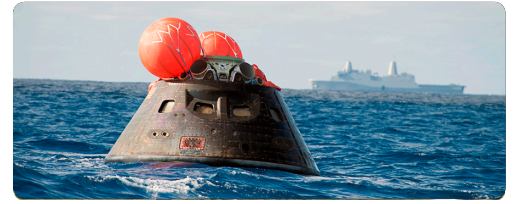
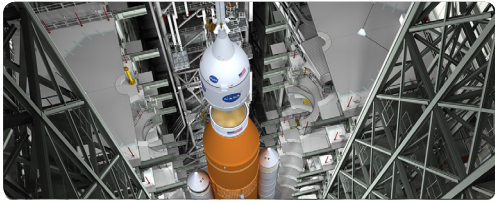




# GSDO

GROUND SYSTEMS  
DEVELOPMENT & OPERATIONS

## EXPLORATION BEGINS HERE



### PROGRAM HIGHLIGHTS • SEPT. 2016

At NASA's Kennedy Space Center in Florida, the Ground Systems Development and Operations (GSDO) Program Office is leading the center's transformation from a historically government-only launch complex to a spaceport bustling with activity involving government and commercial vehicles alike. GSDO is tasked with developing and using the complex equipment required to safely handle a variety of rockets and spacecraft during assembly, transport and launch. For more information about GSDO accomplishments happening around the center, visit <http://www.nasa.gov/groundsystems>.

## Launch Pad 39B Upgrades will Support NASA's Journey to Mars

Launch Pad 39B at NASA's Kennedy Space Center in Florida is undergoing a metamorphosis from top to bottom to support the agency's Space Launch System (SLS) rocket with the Orion spacecraft atop for their first integrated uncrewed flight test. While modifications to the surface of the pad and ongoing work in the flame trench are visible, upgrades to other systems may not be as obvious, but are vital to ensuring safe and successful launches into deep space and NASA's Journey to Mars.

"We have been steadily working a series of projects to modernize or refurbish every part of the pad," said Regina Spellman, launch pad senior project manager in the Ground Systems Development and Operations (GSDO) Program. "Upon completion of this group of projects, we are entering the home stretch in our preparation for the first launch."

These upgrades include a new communication system; new heating, ventilation and cooling system; replacement of water system piping in the pad perimeter; and installing new ignition overpressure/sound suppression bypass valves at the valve complex.



One of two new 400-ton-plus capacity cooling towers arrives at Launch Pad 39B at NASA's Kennedy Space Center Florida in July 2014. The two cooling towers will feed three new 180-ton-capacity chillers for the heating, venting and air conditioning system. Photo credit: NASA

All of these improvements are necessary to support pad prelaunch processing and launch requirements for SLS and the Orion.

"There is a feeling of excitement starting to build as Pad B nears being operational once again," said Lori Jones, an engineer and project

manager for Construction of Facilities for the pad.

GSDO is overseeing upgrades to Pad 39B and other facilities to support NASA's deep-space missions and the transition to a multi-user spaceport.

Read the full story at: <http://go.nasa.gov/2bR1uaG>.



# Multi-Payload Processing Facility Provides ‘Gas Station’ for Orion

The first stop when loading up the family car to go on a long trip usually is the gas station. Before NASA’s Orion spacecraft launches on deep-space missions, an important step to “fill ‘er up” will include a visit to the Multi-Payload Processing Facility (MPPF) at the agency’s Kennedy Space Center in Florida.

At the MPPF, Orion will receive its flight load of propellant, high pressure gases and coolant in a building where recently completed modifications now are being tested.

“After years of design work and installation of state-of-the-art equipment, we now are testing elements of the facility,” said Skip Williams, project manager for the spacecraft offline element integration team. “This is the validation and verification phase to make sure we’re ready when Orion’s crew module (CM) and its service module (SM) arrive before EM-1.”

Orion’s first flight with the Space Launch System (SLS) rocket is targeted for launch in late 2018. During the three-week mission, the spacecraft will venture 40,000 miles beyond the orbit of the moon, farther than any spacecraft built for humans has ever traveled, testing the systems needed for the agency’s Journey to Mars.

The 19,647-square-foot MPPF originally was constructed in 1995. True to its name, the facility can accommodate one or more payloads in processing at the same time depending on their size.

An example of the MPPF’s abilities included payload processing for space shuttle missions STS-95 and STS-88. Also, prior to STS-99, the large Shuttle Radar Topography Mission payload was tested and verified, occupying more than 95 percent of the facility’s high bay space.

