

The structure of the aviation fuel supply industry is changing fast. Here **Mike Farmery**, global fuel technical and quality manager for Shell Aviation and chair of the JIG Product Quality Committee looks at what needs to be done to manage the situation

Moving on from the good old days

The aviation fuelling industry, in some ways, has not changed much over the past 30 years. Fuelling trucks and hydrant dispensers might look a bit more modern but the fuelling equipment is pretty much the same. It is a similar story upstream of the airport. Multiproduct pipelines, terminals and refineries have not changed much either.

On the other hand, the structure of the aviation fuel supply industry, how it works and the number of players has changed dramatically since the 1970s.

When you compare then and now, the really significant changes seem to be a) fragmentation of the supply chain, b) international oil companies (IOCs) selling assets to smaller companies, c) new entrants like banks and traders and d) growth in low-cost airlines with point-to-point operations often based around small regional airports.

Whilst one could spend a few enjoyable hours discussing the reasons behind the changes, for the purposes of assuring product quality, it is critical to understand the consequences.

In this context, one of the most important changes is that there are now many more players. Whether it is refiners, traders, shippers, into plane agents or airlines, there has been a tremendous increase in numbers and diversity compared to the 'old days' when there were just a few major international oil companies and international or domestic flag carrier type airlines.

It should be stressed that this is not a bad thing. In

Everything is a-changin'

- IOCs selling refineries to merchant refiners and small oil companies
- IOCs exiting from countries or parts of the supply chain
- Banks entering the market as wet and dry traders
- Traders setting up as fuel suppliers at airports
- Rapid proliferation of aggregators
- Traders using big crude ships for long-term floating storage
- Airlines entering market as self-suppliers
- Airports going to open access, 'anyone can supply'
- Biofuels creating new producers and supply chains
- Airlines flying point to point to new (small) regional airports

fact, the opening up to new players has done a great deal to drive for improved efficiency, accessibility and affordability.

particularly well covered with excellent documents. In the US, ATA103 (issued by Airlines for America, A4A) is the key

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It is just important to make sure that, in a time of rapid growth and increase in diversity, everyone knows what to do.

Standards

It should also be stressed that, when it comes to defining the right way to assure the quality of aviation fuel and the safety and efficiency of aviation fuelling operations, there are many industry standards. Operations at airports are

well. Obviously they need to be continually developed and harmonised but, as far as airports are concerned, there are no real gaps.

Upstream of the airport, the situation is a bit more patchy. Certainly, very good standards exist. For example, in the US, API 1595 and API 1543 cover pre-airfield operations. In the rest of the world, the main standard is JIG3 covering supply and depot operations. However, neither of these documents contains much about pipeline operations, ocean going vessels and, importantly, refinery operations. The reasons are mainly historic. In the past there were relatively few players and their refineries, pipelines and vessels were covered by company proprietary manuals. No one saw the need for industry documents. However a few years ago, with all the changes to ownership and new players entering the market, the JIG Product Quality Committee recognised the need for a standard for refineries.

The idea was not to tell people how to operate distillation columns, but to clarify key issues that affect how a refinery manufactures aviation fuels to meet the various specifications. The need for a document was further highlighted by both JIG and International Air Transport Association (IATA) receiving requests from new refineries for guidance on how they could be certified as being competent to produce jet fuel.

The initial idea in JIG was to produce a separate document just covering refineries (imaginatively called JIG 5). However, after some scoping work it became obvious



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that, even in a document just covering refineries, there was going to be a great deal of overlap with documents like API 1595 and JIG 3 because large parts of a refinery look like storage terminals. Overlap creates problems like keeping documents synchronised and defining exactly where one stops and the other starts. It was therefore decided to create a separate document to cover all aspects upstream of airports. To make sure that the document had wide buy-in and relevance, JIG linked with the Energy Institute (EI). The EI already publishes many aviation fuel related standards such as EI 1581 for filter water separators and, importantly, more general oil industry guidance such as HM 50 for cleaning ships' tanks.

The resulting document is called EI 1530/JIG 3 and will be jointly published by JIG and the EI. The group writing the document is led by Anja Heckert of Shell Aviation and includes key experts from the major oil companies, pipeline companies and test houses. At time of writing, the EI and JIG are close to issuing the first draft for consultation. In the process of bringing all the requirements for handling aviation fuels upstream of airports together, it became clear that there are some areas that need better coverage and these are being worked on. Whilst refineries might represent the most obvious 'gap', areas

like pipeline operations and ocean going tankers are not well documented. These areas

have been traditionally covered by company procedures. This is not to say that procedures or practices in these areas are somehow inadequate or missing. The point is that if

someone was to ask. Where does it state how aviation fuel quality should be managed in multiproduct pipelines or ocean going tankers?' it would be very hard to point to an industry document. The plan is that EI 1530 will fulfil that role and be applicable across the world.

Whilst the need for a document like EI 1530 was recognised a few years ago, there is always an evolving context. Any discussion about standards for handling aviation fuels in 2012 would not be complete without reference to the new ICAO manual on civil aviation jet fuel supply. One response to the hypothetical question above, could be 'who is going to ask that question?' Well, exactly 'who' might be hard to define at the moment, but the 'why' is easy.

Safety

One of the key principles of aircraft safety is that systems should be either fail-safe or be duplicated. Fuel sits outside this

air transport is concerned, fuel quality has a fantastic track record. However, the potential for catastrophe was highlighted by the Cathay Pacific CX780 incident back in April 2010. The accident investigation concluded that contamination in the fuel caused the throttles on the two engines on Cathay Pacific's flight CX 780 to stick, one at 70% thrust, the other at 17% thrust. If it was not for the skill of the Cathay pilot and a long runway at Hong Kong, many could have died.

Those interested in the details of what happened can find out more from the accident report on the Hong Kong Civil Aviation Department website, but one of the underlying causes was found to be lack of application of existing knowledge at the airport where the aircraft was fuelled. In this particular case, it was not that standards and procedures did not exist, more that they were not understood and followed by all involved at a relatively small airport.

One of the early recommendations from the HKCAD was for International Civil Aviation Organisation (ICAO – the UN body that regulates global civil aviation) to produce a Global Regulatory Standard to define how aviation fuel product quality should be assured from refinery to wing tank. ICAO handed the task to IATA and A4A. After a great deal of work by industry experts and organisations like JIG during 2011, the ICAO Manual was finally published in March this year. It is worth stressing that this manual is primarily a 'signpost document'. Apart from some small gaps noted above, the industry is not short of standards. Many industry bodies (including the EI, JIG, IATA, SAE and API) produce excellent standards covering everything from hoses to couplings to tank cleaning to hydrant commissioning to soak testing to fuel testing to filters and more. The key requirement that the CX780 incident highlighted was that there is a need for a mandated document that dictates to all involved exactly what they need to do. Everyone involved in supplying aviation fuel from refinery to aircraft has to work to the same agreed and comprehensive industry standards. Moreover, in a world where everything is a-changin', everyone needs to know where to find them. ■

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