Monitoring flow of aircraft de-icing fluids

Siemens answers with SITRANS FM Mag1100 Flowmeter

Situation

When there are freezing conditions with precipitation, de-icing an aircraft is crucial. Frozen contaminants can cause critical control surfaces to be rough and uneven, disrupting smooth air flow and degrading the ability of the wing to generate lift, increasing drag. This situation can cause a crash. If large pieces of ice separate when the aircraft is in motion, they can be sucked into the engines or hit propellers and cause catastrophic failure. Frozen contaminants can jam control surfaces, preventing them from moving properly. Because of these potentially severe consequences, de-icing is performed at airports where temperatures are likely to drop below the freezing point.

De-icing is usually done by spraying the aircraft with a de-icing fluid such as Propylene Glycol, similar to ethylene glycol antifreeze used in some automobile engine coolants. Ethylene Glycol is still in use for aircraft de-icing in some parts of the world because it has a lower operational use temperature (LOUT) than Propylene Glycol and is more versatile in application. But, Propylene Glycol is more common because it is classified as non-toxic, unlike Ethylene Glycol. Nevertheless, Propylene Glycol must be used with a containment system to capture the used liquid so that it cannot seep into the ground and streams. Many airports recycle used de-icing fluid, separating water and solid contaminants, enabling reuse of the fluid in other applications.

A leading manufacturer of military, airline, and airport ground support equipment manufactures a complete line of mobile de-icing/decontamination equipment, catering/cabin service trucks, and fixed, pedestal-mounted de-icing systems. This company provides a complete line of de-icers for large commercial and military aircraft.

One of the company's customers uses a flowmeter to monitor the flow of the de-icing fluid from the heated storage tank before being sprayed onto the planes. The customer needs the flow information for logging how much fluid is being sprayed onto each plane.

Challenge

The customer had been using a turbine meter for this application, but was concerned that it was not accurate enough, especially at lower flowrates. Also, those lower flows were not showing to be linear between 3 and 60 GPM. After some testing by the local Siemens representative, the customer found that the flow accuracy of the turbine meter was showing errors in the 2-5% range.

Solution

The local Siemens representative suggested the customer try a Siemens SITRANS FM Mag1100 Flowmeter for this application. During the customer demonstration, the Mag1100 unit (with 1.5" flowtube) verified accuracies within the 0.0% –0.25% error range.

The compact wafer design makes the Mag1100 Flowmeter unaffected by suspended solids, viscosity, and temperature challenges. The corrosion-resistant, stainless steel housing, and resilient liner and electrodes make the Mag1100 Flowmeter suitable for the most extreme media.

FM Mag1100 Flowmeter features

- Designed to allow patented in-situ verification using the SENSORPROM fingerprint
- Compact wafer design meets EN 1092, DIN, and ANSI flange standards
- Easy "plug-and-play" field changeability of transmitter
- Compact or remote mounting possible
- Highly resistant liner and electrodes that are suitable for most extreme process media

FM Mag 1100 Flowmeter benefits

- **Increased accuracy**
  The Siemens Mag1100 Flowmeter provides increased accuracy needed for the customer's aircraft de-icing system.
- **Reduced costs**
  The customer saves money by reducing the de-icing fluid usage and waste.
- **Environment-friendly**
  The end result is a safer condition, lower cost, and a friendlier environment.

FM Mag1100 Flowmeter

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