TEL AVIV UNIVERSITY אוניברסיטת תל-אביב

THE BUCHMANN FACULTY OF LAW הפקולטה למשפטים ע"ש בוכמן
THE ZVI MEITAR CENTER FOR ADVANCED LEGAL STUDIES מרכז צבי מיתר ללימודי משפט מתקדמים
THE LAW AND ENVIRONMENT PROGRAM התכנית למשפט וסביבה

משפט וסביבה – סדנת פרופ' יובל לוי ושות'

The Prof. Yuval Levy & Co. Law and Environment Workshop

משפט וסביבה– מאמרים בדרך

Law and Environment Working Papers

2/5775

The Narrow Environmental Protection from Offshore Petroleum Industry: What Are We Talking About When We Talk About Environmental Protection?

Tamara Lotner Lev
Tel Aviv University
Faculty of Law

Workshop Coordinators:	מנחי הסדנה:
Prof. Issachar Rosen-Zvi issirz@post.tau.ac.il	פרופ' יששכר רוזן-צבי issirz@post.tau.ac.il
Dr. David Schorr dschorr@tau.ac.il	ד"ר דוד שור dschorr@tau.ac.il

THE NARROW ENVIRONMENTAL PROTECTION FROM OFFSHORE PETROLEUM INDUSTRY: WHAT ARE WE TALKING ABOUT WHEN WE TALK ABOUT ENVIRONMENTAL PROTECTION?

I. Introduction

Pictures of massive oil rigs in the middle of the ocean, blackened beak pelicans, and contaminated oily waters have become one of the symbols of the conflict between industrialized society and environmental protection. Both the offshore oil and gas industry and the modern idea of environmental protection have developed and expanded a great deal during the last century, presenting an ongoing challenge to resolve this conflict. This challenge as manifested in different legal regimes is at the core of my research. The research explores the challenge in detail by analyzing its three most pertinent aspects: the "***what"*** question - namely what is the scope of environmental protection that legal regimes *are* implementing and *should* implement? The "***how"*** question – how can this be done; which methods *are* presently used and *ought* to be used in order to achieve such environmental protection? And the "***who"*** question - who should implement it? What is the institutional mechanism that will ensure the desired protection?

This paper begins by addressing the question of **environmental protection scope**. It examines the positive component: the current implementation of environmental protection from the offshore petroleum (OP) industry in several legal regimes, and proposes that ***current regulatory regimes provide narrow environmental protection from OP industry's risks***.

While the mere justification of the environmental value is, generally speaking, listed in the "done" list of environmental law[1], the question of its implementation is still open and raises significant challenges. Therefore, Section II frames this study by defining the environmental protection question as one of *scope and degree*. Section III dives into the OP industry and describes the major environmental risks that it poses. These risks form the basis for discussion in the following sections. Section IV lays out a conceptual

[1] In relation to the reviewed legal regime: Israel, US, UK, Norway, Denmark.

framework within which the study defines and establishes the *Narrow Protection* Hypothesis. Formalistic analysis is supported by a realistic understanding in this study. Taking account of the *gap between the 'law on the books' and 'law in action'* assists in revealing mismatches between some legislation and their implementation, as well as the problem posed by the common "discharges permits system". Furthermore, the *cognitive bias of* "*availability*" may allow for an understanding of the regulation's focus on catastrophic risks of oil spills and its neglect of other risks deemed "out of focus". Section V analyzes five legal regimes (Israel, US, UK, Norway, Denmark), demonstrating the "oil spill focus", the "mismatches" and the "permits system" problem, as manifested in the different regimes. Finally, conclusions are presented in Section VI.

II. Current Environmental Protection from Offshore Petroleum Industry - moving on form "war on values" to "battle of implementation"

Environmental regulation aims to promote one major value – environmental protection.[2] For decades, one of the major debates in environmental law questioned the very necessity of protecting the environment and elucidated the justifications for doing so. For the most part, many legal systems today have moved past this debate.[3] The general value of environmental protection is enshrined in constitutions worldwide,[4] is at the center of general primary laws,[5] and is reflected in many specific policies and legislations and policies.[6] However, the value of environmental protection, like many other values, can be implemented in different ways and to varying degrees. The maneuverability involved in implementation raises thorny questions that remain unanswered. The issue of environmental regulation seems to have developed from discussions about its mere justification to questions of how to harness and shape its value into written laws and regulatory tools. The questions of implementation that are borne out of this shift in the discourse on environmental protection are demonstrated clearly in the case of offshore petroleum (OP) industry regulation. All countries reviewed have adopted into their laws or regulation environmental protection from OP industry's risks to some extent: **In the USA**, *the Outer Continental Shelf Lands Act* (OCSLA), which is the main act regulating OP industry activity, reflects principles of environmental protection in many of its articles. The Act states, "the outer Continental Shelf is a vital national resource reserve held by the Federal Government for the public…. subject to environmental safeguard...",[7] and the

[2] *See* MARK SAGOFF, THE ECONOMY OF THE EARTH, 1-23 and 195-223 (1988), and in laws and regulation mentioned *infra,* notes 4,5,6.

[3]The fact that environmental protection is tied up many times with human health does not derogate this purpose, see for example: "...Indeed "protection of human health and natural resources appears like a mantra in virtually every one of our environmental laws. This statement of purposes recognizes that pollution harms not only people but also other living things" Lisa Heinzerling, *Reductionist Regulatory Reform* 8 FORDHAM ENVTL. L.J. 459, 460 (1996-1997).

[4]*See* Article 110b to the Norwegian constitution. On the history and meaning of this article see: HANS CHRISTIAN BUGGE, ENVIRONMENTAL LAW IN NORWAY 31 (2011).

[5] In the USA environmental legislation since 1969 is headed by the normative statement of National Environmental Policy Act (NEPA) which "established a national policy to protect the environment. According to this 'magna carta' of environmental law all agencies are subject to… and must consider environmental protection". In Denmark: The Act on the Protection of the Marine Environment state in article 1.(1) that "The purpose of this Act is to contribute to safeguarding nature and environment, thus ensuring a sustainable social development in respect of human conditions of life and of the protection of flora and fauna".

[6] Examples for such laws: UK's *Natural Environment and Rural Communities Act 2006* article 2(1): Natural England's general purpose is to ensure that the natural environment is conserved…" Israeli Clean Air Law 5768-2008, article 1: The purpose of this Law is to bring about an improvement of air quality and to prevent and reduce air pollution… all in order to protect human life, the health and quality of life of human beings and in order to protect the environment, including natural resources, ecological systems and biological diversity…"

[7] Outer Continental shelf Lands Act (OSCLA) 43 U.S.C. §§1331 et seq. section 3 (3) (USA).

Oil Pollution Act of 1990 (OPA) strictly defined the OP industry's liability for environmental damage caused by its activity.[8] **In the UK** a handful of regulations reflects the internalization of environmental protection values: from the *Offshore Installations (Safety Case) Regulations 1992* to the *Offshore Installations (Emergency Pollution Control) Regulations 2002* and the O*ffshore Petroleum Activities (Conservation of Habitats) Regulations 2001* and others.[9] **Norway's** *Petroleum Activities Act* (PAA) states that the resource management of petroleum shall be contribute to "an improved environment".[10] In **Denmark,** the *Danish Subsoil Act*[11] which is the main regulation that governs the OP activity states that approvals for offshore projects which are assumed to have a major impact on the environment may only be granted following an assessment of the effects on the environment[12]. The Danish *Marine Protection Act* aims to prevent and reduce pollution to the marine environment from ships, aircraft and platforms.[13] Although the **Israeli** *Petroleum Act*[14] does not internalize environmental protection value, it does require environmental assessment to be carried for each OP facility application according to the *Planning and Building Act*[15] or the "*environmental guidelines for offshore oil and gas drilling*". [16]

These examples of legislation demonstrate that countries' legal regimes have internalized, *to some extent*, environmental protection value. Yet at the same time, the examples exhibit a wide range of implementation. Therefore, it is instructive to develop the question of implementation, which I frame as: what scope of environmental protection is implemented in the different legal regimes for OP industry - **what are we talking about when we talk about environmental protection - What does it actually entail?**

III. The Case of Offshore Petroleum Industry and Environmental Risks

The petroleum industry is one of the biggest industries in the world. It is the source of more than half of energy production in the world for decades now, and it continues to grow each year. [17] The offshore petroleum drilling industry is responsible for about one third of the total industry[18] and is continuing to

[8] Oil Pollution Act of 1990 (OPA) 33 U.S.C. §§2701 et seq. (USA)

[9] The Offshore Installations (Emergency Pollution Control) Regulations 2002 (UK) is enacted under the title: "Statutory Instruments 2002 No. 1861 ENVIRONMENTAL PROTECTION" and pollution includes "pollution by oil or any other substance liable to create hazards to human health, to harm living resources and marine life" (article 2); see also: The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 article 6(2) (UK).

