



THE FRONT PAGE

KSC's front door to Business Development and Research and Technology

MAY 2014

A BI-MONTHLY PUBLICATION



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Center Planning and Development (CPD) is the "front door" for partnerships with NASA's John F. Kennedy Space Center (KSC).

We are developing the world's premier spaceport for government and commercial space industries using comprehensive resource planning and partnerships.

For more information about CPD, visit <http://kscpartnerships.ksc.nasa.gov/>.

NASA, SPACE X SIGN PAD AGREEMENT

The historic site where American astronauts first launched to the moon was the location of a landmark agreement, part of NASA's continuing process to transform the Kennedy Space Center into a 21st-century spaceport.

During ceremonies April 14, agency officials announced they signed a property agreement with SpaceX of Hawthorne, California, for use and operation of Launch Pad 39A for the next 20 years.

NASA Administrator Charlie Bolden said pad A is beginning a new mission as a commercial launch site, part of an ongoing effort to collaborate with industry in meeting the agency's objectives.

"NASA today signed a property agreement with SpaceX, which allows them to develop Launch Complex 39A to serve as a platform for the company's future commercial launch activities," he said during a news briefing at the pad. "SpaceX and our other commercial partners are a critical part of our exploration strategy. This includes the (International Space Station), proving technologies in deep space, the asteroid initiative that brings an asteroid closer to Earth so astronauts can visit it and a mission to Mars in the 2030s."

Bob Cabana, Kennedy's director, noted that permitting the pad's use and operation by a commercial space partner will ensure its continued viability and allow for its ongoing use in support of the nation's space activities.

"This agreement will preserve this national asset and will enable commercial operations at Kennedy," he said. "We continue to enable commercial operations from the Cape, allowing



This view March 11, 2014, shows the flame trench where smoke and flame from the space shuttle's twin solid rocket boosters were deflected away from the pad.

them to use national assets that would otherwise sit empty and decay."

Gwynne Shotwell, president and chief operating officer of SpaceX, said her company places a high value on the significance of the launch site.

"We're honored to sign the lease a few minutes ago," she said. "Pad 39A is a historic pad. I'm so excited that NASA has selected us to be one of their partners and also to be one of their partners in developing pad 39A"

Bolden said work at these launch pads demonstrates NASA's strategy for human space exploration.

He said, "Part of NASA's charge since the beginning of President Obama's administration has been to serve as a catalyst for a vibrant commercial space industry. What we're seeing here today demonstrates one of the many ways that strategy is paying off."

By Bob Granath

Message from CPD Management

On Nov. 9, 1967, Launch Pad 39A launched Apollo 4 as the first test flight for the Saturn V launch vehicle. On July 11, 2011, pad 39A launched STS-135, the last shuttle mission aboard space shuttle Atlantis, ending almost 45 years of storied support to NASA. And on April 14, 2014, the Center Planning and Development Directorate (CPD) completed a historical transition of this Kennedy Space Center iconic landmark. Pad 39A is now slated to be used as a commercial launch site. This 20-year property agreement with Space Exploration Technologies Corp. marks a significant achievement toward implementing the vision of Kennedy as a multi-user spaceport.

In another significant milestone, toward our transition to a multi-user spaceport, NASA Headquarters recently approved the KSC Master Plan.

The Master Plan provides a framework for Kennedy's future development by identifying the possible areas where potential commercial and governmental spaceflight partners could establish operations and manufacturing sites within the KSC perimeter. The Master Plan can be viewed at <http://masterplan.ksc.nasa.gov/>.

None of these accomplishments would have been possible without the entire Kennedy team supporting our office. Almost all of the center's organizations contributed significantly toward the finalization of the pad A agreement and Master Plan. We cannot thank everyone enough for their tireless efforts to make these a success.

-- Tom Engler,
Deputy Director,

Center Planning and Development Directorate

KENNEDY'S RUNWAY SHOWS ADAPTABILITY

March 11 may prove to be the day when the plans to make Kennedy Space Center a shared spaceport showed the first practical success, according to some of the people who coordinated five unique operations at the Shuttle Landing Facility that day.

The SLF hosted NASA's Morpheus lander free-flight test that day, along with a NASCAR team conducting aerodynamic testing, the Starfighters company running its modified jet fighters through afterburner evaluations, and medical evacuation helicopters conducting safety checks and procedure tests -- all while the facility itself underwent its own construction work.

