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Spaceport News

America's gateway to the universe. Leading the world in preparing and launching missions to Earth and beyond.

John F. Kennedy Space Center

Floyd avoids; KSC stands strong

"The storm of the century," as Hurricane Floyd was so named during its approach to America's spacecoast two weeks ago, narrowly turned to avoid making landfall in Florida, but not without leaving its watermark.

The mammoth hurricane managed to complicate the lives of more 12,500 KSC workers, who returned to the space center on Thursday, Sept. 16, after a two-day interruption from normal activities.

In the largest peacetime evacuation in United States history, nearly 2.6 million people all along the southern Atlantic coast were told to get out of Floyd's way. Kennedy Space Center employees did so, but not before they secured the spaceport to face what could have been the worst natural disaster to strike

(See Floyd, Page 4)

Hurricane Floyd approached the Sunshine State on Sept. 14, forcing the evacuation of more than a million people from the Space Coast. Photo credit: The National Oceanic and Atmospheric Administration.

"I wish to congratulate the KSC Team for a professional and orderly response to preparing for and responding to Hurricane Floyd. I also recognize that many of these activities were carried out at the same time that the Team was trying to ensure the safety of their families, friends and property. The outstanding planning and execution of the equipment protection, personnel evacuation, and storm ride-out by the KSC Team truly deserves recognition for a job well done under extremely difficult circumstances."

— Joseph Rothenberg
Associate Administrator, Office of Space Flight

Mission update

STS-103

Based on the progress of wiring inspections and repairs on Discovery, Shuttle managers placed priority on launching mission STS-103, the Hubble Space Telescope Servicing Mission 3A, as the next Shuttle flight.

Discovery is now planned for launch no earlier than Nov. 19, although a target launch date will continue to be assessed as the inspections and repairs continue. Because the area under the liner of Discovery's payload bay has been more easily accessible, the planned wiring work has progressed more quickly on Discovery than it has on Endeavour.

The decision to plan STS-

(See Missions, Page 8)

What on Earth is happening with space technology?

Among the many acronyms in use at Kennedy Space Center, "STC" has gained increased prominence. Center Director Roy Bridges often referred to the concept of a Spaceport Technology Center, or STC, during his most recent address to employees. The title sums up KSC's transition to a place in which development activities are just as vital and visible as operations.

Though the future tense usually accompanies any mention of the Spaceport Technology Center, advanced technological development is thriving in KSC's present.

Throughout KSC, government and contractor personnel, often working in conjunction with other NASA centers, academic institutions or commercial outfits, are pursuing projects that push the Spaceport Technology Center from concept to reality.

In many cases, the projects are likely to yield commercial applications, further solidifying KSC's relations with industrial partners and customers. As space initiatives continue to grow increasingly

(See Technology, Page 2)

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Technology ...

(Continued from Page 1)

commercial, such partnerships strengthen the center's position for the future.

The essence of research and technology development at KSC involves fast-response problem-solving and design techniques, as well as more long-term endeavors geared toward critical operations technology. KSC's most recent report on research and technology includes 81 separate projects in differing stages of development.

These projects share a common DNA, arising from Kennedy's function as the NASA Center of Excellence for Launch and Payload Processing.

Within that framework resides a great variety of pursuits, covering such areas as life sciences, mechanical engineering, environmental engineering, advanced software, atmospheric science, materials science, nondestructive evaluation, process and industrial engineering, automation and robotics and electronics and instrumentation.

In the first of a series of articles on technology development, here is a look at some projects being pursued at KSC.

Hurricane Wind Sensor

It began in 1990 as a prototype that Jan Zysko of the Technology Development office crafted privately in his garage.

Having worked with wind sensors since 1975, he was certain that the conventional devices of the day could be improved upon.

Zysko's pursuit eventually gained the interest of officials from the National Oceanic and Atmospheric Administration (NOAA), which noted that no reliable, land-based measurements of wind speeds were made during Hurricane Andrew in 1992.

All known sensors in the hurricane's path of maximum wind had been destroyed.

NOAA requested the development of a sensor that could withstand winds from hurricanes and tornadoes of up to 300 miles per hour.

The project also suited a particular need at KSC, where such a sensor would allow engineering assessments of buildings, ground support equipment and flight hardware in the wake of a hurricane or tornado.

