



3D MODELS IN PETROCHEMISTRY

In an article on the website Habr Vladimir Andropov, a specialist at SIBUR, spoke about how 3D models can be of use in operating large-scale facilities.

Petrochemical plants are complex structures. Zapsibneftekhim in Tobolsk is the biggest petrochemical facility in the history of modern Russia. 9,831 kilometres of cable, 102,000 tonnes of metal structures and 513,000 cubic metres of concrete – it's an imposing facility that must be properly maintained. Models of the site are very helpful in doing this.

3D MODELS CAN REPLACE THE LARGE AMOUNT OF SCALE MODELS AND PAPER PLANS OF FACILITIES.

3D models can replace the large amount of scale models and paper plans of the site. A scale model, even a very detailed one, is an offline resource that provides only general information about a facility. A 3D model is interactive and allows you to spin around, examine in detail and remember certain parts of the facility.

Therefore, it is not surprising that when it comes to training, a 3D model is much better than a scale model. New employees can be given access to the model, so they can start to familiarise themselves with it. For schoolchildren and students, the possibility of clicking on the model to discover all its details is a much more exciting prospect than fiddling around with a scale model.

3D models help employees to quickly memorise where exactly their area of responsibility begins and ends, how everything is set up and how to get to the necessary component in the shortest amount of time. A 3D model also acts as a safety guide – it clearly displays all areas where wearing a hard hat is compulsory as well as certain areas worth avoiding completely. Studying a comprehensive plan of the facility using a 3D model is much quicker than working with paper plans.



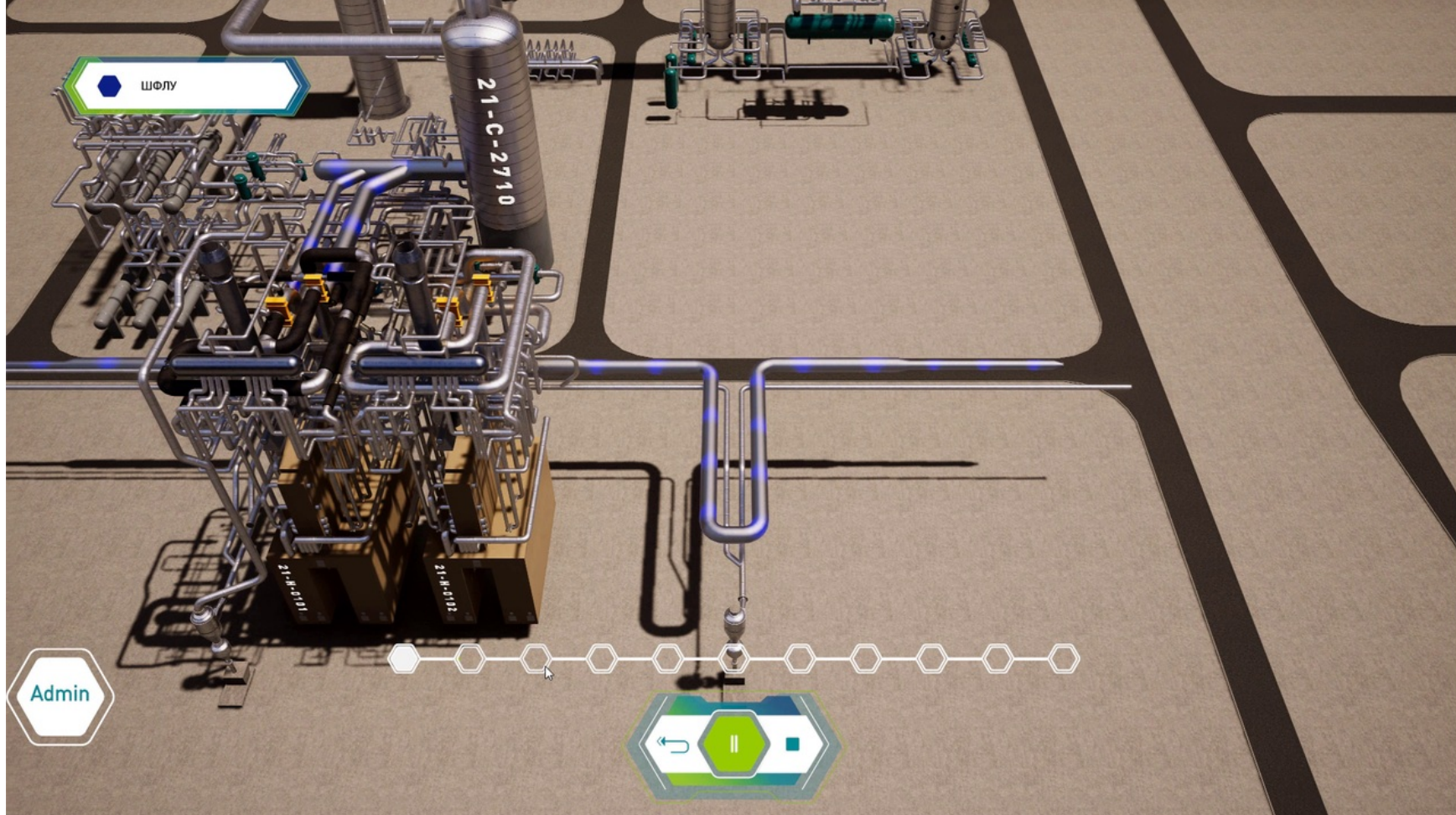
Safety guide: on virtual models, all dangerous zones are clearly indicated.

3D MODELS CAN DISPLAY EMERGENCY RESPONSE ACTIVITIES.

On the basis of a virtual model we can create a functional training simulator that can be used for internal testing purposes. Soon, besides training courses, complete technical documentation of all components will be superimposed onto the model, so before starting their shift, employees can quickly remind themselves of their tasks and plan their day. Furthermore, the models can display emergency response activities.

A 3D model will allow any inspection bodies or interested parties to complete a virtual excursion round the facility – a much more effective solution than studying photos and videos.

So far, the model has been produced in such a way that it is visible on a PC, however in future it may also be possible to view the model using VR.



Virtual model of the facility intended for PC.

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Users have different roles that correspond to their level of access. For example, some might have access to the model in its entirety, including all technical equipment and details, whilst for others, certain layers can be removed, so as only a simple outline of the equipment and its location will be visible.

However, a high-quality picture and detailed data is not all. A good model provides animation of moving parts, sounds and so on. That's why in certain areas we work with specialists from other fields, for example a professional announcer to do voice work for the animation of technological processes.

Visualisers used flowsheets in order to understand the principle of each technological process. The specialists studied every step of the technological process in order to understand how best to represent it visually.

The model is now being actively field-tested and employees are giving their feedback. This helps to check if everything is working as intended and to formulate requirements for future improvements.

You can read the full article on SIBUR's blog (https://habr.com/ru/company/sibur_official/blog/481638/) at habr.com.