

Ministry of Education and Science of the Russian Federation  
NATIONAL RESEARCH UNIVERSITY  
“MOSCOW POWER ENGINEERING INSTITUTE”

# **VR simulator for power engineering facilities**

NEW POSSIBILITIES

Ph.D., senior research fellow of the EPS Department

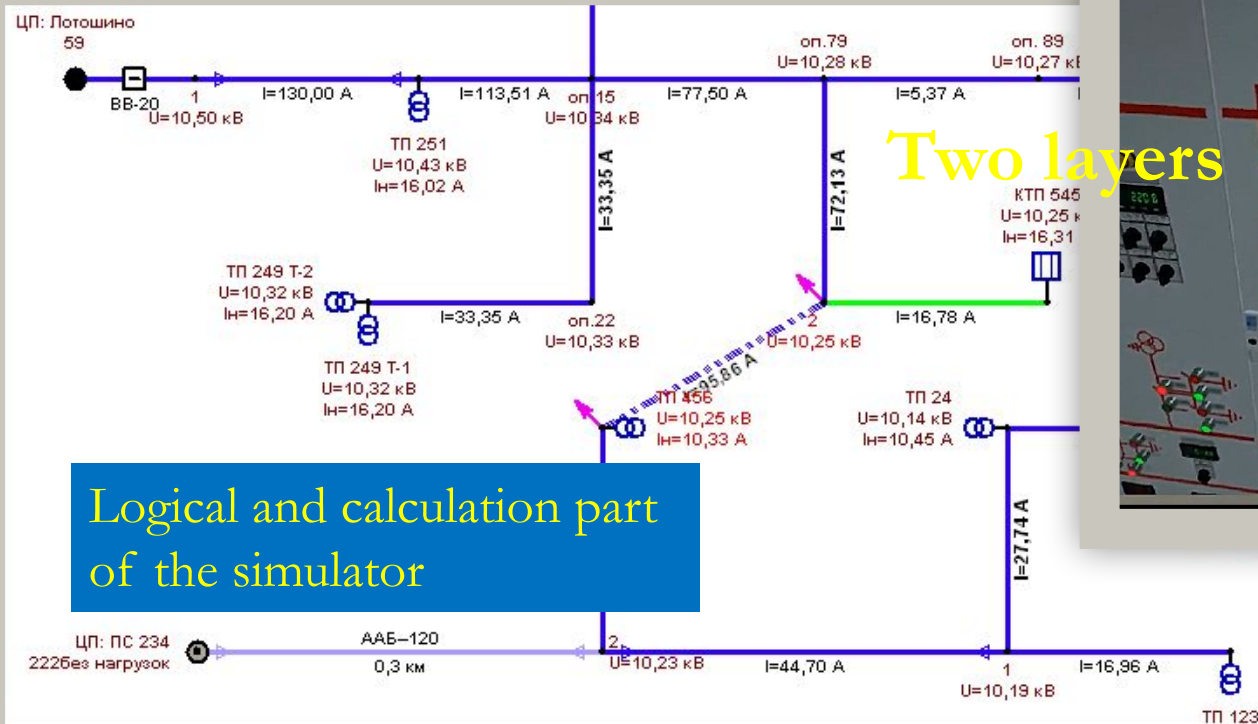
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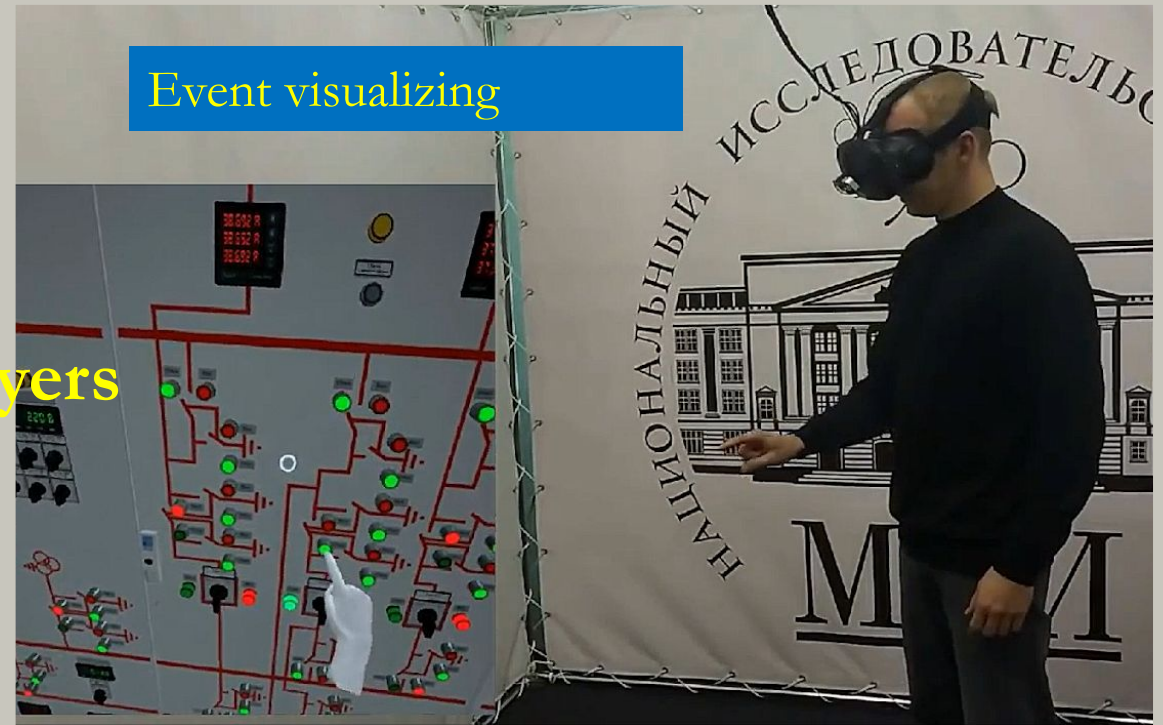
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# System architecture