Funding came from the Center Director's Discretionary Fund in 1997, and Zysko's office began work in collaboration with a contractor, Dynacs Engineering Co., Inc.

In 1998, the team developed the first of three generations of prototype units featuring a 3-inch metal rod as the sensing element.

The sensor measures the aerodynamic force imparted to the rod, which is comparable to the force on a pencil held in someone's hand outside the window of a moving car.

The sensor is superior to existing technology because it has no moving parts. Conventional wind sensors use either propellers or rotating cups, which can break and whose bearings can wear out.

The older sensors also are subject to the effects of inertia, which can skew readings.

Zysko said the current version is accurate up to 150 mph as tested in a wind tunnel at Embry Riddle Aeronautical University in Daytona Beach, and higher speed testing on the unit will continue at Langley Research Center.

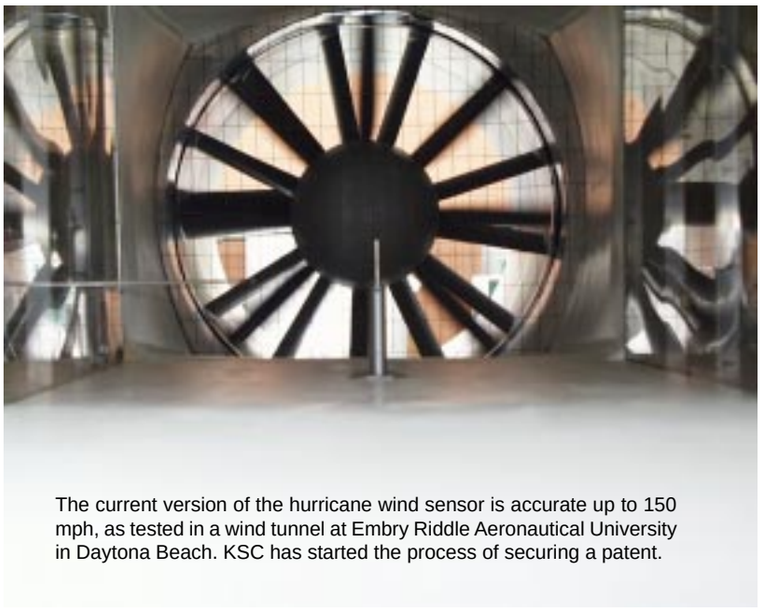
The engineers considered setting up the unit at KSC during the recent approach of Hurricane Floyd, but time constraints and uncertainty about the storm's path made the plans impractical.

Zysko said there is a possibility of having a unit ready for field deployment before the end of the current hurricane season.

Even though the next phase of the project — development of a mounting device — remains a challenge, the diminutive sensor already has become something of a lightning rod for industry.

KSC has started the process of securing a patent.

"A couple of companies are interested in licensing the technology. It has great commercial potential," Zysko said. "NOAA has indicated they would dearly love to have 100 of these to put out in anticipating a hurricane."



The current version of the hurricane wind sensor is accurate up to 150 mph, as tested in a wind tunnel at Embry Riddle Aeronautical University in Daytona Beach. KSC has started the process of securing a patent.

KSC's remote manipulator system helps scientists gather valuable data without disturbing controlled environments.

Advanced Life Support Automated Remote Manipulator

This project resulted from the Advanced Life Support office's need for an improved means of monitoring the plants growing in controlled environments.

The Automated Ground Support Systems Laboratory responded with a device that gives scientists precise measurements without disrupting the conditions in its experimental chamber.

As part of the Biomass Production Chamber breadboard project, KSC transformed an Apollo-era altitude chamber into a facility in which crops such as potatoes and wheat can be grown.

The chamber, known as the Controlled Ecological Life Support System (or CELSS), is part of experiments designed to help NASA understand how to grow crops in space for moon or Mars bases. The Advanced Life Support Automated Remote Manipulator (ALSARM) grew out of a flaw in the experiment: When technicians entered the chamber to take environmental measurements, their presence disturbed the carefully controlled conditions.

In addition to the leak effect caused by the opening of the chamber door, the technicians brought carbon dioxide and organic products into the chamber.