Design work to support Orion began in 2007. The Boeing Design Lab helped develop the complex, integrated engineering strategy for the facility.

The extensive upgrades and modernizations began in 2013. It was a part of Kennedy’s Ground Systems Development and Operations Program’s overall effort to build a premier, multi-user spaceport.

“Just about everything in the building from the floor to the ceiling was modified to support Orion,” said Leo DeCesare, Construction of Facilities project manager in Kennedy Engineering.

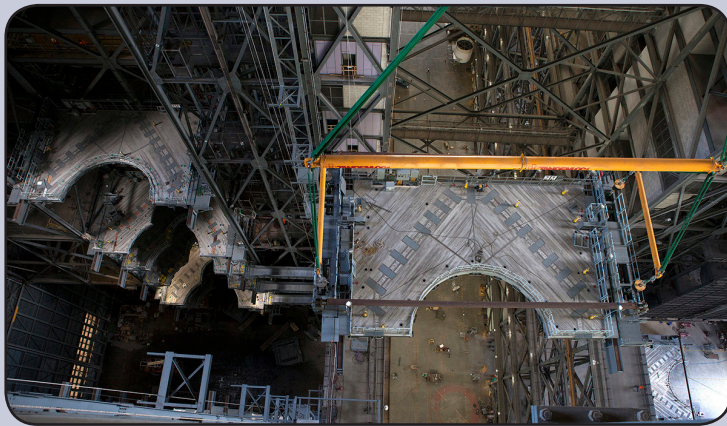
Read the full story at: <http://go.nasa.gov/2dqdWSi>.



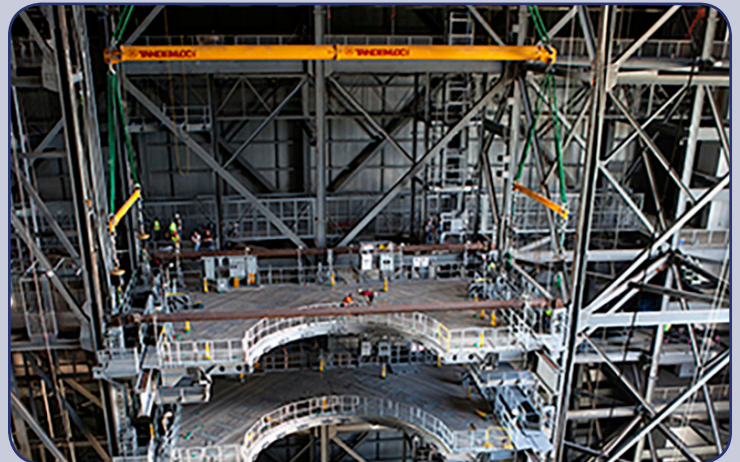
The 19,647-square-foot Multi-Payload Processing Facility, or MPPF, is where Orion will receive its flight load of propellant, high pressure gasses and coolant. After years of design work, state-of-the-art equipment now is being tested. Photo credit: NASA/Ben Smegelsky



The Orion service platform will be used for offline processing and fueling of the Orion spacecraft and service module stack before launch. Modifications now are complete with validations and testing underway. Photo credit: NASA/Ben Smegelsky



Inside the Vehicle Assembly Building, a heavy-lift crane lifts the first half of the D-level work platforms, D south, for NASA’s Space Launch System (SLS) rocket, high above the floor of the transfer aisle Aug. 29. The platform was moved into High Bay 3 for installation on the south side of the high bay. Photo credit: NASA/Kim Shiflett



The second half of the D-level work platforms, D north, was lowered into position for installation on the north side of VAB High Bay 3 Sept. 9. Photo credit: NASA/Ben Smegelsky



# Ground Systems Team Spotlight

**Dena Richmond** is a project manager with Craig Technologies on the Engineering Services Contract at Kennedy Space Center. Her primary responsibility is configuration management for the Ground Systems Development and Operations Program (GSDO), the Engineering Directorate and ISS Flight Payloads support.

For GSDO, Richmond performs configuration management activities focusing mainly on ground support equipment fabrication, assembly, installation and test activities, through acceptance data package compilation and hardware turnover for maintenance and operations.

Richmond recently was recognized by the ISS Flight Payloads customer with the prestigious Silver Snoopy Award. "To know that my payload customer took the time and effort to recognize the job I have done with one of the most coveted honors that NASA can bestow on a contractor employee is very humbling and makes me feel extremely honored and proud," Richmond said.

She has worked at Kennedy for 30 years. Her hometown is New Market, Virginia, in the Shenandoah Valley. She moved to Florida in May 1981.

