J&P Technologies
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A Systems, Software, and Safety Engineering Firm Dedicated to Your Success

WBE, EDWOSB, SDB, TX HUB Certified
Who is J&P Technologies?

- We are a Houston-based small business, established in 1997 to provide contract services for the development, assessment, and support of integrated flight systems, scientific computing, and complex control systems, specifically in the aerospace and biomedical industries.

- J&P provides expertise in all phases of system / software development including system engineering, network engineering, software safety & risk analysis, requirements generation, software design & development, system integration & test, and software configuration management.

- We employ highly-trained professionals who have experience in developing, integrating, delivering, and sustaining major systems in complex environments, and are intimately familiar with development and delivery processes, as well as operational support requirements.

- Current efforts include:
  - Teamed with TASC on NASA’s IV&V Contract. J&P’s current focus is IV&V of human rated systems.
  - Teamed with Lockheed Martin Mission Services on the NASA JSC Facility Development and Operations Contract (FDOC). As a team member, J&P is responsible for the Software Configuration Management and Load Build functions as well as Operations Technology Facility (OTF) technical support.

- Certifications include Small Disadvantaged Business (SDB) [Native American Owned], Women’s Business Enterprise (WBE), Economically Disadvantaged Woman Owned Small Business (EDWOSB), Texas Historically Underutilized Business (HUB).
What Do We Have To Offer?

- J&P can contribute:
  - Configuration & Data Management
  - Safety & Mission Assurance
  - Product Support & Anomaly Resolution
  - Network Engineering
  - Hardware & Software Development
  - Engineering Assessments
  - Requirements Allocation
  - Control / Data Center Architecture

- Extensive software, systems, and safety engineering experience ranging from initial product conception to requirements generation, architecture, design and design presentations, development, integration, testing, delivery, & operations.

- System Development & Operations Support experience:
  - Space Shuttle and International Space Station:
    - Data Mining and Analysis
    - Criticality Assessment
    - Change Request Assessments
    - Anomaly Resolution
    - System / Software Safety
    - Safety Console Support
    - Systems Engineering & Integration (SE&I)
    - Shuttle Avionics Integration Laboratory (SAIL)
    - Shuttle Avionics Software Control Board
    - SSP Chief Safety Officer
  - Government Furnished Equipment (GFE)
    - Requirements Analysis
    - Criticality Assessments
    - Software Safety
    - Safety Console Support
    - SSP and ISS Integration
    - Environmental Control and Life Support System Technical Expertise
    - Docking Systems / iLIDS
  - Multi Purpose Crew Vehicle (MPCV) Support:
    - System and Software Requirements Analysis, Allocation, and Decomposition
    - System / Software Safety
    - System Test Strategies and Requirements Development
    - Technology Readiness Review
  - Next Generation Mission Control Center Development:
    - Network Engineering and Software Architecture / Development
  - Exploration Support:
    - System and Software Requirements Development / Allocation / Analysis
    - System Engineering and Integration
    - Integrated Hazard Analysis
    - IDD / IRD / ICD development and analysis.
    - Integrated Test Strategies and Requirements Development
    - Exploration Chief Safety Officer

- Flexibility in assuming responsibility for a wide range of tasks.
Identify and Manage System Risk

- **Safety:**
  - The recognition of potential failures and their consequences to other systems is the discipline of System Safety. Recognizing hazardous conditions during real-time operations is the responsibility of J&P’s Operations Engineers. J&P maintains a synergy between our system safety and operations engineers, thus creating a more in-depth awareness of risks and effective mitigation strategies.

- **Reliability and Maintainability:**
  - R&M analysis is an important asset utilized by J&P engineers to establish acceptable risk. Our experts identify failure modes, determine availability of redundant controls, and assess effectiveness of maintenance to enhance the design of a system, even as new hardware is introduced.

- **System Safety and Hazard Analysis:**
  - We are experienced in performing hazard analysis on complex systems and minimizing overall risks as it pertains to hardware, software, and operations activities. J&P Software and System Safety Engineers develop and/or update hazard reports and the fault trees defining Design Analysis Cycle configurations in order to perform design optimization studies on the evolving systems thus minimizing project cost and schedules risks.

- **System Risk Management:**
  - Throughout the life of a Program, safety and R&M analyses for hardware, software, and integrated systems must be maintained to reflect current configuration, understanding, and operations of the respective systems. The accuracy and timeliness of these reports enables informed decisions of risk acceptance, minimizes likelihood of failures, and provides opportunity for mitigating failure effects through design or operational procedures. We recognize the importance of maintaining a robust risk management process throughout the life of a project.
Maintain Configuration Control
Deliver New Products to Enhance Existing Systems

- **Identifying Promising Technologies:**
  - Researching current state of the art for promising advanced technology solutions, though non-trivial, is only the first step. Promising technologies would then need to be ranked based on factors such as potential for efficiency gains, technology readiness, priority, cost effectiveness, and implementation/integration complexities. Once ranked, technologies can then be selected for further investigation (i.e. demonstration, development, etc).