"I think it was a glimpse into the future of Kennedy Space Center," said David Cox, Partnerships Development manager at Kennedy. "To me it shows that we are really turning the corner from being a government-only focused space center to really being a commercially shared space center. It really is a huge shift in the culture."

Performance Power LLC of West Palm Beach coordinated closely with the NASCAR and Morpheus teams, along with Starfighters, to craft a precise plan that met everyone's needs said Performance Power owner Johnny Bohmer. They also met in person with the construction and helicopter safety test crews.

"We all had the same goal: let's work together," Bohmer said. "I feel like we've gone to another level and we've proven that we were able to pull off something we thought we could do. Precise coordination created a 'win-win' for everyone during the three-day testing session."

The successful formula is expected to be the basis for policies and procedures that can



The Shuttle Landing Facility is dominated by the 3.2-mile-long runway. Note the Morpheus test area just off the runway.

be repeated as the SLF takes on increasingly diverse users under Space Florida, which is in negotiations to operate and maintain the unique national asset.

"The beauty of it was that everybody was willing to give a little so no one had to give a lot," Cox said. "That willingness made it so everyone could accomplish all of their objectives. I think the first thing that we did was establish a cooperative spirit, and we had extremely effective communications and that allowed us to do so much with just a short period of time."

Typically, the runway hosts a single user each day with the occasional dual mission, such as an aircraft arriving. It will allow aircraft testing one day, car runs another and experimental rockets or unmanned aerial vehicles on another. Even that is a shift from just two years ago.

"Its primary purpose was to bring back and land orbiters and now that we're not doing that, you can find some more uses and some unique uses that you couldn't find before because you had to be available at any time for a shuttle to come back," said John Graves, who coordinates operations at the SLF for NASA's Flight Operations department.

The team of people involved

in the process credited an intense focus on communications and flexibility with getting all the work done.

"We all had the will, so we found the way," Cox said.

The number of companies anticipating using the runway seemingly grows by the day with several mentioning it as a possibility for launching flights into space straight off the runway and gliding back to it, or using the runway's vast width and 3.2-mile length to host a gigantic carrier aircraft lifting a booster to altitude for a space launch.

"We typically host three or four people wanting to take a look at the SLF for one use or another, so there's a lot of interest in coming out here," Graves said. "Hopefully what we did becomes a common occurrence and not that big of a deal."

"I think the SLF is probably one of the most conducive to these kinds of sharing activities," Cox said. "Another facility is going to be the Vehicle Assembly Building one day. I'm sure the Space Station Processing Facility could end up with a similar day-in-the-life, if you will, because it has a very open configuration that can be tailored to different customer requirements."

By Steven Siceloff

PaR Systems celebrates one year in Hangar N

Kennedy Space Center Director Bob Cabana helped mark the one-year anniversary of an agreement with PaR Systems Inc. of Shoreview, Minnesota, for use of the Hangar N facility at Cape Canaveral Air Force Station in Florida during an Open House on April 2.

"This is a unique facility that provides a critical capability to the aerospace community here at the Cape," Cabana said, "and it also employs technicians that have the highest standard of training in nondestructive test and evaluation."

Under a 15-year lease agreement, PaR Systems will operate the Hangar N facility and utilize its unique inventory of nondestructive testing (NDT) equipment. Some of the NDT systems were used during the Space Shuttle Program and could be used for NASA's Space Launch System and Orion programs.

For example, the automated X-ray system contained in the robotic inspection cell once was used to scan the aft skirts of the solid rocket boosters for the space shuttle. And recently, the X-ray system was used to scan a heat shield for the Orion spacecraft.

Brian Behm, president, Aerospace Robotics, said the commercial partnership is good for NASA, good for the local community and good for PaR Systems.

"Our partnership with NASA goes back many years, and Hangar N is only a recent example of the partnership that we had with NASA," said PaR Systems. "We think the future is bright with some good opportunities and we look forward to being a valued member of the space community."

Kennedy is positioning itself for the next era of space exploration, transitioning to a 21st-century launch facility with multiple users, both private and government.

