

Spaceport News

John F. Kennedy Space Center - America's gateway to the universe

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Recovery crew launches as STS-123 lands

By Linda Herridge
Staff Writer

As the crew of space shuttle Endeavour prepared for an evening landing at Kennedy Space Center's Shuttle Landing Facility on March 26, a crew was making preparations on the ground. A recovery crew of nearly 200 NASA and contractor workers, along with 40 vehicles, headed toward the runway with one thought on their minds - to ensure the orbiter is safe once it touches down and comes to a stop.

For United Space Alliance workers Ray Zink and Richard Van Wart, the sound of the twin sonic booms signaled the beginning of a well-orchestrated, post-landing process that involves safing the vehicle and moving it to the orbiter processing facility.

Zink is manager of shuttle recovery operations and serves as the orbiter move director after the shuttle lands. He said the pace on the runway, especially during the first hour or so after landing, is brisk as everyone works to meet timed requirements.

"We are ready, because as a team, we are focused and prepared," Zink said. "We've all studied our lines and rehearsed our parts."

The orbiter is hot during landing process but cools down quickly once on the ground. The



NASA/Kim Shiflett

A recovery crew of nearly 200 workers, along with 40 vehicles, ensure the orbiter is safe once it touches down and comes to a stop. The March 26 landing of Endeavour marked the end of the STS-123 mission, a 16-day flight to the International Space Station to deliver the first segment of the Japan Aerospace Exploration Agency's Kibo laboratory and the Canadian Space Agency's two-armed robotic system, known as Dextre.

auxiliary power units, or APUs, are running during re-entry and for about 15 minutes on the ground. They shoot red flames as they vent, which are more noticeable during night landings.

Zink said the first and most important task is to verify the orbiter is free of toxic vapors.

"Once that is confirmed, we send in crews to assist with Flight Crew egress and initiate the Purge air and Freon cooling systems," Zink said.

"Then we work to prepare the orbiter for towing."

Crew equipment and

payloads are removed. Orbiter technicians configure the external tank doors, install various plugs, inspect the landing gear and then connect the tow bar and tow vehicle to the orbiter.

Van Wart, who is an advance system technician, said this is where things get really interesting as he takes a seat in the tow vehicle and puts his foot on the accelerator.

"It takes a lot to get that 200,000 pound vehicle to start moving," Van Wart said. "It's actually a little intimidating - looking back and seeing the nose of the orbiter, then

the wings - it's massive."

Van Wart said the trip from the landing facility to the orbiter processing facility at 5 miles per hour can take one to two hours depending on which runway the orbiter lands. He said it's a challenge to get the vehicle up and over the bridge on State Road 3.

"Then as we begin the trek down the other side suddenly the orbiter is pushing me, so it's kind of like driving on ice," Van Wart said with a smile. "I can't stop, I just take my foot off the gas and the orbiter pushes me down the road."

The entire move process can take between five and nine hours depending on destow operations and even the weather.

Zink said Shuttle Recovery Operations is a classic example of how everyone works together to make even the most critical tasks seem routine.

"A typical recovery operation utilizes a number of folks representing many groups and disciplines from across the space shuttle program," Zink said. "We are all brought together for this event and it works. It works well, because we are a team."

Transition all about reinvention, reinvigoration

As you may know, NASA sent a report to Congress explaining the agency's plans for the workforce as we retire the Space Shuttle and transition to our new Constellation Program. The report is a living document and will be sent to Congress every six months. You may find it posted at www.nasa.gov/transition. We have been talking about this transition for a while now, so this information is not new, but it is the first time we have given it out in this manner.

This transition is about the reinvention and reinvigoration of NASA. Our

primary goal will continue to be carrying out our human spaceflight missions safely and effectively. We need a skilled workforce to safely fly the shuttle manifest. That skilled workforce is you. We have a lot on our plate and many exciting upcoming missions in the next few years.

I know this change will be difficult for many of us at the Kennedy Space Center. It will require open, honest communication and trust throughout this period. This will be a team effort

between NASA, KSC, and all the outstanding contractors that are a part of this team. It will require leadership at all levels.

Please know that the workforce numbers

and always will be our people. NASA is trying to identify what future work can be assigned to KSC. Several Kennedy facilities are being modified for Constellation right now.

