OFFSHORE OIL AND GAS DECOMMISSIONING BEST PRACTICES

McInnes Cooper
Energy and Natural Resources

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EXECUTIVE SUMMARY

The escalating importance of the offshore oil and gas sector is undeniable. Between 1947 and today, approximately 6,500 offshore oil and gas installations (excluding mobile units and subsea structures) have been commissioned worldwide. But what is commissioned must be decommissioned. Industry immaturity means the decommissioning experience across the globe is uneven. Although completed operations and governing regulations offer some guidance in navigating the decommissioning process, it remains a relatively new regulatory and policy frontier. A map to best navigate this frontier and its costellation of governing international, national and regional regulations will be increasingly important as more offshore installations near the end of their economic lives.

The goal of this guidebook is to provide that map for the Canadian offshore areas. Formulating an effective decommissioning plan requires looking both at applicable regulations and beyond them. Drawing from the experiences of completed offshore decommissioning operations internationally and in Canada, this guidebook seeks to identify the best practices offshore operators must follow to enhance marine safety, environmental sustainability, public consultation and cost outcomes.

This guidebook captures the best practices distilled from: a review of the technical background of offshore decommissioning; the issues that attend the decommissioning process; and a survey of the international, regional and national regulations governing offshore oil and gas decommissioning with a focus on those applicable in Canada. Ultimately, it seeks to provide overarching guidance to companies or consultants as they navigate the decommissioning process.

Chapter 1 reviews the historical development of the offshore oil and gas industry and the regulatory framework that governs decommissioning operations. The chapter charts the industry's growth, identifying the disparity in decommissioning experience globally and the evolution of the regulatory framework in response to that growth. In particular, the chapter considers two key rationales for operators to look beyond mere legal compliance during the decommissioning process: the effect of the *Brent Spar* incident's challenge to the fledgling regulatory framework and the historical limitations of maritime safety and environmental protection regulations to address the inherent risks of the offshore sector.

Chapter 2 introduces the decommissioning of offshore oil and gas installations to contextualize the legal analysis of the regulatory framework governing decommissioning activities. The chapter: describes the structural configuration of offshore installations, their substructures and systems; compares decommissioning methods; surveys the decommissioning process; and explores the issues flowing from decommissioning operations by considering the health and safety, environmental, socio-economic and political impacts that attend the choice of one decommissioning method rather than another.

Chapter 3 describes the international regulatory framework governing decommissioning activities and the regional regulatory framework governing decommissioning in the North Sea,

one of the world's most developed offshore oil and gas producing regions. Sources of international regulations covered include: the 1958 *Geneva Convention on the Continental Shelf*; the 1982 *United Nations Convention on the Law of the Sea*; the 1972 *Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter*; and the *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter* that amended a number of international guidelines, including the 1989 International Maritime Organization *Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone* and the United Nations Environment Program *Guidelines for the Placement of Artificial Reefs*. The chapter next considers the OSPAR Convention and associated OSPAR Commission Decisions that, in the wake of the *Brent Spar* controversy, established a set of more restrictive regulations relative to international standards and arguably articulate current international decommissioning best practices.

Chapter 4 considers the Canadian regulatory framework governing offshore decommissioning operations, primarily with reference to East Coast Accord Act legislation, associated regulations and the practices of the respective Offshore Petroleum Boards responsible for managing Canada's offshore areas. The chapter introduces Canada's offshore oil and gas sector, then considers the specific regulatory requirements that operators must meet to obtain approval to carry out decommissioning operations in Canada's offshore. The chapter draws from the 2004 decommissioning of the Cohasset Project installation to illustrate and anticipate the issues encountered in attempts to obtain regulatory approval.

Chapter 5 sets out the decommissioning best practices in 2016, with reference to international and Canadian regulations governing offshore decommissioning and the experiences of international and Canadian operators navigating the regulatory approvals process.

ABOUT THIS BOOK

Our goal is to create a practical and current guide to help you navigate offshore decommissioning and abandonment issues.

We hope you find this best practices guidebook useful. We are proud of it and therefore a little embarrassed to remind you not to act or rely on any of its contents. It is only a guide to point out the kinds of issues you may encounter in offshore decommissioning and how generally you may address them, and not legal advice. If you would like specific advice on which you may confidently act and rely, please contact any of the authors or any of our Energy and Natural Resources lawyers at client.service@mcinnescooper.com or 1.855.622.6668; that is largely (and perhaps not surprisingly) why we put this guidebook together.

We will also appreciate your insights into what you find helpful, what we can improve upon and what you have learned from your experiences dealing with decommissioning and abandonment issues. To share your insights, please contact any of the authors or any of our Energy and Natural Resources lawyers by emailing us at client.service@mcinnescooper.com or calling us at 1.855.622.6668.

Van Penick
Contributor and Editor

ABOUT THE AUTHORS

The energy and natural resources sector is a mainstay of McInnes Cooper's practice. We understand the oil and gas industry and have been active in its development in areas across Canada and internationally, particularly offshore projects, western Newfoundland and Labrador and the Arctic. Our firm has been involved in virtually every oil and gas project in Atlantic Canada to date. Our lawyers have an unmatched breadth of experience with oil and gas issues in Atlantic Canada. They understand our clients' businesses and take a multidisciplinary approach, developing practical solutions to address their needs. We act for operators, interest owners, major contractors and suppliers participating in the oil and gas, offshore and onshore projects in Atlantic Canada, covering issues from rights acquisition and enforcement, through commercial agreements, into development projects, on to production, and finally, decommissioning offshore infrastructure.

