

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Process Safety and Environmental Protection

journal homepage: www.elsevier.com/locate/psep

Short Communication

The importance of public participation in legislation of TENORM risk management in the oil and gas industry



Khalid ALNabhani, Faisal Khan*, Ming Yang

Centre for Risk, Integrity, and Safety Engineering (C-RISE), Faculty of Engineering & Applied Science, Memorial University, St. John's, NL A1B 3X5, Canada

ARTICLE INFO

Article history:

Received 9 February 2016
Received in revised form 19 April 2016
Accepted 30 April 2016
Available online 7 May 2016

Keywords:

Energy policy
Legislation
TENORM
Risk management
Public participation
Political
Nuclear
Safety
Radioactivity

ABSTRACT

The great debate about incorporating public participation in the legislative process of oil and gas regulation is contentious and triggered by the political game theory, whereby states focus on building a strong economy and full sovereignty at the expense of the environment, the safety of their citizens, and health. The relationship between politics and the economy in oil- and gas-producing states is represented by the oil and gas industry. During oil and gas production, harmful radioactive materials known as TENORM (technologically enhanced naturally occurring radioactive materials) are coproduced. Furthermore, the coproduced radiological materials pose a serious radiological risk to workers in the oil and gas industry as well as the public. This occurs via radiological pathways that contaminate soil, water, and food sources due to the current methods of disposing radioactive materials that are stored either near the surface or underground. Incidentally, TENORM disposal sites that are subsequently developed into residential sites, commercial premises, or industrial sites can increase the radiological risk. This paper focuses on the relationship between the legislation and politics of the oil and gas industry and the laws associated with the oil and gas industry that protect human health and environmental safety. The paper aims to highlight the importance and activate the role of public participation in the formulation of legislation, by striking a balance between the interest of the authorities and interests of the public under democracy.

© 2016 Institution of Chemical Engineers. Published by Elsevier B.V. All rights reserved.

1. Introduction

Since the eighteenth century, several modern and postmodern states have emerged. Even though some of these states appear to be democratic, they are authoritarian by nature, leading to an increase in emerging market governments that are not content with regulating markets alone, but that also wish to dominate the markets. Promoting state–corporate activity is a significant source of wealth for such states, generating

a significant return on the investments of the state. When measured by the reserves they control, the biggest energy companies worldwide are either fully or partly owned and are operated by the government. Government-operated companies, commonly called state-owned companies (SOEs), control about 75% of the world's crude oil production. The production of oil and gas has increased greatly due to increasing global demand. This has led to increased technological risks as a result of the adoption of new technologies to increase oil and

* Corresponding author. Tel.: +1 709 864 8939; fax: +1 7098644042.

E-mail address: fikhan@mun.ca (F. Khan).

<http://dx.doi.org/10.1016/j.psep.2016.04.030>

0957-5820/© 2016 Institution of Chemical Engineers. Published by Elsevier B.V. All rights reserved.



Fig. 1 – Political conflicts and public distrust.

gas production, such as enhanced oil recovery technologies (EORTs). Some of the risks include TENORM (technologically enhanced naturally occurring radioactive materials) wastes, which poses a radiological risk to workers as well as the public. Moreover, public participation in the formulation of safety laws and policies in the oil and gas industry is lacking. The technological risks associated with the production of oil and gas are increasingly politicized and highly contentious. Not only are these controversies and conflicts caused by the public's ignorance or assumptions due to the lack of public knowledge and experience, but they are also viewed as side effects of political authority interests taking precedence over the interests of the public to maintain the highest level of state income to ensure continuity of power. Consequently, the latter has destabilized the trust in political systems (Fig. 1). To acknowledge the significance of trust and the link between national participation and the dynamics of the political systems has serious implications, as well as the methods of approach to the technological risks, particularly in the oil and gas industry, the biggest sector of the industry globally and locally. It is important to further investigate from legal and technical perspectives to what extent the current radiological risk management system is capable of protecting workers in the oil and gas industry, as well as the public, from radiological exposure.

2. An overview of legislative inconsistencies and political conflicts concerning nuclear radioactive wastes

Some of the related legislation as well as the industries producing TENORM tend to avoid anything related to the word “nuclear,” when in fact TENORM are nuclear in nature. TENORM are present in the natural nuclear isotopes produced by radioactive decay from thorium-232 and uranium-238 series. In the oil and gas industry, they are enhanced technologically primarily due to the physical and chemical processes used to enhance oil and gas production (Kolb and Wajcik, 1985;

Baried et al., 1996; Jonkers et al., 1997; O'Brien and Cooper, 1998; ALNabhani et al., 2015). The major source of radiation exposure to the population and environment is the TENORM, either through direct exposure pathways or through ingestion and inhalation pathways from contaminated water and soil in which TENORM wastes are disposed. In fact, TENORM are highly important as enriched nuclear material generated in the nuclear industry, which may be why oil and gas companies use the same methods to dispose of TENORM waste. The methods of nuclear waste disposal include land spreading and deep injection disposal methods. According to Janssen et al. (1998), the doses of radiation, because of regular emissions, from nonnuclear industries are as important as the emissions from nuclear industries. An article from the Netherlands also states that the maximum doses of emissions from nonnuclear industries are more than the emissions from nuclear industries by more than three orders of magnitude (Janssen et al., 1998). The reluctance of TENORM industries to be associated in any way with the term “nuclear” is obvious for many reasons. Legislation is the most important reason. Further, due to the importance of having detailed and safe legislation to accommodate large amounts of TENORM waste treatment, storage, and disposal, this eventually becomes both a financial and administrative burden, which governments try to avoid. In addition, the radiological risk from TENORM associated with oil and gas production threatens the health and safety of workers and the public. Therefore, governments are always reluctant to share their policies regarding radioactive material waste disposal methods and cost-cutting plans with the public, because the public will generally oppose them. The radioactive waste disposal methods currently available pose serious health and safety risks such as direct radiation to the public and industrial workers, as well as contamination of water resources, soil, plantations, the food chain, and the atmosphere. In the history of British politics, technological risk such as nuclear radioactive waste has been full of contradictions in the decision-making and legislative process, often opposed by the public. Nuclear radioactive waste

Download English Version:

<https://daneshyari.com/en/article/588114>

Download Persian Version:

<https://daneshyari.com/article/588114>

[Daneshyari.com](https://daneshyari.com)