The state provided \$35 million to help bring the Orion assembly work to KSC bringing in hundreds of jobs. And,

in just one year, we will launch the Ares I-X test flight. The future has already begun.

Our plans for Constellation ground processing will not be firmed up

until NASA competes and selects the contractor in FY09, which is well ahead of the last space shuttle mission.

We are partnering with federal, state and local agencies, so employees have options during this transition. This includes career assessments, training and career transition services.

I would like to remind you, NASA is not going out of business, but transition is necessary to enable a new line of space business for the next 30 to 50 years. Our workforce is the future, and I am proud to lead such an exceptional group of individuals here at Kennedy.

View the report

The Workforce Transition Strategy Report will be available at:

www.nasa.gov/transition and www.nasa.gov/reports

included in the report are just an estimate and should be considered preliminary at best. The exact numbers in this report should not be taken as a plan or goal.

Our greatest asset is

Modifications, changes at Kennedy already under way

By Steve Siceloff
Staff Writer

It is T-12 months and counting for the first test flight of NASA's new Ares I rocket, the booster intended to ferry astronauts to the International Space Station and later help them on their way to the moon.

The pieces of the new vehicle are starting to come together in different parts of the country and Kennedy Space Center is reshaping its own facilities to accept them and put them together for the launch in April 2009.

Here are some of the changes under way at Kennedy:

- Launch Pad 39B is being modified to host the Ares I test flight. However, the launch complex still is being kept in condition to allow a shuttle launch toward the end of the summer if one is required. The modifications to 39B include construction of a trio

of 594-foot-tall steel and fiberglass masts that will make up a new lightning protection system for the Ares I rocket.

- Bay 3 inside the Vehicle Assembly Building is being reconditioned to service the 323-foot-tall Ares I rocket. The Ares stack is nearly 140 feet taller than the space shuttle stack, so workers are revamping platforms inside the high bay that have not been used since Saturn V rockets were processed there in the 1970s.

- Workers are making enormous changes to Firing Room 1, the same control area used by Kennedy's launch team for the first space shuttle flight in 1981.

The room is expected to be used by launch controllers for the April 2009 test launch. The Ares system does not require as many controllers as the more complex shuttle, so the room is not expected to house as many consoles

and related equipment as space shuttle launches required.

- The Operations and Checkout Building's high bay is being refurbished so it can be used to work on the Orion spacecraft. It is the same area used during the Apollo program to checkout Apollo command and service modules before they were launched to the moon.

- Parachute technicians already are stitching the fabric at the Parachute Refurbishment Facility for the parachutes slated for use on the Ares test launch.

- At the Assembly and Refurbishment Facility, workers are modifying solid rocket booster skirts so they can act as the first stage for the Ares I. The test flight will use a booster that is five segments tall instead of the four segment version used by shuttles. However, the fifth segment of the Ares

test flight will be inert.

Some of the processing steps used for recent space shuttle missions have been used to help engineers learn how to handle the Ares I test flight, which is known as Ares I-X.

Engineers were able to collect information from an unusual stacking operation for STS-122 during which each booster was assembled on the mobile launch platform by itself so engineers would see what weight and balance changes the platform and crawler-transporter will encounter with the Ares I.

The shuttle also provided a proving ground for operating Constellation more efficiently, including performing a paperless power-up of an orbiter.

A prototype heat shield for the Orion spacecraft has been evaluated so new methods of moving it around during processing can be developed.

The changes highlight the first steps toward a robust and efficient spaceflight program determined to extend humanity's reach back to the moon.

The countdown to April 2009 is on.

Current revisions at a glance

- Launch Pad 39B is being modified to host Ares I test flight
- Bay 3 in VAB being reconditioned
- Firing Room 1 undergoing renovations
- Parachute technicians stitching fabric for Ares test launch
- Workers modifying solid rocket booster skirts for first stage of Aries I

Shuttle Launch Experience wins Thea Award

The new “Shuttle Launch Experience” which opened in May 2007 at the Kennedy Space Center Visitor Complex is getting high marks. The attraction was honored with a Thea Award at the 14th Annual Thea Awards Ceremony in Anaheim, Calif., on March 8.

The “Shuttle Launch Experience” was selected for outstanding achievement in the attraction category and was judged to represent the highest standards of excellence and creative achievement in the arts and sciences } of compelling places



and experiences.

The organization presenting the award, the Themed Entertainment Association, honors and celebrates excellence in the themed entertainment and experience design industry.