The following McInnes Cooper Energy and Natural Resources lawyers, in particular, contributed thoughtful input and expertise to this guidebook:

Sara Mahaney Drawing on her civil litigation experience, Sara focuses on the regulatory aspects of the energy and natural resources industry, including the offshore oil and gas, maritime law and environmental law sectors.

Van Penick Van conceived this guidebook and was the motivating force behind its creation and publication. With 38 years of experience, Van specializes in offshore oil and gas law and debt finance.

Michael Simms Mike leads McInnes Cooper's Energy and Natural Resources lawyers and has extensive commercial and regulatory experience in energy, natural resources and environmental matters with a particular focus on offshore and onshore oil and gas.

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McInnes Cooper acknowledges and extends special thanks for the significant contributions of:

Peter L'Esperance At the time of publication, Peter is scheduled to article with McInnes Cooper after completing law school at Dalhousie University in Spring 2016. Peter has already amassed an impressive range of practical and academic achievements in energy and natural resources law.

CHAPTER 1

A BRIEF HISTORY OF THE OFFSHORE OIL AND GAS INDUSTRY AND DECOMMISSIONING

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A BRIEF HISTORY OF THE OFFSHORE OIL AND GAS INDUSTRY AND DECOMMISSIONING

In October 1947, a floating rig drilled the first commercial offshore oil well in 14 feet of water off Southeastern Louisiana in the Gulf of Mexico.[1] In 2015, offshore production accounts for 37% of global oil production and 28% of global gas production. And this proportion could increase as geophysical exploration techniques and deepwater drilling technology permit offshore oil and gas extraction from newly discovered prospects for high-yielding deepwater fields.[2]

Engineering advances have facilitated the offshore oil and gas industry's growth and ability to satisfy demand for petroleum products. These advances have enabled hydrocarbon exploration, extraction, processing and production further from shore, in deeper waters, in increasingly hostile environments, and in growing volumes.

As the technological sophistication, scale and capacities of offshore installations have evolved, so too have the challenges associated with decommissioning them. Today, approximately 6,500 offshore oil and gas installations (excluding mobile units and subsea structures) exist worldwide – all of which will eventually be decommissioned. But the decommissioning experience across the globe is uneven. In certain regions, such as the United States' Gulf of Mexico, the decommissioning process is mature with nearly 45% of offshore installations fully decommissioned.[3] In others, decommissioning is just now emerging: in the North Sea, only 12% of offshore installations are fully decommissioned; in Asia and the southwest Pacific, less than 10% of offshore installations are reaching the end of their useful lives.[4] Offshore Canada, only one project has been decommissioned: the Cohasset Oil Project. This uneven experience means that while completed operations and governing regulations offer lessons in navigating the decommissioning process, this last phase of project infrastructure management remains a new regulatory frontier. As more offshore installations reach the end of their economic lives, a clear map to best navigate this frontier will be increasingly important.

[1] Offshore Technology Magazine, "History of the Offshore Industry", online: <http://www.offshore-mag.com/index/about-us/history-of-offshore.html>.

[2] World Ocean Review, "World Ocean Review 3: Oil and Gas from the Sea" (Hamburg, Germany: maribus gBmbH, 2014) at 17.

[3] Callum Falconer, "Preface" in Marc Hammerson, ed, *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013) at 5.

[4] Decom North Sea, "Decommissioning in the North Sea" (October 2014) at 11; Callum Falconer, "Preface" in Marc Hammerson, ed, *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013) at 5.

The Regulatory Framework Governing Decommissioning Operations

An international regulatory framework, beginning with the 1958 *Geneva Convention on the Continental Shelf*, has evolved to respond to this challenge: how to remove or dispose of offshore installations at the end of their economic lifecycle without adversely impacting marine safety, the environment, fisheries, shipping, other marine uses and the interests of neighbouring states. Against this international backdrop, regional regulations, such as *The Convention for the Protection of the Environment of the North-East Atlantic*, were developed to address regional decommissioning concerns. Finally, coastal states with active offshore oil and gas industries have developed national regulations governing decommissioning to reflect localized concerns and preferences.

Challenging the International Regulatory Framework: The *Brent Spar* Incident

History demonstrates that regulatory compliance alone does not guarantee the success of proposed decommissioning options. The most dramatic example is the controversy that followed Shell's proposed deepwater disposal of the *Brent Spar*, a large oil storage facility, in 1995 – controversy that would lead to significant amendments to the regulatory framework governing decommissioning in the North Sea.

In June 1976, the *Brent Spar* was anchored on the UK's continental shelf for oil storage and tanker loading. When a newly installed subsea pipeline rendered the facility redundant in 1991, Shell commissioned several independent decommissioning studies. After three years of consultations, Shell endorsed deepwater disposal in the remote North Atlantic as the preferred decommissioning method. Shell's decision was motivated by this method's superior performance in the areas of safety, environmental impact and cost relative to decommissioning by means of onshore dismantling. In December 1994, Shell submitted its decommissioning proposal to the UK government. At the time, international, regional and UK regulations permitted the decommissioning of disused offshore installations by means of subsea abandonment under limited circumstances. But despite the proposal's compliance with existing regulations, the February 1995 announcement of the UK government's approval of Shell's deep water disposal proposal triggered an immediate, dramatic, and at times violent, public backlash.

