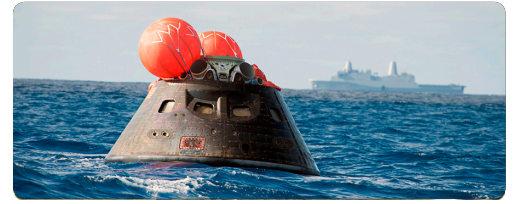
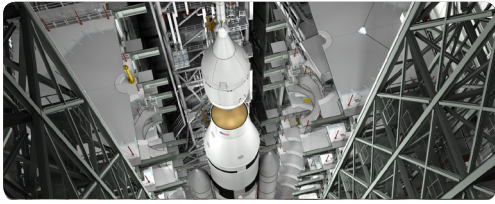




# GSDO

GROUND SYSTEMS  
DEVELOPMENT & OPERATIONS

## EXPLORATION BEGINS HERE



## PROGRAM HIGHLIGHTS • AUGUST 2015

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://go.nasa.gov/groundsystems>.

# Mobile Launcher Will Support Space Launch System

NASA's mobile launcher (ML) is shaping up nicely as modifications continue on the ground structure that will launch the agency's Space Launch System rocket and Orion spacecraft on the journey to Mars and other deep-space destinations.

"We just finished up a major construction phase of the mobile launcher," said Eric Ernst, NASA ML project manager. "We were actually able to accelerate some of the work."

NASA recently selected J.P. Donovan Construction Inc. of Rockledge, Florida, to begin the next phase of work on the 380-foot-tall (including the base), 10.5-million-pound steel structure at NASA's Kennedy Space Center in Florida. The

Ground Systems Development and Operations (GSDO) Mobile Launcher Ground Support Equipment Installation contract is a firm, fixed-price contract that extends for 455 calendar days. Subcontractors are Core Electric of Melbourne, Florida; MDI Services LLC of Orlando, Florida; and Bragg Crane and Rigging of Long Beach, California.

J.P. Donovan Construction will install and integrate ground support equipment (GSE) systems onto the mobile launcher to modify the structure with the systems necessary to assemble, process and launch NASA's integrated Space Launch System rocket and Orion spacecraft. The scope of work includes the installation of mechanical, electrical and fluid subsystems that will support the SLS rocket.

According to Ernst, this phase will include the installation of more than 800 mechanical, fluid and electrical panels, about 300,000-plus feet of cabling, and miles of tubing and piping.

"One of our big challenges is that SLS, Orion and GSE systems are all in development concurrently," Ernst said. "Now we are working to develop an install design for the hardware. There are a lot of unique challenges."

Overseeing modification to the ML is one of many ways GSDO is helping to prepare Kennedy to process and launch the next-generation vehicles and spacecraft designed to attain NASA's goals for space exploration. To achieve this transformation, the NASA and contractor workforce is developing the necessary ground systems while refurbishing and upgrading infrastructure and facilities to accommodate government, commercial and other customers' needs.

To read the complete story, visit <http://go.nasa.gov/1NURcaN>.



Eric Ernst, NASA Mobile Launcher project manager, talks to members of the media beneath the mobile launcher at the Mobile Launcher Part Site at Kennedy Space Center on Aug. 19. Photo credit: NASA/Cory Huston

# GSDO Preparing Center for NASA's Exploration Mission-1

Not since NASA prepared Kennedy Space Center's facilities for the Space Shuttle Program 35 years ago has there been such a large-scale effort to ready the center in anticipation of the launch of the Space Launch System (SLS) rocket and Orion spacecraft on Exploration Mission-1 (EM-1). The Ground Systems Development and Operations (GSDO) Program and support contractors at Kennedy are busier than ever as work continues to transform the center into a 21st century multi-user spaceport.

"Developing ground systems in parallel with flight systems, SLS and Orion, makes it especially challenging and demands a high level of integration," said Mike Bolger, GSDO program manager. "Every day matters, and we have to continue to meet our commitments internally and externally to be ready for EM-1."

GSDO achieved a major milestone on the mobile launcher this month with the award of a new Ground Support Equipment Installation Contract. The work will include installing more than 800 pieces of mechanical, electrical and fluids equipment and about 300,000 feet of cable and several miles of tubing and piping to support mobile launcher operations. Most recently, modifications to the mobile launcher tower and platform were completed to accommodate the size and weight of the SLS rocket.

The first set of new work platforms, designated platform "K", arrived in April and is being readied for installation in the Vehicle Assembly Building (VAB). A total of 10 levels of new platforms -- 20 platform halves altogether -- will surround the SLS rocket and Orion crew module and provide access for testing and processing in High Bay 3.

