CELEBRATIONS AT MTU: CLEAN SKY ENGINE DEMONSTRATOR RUNNING IN THE TEST CELL

News / Manufacturer

Clean Sky is the most ambitious EU funded aeronautical research program ever launched in Europe: More than 600 partners have joined forces to develop new, greener technologies for tomorrow's aviation. **MTU** Aero Engines, Germany's leading engine manufacturer, is a partner in the program, being responsible for an engine demonstrator that is now running in MTU's test cell in Munich. The test campaign marks the culmination of MTU's research activities, and the milestone was celebrated jointly with distinguished representatives from government, business, the Clean Sky Joint Undertaking, and research institutes.

Around 100 guests gathered in the pre-rigging room of test cell 3 to take a closer look at the

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demonstrator engine and to join in the celebrations. The demonstrator, dubbed SAGE 4 (Sustainable And Green Engines), is one of five Clean Sky engine demonstrators. “This demonstrator is based on advanced geared turbofan technology,” explained MTU Chief Operating Officer Dr. Rainer Martens. It is used to show the maturity of the newly developed technologies for low-weight constructions, designs and materials which will help increase the efficiency of future geared turbofan engines and at the same time reduce emissions and noise. MTU is concentrating its efforts on the low-pressure turbine and high-pressure compressor, two technology areas in which the company excels.

Said Martens: “Under the Clean Sky project we not only developed new technologies for our components, but took on responsibility for a complete demonstrator engine which is now being put through its paces in our test cell.” The objective is to validate improved geared turbofan technology, especially for the low-pressure turbine section, in a joint effort with other European partners. Above and beyond the development of breakthrough technological solutions, Clean Sky pursues yet another major objective: to create a network of core partners, small and medium-sized enterprises, academia and research establishments in Europe. On this count, too, MTU has scored a success: More than 20 European partners – companies, universities and research institutes – have contributed to SAGE 4.

In his speech, Eric Dautriat, Executive Director of the Clean Sky Joint Undertaking, had words of appreciation for MTU’s contribution: “This MTU-led project in the Sustainable and Green Engines platform is a very good example of how a recent engine concept, here the geared turbofan, may still be improved through the implementation of a series of new technologies.”

Dr. Joachim Wulf, Chief Engineer, Technology Demonstrators at MTU Aero Engines, recounted how the “super-module”, which consists of the low-pressure turbine made by MTU, the shaft, the turbine exit case (TEC) and the bearing chamber, had been put together since work began in Munich late last year. The TEC was developed and supplied by GKN Aerospace Engine Systems from Sweden, the shaft and bearing chamber by Pratt & Whitney. The new technologies were integrated into a PurePower® PW1500G geared turbofan engine made available by MTU’s partner in the U.S.

With the geared turbofan (GTF) engine, Pratt & Whitney and MTU Aero Engines are building the propulsion system of the future. The GTF represents a huge leap forward in engine technology; for its new architecture reduces fuel consumption by 15 percent, cuts CO2 emissions by the same amount, and almost halves the perceived noise level. MTU contributes the high-speed low-pressure turbine, a key component that is absolutely essential for the GTF, and the forward four stages of the high-pressure compressor.

Referring to the ongoing SAGE 4 test campaign, Wulf said: “To date, we’ve conducted about half of the specified tests, and, judging from the results we’ve gained so far, our expectations are being met in full.” As soon as all of the test runs are completed, the data logged will be evaluated in detail, this analysis being expected to be carried out over the first few months of next year. When Clean Sky 1 ends in late 2016, the technologies will “be available to support the next step in the evolution of the current geared turbofan shortly afterwards,” as Wulf put it.

Alongside its SAGE 4 activities, MTU is preparing for the successor program, Clean Sky 2. Germany’s leading engine manufacturer will be one of 16 lead partners from the aeronautical industry in Europe. To test these new technologies, MTU will again be using demonstrators, which will be put through their paces in the test facility between 2017 and 2020 to prove their capabilities.

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