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JSF Engine Diagnostic Contract Is Big Win For Conn. Company

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By Rich Tuttle

Qualtech Systems Inc.'s selection by Pratt & Whitney to supply diagnostic software for the Joint Strike Fighter's F135 engine "is a pretty big deal" for the small Wethersfield, Conn., company, said Somnath Deb, vice president of engineering.

Pratt & Whitney chose the Qualtech product over several other offerings earlier this year, but the selection was just announced last week. P&W, meanwhile, has begun assembly of the first flight-test engine in the JSF program (DAILY, Aug. 24).

The diagnostic software contract, which Deb said is not yet fully defined, calls for Qualtech Systems to provide fault isolation development tools and an embedded "reasoner" for integration into the F135 as part of P&W's Joint Strike Fighter Engine Prognostics and Health Management (PHM) Program.

"We selected Qualtech on the strength of their technical solution, maturity and hands-on experience integrating diagnostic software on military aircraft," P&W's F135 PHM Engineering Manager Steven Budrow said in a Qualtech announcement. "The Qualtech technology can quickly achieve a diagnostic resolution by considering available health-related information, both positive and negative, to quickly and accurately isolate the root cause."

"What we offer is a model-based reasoner that looks at all the HRCs, or health resolution codes, in real time, in flight, and assesses the health of the engine," Deb said.

"We are different from a lot of the other solutions in quite a few ways," he continued. First, "we have a pretty rigorous way of modeling and quantifying the effectiveness of the solution, even before you deploy it. ... We capture the relationship between the HRCs and the failure mode, and we can quantify what would be a re-test, what would be an ambiguity, do you have enough tests to detect all the faults, do you have enough tests to isolate them, what kind of isolation do you have on board?"

While many onboard products focus mainly on isolating a fault, Deb said, Qualtech's system not only says "what's wrong with the system, but what's right with it. ... It's not just diagnosis of disease, but sort of certification of health."

The result is "a complete health management solution that is not only looking at the current condition and trying to see what the state is, but also trying to identify how ready this engine would be for future missions," he said.

Qualtech has built diagnostics and health management products for Sikorsky helicopters, including the turbine engines of the UH-60 and SH-60. But for the F135 engine, "we are modeling ... a lot more detail," partly because the helicopter engines have less capability, Deb said.

Qualtech also has worked with Pratt & Whitney for the last four or five years on other projects. One effort involves prognostic work on the F119 engine, from which the F135 is derived.