A4A Bulletin

Bulletin 2017.2
Modified ATA103 Requirements for Filter Monitors
December 11, 2017

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The IATA Super Absorbent Polymer (SAP) Special Interest Group has been investigating reports of SAP migration from Filter Monitors for the last several years. SAP is the absorbent material inside filter monitors used to filter dirt and water from fuel; however, SAP is considered a contaminant if released downstream of the filter. On November 14, 2017, the SAP Special Interest Group published a position statement which concludes, "It is the position of the Special Interest Group that filter monitors shall be phased out of all aviation fuel handling systems." A4A member airlines will continue to review the work conducted by the IATA Special Interest Group and determine any long-term actions that may need to be taken.

As of today, there is no commercially viable, approved drop-in alternative to filter monitors. A4A members are supportive of ongoing efforts by filter manufacturers and the Energy Institute (EI) to develop new filtration and/or sensor technology without SAP. However, any new technologies must provide the same or better protection from dirt and water. While these efforts are maturing, A4A members will take steps to reduce the risk of SAP migration from filter monitors. Through work done across the industry, these steps have proven to reduce the risk of SAP migration.

The following six actions are applicable to all sites operating to the ATA103 standard.
A4A members recognize the criticality of these actions and will be closely monitoring operational impacts. Your industry feedback is important and valued. If needed, A4A will release additional bulletins on this subject.

ACTION 1: Filter Monitor Differential Pressure Limit Lowered to 15psi

Airlines for America is immediately modifying ATA103 to ***limit maximum filter monitor differential pressure to 15 psi***. ATA103 paragraph 3.14.1.3. will now state the following:

> **3.14.1.3. Monitor Elements (Full Flow Monitor Elements)**
>
> Monitor elements must be replaced when any of the following conditions are met:
> 1. Filter Membrane Test indicates element is not performing (Ref. [Section 3.2])
> 2. Differential pressure exceeds 15 psi or there is a sudden drop in differential pressure
> 3. Chemical water detection test indicates a positive reading of more than 30 ppm (Ref. [Section 3.3])
> 4. 12-month service life has expired

Although the 15psi maximum differential pressure limit applies immediately, it may take time to adjust all differential pressure limiting device set points back to 15psi. Filter monitors shall not be operated outside the limits in ATA103 paragraph 3.14.1.3; however, all differential pressure limiting device set points must be adjusted to reflect the 15psi limit **no later than January 31, 2018**.

ACTION 2: Modification of EI 1583 and Paragraph 2.8.2.2. of ATA103

On November 3, 2017 the Energy Institute (EI) published a revision to EI 1583, *Laboratory Tests and Minimum Performance Levels for Aviation Fuel Filter Monitors*. Where the 6th edition required a "report only" test for SAP downstream of qualification tests 1 and 10, the new 7th edition imposes an SAP maximum limit in those qualification tests. As the test for SAP was already required in the 6th edition the EI has agreed that any filter monitors which were below the 7th edition limit when they were tested for 6th edition qualification, will automatically receive a 7th edition qualification without additional testing. Several 6th edition elements on the market are therefore already compliant as 7th edition elements.

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The 2017.1 revision of ATA 103, paragraph 2.8.2.2. states:

> Filter monitors must meet the requirements of EI 1583, latest edition.

Airlines for America supports the improved 7th edition specification for filter monitors; however, we recognize that for some filter monitor element types/sizes, there may be no commercially available elements compliant with the new 7th edition. In light of this potential lack of availability, A4A is clarifying the requirement in paragraph 2.8.2.2. as follows:

> **2.8.2.2. Filter Monitors (Full Flow Fuel Monitors)**
>
> Filter monitors must meet the requirements of [EI 1583], latest edition commercially available.

Please consult with your filter monitor manufacturer to determine whether your current elements are 7th edition compliant.

ACTION 3: EI 1583 7th Edition Compliance Requirements for 2-inch Filter Monitors

For 2-inch diameter filter monitors, sites must be compliant with 7th edition elements by the next required filter element change (per the conditions outlined in paragraph 3.14.1.3 of ATA103 2017.2 revision and included in Action 1 above), but **no later than June 30, 2018**.

Please note that some 6th edition elements are already compliant with the 7th edition. If your filter manufacturer states that your current elements are 7th edition compliant, no action is required beyond normal operational parameters outlined in ATA103. Once compliant with this action, the filter vessel operational data plate must be updated to reflect compliance with EI 1583, 7th edition.

ACTION 4: EI 1583 7th Edition Compliance Requirements for 6-inch Out-to-In Filter Monitors

For 6-inch diameter filter monitors flowing from out-to-in, there are currently no commercially available 7th edition qualified elements sold in the United States. Until such time as 7th edition qualified 6-inch out-to-in elements become commercially available in the US, sites should continue using 6th edition elements and paying special attention to differential pressure limits and service life requirements outlined in ATA103.

