What's New About Enabling Technologies in Power Plant Simulators and Training Systems: Visor3D-SD Prototype

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Abstract

The current situation in the generation, supply and use of energy is clearly unsustainable economically, environmentally and socially. For this reason, it is necessary to change the present course of the energy sector by revolutionizing and applying technologies towards energy efficiency in all the involved aspects: from the type of energy generation (renewable), capture/storage of carbon until the operational efficiency of power plants. In this context, building the skills and abilities that plant operators require is an equally important aspect in the application of new technologies related with reliable and sustainable energy.

Certainly, training simulators are an effective tool to train and empower staff skills in operating power plants. The main objective of a simulator is to provide complete training while avoiding risks and reducing costs in operating expenses such as maintenance, deviations in environmental regulations as well as in power plant service life and personnel safety.

With the increase in processing capacity, computational speed, advances in computer technology and the sophistication in modeling, it is becoming more feasible to develop systems based on Virtual Reality (VR) or Augmented Reality (AR). These systems implement hardware interfaces that besides delivering a more stimulating experience to the trainee, contribute to the experimentation of increasingly "realistic" sensations in multidisciplinary areas such as education, medicine, training systems, dynamic simulators and business, to mention some examples.

Regarding operator training simulators for power plants, it is considered that such systems are mature enough in their dynamic and real-time applications, to apply VR or AR to operator training systems. With these systems, operators are not only trained with regard to the operation of the process but at the same time they are trained in understanding the various physical and chemical phenomena that occur, as well as in gaining detailed equipment knowledge. This article presents an overview of VR training systems for power plants and describes in detail a VR prototype system called Visor3D-SD, which is coupled to a thermoelectric plant simulator.