

TECHNOLOGY EVALUATION SUMMARY

No water slugs were observed during the trial; therefore, the DDF and EWS performance in a severe real-world upset cannot be stated. However, laboratory data demonstrate that AFGUARD can detect a water slug using a PLC programmable shutdown time. Given that all other field trial data showed no difference from laboratory data, it is expected that a water slug would be detected.

In the laboratory, the FAUDI DDFs demonstrated a low flow ability to temporarily hold back water (typically <50% of rated flow). During the trial, some temporary increases, including 1- or 2-second spikes, in upstream water did not transfer across the filter. Additionally, occasional overnight water condensation in the filter vessel was detected by the downstream sensor. Given these sensor reading differences, and the filter's limited ability to hold some water, the trial data supports a single downstream EWS will provide sufficient protection against elevated levels of free water in the jet fuel.

Recommendations Derived from the Field Trial

1. **The combination of FAUDI dirt defence filters and FAUDI AFGUARD electronic water sensor should be adopted into the operating standards.**

Almost 11,000 fuellings were conducted during the Joint Industry Filtration Field Trials, throughout which all fuel deliveries met the free water specification. Although the dirt defence filter is not intended to remove free water from fuel, when free water was present the AFGUARD EWS detected that water and successfully shut-down fuelling to prevent increased levels of water from reaching aircraft. The combination was confirmed to be durable in mobile applications and to have sufficient life for routine operations. ***The Field Trials have demonstrated that the combination technology prevents dirt and free water from reaching the aircraft in the environments in which they were tested.***

This recommendation is conditional upon the system settings detailed in item 7 below being used.

2. **Operators should note the potential limitations of this combination.**

Although the Field Trials indicate the technology can ensure delivery of fuel meeting the free water specification, **it may not be suitable in all airports due to operational considerations**. Operators with known free water challenges should note the potential for service disruption due to increased number of EWS warnings and shutdowns. We recommend that operators conduct their own evaluation of the technology to determine the operational impacts at their location before adopting the technology on a large-scale. Such an evaluation might be more meaningful at periods when free water in fuel is more likely to be observed. Operators should weigh this potential impact against the limitations of other technologies. It is our collective experience that other filtration technologies have limitations in locations with water challenges, such as frequent filter monitor change-outs or filter water separators with microbiological growth.

3. **The relationship between Filter Monitor change-out frequency and operability of dirt defence filter with EWS.**

Most field trial locations did not experience any warnings or shutdowns when their EI1583 filter monitor service life was typically 12-months. Field trial locations that historically replace filter monitors more