

Breaking new ground

➤ **REDUCING COSTS AND WASTE THROUGH IMPROVED EQUIPMENT LIFE EXPECTANCY IS THE LATEST TREND IN AIRPORT FUEL AND GROUND HANDLING. MIKE FARMERY OF SHELL EXPLAINS SOME OF THE NEW TECHNOLOGIES TO FUTURE AIRPORT.**



There is continuing interest in improving the quality assurance of aircraft fuel supply.



MIKE FARMERY

➤ Since 1992, Mike Farmery has been global fuel technical manager at Shell Aviation, responsible for quality, specifications, fuel development and environmental issues.

Future Airport: What are the major trends in fuel handling at airports?

Mike Farmery: If you look at fuel, there's a lot of interest in introducing new technology into the quality assurance of fuel supply to aircraft. The filtration process has been the subject of continuous development over many years but now there's a lot of work going on to create inline measurement capability to verify that it is working correctly. Continuous quality monitoring or inline quality monitoring also opens up the opportunity to extend the life of the filters.

FA: So you can improve their life expectancy?

MF: Exactly. It can reduce costs, but more importantly it means you extend their life and reduce waste. Once used, you have to get rid of them, they're waste, and they're soaked in kerosene. At Shell, we're evaluating different systems from different manufacturers, testing their calibration, reliability, response times and their response to dirt, water, and dirt and water together. We're doing that on rig tests where we're able to realistically simulate conditions at airports and introduce controlled amounts of dirt and water, you can't do that sort of testing at a live airport.

FA: What is the actual technology involved in inline measurement testing?

MF: It varies, there are two key solutions. The most likely will be a light-scattering, turbidity meter, which borrows technology from other industries. With this technique, you're picking up the haziness of the product by the scattering of light or lasers across the pipe. There are a few instruments working on that principle and variations on it. The

other area is, particle counting. It still uses light but counts individual particles passing through a small aperture in the instrument. Consequently you use these instruments in a sidestream rather than looking across the whole pipe. Particle counting is very well suited to laboratory use and it is being introduced into one of the jet fuel specifications later this year. Time will tell whether it is also suited to the inline fuelling application.

FA: Are they on level pegging at the moment, or is one the clear front runner?

MF: It's difficult to say because we are only just getting to the point of having collected some data and evaluating it. A key question is: will the technology, with a bit of modification, work in an inline continuous flow sitting on a vehicle on an apron? It is a pretty demanding environment.

FA: As much as you can simulate testing in labs, can you guarantee that it will work on a fuelling vehicle?

MF: No, the jury is still out on that. We have to see what their strengths and weaknesses are in terms of how they respond to levels of dirt and water, how well they stay calibrated, what their minimum level of detection is, how quickly they respond and how quickly they recover from an event such as some sort of sudden burst of water droplets or dirt.

FA: Is that the only area where new technology is being applied to the fuelling process?

MF: Absolutely not. Another technology is electronic data capture systems, where you're electronically capturing delivery details, including the meter readings on the refuelling vehicle. There's a lot of interest in having electronic meters that capture the transaction and communicate it with the base station in the office as well as the cockpit of the aircraft electronically.

FA: So it's fitting the pieces together better, rather than having people scattered around?

MF: It's also about defining standards so you can transmit that to the airline system. Aircraft work in kilograms of fuel but we load fuel in litres. So there needs to be a standard there. It also differs from airline to airline, even when dealing with the same aircraft. That's where there's an operational issue. IATA is addressing it and there's a group working on data standards so there is significant improvement.

FA: Surely this is something airlines want as well?
MF: Absolutely, and they are very much involved. The data structure needs to match up with their systems and meet their needs. Everyone likes the idea of reducing costs through standardisation, but most organisations want to standardise to their own way of doing things. Up until now the system, no matter how crude or archaic, has worked ok. We, like other companies, have our own data capture on the apron system, which we have at big airports, but the key is getting it to interface with all the airline systems. It's about taking it to the next level and increasing automation with Wi-Fi systems or GPRS.

FA: The technology is there but I suppose you need everyone to see the benefit of making the change?
MF: Yes, recognising the benefits in exchange for a bit of restriction.

FA: Especially with the price of fuel, people want to be as efficient as possible.
MF: When fuel is expensive, people have a very strong focus on fuel conservation and monitoring. You could argue that at the moment they have other things on their minds.

FA: But in a year or two priorities could change?
MF: Exactly. At the moment the focus is on passengers, but who knows what lies ahead. In

the fuelling world, the alternative fuels and bio-jet issue has been very topical for the last couple of years. It is a fascinating mix of fuel technology, engines, and airframe certification and sustainability. What impact it might have at the airport level will depend as much on the politicians and the legislators as it will on the technologists. The industry has been aiming for drop-in replacements which can mix with kerosene but the issue is how will an airline get credit for using a bio-jet. One issue for airports will be, does it have to be kept segregated in the supply system, or can it just get mixed in and you give the credit in some other way?

FA: Will it need a system of its own to be operational?
MF: Probably not, the industry is aiming at drop-in replacements, so any new fuel or biofuel will be able to mix with jet fuel. However, some airlines might want to have a segregated supply of a particular bio-jet for a particular application. But this is not an immediate issue, it is hard to envisage significant volumes of biojets in the next five to ten years. ○



At the moment, there is huge interest in alternative fuels.



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