



360° TRAINING WITH VR-HEADSETS: NEW TRAINING DIMENSION WITH ENDLESS POSSIBILITIES

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Wobbling off his feet, the instructor rapidly pulls of the Oculus Quest VR-headset. 'Whoa sh**, this takes some getting used to!', he exclaims enthusiastically. It is a rainy Monday in Schiedam and one of our senior instructors has just tried on a VR-headset for the first time. Our training

module on atmospheric storage tank fire safety is about to be finished, and because the instructor will be teaching the course, a demo seemed suitable.

The technology is not brand new, but has not yet been used in industrial

fire training. As training provider, we have followed the developments with great interest, but it was not until the autumn of 2019 that we decided to step in. Our partner - a local developer in VR/AR software solutions - has programmed a Google Street View alternative for oil and

gas industry and chemical storage.

When wearing the headset, students are equipped with a virtual tablet and pointer to navigate, activate and interact with a photorealistic surrounding of a classic tanker park full of different types of atmospheric storage tanks, product pump stations, jetties and a vapor recovery unit. The tablet contains a terrain map with all interactive spots marked. Using the pointer one can teleport between the spots. All spots display a number of interactive elements to click-on for activation. For example: while standing on a fixed tank roof, the foam pouter can be clicked to display a summary with its most important specs and a video is shown displaying functioning of the specific pouter.

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36 LENSES

After communicating back and forth with one of our oldest clients, we received permission to capture 360°-material. Using a spherical camera with 36 lenses we entered the site for a full day of 360-photography. The images are over 100Mb a piece and contain so much data that you can zoom in to observe surface details on the adjacent tank.

We believe this hardware, software and image-capturing allow for training experiences that were not achievable up to now. Everyone knows the restrictions and safety rules in the industry, very rarely is it allowed to access storage tank roofs just for observation. Even more extreme would be to access multiple roofs in a few hours with a group of 12 pupils. Our 360°-module makes this possible in any given classroom.

INSTRUCTOR'S DREAM

Imagine standing on top of a geodesic dome tank roof with a group of students, while discussing credible scenarios, pointing out safety measures, plotting out heat flux contours, experiencing the true dimensions, displaying behaviour when under fire using footage of recent incidents. Wouldn't that be every instructor's dream? We know there is a list of topics in

basic industrial firefighting courses that are addressed theoretically, because they simply can't be organised in real life. You can't get every newbie on top of a storage tank, you can't demonstrate how to fill a tank bund with foam, and you can't show the full activation of a foam sprinkler on a jetty.

Being able to share these experiences with students is very valuable and we know that this will bring an extra dimension into firefighting education and training.

SENSE OF REALITY

This extra dimension is what we are looking for when further developing educational and training courses. 360° virtual training proves extremely effective for letting students experience a 'sense of reality'. Reality is in the level of detail, the proportions between subject and surrounding, the smoothness of looking around, the imperfections of the real world, the feeling of being on one's own site. When putting on glasses, in no time a student realizes: this is the size of a tank, this is a bund, these are the safeties, these are the stationary fire protection systems. And it is that realization that firefighters can relate to when encountering emergencies.

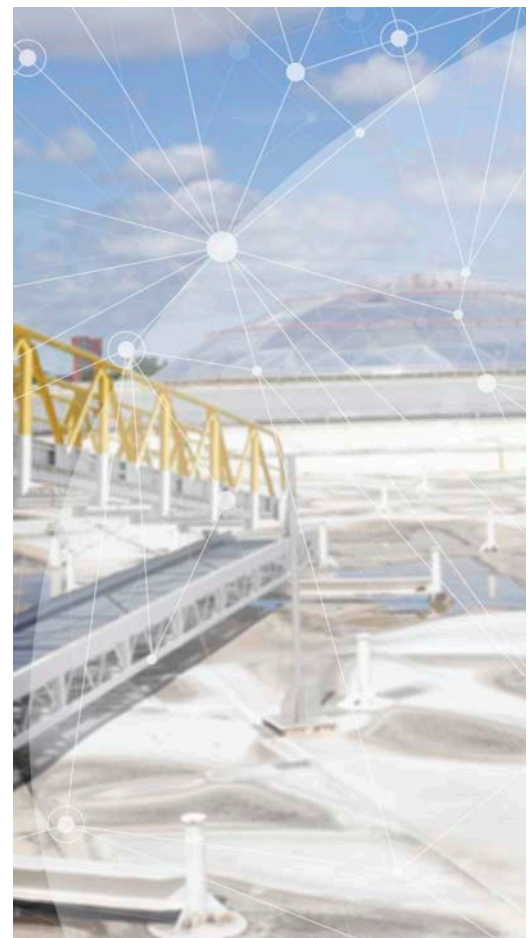
NEXT STEPS

Over the summer period we will finish the pilot phase, and when the school season starts, the first module on atmospheric storage tanks will be incorporated into our curriculum and programs. Then development starts on the next modules.

Already we see possible links between the VR headset and other parts of firefighting education and training. Our existing software for online e-learning could be integrated into the VR module, allowing to not only observe but also answer questions or take tests. Also, we make use of VSTEP's software for virtual scenario training, we believe we can enhance that with the headset. The new dimension of training with VR headsets, offers us possibilities that we did not foresee to be possible. We can hardly wait to try them all out.

ABOUT H2K

Jochem van de Graaff and Simon van Voorst work at JOIFF-member organisation H2K. This agency is specialised in providing firefighting education, training courses and consultancy. Our customers are fire services, company fire brigades and companies with an Emergency Response Organisation, such as petrochemical, pharmaceutical, chemical storage, transport, and food processing industries. We develop innovative tailor-made solutions for preventive safety and operational readiness.



VR / AR / MR - WHAT DOES IT ALL MEAN?

VIRTUAL REALITY

VR provides a full immersive experience. When immersed a person experiences a completely different world, it is not possible to experience the real world at the same time. The virtual world can be created using modelling-software or can be a projection of an earlier recorded situation.

AUGMENTED REALITY

AR is a combination of reality and simulation (such as a hologram). Practically this means a person observes the real world while looking through a transparent display. The display can be used to display objects, text or information while looking at the real world. (Everywhere you move your head, the displayed object will move with you.)

MIXED REALITY

MR uses the same technology as AR, but simulations that are displayed are anchored in a fixed position in the real world. (When moving your head, the displayed object will go out of sight. When panning your head back, the object is in the exact same place as it was.)

The H2K 360° training module uses an Oculus Quest VR-headset to display 360°-recordings. Under development is the possibility to animate certain learning examples onto the recordings for a more realistic experience.

