FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: HQ-18-17R1

SUBJ: Engine Fuel and Control – Filter Monitor Media Migration **Date:** October 9, 2020

This is information only. Recommendations aren't mandatory.

Introduction

This revised Special Airworthiness Information Bulletin (SAIB) updates aircraft operators, Fixed Base Operators (FBOs), FAA repair stations and Flight Standard District Offices (FSDOs), and foreign civil aviation authorities with recent actions and recommendations taken by Airlines for America (A4A) and other aviation industry stakeholders to inhibit or prevent the migration of Super Absorbent Polymer (SAP) filter media particles into aircraft fuel supplies. The SAP media is the filter element material utilized in ground-based water filtration systems called filter monitors to absorb water from the fuel before it enters the aircraft.

A4A issued Bulletin 2017.2, "Modified ATA103 Requirements for Filter Monitors", dated December 11, 2017, and Bulletin 2018.1, "Update on ATA103 Requirements for Filter Monitors," dated June 5, 2018, describing six actions intended to inhibit or prevent the migration of SAP media into the fuel supply. In addition, the Energy Institute (EI) published a bulletin in December 2017, "IATA Super-absorbent Polymer (SAP) Special Interest Group – Data summary and proposed roadmap," describing the work of that group and associated recommended preventive measures. The recommended actions in the A4A bulletins include limiting the maximum filter monitor differential pressure to 15 psi, replacing filter elements with the newest edition elements, and cleaning of hose-end nozzle strainer screens using an improved procedure. The EI bulletin describes the same actions but has not been updated with the current target dates for completing the recommended actions. The EI bulletin also describes a plan for the eventual replacement of filter monitors with new technology filtering systems within the next three years.

The Joint Inspection Group (JIG), A4A, and the International Air Transport Association (IATA) issued Bulletin, "Joint Industry Field Trials: Impacts of the COVID-19 Crisis and Withdrawal of EI1583 Specification," dated May 26, 2020, to alert the aviation fuel community of delays in the introduction of alternative filter technologies and provide recommendations for the continued use of filter monitors beyond December 31, 2020, if necessary.

A4A issued Bulletin 2020.3, "Dirt Defense Filtration with Electronic Water Sensors," dated August 2020, to provide information on the use of this recently introduced filtration system. This filter technology may be appropriate for use for refueling operations in certain locations.

This SAIB recommends that aircraft operators, FBOs, FAA repair stations, FSDOs, and foreign civil aviation authorities review the information described above with aircraft re-fueling operators for compliance with the recommended actions.

At this time, the airworthiness concern is not considered an unsafe condition that would warrant airworthiness directive (AD) action under Title 14 of the Code of Federal Aviation Regulations (14 CFR) part 39.

Background

Filter monitors are constructed as cylindrical vessels that contain approximately 25 to 35 cylindrical filter elements. The active media in the filter elements is SAP, which absorbs water from the fuel as it flows over the element. Filter monitor manufacturers qualify their products to an industry specification published by the Energy Institute: EI 1583, "Laboratory Tests and Minimum Performance Levels for Aviation Fuel Filter Monitors."

The concern with SAP migration had existed since the early 2000's when airlines had to reduce their aircraft fuel filter replacement intervals due to an increase in reported fuel filter bypass incidents and the U.S. Air Force (USAF) experienced engine flameouts caused by SAP clogging of engine fuel filters. The USAF concluded that the use of Fuel System Icing Inhibitor in jet fuel could induce SAP media migration into the jet fuel loaded on to the aircraft and permanently removed filter monitors from their ground refueling operations. The civilian fleet of aircraft continued to use filter monitors, but an industry investigation was initiated in response to the fuel filter replacement reports. As a result of the industry investigation, in 2009 the 6th edition of EI 1583 added a test intended to identify filters that were prone to SAP migration.

The concern was renewed in April 2010, when a Cathay Pacific Airlines Airbus A330 aircraft experienced engine control problems that resulted in an emergency landing. The incident was determined to be caused by SAP contamination of the aircraft fuel system due to an over pressurization of the filter monitor during aircraft refueling. Since this incident, there have been seven additional aircraft events where investigators determined SAP was the cause of operability issues for the aircraft operator.

Bench testing of the current design filter monitor elements has shown that they can release SAP, particularly at differential pressures above 15 psi under normal operating conditions, and filter monitor manufacturers and SAP manufacturers cannot guarantee that trace amounts of SAP will not pass downstream of filter monitor elements when in service. However, recent service experience has shown that the mitigating actions recommended in A4A Bulletin 2017.2 may be sufficient to reduce the risk of contamination until alternative filter technologies are made available.

The first replacement filtration technology that has been qualified for use by industry is the dirt defense filter with electronic water sensor. This filtration system is currently being introduced into service.

The FAA is monitoring the situation to determine if additional action is required. The agency requests that any service difficulties and maintenance and inspection findings on aircraft that are suspected of experiencing SAP contamination should be reported to us in support of this effort.

Recommendations

The FAA recommends the following:

1. Review A4A Bulletin 2017.2, "Modified ATA103 Requirements for Filter Monitors," dated December 11, 2017, and Bulletin 2018.1, "Update on ATA103 Requirements for Filter Monitors," dated June 5, 2018, with aircraft re-fueling operators for compliance with the recommended actions described in the bulletin. The bulletins are attached for your reference.

2. Review EI bulletin “IATA SAP Special Interest Group – Data summary and proposed roadmap,” published in December 2017, with aircraft re-fueling operators for additional information relating to this issue.

3. Review industry bulletin “Joint Industry Field Trials: Impacts of the COVID-19 Crisis and Withdrawal of EI1583 Specification,” dated May 26, 2020, for information on the continued use of filter monitors and the delayed introduction of alternative filter technologies.

4. Review A4A Bulletin 2020.3, “Dirt Defense Filtration with Electronic Water Sensors,” dated August 2020, for information on the use of the recently introduced dirt defense filter with electronic water sensor filtration system.

For Further Information Contact

Mark Rumizen, Senior Technical Specialist, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7113; mobile: (781) 402-4609; fax: (781) 238-7199; email: mark.rumizen@faa.gov.