On June 11, 1995, Shell began towing the *Brent Spar* to the chosen remote Atlantic disposal site – but never got there. Greenpeace activists illegally occupied the facility, intensifying the already prolonged media campaign. Protestors boycotted, vandalized and shot at Shell service stations in Germany. Germany's Chancellor and other heads of state argued against the UK government's approval of Shell's proposed deep water disposal at the G7 summit in Halifax, Nova Scotia in June 1995.[5]

[5] Shell International Limited, "Brent Spar Dossier" (2008).

Shell eventually abandoned the decommissioning operation due to widespread public and diplomatic opposition. It re-initiated the consultation process to identify viable alternatives for decommissioning the *Brent Spar*, engaging governments, consultants and scientists and soliciting public input. Ten years and £60 million later, Shell cut up the *Brent Spar*. Large parts of it were used in building the foundation of a ferry terminal in the Norwegian harbour of Stavanger.

The exceptional events surrounding the decommissioning of the *Brent Spar* illustrate the politically volatile character of offshore oil and gas operations, and underline the importance of looking beyond existing regulations in navigating the decommissioning process and the potentially costly effects of failing to do so.

The Historical Development of Maritime Regulations

Similar to most "disaster response" legislation, maritime safety and environmental protection regulation has tended to lag behind not only highly publicized incidents and their consequent outcries of public concern, but also technological advancements in both the shipping and the offshore oil and gas sectors.

In the early part of the 20th century, new generations of vessels made it possible to carry unprecedented numbers of passengers and volumes of cargo. The scale of such vessels meant they carried enhanced risks and consequences of loss not fully addressed by existing regulations. In 1912, the sinking of the world's then-largest and most sophisticated passenger liner, *The Titanic*, caused an unprecedented loss of life. Two years later, the international community responded with the *Safety of Life at Sea Convention* in an effort to develop new standards regulating the safety of merchant shipping. In the second half of the 20th century, a series of tanker spills caused by the sinking or grounding of ever-larger tankers, including the *Torrey Canyon*, the *Amoco Cadiz* and the *Exxon Valdez*, released unprecedented volumes of hydrocarbons into the marine environment and raised public awareness and concern. The international community and national governments responded by adopting regulations prescribing increasingly stringent marine environmental protection and tanker construction standards.

This regulatory lag is equally present in the offshore oil and gas sector. In 1982, the capsize of the *Ocean Ranger* drilling rig on Newfoundland and Labrador's Grand Banks led Canada's federal and provincial governments to overhaul, in the late 1980s, the regulatory framework governing offshore activities to enact comprehensive offshore safety and training regulations. In 1988, a fatal explosion on what was then the world's largest offshore oil and gas production platform, the *Piper Alpha*, led to recommendations by the 'Cullen Inquiry' commissioned in the wake of the tragedy. This in turn resulted in a significant shift in how the UK government regulated offshore operators, abandoning traditional prescriptive regulations in favour of a goal-based model. More recently, blowouts on the Montara wellhead platform off Australia's coast and BP's *Deepwater Horizon* rig in the Gulf of Mexico have stimulated considerable debate about the adequacy of offshore drilling regulations, particularly as the industry begins to shift into deepwater and ultra-deepwater operating environments and the more ecologically fragile Arctic areas.

These incidents illustrate the historically retrospective and often slow to respond character of offshore safety and environmental protection regulation. They also confirm the value of looking beyond existing regulatory requirements in formulating an effective approach to offshore decommissioning, both to minimize political and public consternation and to improve the safe, environmentally sound and cost effective formulation and execution of decommissioning operations.

CHAPTER 2

DECOMMISSIONING OFFSHORE OIL AND GAS INSTALLATIONS

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There are several different categories of offshore oil and gas installations and accompanying subsea infrastructure, including pipelines. Similarly, there are several decommissioning methods and processes, each with related advantages, disadvantages and site-specific considerations. In addition, health and safety, environmental, socio-economic and political impacts attend the decision to choose one decommissioning method rather than another. All must be weighed in selecting the most appropriate decommissioning approach.

Offshore Installations

The methods and processes available for decommissioning of offshore installations will be determined by the structural configuration of offshore oil and gas platforms, the substructures that support them and the subsea systems that facilitate the production of oil and gas. A survey of the structural configuration of such installations is necessary for a full appreciation of the issues the regulatory framework governing decommissioning must address.

An offshore oil and gas installation typically consists of a large platform or series of platforms that support an oil derrick and the complement of facilities and equipment necessary to conduct petroleum exploration and production activities in the marine environment. The largest offshore installations boast platforms weighing well in excess of 50,000 tonnes, possess the capacity to produce up to tens of thousands of barrels of oil daily and provide accommodations for up to 200 persons.[6] Offshore installations operate in waters as shallow as 30 m and as deep as 2,500 metres.[7] They are built to withstand the forces of wind, waves, tides and ice and the impacts of ship collisions, dropped objects and the loads associated with the transportation and lifting of the installation itself.[8] Offshore installations are typically designed to last for 25 or 30 years.[9] Independent classification societies, such as GL-DNV and ABS,[10] certify offshore installations and ensure they are designed, built and maintained in compliance with all applicable regulations and standards.[11]

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[6] See British Petroleum's "Atlantis" deepwater petroleum platform stationed in the Gulf of Mexico. See Offshore Technology, "Atlantis Deepwater Oil and Gas Platform, Gulf of Mexico, United States of America", online (2015) < http://www.offshore-technology.com/projects/atlantisplatform/>.