Richmond earned a Bachelor of Science in information technology, with a minor in administrative systems, from Barry University in 2007.

She became interested in space in 1980. Her uncle accepted a position with ITT to work communications for the Space Shuttle Program operations and moved his family to Cocoa Beach. His wife accepted a position with Rockwell and worked in configuration management in the Launch Control Center.

"They told our family about all of the exciting things that they were doing and what was going on at the Cape to prepare for STS-1, and I was hooked," Richmond said. "When my family decided to move to Florida, I knew where I wanted to be and that was at Kennedy Space Center."

Her hopes for NASA's future exploration missions is that we once again become the leaders in space exploration and science discovery to asteroids, Mars and beyond.

Richmond's first car was a 1972 blue Ford Pinto two-door with a stick shift.

She and her husband, Kennedy, will celebrate their 37th wedding anniversary in December.



They have two pets, an eight-pound Yorkie named Angel, which according to Richmond, is not an angel most of the time, and a cat named BeBe that they adopted/rescued when she was 17.

Her hobbies include NASCAR, attending car shows with her husband in their 1965 Cobra AC replica, and being outdoors working with plants and doing gardening.

**Mike Shivel** is a logistics support specialist with ERC on the Test and Operations Support Contract at Kennedy Space Center. His main responsibilities are serving as the logistics customer support representative for north end (Launch Complex 39) for the GSDO Operations Program and logistics operations lead for Orion Landing and Recovery operations.

Shivel has worked at Kennedy for 25 years.

"One of my favorite accomplishments was watching the Orion capsule from Exploration Flight Test-1 land in the Pacific Ocean from the deck of the USS Anchorage, and successfully recovering it," Shivel said.

He said the coolest part of his job is working with a great logistics team.

He is a third-generation aerospace worker, so he was always interested in space.

"My father worked at the center for the Apollo program, so I was born to work on the space program," Shivel said.

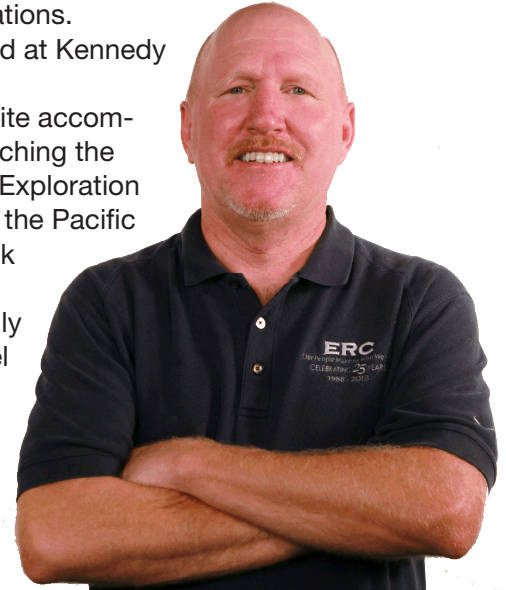
He was born in Huntsville, Alabama, and moved to Titusville, Florida, when he was two years old. He was born in Huntsville while his father was in training to operate the swing arms for the Apollo program.

He would advise students interested in working on the space program to earn a degree in one of the science, technology, engineering or math fields and work hard once they are members of the workforce.

Shivel's first car was a 1968 Mercury Cougar -- aqua with a white top.

He is married to his wife of 23 years, Caren, who is a teacher at Rockledge High School. They have two children: a son, Garrett, 16, and a daughter, Stephanie, 14. They both attend Astronaut High School in Titusville.

They have two dogs, Maggie and Ellie, and a cat named Binx. Shivel's hobbies include doing yard work and watching his children's sporting events.



# Industry Spotlight - Harris Corp.

Harris Corp. was created in 1895 by brothers Alfred and Charles Harris. The company's global headquarters is located in Melbourne, Florida.

Harris specializes in communications and information technology. It provides satellite communications antennas and payloads, satellite bandwidth services, geospatial intelligence, and ground terminal and processing systems supporting commercial, defense, intelligence and civil space missions worldwide.

According to Harris Program Manager Burt Page, the company supports the Ground Systems Development and Operations Program at Kennedy Space Center in two areas. First, the company provides a Commercial off the Shelf (COTS) telemetry, tracking and command software product called OS/COMET. OS/COMET provides the core Command Telemetry processing capability for the Space Command and Control System for the next generation Launch Control System (LCS) at multiple NASA sites. The sets include Firing Rooms 1 and 2 in the Launch Control Center, LCS development set, Marshall Space Flight Center system integration lab, and the Denver integration test lab.