A simulation test of the Resource Prospector payload RESOLVE for a mission to the moon was the first use of one of the new 21st century multi-user control rooms inside Firing Room 4 in the Launch Control Center (LCC). GSDO managed the construction of Firing Room 4 which can be partitioned into four separate control rooms to meet current and future NASA and commercial user requirements.



An artist illustration of NASA's Space Launch System and Orion spacecraft on Launch Pad 39B. Image credit: NASA



The mobile launcher that will support NASA's Space Launch System and Orion spacecraft for Exploration Mission-1 is in view at the Mobile Launcher Park Site at Kennedy Space Center. Photo credit: NASA/Cory Huston

"We also just completed a major software release for Firing Room 1 that is critical to testing our KSC ground subsystems," Bolger said. "We are now configuring it for testing that will continue over the next several months. We will build on this release to provide the capability that we need to process and launch the SLS and Orion."

The landscape at Launch Pad 39B has changed. A clean pad concept has replaced the configuration once used for space shuttle launches. The pad's surface has been completely upgraded. New crawler track panels have been installed and concrete repairs have been completed. The flame trench walls have been resurfaced and work soon will begin on a new flame deflector that will support launch of the SLS rocket.

What's next for the GSDO workforce moving forward? Bolger said a key milestone, the program-level Critical Design Review, will occur in the fall. At that point, the program will transition from design to hardware fabrication, installation and testing.

After the ground systems are tested and certified, Bolger said Kennedy will be ready to process flight hardware beginning in January 2018. Launching and recovering Orion on the first exploration flight test last December was the first step, and the GSDO team is ready for the next challenge.

"What we do is hard and there will be challenges, but communication and working together as a team is helping to overcome them," Bolger said. "We're making progress every day."

To read the complete story, visit <http://go.nasa.gov/1Lx5OrY>.

# Ground Systems Team Spotlight

**JoElla Schroeder** is a project manager with Vencore on the Engineering Services Contract (ESC) at Kennedy Space Center.

Schroeder worked at the center for about five years in the field of database management after graduating from Merritt Island High School. She left the area to pursue an education



in building design and construction, and returned to Kennedy about two-and-a-half years ago to take part in the modernization of the center's facilities ongoing at the time.

Schroeder provides project management support to the Ground Systems Development and Operations (GSDO) Program for

the redevelopment efforts at Launch Pad 39B. She provides input regarding studies, facility design and construction, and ground system equipment installation projects that are part of the redevelopment of pad B to transform it to support NASA's Space Launch System (SLS) and could support possible future vehicles.

The achievement she is most proud of so far is helping to refurbish the interior of the ignition overpressure and sound suppression piping and elevated tank at the pad. It was a fun project and the work environment was challenging from a safety and logistics perspective.

"I'm happy to be part of this period of time at the center, with the focus on the future, not only with the development of an entirely new launch vehicle and mission, but also with the physical transformation of the space center into a new and different paradigm," Schroeder said.

Schroeder grew up in Merritt Island, and says events at Kennedy always have set the tone for the community. The space program is part of her personal and family history. She recalls watching rockets launch as a small child.

"I've always considered landing on the moon and the exploration of space as the most incredible achievements of mankind," Schroeder said. "When I see the pictures of the universe we have today, I'm awed by its majesty."

Her first car was a pale green Mercury four-door sedan, a real "battleship" that her father bought her. The first car Schroeder bought herself was a little red, fastback sports car. "I don't recall the make or model, but it had a rockin' stereo system," Schroeder said.

Her hobbies and interests include art and architecture, photography, music and books, philosophy and natural landscapes.

**Sean Hollis** is a mechanical engineer with Jacobs Technology on the Test and Operations Support Contract (TOSC) at Kennedy, where he has worked for two years.

He supports the GSDO Program as a liquid oxygen system engineer, and also supports software development for the cryogenic systems. He writes work authorization documents for operations and maintenance of the liquid oxygen storage area and aids TOSC Asset Management in facilitating changes in order to optimize the maintenance program. He also develops launch software for the liquid oxygen system, while supporting the liquid hydrogen and the main propulsion system subsystems.

"The most intriguing and rewarding aspect of my job is the satisfaction of knowing that my work contributes to the 'big picture' of launching NASA's Space Launch System rocket to Mars," Hollis said.



He begins his work day on Launch Pad 39B, supporting the operation and maintenance of the liquid oxygen storage area; then he goes to the Launch Control Center to write launch software and test software for that system in the afternoon.

Several factors motivated his decision to work for the GSDO Program. Testing and operations support was similar to his previous position, and he recognized that he could leverage that experience supporting Kennedy to process and launch the next-generation vehicles and spacecraft designed to achieve NASA's goals for space exploration.

"My first memory of being interested in space is when my dad took our family on a summer vacation to Daytona Beach and always timed it so that we could watch a shuttle launch. Since then, I've wanted to learn more and contribute to our nation's space program," Hollis said.