[7] David Russell Schilling, "World's Largest Offshore Oil Platform an Engineering Masterpiece", online (2014): < http://www.industrytap.com/worlds-largest-offshore-oil-platform-engineering-masterpiece/20699>.

[8] The Offshore Centre Denmark, *The Offshore Book 2010* at 39.

[9] *The Offshore Book 2010* at 39.

[10] Members of the International Association of Classification Societies: Det Norske Veritas-Germanisher Lloyd; American Bureau of Shipping.

[11] Jan Groot, "Engineering Aspects of Decommissioning" in Marc Hammerson, ed, *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013) at 147.

Categories of Offshore Installations

Offshore oil and gas installations can be categorized according to their form or according to their purpose. Some installations may only perform exploratory drilling functions; others may perform exploration and production functions. Decommissioning operations respond to the structural configuration of offshore installations, so categorization according to their form is appropriate for purposes of decommissioning practices. There are two main forms of offshore oil and gas installations: mobile units and fixed installations.

Mobile Units

Mobile units are capable of being moved between locations, either under their own power or under tow. Once held in position by means of anchors or dynamic positioning systems, mobile units perform either exploratory drilling or production functions. This category of platforms includes: jack-up barges, semi-submersibles, drillships and floating production and storage systems.

Fixed Installations

Fixed installations are incapable of movement under their own power and are designed to be moved only for initial placement and post-production disposal. Operators establish fixed installations offshore to extract oil and gas for the duration of the field's productive lifecycle. A single fixed platform can service multiple wellheads.[12]

Components of Offshore Installations

There are three main components of offshore installations: a platform(s), substructures and subsea production systems. These components apply to both mobile and fixed offshore installations, though in some cases certain components will not be present for both categories.

Platform

An offshore oil and gas project may feature either one or several platforms, or "topsides", that support the structures and equipment necessary to explore for, extract and process oil and gas. The platform (or platforms) of a fixed offshore oil and gas production installation will typically support:

- A drilling derrick, a flare tower permitting gas incineration, and the equipment necessary to separate water and any contaminants from the oil and gas extracted from the seabeds;
- Loading, unloading and storage facilities necessary to collect, store and export oil or gas, and to load or unload supplies, materials, equipment and personnel; and

[12] *The Offshore Book 2010* at 39.

- Crew accommodation sufficient to house the range of personnel necessary to operate the oil and gas installation at peak productivity.

The platform's size will depend on the field's peak daily productivity and may range from a couple of hundred to tens of thousands of tonnes.[13] Platforms on fixed installations are assembled, either in one piece or in components, by floating cranes or heavy-lift vessels.[14]

Substructures

A range of substructures supports offshore oil and gas platforms. The substructure chosen depends on site-specific considerations including the water depth, seabed conditions and the projected lifecycle of the oil and gas field. The three most common examples of fixed substructures are:

- Steel Jacket Structures consisting of a tower formed by steel lattice that rises from the ocean floor to support the oil and gas platform above the ocean's surface. The steel legs are typically fixed to the sea floor by piles driven to a depth of 50 meters.[15] The size of the steel jacket structure will depend on water depth and the size of the platform it supports.[16]
- Gravity Base Structures **("GBS")** consisting of large, reinforced concrete foundations designed to rest on the seabed. Vertical columns project upward from the foundation to support the oil and gas platform in position above sea level.[17] Gravity base structures remain in position by virtue of their own weight, which can approach one million tonnes.[18]
- Tripod Base Structures consisting of three tubular steel sections that form a base in the form of a tripod. A vertical steel column rises from the apex of the tripod to support the oil and gas platform in position above sea level. Piles driven into the ocean floor hold the base in position.[19]

The two most common examples of substructures that borrow elements of both fixed and mobile offshore installations are:

- Tension Leg Platforms **("TLPs")** consisting of a floating offshore platform resembling a semi-submersible fixed to the sea floor by means of pre-tensioned cables that eliminate the platform's vertical movement. TLPs typically operate in water depths of over 2,000 metres.[20]

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[13] *The Offshore Book 2010* at 39.

[14] *The Offshore Book 2010* at 39.

[15] *The Offshore Book 2010* at 40.

[16] Jan Groot, "Engineering Aspects of Decommissioning" in Marc Hammerson, ed, *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013) at 147.

[17] Hossein Esmaili, *The Legal Regime of Offshore Oil Rigs in International Law* (2001: Dartmouth Publishing Company, England) at 16.

[18] See Gullfaks C in Norway: Jan Groot, "Engineering Aspects of Decommissioning" in Marc Hammerson, ed, *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013) at 147.

[19] *The Offshore Book 2010* at 42.

[20] *The Offshore Book 2010* at 42.

- Spar Buoys, cylindrical steel tubes that project below the ocean's surface, buoyant enough to remain floating yet ballasted to remain upright. The platform is positioned on top of the floating spar buoy. To remain in position, spar buoys are anchored to the sea floor at multiple points.