[10] Act 29 November 1996 No. 72 relating to petroleum activities (Last amended by Act 24 June 2011 No 38. Last translated November 23th 2012) SECTION 1-2 ("PAA", Norway).

[11] Consolidated Act No. 889 of 4 July 2007, as amended by section 2 of Act No. 1400 of 27 December 2008, section 51 of Act No. 718 of 25 June 2010 and Act No. 541 of 30 May 2011 ("Subsoil Act", Denmark).

[12] Subsoil Act article 28a. (1). (Denmark).

[13] Act no. 476 of June 30, 1993 on the Protection of the Marine Environment, article 2 (Denmark).

[14] Petroleum Law, 5712 – 1952 (Israel).

[15]Planning and Building Law, 5725-1965, Planning and Building Regulations (Environmental Impact Statements), 5763-2003 (Israel).

[16] The environmental guideline for offshore oil and gas drilling were published for public comments in 2013 (hereinafter: "the environmental guidelines (Israel)") by the Ministry of Energy are to be applied on offshore facilities which are located *outside* the Israeli territorial waters. They have not yet entered into force, *See:* http://energy.gov.il/Subjects/OilSearch/Documents/OffshoreEnvironmentalGuidelines/offshore%20environmental%20guidelines.pdf (Israel).

[17] ANNUAL ENERGY REVIEW, U.S. ENERGY INFORMATION ADMINISTRATION (EIA), http://www.eia.gov/totalenergy/data/annual/pdf/sec1_6.pdf.

[18]Charles Kennedy, *5 Trends that are Set to Transform the Energy Sector*, OILPRICE.COM (13 November 2013) http://oilprice.com/Energy/Energy-General/5-Trends-that-are-Set-to-Transform-the-Energy-Sector.html

grow as technology develops and allows the industry to drill deeper and farther away from coasts. The OP Industry imposes a variety of risks to the environment. Its impact[19] may arise at all stages of activities - from initial exploration for oil and gas deposit, through platform and pipelines construction, production activities, transportation, processing and refinery, combustion, and decommissioning. This section outlines the major risks associated with the OP industry. Understanding the risks is essential to the subsequent discussion on the scope of environmental protection in current regulatory regimes.

Environmental risks of Noise - The first stage of an offshore oil and gas operation is the geological "seismic survey", which aims to identify potential petroleum traps in the subsurface. During the survey, low-frequency sound waves are transmitted into the subsurface, they are reflected between the geological layers where the layers reflect the sounds differently, and the data is captured and processed in order to gain knowledge of petroleum deposits.[20] The surveys are conducted by using "air guns" that produce an extremely loud noise. Environmental impacts from these booms are widely described in literature as harming lives under the sea, especially those of marine mammals such as wales and dolphins who rely on sounds for fundamental aspects of their lives: navigation, prey location and capture, predator avoidance, and communication.[21] The negative impacts include physical, physiological, and behavioral effects such as displacement from migratory, feeding, and breeding habitat. Such significant harm to mammals' population can later create changes in the ecological chain and ultimately engender environmental impact that is difficult to predict.

***Alien Invasive Species* risk** – Invasive species are one of the largest threats to terrestrial, coastal and freshwater and marine ecosystems and are recognized as a global concern.[22] Offshore oil and gas facilities, which travel in the water from one maritime zone – where they were built or served, to another maritime zone where they were called for service – pose risks of carrying alien species that could become invasive and affect the aquatic ecosystem in the new location.[23]

Discharge of Drilling mud and fluids – Muds and fluids are used to remove cuttings from the drilling hole, control pressure, cool the lubricant and drilling unit, and maintain the integrity of the well to enable installation of a casing.[24] During the drilling process, drilling fluid is circulated down the drill pipe continuously and returns to the platform carrying drill mud and cuttings. The used mud is then cleaned

[19] Environmental impact is defined by ISO 14001 as `any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects (ISO 14001: 2004 (en) - Environmental management systems — Requirements with guidance for use, *available at*: https://www.iso.org/obp/ui/#iso:std:iso:14001:ed-2:v1:en). On classifications of environmental impacts *see:* Edward Salter, *Holistic Environmental Assessment and Offshore Oil Field Exploration and Production* 42 MARINE POLLUTION BULLETIN 45, 45-7(2001).

[20] Robert M. Laws & David Hedgeland, *The Marine Seismic Air Gun,* BIOACOUSTICS: THE INTERNATIONAL JOURNAL OF ANIMAL SOUND AND ITS RECORDING 124 (2008) *available* at: http://www.tandfonline.com/doi/abs/10.1080/09524622.2008.9753788#.VDo4AmMxjfc

[21] Ross Compton, Lisa Goddwin, Richard Handy, Victor Abbott, *A critical examination of worldwide guidelines for minimizing the disturbance to marine mammals during seismic survey* 32 MARINE POLICY 255 (2008); Jonathan Gordon, Douglas Gillespie, John Potter, Alexandros Frantzis, Mark P. Simmonds, René Swift, David Thompson, *A Review of the Effects of Seismic Surveys on Marine Mammals,* 37 MARINE TECHNOLOGY SOCIETY JOURNAL 16 (2003); Caroline R. Weir & Sarah J. Dolman, *Comparative Review of the Regional Marine Mammal Mitigation Guidelines Implemented During Industrial Seismic Surveys, and Guidance Towards a Worldwide Standard,* 10 JOURNAL OF INTERNATIONAL WILDLIFE LAW & POLICY 1(2007).

[22]Nicholas Bax, Angela Williamson, Max Aguero Exequiel, Gonzales Warren Geeves, *Marine invasive alien species: a threat to global biodiversity,* 27 MARINE POLICY 313 (2003).

[23] Henry M. Page et al, *Exotic Invertebrate species on offshore oil platforms* 325 MAR. ECO. PROG. SER. 101(2006).

[24] Douglas A. Holdway, *The acute and chronic effects of wastes associated with offshore oil and gas production on temperate and tropical marine ecological processes*, 44 MARINE POLLUTION BULLETIN 185 (2002).

up to separate the cuttings from the mud. Mud is usually reused, while cuttings mixed with drilling fluids are discharged in the water column.[25] Drilling fluids contain toxic materials such as bentonite and barite and may contain traces of heavy metals that may harm fauna and flora. There is little information regarding the chronic or long-term toxicity of drilling fluids to marine organisms. The impact of cuttings discharge on the deep-water benthos, where drilling is increasingly done is also largely unknown. Because many species of the deep-water benthos reproduce and grow very slowly, recovery of this area may require years.[26]

Produced Formation Water (PFW) - PFW is a by-product of the oil production process. There are often substantial amounts of water contained in subsurface formations where oil and gas occur. When petroleum is produced, this water is brought to the surface and must be disposed of. The volumes of PFW produced are enormous: on the Norwegian shelf, for example, since 2004, more water than oil has been produced.[27] PWF contains various contaminants, which can cause negative biological effects: damage to the surface microlayer surrounding platforms and rigs, altered benthic community species composition, reduced growth of community, and the beginning of a chain of changes in the whole marine ecosystem.[28]

Risk to wetlands - Oil and gas development-related effects have been shown to cause multiple ecological changes to wetlands ecosystems through the various stages of oil and gas developments such as: accumulations of heavy metals in impacted areas, ecological impact including alteration of aquatic community structure and food chains, and regression the of wetland which then leaves the land exposed to storms and hurricanes.[29]

Risk from Pipelines and installations placement on the sea bed. Pipeline for transporting oil and gas disrupts the natural hydrologic regime and provides additional stress.[30] The seabed currents and the type of sediment affect the accumulation and scouring of the sediment around the pipeline. The installations may cause physical impact to the seabed, but the total area affected is still not known.[31]

