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A Song of Ice and Fire: Offshore Methane Hydrates and the Regulatory Laws That Govern the 'Methane Dragon'

John Thomas
thomasjohn206@gmail.com

A SONG OF ICE AND FIRE: OFFSHORE METHANE HYDRATES AND THE REGULATORY LAWS THAT GOVERN THE 'METHANE DRAGON'

John Thomas[†]

Abstract

Offshore methane hydrates have recently made headlines as various countries began experimenting with methods of exploration and extraction of the resource. The value and abundance of this resource presents many exciting opportunities as researchers and developers begin to contemplate the possibility of commercial development of methane hydrate reserves. This Comment seeks to explore the legal regulations in place and assess whether the current legal regime, both in the United States and internationally, would be able to efficiently regulate methane hydrates and their unique composition due to difficulties stemming from exploration and extraction. In particular, this Comment will look at how to impose liability after an accident resulting from exploration and extraction of offshore methane hydrates. Ultimately, because of their unique nature and the narrow focus of current legal institutions that govern liability of off drilling accidents, this Comment recommends the institution of different liability standards to successfully cover the unique problems inherent with Offshore methane hydrates.

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I. INTRODUCTION

"Take a chunk of this stuff up to the surface[,] and it looks and feels much like ice, except for a give-away fizzing sensation in the palm of your hand, but put a match to it and it doesn't just melt, it ignites."[1] This statement is referring to a chemical known as a methane hydrate, more colloquially known as "fiery ice."[2] The substance, most commonly found in the ocean, has been of interest to many in the energy world because of its potential to alleviate the tensions caused by the depleting reserve of fossil fuels and potable water.[3] Scientists speculate that methane hydrates may be able to produce more energy than the current estimation of reserves of fossil fuels with one-third of the carbon footprint.[4] In 2013, Japan made a large stride in developing

1. Martha Henriques, *Why 'Flammable Ice' Could be the Future of Energy*, BBC (Nov. 22, 2018), http://www.bbc.com/future/story/20181119-why-flammable-ice-could-be-the-future-of-energy [https://perma.cc/6SFU-V6UG].

2. *Id.*

3. *See id.*

4. Hiroko Tabuchi, *An Energy Coup for Japan: 'Flammable Ice'*, N.Y. TIMES (Mar. 12, 2013), https://www.nytimes.com/2013/03/13/business/global/japan-says-it-is-first-to-tap-methane-hydrate-deposit.html?pagewanted=2&_r=1 [https://perma.cc/RG39-P9VB]; Martha Henriques, *Why 'Flammable Ice' Could be the Future of Energy*, BBC (Nov. 22, 2018), http://www.bbc.com/future/story/20181119-why-flammable-ice-could-be-the-future-of-energy [https://perma.cc/6SFU-V6UG].

strategies for efficient and safe extraction and exploration of methane hydrates.[5] This experimental expedition gave Japan and other countries hope that this resource may become a commercially viable alternative to coal and natural gas as a world leader in energy.[6] Upon the conclusion of the maiden voyage of Japan's extraction of methane hydrates, a senior researcher remarked, "[n]ow we know that extraction is possible."[7] Japan also conducted a second test in 2017 and was able to successfully run the well for 24 hours without incident.[8] While many applaud the innovative developments that are beginning to pave the way for offshore methane hydrates to become a sustainable source of energy, others believe methane hydrates are more detrimental than they are beneficial. "We are waking up the methane dragon. And that's a dragon we really want to keep in the box."[9] Those who ascribe to Samantha Joye's apocalyptic notions regarding methane hydrates and their commercial development posit that the extraction of the resource will emit greenhouse gases into the atmosphere, and as a general matter, that extraction has the capacity to produce catastrophic results.[10] Some critics even believe an innocuous misstep in exploration or extraction could lead to a tsunami.[11]

Perhaps more concerning is the lack of legal framework in place for these future events. The commercial development for exploration and extraction of offshore methane hydrates is becoming an inevitable certitude. As countries and private companies alike begin to put structures in place for economic development purposes, a legal

5. *See* Hiroko Tabuchi, *An Energy Coup for Japan: 'Flammable Ice'*, N.Y. TIMES (Mar. 12, 2013), https://www.nytimes.com/2013/03/13/business/global/japan-says-it-is-first-to-tap-methane-hydrate-deposit.html?pagewanted=2&_r=1 [https://perma.cc/RG39-P9VB].

6. *See id.*

7. *Id.*

8. Martha Henriques, *Why 'Flammable Ice' Could be the Future of Energy*, BBC (Nov. 22, 2018), http://www.bbc.com/future/story/20181119-why-flammable-ice-could-be-the-future-of-energy [https://perma.cc/6SFU-V6UG].

9. Chris D'Angelo, *Chasing the Methane Dragon That Lurks in The Deep Sea*, HUFFINGTON POST (Sep. 2, 2019, 7:53 AM ET), https://www.huffpost.com/entry/methane-hydrate-atlantic-samantha-joye_n_5d681737e4b0488c0d117841?guccounter=1 [https://perma.cc/F7D9-2YXL].

10. *See id.*

11. Martha Henriques, *Why 'Flammable Ice' Could be the Future of Energy*, BBC (Nov. 22, 2018), http://www.bbc.com/future/story/20181119-why-flammable-ice-could-be-the-future-of-energy [https://perma.cc/6SFU-V6UG].

framework is essential to guide and regulate the exploration and extraction of offshore methane hydrates. With this framework, it is imperative to recognize international laws that establish a legal governance in a global context. This Comment will examine domestic and international laws that would govern the extraction and exploration of offshore methane hydrates in the United States, with a particular lens on how liability is assessed in the wake of an offshore accident. Specifically, this Comment will highlight the particular problem of what type of liability standard is best suited to handle the dangerous nature inherent in offshore methane hydrate exploration and extraction. Finally, this Comment will look at the current legal framework and determine whether a new framework would provide a better structure for efficient, safe, and environmentally sound exploration and extraction of offshore methane hydrates. Part II of this Comment will expand upon intricacies of the resource itself, outlining the chemical components and putative role it can play in solving problems such as the lack of energy and water. Additionally, Part II will enumerate the hazards connected to the extraction of methane hydrates in the ocean that create obstacles for future economic viability. Part III will survey the domestic laws that impose obligations for offshore spills and accidents. Part IV will look at the international obligations currently in place and their specific relation to the United States, with a particular focus on the United Nations Convention for the Law of the Sea. Part IV will provide an analysis of the current landscape and pose that robust additions be made to the United Nations Convention for the Law of the Sea and the International Seabed Authority's Mining Code to ensure that liability can be assessed internationally. Part V will provide a way forward, giving thoughts on a normative regime that could govern offshore methane hydrates in a way that allows companies to enter the market and ensure a forum to compensate victims. Finally, Part VI will provide a summation of the main points of the Comment and concludes.

