

ground handling

INTERNATIONAL

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Aid memoir

Once a year, outside of the Ramp Safety Briefing pages, we take a look at the topic of safety and training in greater detail. In the first feature of our ramp safety section, we present a round-up of simulation training aids that are helping to prepare staff for the ramp.

Is there a problem with safety on the ramp? If you ask this question from a journalistic point of view, the chances are that the respondent will reply in a somewhat superficial manner, not wishing to draw attention to any perceived (or otherwise) deficiency in his operation. Where talk is off the record, much more is usually divulged.

Whilst we cannot blame operators and handlers for requesting anonymity in such circumstances, the fact remains that ramp safety has to be preached from the roof tops and that constant training and familiarisation with the processes and procedures that govern a handler's conduct airside are essential.

If evidence for this is required, we need only look to the statistics relating to runway incursions. Micro Nav has published a study that has been based on Mandatory Occurrence Reporting data provided by the UK's CAA Safety

Regulation Group; it covers the years 2004-2010.

The definition of an incursion is straightforward and is defined as "any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft."

The MOR records for vehicle runway incursions in the UK between 2004 and 2010 have revealed a rise from below 40 incidents (in 2004) to over 80 incidents in 2009. That's effectively a doubling; and if we add the fact that the average number of vehicle runway incursions over the period 2004-2008 was 55 per year, it would appear that incidents are firmly on the rise.

There's worse to come. Initial feeling may well be that that flights have increased exponentially during that period but the fact is, in 2009 there were fewer movements than in previous years. Figures for 2010, though, are a little better. In all, the average total number of annual aircraft movements over the period 2004-2010 (seven years, taken from 69 UK airports) was 3.6m, giving an average of one vehicle runway incursion to every 59,000 aircraft movements for this period.

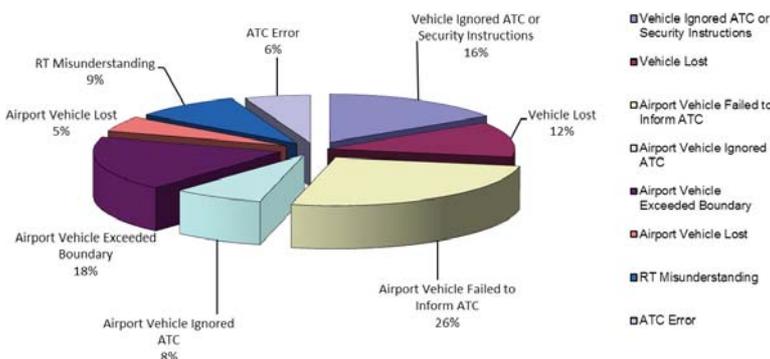
A total of 424 vehicle runway incursions were individually tabled from UK MOR data from the period 2004 to 2010 and categories apportioned, according to the cause of the incident. These broadly reflected the categories used in a US study published in 2009 (An Analysis of the Causes of Airfield Incursions attributed to Ground Vehicles), which appeared in the *Journal of Airport Management*. For that study, some 2,000 airfield incursions were examined. When compared, the two studies largely agreed in terms of causal factors, with the highest proportion of incursions arising from vehicles failing to inform the ATC of their intentions. Add to this incidents involving misunderstood communications and disregard for ATC instructions, and that statistic swells to over 50% of the causes. Interestingly, some 27% of the recorded incidents involved non-airport operated vehicles.

What conclusion can we draw here? The obvious one: more training, especially in the realm of communications, has to be the way forward.

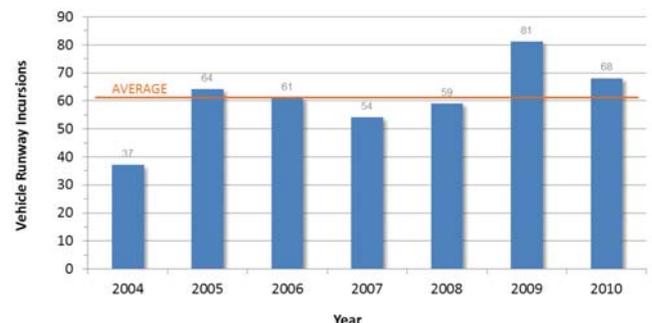
The benefits of simulation

Simulation, if a handling company CEO cares about what happens out on the ramp, is becoming something of a self-fulfilling prophecy.

Categorisation of UK Vehicle Runway Incursions 2004-2010



UK Vehicle Runway Incursions 2004-2010 from CAA SRG MOR Data



Source: Micro Nav



Adacel just one company offering driving simulators

It may be that simulators and software are only selling in penny numbers at present, but as the technology gets better, and the realism accordingly grows, so the wisdom of investing in less traditional forms of classroom training begins to make sense. And we're talking here of educating the operator in several tasks: airside driving, marshalling, pushback and de-icing are activities now covered by simulation software. These are considered tasks worthy of a greater focus when it comes to introducing new staff to the ramp and in many respects, the simulation facility is an ideal precursor to time spent in the real environment of the ramp.