Transfer of the event to  
the model



Event visualizing



Model reaction to the event for  
visualizing



# Components description

VR helmet



Cube (LxBxW) 3x3x3 meters



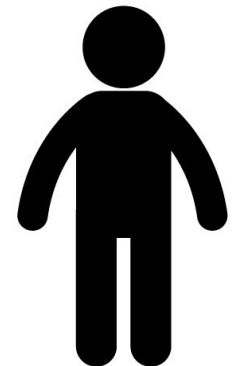
Motion sensors



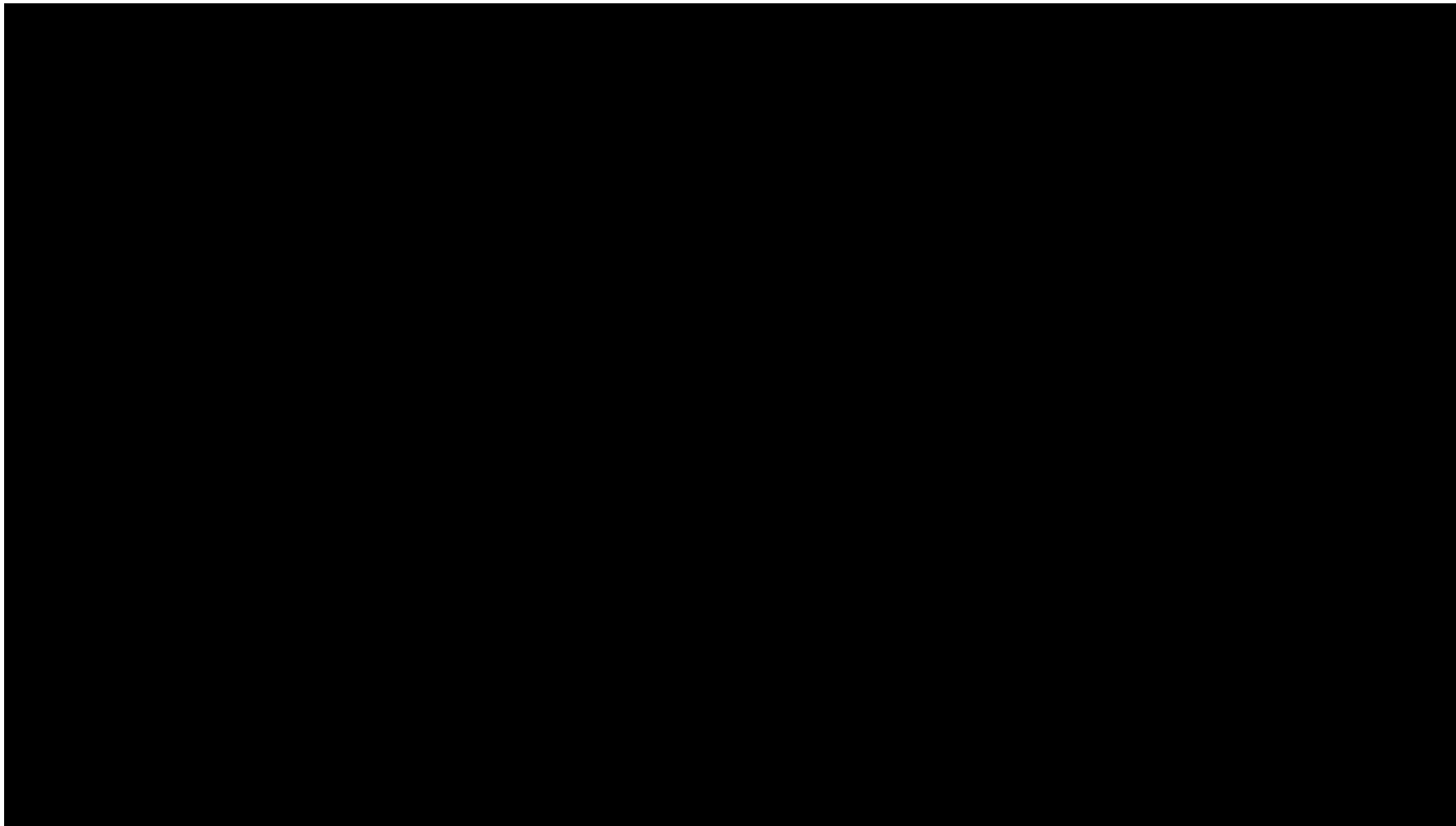
Hands sensor



User