Risks from dispersants and cleaning agents: Traditional cleansing methods to remove spilled oil (e.g., water flushing, sediment and vegetation removal) may result in further physical damages to both vegetation and underlying substrate, accelerating marsh degradation.[32] Other remedial responses include the use of *dispersants* - a mechanical process that primarily consists of skimming oil from the water surface.[33] The long-term ecological effects of dispersants are essentially unknown and have a potential to

[25] Bella Galil and Barak Herut, *Marine environmental issues of deep-sea oil and gas exploration and exploitation activities off the Coast of Israel*, IOLR REPORT H15/2011, 11(2011).
[26] *Ibid.*
[27] Holdway, *supra* note 24.
[28] *Ibid*.
[29] Jae-Young Ko and John W. Day, *A review of ecological impacts of oil and gas development on coastal ecosystems in the Mississippi Delta,* 47 OCEAN & COASTAL MANAGEMENT 597 (2004).
[30] Galil and Herut, *supra* note 25; Jae-Young Ko and John W. Day, *Ibid,* p. 599.
[31] Galil and Herut, *supra* note 25.
[32] *Ibid.* J.L. Lindstedt, *Ecological impacts of oil spill cleanup: are they significant? In*: PROCEEDINGS OF 1979 INTERNATIONAL OIL SPILL CONFERENCE 521-4 (1979).
[33] Grant Wilson, *Deepwater Horizon And The Law Of The Sea: Was The Cure Worse Than The Disease?* 41 BOSTON COLLEGE ENVTL. AFFAIR L. REV. 63, 66 (2014).

cripple ocean ecosystems and may result in net-toxicity levels that are greater than that of the spilled oil itself.[34]

Long term and accumulating impacts: Although not a separate risk, it is important to note that many potential effects from the activity of the OP industry include long-term impact on marine populations. Those risks are the consequence of low-level but chronic exposure to hydrocarbons, drilling fluids, metals and other chemicals associated with the industrial activity.[35] Moreover, long term effects resulting from a combination of wastes or combination of facilities may be different from the impact of each chemical or facility separately.[36]

Oil spills – Small scale oil spills are a daily risk, while big oil spills are considered an accidental risk. Their impact differs in volume and damages, but they share key effects: *coating*- oil may coat the feathers of seabirds and the fur of marine mammals, reducing their ability to provide buoyancy and insulation which leads to increased mortality. *Ingesting*- animals may ingest oil with food and thereby be exposed to potential toxic effects. *Toxicity*- fish may accumulate hydrocarbons in their tissues that can affect their health and also taint their flesh. Toxic components in crude oil include materials that can be mutagenic and carcinogenic. Studies show that the biodiversity and population density of benthic communities are significantly lower in oil-contaminated areas.[37]

Air pollution and gas emission – Combustion of oil and gas produce two of the major global environmental concerns: air pollution and greenhouse gas emission. Emissions from oil combustion include many toxic components such as sulfur oxides, nitrogen oxides, organic compounds, carbon monoxide, particulate matter, and several metals. Some of these pollutants react in the atmosphere, giving rise to other pollutants like sulfates and nitrates. Their effects are represented by acid rain, effects on vegetation, alteration of atmospheric visibility, increased turbidity of the atmosphere.[38] Oil and natural gas industry is the largest industrial source of emissions of volatile organic compounds (VOCs), a group of chemicals that contribute to the formation of the toxic ground-level ozone (smog). Natural gas industry is also a significant source of emissions of methane, a major greenhouse gas, considered a chief contributor to climate change.[39] Usually these effects are not considered as OP industry's impacts and are regulated downstream[40] – within taxes mechanism, trade schemas, and air quality standards.[41] However, given that the OP industry constitutes roughly one third of the total petroleum industry, these tremendous environmental effects must be addressed.

---

[34] *Ibid*, p. 65.

[35] Holdway, *supra* note 24.

[36] On cumulative impacts on the marine environment see: Benjamin S. Halpern, Karen L. McLeod, Andrew A. Rosenberg, Larry B. Crowder, *Managing for cumulative impacts in ecosystem-based management through ocean zoning*, 51 OCEAN & COASTAL MANAGEMENT 203 (2008**).**

[37] Jae-Young Ko and John W. Day, *supra* note 29.

[38] Joao Vicente de Assunca, *Environmental Effects of Toxic Materials from Oil and Gas Combustion*, ENCYCLOPEDIA OF LIFE SUPPORT SYSTEMS (EOLSS) www.**eolss**.net/sample-chapters/c09/e4-23-02-02.pdf.

[39] Ramón A., Alvarez, Stephen W. Pacala, James J. Winebrake, William L. Chameides, and Steven P. Hamburg, *Greater Focus Needed on Methane Leakage From Natural Gas Infrastructure*, 109 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 6435 (2012).

[40] "Downstream regulation" regulates pollution at the end of production chain while "Upstream regulation" regulates the producing industry in the beginning of the production chain.

[41] Air pollution from oil and gas is regulated primarily "downstream", and only in a small part with upstream taxes, *see:* Benjamin F. Hobbs, James Bushnell and Frank A. Wolak, *Upstream vs. Downstream CO2 Trading: A Comparison for the Electricity Context*, ENERGY INSTITUTE AT HAAS WORKING PAPER 203 (2010).

IV. The 'Narrow Protection' Hypothesis – A Conceptual Framework

It can be said, so far, that there is a general regard for the value of environmental protection in the OP industry regulatory regimes (Section II above), but also an extensive list of environmental risks posed by the OP industry (Section III). Thus, this begs the question: How do the regulatory regimes reconcile the conflict between those realities? To what extent the value of environmental protection is implemented, and to what extent does legislation pertaining to the OP industry permit it to operate without interference, thereby leaving environmental protection out of legal attention.

The following sections suggest that current regulatory regimes reconcile this conflict by implementing a ***narrow scope*** of environmental protection from the OP industry's risks. This means that only part of the environmental risks is actually regulated and enforced in order to protect the environment, while other parts of the risks are being under-regulated or under-implemented, thereby leaving the environment *narrowly protected*. In order to demonstrate the different performances of the *narrow protection hypothesis*, this section establishes a conceptual framework and Section V analyzes the different regulatory regimes according the conceptual framework.

The need to consider both formalistic and practical implementation of environmental protection is at the core of the analytical approach employed to demonstrate the narrow protection hypothesis. Formalistic review reveals narrow environmental protection within the laws and regulation, while practical observation support this analysis and uncovers evidence for the narrow protection beneath and beyond written rules. Consideration of both formal and practical aspects is supported by the notion of the ***gap between law on the book and law in action*****,** which is especially pertinent to the examination of environmental regulation.[42] This analytical concept allows for a nuanced illustration of the different demonstrations of the *narrow protection:* the specific cases of *'mismatches',* the general observation of regulator's *'focus on oil spill'* and the problems of *'permits system'*. These three performances are not always separable: mismatches can be an example of the oil spill focus, and permission system can be defined as a "mismatch". They will be explained separately in this section but will be integrated together in the analysis. [43]

The '*mismatches'* are cases in which the legislation that aims to provide environmental protection is not practically fulfilling its objective. This can either be because the legislation does not consider industry characteristic (as we will see in the cases of invasive species), or it is does not match the special risks that the OP industry poses (as in the case of marine mammals' protection).

The regulator's '*focus on oil spill'* is a general observation, according to which regulatory regimes tend to focus on catastrophic risks from OP industry while neglecting other risks. Conceptually, this observation

[42] On the gap between law on the books and law in action in the case of environmental law see: Daniel A. Farber, *Taking Spillage Seriously* HARV. ENVTL. L. REV. 297 (1999).