- **Supportability and Technology Readiness:**
  - Important key factors to consider when selecting a new/advanced technology for further development and/or implementation is technology readiness and delivered system sustainability. Technology readiness assessments can be used to determine the risk associated with delivering a successful system. Factors such as supportability and maintainability are useful in identifying potential life cycle cost issues and system longevity.

- **Delivery of Advanced Technologies into an Existing Environment:**
  - The behavior of new technology solutions must be fully understood and verified prior to delivery. Our human space flight system/software development experience makes J&P uniquely qualified to assure that anomalous behavior is isolated and not propagated within a critical environment.

- **Efficiency and Effectiveness Assessments:**
  - Process optimization is a balance between efficiency (doing things right) and effectiveness (doing the right things). While process efficiency can often be measured, process effectiveness is more qualitative and is often measured via surveys. Prior to delivering an advanced technology, J&P establishes baseline efficiency and effectiveness measurements that can be used to assure new performance gains are realized with the production system.
SEaCLIF - J&P’s Software / System Engineering and Integration Innovation

- System Effects and Capability Losses From Inserted Failures (SEaCLIF) is a “quick look” analysis tool with an integrated logic network that captures the relationship between components within a system or vehicle, such as:
  - Requirements and hardware/software necessary to implement the requirements
  - Hardware and software modules required to control or status the hardware
  - Hazards and associated causes with links to associated CIL’s Flight Rules, LCC, etc.
  - Power generation and distribution with load summing

- Provides the capability to analyze cross-subsystem effects of component failures and/or state changes (propagation of effects across views)

- Provides portals (or “hotlinks”) to existing web-based databases

- Java version delivered to NASA HQ to archive historical Shuttle PRA data

- Potential future uses:
  - Electrical Power Grid Risk Analysis & Delivery Optimization (modeling the generation and delivery of electrical power for both commercial and residential applications)
  - Cyber Supply Chain Risk Analysis & Threat Management (identify and plan for disruptions in data and supply chain flows by integrating threat management tools with our existing logic matrix)
Business History

- Partnered with San Jose State University Research Foundation (SJSURF) to support NASA ARC Human Systems Integration Division in the design and development of Constellation knowledge / risk management systems (i.e. PRACA, FMEA/CILS, PRA, and HA) and Mars surface mission planning and scheduling systems (SPIFe and Europa).

- Contracted to Lockheed Martin (LMSO) to provide System Engineering services for the NASA JSC Mission Control Center (MCC) Operations Support Team (OST) Automation Initiative. The initiative identified operations cost savings opportunities within the existing OST infrastructure and developed approaches and architectural enhancements required to facilitate the savings.

- Contracted by SAIC to provide software architecture and development in support of NASA ARC Engineering of Complex Systems (ECS) research program, in particular the development of SimStation. SimStation is a tool that encompasses orbital mechanics, structural dynamics, hardware and functional fault propagation, and system performance models allowing configuration trade studies to be performed for the International Space Station (ISS). Responsible for developing ISS connectivity model, fault/change propagation, and power/thermal load summing algorithms. Resulted in development of the standalone integration and analysis tool, SEaCLIF, currently utilized by NASA engineers.

- Contracted by Biomedical Development Laboratories (BDL) to design, develop, and document Control Panel and Quality Station Software used to control and monitor five pieces of manufacturing equipment. The equipment produces e-PTFE Vascular Grafts (artificial arteries and veins).

- Contracted to NASA JSC via Lockheed Martin (LMSIS) to develop the ISS Portable Computer System (PCS) User’s Guide and to support analysis of problem reports generated against the system.
J&P’s Senior Management

- J&P’s founder, Jennifer Lewis, was selected as the Small Business Administration's 2010 Small Business Person of the Year - Houston District. She has 32 years experience in developing and delivering small and large-scale systems for both the commercial and government markets. Technical expertise includes system engineering, software design/development, software architecture, and systems integration (of both COTS and customized computer systems). Past projects include:
  - ISS Portable Computer System (PCS)
  - Commercial PTFE Vascular Graft Manufacturing
  - JSC MCC Consolidated Communications Facility (CCF)
  - Air Force Traffic Switch Control System (TSCS)
  - JSC Mission Control Center Upgrade (MCCU)
  - Commercial Cytogenetic Research / Chromosome Analysis
  - JSC MCC Calibrated Ancillary System (CAS)

