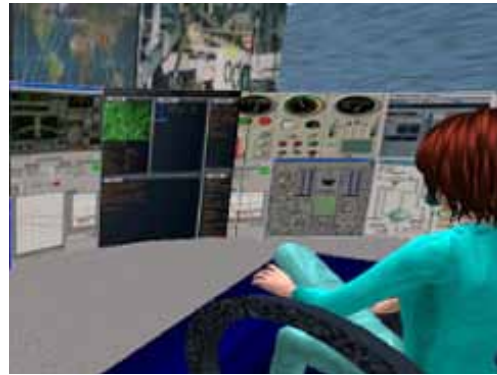


INNOVATION YOU CAN TRUST



Portal for Recertification and Skills Maintenance (PRISM)

The web-based Portal for Recertification and Skills Maintenance (PRISM) replaces hardcopy systems that required countless hours of administrative tracking and hands-on data entry, and provides consolidated training records management system to retain and track critical updates, completions, and training lessons learned.

Saving NASA almost \$2 million in its first year of use, the PRISM application mechanizes and provides timely and accurate electronic buy-off and review of training records. PRISM also retains training history files, providing managers and employees visibility into individual training records and line items. The system automatically distributes training updates, proactively ensuring that needed training is accomplished in a timely manner.

The fully automated PRISM application integrates and provides a single source for recertification and on the job training information.

PRISM's enterprise capability has applicability in areas wherever critical training and recertification records are maintained. Its ease of use and flexibility place PRISM at the top for organizing, tracking, and integrating myriad records from across an organization.



Immersive Network Space Program Innovation Research Environment (INSPIRE)

Using the Immersive Network Space Program Innovation Research Environment (INSPIRE) virtual laboratory workspace, USA technologists are able to rapidly develop and demonstrate mission simulations and training protocols without impact to real hardware or systems. This optimizes training budgets and equipment utilization. Rapidly configurable to individual needs, INSPIRE has the ability to provide highly customized training approaches, helping our employees to rapidly achieve the skills they need for current and future programs.

INSPIRE also provides the capability to simulate and test in non-traditional or hazardous environments. Our lunar and Mars environments provide designers with the opportunity to rapidly generate and examine habitats, spacesuits, rovers, and other systems. INSPIRE is also useful for illustrating the impact of payload configurations on habitable volume, or for demonstrating crew interaction inside of a tight volume.

As INSPIRE gains positive customer and industry feedback, USA employees look to other ways to use the virtual workspace. In its first year of use, INSPIRE contributed to a significant cost avoidance when the company's Ethics Office began using the environment to develop training scenarios.

The company's diversely-located technologist panel uses INSPIRE for its monthly discussion groups, saving the company's travel budget for more critical trips. USA also used INSPIRE for its Technology Summit in Huntsville, Alabama, providing several Houston-based employees the opportunity to remotely support the event.



For more information, contact:
United Space Alliance
(281) 639-3190



INNOVATION YOU CAN TRUST

United Space Alliance is committed to providing innovation solutions for space operations now, and in the future. USA's experience as the operator of the Space Shuttle and International Space Station gives us unique insight into the sustainability and affordability of space systems. As a world leader in space operations, USA is applying its broad range of capabilities to innovative and technological concepts and prototypes for space exploration.

International Space Station Integrated Simulator (ISIS)

Tools such as the International Space Station Integrated Simulator (ISIS) help NASA meet ambitious certification goals, while optimizing available training resources. The ISIS tool is in use as a realistic test bed for validating and verifying new automation technologies for Exploration, and is providing pre-test capability for International Space Station (ISS) software.

ISIS uses an open system design to run unmodified ISS flight software, system models, and astronaut command and control interface. It rapidly integrates multiple ISS models, increasing training resources and providing timely deployment of enhanced part task training to ground controllers.

Scalable to a Space Station Training Facility workstation, this portable tool uses an inexpensive platform to emulate real flight hardware and increases training opportunities for NASA's flight controller community.

ISIS was designed to provide a distributed system for creating, testing and evaluating ISS flight software and models. Designers also incorporated the capability to validate crew and ground controller modules. Since its implementation ISIS' flexible architecture has enabled its evolution to encompass ground operator system, and display training and flight software modification testing. ISIS also serves as a realistic test bed for Exploration automation technology research and development.



INNOVATION YOU CAN TRUST



Collaborative Integrated Processing Solutions (CIPS)

The Collaborative Integrated Processing Solutions (CIPS) uses off the shelf technology to provide a single source recertification and training information service, quickly reacting to changes in skill certification requirements.

CIPS is a fully integrated supply chain management system. It provides an end-to-end integrated solution for Shuttle and Constellation products and processes, including requirements management, supply chain planning, configuration management, asset lifecycle management, process engineering and execution, and data management.