The system has the ability to interpret Space Launch System (SLS) and Orion supplied telemetry and command definition data. It also has the ability to process and distribute telemetry data from ground systems, SLS, the interim cryogenic propulsion state and Orion flight elements, and can translate end-user commands to ground and flight element



*Kennedy Space Center Director Bob Cabana receives a Ground Launch Sequencer demonstration in Firing Room 1 in the Launch Control Center. At far right is EM-1 Launch Director Charlie Blackwell-Thompson. Kennedy Engineering Director Pat Simpkins is watching at far left. Photo credit: NASA*

formats.

OS/COMET provides alarm and valid range limit monitoring and determinations of health for ground and flight instrumentation measurement health, and has the capability to translate raw measurements into engineering units using specific calibrations.

The second area of support is OS/COMET engineering services for the system development support, tool configuration, troubleshooting and resolution of non-conformances, product integration and test, compatibility testing with other COTS products and platforms, documentation updates, technical reviews, analyses, prototyping and independent testing.

The company has supported most

major U.S. space programs since the 1960s. Today, Harris supports launches from Kennedy Space Center through tracking launches and spacecraft as part of NASA's Space Communications Network Services program, and also supported the Orion Exploration Flight Test-1 in December 2014.

"Harris is supporting some of NASA's most outreaching exploration and science missions today, including GSDO LCS for the Space Launch System/Orion programs," Page said. "Harris continues to stand ready to support uncrewed and crewed space exploration programs that originate from Kennedy."

Harris employs more than 6,500 people in Florida; most of them work and live on the Space Coast.

Check out the VAB platform installation midpoint in 360-degree view at:  
<https://www.youtube.com/watch?v=at3cCCstD2Q>

GSDO is Go for Launch with a Facebook Page.  
Check it out at:  
<https://www.facebook.com/NASAGOforlaunch/>



# Employee Spotlight - Steven Larson

Steven Larson is the lead design engineer for the Interim Cryogenic Propulsion Stage Umbilical (ICPSU) for the Ground Systems Development and Operations (GSDO) Program at Kennedy Space Center. He is a mechanical engineer in the Engineering Directorate supporting GSDO and has worked at Kennedy for 10 years.

His main responsibilities include designing the ICPSU system to meet program requirements. The design process includes working with all of the engineering disciplines (mechanical, electrical, cryogenics, pneumatics and hydraulics) to create an integrated design model and drawings.

Larsen served as the NASA technical representative for the fabrication contract. The ICPSU was built by Coastal Steel in Cocoa, Florida, and the main portion of the umbilical arm was delivered to the Launch Equipment Test Facility (LETF) at Kennedy in September 2015 for testing.

“The accomplishment I’m most proud of so far is seeing the delivery of the ICPSU arm to the LETF, and seeing years of hard work come together into a large system that will support the first integrated launch of the agency’s Space Launch System rocket and Orion spacecraft, as well as NASA’s Journey to Mars,” Larson said.

Larsen said the coolest part of his job getting to design mechanisms for the mobile launcher umbilical systems. For the ICPSU, he was the design engineer for all of the release mechanisms. Some of the mechanisms were an innovative DC hub motor winch system, a pneumatic secondary system, and a solenoid release rope retraction device. “Seeing this work come together into

real hardware and then testing it to see if our ideas and calculations really worked is exciting,” Larson said.

Larsen’s first car was a green 1992 Ford Explorer. “This was during the time when there was a lot of problems with the tires failing and causing the SUV to roll. My mom made me sell it and buy a sedan,” Larson said.

He and his wife, Abigail, have been married for more than 10 years. They have two children: a son, Elisha, 8, and a daughter, Anna, 7.

Larsen’s hometown is Merritt Island, Florida. He earned a Bachelor’s of Science in mechanical engineering from Georgia Tech in 2006.

His hobbies include traveling, family activities and church.



Todd Arnold, chief of Program Technical Integration with GSDO, recently received a Certificate of Appreciation from Lauren Leo, NASA’s associate administrator for Human Capital Management.

Arnold co-led one of the agency’s eight teams that assessed and recommended implementation strategies for efficiencies across numerous agencywide human capital management elements for NASA’s Human Capital Baseline Services Assessment (BSA).

Arnold’s focus was on helping to define requirements and implementation strategies for what will become NASA’s new hiring system. Each Human Capital BSA team had representatives from all 10 NASA field centers and several representatives from NASA Headquarters. Photo credit: NASA/Tony Gray