ALSARM, a joint effort of KSC and the University of Central Florida (UCF), addresses those problems by using a completely

(See ALSARM, Page 3)

Keeping customers satisfied at KSC

Satisfying customers' needs is what KSC employees strive to do every day, but an even greater emphasis will be given to that goal during October. A number of special activities are planned at Kennedy Space Center to educate employees and increase awareness of just what great customer service means. The timing is right, since October is Quality Month, and Oct. 4-8 is National Customer Service Week.

Federal budget cuts and increased competition from launch sites across the world have caused managers and workers at Kennedy Space Center to begin rethinking the way KSC deals with customers.

"KSC has come a long way in recognizing who our customers are, the importance of those relationships, and the necessity to build strong partnerships through top-notch customer service," said Linda Buckles, customer advocacy manager in the Business Innovation Group.

"We are government, but we are not immune to comparisons that our customers make about our launch services," she continued. "In fact, as a premier launch site we are often expected to offer more than the others."

One of the highlights of the week will be a discussion of customer relations given by Michael Bonsignore, Honeywell's chief executive officer. The program will be held on Oct. 8, at 10:30 a.m. in the Training Auditorium. Honeywell has not only focused on customers' needs, but, in their own terms, they have made the customer the "center of the universe."

Bonsignore offers valuable insight for KSC in building customer focus systems, Buckles said.

All KSC employees are encouraged to attend the Oct. 8 program in order to learn more about maintaining and building customer relationships.

"With customer expectations in mind, and as our emphasis shifts towards development via the Spaceport Technology Center, KSC will be offering our services not only to our current customers, but to new customers as well," Buckles said. "Given the comparisons that are being made and the reputation that we must maintain, we are forced to understand these new customers' goals and to customize our services to respond. We need to measure the level of customer satisfaction with our services, and improve areas that are not meeting our customers' needs. That is one of the primary goals of the KSC Customer Advocacy Team."

According to Deputy Director for Launch and Payload Processing Loren Shriver: "KSC will need to continue our close coordination in partnerships with current and new customers to insure we are providing needed products and services as we evolve to the Spaceport Technology Center of our vision."

Cards with these customer care tips will be distributed to all NASA employees at KSC in conjunction with the national Customer Service week in October.

ALSARM ...

(Continued from Page 2)

automated robotic sensor system to monitor the growth chambers.

Now fully installed in the facility at Hangar L, ALSARM gives biologists a non-intrusive means of measuring luminescence, temperature in various locations, wind speed and direction and relative humidity and other factors.

"The instrumentation part is finished," said Bill Jones of the Automated Ground Support Systems Laboratory. "Now we're looking at putting in an end-effector that would actually pick the plants and put them in an air lock. That project is ongoing, and right now it's being worked with UCF and NASA/KSC."

Minority Business Awards announced

NASA recently announced the winners of its 1999 Minority Business awards. The winners of the three top awards are:

- Minority Contractor of the Year: Dynacs Corp., Bal Harbour, Fla.;
- Minority Subcontractor of the Year: Information Dynamics Inc., McLean, Va.; and
- Women-Owned Business of the Year: Dynamac Corp., Rockville, Md.

Nominated by Kennedy Space Center, Dynacs Corp. provides technical support for research, development and engineering projects in the Space Shuttle program. Dynacs is one of the most prolific producers of innovations at NASA, having developed 58 new technologies since 1998.

This feat put Kennedy Space Center second among NASA centers in patent applications.

Dynacs Corp., which also won in 1997, is the first company to win the Minority Contractor of the Year award twice.

Information Dynamics Inc. (now InDyne, Inc.), a subcontractor at NASA Headquarters, Washington, D.C., supports the information technology requirements for NASA's offices of Earth Science and Space Science.

The company develops computer applications, focusing on Internet-based and client-server applications.

Because of the company's work, the White House and the U.S. Congress have recognized both offices' Web sites.

Dynamac Corp., also nominated by the Kennedy Space Center, is the first back-to-back recipient of the Women-Owned Business of the Year Award. Dynamac provides technical expertise for NASA's biological research, environmental monitoring, life science flight experiments, biomedical operations and occupational-health programs.

During a recognition ceremony on Sept. 21 at NASA Headquarters, NASA also presented Jackson & Tull Chartered Engineers, Greenbelt, Md., and Rush Construction, Tallahassee, Fla., with the Agency's Special Recognition Award for their support and accomplishments.