TEA is the only international, nonprofit association representing almost 500 companies in 39 countries who employ more than 6,500 of the

world’s leading creators, developers, designers and producers of compelling places and experiences.

The Thea Awards are internationally recognized.

This year, 120 highly qualified nominations were evaluated with 17 being selected as recipients.

Representatives who accepted the award on behalf of Kennedy Space Center were Pam Steel of NASA External Relations, Dan Leblanc of Delaware North Companies, Chuck Roberts of BRC Imagination Arts and veteran Astronaut Charlie Bolden, who serves as host for the attraction’s simulation experience.



NASA file

Former astronauts were among the first to enjoy the Shuttle Launch Experience at Kennedy’s Visitor Complex. In the front row are (from left) Rick Searfoss, Charles Bolden and Norm Thagard.

White House honors launch vehicle processing director

By Linda Herridge
Staff Writer

It’s not everyday the president of the United States recognizes the hard work and achievements of someone at Kennedy Space Center. But that’s what happened earlier this year when Launch Vehicle Processing Director Rita Willcoxon was among 23 Federal employees who received the Presidential Meritorious Rank Award during a ceremony in Washington, D.C., hosted by NASA’s Deputy Administrator Shana Dale.

“It was an honor to receive this award—and quite a surprise,” Willcoxon said. “The reason any of us receive these awards is because of the great work that the people in our organizations do to accomplish our missions.”

Each year, the president recognizes and celebrates a small group



NASA

From left are: NASA Deputy Administrator Shana Dale, Rita Willcoxon, Rita’s husband Jim, and NASA Associate Administrator Chris Scolese.

of career senior executives with the Presidents Rank Award for exceptional long-term accomplishments. Recipients of this prestigious award are strong leaders, professionals and scientists who achieve results and consistently demonstrate strength, integrity, industry and a relentless commitment to excellence in public service.

A panel of judges

reviews each candidate’s qualifications based on executive core qualifications from the past five to seven years, which include leading change, leading people, results driven, business acumen and building coalitions. Meritorious Rank Awards are awarded to only 3 percent of federal executives each year.

Willcoxon came to Kennedy in 1988 in

the Payload Operations Directorate.

She has had an exceptional career touching almost every aspect of Kennedy’s mission, including positions in shuttle processing, spaceport engineering and technology, expendable launch vehicles and payload processing.

In addition to her well-recognized contributions to Kennedy, she also has led several agency-level teams with distinction. Willcoxon has dedicated herself to Kennedy and at the agency level to ensure NASA’s exploration mission becomes a reality. She has demonstrated extreme dedication and commitment to achieving the NASA strategic goal of safely flying out the space shuttle in 2010.

Since becoming a leader in the shuttle processing organization her team has launched eight successful missions.

Over the years, Will-

coxon has earned numerous awards, including the Silver Snoopy award, two Exceptional Achievement Medals, the Outstanding Leadership Medal and an Exceptional Service Medal.

“Being a part of the shuttle program has been a highlight of my career, but I am very excited about being a part of the Constellation Program,” Willcoxon said. “There are great challenges ahead for the Kennedy workforce as we transition from shuttle into the new program but, as always, our Kennedy team will rise to the occasion.”

In receiving this award, Willcoxon follows in the footsteps of other award recipients from the Shuttle Processing organization at Kennedy, including Chief Engineer Charlie Abner, Associate Director for Engineering and Technical Operations Mike Wetmore, and Shuttle Launch Director Mike Leinbach.

Celebrating around K

2008 All-American Picnic at KARS 1

Once again, the KSC All-American Picnic provided a stress-free Saturday for employees to spend time with each other and their friends and families, and enjoy endless food and fun.

“We scored a perfect 10 on the weather which translated into strong attendance at the picnic of about 6,000 people. On behalf of the 2008 KSC All-American Picnic Team, we are very pleased our efforts resulted in so many employees and families having an enjoyable day,” Picnic Chair Jack Fox said.

During the March 29 event at Kennedy Athletic, Recreation and Social (KARS) Park, live entertainment kept the mood upbeat. The children’s carnival area with inflatable slides and tents, games and a train won more smiles.

Other activities included an automobile and motorcycle exhibition, animal rescue booths, a tiger show, rock climbing and astronaut autograph signings.