II. WHAT IS A METHANE HYDRATE?

A. *Allow Me to Introduce My Friend, Methane Hydrates*

Methane hydrates have many denominations. They have been referred to as natural gas hydrates, gas clathrates, or clathrates.[12] Methane hydrates are composed of two ingredients: fresh water and pure natural gas.[13] Under the right circumstances, the water forms "tiny ice cages" around the individual methane molecules, while simultaneously forcing out any other salt or acid molecules.[14] Because excess materials are forced out of the compound molecule, the end result is a methane hydrate with the ability to produce both fresh water and natural gas.[15] Methane hydrates are predominantly made of water, consisting of roughly 85% water and 15% methane gas.[16] Methane hydrates are created and best thrive in low temperatures.[17] Furthermore, they are best formed under high pressures and also require high pressurization to remain stable.[18] Despite their icy or slushy appearance, methane hydrates are stable in temperatures ranging from negative five degrees Celsius to positive thirty-four degrees Celsius, or from twenty-three degrees Fahrenheit to ninety-three degrees Fahrenheit.[19] Both biological and non-biological processes can create methane hydrates.[20] Methane is usually produced biologically as a product of waste from microorganisms as they consume biological material.[21] Methane can also be produced non-biologically through spontaneous decomposition of organism matter, which tends to occur only when the temperature of the organic material exceeds 100 degrees Celsius; however, this process is

12. Roy Partain, *Avoiding Epimetheus: Planning Ahead for the Commercial Development of Offshore Methane Hydrates*, 15 SUSTAINABLE DEV. L. & POL'Y 16, 17 (2015) [hereinafter Partain, *Avoiding Epimetheus*].

13. ROY ANDREW PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS: CIVIL LIABILITY AND REGULATIONS FOR EFFICIENT GOVERNANCE 13 (Kurt Deketelaere ed., 2017) [hereinafter PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS].

14. *Id.*

15. *Id.*

16. *Id.* at 16.

17. *Id.* at 18.

18. Partain, *Avoiding Epimetheus, supra* note 12, at 17.

19. *Id*.

20. Erin Jackson, *Fire and Ice: Regulating Methane Hydrate as a New Potential Energy Source*, 29 J. ENVTL. L. & LITIG. 611, 613 (2014).

21. *Id.*

relatively uncommon.[22] Methane hydrates are typically found in two distinct locations. The first is permafrost regions, and the second is below the sea floor.[23] When methane hydrates exist offshore, they usually form and are found within the first 200 kilometers of the shoreline.[24] Offshore methane hydrates can sometimes be found as shallow as 150 meters; however, the natural resource is most commonly found more than 500 meters below the sea floor.[25]

B. *A People's History of Offshore Methane Hydrates*

Scientists have known about methane hydrates for over two centuries; however, the substance known to them at the time was one created in a laboratory and not one found in nature.[26] The biological methane hydrates found below the sea floor have remained a largely unknown resource until recently.[27] The first methane hydrate gas field was discovered in 1964 in Siberia.[28] The first survey was taken in 1970, and eleven years later, the first attempt to recover the resource was made.[29] It was not until the 1990s, however, that methane hydrates finally became recognized as an energy resource that could potentially and feasibly be commercially developed.[30] The first offshore methane hydrate well was drilled in 1999.[31] It was only six years ago when Japan produced a methane hydrate well that could flow continuously, and it was only two years ago when they produced a well that could continuously flow for more than twenty-four hours.[32] Because methane hydrates are relatively new and unproven, there is uncertainty regarding its economic viability in the future.[33] The Japanese government has speculated that commercial exploration of offshore

22. *Id.*
23. *Id.*
24. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 26.
25. Jackson, *supra* note 20, at 613.
26. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 13.
27. Partain, *Avoiding Epimetheus*, *supra* note 12, at 16.
28. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 14.
29. *Id.*
30. *Id.*
31. Partain, *Avoiding Epimetheus*, *supra* note 12, at 16.
32. Tabuchi, *supra* note 4; Henriques, *supra* note 1.
33. Tabuchi, *supra* note 4.

methane hydrates may occur as early as 2023.[34] Others are less optimistic about the proposed timeline and believe the ability to develop the natural resource commercially will take much longer.[35] Despite claims that the government's estimations are overly ambitious, Japan may have more of an impetus to create the technology to commercially extract methane hydrates in an economically viable manner.[36] Countries like Japan and South Korea lack other forms of natural gas and typically incur extra costs connected with importing energy to their country; thus, these countries may have more incentive to begin to produce methane hydrates commercially.[37] Despite the fact that the United States has the ability to rely on other forms of energy, the excitement surrounding methane hydrates has not diminished.[38] The head of methane hydrate research for the United States Department of Energy has stated that production of methane from methane hydrates deposits has been feasible since 2005.[39] Dr. Carolyn Ruppel, despite her preface that she does not carry around a crystal ball, believes that a long-term extraction experiment, lasting months to a full year, could occur by 2025.[40] Many hope that these statements, in conjunction with one another, show that commercial feasibility is coming in the very near term.[41]

C. Future Potential Benefits of Offshore Methane Hydrate Extraction

1. Global Abundance of the Natural Resource

What makes methane hydrates so desirable as a putative alternative to other fossil fuels is its sheer abundance in the global context. Scientists originally speculated that the methane hydrate reserves would only be double the size of other fossil fuel reserves; however, others now have realized that this figure was a "very conservative understatement."[42] The most recent estimates have

