J&P TECHNOLOGIES

Software & System Engineering Services

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Who are we?

J&P Technologies was 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. The company is backed by 30+ years of experience in supporting, developing, and delivering small and large-scale systems for both the government and commercial markets.

J&P holds SDB [Native American owned], Women's Business Enterprise [WBE], Economically Disadvantaged Woman-Owned Small Business [EDWOSB], and Texas Historically Underutilized Business [HUB] certifications. Awards include SBA's 2010 Small Business Person of the Year and 2010 SBA Administrator's Award of Excellence.

Primary Services

System Engineering:

Perform requirements analysis and development, conceptual design, and staged implementation of subsystems/systems. Provide technical leadership, approve design documentation, and generate requirements and interface control documents. Perform engineering studies including system loading and throughput analyses.

Software Engineering:

Participate in the requirements definition process and support generation of interface control documents, customer design reviews, and project status. Perform detailed design, code, and unit test of software programs and associated interfaces. Generate software documentation (design specifications, user guides, etc.). Support integration and acceptance testing procedure development and implementation.

Software Architecture:

Oversee design, development, and integration of subsystem/system software. Provide technical direction to project team members and schedule, plan, and conduct project review meetings. Ensure commonality and compatibility across subsystem/system interfaces. Act as technical liaison between project systems engineers, software development teams, and customers.

System Integration & Test:

Develop schedules and plans for integrating system components to verify functionality and performance requirements. Plan and perform integration of new or updated systems into the operational environment. Develop test schedules, plans, and procedures.

System / Software Safety:

Perform system/subsystem safety analyses to identify safety-critical software & hardware, ensure inclusion of safety requirements, verify design and implementation properly incorporate the safety requirements, establish verification and validation requirements to ensure implementation of the safety requirements, and assess the scope and level of software IV&V based on the level of criticality and risk.

Software Configuration Management:

Provide world class Software Configuration Management Processes, Tools, and Services to facilitate the successful implementation of project goals and objectives. SCM performs software version control, build, and installation services across multiple platforms. Performs studies on process improvements and optimization of SCM process implementation.

Network Engineering and Architecture:

Meet with the Customer, Users, and Business Unit representatives for the development of detail requirements and specifications. Review Customer requirements and specifications for creating network Concept, Architectural, and Detail Design solutions.

Technical Expertise

J&P employs highly-trained professionals who have extensive experience in developing, integrating, delivering, and sustaining major human-rated systems / projects and are familiar with complex development and delivery processes, as well as system support requirements.

Areas of expertise:

- *System Engineering*
- *Software Design & Development*
- *Software Architecture*
- *System Integration & Test*
- *System Safety & Risk Analysis*
- *Software Configuration Management*
- *Network Engineering & Architecture*

Aerospace examples include:

- *Software & Hardware architecture of NASA JSC's next generation MCC using IBM BladeCenters and 10 GigaBit Ethernet solutions*
- *Development and delivery of the International Space Station (ISS) Portable Computer System (PCS) graphical command and control displays*
- *Software IV&V for Space Launch Systems (SLS)*
- *Design and development of ISS Environmental Control and Life Support System (ECLSS) components*
- *Vehicle and Systems engineering management support*
- *Hazard assessments for the International Space Station, Multi-Purpose Crew Vehicle (MPCV) and Exploration Systems.*
- *Deployment of "Office of The Future and Collaboration Centers" solutions*

Biomedical examples include:

- *Development of a chromosome analysis software package for commercial sale to cytogenetic research and clinical laboratories*
- *Design, development, and documentation of Control Panel and Quality Station Software used to control and monitor manufacturing equipment producing e-PTFE Vascular Grafts (artificial arteries and veins).*

Customers

Lockheed Martin Mission Services

Facility Development & Operations Contract (FDOC):

- Software Configuration Management and Software Build Services for the ISS and Exploration Programs.
- Support to the Mission Control Center (MCC), Astronaut Training Facilities, and User Application software development.
- Next generation MCC and Collaboration Center development.

MCC Operations Support Team (OST) Automation Initiative:

- System engineering services identifying operations cost savings opportunities within the existing OST infrastructure and development of approaches and architectural enhancements to facilitate the savings.
- Specific areas analyzed for improvement included MCC scheduling, MCC activity configuration/ termination, ODRC, and TDRSS scheduling.

ISS Portable Computer System (PCS):

- Technical documentation services to develop the User's Manual for the Astronaut's on-board laptops
- System engineering services to support analysis of problem reports generated against the PCS system.

The Analytic Sciences Corporation (TASC)

NASA IV&V Contract:

- Provide independent verification and validation, software assurance, research and development, and technical quality monitoring of NASA's complex software products.

Biomedical Development Laboratories (BDL)

- Software design and development of Control Panel and Quality Station Software used to control and monitor e-PTFE Vascular Graft manufacturing equipment (artificial arteries and veins).

San Jose State University (SJSU)

- Partnered with SJSU Research Foundation to support NASA Ames' Human Systems Integration Division effort in the design of efficient, usable interfaces for both crewed and robotic missions.

Science Application International Corp (SAIC)

Safety & Mission Assurance Engineering Contract (SMAEC and predecessor SMASS contract):

- Flight Software Hazard Analysis & Risk Mitigation (ISS, GFE, MPCV/ Exploration Systems, and Commercial Crew)
- System / Safety Engineering (ISS /MPCV / CCP / Exploration Systems)
- System Integration (ISS / Exploration Systems / MPCV)
- Operations (ISS)
- Chief Safety Officer / Chief Engineer support
- Data Mining & PRACA Database Support

NASA Ames Engineering of Complex Systems (ECS) Support:

- Software architecture and development services supporting the ECS research program, in particular the development of a SimStation prototype.
- 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.

NASA JSC Safety, Reliability, & Quality Assurance (SR&QA) Contract:

- Assisted in development of software safety requirements for the 2nd Generation Reusable Launch Vehicle (2GRLV) portion of the Space Launch Initiative (SLI) project.

Next Generation Mission Control Center

J&P assisted in architecting NASA JSC's next generation MCC using IBM BladeCenters and 10 GigaBit Ethernet solutions. We were responsible for network engineering and software architecture for the design and implementation of an emulating infrastructure representing the new JSC Mission Control Center (MCC). This next generation Control Center can best be defined as having similarities to state-of-the-art Data Centers. Taking this state-of-the-art theme one step further, J&P Technologies assisted JSC in the deployment of "Office of The Future and Collaboration Centers" solutions. Our effort focuses on the deployment and integration of Wireless, Voice-over-IP (VoIP) and IP Telephony, and Video technologies.

SEaCLIF – J&P's System Engineering & Integration Innovation

J&P's system engineering, safety, and integration tool, "System Effects and Capability Losses from Inserted Failures" (SEaCLIF), is currently used by NASA JSC's Safety & Mission Assurance (S&MA) Directorate to support flight operations. The tool focuses on product integration and provides data to the Safety Engineering Team for pre-flight assessments and anomaly resolution during flight. SEaCLIF enables significant increases in efficiency via the "*presentation*" of pre-integrated design, operational, and safety data sets, without either re-hosting the data (required by most knowledge systems) OR requiring significant maintenance resources. Of primary benefit to the engineer is the integration of classic engineering data. SEaCLIF is extensible to support any logical relationship between items such as requirements, documents, system designs, hardware items, software processes, procedures, documents, or capabilities.