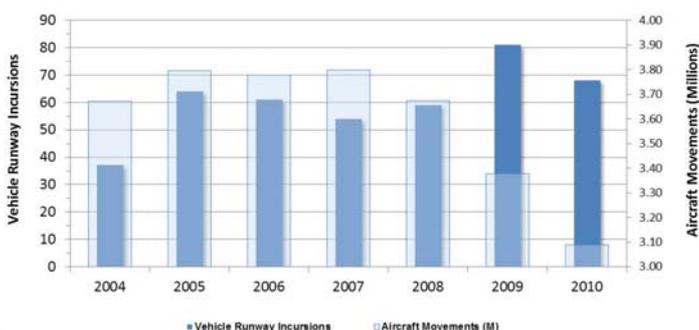
"Statistics show that most runway incursions occur in visual meteorological conditions during daylight hours; however, most accidents occur in low visibility or at night."

(ICAO Doc 9870 AN/463 Manual on the Prevention of Runway Incursions First Edition -2007)

The above extract says it all, really: the airport is a dangerous place and that degree of danger can be exacerbated by any deficiency on the part of a handling staff member in charge of a vehicle.

It comes as no surprise, then, that in recent years the marketplace has been ripe for investment in this type of training. Helpfully, replicating the movements and actions of the

UK Vehicle Runway Incursions vs Aircraft Movements from CAA SRG MOR Data 2004-2010



Source: Micro Nav



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Getting better all the time: the latest software enhances realism...



...giving trainees a real flavour of airside operations, as in this L-3 application

two types of GSE mentioned above doesn't call for quite the funding requirement that would be needed for someone who wishes to fly, say, a B747 without leaving *terra firma*. Not too many companies are marketing the requisite tools, though, and it would be reasonable to assert that buying the consoles, or even the more basic packages, has not necessarily been high on every handler's (or airport's) shopping list.

Arguably the biggest and most experienced exponent of this training tool is L-3 MPRI, which is a part of the L-3 Com group. The software for the application was originally developed by another company, that of gForce, which no longer exists, it having been acquired by L-3 MPRI some years back.

Speaking for L-3 MPRI, Raphael Juarez states that ground support managers are discovering that simulation training can be a part of a training programme to both get their people up to speed quickly and to reduce costs.

The company has looked to innovate in this area so, rather than simply market the necessary hardware and software, it has come up with a novel alternative solution that sees the necessary tools installed inside a trailer. Thus these trailers effectively become mobile trainer centres, ready to be taken to client locations as and when required. In this way there is no physical investment on the part of the client and the cost is, of course, commensurately less.

With its de-icing simulation programme, MPRI can offer the trainee the whole spectrum of ramp conditions, including weather, aircraft types and unexpected occurrences. All of these can be factored into the equation to give the utmost in terms of realism for the operator. Replay facilities are available so that the operator can revisit the actual performance and learn from any mistakes committed.

In a similar way, the pushback programme eases the newcomer into what's required in this important ramp manoeuvre. Of particular note here is the training relating to the unexpected: situations involving black ice or potential

jack-knifing can be flagged up, for example. It's obviously advantageous to learn how to deal with such incidents on a simulator rather than out on the ramp.

Driving and marshalling

The earlier-mentioned company, that of UK-based Micro Nav, is another enterprise that has brought simulator software to the marketplace. It has two packages, both of which are only a couple of years old: Airside Driver and Airside Marshaller. According to Dr Jeremy Goodman, who is New Product Development Manager, these were ground-breaking offerings. "We'd seen flight simulators and simulation for crews but there was little for those on the ramp. So we decided to increase the options available; we're educating the market here, in a sense." Micro Nav has been working with the Civil Aviation Authority, cognisant of the fact that there is an increasing requirement for competency-based evaluation and training. The paper trail is now of paramount importance and soon it will no longer be enough to have a mere verbal acknowledgement that someone has completed training in a certain discipline. Refresher courses and new model training will entail some sort of 3-D testing – which is where the simulator comes into its own.

Both of the Micro Nav applications come in desktop format and typically comprise a trio of screens (although a projected set-up is also possible). Products have been purposely built for the lower end of the market but are nonetheless comprehensive in what they offer. Different lighting conditions, changes of aircraft types and unexpected aircraft problems can all be built into the practice session, for example. Great store is set by the communications facility: good, confident radio transmission skills are a prerequisite where driving on the ramp is concerned.

Just as we went to press Micro Nav revealed that it had plans for installing the Airside Driver Trainer at a major hub. This would represent the

company's second installation, the first being near Jakarta.