[43] Other ways to reveal the narrow environmental protection from offshore oil and gas industry, will be explored in a following research. Such ways include (a) the fact that oil and natural gas are regulated today as if they were the same material even though they pose different risks to the environment. This means that one of the two is over regulated or under-regulated, or that both are not effectively regulate. (b) Liability regime for offshore environmental damages is limited in most regimes in different ways and to different degrees.

stems from the cognitive bias of "**availability"**. The availability heuristic leads people to use exiting readily available knowledge even though it is not the most relevant knowledge. An example of availability heuristic is how extremely dramatic occasions are considered more probable than other small and non-dramatic occasions though they are not.[44] More importantly, the cases that are not dramatic garner less attention; they **are seldom remembered and factored into decision making.** For this analysis I divide environmental risks from the OP industry to two types of risks: (A) risks of low-probability with catastrophic consequences i.e. big oil spills accidents, and (B) risks of high-probability and relatively minor consequences - i.e. risks from noise, invasive species, chemicals discharges, dispersants, the risk posed by the combination and accumulation of multiple risks, long term effects etc. I contend that environmental regulatory regimes tend to focus on A risks, while B risks receive much less regulatory attention. A risks are usually regulated in primary separate or specialized laws, while B risks are covered in general or secondary legislation, or in a "pool-like" regulation or a flexible permission system. A risks regulation is directly connected to the OP industry while B risks are not. A risks receive significant budgetary allocations, while allocations for B risks are not separated from other budgets and are hard to track.[45] A risks draw a disproportionate volume of academic studies, while B risks are much less researched and published. A look at published legal studies can demonstrate this argument: in six environmental and maritime legal reviews, between 2004 and 2014,[46] 17 articles or comments were devoted to offshore oil spills. In those same years and in those same legal reviews, not a single article was published about offshore noise and marine mammals' protection, produced waters risk, toxic discharges risk, or invasive species risks posed by the OP industry. Four articles discussed other environmental impacts from the OP industry.[47] The regulators' disproportionate concentration on oil spills may also create a "path dependent" bias, as it strengthens the *availability heuristic*. After a regulator has started to focus on oil spills, oil spills appear more in regulation, laws, budgets and studies, creating a cycle that promises further future focus on catastrophic oil spills.

The *permits system*, is basically a system that is created in order to permit pollution. Since each permit is individual and based upon specific conditions of the case (the drilling's environment and depth, the specific species considered, additional polluting activities in the area etc.), the system is flexible in its nature and set no strict or clear standards that can be criticized or judged. Moreover, it may provide the industry with the power to influence the regulator so the latter allow it pollute more than what formal legislation intended.

---

[44] Amos Tversky and Daniel Kahneman, *availability: A Heuristic for Judging Frequency and Probability, in:* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES (Daniel Kahnemen, Paul Slovic and Amos Tversky eds., 1982); Avishalom Tor*, The Methodology of the Behavioral Analysis of Law*, 4 HAIFA L. REV. 237 (2008).

[45]It should be noted that budgets are very complicated to compare in this case, as every state names similar allocation in different ways, has different level of detailing etc. The budgets that I do use are not directly compared and may not cover all possible budget sources. They are used to obtain a general picture wherever this is possible.

[46] The legal reviews: HARVARD ENVIRONMENTAL LAW REVIEW, UCLA JOURNAL OF ENVIRONMENTAL LAW AND POLICY, OXFORD JOURNAL OF ENVIRONMENTAL LAW, TULANE MARITIME LAW, JOURNAL NATURAL RESOURCE JOURNAL, and ECOLOGY LAW QUARTERLY. The research were done by reviewing the content and abstract of the reviews. The journals chosen for few reasons: 4 are ranked among the top 20 environmental and natural resource law review (Gregory Scott Crespi, *Ranking the Environmental Law, Natural Resources Law, and Land Use Planning Journals: A Survey of Expert Opinion*, 23 WM. & MARY ENVTL. L. & POL'Y REV. 273 (1998); OXFORD JOURNAL OF ENVIRONMENTAL LAW is a top environmental Journal outside the USA; THE TULANE MARITIME LAW JOURNAL was chosen because of the special interest and relevance that it has in Offshore industry, as neighboring the Gulf of Mexico.

[47] Those articles concerned: ocean acidification (1); oil pollution from marine vessels (1), oil and gas development in the arctic (1), global warming and the oil and gas industry (1).

V. The 'Narrow Protection' Hypothesis - Comparative Analysis of Regulatory Regimes

After establishing the conceptual framework to analyze the regulatory regimes this section will review environmental protection in five legal regimes, presenting evidence to affirm the *narrow protection hypothesis*. The newborn Israeli regime which is the most familiar to me, is a good place to start, as is demonstrates how even the early stages of regulatory design reveal and predict *narrow environmental protection*. Next, the US and UK regimes, experienced and extensive regulatory regimes, demonstrate how similar *narrow protection* can be presented by very different regulatory approaches. Finally, Norway and Denmark, which are reliant on the industry and have a much "thinner" regulatory regime, present another example, but also suggest a potential alternative to the "narrow protection" hypothesis.

In ***Israel***, OP industry started to operate in 2004 with one small natural gas deposit, but it was only in 2009 -2010 with the discoveries of the large Tamar and Leviathan natural gas fields that the public and regulator became aware of the nascent industry. The discoveries have caught the Israeli legal system by surprise; Israel has no previous experience in applying its legislation on offshore activities in the outer continental shelf.[48] When the legal status got clearer environmental protection was still hard to find: Israeli law does not include a general environmental law and the Israeli Petroleum Act does not mention the environment throughout its 82 articles. Moreover, the liability regime in Israel does not cover, generally, environmental damages and is based on a negligence regime, meaning that environmental harm from the OP industry that is not proven to be the result of negligence is not recovered or compensated.[49] Though even under those circumstances, the disproportionate focus on oil spills and the mismatches are manifest in the Israeli regime. In regard to marine accidental oil spills, Israel must comply with international requirements to which it is committed. Therefore, the Ministry of Environment has prepared a National Contingency Plan for Preparedness and Response to Combating Marine Oil Pollution,[50]which is required by the International Convention on Oil Pollution Preparedness, Response, and Cooperation, (OPRC 1990) and the Barcelona convention.[51] The plan aims to "assure prompt and effective action to minimize any damage that may results from **major oil spills.**[52] Although the plan was

[48] Many offshore petroleum deposits worldwide are located outside territorial waters of the state that authorizes those activities. Few Mechanism were established in international law to apply certain state laws including environmental laws on those activities: 1958 CONVENTION ON THE CONTINENTAL SHELF,499 UNTS 311 and 1982 UNITED NATION CONVENTION ON THE LAW OF THE SEA (UNCLOS), 1833 UNTS 3; Israel signed the first but not the second, and never announced clearly its Exclusive Economic Zone. For more than a decade authorities did not enforce environmental laws and the legal status was unclear. An opinion by the deputy to government's legal advisor (Avi Licht) published in 2013 stated that Israeli environmental laws and its oil and gas laws do apply on the petroleum facilities in the EEZ. The question which is out of the scope of this paper, is however yet to be fully resolved.

[49] David Schorr and Tamara Lotner Lev, Who's to Blame? Gaps in Tort Liability for Environmental Damage from Offshore Drilling, 5 ECOLOGY AND ENVIRONMENT 6 (2014). *Available at* SSRN: http://ssrn.com/abstract=2432585.

[50] The National Contingency Plan for Preparedness and Response to Combating Marine Oil Pollution, July 2007(As approved by Government Decision 5\6\2008, Jerusalem) *available at:* http://www.sviva.gov.il/English/env_topics/marineandcoastalenvironment/Documents/NatlContingencyPlanForPreparednessAndResponseToOilPollutionIncidents-July2007.pdf

[51] CONVENTION FOR THE PROTECTION OF THE MEDITERRANEAN SEA AGAINST POLLUTION, (BARCELONA CONVENTION OF 1976) 1102 UNTS 27 (ratified by Israel in 1978, amendments ratified by Israel in 2005); 1990 INTERNATIONAL CONVENTION ON OIL POLLUTION PREPAREDNESS, RESPONSE AND CO-OPERATION (OPRC), 1891 UNTS 51 (ratified by Israel in 1999).

