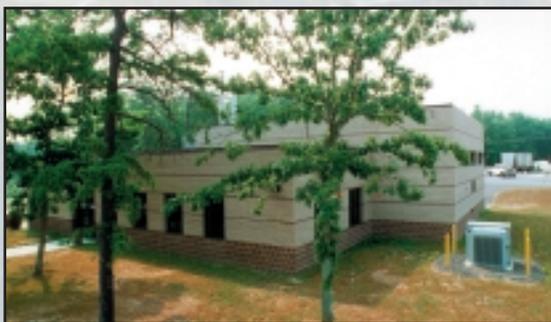


# FAA William J. Hughes Technical Center

## Propulsion and Fuel Systems Test Facilities Buildings 211 and 292

*The propulsion and fuels systems test facilities, located within the Safety Research and Development area at the FAA William J. Hughes Technical Center, provide research and testing to ensure the safety of all civil aircraft propulsion, fuel, and powerplant and fuel system installations.*

These facilities, located in Buildings 211 (shown on right) and 292 (shown below), also provide the validation of data and technical bases for improvements to civil aircraft certification and operational standards, including procedural guidance and means of demonstrated compliance to these standards. The individual laboratories include the Large-Engine Test Laboratory, Small-Engine Test Laboratory, Fuels Research Laboratory, and Wing Fuel Spillage and Jettison Laboratory.



### Large-Engine Test Laboratory

The Large-Engine Test Laboratory consists of one test cell (40 by 30 ft.), a control room, and supporting test and data acquisition equipment that can be used to assess the safety and performance of large turbine engines and general aviation piston engines and related systems. The test cell has been upgraded with a new eddy-current dynamometer that can



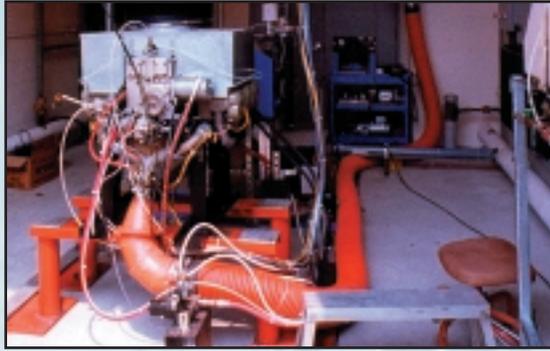
accommodate aviation piston engines up to a maximum rating of 500 shaft horsepower. The test cell is also used as the engine build-up and tear-down work area. The upgrade of this test cell includes the addition of a conditioned air system (CAS) and new data acquisition equipment. The CAS enables test engineers to provide combustion air to test engines over a wide range of temperature and relative humidity. This new capability allows the conduction of more realistic engine performance tests. The new dynamometer in Building 211 is shown below.

### Small-Engine Test Laboratory

The Small-Engine Test (SET) Laboratory is designed for full-scale testing and performance evaluation of small aircraft engines, including existing engine (i.e., turbine, piston, etc.) and future engine (i.e.,



R&D Facilities



diesel, rotary, etc.) designs. The building contains two test cells equipped with brake (750 hp) and eddy-current (500 hp) dynamometers, control room, data acquisition system, and associated support equipment needed to perform engine combustion analysis, exhaust emission, detonation detection, and other safety- and performance-related assessments. The photograph above shows a piston engine-dyno test cell installation in the SET Laboratory.

#### Fuels Research Laboratory

The Fuels Research Laboratory consists of two main test areas, one for fuels analysis and another for fuel component system testing. The fuel analysis area is equipped for

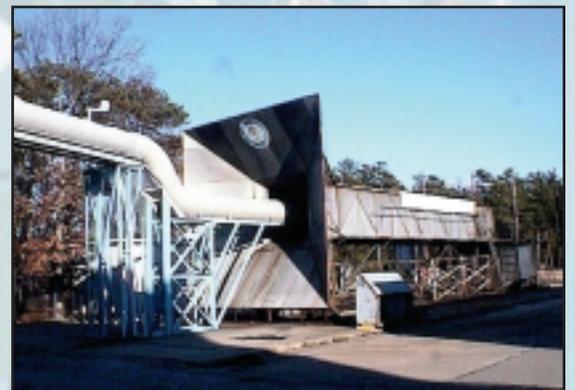


conducting tests in accordance with American Society for Testing and Materials (ASTM) test standards specified for aviation turbine fuels (ASTM 1655), aviation gasolines (ASTM D910), automotive gasolines (ASTM D439), and other alternate fuels. The fuel component systems test area includes bench test installations to perform research and testing associated with aircraft

fuel transfer and other handling systems. The fuel component systems test area is set up to conduct tests on engine fuel systems, engine controls and accessories, and engine fire protection systems.

#### Wing Fuel Spillage and Jettison Laboratory

The Wing Fuel Spillage and Jettison Laboratory (shown below) consists of a ram air (200 knots) wind tunnel and a wing test section and data acquisition control area that is used to assess the safety and performance characteristics of fuels and fuel transfer systems under simulated high air flow flight conditions. The laboratory has



been used to evaluate postcrash effectiveness of safety fuel additives and can be used for procedures associated with the emergency jettison of aircraft fuel and other experiments involving fuel and fuel transfer system performance needs.

To find out more about the Propulsion and Fuels System Test Facilities, contact:

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