Safety Management Systems

Gerflor

Safety Management Systems are well known in the aviation industry and their benefits variable if we're honest.

Their value increases significantly when they document the way the organisation does business and provide the backbone for operational standards, training and procedures. They can help decide strategy, deliver consistently excellent performance, identify and respond to hazards before they become incidents.

Outside the aviation industry, mining and petrochemical industries, the benefits of Safety Management Systems are less well known.

Exceptional companies with good senior management, clear objectives and a strategy to achieve these will recognise the benefits. STAR has the experience to help these types of companies develop a system from which they can gain greater benefits.

Gerflor is an example. A new MD and HR Manager, an internal review, and a realization that they could improve the safety culture, reduce their liabilities and risks, improve their profitability and create an industry-leading organisation was the impetus for them to contact STAR.

For those that don't know Gerflor, you will have walked over their vinyl flooring in schools, hospitals and many businesses. Gerflor is based in France with operations in a number of countries around the world; here in Australia, the business leaders want to drive the company to be the industry leader and to minimise their liabilities with a well-performing SMS.

What better than to leverage the experience of STAR's people who have developed and worked with world-class SMS's from the mining and petro-chemical industries over many years.

We won't disappoint!

New DEF STAN 91-091

DEF STAN 91-091 issue 32 has been released. DEF STAN is the Defence Standard for Jet fuel quality. With the ASTM D1655 standard, these two standards for Jet fuel form the basis of the AFQRJOS industry standard for Jet fuel. AFQRJOS stands for Aviation Fuel Quality Requirements for Jointly-Operated Systems.

The AFQRJOS standard came into existence many years ago to create a commonly-accepted minimum specification for suppliers to provide Jet fuel into storage and distribution systems where the fuel was comingled with the fuel from other suppliers.

Without AFQRJOS, airports that comingle fuel from different suppliers would almost need a full-time product quality expert to ensure the fuels were suitable to mix together. Fuel arriving at airports with a Release Note that shows it meets the latest issue of the AFQRJOS checklist and can be received with confidence.

We have a copy of the latest DEFSTAN 91-091 standard on our Learning Management System in the resources tab – or contact us if you would like a copy emailed to you.

Produced by STAR Specialised Training in Aviation Fuels and Refuelling
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Aviation Maintenance eLearning

STAR is working with Aviation Components to develop eLearning for aviation asset maintenance tasks.

The finished product will show how to maintain and test all critical assets in fixed and mobile equipment.

The reason for this project is two-fold.

Firstly, Aviation Components want a training package that provides the front-end of the learning pathway for their new employees as well as serving as a resource for refresher training; and secondly, they recognise a gradual loss of skills and competence in the industry with many "maintenance organisations" not understanding how to professionally maintain these critical assets to preserve fuel quality and to provide trouble-free operation for the operators.

The training material should be available around the middle of 2022. Contact Aviation Components (***avicom.com.au***) to register your interest for early access to this new eLearning package.

AVIATION FILTER UPDATE

We've talked about the development of new aviation fuel filter technology in previous newsletters. In 2020, JIG produced Bulletin 132 announcing that from 1 July 2023, locations operating to JIG standards would no longer be able to use Filter Monitor elements containing Super Absorbent Polymer (SAP) as the filter media.

This means that these locations now have just over one year to change the filter elements to eliminate SAP.

We believe that Filter Monitor elements will still be available for purchase. Currently on the market that are only three viable options.

Dirt Defence Filter and Electronic Water Sensor developed by Faudi that requires pipework modifications to install.

Water Barrier elements developed by Velcon as a drop-in replacement for the Filter Monitors.

Filter Water Separator (Coalescers) available through Faudi, Facet and Velcon.

All three options are SAP-free therefore comply with the JIG standards.

Let's discuss the merits and limitations of each option to help you decide which is appropriate for your assets and application.

The Faudi DDF/EWS system requires the Filter Monitor elements to be replaced with Dirt Defence elements (basically microfilters) to capture particulate matter only. They will not stop water. The Electronic Water Sensor must be positioned in pipework downstream of the Dirt Defence elements to monitor fuel flow for water greater than 15ppm.

If water is detected, it will shut down the fuel flow requiring all fuel affected by suspended or free water to be removed from the system before fuelling can resume. This is likely to be a significant issue for fuelling systems that are known to be affected by free or suspended water.

The electronic water sensor requires a power supply and costs in the vicinity of $A25,000 to fit per unit. The sensor must be removed and sent to an authorised Faudi agent for testing and calibration every 2 years.

Velcon have developed a ***Water Barrier Element*** as a "drop in" replacement for the filter monitor element. They capture particulate matter and shed any water from fuel on the outer surface of the element so the water drops to the filter vessel sump (in a similar manner to a coalescer element), the differential pressure will increase but will return to normal levels once the water is drained from the vessel.