34. Henriques, *supra* note 1.
35. *Id.*
36. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 14.
37. *Id.*
38. Partain, *Avoiding Epimetheus, supra* note 12, at 16.
39. *Id.*
40. Henriques, *supra* note 1.
41. Partain, *Avoiding Epimetheus, supra* note 12, at 16.
42. Tabuchi, *supra* note 4; PARTAIN, ENVIRONMENTAL HAZARDS FROM

varied considerably; however, one survey took a collection of the varied estimates and found that most estimates are currently assuming at least a hundred-fold, if not more, increase over conventional fossil fuels.[43] One survey speculated that there would be enough producible methane hydrate reserves to provide the entire globe with sufficient energy supplies for a millennium.[44]

Not only is there a large quantity of the resource where it exists, but it also appears to exist across the globe. Estimates state that there are currently seventy locations where methane hydrate reserves have been identified.[45] In essence, methane hydrate fields have been found across almost every coastline.[46] This should be juxtaposed with current oil and gas fields, which are limited both in quantity and location.[47] Because of the seeming surplus of methane hydrates across the globe, many countries will be able to become subsistence energy producers, providing both revenue and affordable energy to their economies.[48] While not all countries would have access to methane hydrates, the number of resource owners is drastically larger than those who currently own traditional fossil fuels.[49]

A complicated issue, and one that is beyond the ultimate scope of this Comment, is that the commercial development of offshore methane hydrates could create a further disparity of wealth between coastal states and those that are landlocked.[50] Countries with access to methane hydrate deposits will benefit from the profits, unlike those countries that do not have access to it.[51] Furthermore, impoverished countries that do have access to offshore methane hydrates; may be more willing to let private companies exploit the resource with limited legal restrictions in place.[52] The lack of legal restrictions would attract companies that are seeking to limit their liability, especially

OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 19.

43. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 19.

44. *Id.* at 21.

45. Jackson, *supra* note 20, at 614.

46. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 26.

47. *Id.*

48. *Id.* at 28.

49. *Id.* at 29.

50. *Id.* at 28.

51. *Id.*

52. *Id.*

considering the inherent dangers present with methane hydrate exploration and extraction.[53] The danger with this model is that it could create a proverbial "race to the bottom" between nations whose economies are in need of financial stability; therefore, companies would extract the methane hydrate resource without any structure in place to enforce liability.[54] The lack of governance over the exploration and extraction of methane hydrates could prove damaging to the country's marine life, and companies could avoid liability for any catastrophic damage caused from potential methane leakage or landslides.[55]

When discussing the putative economic benefits of offshore methane hydrates, it is important to consider what is stopping private companies from investing enough capital to ensure that commercial development becomes a reality. Some have speculated that the commercial development of methane hydrates would be a complete "game changer" in global energy markets, providing substantial benefits to national and global economies.[56] Others are more recalcitrant, believing that an incentive to develop technology to commercially produce methane hydrates will not become prevalent as long as shale gas continues to be a major player in the energy industry.[57] The main argument stemming from this line of thought is that producing shale is currently less expensive than producing methane from hydrates.[58] The cost of producing shale has decreased dramatically in recent years, and the possibility that the cost of methane hydrates also decreases is equally as plausible.[59] If that reduction in costs occurs, a "tidal wave" of energy production could flood the American markets, causing a shock in the markets larger than the previous surprise caused by shale gas.[60] Furthermore, while

53. *Id.*
54. *Id.*
55. *See infra* Part II.D.
56. Edward Dodge, *Methane Hydrates are a Promising Energy Resource*, BREAKING ENERGY (Feb. 10, 2015, 12:00 PM), https://breakingenergy.com/2015/02/10/methane-hydrates-are-a-promising-energy-resource/ [https://perma.cc/B7HH-6F9P].
57. Clare Foran, *Is Methane Hydrate the Energy Source of the Future?*, THE ATLANTIC (Dec. 24, 2013), https://www.theatlantic.com/politics/archive/2013/12/is-methane-hydrate-the-energy-source-of-the-future/444258/ [https://perma.cc/995A-SZ5N].
58. *Id.*
59. *Id.*
60. Foran, *supra* note 57; Dodge, *supra* note 56.

America is "awash with natural gas," other countries, like Japan, are forced to import most of their natural gas, and production of hydrates could contribute to the global economy from an import standpoint.[61]

Another benefit of the methane hydrate is the amount of water that could be produced and utilized from the resource. As previously stated, roughly 85% of a methane hydrate is water.[62] The water extracted from methane hydrates would be available for both consumer and agricultural uses.[63] The extracted water would take little treatment, if any at all, to become potable.[64] The potential for the water of a methane hydrate to become potable water could go a long way in alleviating the tension caused by the global drought and the predictions of water scarcity in the next twenty years. Some have treated the water portion of a methane hydrate as a disposal cost, or something that inhibits the extraction of the methane gas.[65] However, given that global drought may currently constitute a "slow-moving natural disaster," the water retrieved from methane hydrates may assist in a more immediate capacity, considering that there are current reserves for traditional fossil fuels.[66]

2. Offshore Methane Hydrates: A Greener Future?

The next logical question, then, is so what? Are we merely replacing the devil we know with the devil we do not? In the very least, methane hydrates would alleviate the tension caused by depleting conventional fossil fuels. At current levels of global consumption, traditional natural gas consumption forecasts enough reserves to last roughly fifty years.[67] Beyond that, however, methane hydrates may be

61. Nicola Jones, *The World Eyes Another Unconventional Source of Fossil Fuels*, YALE ENV'T 360 (Aug. 21, 2017), https://e360.yale.edu/features/the-world-eyes-yet-another-unconventional-source-of-fossil-fuels-methane-hydrates [https://perma.cc/B5UZ-YRF2].

62. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 51.

63. Partain, *Avoiding Epimetheus, supra* note 12, at 19.

64. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 51.

65. Partain, *Avoiding Epimetheus, supra* note 12, at 19.

66. Michon Scott & Rebecca Lindsey, *2017 State of the climate: Global* drought, CLIMATE.GOV (Aug. 1, 2018), https://www.climate.gov/news-features/featured-images/2017-state-climate-global-drought [https://perma.cc/S4AH-KA5X].

67. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 20.

a quasi-green energy source. Scientists familiar with the resource believe that methane hydrates would produce only one-third of the carbon amount that traditional fossil fuels produce.[68] Comparatively, a methane hydrate is a "sweet" natural gas that contains relatively few impurities.[69] Methane would not, therefore, produce significant pollution beyond the possible greenhouse gases, that can be dangerous to human health like coal.[70] In addition, unlike coal, methane does not produce ash and other carcinogenic materials.[71]

While significantly reducing the carbon footprint of producing energy is appetizing, it may not provide the long-term results necessary to sufficiently reduce carbon emissions. There is, however, a potential solution to carbon emission present in the extraction of offshore methane hydrates. The process is known as carbon capture and sequestration, and, in essence, is a process by which the methane component of the icy lattice structure is replaced with carbon dioxide, thereby converting the extraction process into a carbon neutral or carbon negative activity.[72] Other researchers have attempted to harness the carbon by-product from extraction to attempt to generate electricity.[73]

D. *Risks Inherent in Offshore Exploration and Extraction of Methane Hydrates*

There are numerous dangers that accompany the process of exploration and extraction of offshore methane hydrates. For many, assuming technological innovation allows for methane hydrates to become a pragmatic alternative energy source, the potential environmental benefits far outweigh the risks associated with the exploration and extraction of offshore methane hydrates.[74] Others, however, are more reticent to perform this type of cost-benefit analysis and believe methane hydrates, even left to their own devices, are inherently dangerous.[75] Methane, as a gas, currently accounts for

68. Henriques, *supra* note 1.
69. Partain, *Avoiding Epimetheus, supra* note 12, at 19.
70. *Id.*
71. *Id.*
72. *Id.*
73. *Id.*
74. *See* PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 51.
75. D'Angelo, *supra* note 9.

roughly 20% of all human-caused planetary warming.[76] Samantha Joye has referenced methane hydrates as a "ticking time bomb," and her fears stem from the notion that rising ocean temperatures will force methane hydrate structures to destabilize, causing a large release of methane into the atmosphere.[77] Other scientists believe these apocalyptic notions are a bit jejune in nature; Dr. Carolyn Ruppel has noted that over 95% of methane hydrates exist more than 1000 meters below sea level, making a release of methane gas into the atmosphere very difficult.[78] In fact, Dr. Ruppel believes that any methane that seeped from 1000 meters below sea level would dissolve before it reached the surface.[79]

Despite the conflicting understandings of the dangers of methane hydrates, it is evident that there are risks inherent and unique to the resource that would be exacerbated upon exploration and extraction that are not present with the production of other traditional natural gases.[80] Unlike traditional oil and gas, which is found deep under the secure, rocky seabed, methane hydrates are found on slopped mud beds that are at risk of slipping.[81] Due to the nature of methane reserves existing on slopped sea beds in the ocean, there are numerous ways in which the exploration and extraction process could present environmental hazards.[82] The two prevalent risks that stem from exploration and extraction of offshore methane hydrates are non-cataclysmic and cataclysmic events.[83]

A few prominent, non-cataclysmic hazards that have been identified are the release of methane into the ocean, impacting surrounding underwater fauna, and other disturbances on the seabed that can negatively impact fisheries and other underwater life.[84] These risks, already present from methane seepage, would only be exacerbated by disturbing the mud bed during the exploration and extraction process.[85] The methane released during the extraction

76. *Id.*
77. *Id.*
78. *Id.*
79. *Id.*
80. *See* PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 57.
81. *Id.*
82. *Id.*
83. *See id.* at 66.
84. *See id.*
85. *Id.* at 72.

process could present a problem of toxicity to marine life in surrounding habitats.[86] The release of methane could further present a problem if conditions were present for the gas to reach the ocean surface.[87] Methane that reaches the surface is called "swamp gas" and presents visible bubbling and burping at the water's surface.[88] In some instances, the methane reaching the surface has been so concentrated that it has killed livestock and humans.[89] Furthermore, some scientists have speculated that a massive disturbance forcing methane to the water's surface could disrupt the buoyancy of a boat and force that boat to sink.[90]

While non-cataclysmic events pose a constant threat due to the release or seepage of methane, a cataclysmic event brought on by extraction of methane hydrates could create large-scale damages to coastline communities.[91] As mentioned above, methane hydrate reserves located on slopped mud beds allows the reserve to be easily disturbed.[92] The exploration and extraction of methane hydrates could allow the mud bed structure to lose its integrity, forcing a large-scale mudslide in the ocean. The impact of a potential mudslide could result in either a large release of methane gas or an "earthquake-like impact such as a tsunami."[93] Extraction of this resource presents a problem because it disassociates the methane hydrate structure in one part of the deposit, which in turn creates more pressure in other parts of the deposit.[94] This level of instability, if it generates enough energy, can force large-scale natural disasters.[95] It should be noted here that not all deposits are created equally; methane hydrates found in shallow waters—depths of 400 meters and below—would generally lack the conditions to yield a landslide.[96] Furthermore, the deeper the mud layer over the deposit, the safer, as a general matter, the methane hydrate is from a cataclysmic event.[97] Thus, the key to alleviating the

86. *See id.* at 72–73.
87. *Id.* at 69.
88. *Id.*
89. *Id.* at 70.
90. *Id.*
91. *See generally id.* at 76.
92. *See id.*
93. *Id.*
94. *Id.* at 78.
95. *Id.*
96. *Id.* at 79.
97. *Id.*

potential dangers that exist with the extraction of methane hydrates is to determine the safest deposits available for extraction.[98]

It is evident, given the risks enumerated above, that the exploration and extraction of offshore methane hydrates presents issues that are vastly different than the current risks inherent in exploration and extraction of traditional oil and gas and the legal and regulatory frameworks that guide them. In addition, scientists have stated that a large, contributing factor to the widescale damages caused by the Deepwater Horizon Spill in 2010 can be attributed to the "corruption of the containment dome" by methane hydrates.[99] While oil spills can produce damage to individuals and the marine environment, that damage does not compare to the damages contemplated by offshore methane hydrate accidents. Thus, it is imperative to outline the current structure for regulating oil accidents, focusing particularly on liability and compensation, and determine whether a new regulatory scheme should be put in place to account for the large-scale damage that may ensue if an accident were to occur.