In addition to lunch, drinks, and snacks, the popular chili and dessert contests offered even more food choices.

Meals were served on biodegradable and compostable dishes, and recycling stations were located throughout the park resulting in the picnic making an environmental impact too.

Fox said the effort raised awareness and they discovered ways to improve the process next year.



NASA/Debbie Odom

Matt Nylen and Rockit performed a great rendition of The Edgar Winter Group’s Frankenstein.



NASA/Debbie Odom

There were lots of oohs and ahhs at the Car and Motorcycle Show.



NASA/Kevin O’Connell

Hundreds enjoyed the Chili Cook-Off which had three competitions: Official Chili, People’s Choice Chili and Best Store Front.



NASA/Debbie Odom

Picnic goers enjoyed hamburgers, veggie burgers, chicken sandwiches and hot dogs - and the plates and utensils eventually will become soil for use at Walt Disney World.

Kennedy Space Center

NASA Day at Space Coast Stadium

NASA and the Washington Nationals teamed up for a day of preseason baseball and space agency education on March 24.

About 5,000 fans watched Kennedy Space Center Director Bill Parsons and the Visitor Complex's Space Man mascot throw out the first pitches at Space Coast Stadium in Viera, Florida as the Nationals took on the Detroit Tigers.

NASA personnel from Kennedy Space Center answered questions from fans and handed out educational material about the agency's space exploration programs, aeronautics research and scientific discoveries.



NASA

Visitor Complex's Space Man was a hit at Space Coast Stadium on NASA Day as the Washington Nationals faced the Detroit Tigers in a Spring Training game on March 24.



NASA

Fans of all ages were successful in getting their favorite player's autograph.



NASA

Kennedy Space Center Director Bill Parsons threw out the honorary first pitch.

Testing on Ares I rocket keeps rolling along

By Steve Siceloff
Staff Writer

NASA and United Space Alliance engineers and technicians working at Kennedy Space Center tested procedures they will rely on to handle and load the propellant tanks that will be used on the roll control system of the Ares I.

The latest testing on the new Ares I rocket brought together components from an Air Force missile program with support equipment invented for handling space shuttle parts.

The evaluation is the latest in a series of studies at Kennedy leading up to the first test launch scheduled for April 2009. The flight will not carry any astronauts and mainly is a chance to evaluate the performance of the rocket during the first stage of flight.

The roll control system is a set of thrusters aligned to turn the Ares I stack soon after liftoff to line the rocket up with its proper heading. The thruster system is the same design as the one used by the Air Force's Peacekeeper missile fleet. In fact, NASA used parts of a decommissioned Peacekeeper as stand-ins during the test for the Ares I parts.

The Ares I is part of the Constellation Program. The 323-foot-tall rocket is a pencil-shaped craft that uses a five-segment solid



NASA/Kim Shiflett

A technician loads a test tank during evaluations at Kennedy Space Center for handling the Ares I roll control system. The Ares I control system is based on designs proven in other launchers.

rocket booster as a first stage and a liquid-fueled upper stage. The stack is topped with an Orion spacecraft.

The Ares I will loft astronauts to the International Space Station. Later missions call for the rocket to send Orion capsules on the first leg of a trip to the moon.

But before astronauts can ride the new spacecraft, it has to be tested in flight. And before those flight tests can begin, the people who will prepare the rockets need to learn how to do so safely.

That's where this round of testing came in.

NASA's David Tomasic, a

fluid systems engineer at Kennedy, said both the propellant system components and the ground support equipment the teams were trying out worked well. The team focused particularly on the helium tanks to find out how they would react when pressurized.

The group also studied the large titanium tanks that will hold hypergolic fuel and oxidizer. Rather than perform the test using the hazardous fuel, though, the group filled the tanks with water and measured the results.

"We learned to make some adjustments on our ground support equipment," Tomasic said. "Every-



NASA

An Ares I rocket lifts off from Kennedy Space Center in this artist's concept. The Ares I will loft the Orion spacecraft into low Earth orbit.

thing worked pretty much flawlessly."

With the evaluation behind it, the team is looking forward to the arrival in September of the components that will be used in the first Ares test flight.

"When you get hardware sitting down at KSC, you know you're moving," Tomasic said.

Local color guard to march at Veterans Day parade in D.C.