Five of NASA's field centers and several NASA employees were recognized for their outstanding contributions and innovative approaches to using minority and women-owned businesses.

In addition, David Ortiz, procurement center representative with the U.S. Small Business Administration, was presented with a Special Recognition Award for using a NASA initiative to match a minority business with a multi-million-dollar, multi-year award at another federal agency.

For more information and a full list of winners, visit the NASA Office of Small and Disadvantaged Business Web site at *http://www.hq.nasa.gov/office/codek/*

Floyd ...

(Continued from Page 1)

Brevard County and Florida — ever.

Forecasters expected the storm to reach catastrophic proportions with winds blowing in excess of 156 mph. That would have made it a Category 5 storm, only the third such storm to hit the United States this century.

Measuring about 800 miles across, the storm posed a real threat to the barrier islands — from Cape Canaveral to Melbourne Beach — coming from a storm surge that could have been in excess of 20 feet in the event of a direct hit.

KSC workers got a head start on implementation of the center's standard hurricane preparedness plan over the weekend preceding Hurricane Floyd's arrival.

All possible steps to protect Shuttle flight hardware, payloads, equipment and facilities were accomplished at KSC by at least 24 hours before the storm's predicted arrival.

Workers closed the payload bay doors on all orbiters and protected the landing gear as part of standard hurricane protection efforts. Shuttle and payload test equipment was raised above floor level to avert flood damage.

The Rotating Service Structures at Launch Pads 39A and 39B were rotated back to the Fixed Service Structures to maximize protection from high winds, and 15 solid rocket booster segments and four end cones were transported to Chattahoochee, Fla., by rail for protection from Floyd.

In the Space Station Processing Facility, the International Space Station flight hardware was already elevated in test stands, but was also covered for protection from the storm. Test equipment also was elevated and covered.

The Shuttle Radar Topography Mission payload rode out the storm in the Space Station Processing Facility high bay inside the payload canister with the doors closed. In the Payload Hazardous Servicing Facility, the Hubble Space Telescope flight elements were bagged and the test equipment was covered.

Besides protecting the orbiters and payloads within the facilities, the buildings themselves were secured. This included boarding windows, removing or tying down antennas and sandbagging doors. Kennedy Space Center's elevation is approximately nine feet, so a concern for water intrusion exists in the event of a storm surge.

"The entire KSC team did a superb job of planning our hurricane protection measures and then executing those plans in approximately one day," noted KSC Director Roy Bridges.

A Hurricane Ride-Out Team of 105 employees stayed at Kennedy Space Center during the storm.

"They stayed behind to protect our critical flight hardware and ground support equipment," said Bridges. "Without their courageous actions, we would have certainly lost our ability to control the environment in our payload processing and orbiter processing facilities.

"For example, they were able to restore operations of our chiller plant during the storm and kept our critical payload facilities within specifications," he added.

Power was maintained to chiller equipment and air handling systems at the Space Station Processing Facility and other payload facilities except for brief outages.

These were restored within five to 10 minutes in each case, and the temperature and humidity standards for all the payloads were maintained.

"They also had to be prepared at home in advance so they could stay behind," Bridges pointed out. "I know that family separations during the biggest evacuation in recent history were stressful for all. I just want you all to know that it was appreciated and saved one-of-a-kind flight hardware from nearly certain damage."

NASA Administrator Daniel Goldin noted that "it has been validated once again that our

A guard shack near Launch Complex 41 (above) suffered some jostling from high winds during Hurricane Floyd, while a relay antenna (below) behind Launch Pad 39B toppled over into the water during the storm. Various antenna systems around KSC received light to moderate damage, all of which is repairable.

KSC's hurricane plans call for protective measures, such as boarding up windows and placing sandbags around susceptible areas. When Hurricane Floyd neared the Space Coast on Monday, Sept. 13, workers executed those protective measures in a day. Here, the Vehicle Assembly Building was reflected in the windows of the Operations Support Building (OSB) as workers placed plywood barriers on the windows Sept. 23, 1998, as part of a precautionary plan before Hurricane Georges threatened Central Florida.