By Linda Herridge

FORUM FOCUSES ON PARTNERSHIPS, MULTI-USER SPACEPORT

Teamed with its industry partners, NASA at the Kennedy Space Center is well on its way to establishing a multi-user spaceport to help meet America's spacefaring needs for the 21st century. Counterparts from companies that are now operating several space center facilities recently met with agency officials to discuss ongoing partnerships and plans for the center's future.

Hosted by Kennedy's Center Planning and Development Directorate, the first Partnership Landscape Forum was held on April 10, 2014. The gathering is designed to be a quarterly meeting between Kennedy leaders and current partners. The first get-together focused on how the center has changed since the end of the Space Shuttle Program and plans for the road ahead.

Center Director Bob Cabana opened the forum, noting the progress that has been made in transitioning Kennedy from a historically government-only launch facility to a multi-user spaceport.

"If you look at what we're putting in place here at Kennedy, it's pretty amazing when you consider that three years ago there was one program here that paid for everything," he said. "Now we've got multiple commercial customers, we've got a new government program, and we're utilizing these assets to become a spaceport with government and commercial operations to and from low-Earth orbit and beyond for both crew and cargo."

Center Planning and Development is the "front door" for partnerships with NASA's Kennedy Space Center. The Partnership Landscape Forum took place to promote awareness of center activities, programs and policies which may impact partnerships and existing ca-



Trey Carlson, the Kennedy Space Center's master planner, standing, describes how the Center Planning and Development Directorate is working to help transform Kennedy into a multi-user spaceport through partnerships and resource planning. The April 10, 2014, Partnership Landscape Forum was the first of what is planned to be quarterly meetings between NASA and its industry partners.

pabilities, and allow input from industry leaders.

Tom Engler, Kennedy's deputy director of Center Planning and Development, explained that as the shuttle program was winding down, NASA saw that it would be left with many key facilities that would not be needed in the immediate future.

"We invested 30 years in the shuttle program, 50 years overall at the center, and billions of dollars in capabilities that we really didn't want to lose," he said. "We've taken center facilities that we didn't need and we've found outstanding partners to be able to take advantage of those capabilities."

One example of a key partnership is Bay 3 of the shuttle era's Orbiter Processing Facility. It now is being modernized by The Boeing Company as the Commercial Crew and Cargo Processing Facility (C3PF). There, Boeing plans to prepare its CST-100 spacecraft, currently under development with the agency's Commercial Crew Program to ferry astronauts to and from low-Earth orbit.

NASA recently established a partnership with PaR Systems, Inc., for operation of Hangar

N at Cape Canaveral Air Force Station and its nondestructive testing equipment.

The agency also signed a partnership agreement with Craig Technologies to maintain unique processing and manufacturing equipment in Cape Canaveral, Florida, for future mission support at the space center. Formerly known as the NASA Shuttle Logistics Depot, in its new role. The facility is now the Aerospace and Defense Manufacturing Center.

In addition to Boeing, Craig Technologies and PaR Systems, other partners participating in the forum were Energy Florida, Sierra Nevada Corporation, Space Florida, SpaceX and United Paradyne.

Trey Carlson, NASA's master planner for Kennedy, looked further into the future and described what will guide space center activities during the next two decades.

"We have a future development concept that is fully defined for our master plan," he said. "We were the first center to go down that route and that was approved a couple of years ago. We have a master plan of how we're going to develop over the next 20 years."

That plan includes adopting new business practices allowing companies and outside organizations to make investments in the center to operate their enterprises. Operation of facilities not being used by NASA will be transferred to partners and the agency will dispose of those not needed. Where needed, new facilities will be built that are economically and environmentally sustainable and can be used by a variety of people, organizations and programs.

Engler pointed out that the effort to involve industry in operating the Kennedy Space Center is ahead of schedule.

"As we started the planning for where we were going in developing an emerging multi-user spaceport, we thought we'd get there in the 2020 to 2025 timeframe," he said. "We're basically there now. We have a multi-user spaceport and we are looking for more customers."



Paul Vona, a NonDestructive Test Services operations engineer with PaR Systems Inc., demonstrates an automated X-ray system in the robotic inspection cell in Cape Canaveral Air Force Station's Hangar N on April 2. Under a 15-year lease, PaR Systems is utilizing Hangar N and its unique nondestructive testing equipment.

