Interagency Aviation Accident Prevention Bulletin

No. IAAAPB 07-01 **Date: August 29, 2007**

Subject: Aviation Fuel Filtration Warning

Area of Concern: All Aviation Fueling Activities

Distribution: All Aviation Users

Discussion: The Energy Institute (EI) has issued a warning relative to aviation fuel filtration. The warning is specific to aviation fuel filtration using water absorbent media/(monitors) (see complete EI warning on pages 2 and 3).

It is important to read and understand the entire Energy Institute warning. The critical factor is repeated below for emphasis and immediate action where warranted..

Do not use filter monitors in fuel containing any Fuel System Icing Inhibitor (FSII), also known as DiEGME (diethylene glycol monomethylether) or Prist®.

The use of filter/separators containing coalescer and separator elements is required where fuel contains the FSII additive.. The coalescer/separator elements shall meet American Petroleum Institute Bulletin 1581 Specifications and Qualification procedures for Aviation Jet Fuel Filter/Separators.

Recommendations: Aircraft refueling facilities, or equipment that dispenses aviation fuel containing FSII, should have filter conversions accomplished immediately. Continued vigilance while performing daily, weekly, and monthly fuel quality control checks is essential to detect fuel contamination before aircraft refueling operations are accomplished.

In addition to following the Energy Institute's specific warnings all pilots should sump at least 10 ounces of fuel from each aircraft fuel tank sump drain after each fueling. The sump sample should be examined closely for contamination such as: water, particulate, and filter media (fibers). Use of a "GATS" sump jar (below) is recommended.

Point of contact for this Bulletin is Mr. Charles Mathwig, NBC-AM Fuels Specialist (907) 271- 5061 or charles_mathwig@nbc.gov.

26th October 2006

WARNING ON USE OF AVIATION FUEL FILTER MONITORS (FUSES)
'QUALIFIED TO' IP 1583[1] 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.

LEGAL NOTICES AND DISCLAIMERS

The contents of this WARNING are provided as guidance only, and are not intended or designed to define or create legal rights or obligations. EI is not undertaking to meet the duties of manufacturers, purchasers, users and/or employers to warn and equip their employees and others concerning safety risks and precautions, nor is EI undertaking any of the duties of manufacturers, purchasers, users and/or employers under local and regional laws and regulations. **EI MAKES NO GUARANTEE THAT THE INFORMATION HEREIN IS COMPLETE OR ERROR-FREE. ANY PERSON OR ENTITY MAKING ANY USE OF THE INFORMATION HEREIN DOES SO AT HIS/HER/ITS OWN RISK. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THE INFORMATION HEREIN IS PROVIDED WITHOUT, AND EI HEREBY EXPRESSLY DISCLAIMS, ANY REPRESENTATION OR WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. IN NO EVENT SHALL EI BE LIABLE TO ANY PERSON, OR ENTITY USING OR RECEIVING THE INFORMATION HEREIN FOR ANY CONSEQUENTIAL, INCIDENTAL, PUNITIVE, INDIRECT OR SPECIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS), REGARDLESS OF THE BASIS OF SUCH LIABILITY, AND REGARDLESS OF WHETHER OR NOT EI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR IF SUCH DAMAGES COULD HAVE BEEN FORESEEN.**

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

/s/ Robert Galloway
Robert Galloway
Aviation Safety Manager

/s/ Ron Hanks
Ron Hanks
National Aviation Safety and Training Manager