[52] "The National Program for Preparedness and Response to Incidents of Oil Pollution of the Sea constitutes an organizational framework, which encompasses the various parties working in response to an occurrence of oil spillage that might give rise to pollution of the marine environment along the coastline of the State of Israel and in the Mediterranean Sea. This program is part

set aside for several years without any budget and the law was left literally on the books, it has finally made it into the last State Budget Proposal (2014) and is supposed to be allocated with a special budget of 22,000,000NIS (roughly 6,000,000$US) during the next five years.[53] Although the national plan is a responsive *ex post* and not a preventive tool, and although the plan is not enacted as primary legislation, is it at least a specific regulatory tool that aims to protect the environment from major oil spills (A risk). Another oil spill provision can be found within the "*license to produce*" that must be obtained by each petroleum deposit by the Ministry of Energy. Under the 'environmental protection' section there are two types of provisions: a general provision regarding "environmental impacts minimizing plan and actions" which must be submitted to the approval of the Ministry of *Energy*; and a special provision for "oil spill" accidents, which requires that a plan be prepared and submitted in order to be approved by the Ministry of *Environment*.[54]

Similar regulatory attention for B risks is scant. ***B risks*** are regulated in Israel (and in other regimes as we shall see) through two types of regulation: *some B risks* are regulated under the permissions system. This system allows for the discharge of waste, small quantities of oil, chemicals and emissions according to a permit from a special inter- ministerial committee. *The Prevention of Seawater Pollution by Land-based Sources Regulations, 5750-1990 (PSPL),* for example, is a primary regulatory tool that prohibits the discharge of any material into the sea without permission from the aforementioned committee.[55] This system means that the discharge is not entirely off the regulator's radar, but permission is given on a routine basis that never actually refuses an application and hardly ever stops operation as a result of violating permit conditions.[56] In order to obtain permission the applicant must show that there is no terrestrial alternative and that the waste will be treated prior to discharging it with the Best Available Technology.[57] There are no set limitations on the amount of discharge that can be approved since for each case the specific conditions are considered before a decision is made and permission is granted. Finally, there is no evidence that the *accumulative impact* of the repeated discharge of waste is being considered.[58] Given that the monitoring and reporting of all discharge are optional and executed by the applicant and not by a third independent party, the *in action* environmental protection for those B risks are called into question altogether.[59]

Other B risks are even further from the regulator's attention. The risks from noise to **marine mammals** are a prime example: the general law prohibiting noise, *Abatement of Nuisances Law 5721-1961*, relates to noise as a hazard to *people* and cannot be applied.[60] *The Animal Welfare Law, 1994* which is the main legislation to protect animals, prohibits cruelty to animals but it is a stretch to categorize the exercising of seismic surveys as such. In 2013, more than a decade after offshore drilling commenced in the region, a draft for Environmental Guidelines to Offshore Drilling was published for public

---

of the regional organization for joint handling and mutual assistance at the time of emergency occurrences of major pollution incidents."(The Israeli Contingency Plan, *supra* note 50 article 1.1).

[53] BUDGET PROPOSAL FOR 2013-, THE MINISTRY OF THE ENVIRONMENT, p. 19 http://mof.gov.il/BudgetSite/statebudget/BUDGET2013_2014/MINISTERIESBUDGET/MinisteriesBudget/Documents/Sviva_Prop.pdf.

[54] "Permission for Operation of Production System of Natural Gas from Tamar Deposit" signed by the petroleum supervisor in the Ministry Of Energy on June 3rd 2013.

[55] The committee is established according article 3 to PSPL regulation (Israel).

[56] The applications are not published and it is impossible to demonstrate that they are never refused, but my correspondent with officers from Ministry of Environment have approved that the application are rather negotiated until approved then refused.

[57] PSPL regulation, articles 6-10 (Israel).

[58] *Ibid*.

[59] *Ibid*, article 11.

[60] Abatement of Nuisances Law 5721-1961, article 2 (Israel).

comments.[61] However, in regards to seismic surveys, the draft guidelines do not include any special requirement and leave it to "annex A", which has yet to be published. Even when published, the legal status of the guidelines is not clear.[62] The risk from *Invasive Species* constitutes another example: although the Ministry of Environment drafted a plan in 2010 for meeting the challenge of invasive species, it has not been adopted and aquatic invasive species risk from the OP industry is left without any regulatory attention.

The USA, an experienced and extensively regulated regime, presents several primary regulatory tools for coping with the risk of big oil spills pollution. *The Clear Water Act of 1972* (CWA) prohibits the discharge into the water of all pollutants and specifically prohibits the discharge of "harmful" quantities of oil in connection with OCSLA activities.[63] Since 1990 it is *The Oil Pollution Act* (OPA) that is especially designed to govern major oil spills. Enacted after the 1989 Exon Valdez oil spill in Alaska, OPA's section 1002 defines strict liability for damages on the responsible party,[64] including damages to the environment. OPA provides a strong incentive to the industry to prevent big oil spills,[65] while small oil discharges (B risks) do not fall under this incentive. Again, small damages that carry pure environmental damage which only in the future may be defined as damage to humans is beyond the purview of the regulation. Therefore, they do not pose a "threat" to the operators as the big oil spills do. A risk oil spills are also covered by *the National Oil and Hazardous Substances Pollution Contingency Plan*[66] (NCP), which was developed and published in 1968 in response to a previous big oil spill, the oil tanker *Torrey Canyon* spill off the coast of England. Those three instruments, 2 federal acts and one national plan, clearly and categorically prohibit the discharge of oil and deal directly with great oil spills. As such, they are supported by budget and enforcement authorities: after the Macondo oil spill in 2010 the Bureau of Safety and Environmental Enforcement (BSEE) was appointed to be the agency that oversees oil spill planning and preparedness for U.S. facilities. Within BSEE, Oil Spill Response Division (OSRD) is especially responsible for ensuring that the offshore operators and response community have the necessary equipment, resources, trained personnel, etc. to respond to an oil spill.[67] BSEE receives funding through the Offshore Safety and Environmental Enforcement (OSEE) and through Oil Spill Research (OSR) appropriations. The budget allocation demonstrates that there is the "oil spill" and there are all other "safety and

[61] The Environmental Guidelines (Israel), *supra* note 16.

[62] Environmental organization in Israel protested against the fact that the regulation of the environmental aspect of the OP industry in done in guidelines and not in primary legislation, *see*: representatives of the Society for the Protection of Nature in Israel in *protocol of round table discussion regarding environmental guidelines for offshore drilling*, Ministry of Energy 27.4.2014.

[63] Federal Water Pollution Control Act 33 U.S.C §§1251 et seq. It is not disputed that this oil spill violated article 110.3 to the Clean Water Act. *See In re: Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, on April 20, 2010 MDL2179 (from the BP phase 1 decision of 2014, p. 113 note 160)*. This act also creates permits system, which is relevant to B risk oil spills as discussed further below.

[64] OPA §2702(a).

[65] OPA §2702(b) (2).

[66] 40 CFR 300.

[67] Practically, the OSRD conducts roughly 200 plans, its personnel attends at least 35 industry exercises, and initiates about 15 unannounced government exercises each year to ensure plans are executable. See: Y 2015 BUDGET JUSTIFICATIONS BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT, http://www.doi.gov/budget/upload/fy2015_bsee_greenbook.pdf.

environment" issues.[68] After years of regulating the oil spill risks studies are showing that offshore Oil spill in the US are actually on the decline.[69]

For B risks, the situation is different. Risks from the discharges are regulated by the permissions system. For any discharge to the US waters a permit needs to be issued by the U.S. EPA or a State regulatory agency that sets specific limits on the type and amount of pollutants that can be discharged according to the CWA's National Pollutant Discharge Elimination System (NPDES).[70] The guiding idea of the permission system is to prohibit the discharge of chemicals or waste because they are toxic and pollutant, but to then permit the discharge under regulatory control. The system *a priori* provides limited environmental protection. Moreover, the control is highly questionable as there is no evidence to show that permission issuances consider: (a) the accumulative effect of multiple toxins together (b) the accumulative effect of multiple licenses.[71] Also, since every permit is issued based on the specific characteristics of the case, there is no absolute number set in regulation and it is hard to follow and fully understand the amount of pollution that is permitted. Finally, this flexible mechanism opens the door to the industry's ability to wield discernible influence on the regulator.

