

Spaceport News



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Discovery, STS-121 crew complete busy 13-day mission

The Space Shuttle Discovery and its crew are home after a 13-day, five-million-mile journey in space.

The mission, STS-121, succeeded in testing shuttle safety improvements, repairing a rail car on the International Space Station and producing never-before-seen, high-resolution images of the shuttle during and after its July 4 launch.

Discovery's Commander Steve Lindsey, Pilot Mark Kelly and Mission Specialists Mike Fossum, Piers Sellers, Lisa Nowak and Stephanie Wilson landed July 17 at Kennedy Space Center at 9:14 a.m.

Following landing, Lindsey and his crew completed the traditional walk-around, post-landing inspection of the shuttle.

"I have been on four flights, and this is the cleanest vehicle I've ever seen," said Lindsey. "We had two major objectives and we

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DISCOVERY TOUCHES down on Runway 15 at NASA's Shuttle Landing Facility after completing mission STS-121 to the International Space Station. Main gear touchdown occurred at 9:14 a.m.

STS-115 crew members train for space station assembly flight

By Cheryl Mansfield
Staff Writer

As Discovery stood poised for liftoff on Launch Pad 39B in late June, the crew for the following mission, STS-115 on Space Shuttle Atlantis, arrived at Kennedy Space Center for the three-day crew equipment interface test that is part of their training.

Mission Commander Brent Jett, a veteran of three space missions, will lead the STS-115 crew on the 19th mission to the International Space Station. The crew of Atlantis is scheduled to deliver and install the P3/P4 truss segment, along with solar array set 2A and 4A and batteries to continue constructing the station.

Joining Jett on the mission are three other space shuttle veterans: Mission Specialists Joe Tanner, Dan Burbank and Steve MacLean. Rounding out the crew are Pilot Chris Ferguson and Mission Specialist Heidemarie Stefanyshyn-Piper, both making their first space flight.

The orbiter Atlantis, which lifted off on its maiden voyage on Oct. 3, 1985, will make its 27th trip to space. Atlantis last flew in October 2002 for STS-112, when it delivered the S1 integrated truss segment to the space station. The vehicle has also delivered several other vital components to the station, including the U.S. Destiny

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STS-115 PILOT Christopher Ferguson (left) and Commander Brent Jett review procedures in the cockpit of the orbiter Atlantis.



Jim Kennedy
Center Director

The Kennedy Update

Hi, everyone! As I sit and reflect back on the success of mission STS-121, the tremendous amount of joy I feel comes from knowing I work alongside the greatest space team in the world.

The attitude each of you displays is phenomenal, whether it's inventing a way to take a clear picture of an area of concern on the external tank, or inspiring members of our future work force as they complete summer internships.

While standing at the Shuttle Landing Facility watching Commander Steve Lindsey glide Discovery to a perfect landing, I became excited as my thoughts drifted to Kennedy Space Center's role in the future of human space

flight. With shuttle safety modifications now tried and tested, and the construction of the International Space Station back on schedule, you all deserve a pat on the back for your tireless efforts.

With the safe landing of Discovery, it's time to refocus on Atlantis and the crew of STS-115 as we prepare to deliver major truss segments and solar arrays that will provide additional power to the space station. Making its 27th trip into space, Atlantis will be commanded by Brent Jett, a veteran of three space missions. Launch is currently targeted for no earlier than Aug. 28.

The Launch Services Program is completing final preparations for the STEREO launch aboard a

Boeing Delta II in August. STEREO, which stands for Solar Terrestrial Relations Observatory, will give us a much better understanding of space weather, providing useful information as we continue to send astronauts into the rigors of space travel.

STEREO will also help safeguard the nation's electrical grids. A solar weather storm in 1989 disrupted electric companies throughout the U.S. and Europe. This new forecasting system will give researchers the three-dimensional view they need to better

at last month's NASA Environmental and Energy Conference.

Although his accolades are many, Burt was given the award for developing the KSC Environmental Management System Plan, completing the remediation work at KARS Park to remove hazardous soil, and other environmentally friendly activities around the center. Way to go, Burt!

