

Chevron Global Aviation Operations Bulletin # 2007/01

GUIDANCE FOR FIXED & MOBILE FILTRATION Aviation Turbine Fuel (Jet A & Jet A-1)

Author: Phil Wetmore, Manager of Design & Engineering

Date: 12 February 2007

This serves as a follow-up and does not in anyway supersede the previous Operations Bulletins:

- 2003/04 - Filter Element Change-out dated May 19, 2003
- 2005/02 - Jet Fuel & FSII dated December 28, 2005
- 2006/01 - Filter Monitors dated February 14, 2006

Subsequent to the Energy Institute's issuance of the "Warning" bulletin dated 26 October 2006 on Filter Monitors, Chevron is taking the following position and associated actions:

1. Required Equipment Actions for Chevron Owned and Controlled Fleet in Commercial Airports

- a. All existing filter monitors will be replaced by Filter Water Separators qualified to API/IP 1581 5th Edition in all its fixed and mobile filtration system used for Aviation Turbine Fuel (Jet A & Jet A-1) on a multi-year plan and be complete no later than 1 Nov 2009.
- b. For all new equipment, Chevron Global Aviation into-plane vehicles will continue to be equipped with the API/IP 1581 5th edition Filter Water Separators (FWS) as the standard filtration system. This has been Chevron's equipment standard since mid-2003.

2. Required Procedural Actions for Chevron Owned and Controlled Fleet

- a. For newly installed Filter Monitor elements (2" & 6" dia. Out to In flow), a recommended 10 minutes product flushing at maximum achievable flow is required prior to regular service. A detailed procedure will follow.
- b. Normal water checks during aircraft fueling operations should still be continued to ensure that the fuel is free of water.
- c. Convert all existing Filter Monitor elements fitted in FWS housings back to FWS. Water defense equipment shall also be installed.
- d. Strict adherence to Product Integrity procedures and protocols to keep fuel dry and clean must be maintained.

3. Ongoing Actions:

Chevron will continue to evaluate other current filter technologies. If new technologies are proven effective at removing water and particulate without adding contaminants to the fuel, Chevron will seek to adopt these systems.

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WARNING ON USE OF AVIATION FUEL FILTER MONITORS (FUSES)
'QUALIFIED TO' IP 1583¹ 4TH EDITION OR EARLIER EDITIONS

Aviation fuel filter monitors (fuses) containing water absorbent polymer have been used for many years to prevent water and dirt being delivered to aircraft during refuelling operations.

In recent years it has been determined that **FILTER MONITORS 'QUALIFIED TO' IP 1583 4TH EDITION OR EARLIER EDITIONS CANNOT BE REGARDED AS FAIL-SAFE DEVICES FOR PREVENTING WATER BEING DELIVERED TO AIRCRAFT.**

IT HAS ALSO BECOME APPARENT THAT WATER ABSORBENT POLYMER FROM SUCH ELEMENTS MAY MIGRATE DOWNSTREAM.

However, in many operations filter monitors continue to form one component in the comprehensive system to control dirt and water in aviation fuel.

RECOMMENDED ACTION TO BE TAKEN BY FILTER MONITOR USERS

- Always operate filter monitors in strict accordance with manufacturer's instructions.
- Do not use filter monitors in fuel containing any Fuel System Icing Inhibitor (FSII), also known as DiEGME (diethylene glycol monomethylether) or Prist[®].
- Do not use filter monitors where any free water in aviation fuel may contain high concentrations of salts.
- Seek assurance from the filter monitor manufacturer that, in addition to meeting the laboratory qualification requirements of IP 1583 4th edition, filter monitors are suitable for your intended service application.
- Ensure that where a filter monitor is used it forms only one part of a comprehensive system to control dirt and water in aviation fuel. A comprehensive system includes housekeeping procedures and quality assurance checks during into-plane fuelling.
- Users concerned about filter monitor performance should consider the use of different technology, or combinations of different technologies, but should assess the limitations of such alternatives on an individual basis.

ADDITIONAL INFORMATION

- **Filter monitor elements 'qualified to' IP 1583 4th edition or earlier editions should not be solely relied upon to ensure that water in fuel is prevented from passing onto aircraft.** The water removal performance of filter monitor elements 'qualified to' IP 1583 4th edition or earlier editions may deteriorate in service, to the extent that a filter monitor may not effectively shut off fuel flow or register a rise in differential pressure sufficient to alert the operator to the passage of water. Despite significant collaborative research and investigations by industry representatives it has not been possible to identify with certainty the causes of such deterioration in service. **WATER IN AIRCRAFT FUEL TANKS MAY AFFECT AIRCRAFT OPERATIONS.**
- Filter monitors that are 'qualified to' IP 1583 4th edition or earlier editions must never be used with aviation fuel containing FSII. **THE PERFORMANCE OF FILTER MONITOR ELEMENTS IS SIGNIFICANTLY IMPAIRED WHEN THEY ARE USED IN FUELS CONTAINING FSII. FILTER MONITOR ELEMENTS ARE ALSO MORE VULNERABLE TO WATER ABSORBENT POLYMER MIGRATION IN FUELS CONTAINING FSII.**
- **The water absorbent polymer in filter monitors may pass downstream from filter monitors into fuel, even in the absence of FSII.** All aviation fuel filter monitor manufacturers providing elements 'qualified to' IP 1583 4th edition have stated that unknown quantities (possibly undetectable) of water absorbent polymer may pass into fuel even when filter monitors are operated in civilian fuels not containing FSII. All size and flow formats of filter monitors are implicated, but the extent of migration from them may vary. **Assessment, impact and mitigating action by commercial airlines on this issue is the subject of current study by the International Air Transport Association working with industry stakeholders including the Energy Institute.**

¹ IP Specification 1583 *Specifications and laboratory tests for aviation fuel filter monitors with absorbent type elements*, 4th edition, September 2004. Published by the Energy Institute.

Limitations of the laboratory test methods included in IP 1583 4th edition and earlier editions:

- IP 1583 4th edition is not a product specification. It provides general requirements for filter monitor elements and systems, and a series of laboratory tests to measure selected aspects of performance of new unused filter monitor elements.
- Laboratory tests alone cannot replicate the operating conditions to which filter monitors are exposed when in service, and therefore are of limited utility in predicting in-service performance.
- Filter monitors in current use that are 'qualified to' IP 1583 4th and earlier editions, may meet the requirements of the selected laboratory tests, but may not meet 1.7.2.1 d, which states:

"1.7.2 Performance features

1.7.2.1 A filter monitor shall have the following general features:

(d) It shall not contaminate the fuel and fuel properties shall remain within the prescribed limits of the relevant fuel specification."

ENERGY INSTITUTE DEVELOPMENTS

The Energy Institute (publisher of IP 1583 4th edition) is currently developing a 5th edition of IP 1583 for publication in November 2006. Laboratory tests will be included to measure SAP migration with the requirement that none is detected as the limit for qualification. It is not known at this time whether filter monitors meeting this limit will be developed.

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CONTACTS

- For further information on the use of filter monitors contact your filter monitor manufacturer/supplier.
- For any clarification on the content of this warning contact Martin Hunnybun, Technical Manager – Distribution & Aviation, Energy Institute, 61 New Cavendish Street, London, W1G 7AR. Tel +44 (0)20 7467 7133; +44 (0)77 9527 2368; mh@energyinst.org.uk