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### Review of Naturally Occurring Radioactive Materials and Applied Radiation-based Technologies Management in the Oil and Gas Industry

Wassaf N. J. Alkhalaf, Mohammed A. Almekki, and Faisal S. Altwast  
Department of Petroleum and Natural Gas Engineering, College of Engineering, King Saud University, Riyadh, Saudi Arabia

**Abstract**  
The presence of naturally occurring radioactive materials (NORM) in the oil and gas industry is a significant concern due to the potential health and environmental risks associated with their release. This paper provides a comprehensive review of NORM and the various radiation-based technologies used for their management in the oil and gas industry. The review covers the sources of NORM, the types of radiation, and the different methods used for NORM detection, monitoring, and remediation. The paper also discusses the regulatory framework governing NORM management in the oil and gas industry and provides recommendations for improving NORM management practices.

**Introduction**  
NORM are radioactive materials that occur naturally in the earth's crust. They are found in various forms, including uranium, thorium, and radium. NORM are present in oil and gas reservoirs, and they can be released into the environment during the production and processing of oil and gas. The release of NORM can pose a significant health and environmental risk, particularly if the NORM are inhaled or ingested. Therefore, it is essential to have effective methods for detecting, monitoring, and managing NORM in the oil and gas industry.

**Methodology**  
This review was conducted through a search of scientific literature, industry reports, and regulatory documents. The search was limited to English-language sources published between 2010 and 2020. The search terms used were "NORM", "radiation-based technologies", "oil and gas industry", and "management". The search results were screened for relevance, and the most relevant sources were selected for review.

**Discussion**  
The review identifies several key areas for improvement in NORM management in the oil and gas industry. These include the need for more effective methods for NORM detection and monitoring, the need for more comprehensive regulatory frameworks, and the need for more training and education for industry workers. The review also highlights the importance of public awareness and communication regarding NORM risks.

**Conclusion**  
The review concludes that NORM management in the oil and gas industry is a complex and challenging task that requires a multi-faceted approach. It is essential to continue to research and develop new methods for NORM detection and monitoring, to strengthen regulatory frameworks, and to provide training and education for industry workers. Public awareness and communication are also crucial for ensuring that the risks of NORM are properly understood and managed.

Source	Reference
Alkhalaf, W. N. J., Almekki, M. A., & Altwast, F. S. (2020). Review of Naturally Occurring Radioactive Materials and Applied Radiation-based Technologies Management in the Oil and Gas Industry. <i>Journal of King Saud University</i> , 32(1), 101-110.	
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