Today also marks the 45th anniversary of the Mercury 4 launch, which ended with the Liberty Bell 7 capsule slipping to the bottom of the Atlantic Ocean.

"...You all deserve a pat on the back for your tireless efforts."

It was retrieved in 1999, and you can now see this piece of history on display at the KSC Visitor

Complex for a limited time.

understand this disturbance. Although I do not often single out individuals in this column, I cannot contain my pride when talking about our own Burt Summerfield, who established a legacy by demonstrating environmental leadership while directing the center's environmental and energy programs.

Burt's career at KSC spans more than 20 years, and his leadership led to him being the recipient of a Blue Marble Award

Remember, employees receive free admission until Labor Day, so don't miss your chance.

I also want to remind employees to take preventative measures to ward off any type of heat stress. Drink plenty of water before and while working outdoors and be sure to take frequent short breaks in a cool, shaded area.

Have a great week and see you around the center!

Foreign Object Debris is everyone's responsibility

What do a turkey vulture, a golf ball and a chunk of foam have in common? They all have been evaluated as foreign object debris or damage (FOD) for the space shuttle.

Foreign object debris is a substance, debris or article alien to a vehicle, system or facility which potentially could cause damage.

Foreign object damage is any damage attributed to a foreign object which may degrade the product's required safety or performance characteristics.

FOD is somewhat ambiguous, because it varies depending on the situation. A paper clip on a desk is not FOD, because it is not foreign to that environment. But a paper clip in a commercial passenger jet engine or space shuttle main engine could prove catastrophic to the flight vehicle, crew or both. Anything can be FOD if it is foreign to that environment.

A FOD Prevention Program has been implemented at Kennedy Space Center to improve the reliability of space shuttle processing. The key to success is in a simple formula: awareness plus prevention equals compliance. To attain a successful FOD Prevention Program, total employee involvement is required. Everyone needs to be responsible.

KSC's foreign object control manager, Laura Rine of the Safety and Mission Assurance directorate, is responsible for directing the provisions of the Foreign Object Control Program for the center.

If you have any questions pertaining to FOD prevention or requirements, or any suggestions for improving FOD prevention in your area, contact Rine at 867-8715.

July NASA employees of the month



THE JULY NASA Employees of the month, back row from left, include James Lichtenthal, Office of the Chief Engineer; Carl Thorn, Information Technology and Communications Services; and Christopher Torres, Safety and Mission Assurance. Seated from left are Pamela Lohning, Shuttle Processing; and Diana Alicea, Launch Services Program. Not shown are Erica Jackson, Cape Canaveral Spaceport Management Office; Rosemary Baize, Applied Technology; Robert Cummings, Center Operations; Yvonne Fuchs, Engineering Development; and Karon Buchner, Payload Processing.

NASA's STEREO prepares for August launch

NASA's Solar TERrestrial RELations Observatory (STEREO) is scheduled to lift off from Launch Pad 17-B at Cape Canaveral Air Force Station aboard a Boeing Delta II rocket in August. The observatory will provide a unique and revolutionary view of the Earth-sun system.

The satellites will trace the flow of energy and matter from the sun to Earth, as well as reveal the 3-D structure of coronal mass ejections and help us understand why they happen. STEREO also will provide alerts for Earth-directed solar ejections, from its unique side-viewing perspective among the fleet of space weather-detection satellites.

STEREO features many firsts for a NASA mission. This will be the first stereo viewing of the sun from vantage points beyond Earth orbit, and the first imaging and tracking of space weather disturbances from the sun to Earth.

It also will be the first continuous determination of interplanetary shock positions by radio triangulation, and the first simultaneous imaging of solar activity with in-situ measurement of energetic particles at 1 AU.

Mission designers will use the moon's gravity to redirect the observatories to their appropriate orbits – something the launch vehicle alone is not able to do. For information, visit www.nasa.gov.



