

## Virtual Incident Simulation for petro/chemical industry

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*Virtual incident exercises have been used successfully since 2006 for training safety professionals at ExxonMobil (The Netherlands) and BASF (Germany). The virtual incident exercises are used to exercise fire leaders and emergency leaders in combatting fire, leaks and gas emissions in different sections of their (petro)chemical production plant.*

*In this workshop, the presenters will show the virtual incident exercises used by BASF and ExxonMobil and explain how the simulation technology is used to enhance individual and team competencies. The workshop participants will be able to participate in demonstration exercises during the workshop.*

### **Virtual incident exercises**

Virtual incident exercises are incidents realistically simulated by a computer. Using a joystick, one or more course participants walk around in the simulated world of a virtual incident. Course participants experience a virtual incident scenario as extremely realistic. The stress felt during exercises is considerable, because the problem situations that arise fully match reality.

In this virtual world, the course participant can open doors, enter buildings, walk up and down stairs and look into and under vehicles. The course participant assesses the incident, communicates with other course participants, takes decisions on deployment and subsequently deploys virtual teams. The vital signs of victims can also be retrieved, for triage purposes.

The consequences of orders can be observed in the scenario, and in turn call for new decisions. Because every possible hazard can be simulated, these safe virtual incidents are particularly suitable for focusing specific attention on risk procedures and personal safety.

Virtual incident exercises have not been produced with a view to replacing all manuals, classical teaching and outdoor exercises. Virtual exercises do however offer specific possibilities for exercising image forming, judgement decisions and overall decision making which within the existing range of teaching forms are clearly restricted.

The virtual incident scenarios presented during this workshop have been developed for international petroleum and chemical companies ExxonMobil and BASF. The virtual incident scenarios provide an effective platform to train the safety personnel in vital incident management areas like tactical, communication and leadership skills.

### **Individual or team exercises**

The virtual incident simulation can be used either for individual exercises or for exercising teams of students either from one single agency or in a multi-agency exercise.

During the exercise, the instructor decides what happens. He/she has total control over the development of the scenario. The instructor decides how the learning objectives of the course participant(s) will be achieved.

By role-playing the dispatch centre and the crews at the scene, the instructor can use their own experience and creativity optimally. They are not led by or limited by the scenario but decide for themselves in which (educational) direction they let the scenario evolve.

### **Library with industrial virtual incident scenarios**

The current users of virtual incident simulation for industry have allowed their scenarios to be included in a "Virtual Incident Scenario Library". This virtual library contains detailed 3D models of sections of existing petroleum and chemical plants. The virtual library is available to other rescue professionals who use the DiaboloVR XVR Simulation software. Examples of available 3D environments in the library are: LPG spheres storages, crossing section of piping lines and a section of an ammonia factory.

### **Virtual incident simulation in your own plant**

With laserscan technology it is also possible to recreate your plant into the virtual incident simulation software. As result you can educate and exercise your staff in a recognizable and highly accurate environment. Laserscanning of your plant might have already been done for engineering purposes. Existing CAD drawings of your plant could also be used as basis for 3D development.

### **Other applications**

Virtual plants can be used for more than training and exercising. The virtual environment can also be applied in the area of security analysis (virtual audits) as well as security design (for example analysis of field of view of CCTV security cameras). The accurate 3D representation of your plant is also a good basis for after action review of exercises and live security audits held at your company.

### **Videos**

Please view the videos supplied on the DVD to see an example of the virtual incident simulation in petro/chemical environments.

- Virtual walkthrough of a factory for location awareness training
- Virtual scenario in petrochemical plant with security threat
- Virtual incident scenario for fire fighter training in petrochemical plant
- Example of team exercise in Safety Academy in Tallinn Estonia

**About the authors**

The authors are co-founders of the Dutch company E-Semble bv, the developer of the simulation technology. Both presenters have been involved in the design of the security scenario's as well as the training of the trainers at both BASF and ExxonMobil.

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