# Simulator actions

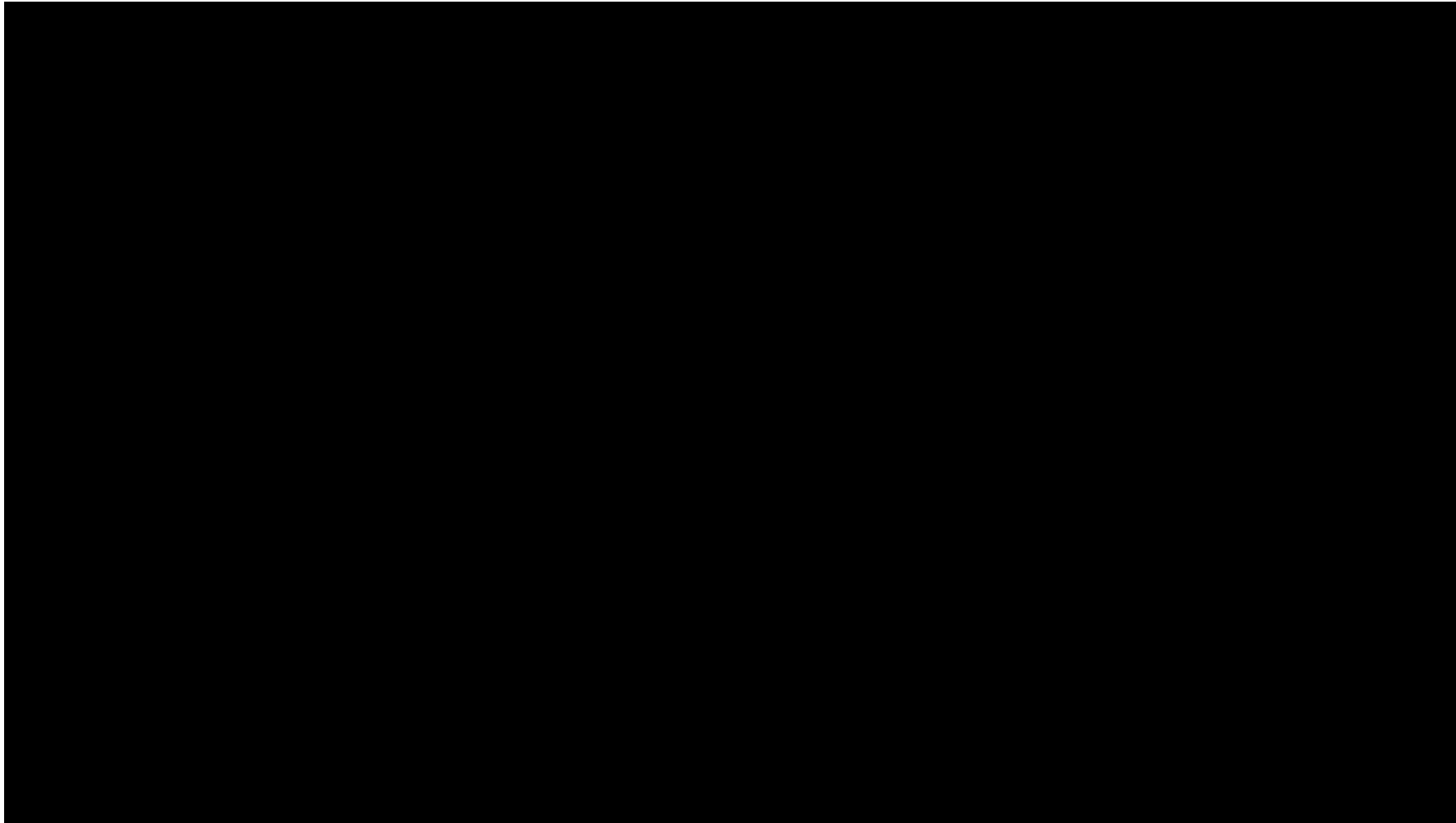


## Movement throughout the facility

Performed in 2 stages:

1. By pushing a button on the left hand wrist with the right hand pointer finger;
2. By selecting a teleportation location on the facility plan.

# Simulator actions



## Movement within the visual