IN THE hazardous processing facility at Astrotech Space Operations in Titusville (left), technicians check Observatory A, one of two in the STEREO spacecraft, before lifting it onto a scale for weight measurements.

Below, a solid rocket booster for STEREO's Delta II arrives on Launch Pad 17-B at the Cape Canaveral Air Force Station.



Ordnance manager Taylor has a blast at his job

By Elaine Marconi
Staff Writer

As the manager of Ordnance, Optics and Labs with United Space Alliance, Larry Taylor oversees a team that is responsible for testing and ensuring the safety of more than 250 strategically placed and precisely timed explosive devices that detonate on the space shuttle each time the vehicle flies.

In the late '60s, Taylor became

interested in the space program as a young man living in Brevard, where each Apollo launch filled him with enthusiasm.

Upon joining the U.S. Air Force after high school, Taylor served as a munitions specialist.

"That was an accident," he said, "That was meant to be a volunteer career field. But during the Vietnam War, they needed people to work in that particular area. I was kind of annoyed at being chosen, but I stuck with it

and now I've been in it for many years."

Taylor was hired at Kennedy in 1982, awarded the coveted Silver Snoopy in June of 1990 and became manager of the ordnance facility in 1991. This year, he's celebrating his 24th anniversary at the space center.

Part of Taylor's team of technicians handles all of the ordnance for the shuttle orbiter, external tank and solid rocket boosters. They assemble and test each electrical device with a variety of tests, once upon receiving them and again at the Ordnance Storage Facility before flight.

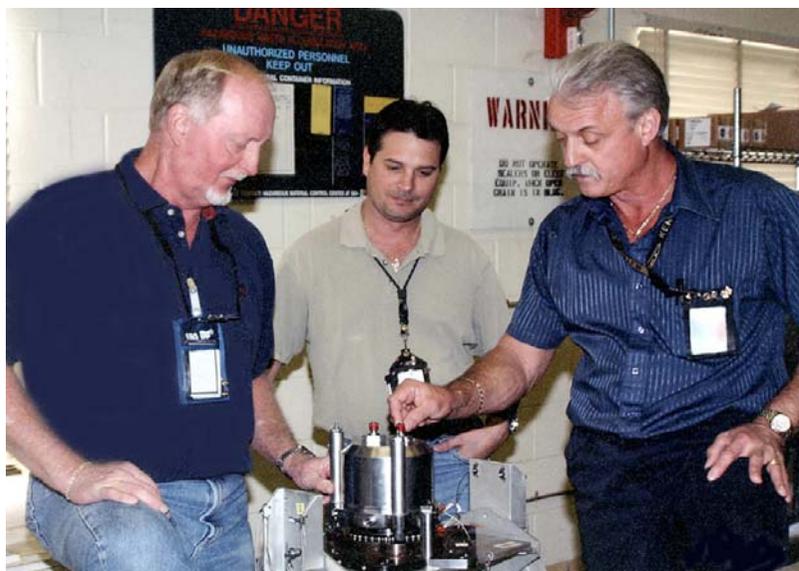
Taylor is also responsible for the Ordnance Test Lab. The lab has two testing cells and each is equipped with a blasting chamber, which is a 1/4-inch-thick steel box

slightly larger than a microwave oven. The chambers are housed in rooms with one-foot-thick walls of reinforced concrete.

The group processes "NASA standard initiators," devices that operate like blasting caps, detonating the explosive devices on the shuttle. NASA also uses these devices on satellites for various purposes.

"The reliability of the NASA standard initiators has been impeccable," remarked Taylor. "The explosives that the space program uses are very, very safe. We have never in the history of the program had a NASA standard initiator device fail. All of the ordnance that has failed to fire has been as a result of an electrical problem."

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LARRY TAYLOR (right), Jeff Morris (left), and Steve Holihan inspect a separation bolt assembly at the Ordnance Storage Facility.

Discovery, STS-121 crew members deliver more than 28

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accomplished both of those, and we're ready to assemble the space station."

