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ERSS-26; No. of Pages 12
ARTICLE IN PRESS

Energy Research & Social Science xxx (2014) xxx–xxx

Contents lists available at ScienceDirect

Energy Research & Social Science

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

Original research article

Reinventing rules for environmental risk governance in the energy sector

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ARTICLE INFO

Article history:
Received 20 January 2014
Received in revised form 14 March 2014
Accepted 14 March 2014
Available online xxx

Keyword:
Risk governance energy law

ABSTRACT

The debate over expert versus laypeople participation in risk analysis has deep theoretical roots. It also has practical implications, with both camps often attempting to assign the blame for shortcomings in risk analysis to the other side's faulty approach. A fairly recent concept in risk analysis, risk governance attempts to put the strengths of each camp into productive use by making them work together toward the same goal. Yet the legal and regulatory frameworks for implementation of the non-technical context of risk governance, as well as the underlying theoretical concepts, need development. This paper attempts to elaborate on the theoretical foundations of the debate and its practical applications, and propose an agenda for future research.

1. Introduction

Most people regard hydraulic fracturing, a technique used to extract shale gas and oil, tight oil and gas, and other unconventional hydrocarbons, as a recent phenomenon. However, hydraulic fracturing has been known since the 1940s, while its accompanying technique, horizontal drilling, has been around since the 1920s.[1] Some environmental dangers of pumping water containing toxic chemical substances and proppants underground had become apparent in the 1990s, shortly after the technique gained traction in the industry. In March 1994, members of the Legal Environmental Assistance Fund (LEAF) submitted a petition to the U.S. Environmental Protection Agency alleging deterioration of the quality of the drinking water in their wells.[2] LEAF asked the agency to suspend their state's Underground Injection Program (UIC), arguing that it did not meet the standards set under the Safe Drinking Water Act (SDWA).[3] After the agency denied the petition, LEAF members challenged it in court.[4] It took another lawsuit for the EPA to finally release a study in 2004 on the impacts of hydraulic fracturing on drinking water – *ten years* after LEAF members filed their first petition.[5]

The story does not end there. The study focused on coal bed methane (CBM), despite the expanding application of hydraulic fracturing to the extraction of other forms of unconventional hydrocarbons.[6] The study concluded that "the injection of hydraulic fracturing fluids into CBM wells poses little or no threat to groundwater and does not justify additional study at this time."[7] The study received a great deal of criticism from environmental groups and even its own officials, including a 30-year agency veteran.[8] In addition to several design and data flaws, the study contained a number of shortcomings outside the realm of science.[9] For example, certain chemicals were exempted from the review on the sole basis of being considered proprietary.[10] Unsurprisingly, the EPA came up with a different conclusion six years later, linking hydraulic fracturing to groundwater contamination in a study

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[1] Samuel C. Stephens, Poison Under Pressure: The EPA's New Hydraulic Fracturing Study And The Case For Rational Regulation, 43 Cumberland Law Review, 63 (2012–2013) [hereinafter Stephens].
[2] Stephens at 77.
[3] Stephens at 77.
[4] Stephens at 77–78.
[5] Stephens at 78.
[6] Stephens at 78–79.
[7] U.S. Environmental Protection Agency, Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs, Final Es-1 (Jun. 2004), available at: http://fracfocus.org/sites/default/files/publications/evaluation_of_impacts_to_underground_sources_of_drinking_water_by_hydraulic_fracturing_of_coalbed_methane_reservoirs.pdf
[8] Stephens at 79.
[9] For example, the underground water was actually never tested as the determination was made based on the literature review.
[10] Stephens at 79.

http://dx.doi.org/10.1016/j.erss.2014.03.013
2214-6296/

conducted in Pavillion, Wyoming in 2010.[11] Yet Congress used this incomplete, outdated, and otherwise faulty 2004 study to amend the SDWA, exempting fracking fluids (other than diesel fuel) from the purview of the statute.[12] This controversial legislation became known as the "Halliburton loophole" due to former VicePresident Dick Cheney's (the legislation's alleged mastermind) ties to Halliburton, the company that holds many patents on hydraulic fracturing.[13]

There is little doubt that the EPA botched the assessment of environmental risks in the 2004 study. Yet, as noted above, it did so not only by choosing a suspect study design, among other "technical" shortcomings. It also made a value judgment that placed the importance of proprietary information above the importance of public health. Even more troubling is that the U.S. political and legal systems failed to put a massive red flag on an activity loaded with the potential for adverse consequences nationwide. It failed to give the public a fair opportunity to accept the risks of hydraulic fracturing (and reap the benefits of shale gas and tight oil booms) or to avoid the risks at the expense of stalling hydrocarbon production.

The purpose of this example is not to speculate regarding the "real" reasons behind the Halliburton loophole or to make a political point. Rather, it is to highlight the importance of the non-technical context surrounding formal risk analysis and the impact it has on laws enacted on the basis of such risk analysis. Congruently, this paper focuses on the non-technical context of environmental risk analysis in the energy sector and the law that governs it, with an overarching goal of proposing a research agenda for legal concepts underlying such law. I start with an overview of risk theory, tailored to identifying key theoretical concepts and debates relevant to the paper's chief goal. I continue with a discussion of the non-technical context as a societal element of risk governance. I conclude with identifying the need for future research and proposing a three-item research agenda. I utilize examples from the energy sector, predominately the oil and gas industry, to illustrate my points.