sector

Pushing a virtual button above the left hand thumb teleports the user to the center of the visual sector (center of the screen).

# Simulator actions

## Local movement

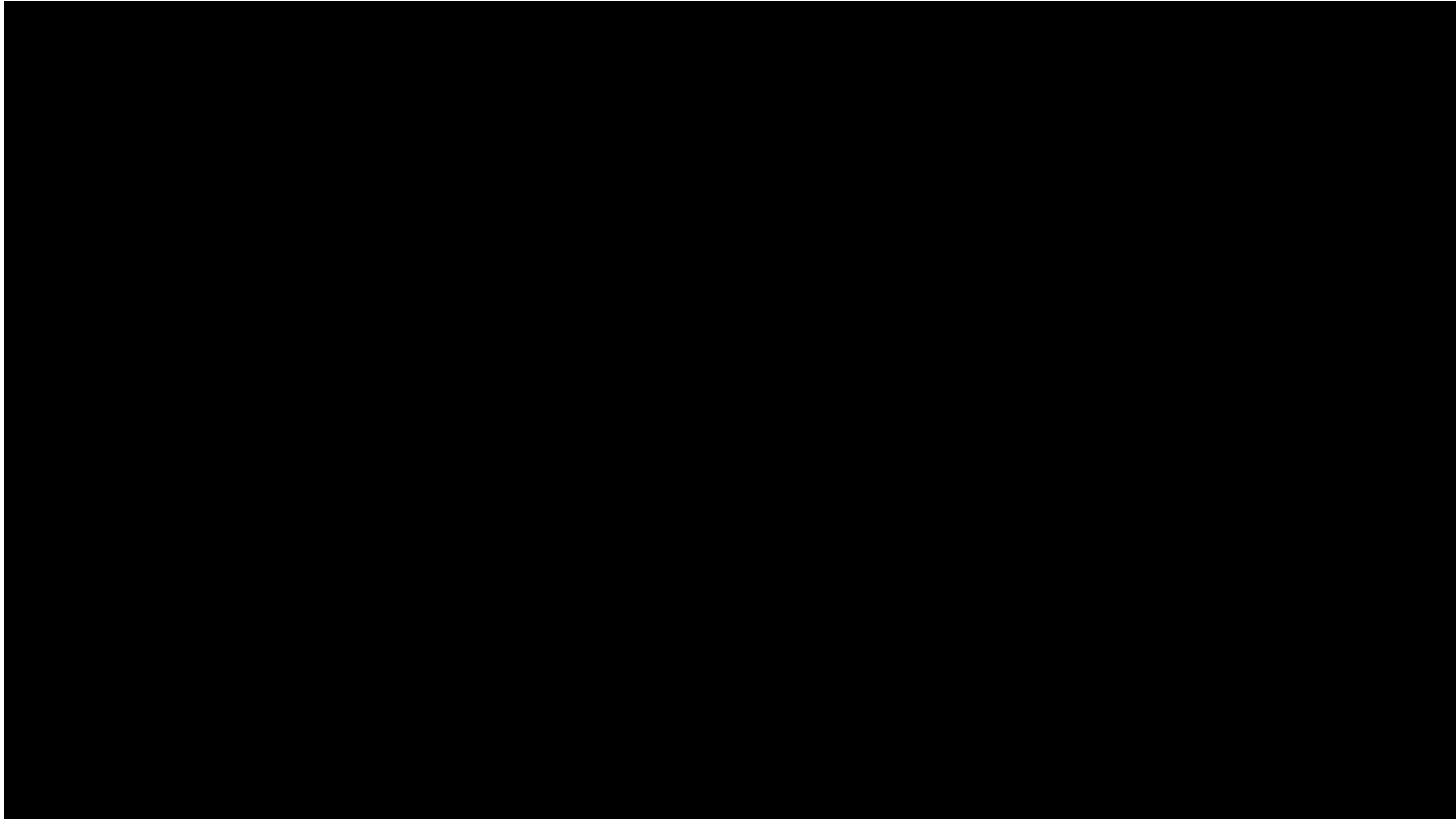
Natural movement is possible within the cube. Virtual mesh in the VR informs about cube walls.

