

Mick Bates talks to IFJ about the hazards of Simulator maintenance and industry requirements.



Heathrow Airport Fire Training Rig.

**T**hroughout industry today, firefighter training is (thankfully) reasonably consistent - it involves elements such as: fire chemistry; fire behaviour; use of small hoselines; use of self-contained breathing apparatus (SCBA); use and limitations of firefighter protective clothing; use and operation of portable fire extinguishers and wheeled-units and activation of fixed fire protection systems. Advanced training generally includes the use of mobile fire apparatus (fire trucks and appliances), pump operations, driver training, hydraulic operations, and aerial ladder/platform operator training.

Training 'realistically' becomes more difficult as the tools and techniques for the fire team become larger and more complex. The scale, complexity, and realism of the live fire training scenario can be directly related to the ability of the student to respond to a large industrial fire successfully, the first time faced with such a

house engineers, with no knowledge of industry requirements. Alternatively, simulators can be serviced and repaired by the fire crews on shift at the time, and signed off as repaired and safe.

The recently published Fire Service Manual - Volume 4 titled "Guidance & Compliance Framework for Compartment Fire Behaviour Training" now sets out guidance for operators and management for the facility in their charge. However, at present, there are no specific BSI, CEN or NFPA standards, which cover the design, construction and operation of Fire Training Facilities in their totality. There are numerous regulations, technical standards and guidance notes that are relevant to individual systems, but unfortunately, they are often totally disregarded on many systems once the warranty period has expired. Fire Stations (military, civil, airports) also make their own training aids, which are not necessarily compliant with appropriate safety

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challenge. Any lack of such training at the time of need can result in significant life loss, injury and property damage. The immediacy, urgency and unforgiving nature of industrial emergencies only make the problem worse

### Standards & Safety

The simulator industry has grown so fast and expanded at such a rate, that the market has been flooded with in-house training aids before standards could be introduced. The majority of these systems are repaired by in-

regulations. This is not just an UK problem, simulators are used all over the world, many organisations fail to have their facilities inspected and safety -tested.

### Employer Liability

In the UK, the only legal statutes employers have to adhere to are: Health & Safety at work etc. Act 1974, The Construction (Design and Management) Regulations 1994, The provision and Use of Work Equipment Regulations 1994 and Confined Space Regulations.

*Firefighters training at the Williams Foam Technology School.*



extent, if the Pipework were to fracture during an exercise, raw fuel could spill onto the floor and burn out of control. Whilst a simulator is designed to simulate real scenarios as closely as possible, they are still controlled scenarios. If any fuel line fractures during operation, the safety aspect of simulation is broken and can cause serious injury.

### Personnel Training

The lack of trained personnel is another worrying issue that we encounter every day. When the simulator was first installed, competency certificates were issued to all personnel trained on

If an organisation claims to operate to an ISO standard, then by rights, all equipment should come under the provisions and use of work equipment act. However, some sites under control of a contractor do not necessarily recognise simulator equipment as requiring a regular service; they may only repair it when it breaks.

### Simulator Death Traps

As pressure to fit in as much training as possible grows, a lot of simulators are literally used to destruction; occasionally a maintenance crew will attend a site only to find that the equipment has been damaged beyond a safe limit. Although most responsible maintenance contractors will identify serious defects to an owner, and place the unit 'out of action' until such time as the repair has been carried out, if the customer wishes to continue to use the equipment, there is not a lot an inspector can do. Apart from officially reporting problems to the persons responsible by way of a headed letter and recommendations, if the equipment is used after this, it is at the owner's responsibility.

### Propane Gas

Several simulators around the UK use Liquid Propane Fuel as the fuel for each scenario. In order to light the rapid expanding gas, current common practice requires an operator to stand near enough to the scenario with a torch to light the gas. If the wind changes direction at that point, the rapidly expanding liquid propane will engulf the operator and the gas bottle in his hand; the consequences can be very severe.

One of our customers identified this as very bad operational practice, and took it upon themselves to invest in a basic pilot system, which will ignite the main scenario when everyone is well away from the simulator. Other sites will 'over burn' the simulator to such a degree, that the extreme temperatures 'cook' the metal framework of the unit. As a result, welds fracture and several tons of steel are just waiting to fall during the next exercise. Pipework for the distribution of the fuel on some simulators are distorted to such an

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can leave a facility vulnerable to legal challenges from clients with heat exhaustion.

### Ensuring Simulator Safety

Regular maintenance either by appropriately qualified in-house staff or preferably by an outside body who can certify safe operational use, is key in ensuring not only the continued safe running of a facility, but also the quality of the experience provided to clients. Adequate provision must be made for regular inspection and maintenance of the facility and its control, monitoring and safety systems.

The new Volume four of the fire service, mentioned earlier, now sets out guidance for operators and management for the facility in its charge. The facility must be maintained in such a way as to ensure that the risks associated with the facility itself are identified

the use of the equipment. However, over time, people leave and new people join, until eventually, the simulator is operated by "Chinese whispers". If a serious accident were to occur or an accident that warranted a RIDDOR report, the first question that would be asked, is are you trained on this equipment. Although training requires money, safety is without doubt the most crucial investment we can make. The question is not what it costs us, but ultimately, what it saves.

## Training requires money, but safety is without doubt the most crucial investment we can make



**The FirePan™, from Survival Systems is used exclusively for fire extinguisher training. Survival Systems also offers this unit for sale on a retail basis. This simulator is safety certified to ANSI standards, lightweight, portable and because of its unique electronic ignition system it is compatible with all fire suppression agents. For more information about Fire Safety and Rescue Training, e-mail: [ssil@auracom.com](mailto:ssil@auracom.com)**

Additional problems can occur if a simulator is operated without any pre-planning or objectives. For example, if BA chambers are operated without any temperature monitoring systems, safety personnel have no way of knowing who has been exposed to what temperatures and for what length of time. This

and adequately controlled. However, this guidance and the requirements for the design of Compartment Trainers are only applicable to new simulators, existing rigs are not subject to these recommendations. Implementation of Volume 4 guidance at older facilities is only at the discretion of the operator.

The introduction of correct procedures and regular inspections will ensure simulators are kept up-to-date with recommended changes and are safe to use. Providing safe, correctly-functioning equipment which gives clients the training scenarios they require, must be the ultimate goal of any training organisation.

Implementing these recommendations will not only benefit all firefighters by providing effective and safe training, but will also protect the personnel responsible for the facilities under common law. ■



**The world was well represented at this year's Foam Technology Workshop, run by Williams Fire and Hazard. Firefighters from the UK, South Africa, Germany, South America, the Middle East, United States, and Australia were in attendance for valuable training for waging victory against industry's various fire scenarios. More information and to register for next year's Foam School visit [www.williamsfire.com](http://www.williamsfire.com)**

### THE AUTHOR

Mick Bates' career began with 15 years in the Royal Navy as an Engineer. Mick was an instructor at the Royal Navy Fire Fighting School in Portsmouth before leaving the Navy in 1994, and starting work as a Maintenance Engineer. Mick has trained the Airport Fire Service in Hong Kong on their simulator and now works for MSF Ltd. providing support and servicing on a range of simulators.