Subsea Production Systems

As newer production platforms are designed to accommodate more wells at greater distances, subsea production systems play an increasingly important role in the production and transmission of oil and gas.[21] Subsea production systems consist in the various technologies that facilitate the extraction of oil and gas from offshore reservoirs and the transmission of that oil and gas to onshore or offshore reception facilities. The primary examples of subsea production systems are subsea pipelines, subsea wells and the various technologies that connect multiple well heads to pipelines and other transmission and production infrastructure.[22] Subsea pipelines can take the form of a single pipeline or a complex grid of transmission infrastructure, constructed of either rigid or flexible materials. Subsea production systems may be present for both mobile and fixed offshore installations.

Categorizing Offshore Installations and the Appropriate Decommissioning Regime

Fixed installations and mobile units each raise distinct decommissioning concerns. This guidebook focuses on the decommissioning regime applicable to fixed installations. However, an awareness of the decommissioning regime for both fixed installations and mobile units is critical to provide advice on decommissioning issues related to hybrid offshore structures.

Mobile units raise different, and usually lesser, decommissioning concerns than their fixed counterparts. Unlike fixed installations, mobile units (drillships, semi-submersibles, and floating production systems) can move from the exploration or production site either independently or under tow. Their subsea systems and their impacts on the seabed will generally be less extensive. The more appropriate decommissioning model will be that governing ships rather than that governing fixed offshore installations mounted on jacket substructures or GBSs.

However, for installations that borrow elements of both mobile and fixed units, such as spar buoys or TLPs involving some measure of infrastructure on the seabed, the applicable decommissioning regime will be more varied. The decommissioning regime pertaining to fixed structures will presumably govern the installation and removal of any subsea infrastructure, while the decommissioning regime pertaining to ships or mobile units will presumably govern the decommissioning of the oil platform or spar buoy itself.

[21] *The Offshore Book 2010* at 42.

[22] *The Offshore Book 2010* at 44.

Decommissioning Methods

A range of decommissioning methods exists for obsolete oil and gas installations. The breadth of methods reflects the diversity of offshore oil and gas platforms, substructures and subsea production systems. Each installation has a unique marine spatial profile in terms of its size, characteristics and surrounding environment, and each requires an individualized decommissioning program.

The breadth of methods also reflects the fact that the marine ecosystems in which offshore installations operate are not static: they are dynamic and evolve in response to changing ecological, oceanographic and climactic patterns. Accordingly, a proposed decommissioning method that is appropriate at the outset of an installation's lifecycle may not be appropriate at its conclusion. Even within relatively confined regions, variability in ocean and climactic conditions may mean one decommissioning method is appropriate for one platform, while a substantially different method is appropriate for another.[23]

There are three main decommissioning methods: complete removal, partial removal and secondary uses.

Complete Removal

Complete removal involves deconstructing the offshore installation into transportable pieces and removing them to onshore sites for disposal, reuse or recycling.

Proponents of complete removal endorse the idea that "leaving the seabed as you found it" is the most environmentally sound strategy for decommissioning offshore installations.[24] Complete removal from the offshore area prevents any marine pollution arising from the partial or complete disposal of the installation itself in the sea or the abandonment *in situ* of any parts of the installation, and minimizes the risk of marine pollution caused by any substances, such as hydrocarbons, remaining in the installation. This method can also generate economic benefits in the form of revenues from the scrap value of the recycled materials, increased employment onshore in relevant industries, and the applicable tax structure. Once complete, the installation's removal eliminates risks of any conflicts with other marine uses, such as shipping and fishing. Complete removal also eliminates expenses associated with the partial removal of an offshore installation, including ongoing maintenance costs, legal liability and financial responsibility expenses.[25]

[23] Michael Vincent McGinnis, Linda Fernandez & Caroline Pomeroy, "The Politics Economics and Ecology of Decommissioning Offshore Oil and Gas Structures", MMS OCS Study 2001-006, Coastal Research Centre, Marine Science Institute, University of California Santa Barbara, California, MMS Cooperative Agreement Number 14-35-00001-30761 at 19.

[24] AM Fowler, PI Macreadie, DOB Jones et al, "A multi-criteria decision approach to decommissioning of offshore oil and gas infrastructure" (2014) 87 *Ocean and Coastal Management* 20.

[25] AM Fowler, PI Macreadie, DOB Jones et al, "A multi-criteria decision approach to decommissioning of offshore oil and gas infrastructure" (2014) 87 *Ocean and Coastal Management* 20.

However, complete removal followed by onshore disposal, reuse or recycling can be dangerous, energy-consuming and costly work.[26] From a health and safety perspective, complete removal involving extensive offshore operations poses risk to the personnel involved. From an environmental perspective, it will consume fuel in transportation, use energy in metal-cutting and handling and generate carbon emissions in all these processes. Perhaps ironically, complete removal can also disrupt marine biotic communities supported by the structure during the years of production, such as fish populations, corals and other aquatic flora and fauna.[27] These negative consequences erode the benefits of complete removal programs and require a balancing of interests and consequences.

Partial Removal

Partial removal involves deconstructing the offshore installation and removing certain components to shore for disposal, reuse and recycling, while leaving others in place or relocating them elsewhere in the ocean. An example of decommissioning through partial removal is a "rigs-to-reefs" program in which the installation is abandoned in whole or in part by tipping it over in its offshore site or delivering it to an alternate offshore site.

