processing for the ISS

Jacobs provides sustaining engineering and operations for the ISS through our JETS, ESSCA, and TOSC contracts at JSC, MSFC, and KSC.

Anomaly Resolution and Operations Support

Jacobs’ Cold Stowage team was able to successfully resolve an unusually large number of on-orbit hardware failures and late manifest changes. Notable examples included reworking the packing configurations for SpX-10 and OA-7 missions; resolving hardware failures on ISS including MELFI, Glacier, and Polar; and devising a creative solution to be able to accommodate the return compliment of science for SpX-12. We also provided exemplary and continuous Mission Evaluation Room console support during the HTV-6 stage ISS battery upgrade operations. These operations occurred over the holidays and often late at night or early in the morning, requiring many 13-hour shifts.

Flight Hardware Processing

Jacobs was praised for providing outstanding support to the ISS Orbital Replacement Unit (ORU) Integrated Product Team during the design and buildup of new support equipment required for processing the Portable Breathing Apparatus ORUs. Jacobs performance was regarded as ‘exceptional’ by the customer. The equipment and processes worked flawlessly, allowing KSC to meet the ISS milestone for delivery of the first two mission Portable Breathing Apparatuses. Additionally, Jacobs provided in-between-flight servicing of the Nitrogen/Oxygen Recharge System, Recharge Tank Assemblies, and ORUs. The Spacecraft Processing group went above and beyond to evaluate and implement a flight processing change that will reduce sampling and overall flight servicing time of either an Oxygen or Nitrogen RTA by approximately 1.5-2.5 hours.

Sustaining Engineering

Jacobs personnel were very flexible to work 12-hour days as well as weekends to complete the electromagnetic interference testing required on the Life Sciences Glovebox (LSG) power controller module and to support a failed power up test of the LSG Power Control Module needed to meet hardware integration for the Atlantis Launch Package shipment. Our personnel found a more efficient approach to convert two flight drawings to new Engineering Unit drawings and models, allowing the new parts and assemblies to maintain the link to the next higher assembly. The Jacobs team compressed what could have taken over a month of design effort into a 2 1/2 week task assignment, saving the customer critical schedule time to meet project deliverables. The successful delivery of this novel sustaining engineering approach earned us recognition by the American Astronautical Society with the 2017 Space Life Science Award for contributions to the ISS.

Missile Defense Agency

Success Stories

Providing Secure Solutions for Our Nation’s Defense

Jacobs is the prime contractor for the Missile Defense Agency’s Integrated Research and Development for Enterprise Solutions Contract.

Built to handle the dynamic and evolving needs of missile defense, the Missile Defense Agency’s Integration and Operations Center (MDIOC) supports research and development, system-level test and evaluation and operational training for U.S. combatant commands. Jacobs provides 24x7 support to the MDIOC – a key component of the Ballistic Missile Defense System (BMDS). We also support the full life cycle from weapons development to sustainment, where we provide enterprise solutions to support concurrent tests, training and operations for the MDIOC mission platform. Our Jacobs team supports flight systems and ground systems testing; Hardware-in-the-Loop tests, execution, and control; and classified and unclassified war games for the development of the BMDS, where we also provide IT, cybersecurity and telecommunication solutions for the Missile Defense Agency’s enterprise communications and information technology environment to help secure and protect our nation’s most coveted assets.

Concurrent Testing and Operations Ensuring Readiness and Reliability

Jacobs’ expertise spans development, modification and testing processes and procedures for UAVs, missile and space systems, fixed and rotary wing platforms, air and land combat support systems, turbine engines and associated subsystems. We perform all aspects of support from initial delivery, buildup and modification (including design and fabrication of parts), installation and instrumentation, operation, data collection, troubleshooting, validation and delivery of data and final product delivery.
Aeronautics Research Mission Directorate

Success Stories

Sustaining Unique Aeronautics Test Assets
UPWT was reactivated for the next five years of SLS testing planned to begin in January 2017. The UPWT was last operated in August 2015, and the effort to bring it back online began in June 2016. During the effort to reactivate the UPWT, Jacobs obtained and coordinated the necessary expertise in pressure systems, maintenance, engineering, and operations to ensure success of this massive project. Because of the significant engineering and maintenance efforts – which included working weekends to ensure the test schedule would not slip – the first of two checkout tests were successfully completed the weekend before Christmas, 2016.