- J&P’s Chief Engineer, Phil Lewis, has 32 years of professional engineering and management experience. Until recently he was Chief Engineering Technical support to the Constellation Program Chief Safety Officer prior to supporting J&P full time. Mr. Lewis currently provides his technical expertise to SR&QA’s Flight Safety Office. Prior experience includes:
  - Eight years in military / fighter and commercial aircraft development including the conceptual design of the National Aerospace Plane.
  - Responsible for the design, manufacturing, and system integration of space flight hardware, as well as the development of detailed assembly and process procedures. Technical expertise includes environmental and active thermal control system development, including combustion and materials compatibility.
  - Expertise in numerous analysis techniques and their implementation, including structural / stress analysis, thermal and fluid flow analysis, and dynamic system modeling of integrated control systems.
  - Responsible for development and oversight of both on-board (i.e. space flight) and test software / hardware.
Additional J&P Key Employees

- **Paula Smith** - Ms. Smith possesses 20 years of experience supporting major Projects and Programs at NASA JSC during which she has managed and directed numerous contracts. Her distinguished career includes receiving the Rotary National Award for Space Achievement for her work on the STS-107 Columbia Accident Investigation and Return-to-Flight team. Ms. Smith managed personnel and contract activities for flight software development in support of the SBInet, Shuttle, and Orion Programs. She has coordinated resources in support of project engineering initiatives spanning multiple NASA/JSC programs and is knowledgeable in the preparation of project plans, including scheduling, resource allocation, task assignment, budget, and variance reporting. Ms. Smith is currently Chief Engineering technical support to NASA’s Exploration Systems Chief Safety Officer.

- **Gary Johnson** – Mr. Johnson retired from NASA in 2006 as the Associate Director for Technical, Safety and Mission Assurance Directorate. During his 42 years at NASA Mr. Johnson progressed from project engineer for Apollo’s sequencer system, to Chief - Mechanical and Payload Systems Branch and Chief - Guidance and Propulsion Systems Branch, to Deputy Director SR&QA and Deputy Director of Russian Projects where he was C0-Chairman of the ISS Program Joint American Russian Safety Working Group. Mr. Johnson also developed and managed the S&MA Qualification Training Program and the Space Shuttle Close Call Awareness Program. Currently Gary supports the SR&QA Flight Safety Office.

- **Bob Bobola** - Mr. Bobola retired from NASA in 1997 at the Senior Executive Service rank. During his 38 years at NASA Mr. Bobola progressed from Apollo Project Engineer to Space Shuttle Orbiter Chief Engineer and finally Manager for Development, Space Station Projects at the Johnson Space Center (JSC). He has extensive experience in detailed systems design, systems engineering/integration, ground/flight operations and project management. Until recently Mr. Bobola was Chief Engineering Technical support to the Commercial Crew Chief Safety Officer (CCP CSO - Scott Johnson, transitioned from Space Shuttle efforts). Mr. Bobola is a registered Professional Engineer in Texas, holds two United States patents, and is currently an on-call expert for J&P.

- **Jim Raney** – Mr. Raney retired from NASA in 1990 as the Deputy Program Manager – Space Station Software Support Environment. During his 28 years at NASA Mr. Raney has delivered a wide range of technical products ranging from simulations of the on-board computers for the Apollo Command and Lunar Module trainers, the Apollo/Soyuz docking mechanism test and simulations, to Agency-Wide requirements allocation for the Space Station Software Environment. Since leaving NASA Mr. Raney has supported complex Independent Verification and Validation tasks for both NASA and DoD, and is currently supporting the delivery of NASA/JSC International Low-Impact Docking System (iLIDS).

- **David Sumpter** – Mr. Sumpter has extensive experience developing software for various Space Shuttle and Space Station projects (all phases of the software development life cycle). Mr. Sumpter has BS and MS degrees in Computer Science and is knowledgeable in a wide variety of platforms and languages including Unix/C/C++, Java3D, OpenGL, X Window System, Motif, Object-Oriented Analysis/Design (OOA/OOD), Unified Modeling Language (UML), Rational Unified Process (RUP), Windows/.NET/C# development, as well as strong object-oriented analysis and design skills. Mr. Sumpter has developed and supported a variety of applications in the Mission Control Center. As software lead of the PCS Common Display Development Team (CDDT), he designed and led development of critical path Space Station software, including an object-oriented, extensible class library for the rapid implementation of on-board graphical command and control displays. David is currently the lead developer for SEaCLIF as well as providing his extensive software skills in support of projects in the Operations Technology Facility (OTF).
Why Hire J&P Technologies?

- Extensive experience in the design, development, integration, and delivery of a wide variety of products with a special emphasis on post-delivery customer support including high-quality documentation, training, and troubleshooting.

- Consistent demonstration of commitment and dedication to the task at hand to ensure customer satisfaction.

- J&P Technologies can provide high-quality support to accommodate both short-term and long-term needs.

- The same precision development that launches humans into space can help you protect your assets and ensure the success of your projects.

- At J&P we understand what it takes to be successful in high-risk endeavors, let us put our experience to work for you.