NASA's Space Shuttle Program managers also were pleased with Discovery's performance. The flight verified the safety of the biggest aerodynamic change to the external fuel tank in shuttle history. The protuberance air load ramps were removed after a piece of foam came off this area during Discovery's flight last year.

STS-121 is the most photographed shuttle mission ever, with more than 100 high-definition, digital, video and film cameras documenting the launch and climb to orbit. Data from these images helped assess whether the orbiter sustained any damage and whether that damage posed any risk to Discovery's return to Earth.

The STS-121 mission also bolstered the International Space Station. Fossum and Sellers, with the help of crewmates, completed three spacewalks. The third spacewalk was confirmed after mission managers determined there was enough electrical power to add another day to the flight.

The astronauts tested the shuttle's 50-foot robotic arm boom extension as a work platform. They

removed and replaced a cable that provides power, command control and data and video connections to the station's mobile transporter rail car. The transporter is used to move a platform containing the station's robotic arm along the truss of the complex.

During the third spacewalk, the astronauts tested techniques for inspecting and repairing the reinforced carbon-carbon segments that protect the shuttle's nose cone and leading edge of the wings.

Discovery delivered more than 28,000 pounds of equipment and supplies to the station, as well as a third crew member. European Space Agency astronaut Thomas Reiter joined Russian Pavel Vinogradov and American Jeff Williams. This marks the first time since May 2003 that the station crew has three members.

President George W. Bush called the astronauts to congratulate them on a successful mission and to thank them for their work to further America's Vision for Space Exploration. The vision calls for NASA to return humans to the moon, and then venture to Mars and beyond.

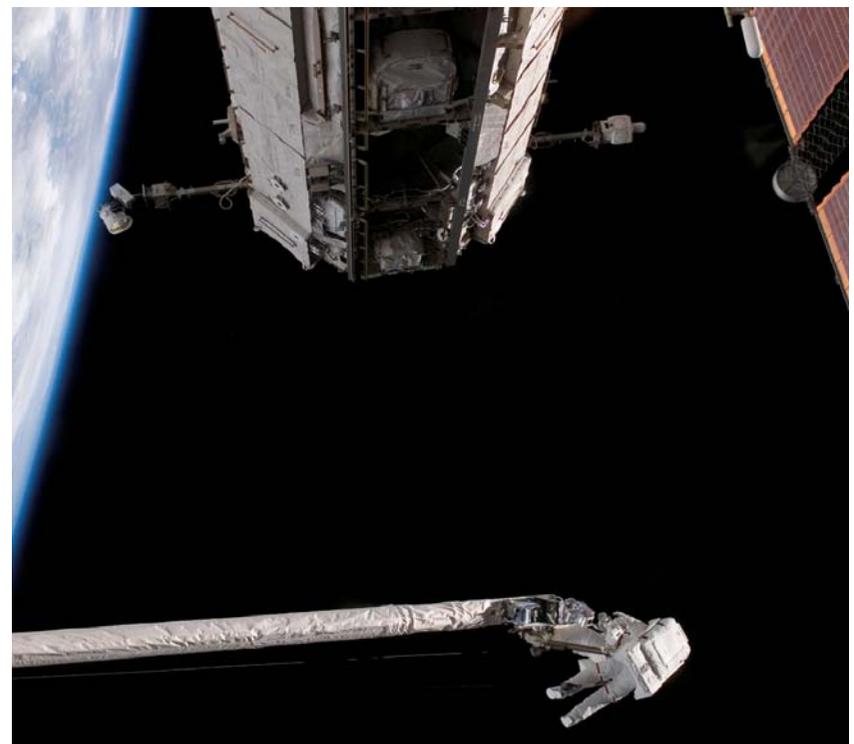
With Discovery and its crew safely home, the stage is set for the resumption of International Space Station assembly.



FOLLOWING THE traditional post-flight walk-around after the landing of an orbiter, the crew members of STS-121 pose for a group photo in front of Discovery. From left are Mission Specialists Michael Fossum and Lisa Nowland, Mission Specialist Stephanie Wilson, Pilot Mark Kelly and Mission Specialist Piers Sellers.