The aforementioned issue of mismatch pervades other risks, particularly those that stem from noise damage to marine mammals. The American Noise Control Act of 1972[72] does not cover the mammals' problems since it provides "welfare" to people.[73] Although mammals are protected under the special Marine Mammals Protection Act of 1972 (MMPA),[74] there is no protection from noise in that act. The act does prohibit the "taking" of marine mammals. "Taking" includes "harassment" of mammals, and harassment means "a*ny act of pursuit, torment, or annoyance which … has the potential to disturb a marine mammal… by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering*." As shown in section III, studies have established such disturbance to mammals from the seismic surveys. Yet, even noise is considered "harassment", the act doesn't prohibit noise categorically. In other words, one must prove that noise indeed constitutes harassment. This is not to say that this act is entirely irrelevant, but its utility is certainly different from the prohibition that applies to oil pollution. Any change in the way seismic survey is done, for example, can start a discussion whether this disturbs mammals or not. Moreover, in practice the industry is regularly exempted from this prohibition: The MMPA includes exemptions which allow for the taking of marine mammals for certain activities and under specified conditions. For activities related to offshore energy production, this exemption outlined in the Incidental Take/Harassment Authorization (ITA/IHA), allows the unintentional taking of *small numbers* of marine mammals, provided that the activity has a

[68] BSEE budget reveals that it allocated in the last 3 years approximately 62,000,000-82,000,000$ (net allocation), to implement and enforce *all* other environmental risks under BSEE, and app. 14,000,000-15,000,000$ per year for oil spills research only. *Ibid*, Oil spills are also budgeted by the Oil Spill Liability Trust Fund (OSLTF), the federal source of funding oil pollution prevention, response and compensation under the OPA which allocated in 2012 app. 200,000,000$. I. See: OIL SPILL LIABILITY TRUST FUND DISBURSEMENTS FOR FY 2012 REPORT TO CONGRESS NOVEMBER 27, 2013. t should be noted that other budgetary sources such as states budget were not considered here.

[69] Cheryl McMahon Anderson & Robert P. LaBell *Update of Comparative Occurrence Rates for Offshore Oil Spills*, 6 SPILL SCIENCE & TECHNOLOGY BULLETIN, 303 (2000); Jonathan L. Ramseur *Oil Spills in U.S. Coastal Waters: Background and Governance*, CONGRESSIONAL RESEARCH SERVICE 7-5700 (2012).

[70] 33 U.S.C §1342.

[71] Legislations which do consider accumulation impacts can be found in other US laws. See for example: the Noise Control Act of 1972 section 7(3) in regard to aircraft noise control.

[72] 42 U.S.C. §4901 et seq.

[73] 42 U.S.C. §4901 (a) and (b).

[74] 16 U.S.C. §§1361 et seq.

negligible impact on marine mammals.[75] For this exemption to apply the applicant needs to show that "there is no potential for serious injury or mortality". Serious Injury is defined as: "Any injury that will likely result in mortality".[76] This is a tricky definition the practical result of which affords the OP industry exemption from the MMPA. Consider the following example:

> *"BP Exploration… is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 137l(a)(5)(D)),to harass small numbers of marine mammals incidental to specified activities associated with a 3D ocean bottom sensor seismic survey in the Prudhoe Bay area in the Beaufort Sea, Alaska…"*[77]

Special guidelines that were published via "Notice to Lessee" (NTL) should also be mentioned. NTL is a less powerful but common tool which is being employed by US agencies to address the industry with requirements. A JOINT NTL No. 2012-G02 of 2012 published guidelines for the industry specifying "how you should implement seismic survey mitigation measures".[78] But first, regulators have relied primarily on operational requirements to mitigate the risk. The efficacy of such operational requirements is highly limited, again leaving the accumulative impact of ocean noise yet to be addressed in a meaningful way.[79] Second, the NTL are not laws and their legal status is not completely clear.

Budget and Enforcement **-** The MMPA is implemented by the National Oceanic and Atmospheric Administration (NOAA) fishery division and is supervised by The Marine Mammal Commission - an independent agency of the U.S. Government, established under MMPA to provide independent oversight of the marine mammal conservation programs carried out by federal regulatory agencies. In 2014, NOAA fisheries allocated a budget of $49,000,000 for the marine mammals.[80] This amount is allocated to *all* marine mammal protection and is still less than one fifth of the budget enjoyed by oil pollution. It is difficult to know how much will be allocated, if at all, to the case of noise from seismic surveys. Another relevant authority is the Environmental Enforcement Division (EED) within the BSEE which is charged with monitoring, verifying, improving, and enforcing the OP industry's compliance with environmental standards, regulation, and conditions placed on leases, plans, and permits during operations. EED Responsibilities include compliance and monitoring of basically all environmental regulation which are not big oil spills. The EED budget is defined in the BSEE budget under the general Offshore Safety and Environmental Enforcement (OSEE) and has been allocated $61-82,000,000 in the 2012-2014 fiscal years.[81] Given that this sum includes *all* environmental risk associated with OP industry,[82] this is much less than the sum allocated to oil spills alone.

---

[75] BOEM encourages offshore operators to apply for an ITA, *see*: http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/MMPA/index.aspx.

[76] MMPA §1371.

[77] IHA of 25 June 2014, *available at*: http://www.nmfs.noaa.gov/pr/pdfs/permits/bp_prudhoebay_iha_issued2014.pdf.

[78] OMB Control Number: 1010-0151. Available at: http://www.boem.gov/2012-JOINT-G02/.

[79]See: Cara Horowitz & Michael Jasny, *Precautionary Management of Noise: Lessons from the U.S. Marine Mammal Protection Act,* 10 JOURNAL OF INTERNATIONAL WILDLIFE LAW & POLICY 225, 228 (2007).

[80] BUDGET LINES AND FUNDING BY YEAR, NOAA**,** http://www.nmfs.noaa.gov/pr/about/budget.htm (this budget is within the resource protection program, other budgetary allocation for that could not be found).

[81] BSEE BUDGET JUSTIFICATION FY 2014, http://www.bsee.gov/uploadedFiles/BSEE/About_BSEE/Budget/BSEE%202014%20Greenbook%20Final.pdf.

[82] With the exception of the risks of air pollution and emissions.

The risk from *invasive species*- Nonindigenous Aquatic Nuisance Prevention and Control Act Of 1990 (NANPCA), as amended by the National Invasive Species Act of 1996 (NISA)[83] intended to minimize and eliminate the introduction of aquatic invasive species. However, while NISA has a comprehensive title, its content is relatively narrow: NISA aimed chiefly to prevent the unintentional introductions of aquatic species via the ballast water of ships, especially into the Great Lakes**.**[84] Before expiring in 2002, the NISA established the federal Aquatic Nuisance Species Task Force, which was charged with developing and implementing a broad program for US waters to prevent aquatic introductions, to monitor, control and study such species. The task force is comprised of regional panels each of which prepares a strategic plan according to the principles and mandates of NANPCA. In regard to the OP industry activity, it seems that this act is of a little help. First, it relates to ballast water, which relates to the case of ships, and much less to offshore platform. Second, since the act does not mention the OP industry directly, the Task Force is left to implement the basic principle. The Task Force's strategic plan for the years of 2013-2017 shows no sign for the OP platform risk.[85] Budget wise, it is difficult to find any allocation for the risk of aquatic invasive species. The ANSTF operates within a limited budget to conduct semiannual meetings and provides a fraction of the support needed to achieve goals identified by the Regional Panels and ANSTF approved management plans.[86] The National Invasive Specifies Council (NISC) created by Executive Order 13112 in 1999 to deal generally with IS is not especially concerned with the aquatic species, which was budgeted with the impressive number of 1.3$ billion yearly. Though, the drafting and revising of the National Invasive Species Management Plan published most recently in 2008, does not mention the risk from the OP industry.[87]

In the **UK,** offshore environmental regulation went from practically self-regulation (until the beginning of the 70's), to a prescriptive approach and to what is known today as the "safety case" regime.[88] The shift to the safety case approach was carried out primarily as a result of the 1988 Piper Alpha petroleum platform accident in which 167 people were killed.[89] The major objective of the newly established regime was to prevent such A risks' catastrophic accidents. The general tool for implementing the safety case is *The Offshore Installations (Safety Case) Regulations 1992* and *The Offshore Installations (Safety Case) Regulations 2005,* according to which every operator must prepare a detailed safety case that includes information regarding the facility, the operation, management etc.**[90]**

Oil spills **-** *The Merchant Shipping Act 1995* and *The Merchant Shipping (Oil Pollution Preparedness, Response Co-operation Convention) Regulations 1998* in the UK implement the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC Convention), as a major oil spills

[83] 16 U.S.C. §§ 4701 et seq.

[84] On the history of NISA and the great lakes invasive species problem see: *The National Invasive Species Act An Information Update by the Union of Concerned Scientists,* Aug. 2002, http://www.dodinvasives.org/nisa-union_of_concerned_scientists.pdf.