Hollis' first car was a 2003 red Ford Focus. He has two dogs, Duke and Pups. Both are Black Labrador retriever and German shepherd mix.

His hobbies include building rocket engines and supporting NASA's Rocket University Neo Project. He also enjoys fishing, boating, swimming, baseball and golf.

# Industry Spotlight: J.P. Donovan

J.P. Donovan Construction, based in Rockledge, Florida, is a third-generation, general contracting firm that has been providing a wide range of industrial engineering and construction services for clients in Florida and California for 27 years.

The company is committed to delivering quality service that provides a superior value for their clients' resources and has an established reputation of successfully completing large, technically complex projects while meeting or exceeding their clients' expectations.

At Kennedy, J.P. Donovan is finalizing the modification of the mobile launcher for NASA's Space Launch System and is gearing up to begin work on the flame trench at Launch Pad 39B.

"We are very excited to have been awarded the Mobile Launcher Ground Support Equipment contract," said John Donovan, president of the company. "It is an honor to continue work on the mobile launcher."

J.P. Donovan's recent work on the mobile launcher includes modification of the existing structure to accommodate the larger rocket, installation of pre- and post-liftoff water systems and main engine fire suppression systems, and modification of all electrical systems.

The Phase II work will include installation and integration of new fluid, electrical and launch accessory ground support equipment and modification of the existing structure.

It also includes installation of cryogenic and environmental control systems and 19 fluid and electrical subsystems.

Pad B work will include refurbishment of the flame trench, side flame deflectors and fabrication of a new main flame deflector. This new structure will deflect SLS exhaust away from the vehicle during launch and protect structures above the launch pad surface.

Donovan is proud of the reputation that his company has established and the team environment that has developed be-



*A crane is used to lift one of the heavy steel girders for installation on the mobile launcher at the Mobile Launcher Park Site. Photo credit: JP Donovan*

tween everyone involved in the project.

"The NASA construction services team and all of our dedicated subcontractors have pulled together to make this a successful group effort," Donovan said.

Currently, the company has 15 project team members at Kennedy. With the award of the mobile launcher GSE project, the company will be looking for dedicated and talented individuals to join the J.P. Donovan team.

"The continuation of space exploration is an integral part of the success of NASA, the Florida space coast area and the U.S. We are thrilled to be a part of that progress," Donovan said.



Kennedy Space Center Fire Rescue personnel are with one of the new emergency egress vehicles, a Mine-Resistant Ambush-Protected (MRAP) vehicle, Aug. 6, in the perimeter of Launch Pad 39B at Kennedy Space Center in Florida. At right, in the photo, is an artist illustration of NASA's Space Launch System rocket and Orion spacecraft atop the mobile launcher on the pad. During crewed launches, the MRAP will be stationed by the Launch Pad 39B slidewire termination area. In an emergency, the crew would ride a slide-wire to the ground and immediately board the vehicle for safe egress from the pad. The 40,000-pound, heavy-duty vehicles will provide protection against chemicals and projectiles that could be carried through the air during a catastrophic event at the pad. Photo credit: NASA

# Employee Spotlight: Paul Mogan

Paul Mogan works in the Systems Engineering and Integration Division of the Ground Systems Development and Operations Program at Kennedy Space Center. He has worked at Kennedy since 1987 in engineering design and project management.

His main responsibilities include setting technical policy for how the program does systems engineering and integration and program technical reviews.

"The coolest part of my job is really two things. One is the people, they are really great," Mogan said. "And the second is really knowing that here in a couple of years, we're going to be launching again. That's a good feeling."

One of the achievements he is proud of is helping to get the program to the critical design review milestone, which is coming up at the end of this year. He is involved in planning for the review and how GSDO will support it, what products are needed, and all of the engineering and other things that they need to ensure are good to prepare for the review.

"What I'm really looking forward to is when we get back to launching people from Kennedy in a few years," Mogan



Mogan has a son and a daughter, both in their "tweens."

He enjoys gardening and travel. One of the places he visited that filled him with awe was Niagara Falls.

"Being on a boat below the falls and seeing just how much water flows over is incredible," Mogan said.



said. "I think that human spaceflight and exploration are really important. When I see that, it's going to be a great day."

Mogan originally is from Atlanta, Georgia, but now resides in the space coast area. He earned bachelor and master degrees in electrical engineering from Georgia Tech.

View the latest ESD quarterly video, "Episode 10: Constructing the Future" at: <http://go.nasa.gov/1hGuHHY>

## U.S. Navy Recognized for EFT-1 Recovery Efforts



During a recent ceremony at Naval Base San Diego in California, Jeremy Graeber, Orion Recovery director with the Ground Systems Development and Operations Program, recognized U.S. Navy personnel for their Orion EFT-1 recovery operation efforts. Photo credit: U.S. Navy