WITH DRAG chute deployed, the orbiter Discovery slows to a stop after landing on Runway 15 at the Shuttle Landing Facility, completing mission STS-121 to the International Space Station.



ASTRONAUTS PIERS Sellers and Michael Fossum (out of view) work in tandem on the shuttle's Remote Manipulator System/Orbiter Boom Sensor System during the mission's first scheduled session of extravehicular activity.

,000 pounds of equipment, third crew member to station



the STS-121 crew poses for a photo
owak, Commander Steven Lindsey,
Sellers.



BACKDROPPED BY Earth, the International Space Station moves away from Space Shuttle Discovery. Undocking of the two spacecraft occurred on July 15.



DURING THE traditional post-flight walk-around after the landing of an orbiter, crew members Michael Fossum, mission specialist, and Steven Lindsey, commander, talk with NASA Administrator Mike Griffin (left).



CENTER DIRECTOR Jim Kennedy greets Mission Specialist Stephanie Wilson after landing. To the right of Kennedy is Deputy Director Bill Parsons talking to Mission Specialist Piers Sellers.

STS-115 astronauts train for late-August mission

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Laboratory and the Quest Joint Airlock modules.

STS-115 will mark the return to construction of the station, the main goal of the remaining space shuttle flights. The P3/P4 segments — which are approximately 45.3

feet long — will attach to the P1 truss on the port side of the station's integrated truss segment. Once in place, the addition of the P3/P4 trusses with their two large solar arrays will provide one-fourth of the total power-generation capability of the completed station.



IN THE Space Station Processing Facility, STS-115 Mission Specialists (foreground, from left) Daniel Burbank, Joseph Tanner, Heidemarie Stefanyshyn-Piper and Steve MacLean are fit checking components in a large Orbital Replaceable Unit transfer bag.



WHILE TECHNICIANS and crew members observe him in the Space Station Processing Facility, STS-115 Mission Specialist Daniel Burbank (right) is practicing folding a multilayer installation blanket.



IN THE Orbiter Processing Facility, STS-115 Mission Specialist Joseph Tanner (left) gets familiar with a camera that is a mockup of one the crew will use to take photographs on orbit. With him are Mission Specialists Steven MacLean, who represents the Canadian Space Agency, and Heidemarie Stefanyshyn-Piper.



STS-115 CREW members look over the cockpit on the orbiter Atlantis. From left are Mission Specialists Joseph Tanner, Daniel Burbank, Heidemarie Stefanyshyn-Piper and Steven MacLean.

Remembering Our Heritage

45 years ago: Mercury 4 mission was all in a day's work

By Kay Grinter
Reference Librarian

In 1961, the first two manned missions in the Mercury Program were all in a day's work. The suborbital flights were designed to determine an astronaut's ability to survive and perform in the space environment, and both launches and landings took place on the same day.

On July 21, astronaut Virgil I. "Gus" Grissom launched in the Liberty Bell 7 capsule atop a Redstone rocket for the second and last suborbital flight in the program. The 15-minute, 37-second ride confirmed the data collected during Alan Shepard's

mission two months earlier.

The events following splashdown, however, cannot be confirmed and are still the topic of debate.

The 3,200-pound aluminum and titanium capsule sank after splashdown when its hatch blew off prematurely and the spacecraft took on water.

Grissom was still inside, awaiting recovery after recording the switch positions on the capsule's instrument panel. When he realized the seriousness of the situation, he hauled himself out of the capsule and swam clear of the sinking craft.

A Marine rescue helicopter on the scene was unable to lift the

now-5,000-pound object, already a thousand pounds beyond its lifting capacity. The chopper's pilot cast it loose, unwilling to jeopardize his own craft, and Liberty Bell quickly sank three miles to the ocean floor.

Grissom maintained until his death in 1967 in the Apollo 1 fire that he did nothing to cause the hatch to blow.

Guenter Wendt, retired since 1989 and living on Merritt Island, strongly agrees.