[85] THE AQUATIC NUISANCE SPECIES TASK FORCE STRATEGIC PLAN (2013-2017), U.S. Fish and Wildlife Service, http://anstaskforce.gov/Documents/ANSTF%20Strategic%20Plan%202013-2017.pdf.

[86] *Ibid*, p.28

[87] The National Invasive Species Council (NISC) 2008 – 2012 NATIONAL INVASIVE SPECIES MANAGEMENT PLAN, Aug 2008, http://www.invasivespecies.gov/home_documents/2008-2012%20National%20Invasive%20Species%20Management%20Plan.pdf

[88] John Paterson, *Health and Safety Regulation on the UK Continental Shelf, in* RISK GOVERNANCE OF OFFSHORE OIL AND GAS OPERATIONS 132 (PREBEN H. LINDOE, MICHALE BARAAM AND ORTWIN RENN, EDS. 2014).

[89] "It was this unprecedented disaster that shock the industry and the regulator alike that prompted the establishment of the governmental investigation". *Ibid*, p. 140.

[90] On the safety case regimes see: Jeffery Ray *Offshore Safety and Environmental Regimes: A Post Macondo Comparative Analysis of The United Stated and United Kingdom*, 33 MISSISSIPPI COLLEGE LAW REVIEW (forthcoming 2014) ssrn.com/abstract=2370709.

regulation. The act and the regulation state that every offshore installation must have an approved oil pollution emergency plan (OPEP) setting out arrangements for responding to incidents that cause or may cause marine pollution by oil, with a view to preventing such pollution or reducing or minimizing its effect. New installations and/or new operations require an OPEP to be submitted at least two months prior to start-up. Personnel responsible for oil pollution incident response must be competent. *Offshore Installations (Emergency Pollution Control) Regulations 2002* give the Government power to intervene in the event of an incident involving an offshore installation where there is or there may be a risk of significant pollution. Department of Energy of Climate Change (DECC)'s *Oil Pollution Emergency Plans Guidance Note (July 2012)* and *DECC Guidance Note on Offshore Installations (Emergency Pollution Control) Regulations 2002* (April 2009) state that all new Oil Pollution Emergency Plans (OPEPs) are subject to a 5 yearly review.

B risks are regulated, again, under two regimes. The permits system includes all discharges into the sea of waste, chemicals, oil, air pollution and emission. The permits system means that all discharges are prohibited unless licensed according to a detailed application. The result, in environmental protection terms, is that the discharge is not prohibited but actually permitted via the *Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005,*[91] *The Offshore Chemicals Regulations 2002*[92] etc. The permit is granted or refused only after consideration by the Secretary of State and can be granted with conditions by The Secretary of State as it sees 'fit'. The Secretary of State has discretion and there are no clear requirements to consider the accumulative impact of few offshore facilities operating in parallel within the permission system.

Other B risks such as the marine mammals' protection from seismic survey's noise case are not part of the permissions system. *The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001* state that any activity of "geological surveys by physical or chemical means" must not be carried out without the prior written consent of the Secretary of State,[93] who must "take an appropriate assessment of the implications for the site in view of the site's conservation objectives" (regulation 5(1)). The assessment must be done after consulting with the Joint Nature Conservation Committee (JNCC)[94]. The JNCC published guidelines in 1995,[95] with the aim of minimizing acoustic disturbance of marine mammals from the OP industry seismic surveys. These guidelines are important as they are the *first national guidelines* to be developed and have subsequently become the basis of international mitigation measures for noise from seismic surveys. Although focused on a specific B risk case, the guidelines are not primary legislation or even regulation but a secondary tool of guidelines. Moreover, the guidelines have been criticized for poorly protecting the marine mammals. The three main methods that are described in the guidelines are: (1) implementation of operational procedures (e.g., 'soft start'—where sound levels are gradually increased over time); (2) detection of animals close to airguns and implementation of real-time mitigation measures (e.g., shut-down when mammals are viewed), and (3) time/area planning of surveys

[91] The Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 No. 2055 (UK).
[92] The Offshore Chemicals Regulations 2002 No. 1355 (UK).
[93] The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 No. 1754 regulation 4 (UK).
[94] The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 No. 1754 Regulation 5(2) (UK).
[95] The UK like other EU member states, is required to establish a system of strict protection for the animal species listed in Annex IV of the EU Habitats Directive 92/43/EEC which includes all cetaceans. It is under this requirement that the United Kingdom's Joint Nature Conservation Committee (JNCC) has published the guidelines.

to avoid marine mammals. The criticism of the mitigation methods are:[96] (1) lack of definitions for sensitive area where more stringent mitigation procedures are required; (2) visual monitoring is inefficiency (3) Because animals are not visibly fleeing from a seismic survey vessel does not mean that they are not significantly impacted; (4) the guidelines do not address the potentially significant biological impact that occurs on much broader temporal and spatial scales. The practical result is that numerous surveys are being approved and exercised every year: during the first 8 month of 2014, for example, more than 150 approvals were given to geological surveys, of which around 60 were seismic surveys. Some of those surveys are requested for 2-3 days, other for 20, 60 or even 180 days.

In Norway, legislation is much less scattered and fragmented than in the US and the UK. The two major relevant acts are the Pollution Control Act (PCA) and the Petroleum Activity Act (PAA). The PAA does not relate to B risks at all but does prohibit oil pollution and set strict "liability for pollution damage" on the operator, with pollution defined as "damage or loss caused by pollution as a consequence of effluence or discharge of petroleum from a facility..".[97] In other words, the liability regime relates to oil spills damage but not to other kind of environmental damages. Big oil spills are also governed by the Norwegian Oil Spill Preparedness Plan which is based on Chapter 6 of the PCA. This chapter was enacted after the Torry Canyon accident near England in 1967 to deal with accidental pollution.[98]

Some of the B risks are governed by a permission system established by the PCA: Article 7 states that **n**o person may do or initiate anything that may entail a risk of pollution unless this is lawful (pursuant to section 8 or 9) or permitted (pursuant to section 11). However, the PCA set up a flexible permission mechanism, and "provide(s) the authorities with a wide margin of approximation when deciding an application for pollution permit".[99] Liability for unpermitted pollution is strictly set on the polluter according to PCA article 55, but liability for permitted pollution is limited only to the rare cases of causing *unreasonable or unnecessary* damage to neighboring property.[100]

There are, however, some B risks which were removed from the permits system, as is the case of produced water. Since 1997, Norwegian authorities have stated as a goal that no environmentally harmful produced water shall be discharged. No minimal discharges of naturally occurring environmentally harmful substances are allowed. Moreover, some added chemicals that were categorized "red" or "black" must not be discharged to sea and must therefore be replaced.[101] This important exemption shows that the common permission system, which serves as a pull solution for managing many B risks, has alternatives. Discharges of polluting materials can be prohibited and replaced with nontoxic materials or zero

[96]Ross Compton et al. *supra* note 21; E.C.M. Parsons, Sarah J. Dolman, Michael Jasny, Naomi A. Rose, Mark P. Simmonds and Andrew J. Wright, *A critique of the UK's JNCC seismic survey guidelines for minimizing acoustic disturbance to marine mammals: Best practice*? 58 MARINE POLLUTION BULLETIN 643 (2009).

[97] PAA section 7-1 (Norway).

[98] BUGG, *supra* note 4, p. 86

[99] BUGG *supra* note 4, p. 81

[100] PCA article 56 states that liability for permitted pollution is limited to the extent that the pollution is unreasonable or unnecessary, pursuant to Act of 16 June 1961 No. 15 relating to the legal relationship between neighboring properties.

[101] The zero harmful discharges goal was laid down in the Norwegian parliament (the "Storting)" White Paper No. 58 (1996-1997), and later specified in several white papers, most recently in No. 26 (2006-2007). See: Norwegian Petroleum Directorate's official website: http://www.npd.no/en/Topics/Environment/Temaartikler/More-water-than-oil-on-the-shelf/ (2.9.104).

discharges. By affixing red and black labels to chemicals and by prohibiting discharge of produced water, Norway managed to place some B risks into a real regulatory regime.