At Cape Canaveral Air Station's Complex 5/6, a Redstone rocket (above) lies broken on the pad after Hurricane Floyd passed along the East Coast of Florida, Sept. 14-15. Still standing behind it are the Explorer I (center) and Jupiter C (right) rockets. The complex, now dismantled, was the site of the first manned launch May 5, 1961. At a weather tower located between Shuttle Launch Pad 39A and Launch Complex 41, the highest winds recorded during the superstorm were 91 mph from the NNW at 4:50 a.m. on Wednesday, Sept. 15. The maximum sustained winds were recorded at 66 mph. The highest amount of rain recorded at KSC was 2.82 inches as the eye of Hurricane Floyd passed 121 miles east of Cape Canaveral at 4 a.m. Wednesday. The east side of the Vehicle Assembly Building (below) shows missing panels around the leaves of the upper door, the effect of the high winds from Hurricane Floyd. There appeared to be no major damage to NASA assets, including the launch pads, the four Space Shuttle orbiters and flight hardware.

greatest national treaures are our employees."

Bridges added that KSC will reassess its performance from Floyd with an eye to improving the robustness of its facilities and procedures to weather such potent hurricanes in the future.

During Hurricane Floyd's approach, NASA officials had expressed concern that Floyd's fiercest winds could wreak significant damage on the hangars housing the Agency's orbiters.

Three of the orbiters were parked in the Orbiter Processing Facilities, built to withstand 105 mph winds, while Atlantis was in the 525-foot-high Vehicle Assembly Building, designed to handle 125 mph winds. Other payload and flight hardware support facilities can endure winds of 110 mph.

The highest wind recorded at the space center was 91 mph at 4:50 a.m. on Sept. 18.

An assessment later that day showed that most of the storm damage was institutional in nature.

The east side of theVehicle Assembly Building (VAB) shows missing panels around the leaves of the upper door — the effect of the high winds — and some VAB siding panels are blown off of the east and west sides of the building; however, there was no structural damage.

Blowing rain caused some water intrusion underneath hangar doors at the Orbiter Processing Facility high bays, the doors of the adjacent main engine maintenance facility, and the north door of the VAB transfer aisle.

There is minor damage at Pad 39-B from damage to the weather protection that encloses the primary pad electrical system. Various antenna systems around KSC also received light to moderate damage, all of which is repairable.

There was roof damage, which caused some leakage, to the Canister Rotation Facility. As a result, repairs to the electrical and mechanical equipment within the facility are necessary. In the interim, the payload canisters will be rotated in the VAB.

A railroad spur running alongside Launch Pad 39A and 39B is covered with debris washed up by Hurricane Floyd. Numerous signs were blown over, some trees are felled and two traffic lights were fully down.

Four rockets with a total value of $825 million remained secured to their launch pads at Cape Canaveral Air Station, adjacent to Kennedy Space Center.

Two NASA facilities in Virginia — Wallops Flight Facility and Langley Research Center — were closed Thursday as Floyd passed through.

Just east of Kennedy Space Center's Launch Complex 39, Pads A & B (Pad 39B is seen upper left), sea-oat-covered sand dunes along the Atlantic Ocean show the effect of wind and high water from Hurricane Floyd.

"I salute the NASA employees for their preparedness and responsiveness during the threat of Hurricane Floyd," said Goldin. "My deepest appreciation goes to the 105 volunteers at KSC who rode out the storm. The willingness of the NASA team to protect our nation's assets is the hallmark of what makes us great."

Although the damage turned out to be minor, Floyd ranked among the closest calls with bad weather ever experienced at the Kennedy Space Center.

Goldin told CNN that "God has been good to us. We look like we dodged a bullet." He added that Floyd's close call rang "a warning bell."

In a special message to NASA employees, Goldin stated that "the President, the Vice President and the Federal Emergency Management Administration Administrator each called me to convey their concern. The President particularly expressed his commitment to preserving and protecting the space assets of our country."

Celebrate wild things at Merritt Island National Wildlife Refuge

On Saturday, Oct. 16, the Merritt Island National Wildlife Refuge will sponsor live animal exhibits, educational activities for children, a free fishing clinic, free kayak tours, special wildlife and habitat demonstrations along with special 'discover your refuge' tours. The goal of the day-long free celebration will be to raise awareness, appreciation and understanding of the values of Merritt Island National Wildlife Refuge.