III. ASSESSING LIABILITY FOR DRILLING ACCIDENTS IN THE UNITED STATES

Typically, liability and risk of offshore exploration and extraction are discussed in three separate categories.[100] The first category contains the preventative measures that are in place to attempt to eradicate or alleviate the potential for a spill.[101] These measures typically come in the form of regulatory schemes both publicly by states, countries, and international bodies as well as those that are self-imposed by the oil and gas companies.[102] From there, the second category tends to be the reactionary measures in place once a spill occurs. In essence, the question here is whether a government or private company has plans in place to effectively clean up a spill once

98. *Id.* at 87.

99. Zack Colman, *Should the World Tap Undersea Methane Hydrates for Energy?*, SCI. AM. (Aug. 1, 2017), https://www.scientificamerican.com/article/should-the-world-tap-undersea-methane-hydrates-for-energy/ [https://perma.cc/8SP6-EWMU].

100. *See generally* MANAGING THE RISK OF OFFSHORE OIL AND GAS ACCIDENTS (Günther Handl & Kristoffer Svendsen eds., 2019).

101. *Id.*

102. *Id.*

it occurs.[103] Finally, the third category discusses how victims affected by the spill will impose liability.[104] The last category focuses mostly on assessing damages and ensuring the culpable parties adequately compensate the victims.[105]

While this Comment focuses primarily on the liability aspect of managing the risks of offshore methane hydrates, it is imperative to note that all three categories are necessary for effective regulation of methane hydrates. While a prevention strategy governing methane hydrates is important and necessary for the efficient, safe extraction of the resource, a strong liability regime is more favorable based on the inherent nature of methane hydrates. Often, accidents occurring are not a matter of if, but when. Despite the regulatory body's best attempts to allay destruction, an accident may be inevitable. For this reason, there should be more of an impetus on a liability regime, which is the focus of this Comment. The Author notes, however, that the best approach is ultimately for both categories to be present. Furthermore, robust activity in all three categories, or rather a "belt and suspenders" approach, can provide a complimentary regime that could both enable private companies to explore and extract methane hydrates, thus providing a global benefit by making this resource available, and ensure that anyone affected from a potential spill will be sufficiently compensated for any loss or damage that occurs.[106]

In the United States, there are two distinct avenues to pursue a claim due to an oil spill or other offshore drilling accident. The first avenue is through tort liability, and the second is through the Oil Pollution Act of 1990.[107] Tort law in this area is a well settled principle pursuant to the precedent established in the early 20th century, which has since been affirmed by courts in the wake of the Deepwater Horizon disaster.[108]

103. *Id.*
104. *Id.*
105. *Id.*
106. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 141.
107. Mark Latham, Victor E. Schwartz, & Christopher E. Appel, *The Intersection of Tort and Environmental Law: Where the Twains Should Meet and Depart*, 80 FORDHAM L. REV. 737, 757 (2011).
108. *Id.* at 749.

A. *Robins Dry Dock and its Heirs*

The seminal case in determining liability in maritime negligence claims is *Robins Dry Dock & Repair Co. v. Flint*.[109] The case was a libel action filed by time charters of a steamship against the dry dock to recover for the use of the steamer due to the defendant's negligence in injuring the steamships propeller.[110] In a contract between the two parties, the steamship would be docked every six months, at which point the defendant negligently injured the propeller, resulting in the need for a replacement.[111] The court ultimately determined the damage came from the delay caused by having to make repairs on the propeller, and that would be "a wrong to no one except for the [defendant's] contract with the vessel owners."[112] The court continued to say that, as a general rule, "a tort to the person or property of one man does not make the tortfeasor liable to another merely because the injured person was under a contract with that other unknown to the doer of wrong."[113] The court also stated that justice does not permit the defendant to be charged with the loss unless there is someone who has a claim in either contract or tort."[114] "Most courts have concluded *Robins Dry Dock* has become the pillar for establishing a bright-line rule for damages recoverable under the general maritime law for unintentional maritime torts."[115] In essence, most courts have come to believe that *Robins Dry Dock* stands for the proposition that parties are barred from recovering any economic loss without an accompanying property loss.[116]

A prime example of this bright-line rule can be seen in *In Re Deepwater Horizon*, a case occurring in the wake of the Deepwater Horizon Oil Spill.[117] In a parenthetical, the Fifth Circuit noted, "This circuit and others have interpreted *Robins Dry Dock* to mean that there can be no recovery for economic losses caused by an unintentional maritime tort absent physical damage to property in which the victim

109. Robins Dry Dock & Repair Co. v. Flint, 275 U.S. 303 (1927).
110. Sye J. Broussard, *The Oil Pollution Act of 1990: An Oil Slick Over Robins Dry Dock*, 8 LOY. L.J. 153, 155 (2010).
111. *Id.*
112. *Id.*
113. *Id.*
114. *Id.*
115. *Id.*
116. *Id.*
117. *In re* Deepwater Horizon, 784 F.3d 1019 (5th Cir. 2015).

has a proprietary interest."[118] The Fifth Circuit affirmed the district court's holding that the three Mexican States who filed complaints alleging damages as a result of the oil spill did not hold a sufficient proprietary interest in the allegedly damaged property, and therefore were barred from recovery.[119] This holding presents multiple issues: the first being that foreign countries may be barred from recovery based on a lack of uniformity in the laws. The second, and perhaps more problematic, is that at one point after the Macondo Well incident, over 99% of claims filed with the Trust Administrator in the BP spill were for lost earnings, whereas only 1% related to property damages caused by the spill.[120] In the realm of torts, it appears that these claimants would be without any judicial reprieve. Enter the Oil Pollution Act of 1990.

