

Introduction

Development of nuclear energy is an important area of functioning of developed world countries. The publication [1] states that nuclear energy created new round in the history of human development. Unfortunately, three major nuclear accidents in the history of nuclear power plants (NPPs) (Tri-Mile Island, Chernobyl, Fukushima- 1) caused global impact and led to significant radioactive contamination, causing significant damage to public health, natural and agro-environmental systems, etc.

Therefore, safety is a necessary condition for the nuclear energy development [1, 2].

NPPs are objects of increased danger. So, their development prospects are closely related to issues of their safe operation and protection of territories, civilians and the environment on plant territory. Under various negative circumstances (violations of technological processes, safety and operating conditions, man-made accidents and incidents, natural phenomena, terrorist sabotage, hostilities, etc.), various emergencies can happen at NPPs. It pose a significant risk to environment, health of staff and population of the surrounding areas. Analysis of man-made emergencies by threat to human life, nature of action, scale of destruction of buildings, amount of material and economic damage, etc., shows that the most dangerous are emergencies causing radioactive and chemical contamination of the environment [2].

Currently, Ukraine has developed nuclear energy industry. It is based on four existing nuclear power plants: Rivne, Khmelnytsky, South Ukraine and Zaporizhia.

It is planned to increase capacity of this industry for the next decades according to the “Energy Strategy of Ukraine until 2035” [2].

Development of most analog systems becomes impractical in the new technological era due to availability of digital alternative. Digital state becomes usual state of functioning and development of many systems, spheres, organizations, industries and economies. Main purpose of digitalization is to achieve digital transformation of existing and creation of new economy sectors, as well as the life spheres transformation into new more efficient and modern. Such growth is only possible when digitalization-related ideas, actions, initiatives and programs are integrated into national, regional, sectoral and development strategies. High-tech production and modernization of industry with the help of digital technologies, scale and pace of digital transformations should be priority of economic development. Sectors of the economy using digital technologies grows faster, cheaper and better [3]. So, digital technologies and successful projects of foreign developers need to be introduced more widely in the field of energy.

The work [1] state that NURES SAFE7 simulation platform based on NURS IM was created after the Fukushima-1 nuclear accident. It is a platform for safety analysis, operation and engineering of nuclear reactor design. Virtual Nuclear Power Plant (Virtual4DS) is an integrated simulation platform covering NPP environment, based on digital reactor consisting of digital traffic, digital meteorology and data on processes in the earth’s crust. Virtual NPP gives opportunity to perform modeling of multiactive operations, consider the evolution of nuclear accidents, use to support management decisions, anticipate emergencies and others based on big data, mobile internet, artificial intelligence, cloud computing platform and other advanced digital technologies [1]. Therefore, issues of “nuclear energy safety” have gained new importance both for NPP personnel and for the training of future specialists in the energy sector thanks to digital technologies.

Indeed, new evolutionary stage of society is called technological era. For this era it is important to train professionals who will be competitive and will be able to quickly master the professions of the future. We believe that it is important to use digital technologies, in particular, virtual reality (VR) and augmented reality (AR) in specialists training for the new technological era [4].

Enterprises and large industries can’t operate without digital technology in the digital era. So, process of staff training needs should be improved. VR and AR technologies are functional and affordable. It is possible to model complex tasks that require adaptive thinking and real skills by their help. Therefore, these technologies are an ideal tool for learning in the digital era. Today, global VR and AR spending will grow by 100% or more every year. Rising costs reflect willingness of companies to provide their employees with virtual environments for learning new skills and abilities. VR and AR technologies will become basis of training in an industrial environment, as training will become more effective, interesting and safe. Also, widespread use of immersion technologies requires cooperation between industrial companies and developers of VR and AR technologies, which must ensure their compliance with training and safety requirements for different organizations [5].