The filter will capture particulates and the elements will require changing when the differential pressure increases beyond 15 psi as is currently the case. The elements have 0.5-micron absolute pore size. Unlike the Filter Monitor elements where the pore size can vary with an average of 0.5 micron (some smaller and some larger), all pores in the Water Barrier elements are 0.5 micron, so may block up more readily than the Filter Monitor elements.

The Water Barrier technology is not yet approved by JIG but is in test.

The cost of these elements is about four times the cost of traditional Filter Monitor elements at present.

Filter Water Separators contain two-stage elements – separators and coalescers. These are generally larger and heavier units than the Filter Monitor vessels except for the small fixed-dispenser vessels. To replace the Filter Monitor vessels on vehicles or in fixed facilities with a Filter Water Separator vessel is likely to require pipework modifications and may not even fit on vehicles. If exposed to surfactants, they may be disarmed allowing water to carry through the elements which can make these unsuitable for final into-plane filtration. There are often drop-in replacement Separator-Coalescer elements for the fixed-dispenser vessels.

IATA, ATA103 and A4A have all qualified the Water Barrier Elements but JIG have not. We will advise when JIG provides qualification and this seems the most reasonable option for smaller throughput sites.

STAR has no affiliation with any of the suppliers, as such, we remain unbiased in our assessments and advice.

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Ship-to-Shore operations

When receiving cargo from ships into terminals, one of the most crucial aspects of the receipt process is timing the interface. This applies whether it is product-to-product interfaces, product-to-nitrogen interfaces or product-to-pig interfaces.

Product receipts should always be slowed to a flow rate as close to 1 metre / second when the interface is in the pipeline from the wharf (or indeed another terminal or refinery) so staff have time to manage the interface receipt and tank valves properly.

Timing the arrival of the interface at the terminal manifold is not hard but it does take some time to determine and set up the procedures to do this.

Have the ship slow the pumping rate to achieve a transfer rate of 1 m/sec, or as slow as they can. We do this during the product transfer by measuring the rise in product level within the tank. Once it is known how slow the ship can pump, we can calculate the flow rate in the transfer pipeline. We then use this slowest transfer rate and the distance of the pipeline to calculate the amount of time it will take the interface to arrive at the terminal sight glass after it leaves the wharf sight glass.

When this time is known, for a certain flow rate, we know exactly how long the interface will take to arrive at the terminal. It is then simply a matter of the Shore Officer or Wharf Attendant radioing the terminal staff when the interface is leaving the wharf sight glass for the terminal staff to start timing its expected arrival.

If you want more information, or need help to calculate the specifics for your site, contact STAR –
E: globalsafetypartners@gmail.com

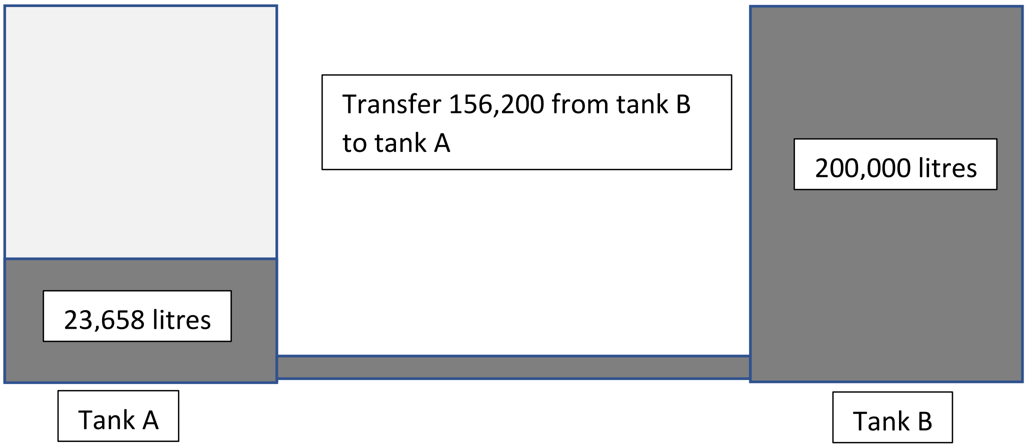
Density Conversions

Many people struggle with the concept of weighted-average density calculations, but it is actually a simple process.

Comingling (mixing the same grade of product from different batches) two different batches with two different densities will produce a density that is different from both batches. Because we need to satisfy ourselves that we have not had a cross-contamination from a different product grade, we need to calculate the expected density when the two batches are mixed and compare this with the actual density after receipt.

We do this every time we are comingling product from different batches, whatever the activity – loading tanker trucks, ships, tanks, etc.

Here is an example.



The expected Density of the comingled fuel in tank A after the transfer is calculated here

$$\frac{(23{,}658 \times 0.8251) + (156{,}200 \times 0.7957)}{(23{,}658 + 156200)} = \frac{19{,}520.2158 + 124{,}288.34}{179{,}858} = 0.799567$$

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