B. *The Oil Pollution Act of 1990*

The Oil Pollution Act of 1990 (the "Act") was a direct response to the Exxon-Valdez Spill that occurred in 1989.[121] The Act was intended to provide quick cleanup of spills and allow compensation of victims of such spills.[122] In addition, the Act clarified which damages were compensable and softened the causation standard.[123] Perhaps the main departure from the traditional tort method of recovering losses in this arena was that the Act allowed victims who experienced pure economic loss due to an oil spill to bring a cause of action regardless of proprietary ownership.[124] Furthermore, the Act imposes strict liability on parties responsible for the discharge of oil on navigable waters.[125] The imposition of strict liability implies a duty is inherent to the nature of the work.[126] Now, plaintiffs will not need to prove that an activity occurred negligently, rather they will merely need to prove

118. *Id.* at 1024.
119. *Id.* at 1030.
120. MANAGING THE RISK OF OFFSHORE OIL AND GAS ACCIDENTS, *supra* note 100, at 288–89.
121. *Id.*
122. Broussard, *supra* note 110, at 155.
123. MANAGING THE RISK OF OFFSHORE OIL AND GAS ACCIDENTS, *supra* note 100, at 288–89.
124. *Id.*
125. 33 U.S.C. § 2702(a) (2018).
126. MANAGING THE RISK OF OFFSHORE OIL AND GAS ACCIDENTS, *supra* note 100, at 289.

the activity occurred.[127] While the Act facially appears to provide an avenue for more victims to bring suit for any perceived tortfeasors, it is unclear whether victims have in fact filed more claims because of the Act.[128] The Act appeared to relax the causation standard. However, by using the phrase "due to" and omitting any language requiring a proximate cause, the Act creates uncertainty regarding its ultimate intent.[129]

First, it can be demonstrated that factual causation is required to bring a claim under the statute.[130] "In other words, it must be proved that the claimant sustained pure economic loss, such as lost profits, and/or impairment from earning capacity 'due to' natural resource damage, which 'resulted from' an oil spill in navigable waters."[131] The seemingly simple standard may in fact be difficult to prove and costly to litigants; to establish a factual connection, one may need a forensic accounting of events as well as "in-depth[,] local[,] economic knowledge before and after the spill."[132] The issue of proximate cause, however, is less certain. The statute providing the liability standard does not explicitly determine the causation standard, and no court has specifically determined the intent of the statute on this matter.[133] One judge opined that the causation standard "may lie somewhere between traditional 'proximate cause' and simple 'but for' causation."[134] Other authors have argued that the statute only articulates a "but for" test of causation, but this test is further limited by both the scope and purpose of the statute and the explicit monetary limit on damages imposed by Congress.[135] The scope and purpose argument diminishes the question of proximate cause and eliminates the need for a foreseeability inquiry, which would prevent further ambiguity in the statute.[136] Further, the absence of a proximate cause standard within the statute, when the standard is present in other federal statutes imposing liability, is also telling.[137] The proximate cause language appears one

127. *Id.*
128. *Id.* at 301.
129. *Id.* at 288–289.
130. *Id.* at 290.
131. *Id.* at 291.
132. *Id.*
133. *Id.* at 294.
134. *Id.* at 288–289.
135. *Id.* at 299–300.
136. *Id.* at 300.
137. Allan Kanner, *More than Seals and Sea Otters: OPA Causation and*

time in an exception provision dealing with the removal of the liability cap.[138] The lack of explicit proximate cause language demonstrates Congress's intent to leave that standard out of the analysis for liability under the Act.[139]

Second, and perhaps more important, Congress provided an explicit limit on cause-in-fact liability by instituting monetary caps on recovery.[140] The monetary cap ensures that recoveries do not exceed the explicit dollar limit.[141] In particular, the cap is based on different categories that each tanker or drilling rig would fall into.[142] For instance, an oil tanker that is 100,000 tons would be liable for up to $120 million.[143] The monetary caps represent two policies that are inextricably and inherently at odds with one another.[144] On one hand, a monetary cap allows different companies to enter the market with the knowledge and certitude of their putative liability from a spill. On the other hand, the monetary cap would effectively reduce the recovery amount awarded to a class of plaintiffs affected by the spill.[145]

In these instances, where civil liability rules appear to be short-sided, the presence of regulatory rules is imperative to ensure that drilling companies are compliant with safety and environmental standards.[146] An effective regulatory scheme helps to alleviate the tension caused by the issues implicit in the monetary cap regime of the Act.[147] The liability structure in the United States appears to work in most cases, except with regard to victims who suffer a pure economic loss. The ultimate issue is that any accident stemming from the extraction of methane hydrates could potentially wreak havoc to the extent that the monetary cap would prevent numerous victims from being compensated for their loss. Clearly, a monetary cap on liability would not be the best regime for the extraction of offshore methane

Moratorium Damages, 28 DUKE ENVTL. L. & POL'Y F. 31, 43–44 (2017).

138. HANDL & SVENDSEN, *supra* note 100, at 300–01.
139. *Id.* at 301.
140. *Id.*
141. *Id.*
142. *Id.* at 301. n. 67.
143. *Id.*
144. *Id.* at 301.
145. *Id.*
146. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 133–34.
147. *Id.* at 134.

hydrates as it would leave many victims without a forum for their cause of action.

IV. INTERNATIONAL LAWS GOVERNING DRILLING ACCIDENTS

Given the complexity and uncertainty around liability in the United States for offshore oil spills, one must consider whether there are any international conventions or treaties that provide and enforce liability to offshore accidents. Many oil spills, by their ability to reach waters beyond specific territorial boundaries, "become international events."[148] A robust and unified international scheme could provide and enforce liability to offshore accidents in ways that individual country regimes could not. A review of the current international laws will further demonstrate that a stronger international convention is needed, especially in dealing with offshore methane hydrates. Experts have articulated that there are currently "large gaps in what the international agreements cover."[149] In the wake of the BP spill, many have reflected that a spill infiltrating international waters would further reveal the large holes in the international regulations.[150] Due to the erratic and perhaps dangerous nature of methane hydrates, it is imperative to have a cogent and unified regulatory system in place to ensure recompense for any issues that may arise.

A. *United Nations Convention for the Law of the Sea*

The most prominent reform in property rights over international waters came from the Third United Nations Conference on the Law of the Sea in 1982, which created the United Nations Convention on the Law of the Sea ("UNCLOS").[151] UNCLOS divided the sea into distinct territorial zones, each subject to different legal status.[152] Most importantly for the extraction of methane hydrates,

148. Katie Galbraith, *Gap Rules on Oil Spills from Wells*, N.Y. TIMES (May 16, 2010), https://www.nytimes.com/2010/05/17/business/energy-environment/17green.html [https://perma.cc/26FN-VY9P].