Improving Acoustic Testing Capability in the 9x15 Leg of the Supersonic Wind Tunnel
Jacobs is in the latter construction stage of a Design-Build project for significant acoustic improvements of the 9x15 leg of the Supersonic Wind Tunnel. These improvements include Acoustic Turning Vanes, Acoustic Baffles, and an all-new Acoustic Test Section. The improvements also include a unique serpentine baffle design and a special low-noise Test Section Wall treatment. When completed, these improvements will provide the reduced background noise levels required to meet future needs for testing of scale model jet engine fan sections for NASA’s commercial clients.

Ensuring the Safe Integration of UAS
Under the Unmanned Aircraft Systems (UAS) National Air Space (NAS) Flight Test 4 (FT4) project, Jacobs supported NASA and the Federal Aviation Administration (FAA) in the evaluation of multiple sensors and algorithms that large UAS will need to carry to prevent airborne collisions with manned aircraft. FT4 research was accomplished by flying a large 66’ wingspan UAS past one or more manned aircraft, with a closure rate of up to 700 mph. This was achieved with as little as 200’ vertical separation, and/or 0.5 miles lateral separation. AFFRC praised our approach and specifically our safety measures, which included making real-time precautionary calls and developing innovative planning tools that greatly reduced the number of required flights while simultaneously mitigating project risk.

Jacobs Solution Driven Approach
Cross-Domain Solutions Provider
While many companies claim to be “solution providers,” more often than not, they do not have structured solutioning capabilities that cross domains, but rather previous experience in a specific area that they can apply to solve a specific issue. Proven across our portfolio of NASA contracts, Jacobs Solutions are designed for cross-organizational implementation to consolidate common management and technical practices that lead toward more efficient operations. This unique delivery of solutions encompasses program/project management, systems engineering, cybersecurity, intelligent asset management, and sustainability. Our commitment to the delivery of cross-domain solutions produces consistent cost advantages for our customers. In FY17, we produced more than $2.72B in customer-validated savings across Jacobs.
Securing and Defending Our Nation’s Most Critical Networks

Jacobs is a premier provider of national security-grade cybersecurity solutions that ensure the confidentiality, integrity, and availability of the world’s most sensitive networks, systems, and data. We offer integrated cybersecurity solutions that span the cybersecurity lifecycle, as well as stand-alone capabilities that address specific security challenges. Our more than 4,000 engineers and systems administrators are currently delivering cybersecurity solutions to the Intelligence Community, USSOCOM, and the Missile Defense Agency.

Cybersecurity Situational Awareness

A classified customer desired consolidation and sharing of cyber threat situational awareness across multiple networks and information sharing domains while ensuring protection of data. Jacobs developed a Cybersecurity Information Sharing Portal with integrated Public Key Infrastructure (PKI)-enabled authentication services coupled with corporate authorization services, which enabled the consolidation and dissemination of real-time cybersecurity situational awareness information across the global enterprise. We also integrated key cyber data feeds and implemented data fusion techniques to enhance cyber situational awareness. Our solution now represents the primary mechanism through which cyber event-related information is shared among critical stakeholders in support of the client’s cyber defense mission.

Incident Response and Remediation

The Heartbleed security vulnerability impacted all HTTPS web browser sessions and remote login capabilities that could have compromised legitimate DOD system administrators credentials. In response to the vulnerability, Jacobs developed security testing scripts and assisted our DOD customer in the development and implementation of a remediation program to patch vulnerable systems. This solution was developed within 48 hours of the discovery of the vulnerability, a full week before any form of testing was to patch vulnerable systems. This solution was developed within 48 hours of the discovery of the vulnerability, a full week before any form of testing was to patch vulnerable systems.

Industrial Control Systems and SCADA

Cyber attacks in the Middle East prompted the initiation of security requirements for all Physical Security Information Systems and Industrial Control Systems for one of our oil and gas clients. As a central aspect of the client’s $20B refinery expansion project, our engineers performed an in-depth risk assessment, audited plant and control networks, and assessed proposed architectures to secure more than 1,000 endpoints covering seven major units across Plant, Process, and Business networks. Our engineers designed and developed requirements that incorporated Security Information and Event Management solutions optimized for an ICS/SCADA environment, and Intrusion Detection Systems, Network Monitoring, and Industrial Firewall solutions. This raised the overall security posture of the customer through the deployment of security management and monitoring technologies optimized for the customer’s environment. We also increased the overall ICS security awareness of client staff, influencing the security and safety consciousness of the organization.

Maximizing Our Clients Return on Investment

Asset management is about maximizing returns on asset investments. Jacobs addresses every aspect of asset management, from concept to asset retirement. Regardless of the asset’s lifecycle phase – from strategic planning, concept, design, construction, operation, maintenance, or asset extension/retirement – Jacobs deploys our Asset Management Delivery Framework to improve asset effectiveness and reduce the total cost of ownership. Whether building reliability into capital plans for growth or extending the life of aging assets, Jacobs’ highly experienced team works in partnership with our customers to tailor a program that will safely and dependably increase the return on investment of high-valued assets throughout their full lifecycle.