# Simulator actions

## Control of switching equipment

Control buttons are pressed with the right hand pointer finger.

# Simulator actions

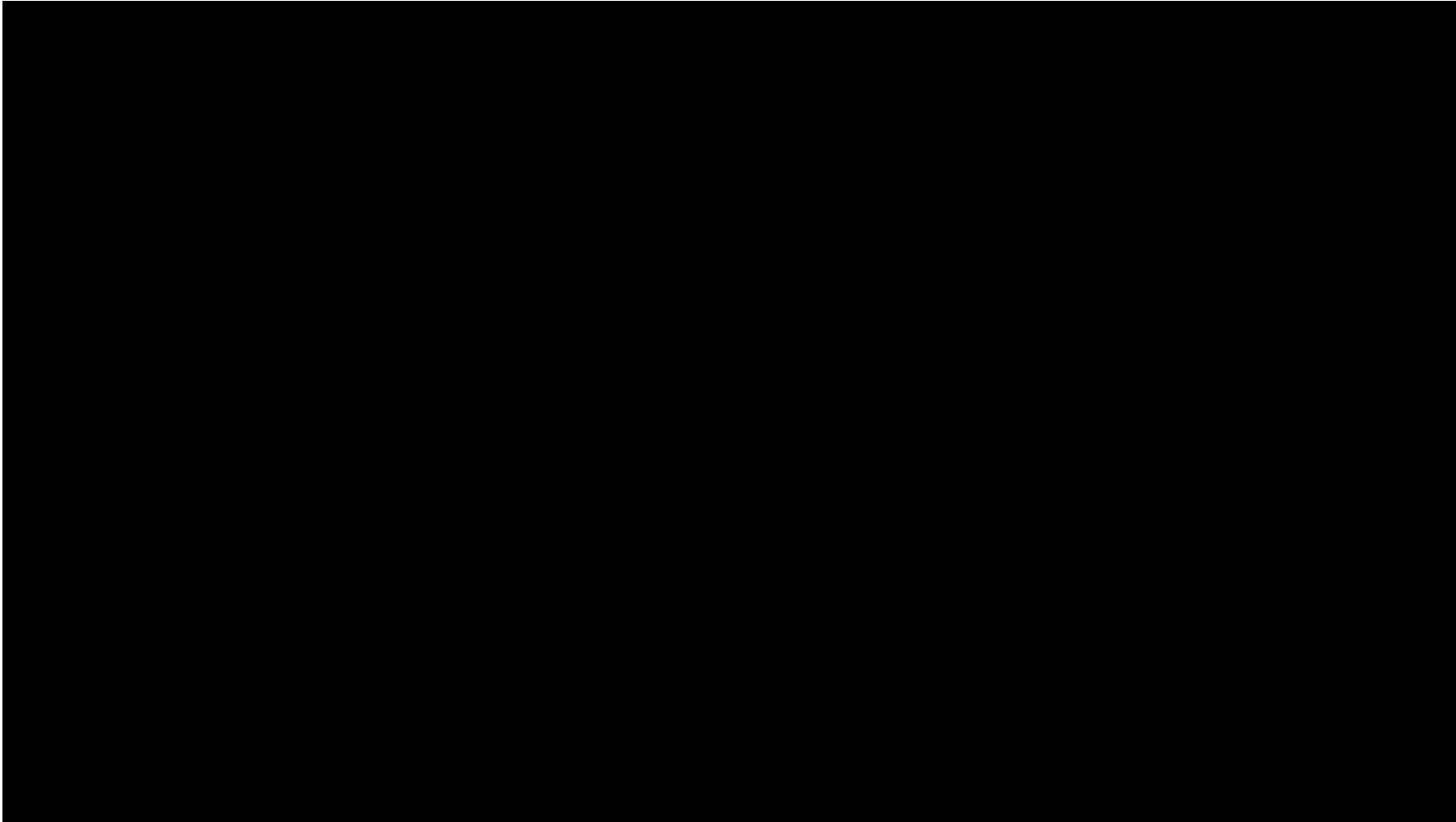


## Control of switching equipment

Rotation of levers is performed with natural hand movement – rotating the lever in the needed direction.