149. *Id.*

150. Yee Huang, *International Law Implications of the BP Oil Spill*, CENTER FOR PROGRESSIVE REFORM (June 8, 2010), http://progressivereform.org/CPRBlog.cfm?idBlog=FBF393AA-EE0A-FF0C-695B9BA163B50BDB [https://perma.cc/D4WU-DSF7].

151. United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397.

152. *Id.*

UNCLOS established that the first 200 nautical miles off the coast would be the Exclusive Economic Zone of each state, unless other states' boundaries conflict with that measurement. For purposes of determining liability for offshore methane hydrate accidents, UNCLOS's important effect relates to the duties and standards to protect the marine environment set forth by the international agreement.[153] Currently, over 168 nations have ratified the treaty; however, the United States is not one of them.[154] The United States, despite not ratifying the treaty, has signed the document and has agreed to follow the principles of UNCLOS because they crystalize customary international law.[155] When proposing the convention to the different nation states, Ronald Reagan announced that the United States will recognize the rights of other states in the waters off their coasts pursuant to both the convention and customary maritime law.[156] Customary international law is widely recognized as a binding source of international law, when two elements are met.[157] The first element is state practice, which can be defined as any act or statement by a state.[158] The second element, *Opinio Juris*, requires a belief that the act is legally necessary or that the nation conducts themselves out of a sense of legal obligation.[159] In essence, the United States is bound by customary international law principles codified in UNCLOS; therefore, the international convention has bearing on a conversation regarding offshore resources in transboundary areas.

Part XII of UNCLOS and, more specifically, Article 192 provide an obligation to protect and preserve the marine environment.[160] Furthermore, countries that are a part of UNCLOS are required to "ensure that activities under their jurisdiction or control are conducted so as not to cause damage by pollution to other [countries] and their environment."[161] UNCLOS requires the development of regulatory systems prior to the commercial development of methane

153. Grant Wilson, *Deepwater Horizon and the Law of the Sea: Was the Cure Worse than the Disease?*, 41 B.C. ENVTL. AFF. L. REV. 63, 84-85 (2014).
154. *Id.*
155. *Id.*
156. LORI F. DAMROSCH, LOUIS HENKIN, SEAN D. MURPHY & HANS SUIT, INTERNATIONAL LAW CASES AND MATERIALS 1374 (5th ed. 2009).
157. Wilson, *supra* note 153, at 85.
158. *Id.*
159. *Id.* at 87.
160. *Id.* at 84.
161. Huang, *supra* note 150.

hydrates.[162] "Rules, regulations[,] and procedures shall be drawn up in order to secure effective protection of the marine environment from harmful effects directly resulting from activities in the 'Area' if undertaken with regards to the exploitation of minerals, such as methane hydrates."[163] The "Area" is a reference to the area outside of the exclusive, economic zone that belongs to everyone and should be mined for the benefit of mankind.[164] Finally, if an operator causes harm because of an offshore accident, they will be liable for the actual amount of damage.[165] According to Professor Roy Partain, "UNCLOS has sufficient ambit to regulate the development of the methane hydrates. [T]here would need to be a new set of regulations and rules to establish proper safety practices and methods of handling environmental damages. Such rules and regulations currently do not exist."[166]

B. *The International Seabed Authority*

The International Seabed Authority ("ISA") is an authority established by UNCLOS to regulate mineral extraction from international waters.[167] In particular, the ISA is in the process of promulgating the Mining Code, which is intended to cover all environmental, financial, reporting, and regulatory obligations incurred by "seabed mining operations."[168] The ISA originally anticipated that the Mining Code would be published in 2020; however, the timetable has been pushed back as it has taken more time to develop exploitation regulations.[169] Currently, the ISA is inviting delegates to send written comments on draft exploitation regulations

162. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 194.
163. *Id.*
164. *A Glance at the Mining Code*, DSM OBSERVER, https://dsmobserver.com/2017/07/glance-mining-code/ [https://perma.cc/ZX7Q-NW2H].
165. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 194.
166. *Id.*
167. *A Glance at the Mining Code*, *supra* note 164.
168. *Id.*
169. *International Seabed Authority Under Pressure Over Deep-sea Mining Impacts*, WORLD OCEAN INITIATIVE (Aug. 16, 2019), https://www.woi.economist.com/international-seabed-authority-under-pressure-over-deep-sea-mining-impacts/ [https://perma.cc/389S-3CJW].

for their meeting in February of 2020.[170] In that same invitation, the ISA called for proposals to study an environmental compensation fund in the context of minerals in the "Area."[171] The proposal recognizes that in the current system, a company or operator will only be liable to the extent that the damage occurring arises out of a wrongful act.[172] The proposal is an attempt to establish a trust fund that would compensate victims when a state is not considered liable.[173] It is also clear that the ISA is aware and has contemplated the extraction of offshore methane hydrates; in assembly notes from 2008, the ISA mentioned the innovations put forth by Japan in experimenting with the resource.[174] The question then is whether a compensation fund will be able to compensate victims from offshore methane hydrate exploitation accidents. Given the amount of damage that is possible, it is unclear whether a compensation fund could cover the extensive claims brought by the innumerable putative victims, especially when a state actor is not liable.

C. *International Maritime Organization and the Civil Liability Convention*

Adopted in 1948 at an international conference in Geneva, Switzerland, the International Maritime Organization ("IMO") was formally established to improve the safety of the sea by developing international regulations.[175] The IMO has produced many conventions regarding the safety of the sea; however, one main convention promulgated by the IMO, the Civil Liability Convention ("CLC"), may provide some insight into the international regulation of offshore

170. *Id.*

171. Int'l Seabed Auth. [ISA], *Call for Proposals for a Study on an Environmental Compensation Fund in the Context of Exploitation of Minerals in the Area*, ¶ 4, at 1 (Feb. 5, 2020), https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/files/documents/ecf.pdf [https://perma.cc/7KDJ-QU5J].