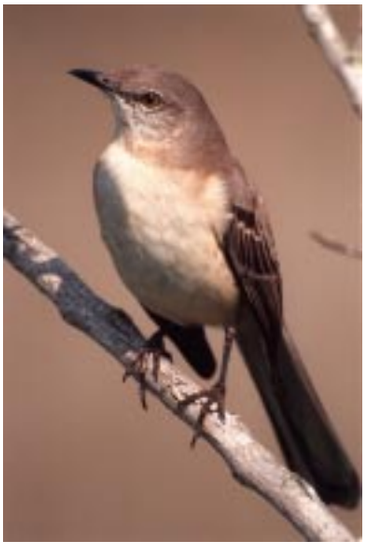
"We hope that all residents will consider this an open invitation to come learn about and enjoy our rich wildlife resources that are found on our national wildlife refuges," said Ron Hight, refuge manager at Merritt Island National Wildlife Refuge.

Live animal exhibits will be showcased at the refuge's Visitor Information Center from 11 a.m. to 3 p.m. They will include live raptors and a bald eagle from the Audobon Center for Birds of Prey; live native Florida wildlife, such as a gopher tortoise and snakes, a live alligator and a crocodile from the Florida Fish and Wildlife Conservation Commission; and a living aquarium exhibit from the Department of Environmental Protection.

Also at the Visitor Information Center, KSC's Dynamac Corporation will exhibit special wildlife technology demonstrations, and the Native Plant Society will offer native plants for sale. Children visiting the center will have a special opportunity to build birdhouses and feeders and get their faces painted.

Highlighting the day's events will be a self-guided 'discover your refuge' tour, where participants following a designated route will discover many species of wildlife, including eagles, scrub jays and manatees.

At left, an alligator lurks in the murky, mossy waters of the Merritt Island National Wildlife Refuge at Kennedy Space Center. Its tail surfaces behind him, looking like a log in the water. The wildlife refuge harbors nearly 5,000 American alligators, some of which can be seen in the canals and ponds around KSC. The open water provides wintering areas for 23 species of migratory waterfowl and a year-round home for great blue herons, great egrets, wood storks, cormorants, brown pelicans and other species of marsh and shore birds.



Above, a mockingbird perches on a limb in the Merritt Island National Wildlife Refuge. Mockingbirds are very vocal, often imitating the sounds of other birds. Besides providing a winter home for mockingbirds, the refuge provides wintering areas for 23 species of migratory waterfowl, as well as a year-round home for great blue herons, great egrets, wood storks, cormorants, brown pelicans and other species of birds. The 92,000-acre refuge is also habitat for more than 331 species of birds, 31 mammals, 117 fishes and 65 amphibians and reptiles.

Also along the route, stops will include demonstrations on songbird mistnetting and banding, live fish seining in the salt marsh, waterfowl and wading bird identification, and invasive plant species, among others. At each stop, participants will get their tour map stamped and obtain information on different species of wildlife and habitat and learn how they can help to protect them. Each participant who completes the tour will receive a bag filled with goodies from the refuge.

Additional activities for the event include a free youth fishing clinic at the refuge fishing pond from 9 a.m. to 3 p.m. conducted by the Space Coast Sportfishing Foundation.

The fishing clinic will give hands-on experience and education on fishing, including casting, knot tying and baiting.

Bait will be provided, but a limited number of fishing rods will be available, so participants are encouraged to bring their own.

Osprey Outfitters will offer free kayak tours from the northwest corner of Haulover Canal in the Indian River Lagoon.

The kayak tours will be offered at 9 a.m., 11 a.m. and 1 p.m. and will be limited to 28 persons on each trip.

The Save the Manatee Club will hold a membership drive at the refuge's Manatee Observation Deck and will be available for visitors to answer questions and provide educational information about how people can help protect manatees.

Canaveral National Seashore will hold a special program from 10 to 11:30 a.m. on Oct. 16 at Eddy Creek Pavilion as part of the Wild Things Celebration.

'Sea Turtle Adventure' will explore the different species of sea turtles, how they nest and what is affecting their survival. If a nest is available, the group will have the opportunity to excavate it to check for baby sea turtles.

With this and other events on wildlife refuges across the country, the Fish and Wildlife Service announces the fifth annual National Wildlife Refuge Week Celebration from Oct. 10-16.

For more information, call the Merritt Island National Wildlife Refuge at (407) 861-0667.