# Simulator actions

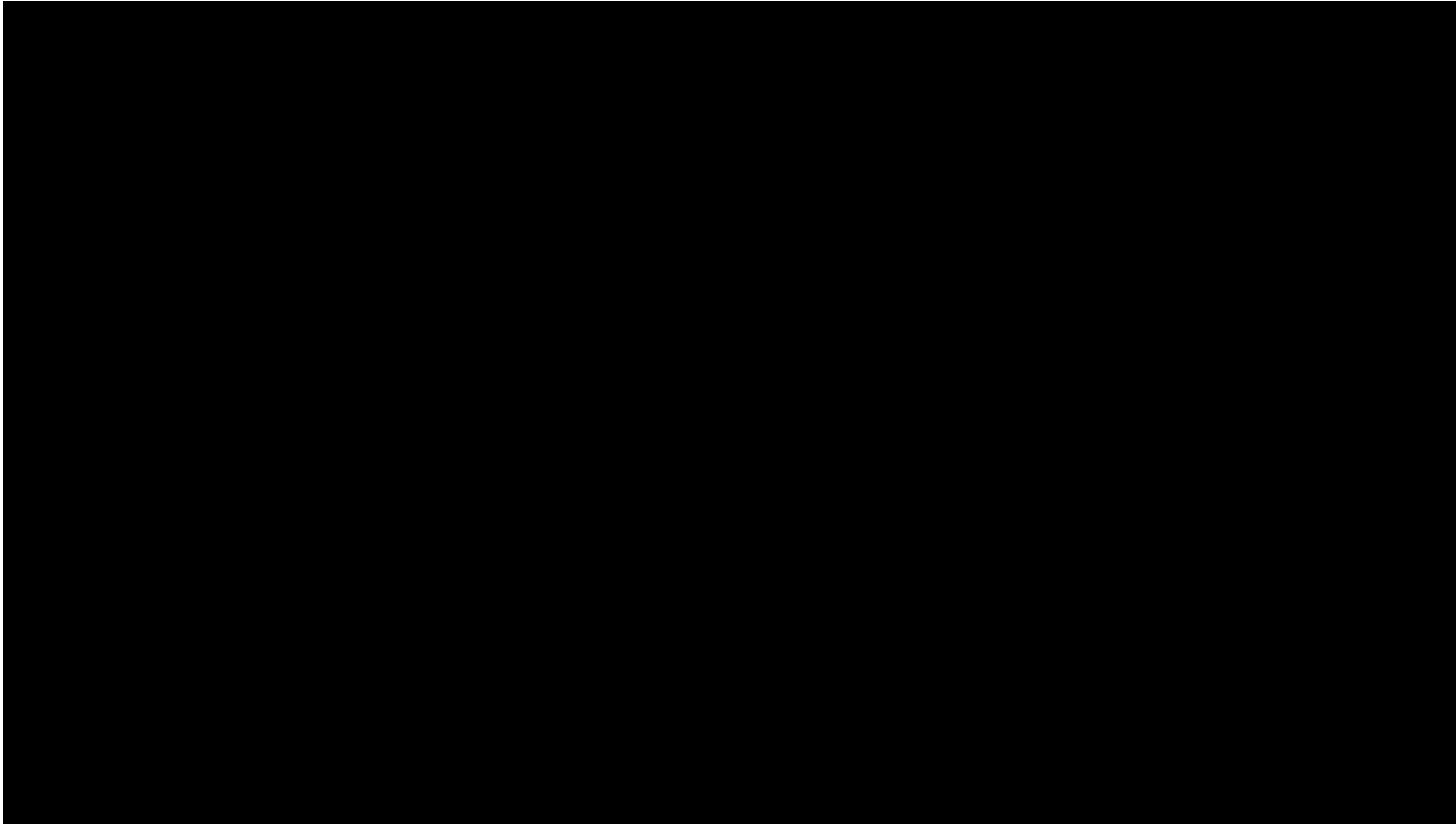


## Work with protection equipment

Use of interlocks is obligatory at facilities, and the simulator includes interlocks.

This video shows works with electromagnetic interlocks.

# Simulator actions



## Control of small size objects

VR has limits for visualizing objects smaller than 2 cm. To interact with such objects a zoom function is available.

# Simulator actions

## Interaction with complex dynamic objects

Objects of any complexity can be used in our simulator.

# Simulator actions

## Feedback

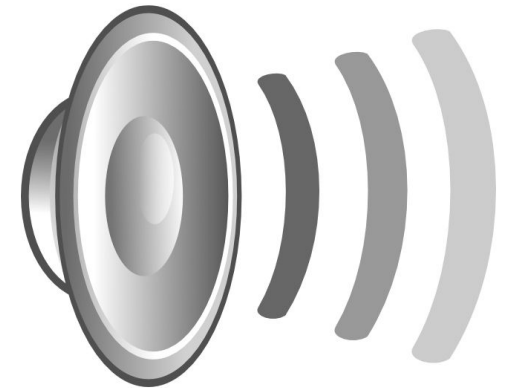
Any kind of feedback from simulator to user is possible



