



Boeing Houston Program Integration Flight Systems & Software Engineering team

If the space shuttle's Primary Avionics Software System (PASS) fails during a mission, the Space Shuttle program calls on us to ensure our Backup Flight System (BFS) is ready to safely complete the mission.

Our team of about 150 employees at Kennedy Space Center, Fla., Huntington Beach, Calif., and Houston designs and documents the flight software requirements for both the PASS and the BFS. We also design code and maintain the flight software for the BFS and the Multifunction Electronic Display Subsystem, a "glass cockpit" crew display that serves as the primary crew interface with flight software.

We've been doing this work since the beginning of the shuttle program, but we have continued to evolve as a team to work more efficiently and effectively. So it's no wonder we would take that same philosophy when it comes to our processes.

The saying, "If it ain't broke, don't fix it," is one we rarely use. We are continually looking for ways to improve our process via our Program Integration Lean Working Group. One improvement we recently tackled was the complicated BFS patch process. This process might qualify as "ain't broke," but it was one that could use some attention. Historically it's produced minor errors due to simple user misunderstandings. That's where our Lean+ team comes in. Thanks to a group of dedicated Lean+ champions, our team was able to improve the process and eliminate waste.

Our goals were simple: "Leaning out" the BFS patch process to reduce cycle time for patch creation (eliminate waste) and maintain patch quality (be error-free), while documenting the entire implementation process. We also wanted to create a "future-state map" that's easily understood by new personnel and that required less specialization.

Using our Lean+ toolbox, we moved forward with a Value Stream Mapping workshop last October. Our results were outstanding: We reduced cycle time by 75 percent, from 45 days to 11 days. The key enabler to the improved process was modifying



peer reviews into real-time engineering development reviews, or "scrums." We are also able to reduce signature cycles and conduct training for the development team.

Our team is just one of many within the Space Shuttle program continuing to make strong progress with our Lean+ initiatives. The entire program is constantly coming up with creative ways to improve and simplify processes without compromising quality. ■

PHOTOS: (TOP) From left: Hoa Nguyen, Karlos Steele, Blake Frere, Joy Cox, George Miller, Ulrica Fontenot, Douglas Corbin, Stephen Jayne, Paul Allen, Viet Nguyen. **ELIZABETH MORRELL/BOEING**

(ABOVE) Here is a look inside a space shuttle flight deck. Among the Flight Systems & Software Engineering team's many tasks: designing code and maintaining flight software for the space shuttle's "glass cockpit" crew display. **NASA**