The American Veterans Color Guard, made up mostly of spaceport workers, plans to march in the 2008 National Memorial Veterans Day Parade in Washington, D.C., on May 26. Because the group has performed so well in other events, it will be positioned toward the front of the parade and march down Constitution Avenue from Capitol Hill to the White House.

Founded in 2002 by InDyne employee Gary Cassell and Space Gateway Support employee George Hoggard, the AVCG performs upon request at parades and patriotic events.

This unique group claims to represent the spaceport, as well as those who have given their lives during the many wars our country has experienced.

The color guard consists of 11 primary members and several alternates.

Members purchase their own uniforms and carry authentic, operating firearms. The group performs gun salutes on request.

About 30 AVCG members and their family hope to make the trip to Washington.

For more information on the AVCG, call Sam DiBlasio at 321-861-8824 or 321-544-7816.



NASA

American Veterans Color Guard buy their own uniforms and carry authentic, fully functional firearms.

Apollo 6 overcame obstacles on march to moon

By Kay Grinter
Reference Librarian

April 4, 1968, is remembered more often not as the day the Apollo 6 mission was launched, but as the day Rev. Martin Luther King Jr. was shot on the balcony of his Memphis hotel room. This violent act was understandably the focus of the media that day and the launch received little mention. But Dr. King's vision of working together for a common goal was apparent during the Apollo 6 mission.

"The most amazing thing about the Apollo Program was not the technology, but how all these people from all these organizations pulled together to achieve a common goal," said Joe Barfus, the test support controller of the mission.

And while all launch campaigns are challenging, the Apollo 6 mission was no exception.

The second test flight of the Saturn V without a crew lifted off Pad 39A on Kennedy Space Center at 7 a.m. April 4, 1968. Following the success of Apollo 4, the mission was conducted primarily to gain more confidence in the Saturn V while providing the launch and flight teams another rehearsal before flights with astronauts began. A command and service module, or CSM, and a boilerplate lunar module were aboard.

Transporting the vehicle to the pad eight weeks before launch was stressful. The 363-foot-tall Saturn V began moving out of the Vehicle Assembly Building just before noon. About 1:30 p.m., the winds picked up and rain began to pelt the area.

After a two-hour delay caused by a communications failure, the crawler proceeded in the driving rain. By the time the rocket reached the top of the pad shortly after 7 p.m., the storm was over.

Former NASA Shuttle Launch Director Jim Harrington was in charge of the rollout. "It was my first assignment as a senior test supervisor," he recalled. "When the communications failed, the test team in the firing room was

Remembering Our Heritage

transported by security to the crawler-transporter where we conducted the rest of the trip to the pad."

Other former NASA employees on his crew were Art Franklin, the assistant test supervisor; John Copeland, the launch vehicle test conductor; Charlie Stevens, the spacecraft test conductor; and Barfus.

The final processing of the vehicle and spacecraft at the pad was also challenging. Former NASA Shuttle Launch Director Bob Sieck was a spacecraft test team project engineer assigned to the CSM.

"The CSM carried a 'mechanical man,' a computer that was mounted in place of one of the crew seats," Sieck recalled. "Early in its testing, some fuses blew, but we couldn't find the cause. The issue was still open during the Flight Readiness Review. However, as the access blankets were being removed for flight, we discovered a clamp around one of the wire bundles had been crushed. We were relieved to solve the mystery before launch."

The launch on April 4 went smoothly, but problems with the engines developed two minutes into the flight. Thrust fluctuations caused the vehicle to bounce like a giant pogo stick for about 30 seconds. These oscillations had occurred on the first Saturn V test flight, as well, but to a lesser degree. However, except for the bouncing, the first stage did its job.

Shortly after the second stage ignited, two of its five J-2 engines stopped. The other three had to fire longer to compensate and the second stage did not reach the desired altitude and velocity before its fuel ran out. To reach the required speed, the third stage had to burn longer than planned, putting the spacecraft into an incorrect orbit.

"Had the flight been manned, the astronauts would have returned safely," Marshall Space Flight



NASA file

A bird's-eye view from the roof of the Vehicle Assembly Building as the Apollo Saturn 502 is rolled out of the VAB on its way to Launch Pad 39A. Apollo 6 was an Earth orbital mission without astronauts aboard.

Center Director Wernher von Braun emphasized afterward, "but the flight clearly left a lot to be desired. With three engines out, we just cannot go to the moon."