2. Theoretical perspective of risk

2.1. *Risk and hazards, objective and perceived risk: why risk theory matters*

Literature on risk is plentiful. It spans across a multitude of topics and subtopics. Some of it is based on empirical knowledge, whereas some is purely theoretical. The description of theoretical concepts of risks in this section does not do justice to the effort and expertise that some social scientists put into their research and scholarship. And given the size constraints of the article, the review only covers a very small portion of the vast body of risk literature.

However, such a review is necessary because what is understood and described in the literature as a risk often reflects and influences what the decision-makers and societies at large *do* about risks. This, in turn, shapes the legal rules governing decisions about risk, including laws and regulations governing environmental risks in the energy sector. For example, the narrow understanding of risk as "probability multiplied by severity of an adverse effect" often leads to the equally limited cost–benefit analysis solution.[14] In fact, the latter is generally understood as the approach of handling environmental risk in American jurisprudence. In my seven years of studying, teaching, and practicing environmental law and consulting on environmental issues in the United States, I have never encountered a different definition or model of handling risk.

Such a conceptual difference begins with the use of the terms "risk" and "hazard" interchangeably. Even though some theorists understand risk as hazard (*i.e.* danger "related both to its probability and to the magnitude"), most mark a difference.[15] According to the International Risk Governance Council (IRGC), "hazards characterize the *inherent properties* [emphasis added] of the risk agent."[16] Risks, on the other hand, "describe the *potential effects* [emphasis added] that these hazards are likely to cause on specific targets such as buildings, ecosystems or human organisms and their related probabilities."[17] Correct "translation" of the conceptual differences between hazard and risk into the text of a statute or regulation is important as it determines *what* is regulated: adverse consequences or dangerous properties of the object or activity.

In addition, reducing an activity or event to its properties (hazardous, dangerous) may be rather limiting for gathering knowledge about the fast changing technological and geographic dimensions of energy. This is especially important for obtaining empirical data by engaging a wide range of stakeholders who are mostly familiar with adverse *effects* of an activity and not necessarily with the activity itself. Consider offshore oil and gas development as an example. Some stakeholders, indigenous communities and marine scientists, for example, are unlikely to understand the nuts and bolts of offshore oil and gas drilling. However, members of an indigenous community may be very familiar with routine spills and seepages (not all oil spills are catastrophes like the Deepwater Horizon accident) because of the fishing activities in which they are engaged. Marine scientists may have something to say about the increasing acidity of the ocean.[18] No doubt, one can learn quite a bit from the industry or permitting agency about the dangers of offshore drilling, the actors that propose and approve the hazardous activity. However, shifting the definition of risk from the activity to the effect of the activity allows gaining both a wider and deeper insight. If we classify exploratory drilling as the hazard, oil exploration becomes the source of the hazard, and oil spill becomes one of the risks (uncertain adverse consequences) of exploratory drilling. Departing from "conventional" risks associated with oil and gas development and giving consideration to climate change, climate change becomes the hazard, oil exploration its source (because of direct emissions during the exploratory activities and "ensuing" emissions from the combustion of extracted hydrocarbons), and ocean acidification becomes one of the risks.[19] As a policy outcome of such thinking, a catastrophic oil spill ceases to be the only severe risk associated with oil exploration. After all, short-term (contamination of locally caught fish) and long-term (drastic reduction of stocks due to the acidification) impacts on the world's fisheries may lead to devastating consequences.

Yet the most significant difference in conceptual understanding of risk is the difference between objective and subjective

[11] Stephens at 81–82.
[12] Stephens 80–81.
[13] William J. Brady & James P. Crannell, Hydraulic fracturing regulation in the united states: the laissez-faire approach of the federal government and varying state regulations, 14 Vermont Journal of Environmental Law, 39, 45, Fall, 2012.
[14] See e.g. John Martin Gillroy et al., A Primer For Law & Policy Design: Understanding the Use of Principle & Argument in Environmental & Natural Resource Law 346–354 (2008).
[15] Anne V. Whyte & Ian Burton eds. Environmental Risk Assessment 1 (1980) [hereinafter Whyte & Burton].
[16] IRGC, Risk Governance: Towards and Integrative Approach, White Paper 19 (Sep. 2005) [hereinafter IRGC 2005].
[17] IRGC, Risk Governance: Towards and Integrative Approach, White Paper 19 (Sep. 2005) [hereinafter IRGC 2005].
[18] Margaret Cappa, Ocean acidification could cause loss of biodiversity in BarentsSea, Barents Observer (May 18, 2010), available at: http://barentsobserver.com/en/sections/business/ocean-acidification-could-cause-loss-biodiversity-barents-sea
[19] See Roman Sidortsov, Measuring our Investment in the Carbon Status Quo: Case Study of New Oil Development in the Russian Arctic, at 624–629 13 Vt. J. Envtl. L. 613 (2012) [hereinafter Sidortsov].