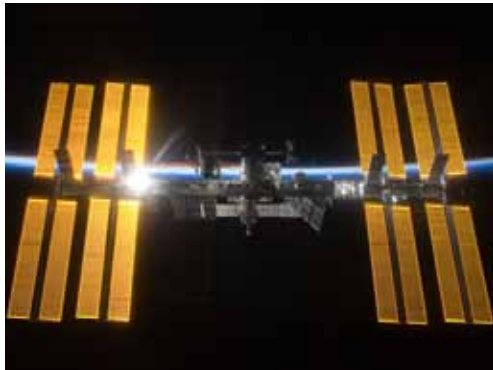
Accessible from stationary workstations and tablet computers, CIPS uses wireless networks that allow personnel to accomplish electronic work instruction authoring, paperless work execution, labor planning, supply chain management and other integrated tasks. CIPS connects with our customer's Integrated Collaborative Environment speeding collaboration, and enabling real-time response.



Manipulator Configuration Optimizer/Planner (MCO/P)

Manipulator Configuration Optimizer/Planner (MCO/P) enables Space Shuttle tile inspection, giving ground-based teams the ability to develop customized and multiple path planning to optimize inspection. The tool can also be used for other robotic systems, such as future habitats, rovers, or vehicles.

Developed for USA's Mission Operations Directorate customer, MCO/P identifies an optimized path within minutes, saving wear and tear on valuable NASA training hardware.



Laser Fluorescent Penetrant Inspection (LPI)

The Laser Fluorescent Penetrant Inspection (LPI) innovation has provided an accurate and reliable means for clearing critical NASA equipment, resulting in a \$350,000 cost avoidance for each assembly we are able to inspect and return to the customer. In total, this has resulted in an estimated \$7.7 million cost avoidance to NASA.

LPI is the first and only approved non-destructive technique for inspecting and clearing NASA's gas generator injector stems. The LPI laser probe is the world's smallest, incorporating both a UV light source as well as detector sensor into only 0.073 outside diameter.

LPI has improved supportability for NASA and has helped us to return valuable and irreplaceable flight assets to use, contributing to our customer's bottom line for safety and reliability.

USA and its design partner Laser Techniques Company developed the LPI innovation that uses an ultraviolet light source (laser) and visible light sensor to inspect for stress corrosion cracking in NASA's Solid Rocket Booster Auxiliary Power Unit Gas Generator injector stems. These stems are susceptible to stress corrosion cracking, but limited access and an inner diameter of only 0.1" made traditional non destructive evaluation techniques for these stems impossible.



INNOVATION YOU CAN TRUST

Spacecraft Position Optimal Tracking (SPOT)

Calculating orbital trajectories with significantly higher levels of accuracy than previous methods, the Spacecraft Position Optimal Tracking (SPOT) can determine orbital positions to within 100 feet of accuracy, in near real-time. This capability provides NASA's flight control team with reliable state vectors for mission operations and mission planning, eliminating previous methods which relied upon international partners and U.S. Strategic Command for data.

NASA's first real-time ground-based navigation application using onboard sensors, SPOT is also noted for its reliability and flexibility. It uses a robust Kalman filter to protect against data drop-outs, and resolves inherent shortcomings within onboard GPS receivers.

Designed by the USA Flight Operations Flight Design and Navigation team, SPOT calculates accurate navigation estimates of vehicle position and velocity (state vector). SPOT integrates onboard Global Positioning System receiver measurements to sequentially calculate vehicle state vectors, then relays the information to ground flight controllers. Used in the NASA Mission Control Center, NASA relies upon this technology for both Space Shuttle and International Space Station operations, as well as for post-flight mission analysis.

Originally designed in response to NASA's planned phase-out of the Shuttle Program's Tactical Air Navigation system, SPOT has subsequently been put into use for service for the Space Shuttle and the International Space Station.

Solar Array Management technologies (SAM)

NASA's electrical power system specialists use the Solar Array Management (SAM) suite on laptops for quick analysis. Solar's user-friendly graphical interface and machine learning algorithms provide increased electrical simulation accuracy, and enable rapid response to critical NASA mission timelines.

Currently in use on the International Space Station, the SAM technology tool set offers flexible capability to support future space vehicles such as Orion, or assets such as rovers, habitats, and satellites. SAM's automated real-time constraint modeling, power generation, and power modeling and simulation optimize and automate valuable customer resources.

Designed to optimize NASA resources, SAM technology tool set provides constraint situational awareness, constraint mode configuration, longeron shadowing computation capability, and array tracking computation capability. Known as SAM CS, SAM Shady, SAM Win, SAM Lock, and Solar, these integrated technologies provide high reliability and uptime, and are in use on the NASA Mission Control Center's certified computing platform.

