



# Cable vision

Expertise developed to support space shuttle operations could help other Boeing programs take flight **By Tabatha Thompson**

**S**even million pounds of thrust from its three main engines and two solid rockets produces a whole lot of shaking when a space shuttle blasts off.

More than a year before each mission, a Boeing team in Houston begins mapping out the complex system of cabling and brackets that keeps the electrical wiring stable and connected for powering, controlling and monitoring the shuttle's valuable onboard cargo.

The process has become even more effective and efficient as a result of the avionics integration team engineers' taking part in a Lean+ pilot project to test a new modeling program, called Capital Harness Systems.

With the shuttle program winding down, the team hopes to apply that capability to other Boeing programs.

Capital Harness Systems involves the use of 3-D tools to map out the most logical path for electrical cables. It also provides a list of all materials the team needs to tackle each job.

Manager Jack O'Neill said the Boeing team shaved about 50 percent off labor costs after switching to the new system. Engineers in the Mission Engineering

Room at Johnson Space Center also can refer to Capital Harness Systems-generated drawings to troubleshoot glitches during flight.

"They're good electrical engineers and use tools for problem-solving on a daily basis," said Mariella Hartgerink with United Space Alliance, the joint venture by Boeing and Lockheed Martin and space shuttle operations contractor. She has worked with O'Neill's team for 12 years.

"We had a failure on one of our pieces of hardware, called the remotely operated electrical unit, in 2008 when the orbiter was in space," Hartgerink said. "I worked with the Boeing Houston guys, Jack O'Neill's group. We found out what the problem was and we fixed it."

The shuttle program is set to end at the close of the year or in early 2011, but O'Neill and his team want to keep critical capabilities they learned on the program available to colleagues throughout the company.

"Wire harness design tools exist in all Boeing design facilities, O'Neill said. "They're used in helicopters, aircraft, spacecraft and satellites." Boeing engineer Samer Hasbani said the

system has worked great for the shuttle program and he is excited about the possibility of other applications within Boeing. "It has a much higher capability," he said. "It could be used for anything being started from scratch, any vehicle using different components that need to connect to each other." ■

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**PHOTO:** At the Houston Product Support Center, avionics engineers Samer Hasbani (foreground) and David Stinson decide whether a cable destined for the space shuttle measures up. **ELIZABETH MORRELL/BOEING**