Partial removal may involve a reduced and often simpler set of offshore operations because personnel are exposed to a lower degree of risk associated with hazardous operations. This method is also typically less energy and emission intensive. Finally, it may result in a lower level of overall disruption to the marine environment. Evidence demonstrating the ability of decommissioned or functioning offshore installations to support rich communities of marine biota, including fish populations,[28] corals and other marine life, suggests that retention of components of the installation may produce ecological benefits. Economic benefits may accompany those ecological benefits where the abandoned installation supports recreational diving or recreational and commercial fisheries. Proposals to decommission obsolete offshore installations by means of rigs-to-reefs programs can also produce stakeholder consensus. For example, in California, oil companies, federal and state regulators, commercial and recreational fisheries groups and environmental and conservation groups all endorsed Assembly Bill 2503 authorizing the state to permit operators to decommission offshore installations by means of rigs-to-reefs programs.[29]

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[26] Hossein Esmaili, *The Legal Regime of Offshore Oil Rigs in International Law* (2001: Dartmouth Publishing Company, England) at 194.

[27] MS Love, DM Schroeder, W Lenarz et al, "Potential use of offshore marine structures in rebuilding an overfished rockfish species, Boccaccio (Sebastes Paucipinis)" (2006) 104 Fish Bulletin 383 390. See also the public debates surrounding United States' rigs-to-reefs legislation. For example JS Stephens, "Do we support a "Rigs to Reefs" Program for Southern and Central California?" Paper for the UCLA Marine Science Center (1998).

[28] BJ Gallaway, ST Szedmayer, WJ Gazey, "A life history review for red snapper in the Gulf of Mexico with an evaluation of the importance of offshore petroleum platforms and other artificial reefs" (2009) 17 *Reviews in Fisheries Science* 48-67.

[29] US, AB 2503, *An act to add Chapter 5.5 (commencing with Section 6600) to Part 1 of Division 6 of the Fish and Game Code, and to add Division 37 (commencing with Section 71500) to the Public Resources Code, relating to ocean resources*, 2009-10, Reg Sess, Cal, 2010 (inactive).

Disadvantages associated with partial removal programs include physical damage to the seabed caused by the installation's abandonment and pollution risks caused by the release of residual hydrocarbons or other contaminants as the abandoned installation deteriorates underwater. Abandonment or partial disposal of the installation and its components on the seabed also increases the likelihood of conflict with other marine users, including shipping and commercial fishing, particularly bottom trawling. Finally, it may result in increased costs associated with continued monitoring, maintenance and lingering legal liability with respect to a partially dismantled offshore installation.

Secondary Uses

A range of secondary uses for post-production offshore installations or their components have been proposed and implemented. These include employing the installation as a platform for: tidal, wind or thermal energy generation; port and harbour infrastructure; offshore search and rescue bases; vessel traffic navigation baes; meteorological stations; and aquaculture frameworks.[30] Implementing these secondary uses can occur at the original site of the offshore installation or in a different location.

Employing a no-longer useful installation for a secondary use maximizes its recoverable value and accords with notions of environmental and economic sustainability. In particular, it satisfies the precepts of the waste management hierarchy, a conceptual framework that ranks decommissioning waste management approaches according to their environmental sustainability. The waste management hierarchy informs international regulatory instruments, such as the OSPAR Decision 98/3 (see chapter 3 of this guidebook) and the regulatory approaches of countries including the UK.[31] The hierarchy gives priority to reducing waste generation followed by waste re-use and then recycling; disposal will only be considered if none of these options are available.

Despite the desirability of the secondary use option, its ultimate viability will depend on a range of factors, including the installation's characteristics, size, age, condition, original design fatigue life and the environmental parameters of its original or proposed new location.[32]

[30] Hossein Esmaili, *The Legal Regime of Offshore Oil Rigs in International Law* (2001: Dartmouth Publishing Company, England) at 193. See also CS Johnstone and J Side, "Alternative Use of Offshore Installation: Final Report on SERC Fund Study, Heriot Watt Institute of Offshore Engineering, Edinburgh (1985).

[31] United Kingdom Department of Energy and Climate Change, "Guidance Notes: Decommissioning Offshore Oil and Gas Installations and Pipelines under the Petroleum Act 1998" produced by the Offshore Decommissioning Unit of the Department of Energy and Climate Change (March 2011) at para 6.1.

[32] Hossein Esmaili, *The Legal Regime of Offshore Oil Rigs in International Law* (2001: Dartmouth Publishing Company, England) at 193.

Table 1 Comparison of Decommissioning Methods

Decommissioning Option	Advantages	Disadvantages	Installation/Site Specific Factors
Complete Removal	Minimizes post-decommissioning risk Creates economic benefits through onshore reuse/disposal Eliminates conflict with other marine uses Reduces costs of post-decommissioning legal liability and financial responsibility requirements	Potentially costs more than other options Involves more complex removal operations which may increase health and safety risks Energy/emissions intensive May result in greater disruption to marine aquatic communities	Complete removal of certain categories of installation (e.g., subsea) may not be feasible Characteristics of the physical environment will dictate the level of ecological disruption caused by complete removal activities
Partial Removal	Involves simpler, less costly operation Reduces health and safety risks during the process Uses less energy, fewer emissions May result in a lower disruption to marine aquatic communities Creates some economic benefits	Increases ongoing pollution risk Increases risk of conflict with other marine uses Increases costs of post-decommissioning legal liability and financial responsibility Potentially politically unpopular	Viability will depend on characteristics of the installation, its physical environment, and the relative level of environmental disruption caused by decommissioning through partial removal rather than complete removal
Secondary Use	Satisfies precept of the waste hierarchy preferring re-use Maximizes economic value of the redundant installation Eliminates pollution risk of removal or partial removal	Depends on external available reuse options, possibly different regulations	Viability will depend on a range of factors, including the installation's characteristics, size, age, condition, original design fatigue life and the environmental parameters of its original or proposed new location