Jacobs Asset Management Deployment Strategies for Langley Research Center:

- Instrumented ~55 assets using ~5,000 discrete points to measure vibration data through a wireless network.
- Applied data analytics capabilities to measure and analyze the data.
- Introduced Building Automation and combined 11 disparate systems (primarily HVAC) into a single integrated system, now monitoring more than 100,000 points.
- Designed and implemented the hardware and software to enable real-time asset monitoring and data capture in the Center’s control room (Integration Operations Center).
- Leveraged our Jacobs cybersecurity experts to ensure the safety and integrity of data transfer and capture.
- Linked floor plans using Geographic Information Systems (GIS) and attached control drawings to facilitate troubleshooting and quickly identify problem areas.

Benefits to NASA Langley Research Center since rollout of our Asset Management Delivery Framework in October 2015:

- No failures or unplanned outages of instrumented assets.
- Validated client cost savings of ~$3M equating to a 2-year return on investment.
- LaRC program has been recognized as the benchmark reliability program for all NASA centers.
- Recognition by Uptime Magazine as the Reliability Program of the Year for 2017.
- Jacobs developed and executed an asset management program actively tracking ~5,000 line items of Government furnished property inventory valued at $9M. (Langley Research Center)
Sustainability Solutions

Advancing Sustainability to Create Enduring Legacies

Environmental stewardship is at the core of our business and the heart of our ethos. That is why our environmental commitment extends beyond just helping our clients with compliance and reducing their environmental impact, to restoring natural resources and advancing the safety and security of the nations where we work.

- Approximately 2,700 Jacobs personnel support global environmental projects
- Ranked #2 on the ENR’s Top Environmental Firms (2016, 2017)
- 2016 World Environment Center Gold Medal Award for Sustainable Development
- Services include geospatial; site characterization; remediation; environmental planning; integrated waste solutions; engineering, design, and construction; and compliance and data management
- Customers include:
  - Environmental Protection Agency
  - U.S. Air Force
  - U.S. Army/Corps of Engineers
  - Federal Emergency Management Agency
  - NASA
  - U.S. Department of Energy
  - National Science Foundation
  - U.S. Navy
  - Tennessee Valley Authority
  - Multiple Commercial Customers

Smart Water

Smart Water allows all utility water infrastructure and metering to be connected for a more predictive and preventative operating model. Our Smart Water model involves advanced metering, infrastructure, and sensors (i.e., allowing customers to know in real-time when a leak occurs), information management and system integration, innovation systems, tools, and techniques.

Benefits of Smart Water System:
- Real-time monitoring and reduced overflow
- Remote control of facilities
- Big data collection and delivery
- Wireless communication with assets and sensors
- Automated analytics to alert abnormalities

NASA and Industry Recognition

- NASA’s Center-Level Large Business Contractor of the Year for 2017 (AFRC, KSC, and MSFC)
- NASA’s Center-Level Large Business Contractor of the Year for 2016 (AFRC, JSC, KSC, and MSFC)
- NASA’s Agency-Level Large Business Contractor of the Year for 2016
- FORTUNE Magazine – Jacobs ranked No. 3 Most Admired Company in the World among engineering and construction companies. Jacobs has held a top-5 spot on the coveted list since 1999. CH2M ranked No. 22 in Fortune Magazine’s Top 50 Companies to Change the World list in 2017
- Forbes – Jacobs named to the Forbes America’s Best Employers list
- Small Business Administration (SBA) Eisenhower Award for Excellence 2017 – Jacobs was awarded, as a Federal prime contractor, for using small businesses in areas of research and development, manufacturing, service, construction and utility
- The Occupational Safety and Health Administration (OSHA) – Jacobs was recognized for excellence in worker safety and health as a Voluntary Protection Programs (VPP) Corporate participant. Only four other corporations currently hold this recognition in the United States
- Engineering News-Record (ENR) – Jacobs is consistently recognized in a number of ENR’s Top Lists. In 2017 Jacobs was ranked No. 2 in the Top 500 Design Firms
- Building Design & Construction – Jacobs is ranked No. 2 in the Top Architecture/Engineering Firm category in Giants 300 Report

Jacobs has achieved performance scores averaging 95% across 9 NASA centers.

41.6

Million metric tons of CO₂ savings identified for our clients in FY2017