The event will be coordinated from the refuge's Visitor Information Center, located four miles east of US 1 on State Road 402 in Titusville.

A black-necked stilt waits near its nesting mate nest in the Merritt Island National Wildlife Refuge, which shares a boundary with Kennedy Space Center. Stilts usually produce three or four brown-spotted buff eggs in a shallow depression lined with grass or shell fragments. In the nesting season they are particularly agressive. Stilts are identified by a distinct head pattern of black and white, very long red legs, and straight, very thin bill. Their habitat is salt marshes and shallow coastal bays from Delaware and northern South America in the East, and freshwater marshes from Oregon and Saskatchewan to the Gulf Coast.

Expo '99 scheduled for Oct. 27

The Business Opportunities Expo '99 will be held from 9 a.m. to 3 p.m. on Oct. 27 in Cruise Terminal No. 5 at Port Canaveral. The annual trade show will feature 129 exhibitors and a contractor award presentation.

Exhibitors will include vendors from a variety of product and service areas, including computer technology, printed circuit boards, safety products and more. The public is invited, so attendees will be able to interact with community and business leaders from throughout Brevard.

Although the Expo is well attended each year, organizers would like to see more KSC employees take advantage of this networking opportunity.

"The truth is that they'll be saving time in the long run because they'll have more ideas about where to go to get a particular product or service instead of scrambling for the information when the need arises," said Celene Morgan, small business liaison with NASA's Central Industry Assistance Office.

Morgan's office provides support to small businesses who want to do business at KSC. Her office works with the NASA/KSC Small Business Council — led by United Space Alliance, The Boeing Co., Space Gateway Support and Dynacs Engineering Inc. — to help small businesses learn how to navigate in the world of government contracting.

By co-sponsoring the Expo, the Council helps provide a one-stop environment for buyers and sellers, where both parties can benefit. Other sponsors of the event are the 45th Space Wing and the Canaveral Port Authority.

Contractor awards from NASA KSC will be presented at 9 a.m. Companies being honored this year include Boeing, Dynacs Engineering, Dynamac Corp., Jack B. Kelley Inc., Oneida Construction, Chemko Technical Services, and Analex Corp.

Safe Haven underway, strengthening KSC's hurricane preparedness

The Butler Building at Kennedy Space Center was recently demolished, with the help of the crane in the background. The building, which is near the Orbiter Processing Facility (far right), was demolished in order to extend the crawlerway leading to the high bay of the Vehicle Assembly Building (VAB), part of KSC's Safe Haven project. The goal of Safe Haven is to strengthen readiness for Florida's hurricane season by expanding the VAB's storage capacity. Construction includes outfitting the VAB with a third stacking area, in high bay 2, that will allow NASA to preassemble stacks and still have room in the VAB to pull a Shuttle back from the pad into the safety of the VAB if severe weather threatens. The VAB can withstand winds up to 125 mph.

New technical records center celebrated

NASA and Boeing celebrated the opening of a new NASA Technical Records Center in a ribbon-cutting ceremony on Sept. 21.

The building is "a testimony to the idea of partnership that we are trying to build at the spaceport," noted KSC Director Roy Bridges at the ceremony. "We will be better served not only by the building, but also by the act of partnership."

The new facility, completed in June, solved several space issues for NASA and Boeing through an innovative agreement and excellent teamwork.

Boeing gained the space they needed to support their new Delta IV program and NASA gained a new records storage site. Center Director Roy Bridges and other officials attended the ceremony.

The construction of this 14,000 square foot facility is an excellent example of a successful 'win-win' solution that benefits Boeing, NASA and several other contractors," said Bridges, "and it has advantages over the previous site, such as being more accessible for KSC employees, and having the capability to expand. I am pleased that we could work together with Boeing in solving both our needs."

The need for a new records facility surfaced when the Air Force awarded a contract to the Boeing Company for the Delta IV/ Evolved Expendable Launch Vehicle (EELV). Boeing then required use of the Launch Complex 37 (LC 37) blockhouse that had served as NASA's storage site for technical records since the mid-1980s. When no suitable existing site could be found for NASA to relocate to, Boeing agreed to provide a suitable replacement facility and to relocate the NASA records.

NASA at KSC then agreed to transfer the LC-37 blockhouse (Building 33000) to the 45th Space Wing of the Air Force to support Boeing's Delta IV/EELV contract.