De-icing training

There are also other companies offering a simulation solution. Vestergaard, which is well known for its Beta de-icing rigs, has a couple of examples at its headquarters in Denmark and the technology is derived from the above-mentioned US company. It sells globally and because it is a de-icer designer and manufacturer, so it offers technology that replicates the functionality of its own particular GSE. Any prospective purchaser can thus take advantage of the company's simulator technology.

As with the MPRI product, the Vestergaard simulator offers the novice plenty of climatic conditions, night or day environments, a choice of aircraft types and complete freedom of movement, so that the operator can "drive" around the aircraft and try out different strategies.

Another company following the path of de-icer builder and simulator supplier is that of Global Ground Support. The US enterprise has a long history in the software side of the equation and was amongst the first to experiment with rudimentary programmes from a training perspective. Over the years the product has become more refined and consequently today Global's simulator can stand alongside the best of them. A useful by-product arising out of all this has been the free supply of software upgrades to customers who have invested in this technology. Global's version is about as realistic as they come since the programme charts the operator's progress through a points system: this apportions marks for correct usage whilst deducting points where mistakes are committed.

The very latest developments include dual de-icing programmes, whereby two operatives can work in tandem, and the advent of de-icing aircraft that can have engines switched on or turned off.

Turkish IT specialist KaTron supplies an impressive range of simulation tools, and these are not simply confined to the airport environment. In terms of airside driver training, it's virtually a one-stop-shop. Not only are there simulation tools for de-icers, pushbacks and general airside driving but the company's product range also allows a client familiarity with tractor and trailer driving, beltloaders, passenger

"We're educating the market here, in a sense."

Dr Jeremy Goodman
Micro Nav

steps, hi-loaders, bus driving, boarding bridges and even ambulifts. Speaking on behalf of the company, Tarcan Kiper says that KaTron has been marketing this training tool for a couple of years now.

“The most popular application has been the pushback simulator for both conventional and towbarless tractors: both HAVAS and Dnata have bought these and altogether six have been sold. The operating languages are English and Turkish but adding other languages is easy.”

The entire product has been developed in-house and can be configured to an individual client’s requirements. In terms of hardware, this typically translates into a triple LCD screen set-up, with the option for a fourth screen if required. However, as a manufacturer, KaTron does not have the ability to host courses.

“All our GSE simulators are based on our DRIVEtron framework for any type of vehicle simulator. We also produce car, truck and bus simulators. We can address the full range of learning skills based on some new emerging airside driving standards like CAA CAP790, ICAO 9870 and so on. The systems have a state-of-the-art Instructor Operator Station, where instructors can create any type of scenario with different aircraft types and with different weather conditions. The IOS has simulation session recording, debriefing and reporting tools, too. New graphics cards and multiple CPUs are offered as they become available.”

Finally, we must mention Adacel, which markets a similar product to that of Micro Nav.



KaTron offers a wide range of simulator packages

The company’s Flightline Driver Simulator (AFDS) has been on the market for about four years and whilst the company doesn’t offer the training itself, it can sell a client a simulator for use with their own designed programmes.

“Our software is developed in-house, including the modelling (vehicles, aircraft and airport layouts) and we do offer technology upgrades,” declares Tom Evers.

“The Flightline driver runs on a non-motion platform using COTS PC hardware to drive the simulation and the dynamic visual system. It is designed to familiarise people with the aerodrome and to train them to operate safely within established airport procedures. It is intended for both new and experienced personnel.”

The simulator uses site-specific airport databases to present a realistic environment

where trainees can manoeuvre as they would in real life, enabling them to learn and gain experience without any risk to actual operations. The system also allows practice in day, night and varying weather conditions with detailed airfield lighting.

“To date, several international airports within the US have purchased multiple AFDS systems for training, including Dallas Fort Worth, Phoenix Sky Harbor, San Antonio and most recently Cleveland Hopkins International. Dallas Fort Worth is arguably the most complex airport layout in the US and the risk for inexperienced people is high and there is no room for complacency.”

Training for airport personnel requiring access to movement areas is mandatory and the airport targets over 900 individual training sessions per year, using Adacel’s driving simulator. At that training rate over the lifetime of the product the investment in the AFDS equates to less than US\$35 per session. Readers still sceptical about the benefits of the technology might want to weigh up that cost against a ramp incident.

And it doesn’t stop there. The driving simulators are actually contributing environmental benefits. DFW credits the driving simulation programme with saving 1.7 tonnes of carbon emissions from January to April 2010 alone. Based on a projection, it could result in a reduction of the airport’s carbon footprint by more than 6 tonnes per year, with significant accompanying vehicle fuel savings. Driving simulators are literally helping to pay for themselves. ☺



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