By Bob Granath

SpaceX

The recent launch of the SpaceX-3 mission to the International Space Station highlighted the latest achievement in a partnership that was at first unique but now may indicate a strong alternative way for NASA to do business. The Hawthorne, California-based SpaceX is the only private company capable of launching a spacecraft to the International Space Station and return it to Earth safely. Another American company, Orbital Sciences, launches cargo spacecraft in partnership with NASA, but the cargo craft is designed to burn up in the atmosphere at the end of a mission in order to help dispose of trash and unneeded equipment from the space station.

NASA awarded the Cargo Orbital Transportation Services contract in a process begun in 2006 that led directly to successful testing and, later, full flights of the SpaceX Falcon 9 and the company's Dragon spacecraft.

SpaceX became the only private company to return a spacecraft from low-Earth orbit in December 2010. The company accomplished another milestone

in May 2012 when its Dragon spacecraft attached to the International Space Station (ISS), exchanged cargo payloads, and returned safely to Earth—a technically challenging feat never completed by a private company.

SpaceX began official cargo resupply to the ISS in October 2012, with the first of 12 commercial resupply (CRS) missions for NASA. Under a \$1.6 billion contract with NASA, SpaceX will fly at least 9 more cargo supply missions to the ISS for a total of 12.

SpaceX also is an aerospace industry partner of NASA's Commercial Crew Program and is working to adapt the Dragon to carry humans to destinations in low-Earth orbit.

By Steven Siceloff



SpaceX's Dragon flies in orbit March 12 during its resupply mission to the International Space Station.

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TECH NEWS

As Kennedy Space Center transforms from a historically government-only launch complex to a multi-user spaceport supporting a broader range of government and commercial space activities, investments in Research and Technology (R&T) will be critical for strengthening KSC's ability to continue providing important capabilities and skills to contribute to NASA's missions. Collaborative partnerships are highly valued by NASA to enable leveraging of resources and expertise and to assist our workforce in remaining current in our areas of expertise by learning from others while also enabling the transfer of technology to external parties.

The Technology Advancing Partnerships (TAP) Challenge was formulated by a Foundations of Leadership (FoL) team sponsored by the Research and Technology Management Office and the KSC Chief Technologist in 2013. The FoL team performed a comprehensive trade study of existing challenges and mechanisms and rolled their recommendations into the TAP challenge concept. The TAP Challenge will greatly impact NASA and its technology community by aligning with key goals and objectives, as well as expanding external collaborations. The TAP Challenge will allow KSC to benefit from these partnerships in areas where the workforce has identified gaps, needs, and opportunities for technology development.

NASA Kennedy Space Center released the TAP Challenge Cooperative Agreement Notice (CAN) April 16, 2014, to solicit

proposals for enhancement of the following technology needs:

- Robotics, Telerobotics and Autonomous Systems
- Human Health, Life Support and Habitation Systems
- Human Exploration Destination Systems
- Ground and Launch Systems Processing
- Modeling, Simulation, Information Technology and Processing
- Thermal Management Systems
- Communication and Navigation

The cooperative agreement award recipient is expected to cooperatively share in the development cost and interact with the appointed KSC contact on a regular basis. Proposals, due May 15, 2014, are being accepted from U.S. organizations, including educational institutions, industry and nonprofit institutions.

NASA plans to fund projects in the remainder of FY14 at approximately \$75K covering all awarded projects, with a period of performance of 12 months. It is anticipated that zero to three projects will be awarded. Project awards are contingent upon availability of funds.

The expectation is that the small amount of seed funding will be added to funding provided by the partner/team proposing. An additional expectation is that KSC will be made aware of potential partners who are interested in teaming with technologists at our center for future collaboration opportunities as well.

For additional information, email KSC-TAPChallenge@mail.nasa.gov.

Congratulations!

Alan Zide received a Silver Snoopy for his direct contribution to growing Kennedy Space Center's business base while maximizing the use of Kennedy's underutilized capabilities through technical leadership, allowing the Center to establish critical partnerships with commercial companies and other government agencies.

Robert Hubbard, was nominated for the the Rotary National Award for Space Achievement, because of his exceptional leadership and project management, ensuring continued use of NASA's Shuttle Landing Facility. An award ceremony is held annually, in Houston, to recognize nominees and recipients for their outstanding achievements in space and to create greater public awareness of the benefits of space exploration.

For more about Kennedy Space Center's Planning and Development, go to <http://kscpartnerships.ksc.nasa.gov/>