Fire Service College - immersive 3D emergency training

The Fire Service College are an award-winning leader in fire and emergency response training and operate one of the world’s largest fire and rescue training facilities. They specialise in providing dedicated training for fire and rescue services, emergency responders and a wide spectrum of global commercial and public sector clients.

The challenge: the ability to train in a real life environment is critical for the emergency services, but in reality the opportunity to do this is complex, expensive and time consuming. The need was therefore identified to develop a ‘next generation’ of incident command training utilising immersive simulation technology. The desired solution needed to place fire service personnel at the heart of an emergency situation, challenging and testing their command skills.

The solution: The ‘Bluehawk’ simulation platform that was delivered allows emergency personnel to train in a realistic, yet safe environment – while being exposed to a range of different crisis situations. The initial series of virtual emergency scenarios was targeted at training and assessing Fire Service Incident Commanders to UK Level 1 accreditation and includes 16 different situations from a terraced house fire, through to road traffic collisions and chemical spills.

A simulation suite has been built at the Fire Service College to facilitate immersion in the various simulated environments. This includes a specially designed ‘igloo’ that provides a 360 projection of the virtual environment. Here the delegate is positioned in the midst of one of the realistic 3D scenes which were developed in collaboration with fire service subject matter experts. These environments have been tailored to UK based locations to ensure they feel authentic, and compelling audio has been developed to enhance the immersion experience. Advanced ‘pathfinder’ technology has been created to support realistic character walking and interaction with the 3D environment, while advanced physics technology realistically places vehicles etc on uneven surfaces. The following pages provide a snapshot into how the simulations were developed to ensure maximum effectiveness.
Developing the solution:

Realistic, immersive 3D environments were built in collaboration with the fire services.
Realistic 3D characters were produced by specialist artists for each scenario.
Special effects and fire were developed with fire services experts so that the behaviour of smoke and flames mirror the real thing.
Bespoke assets such as bins, bags, for sale signs etc were built to replicate UK based environments.
UK vehicle and other assets were developed in collaboration with fire services experts.
Authentic 3D environments were developed for each emergency services scene.
A control/facilitator application was developed which controls events during the simulation.
A 3D scenario builder tool was developed which allows assets to be placed as required within a particular scene, allowing situations to be adapted and flexed.
An assessor iPad app was produced to enable face to face assessment of the Incident Commander.
The physical architecture of the system comprises four simulation rooms and a control room.
Functionality has also been developed that allows a dynamic hose to be placed in, and extended to, any area of the simulation, handling as the operator requires, further replicating a genuine situation. Incident Commanders simultaneously manage the fire incident scenario following the appropriate protocols and procedures.

Given that this is a training tool it is critical that the individual’s performance can be assessed, scored and recorded. All the simulation scenarios are therefore mapped to the appropriate National Occupational Standards and integrated into the assessment and reporting tools which are exportable to DVD. Delegates can therefore take away a video as well as instant feedback on their assessment.

**Solution flexibility:** Both onsite and Cloud based internet training options are available. This means that the training can be taken ‘on the road’ via use of two laptops and an Oculus Rift Virtual Reality headset (see photo below). The Bluehawk 3D simulations can therefore be delivered locally to customers, making the simulated environment both flexible and cost effective – minimising the amount of time fire personnel have to be away from service. The simulation experience can equally be delivered regionally, at a fire station for example.

![Image of a training scenario](image.jpg)

**The future:**

- Following the successful roll out of the level 1 training programme, work is now under way to further develop the platform to provide even more sophisticated training for Incident Command levels 2 and 3.
- Cross platform versions have been developed including Windows and iPad apps. There is also the potential to migrate the applications to tablets and other platforms, and this is being explored to maximise the scope for how the training can be accessed.
- Plans are unfolding to roll this programme out nationwide.