172. *Id.* ¶ 3, at 2.

173. *Id.*

174. Int'l Seabed Auth. [ISA], *Report of the Secretary-General of the International Seabed Authority Under Article 166, Paragraph 4, of the United Nations Convention on the Law of the Sea*. ¶ 101, (June 6, 2008), https://ran-s3.s3.amazonaws.com/isa.org.jm/s3fs-public/documents/EN/14Sess/Ass/ISBA-14A-2.pdf [https://perma.cc/CW8A-CRWR].

175. *Brief History of IMO*, INTERNATIONAL MARITIME ORGANIZATION (Aug. 28, 2020), http://www.imo.org/en/About/HistoryOfIMO/Pages/Default.aspx [https://perma.cc/5PM8-SWDK].

methane hydrates. It should be noted that, currently, the CLC would not apply to offshore methane hydrates;[176] however, the convention may provide an understanding to how regulations for offshore methane hydrates may be successful. Notably, the CLC provides strict liability in the sense that reasonable care cannot shield the owner from liability and eventual repayment of damages.[177] Furthermore, the CLC typically puts liability squarely on the owner, with some exceptions.[178] Facially, the CLC allows for pure economic loss; however, it is often curtailed by a "scope and purpose" inquiry that inhibits full recovery from loss.[179] Under the CLC, salmon farmers, fishers, divers maintaining salmon cages, ice producers supplying salmon farmers, and box manufacturers have been able to bring claims against oil and gas companies.[180] Ironically enough, employees at fishing plants were unable to bring claims of lost wages because their hours were reduced due to accidents that damaged the fish market.[181] This contradiction demonstrates that some pure economic loss claims are honored, whereas others are deemed too attenuated to receive compensation. In this regard, it appears that the CLC is narrower than the OPA in the sense that it does not allow secondary or relational claims to be brought.[182]

With relative uncertainty with the CLC and a lack of a substantive framework within UNCLOS regarding liability of offshore accidents, it is no wonder that many have advocated for a uniform, international regime instituting liability for offshore accidents.[183] Though many private companies do their best to create their own regulatory policies, an international, public, regulatory scheme "will become necessary in the future."[184] In addition, unilateral regimes like the one in the United States may not provide

176. *See generally* PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 219.
177. *Id.* at 220.
178. *Id.*
179. MANAGING THE RISK OF OFFSHORE OIL AND GAS ACCIDENTS, *supra* note 100, at 303.
180. *Id.* (See note 74 where the Author discusses the secondary economic claims that have been barred by varying courts).
181. *Id.*
182. *Id.*
183. Ekaterina Anyanova, *Oil Pollution and International Marine Environmental Law, in* SUSTAINABLE DEVELOPMENT: AUTHORITATIVE AND LEADING EDGE CONTENT FOR ENVIRONMENTAL MANAGEMENT (Sime Curkovic ed., 2011) (ebook).
184. *Id.*

the most efficient means of enforcing liability and may even be "damaging to the international economy."[185] In the very least, it is profoundly evident that a uniform, international scheme is necessary when methane hydrate exploration and extraction becomes commercially viable.

V. PROPOSED REGULATORY ENACTMENTS

It is evident that the novel nature of offshore methane hydrates presents risks that are not currently contemplated by the regimes in place regulating offshore oil and gas exploration and extraction. "The risks of cataclysmic accidents are unique to the specific operations of offshore methane hydrate fields…"[186] It is therefore imperative to implement a uniform scheme that can handle the risks inherent in offshore methane hydrates.

First, the principles of strict liability should govern the regulatory scheme, rather than the principles of negligence or the modified strict liability seen in the United States. There are dueling policies when discussing the two different regimes. First, a negligence standard provides a safe harbor for energy players who are determining the risks before entering the market. Given the dangerous nature of offshore methane hydrates, different companies may be reluctant to waste money researching a way to commercially develop the resource that provides too much liability to the activity. Given the unique potential for danger, a negligence standard would prevent victims from having a forum as long as the energy actors are acting reasonably during the exploration and extraction. Ultimately, given the dangers associated with offshore methane hydrate exploration and extraction and the potential for unfathomable damage stemming from putative accidents, a strict liability standard without monetary caps or other causation standards is preferable because it ensures that victims will be able to secure judgments for damages that occur.

Second, given the ubiquitous nature of the offshore methane hydrates across the globe, the ideal solution is to implement the strict liability standard through an international convention. The difficulty in countries unilaterally determining laws is that the accidents caused

185. *Id.*
186. PARTAIN, ENVIRONMENTAL HAZARDS FROM OFFSHORE METHANE HYDRATE OPERATIONS, *supra* note 13, at 156.

by offshore methane hydrates have the capability of moving beyond territorial waters, thus becoming an international issue. Implementing a strict liability standard to govern offshore methane hydrates provides uniformity and reliability in the sense that other nation states will not be without a forum if an international accident does occur.

VI. CONCLUSION

It has been the earnest attempt of the Author to apprise the reader of the energy resource known as methane hydrates and their global abundance. In addition, their chemical composition presents an opportunity to the global energy market that could theoretically replace other types of oil and gas as the march for renewable energy presses onward. With these exciting opportunities, however, there are real and present dangers that are inexorably intertwined with the commercial development of offshore methane hydrates. These complex hazards, in conjunction with the lack of certitude regarding how liability will be assessed when an accident occurs, have been a major barrier to energy in the offshore methane hydrate market. This Comment presented regulatory and liability rules governing offshore oil and gas accidents in the United States and how liability is assessed in international regimes in hopes of determining whether major changes are necessary to incorporate methane hydrates. Currently, the hybrid form of strict liability in the United States does not allot for pure economic loss and is limited by monetary caps and causation standards. Furthermore, while UNCLOS may have the teeth to enforce international liability, there are no specific regulations that allow it to do so, and the Mining Code promulgated by the ISA is not currently in force and may not encompass the issues presented by offshore methane hydrates. It is evident that, given the dangerous nature of offshore methane hydrate exploration and extraction, a strict liability standard should be adopted internationally and enforced through UNCLOS and the ISA to ensure uniformity of the rules and provide an avenue for victims to bring claims against the private companies.