The second group of B risks, which are not under the general permission system, is still left behind as in previous regimes reviewed. Such are the *marine mammals' protection*: the *Regulations Relating to Resource Management in the Petroleum Activities of 2001* state a list of "particular information" that must be submitted to the authorities and includes a "number of air guns and total chamber volume". [102] However, those are not helpful to marine mammals as they are directly correlated with the risks posed by the survey's noise to fish and more specifically with the commercial fishery industry. "The petroleum and fishing industries are two important industries for Norway. Both generate large revenues and create many jobs. Ever since the dawn of Norway's petroleum industry in the late 1960s, it has been an important goal for the government to ensure sound coexistence, where both industries can thrive".[103] Therefore, the regulations require that vessels carrying out seismic surveys maintain a "safe distance" from vessels carrying out **fishing** activities and have a "**fishery** expert" on board.[104] In relation to mammals in general, there are no special protection provisions in the guidelines.

Invasive species is another B risk left behind. Invasive Species are regulated under Chapter IV of the *Nature Diversity Act* which deals with alien organisms. Import of alien species is generally prohibited, but may be done under permit.[105] However, legislation does not refer to the OP industry, and no measure to prevent this or monitor it are to be found it the Norwegian regulations.[106]

Denmark. *The Danish Subsoil Act*[107] lays down all the comprehensive rules and procedures for the oil and gas exploration and exploitation in the Danish North Sea area. The main environmental regulatory framework for the offshore industry is the *Safety Act*[108] and *the Act on Protection of the Marine Environment*.[109] Provision concerning accidental emergency response plans (A risks) is found in section 45 of the Offshore Safety Act as well as in Executive Order no. 1501 of 15 December 2010 on *Emergency Response on offshore installations.* Oil spill plans are also required according to the Ministry of Environment's Order no. 395 of 17 July 1984 on Preparedness in Case of Pollution of the Sea from Certain offshore Installations.

[102] The Regulations Relating to Resource Management in the Petroleum Activities of 2001 Chapter 2 section 4 (Norway).
[103]Norwegian Petroleum Directorate's Guide published by the Ministry of Fisheries and Coastal Affairs and the Ministry of Energy and Petroleum, "Implementation of seismic surveys on the Norwegian Continental Shelf" http://w o/Global/Engelsk/5-Rules-and-regulations/Guidelines/Guidelines-Seismic-Surveys.pdf
[103] *Ibid*, Section 5ww.npd.no/Global/Engelsk/5-Rules-and-regulations/Guidelines/Guidelines-Seismic-Surveys.pdf
[104] *Ibid*.
[105] BUGG *supra* note 4 p. 199
[106] Further research should be done concerning the voluntaries procedures made by industry.
[107] Act No. 960 of 13 September 2011 on the Use of the Danish Subsoil, consolidating Act No. 293 of 10 June 1981 (Denmark).
[108] Act on Safety, etc. for Offshore Installations for Exploration, Extraction and Transport of Hydrocarbons (Offshore Safety Act) (Denmark).
[109] Act on Protection of the Marine Environment (Consolidated Act No. 963 of 3 July 2013), article 2 (Denmark): The Act aims at preventing and reducing pollution of the environment, in particular the marine environment, from ships, aircraft and floating and fixed platforms…that may… 2) harm living resources and marine life.."

Discharge of oil and chemicals into the sea from offshore activities (B risks) is regulated by a permits system carried out by the Danish Environmental Protection Agency (DPA).[110] The DPA has since 2005 cooperated with the Danish Offshore Operators to develop offshore action plans for the protection of the marine environment. According to those plans, effects on the environment from the offshore activities should be within the limits that are set by national and international regulation. The action plans have primarily focused on a reduction of the discharge of the most environmentally harmful substances, on the discharge of oil in produced water, and on the introduction of annual environmental performance reports form the operators. This cooperation is supported by a reporting mechanism and could represent an alternative to the stand alone permits system. However, the cooperation between the regulators and the industry makes it difficult to fully understand how much those guidelines are binding and enforced. In the case of produced water, for example, the cooperation which aimed to reduce produced water discharge has led so far to an *increase* in the amount of the produced water from wells.[111]

Marine mammals' protection - Article 28 of the Subsoil Act states that seismic surveys are subjected to approval of the environmental agency and are to be done according to the "Best practice for pre investigations offshore" guidelines, prepared by the National Environmental Research Institute.[112] The application for conducting the survey must contain information concerning equipment, program, working methods, and the impact the survey will have on the fauna. Against this background, conditions may be imposed to ensure that the surveys are carried out in accordance with the provisions of the Subsoil Act. The only general condition that is stated is that companies use the 'soft start' procedure which gives marine mammals a chance to leave the area before the pressure waves reach their operational level. Other than that, the conditions imposed for the approval of seismic surveys are based on the latest data and information concerning marine mammals in the Danish offshore area. At the end of 2009, the DEA received the preliminary results of two monitoring programs concerning the presence and behavior of porpoises and other fauna and this is currently under evaluation with the aim of clarifying whether there is a need for additional measures in order to provide marine mammals with the best possible protection. It seems that although Denmark provides similar protection to marine mammals through similar guidelines which are highly criticized, it is supplemented by a monitoring and cooperation mechanism that may lead to better and wider protection. Moreover, the approval of the seismic survey is specifically mentioned in the primary act, which is unique to the Danish regime.

VI. Conclusions

[110] The Act on Protection of the Marine Environment (*Ibid*) and the Statutory Order on Discharge of Substances and Materials to the Sea from Certain Facilities at Sea (Danish Environmental Protection Agency, http://eng.mst.dk/topics/industry/offshore-activities/).

[111] Though, the increase may also be a result of the fact that many wells are mature, and thus contain more water within the petroleum, see: Danish Energy Agency, *Oil and Gas Production in Denmark 2013*, http://www.ens.dk/sites/ens.dk/files/dokumenter/publikationer/downloads/danmarks_olie-_og_gasproduktion_2013_uk.pdf.

[112] Steen Hartvig Jacobse**,** *Seismic surveys respect the natural environment*, DANISH ENERGY AGENCY NEWS, June 8th, 2010, http://www.ens.dk/en/info/news-danish-energy-agency/topics/topic-danmarks-oil-gas-production-2009/seismic-surveys-respect.

In 2007, an experiment was conducted in California: a group of people were given an Ambient Orb, a ball that glows red when their energy consumption is high but green when energy consumption is low. Within a few weeks, users of the Orb reduced their use of energy by 40%.[113] Above all, this experiment demonstrates the significance of *seeing* the result of our action in order to change our behavior, and highlights the significance of failing to *see* it**.** Regulatory regimes of the OP industry that operate in the middle of oceans far from our scrutinizing eye, suggest that although they make an effort to minimize environmental harm, the efforts are concentrated on the damage that can be seen by the public and neglect those that are hidden.

This paper aimed at elucidating the scope of environmental protection as implemented in several OP regulatory regimes. It examined several regimes and revealed a number of similar trends in their implementation of environmental protection. First, the regimes are more focused on oil spill risks than the list of other environmental risks. Second, all regimes employ a permits system for discharge of many materials into the sea. This system allows for pollution instead of prohibiting it, and does so according to standards that vary from well to well and are thus difficult to be reviewed. Third, regimes use provisions that do not always match the industry conditions or the nature of risks, as in the cases of aquatic invasive species and marine mammals. The result is implementation of *narrow environmental protection*: only part of the risks are actually regulated in a manner that efficiently provides protection, while other risks - such as the risk to marine mammals, the risk from invasive species, and the risk form operational discharges into the water - are only partially or weakly regulated.[114]

In order to assess whether the *narrow environmental protection* is sufficient, its ethical and economic meaning must be further analyzed: whether the ethic that is implemented by the *narrow protection* is reflective of the environmental ethics that those legal regimes have identified and seek to uphold; what economic efficiency is achieved through extant regulations- are externalities internalized and are costs imposed on the most effective entity? These questions demand further research, and their answers are to enable constructing a framework for appropriate environmental protection from the offshore petroleum industry.

[113] RICHARD H. THALER AND CASS R. SUNSTEIN, NUDGE 196 (2008).

[114] Such protection not only does not fulfill the value of environmental protection, it also focuses on the "louder" risks and could provide the industry with a public legitimacy, a "social license to operate". This is because if oil spill are well regulated, the public may believe that OP industry is actually an innocent industry that causes no harm, while the damages actually created by the industry are still huge.