He was among the employees who were assigned final tasks to prepare Liberty Bell for its launch from Launch Complex 5/6, and Wendt helped secure Grissom in the capsule for his 303-mile flight down the Atlantic Missile Range.

In 1999, Wendt was invited to join a hand-picked crew to recover Liberty Bell. On the expedition, sponsored and filmed by the Discovery Channel, underwater salvage expert Curt Newport successfully raised the capsule to the surface and returned it to Cape Canaveral, 38 years after it was lost. Unfortunately, the hatch was

not recovered.

"We cannot prove what happened, but I know that Grissom did not blow the hatch," Wendt asserts. "He had no bruising on his right hand. The kickback from the pyrotechnic initiator would have injured some fingers on Grissom's right hand if he had activated it."

Liberty Bell 7 is on display at the Kennedy Space Center Visitor Complex through Sept. 10 before it is returned to the Kansas Cosmosphere and Space Center in Hutchinson, Kan., for permanent display.



GUENTER WENDT, a former NASA pad leader, helped prepare Liberty Bell 7 for its July 21, 1961, suborbital flight atop a Redstone rocket.

TAYLOR . . .

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He pointed out that explosive devices are needed to release the orbiter from the mobile launch platform. After liftoff, the solid rocket boosters are separated from the external tank by explosive devices and pushed away from the orbiter by 16 rocket motors that provide 26,000 pounds of thrust in just 6/10ths of a second.

During a shuttle landing, few people realize that an explosive thruster pushes the nose landing gear downward. The drag chute is also deployed and released by explosive charges that are manually activated by the crew.

Taylor's team also handles many aspects of shuttle optics, entailing fine measurements and alignments with a variety of different tools.

Before the space shuttle launches, for example, the Optics group is the first crew on the mobile launch platform to perform the alignment of the "hold-down" posts for the booster aft skirt that connects the entire space shuttle to the platform.

On occasion, Taylor's Optics group has had to measure the

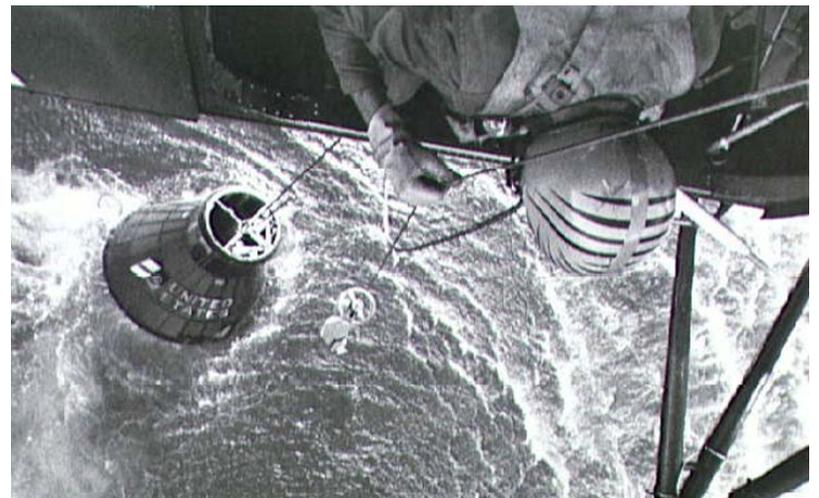
inside of the orbiter cargo bay because of a concern about a particular payload fitting. A computer using those coordinates is able to draw the cargo bay to exact measurements within 10,000th of an inch.

The team prepares flight batteries for payloads, including those used for the Hubble Telescope. "I even have responsibilities for the power supplies and batteries all over the Cape and at Dryden (Flight Research Center). I have to send a crew there once a year for test purposes, so we do quite a bit with the program."

In addition, Taylor's team is in charge of configuring the Launch Control Center's firing rooms to communicate with the shuttle at the launch pad, the orbiter processing facility and the mobile launch platform.

He's often asked how he got a job that includes "blowing things up." Taylor modestly replies: "I never thought I'd use the explosive training after the Air Force, and then I ended up here at Kennedy and was lucky enough to work with explosives for the space shuttle."