Selecting the Optimal Decommissioning Method

No one solution to decommissioning offshore installations will yield the optimal outcome in all circumstances. Operators typically select the optimal decommissioning alternative by engaging consultants to perform multi-criteria decision analyses considering the feasibility and desirability of alternative decommissioning methods with reference to selection criteria including:[33]

- Physical characteristics and condition of the offshore installation.
- Physical characteristics and condition of the installation site.
- Regulatory requirements.
- Secondary use possibilities.
- Health and safety considerations.
- Environmental considerations.
- Socio-economic considerations.
- Political considerations.

The regulatory requirements applicable in the installation's production location and in any suggested second location will influence the selection process. However, best practices call for more than only following the law, regardless of the extent to which it addresses the multifaceted issues raised during the decommissioning process. Operators will also exercise independent judgment to anticipate public response and provide for best reasonable practices in their proposed decommissioning plan. This includes a comprehensive communications strategy to anticipate and deal with possible public reaction like that which dramatically altered the *Brent Spar's* decommissioning.

This guidebook sets out applicable regulatory approaches to decommissioning in several jurisdictions. However, the best practices we identify in chapter 5 result from the successes and failures of industry, regulators, public stakeholders, states and international organizations working together to address the complex issues flowing from the offshore decommissioning process.

[33] For an example of the application of this approach, see AM Fowler, PI Macreadie, DOB Jones et al, " A multi-criteria decision approach to decommissioning of offshore oil and gas infrastructure" (2014) 87 Ocean and Coastal Management 20; Peter Osmundsen & Ragner Tveteras, "Decommissioning of petroleum installations - major policy issues" (2003) 31 Energy Policy 1579 1578 at 1579.

The Decommissioning Process

The literature identifies 13 major decommissioning methods for obsolete offshore oil and gas installations. Those methods range from complete removal to abandoning the installation intact on site and comprised, to varying extents, of the three main approaches outlined earlier in this chapter.[34] However, the following steps will generally feature in the planning and execution of the decommissioning process.[35]

1. Planning

During the planning phase, the operator selects the optimal decommissioning strategy with reference to technical feasibility, cost and other selection criteria, including health and safety, environmental, socio-economic and political impacts. The operator then submits the chosen strategy for regulatory approval. Where the requirement to submit a decommissioning plan constitutes a regulatory precondition of production facility approval,[36] decommissioning planning will start far in advance of the actual establishment of the offshore oil and gas installation.[37] The submission of a decommissioning plan can thus take place many years, even decades, before the actual decommissioning. Alternatively, regulations may compel operators to submit a decommissioning program before the proposed decommissioning but only after the installation is established.

The relationship between the party submitting the decommissioning proposal and the regulator will often be a dynamic one, with proposed modifications and revisions coming from both sides. Equally, the planning phase will require stakeholder consultation. For these reasons, the planning phase will occur over a period of several years.[38]

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[34] AM Fowler, PI Macreadie, DOB Jones et al, " A multi-criteria decision approach to decommissioning of offshore oil and gas infrastructure" (2014) 87 *Ocean and Coastal Management* 20 at 22; P Ekins, R Vanner & J Firebrace. "Decommissioning of offshore oil and gas facilities: a comparative assessment of different scenarios" (2006) 79 *Journal of Environmental Management* 420-438; DM Schroeder, MS Love, "Ecological and political issues surrounding decommissioning of offshore oil facilities in Southern California Bight" (2004) *Ocean and Coastal Management* 21-48.

[35] This report mirrors the Decommissioning Work Breakdown Structure provided by Decom North Sea, *Review of Decommissioning Capacity 2014*. Decom North Sea is an industry group composed of members of the North Sea's decommissioning industry. Equally, this report incorporates decommissioning steps from Jan Groot, "Engineering Aspects of Decommissioning" in Marc Hammerson, ed, *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013).

[36] The United Kingdom and Canada, Nova Scotia and Newfoundland, require the submission of a decommissioning program as a precondition for authorization of an offshore installation.

[37] The United Kingdom and Canada, Nova Scotia and Newfoundland, require the submission of a decommissioning program as a precondition for authorization of an offshore installation.

[38] Jan Groot, "Engineering Aspects of Decommissioning" in Marc Hammerson, ed. *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013) at 149.

