



Elijah Walker (from left), Kyle Fears and Max Santiago, Boeing Checkout, Assembly & Payload Processing Services technicians, help guide one of six batteries for the P4 truss onto a stand in the Space Station Processing Facility at Kennedy Space Center, Fla. Fresh batteries were installed on the truss before launch.

NASA PHOTO

# Back to work

## ISS assembly resumes with Boeing-built truss

By Ed MEMI

For the first time in four years, construction on the International Space Station is set to resume, and Boeing-built products are leading the way to expand the size of the orbital structure and further the science needed for long-duration space flight.

Following Space Shuttle *Discovery's* near-perfect return to flight in July, Boeing employees are now eager to get the port-three-and-port-four (P3/P4) integrated truss segment installed on the Space Station. Space Shuttle *Atlantis*, which is carrying the P3/P4 segment, was scheduled to launch from Kennedy Space Center, Fla., during a launch window that opened Aug. 27 (after *Boeing Frontiers* went to press).

The 45-by-15-foot aluminum truss is part of the structural framework of the station that houses the space outpost's power, data and temperature control systems. The

P4 element contains a set of power-producing solar arrays. Eventually, this truss will span 300 feet and contain four sets of solar arrays—two sets of which will be on orbit following this mission. These arrays will produce enough power to support a crew of six, allowing experiments exploring how to live and work in space for long periods, critical to the United States' plans to return to the moon and journey to Mars someday.

On Earth, the P3/P4 segment weighs almost 35,000 pounds. But it will be weightless on orbit, allowing the astronauts to remove the segment from *Atlantis'* payload bay using the shuttle's remote arm and hand it off to the station's remote arm. The astronauts then will maneuver the segment into place before attaching it to the Port 1 truss segment.

"While waiting to launch P3/P4, we've been diligent in maintaining the flight hardware to ensure the vehicle's mechanical and electrical systems work as designed when they reach the station," said Chuck Hardison, Boeing ISS site manager at Kennedy Space Center. "The entire team is excited about resuming assembly operations."

The ISS travels around the earth every 90 minutes at an altitude of about 220 miles (350 kilometers). For about 30 minutes it's in the earth's shadow; batteries inside P4 provide power during that time. Since P3 and P4 were delivered to KSC in 1999 and 2000, Boeing replaced the batteries (which last about eight to 10 years) in 2005. Boeing engineers also worked with NASA and Lockheed Martin to ensure the solar array wings, which are folded up accordion style into two long boxes for launch, would not stick together when deployed.

The Boeing team at Huntington Beach, Calif., designed P3. Boeing Rocketdyne Power and Propulsion (now Pratt & Whitney Rocketdyne) in Canoga Park, Calif., designed P4. Assembly of P3 and P4 in Tulsa, Okla., started in 1997. The two segments were later joined together at Kennedy Space Center.

Boeing became the ISS' prime contractor in 1993 and built many of the U.S. elements. Boeing now is responsible for sustaining engineering, integrations, the operations element and development of the truss systems and most of the onboard mechanical systems. The ISS, when completed in 2010, will be equivalent to a five-bedroom house, weigh almost a million pounds (454,000 kilograms) and be as long as a U.S. football field, including the end zones. ■

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