"It's really interesting work. I wish I had done it sooner."



A MARINE rescue helicopter on the scene was unable to lift the Liberty Bell before it quickly sank three miles to the ocean floor.

NASA's AP2 program develops eco-friendly technologies

By Linda Herridge
Staff Writer

Inside the Corrosion Technology Lab at the Operations and Checkout Building, workers from NASA's Acquisition Pollution Prevention program are comparing several coating test samples with some new environmentally friendly coatings to gauge their resistance to Kennedy Space Center's corrosive environment.

According to Kevin Andrews, senior principal engineer of the program, several of the new coating samples are performing very well.

The program — also known as "AP2," managed by KSC's Applied Technology Directorate — helps to identify pollution prevention needs. It fosters joint efforts between NASA centers and other organizations, including the U.S. Department of Defense and the U.S. Air Force Space Command, and contractors such as United Space Alliance and The Boeing Company, to develop and test environmentally friendly technologies.

The program aims to identify sustainable pollution prevention technologies through joint activities that enhance mission readiness and reduce risk.

According to AP2 manager Christina Brown, the program's approach to pollution prevention is an effective way to help NASA comply with environmental regulations, improve product

performance and reduce costs.

"Partnering to prevent pollution is a cornerstone of NASA's prime mission and the One NASA Initiative," Brown said. "In today's environment, partnering is often the best way to tackle tough problems shared by many."

International Trade Bridge Inc. (ITB) on Merritt Island works with NASA's AP2 office to identify ways to reduce or prevent pollution and find common opportunities within several organizations to initiate partnerships for testing and research on new technologies. For example, the new coatings being tested at KSC and NASA's Marshall Space Flight Center in Alabama may have applications for the Constellation Program's alloys.

Brian Greene, ITB principal senior engineer, said current suppliers Space Shuttle Program products, such as coatings, could change the composition of their materials, making them unusable for KSC's needs.

Because the space program's requirements are so unique, Greene said it's important to keep a close eye on industry trends.

When the AP2 office receives a request for a new product or process, ITB seeks alternative technologies and brings the experts on alternative products and processes together with the end users, so they can make decisions based on the most reliable recommendations.

"Reducing environmental risk, sharing or reducing costs, getting



INTERNATIONAL TRADE Bridge engineer John Herrington (left), ASRC Aerospace Corporation corrosion engineer Jerry Curran, and NASA AP2 senior principal engineer Kevin Andrews compare several urethane replacement coating test panels inside the Corrosion Technology Lab.

input and performance requirements from the end user, and exchanging knowledge allows for increased technical information sharing and a better end product," Greene said.

Some eco-friendly products or processes currently being tested at KSC or other NASA centers include a portable laser coating removal system for ground support equipment, low-emission surface

depainting for structural steel, low-temperature powder coatings, non-chrome coating systems, and a lead-free solder product.

The AP2 office, along with the Portuguese Center for Pollution Prevention, co-host an annual technical workshop showcasing innovative and emerging technologies. This year's workshop will be held in Colorado Springs, Colo.

Need to use the O&C Mission Briefing Room?

Alison Van Cleef is the new point of contact for the Operations and Checkout Building's Mission Briefing Room (MBR). The following information is needed in order to reserve the MBR:

- Date, time, and subject of the meeting
- Requestor's name, company and phone number
- Approximate number of people attending the meeting
- Communication requirements and room layout (forms are available from Van Cleef at 867-9406 or Beth.VanCleaf-1@ksc.nasa.gov.)

The requester is responsible for providing communication requirements (teleconference, microphones, etc.) and room layout forms showing the arrangement of chairs and/or tables no later than the Wednesday two weeks prior to the meeting. The "Conference room O&C/MBR" has now been set up on Microsoft Outlook for all NASA employees to view. If you want to set up a meeting in the MBR, please send an e-mail to the "Conference room O&C/MBR" and be sure to include a point of contact and phone number.



John F. Kennedy Space Center

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