

# GREEN EME 2023

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**Proceedings of the Sixth International Scientific Conference  
EARTH AND ENVIRONMENTAL SCIENCES,  
MINING FOR DIGITAL TRANSFORMATION,  
GREEN DEVELOPMENT AND RESPONSE  
TO GLOBAL CHANGE**

**Proceedings of the Sixth International Scientific Conference  
EARTH AND ENVIRONMENTAL SCIENCES, MINING FOR DIGITAL TRANSFORMATION,  
GREEN DEVELOPMENT AND RESPONSE TO GLOBAL CHANGE**

VIETNAM NATIONAL UNIVERSITY - HO CHI MINH CITY  
VIETNAM METEOROLOGICAL AND HYDROLOGICAL ADMINISTRATION



THE STATE COUNCIL FOR PROFESSORSHIP  
THE INTERDISCIPLINARY SCIENCES COUNCIL  
FOR PROFESSORSHIP



東京大学  
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SESSION 1

DIGITAL TRANSFORMATION AND TECHNOLOGY IN EARTH, MINING AND ENVIRONMENTAL SCIENCES (Big Data, ML, and AI)

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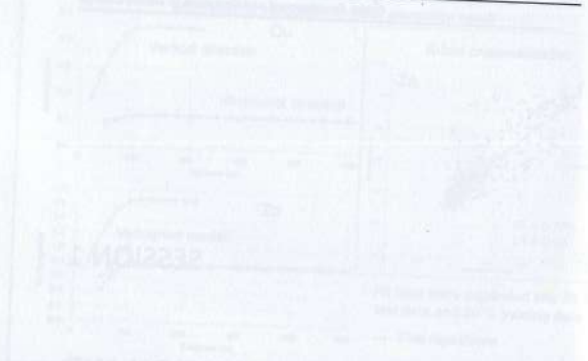
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DIGITAL TRANSFORMATION AND  
TECHNOLOGY IN EARTH MINING  
AND ENVIRONMENTAL SCIENCES  
(Big Data, ML, and AI)

### IMPROVING THE PRE-WARNING SYSTEM FOR OFFSHORE RIG IN VIETNAM, CASE STUDY OF HAITHACH-BIENDONG OIL COMPANY

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**Abstract:** Offshore oil and gas exploration and production activities present inherent risks to both personnel and the environment, necessitating stringent safety measures. In all offshore rig of VietNam the need of ensure safety requirements is always the top priority. By applying the simulation for investigating a typical offshore rig, the paper explores the critical need for improving safety requirements on offshore rigs, with a specific focus on preventing smoking and gas leaks. An algorithm is proposed to optimized the location of smoke and gas sensors for covering all required protection zone. Because smoking poses a direct fire hazard, while gas leaks can lead to catastrophic incidents such as explosions and environmental pollution, the system must not only fast detect, but also activate the pumping system in all layers of the rig. Current safety protocols may lack comprehensive strategies to address these specific challenges adequately. This paper advocates for an integrated approach that combines technological advancements, robust regulatory frameworks, and a culture of safety awareness. The proposed system installed in HaiThach rig includes the implementation of advanced gas detection systems, strict smoking prohibition policies. Base on setting up system, a continuous training programs to enhance the awareness and skills of offshore personnel is recommended. The output results of this model are also considered to apply for other similar-condition rigs of VietNam. The integration of sensors is essential to mitigate the risks associated with smoking and gas leaks, ensuring a safer working environment on offshore rigs and safeguarding the well-being of personnel and the marine ecosystem.