Vibration



Light



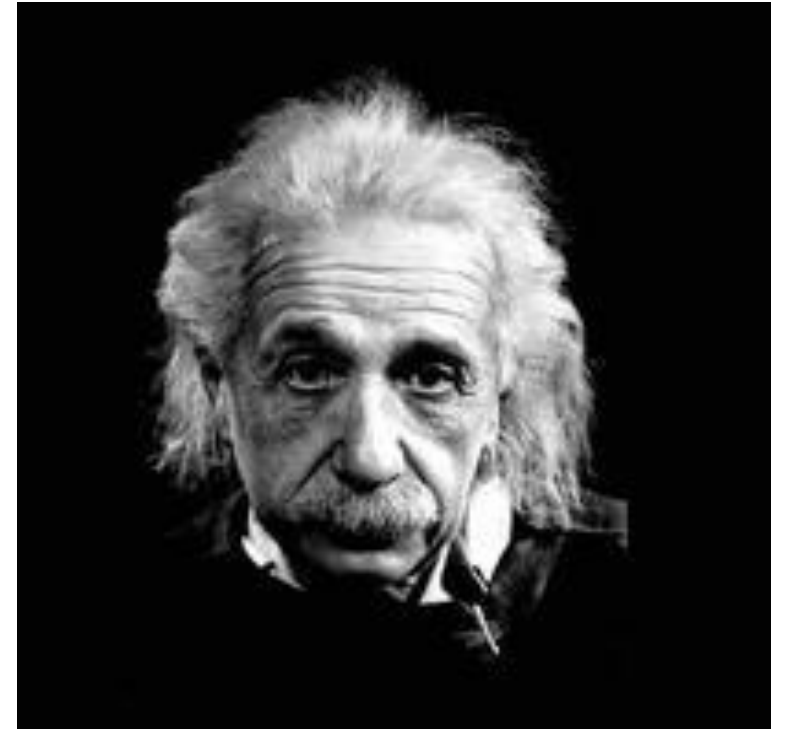
Sound

# Development and improvement of the model

Improvement of the model used in the simulator is possible under your team after installation at the customer's facility.

At the same time it should be noted that high-skilled programmers are required for this purpose.

Thereby development of the terms of reference is a really important step, as a properly developed simulator will not require any improvement.



# Patent clarity

## Shall be provided

Conditions of the rights transfer to the customer  
can be discussed separately.



# Partners and customers



Федеральная  
Сетевая Компания

