Application News

Turbine Meter Meets Pressure Drop Demands In Fuel Application

Industry: Aerospace ***Service: Ground Test Flow Rate*** ***Fluid: Jet A***

Overview

In the aerospace industry, ground testing of fuel systems and components is critical to ensure flight worthiness. Engineers evaluating this equipment require valid flow data to order to understand the operation of the fuel system or individual component under changing environmental conditions.

Turbine flow meters are the most common choice for ground testing applications, where demanding accuracy, range, dynamic response and environmental conditions are encountered.

Situation

A leading manufacturer of jet turbine engines was seeking a flow meter to accurately measure fuel flow rate over a wide range of 1,00 to 40,000 PPH (2.5 to 100 GPM). Flow data had to be collected with the fuel at ambient operating temperatures. In this instance, pressure drop requirements were < 2psi at maximum flow.

Solution

With today's turbine flow meter design, pressure drop is directly proportional to the flow rate passing through the device. Typical pressure drop on a turbine meter is <10 psi at maximum flow. The challenge on this ground testing application was to meet the pressure drop specification at < 2 psi at 40,000 PPH (100 GPM), and at the same time, maintain the best possible accuracy. Because of these requirements, the flow meter would have to be oversized in order to handle the pressure drop in Jet A fuel at ambient operating temperature. To address the wide flow range, 1,000 to 40,000 PPH (40:1 turndown), linearization would have to be performed by the flow meter's electronics.

System Description

Flow Technology supplied a flow measurement system providing the best possible accuracy over a wide flow range with minimal pressure drop. The system included a standard two-inch FT-32 Series turbine flow meter delivering exceptional accuracy and reliability. Pressure drop in fluid at ~ 1.2 cst. is < 2 psi at 40,000 PPH (100 GPM).

A pickoff-style LinearLink™ flow meter linearizer provides a signal that compensates for turbine non-linearity inherent at the lowest flow rates. The unit ensures the linearity of the flow meter will meet a +/- 0.1 % reading specification over the 40:1 turndown. Using the LinearLink, turbine meters can achieve 100:1 turndown with increased speed of response.

Technical Information

Flow Meters (Model Number):	FT-32 AEXSBLEA-0
Electronics (Model Number):	LN-5-C-MA-1 with programming cable
Flow Rate:	2.5 to 100 GPM
Fluid:	Jet A

FTI FLOW TECHNOLOGY™

8930 S. Beck Ave., Suite 107 • Tempe, AZ, 85284 USA
Tel: 480.240.3400 • Fax: 480.240.3401 • Toll-free: 800.528.4225
E-mail: ftimarket@ftimeters.com • Web: www.ftimeters.com