Once 7th edition 6-inch out-to-in elements are commercially available in the United States, sites must comply with 7th edition elements by the next required filter element change (per the conditions outlined in paragraph 3.14.1.3 of ATA103 2017.2 revision and included in Action 1 above), but **no later than 6 months after the 7th edition elements are commercially available in the US.**

One additional option for 6-inch out-to-in filter monitor compliance with EI 1583 7th edition is to utilize an adaptive element mounting hardware kit to allow the installation of 7th edition compliant 2-inch filter monitor elements in a 6-in out-to-in filter monitor vessel. Please consult with your filter or vessel manufacturer for more details on this method of compliance with EI 1583 7th edition. There may be an associated flow penalty and increased differential pressure with this compliance option which makes it the least preferred method for compliance with EI 1583 7th edition.

Once compliant with this action, the filter vessel operational data plate must be updated to reflect compliance with EI 1583, 7th edition.

Bulletin 2017.2
Modified ATA103 Requirements for Filter Monitors
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ACTION 5: Conversion of 6-inch In-to-Out Filter Monitors Back to Filter Water Separators

For 6-inch diameter filter monitors flowing from in-to-out, there are currently no commercially available 7th edition qualified elements sold in the United States. Further, filter manufacturers have advised A4A that they do not intend on pursuing 7th edition qualification for 6-inch in-to-out elements. 6-inch in-to-out filter monitor elements were originally designed as drop in replacements for EI 1581 filter water separator elements, and as such, the vessels that house these 6-inch in-to-out elements were originally filter water separator vessels that were converted to use as filter monitor vessels.

Sites must convert vessels housing 6-inch diameter in-to-out flowing filter monitors elements back to filter water separator vessels with the latest edition of EI1581 qualified elements, following all provisions required in paragraph 2.8.2.1 of ATA103, by the next required filter element change (per the conditions outlined in paragraph 3.14.1.3 of ATA103 2017.2 revision and included in Action 1 above) but **no later than June 30, 2018.** Once compliant with this action, the filter vessel operational data plate must be updated to reflect compliance with EI 1581, latest edition.

ACTION 6: Modification of ATA103 Paragraphs 2.5.4.4, 3.13 and 3.17 to Add New Nozzle Screen Cleaning Procedure Requirement

Data has been collected which shows that in the event of SAP migration, some SAP particles can be captured in hose end nozzle screens. In order to reduce the impact of a possible SAP migration event, a nozzle screen cleaning procedure will be added upon new filter monitor element commissioning and during the monthly nozzle screen inspection.

Paragraph 2.5.4.4. of ATA103 will be modified as follows:

2.5.4.4. Nozzle Screens

(a) Examine each nozzle screen for particles or other solid contaminants, and inspect for damage

- If particles are found, investigate possible sources of contamination (inner hose lining, pipe rust, sand, seals, gaskets, equipment failure, etc.) and take appropriate corrective action.

(b) Clean screens as necessary or replace if damaged

(c) For nozzle screens on refueling equipment fitted with filter monitors, one of the following must be performed even when there is no visual evidence of nozzle screen contamination:

1) Nozzle screen must be cleaned using the procedures outlined in [Section 3.17] or equivalent procedure, or

2) The nozzle screen must be replaced with a screen that has been cleaned using the [Section 3.17] or equivalent procedure, or

3) The nozzle screen must be replaced with a new screen

Bulletin 2017.2
Modified ATA103 Requirements for Filter Monitors
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Paragraph 3.13. of ATA103 will be modified to add the following paragraph:

3.13. Filter Element Change Procedures

(n) For filter monitor elements only, one of the following must be performed even when there is no visual evidence of nozzle screen contamination:

1) Nozzle screen must be cleaned using the procedure in [Section 3.17] or equivalent procedure, or

2) The nozzle screen must be replaced with a screen that has been cleaned using the [Section 3.17] or equivalent procedure, or

3) The nozzle screen must be replaced with a new screen

Maintain a record of filter vessel inspection and cleaning on ATA Form No. 103.09 (or similar).