Investigation teams and task forces were set up to solve the engine problems. By fall, NASA managers decided that the first manned test flights could go forward.

"Apollo 6 was an important flight in other respects," Barfus

recalled. "It gave the Apollo team the opportunity to become more familiar with the launch procedures and gain additional experience at working together."

Today, the Apollo 6 command module is on display at the Fernbank Science Center in Atlanta, just a few miles from the Martin Luther King Jr. National Historic Site which is administered by the National Park Service.

WORD ON THE STREET

What Kennedy Space Center accomplishment are you most proud of and why?



"The fact I've been able to work with several contractors and the government."
Kyle Dixon, NASA Test Director

"Giving safety guidance to the test team and safety professionals."

Lisa Devries, Safety Council coordinator with USA



"Moving up the workforce ladder. I just hit the 20-year mark in February."

Barry Taylor, manager I for USA



"The pad closeouts, preparation for tanking and the Constellation planning."

Sean Black, NASA Test Director



"The successful launches. Being a newcomer, I'm like a kid in a candy store."

John Church, manager II, LPS maintenance with USA



NASA Employees of the Month: April



NASA/ Tom Farrar

From left: Herb Rice, Constellation Project Office; Renee Y. Vessels, Engineering Directorate; Kevin Clinton, Launch Services Program; Diana Kiesling, Safety & Mission Assurance Directorate; Jared Sass, Applied Technology; Lorraine Hennig, Launch Vehicle Processing Directorate; Steven L. Larsen, Engineering Directorate; Anne Marie Keim, Information Technology & Communications Services; and Mitch Rabinowitz, Center Operations. Not pictured: Matthew Jimenez, Chief Financial Office.

Pair of Toastmasters earn contest honors

Rob Mueller placed second in the Table Topics contest and Welmon Speed finished third in the International Speech contest in the 2008 International Speech and Table Topics Contest in Vero Beach on March 22.



Looking up and ahead

Camp Kennedy Spring Session begins April 7

Children entering second- to ninth-grades can attend Camp Kennedy at the U.S. Astronaut Hall of Fame from 9 a.m. to 4:30 p.m. April 7-11. Tuition is \$295 per child, but there is a 15 percent discount for badged employees and contractors of Kennedy, Cape Canaveral Air Force Station, Patrick Air Force Base and retired KSC personnel. There is extended early drop-off and late pick-up hours available free. Summer Camp sessions are available June 9 through Aug. 15. For more information and registration details, call 321-449-4444 or visit www.kennedyspacecenter.com.

Wed., April 9 10 a.m. to 1 p.m.	Women's Health Seminar OSB II 5th Floor Conference Room
Thu., April 10 2 to 4:30 p.m.	Kennedy Space Center Beach Clean Up Eagle 4 Tower, Beach Road to NASA/AF Boundary
Target Mon., April 14	Launch/CCAFS: Atlas V, ICO G1; 4:12 to 5:12 p.m.
Target May 16	Launch/CCAFS: Delta II, GLAST; 11:45 a.m. to 1:40 p.m.
Target May 31	Launch/KSC: Discovery, STS-124; at 5:01 p.m.
Target June 30	Launch/CCAFS: Delta II, GPS 2R-20 (M7); TBD
Target Aug. 2	Launch/CCAFS: Atlas V, WGS SV 2; TBD
Target Aug. 28	Launch/KSC: Atlantis, STS-125; 9:38 p.m.
Target Sept. 11	Launch/CCAFS: Delta II, GPS 2R-21 (M8); TBD
Target Oct. 16	Launch/KSC: Endeavour, STS-126; TBD
Target Oct. 28	Launch/CCAFS: Atlas V, LRO; TBD
Target November	Launch/CCAFS: Atlas V, AEHF 1; TBD
Target Dec. 4	Launch/KSC: Discovery, STS-119; TBD
Target Feb. 16, 2009	Launch/CCAFS: Delta II, Kepler
TBD	Launch/CCAFS: Delta IV-H, NROL-26; TBD
TBD	Launch/CCAFS: Delta IV, GOES-0; TBD
TBD	Launch/CCAFS: Atlas V, SDO; TBD
TBD	Launch/CCAFS: Atlas V, GPS 2F-1; TBD
TBD	Launch/CCAFS: Delta IV, WGS SV 3; TBD



John F. Kennedy Space Center

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