Boeing completed the 14,110-square-foot NASA Technical Records Center in record time. By late June they began moving records and personnel into the new facility. The building is on the southern perimeter of the NASA Education and Training Center on 2nd Street and B Avenue in the KSC Industrial Area. Besides NASA, other organizations that will utilize the center are United Space Alliance/Troutman Technical Services; Space Gateway Support/ InDyne Inc.; and the Defense Contract Audit Agency.

The new NASA Technical Records Center has several advantages over the former site. The building not only is larger, but also has improved lighting and safety factors, and the location makes it much more accessible for customer use.

Because it is located within the KSC Industrial Area, employees no longer have to drive 20 miles each way to pick up or deliver drawings, nor does it have to be evacuated during manned and unmanned launches. The center is more efficiently arranged for storage and is designed to enable future expansion.

Above, Center Director Roy Bridges (third from right) was joined by contractor officials on Sept. 21 to dedicate the new NASA Technical Records Center. Relocated from the LC 37 blockhouse, technical records now reside in Building M6-489, which is in the south parking area between Second Street and B Avenue in the KSC Industrial Area. The move was dictated by Boeing's need for the blockhouse to support their new Delta IV contract. The new location is more accessible and is designed for future expansion.

Missions ...

(Continued from Page 1)

103 as the next Shuttle flight was based on that progress.

STS-99

Managers also continue working toward a possible launch of Endeavour this year on mission STS-99, the Space Radar Topography Mission. However, according to the current status of wiring work on Endeavour, it is projected that it could be ready for a launch of STS-99 no earlier than December. Managers plan to continue to assess the progress of the wiring inspections and repairs on both orbiters weekly and to adjust target launch dates once the time required to complete the work is better understood.

Mars Climate Orbiter missing in action

NASA's first interplanetary weather satellite failed to re-establish contact with Earth after it entered Martian orbit. Mission managers stated that it probably broke up in the upper Martian atmosphere. They said the Climate Orbiter apparently came in too low and did not survive the maneuver.

After a nine-month cruise from Earth, the spacecraft fired its main engine as scheduled on Sept. 23, and five minutes later it slipped behind the Red Planet to begin what should have been its first orbit. Mission controllers at NASA's Jet Propulsion Laboratory in Pasadena, Calif., planned to regain communications with the craft at about 5:30 a.m. EST when it came around the other side. But instead, they heard nothing. Hours later, Mars Surveyor project manager Richard Cook said that "a significant navigation error had occurred" during Climate Orbiter's approach to Mars.

Artist's concept of Mars Climate Orbiter

The original plan called for the spacecraft to pass about 90 miles above the surface during its closest approach. However, Cook said a review of the telemetry showed that on Sept. 22, the estimate of closest approach had slipped to 37.5 miles. That would be about 9 miles beneath the survivability level for the spacecraft, he said.

The Mars Climate Orbiter launched Dec. 11, 1998, from Cape Canaveral Air Station.

KSC's 1999 Combined Federal Campaign kicks off today

Today marks the kickoff of KSC's annual Combined Federal Campaign (CFC) — the time for all civil service employees to reach out and support less fortunate people in the local community, our nation and throughout the world.

The kickoff rally was scheduled to occur today in the Training Auditorium.

Information concerning the campaign can be found on the KSC CFC Website at *http://cfc99.ksc.nasa.gov/*

This website, which can be used by all employees to make their contribution, is now active.

This year, a drawing from the names of all contributors will be held each week during the campaign, so the earlier in the campaign that an employee makes a contribution, the more opportunity he or she will have to be selected for one of the excellent prizes.

A grand prize will also be awarded at the conclusion of the campaign. Prizes are expected to include gift certificates to the NASA Exchange; KSC Visitor Complex Tours, including IMAX Movies and KSC Bus Tours; as well as passes to local area theme parks.

In the spirit of this year's campaign slogan — "Those who care, share" — Center Director Roy Bridges said, "Let's join together and show that we at NASA KSC are those who care and that we share!"

KSC Director Roy Bridges (right) makes his Combined Federal Campaign (CFC) contribution on-line at *http://cfc99.ksc.nasa.gov*, while Ed Markowski, training coordinator for Shuttle Processing and CFC member, looks on.

John F. Kennedy Space Center

Spaceport News

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