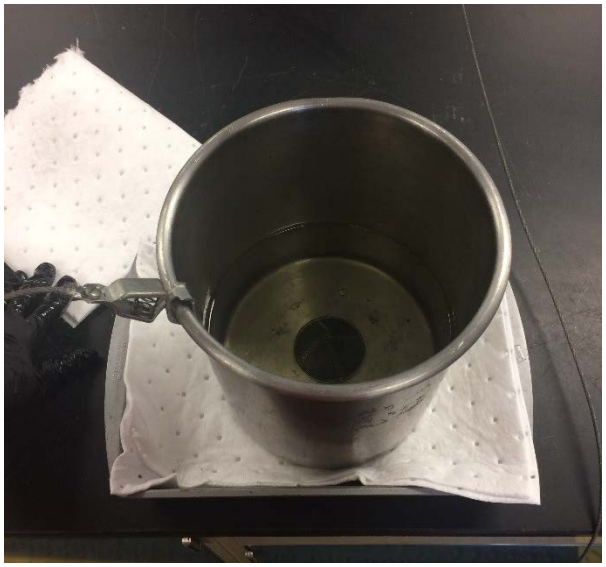
New Paragraph 3.17. of ATA103 will be added as follows:

3.17. Aircraft Fueling Nozzle Strainer Cleaning Procedure for Fueling Equipment with Filter Monitors

The following steps have been extracted with permission from the Shell Global Solutions procedure SR.17.01641. Research conducted by Shell has shown that in the event of super absorbent polymer (SAP) migration from filter monitors, SAP debris can be caught in aircraft fueling nozzle strainers. The Shell procedure is intended to remove SAP from nozzle strainers and has been reproduced here with modification to meet the needs of ATA103 sites.

(a) Remove aircraft fueling nozzle strainer according to manufacturer's instructions

(b) Invert nozzle strainer (dirty side down) and completely submerge into a bonded bucket of clean fuel



(c) Vigorously agitate nozzle screen while submersed in the bucket of jet fuel for about 1 minute

(d) While keeping the nozzle screen below the top level of the container, successively dunk the nozzle screen into and out of the jet fuel to back flush any debris into the fuel bucket. Perform this dunking process at least 10 times

(e) Perform one of the following three procedures based on available equipment at your location:

1) Procedure 1: Compressed Air Cleaning

a. Using shop air from a lubricant-free compressed air system, blow any potential debris from the "clean side" of the nozzle strainer towards the "dirty" or "upstream" side of the strainer. Compressed air system should be limited to no more than 30psi. Strainer should be as dry as possible before blowing air through it and care taken to avoid generating fuel mists

i. Alternatively, compressed air cans may be used in place of compressed shop air; however, cans must be discharged while upright as freezing may occur

b. Follow a systemic approach to ensure that the small jet of air passes over the entire surface area of the nozzle screen cone

c. Repeat this process at least three times over the entire exterior surface area of the nozzle screen

2) Procedure 2: Wash Bottle Cleaning

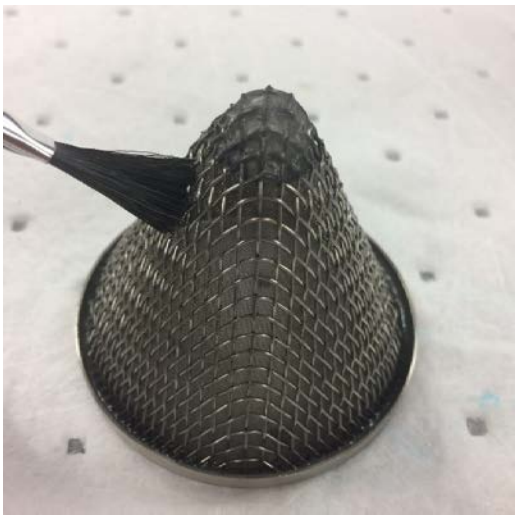
a. Using a jet fuel wash bottle, wash any potential debris from the "clean side" of the nozzle strainer towards the "dirty" or "upstream" side of the strainer

b. Follow a systemic approach to ensure that the small stream of fuel passes over the entire surface area of the nozzle screen cone

c. Repeat this process at least three times over the entire exterior surface area of the nozzle screen

3) Procedure 3: Brush Cleaning

a. Using a fine haired 1/4-inch brush, stipple the “clean side” of the nozzle screen to loosen any potential debris pushing it towards the “dirty” or “upstream” side of the strainer. Be sure to cover the entire exterior of the nozzle screen with the stippling process



b. Wet the brush with jet fuel from the bucket

c. Starting from the interior point of the nozzle screen, use brush to carefully brush any debris towards the rim and out of the nozzle screen. Re-wet the brush with jet fuel frequently to aid the cleaning/flushing process. Be sure that no brush bristles are dislodged and get caught in the nozzle screen

Bulletin 2017.2
Modified ATA103 Requirements for Filter Monitors
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(f) After completing one of the above cleaning procedures, do not dry the nozzle screen with any towels or rags

(g) Visually inspect the nozzle screen to ensure nozzle screen has no signs of damage or residual debris from the flushing process or cleaning procedure

(h) Re-install the nozzle screen into the aircraft refueling nozzle following the manufacturer's protocols

A4A Members would like to thank the members of the IATA SAP Special Interest Group, especially the Energy Institute and Shell Global Solutions, for the work and resources expended to help the industry better understand SAP.

Questions or requests for further information should be submitted to fuel@airlines.org

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