



B3 - Substations and Electrical Installations

APPLICATION OF BIM AND DIGITAL TWINS IN SUBSTATION ENGINEERING, O&M AND BENEFITS OF USING VIRTUAL REALITY MODELS CONNECTED WITH ASSET MANAGEMENT DATA

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***Abstract** – This paper presents a real case substation digital twin of a German operator and presents the experience and benefits of the BIM method for model creation and the concept of the digital twin - a lifecycle model that follows all changes and represents the physical twin in a digital model of the substation. A new method is presented for creating virtual reality substation models from BIM models and connecting them to other databases. The paper illustrates that the digital twin - together with a virtual reality environment - improves operation, maintenance and engineering by supporting teams and procedures with special simulations and proactive maintenance activities, so contributing to reduction in costs, time of substation projects as well as improving people's safety.*

Keywords: Virtual Reality – BIM – Engineering – Substation – Digital Twin – Point cloud – Simulation – Asset Management – Operation – Maintenance

1 INTRODUCTION

Electricity is one of the main needs of human population and industry, to improve, grow and maintain countries. Local governments and their operators face the challenges of finding the balance of investments - optimizing the cost structures of infrastructure projects in the energy sector to ensure the stability and maintenance of networks, with extensions and renewals. Likewise, providing more energy and integrating renewable energy sources into the grid is a challenge taken up by the governments. Terms such as digitalization, digital transformation, industry 4.0, building information modeling (BIM) and digital twin (DT) are terms commonly used by industry and experts to address the challenges of process optimization and

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