2. Cessation of Production

This phase involves closing the wells and shutting down or depowering the platform so it can be left in a safe state.[39] Notably, a significant temporal delay between cessation of production and the actual decommissioning of an installation may cause prolonged exposure and irregular maintenance, and lead to deterioration of the platform. This deterioration, especially of walkways and handrails, increases hazards encountered by decommissioning personnel and may necessitate remedial operations to make a platform safe, increasing decommissioning costs.[40]

3. Well Plugging and Abandonment

Well plugging and abandonment involves putting three distinct concrete plugs at different levels of an offshore well: at reservoir depth, at cap-rock level and just below iceberg-scouring depths in the seabed.[41] Plugging and abandonment activities require: a live platform; drilling equipment; crew accommodation; and operational electricity, water and air supply systems. For an undamaged well, plugging and abandonment activities normally take between seven and fourteen days;[42] for damaged wells, these activities may take far longer.[43]

4. Removal of Hazardous Products

The removal of hazardous products involves taking appropriate measures to ensure that decommissioning crews can safely work on the platform and any substructures or subsea production systems. These include removing all hydrocarbons and hazardous waste from the platform, substructure and subsea systems to permit decommissioning crews to safely use acetylene torches and welding equipment.[44] Hydrocarbons and other hazardous materials are removed from pipelines, production systems and tanks, after which they are flushed out with water before dismantling activities start.[45]

5. Platform Preparation or "hook down"

Platform preparation, or "hook down," involves preparing the topsides for deconstruction and removal. This phase involves several sub-steps, including:

[39] Jan Groot, "Engineering Aspects of Decommissioning" at 150.

[40] Jan Groot, "Engineering Aspects of Decommissioning" at 150.

[41] Jan Groot, "Engineering Aspects of Decommissioning" at 150.

[42] Jan Groot, "Engineering Aspects of Decommissioning" at 150.

[43] Jan Groot, "Engineering Aspects of Decommissioning" at 150.

[44] Jan Groot, "Engineering Aspects of Decommissioning" at 150.

[45] Jan Groot, "Engineering Aspects of Decommissioning" at 150.

- Development and implementation of a management plan. Coordinating the activities of the large number of diverse specialists required to prepare the topsides for removal demands a comprehensive management plan that defines the respective roles, responsibilities and procedures assigned to each working group.[46] The plan should provide for the identification and handling of workplace hazards, procedures for ensuring safe working conditions and channels for communicating the existence of those hazards.
- Installation of temporary water, air and electricity utilities. After production ceases, water, air and electrical utilities to support the work of personnel engaged in decommissioning the platform must be temporarily installed.
- Removal of piping, electrical cable trays and air ducting. Before removing the topsides, all hydrocarbon piping, electrical cable trays and air ducting must be removed.[47]
- Inspection, repair, reinforcement and replacement of structural members in load path. Floating cranes or heavy lift vessels typically remove an obsolete installation's platform by lifting it, or components of it, from the substructure and moving it to the vessel's cargo deck or to a barge for transport to shore. Lifting the platform safely requires inspecting all load bearing members of the platform, or the platform's components, to ensure their structural integrity. If necessary, components of the platform requiring repair, reinforcement or replacement will require modifications to ensure the lift can be conducted safely.
- Installation of pad eyes. Secure pad eyes must be welded to all lift points on the platform and inspected.

6. Topsides Removal

Once decommissioning crews finish platform preparation activities, they perform a set of tasks to prepare the platform and its components for the lift, potentially in collaboration with contractors from heavy lift vessels or floating cranes. These tasks include rigging, installing lifting guides and ensuring the stability of the components to be lifted.[48] Once these tasks are complete, the platform is detached from the substructure. The crane can then lift the platform from the substructure to the cargo deck to be transported to shore for reuse or recycling, or to another location in the sea for abandonment.

This is the process applicable for decommissioning using appropriately-sized cranes, the most common method of decommissioning obsolete platforms. An alternative form of decommissioning involves deconstructing the platform on site piece-by-piece and loading the pieces into containers that are then usually placed on supply vessels.[49] Where the obsolete platform is slated for reuse, topsides preparation will be guided by the structure's subsequent use.

[46] Jan Groot, "Engineering Aspects of Decommissioning" at 151.

[47] Jan Groot, "Engineering Aspects of Decommissioning" at 152.

[48] Jan Groot, "Engineering Aspects of Decommissioning" at 154.

[49] Jan Groot, "Engineering Aspects of Decommissioning" at 154.

7. Substructure Removal

While the major challenge that topsides preparation and removal presents is logistics, the major challenge associated with substructure removal is technical feasibility. Complete removal of all installation components may be practically impossible for certain substructures, such as: gravity base foundations, which can weigh upwards of one million tonnes;[50] or large steel jacket structures deployed in deep water, which can weigh upwards of 50,000 tonnes.[51]

In shallow water, floating cranes, heavy lift vessels and cargo barges can remove relatively small jacket structures in one piece once the appropriate rigging cables are connected and the foundation piles cut. In deep water, the same floating cranes, heavy lift vessels and cargo barges facilitate the removal of jacket structures. However, the lifting capacity and cargo space of those vessels require that larger-sized jacket structures be cut into pieces. The cut plan must account for crane capacity at different water depths, the cut pieces' dimensions and weight, vessel cargo space, rigging systems and local environmental conditions.[52] Divers and remotely operated vehicles perform cutting operations. However, more recently, developments in semi-submersible crane vessels have facilitated the removal of jackets in one piece.

8. Subsea Infrastructure Removal

This phase involves decommissioning or removing subsea infrastructure. All pipelines must be drained of petroleum products and removed. Alternatively, pipelines are covered with rock blankets or concrete mattresses to prevent interference with deep water commercial fishing, specifically bottom trawling.

9. Site Remediation

This phase involves removing or mitigating the effects of any remaining installation components, subsea production infrastructure or material by-products of the production process that are not removed during the decommissioning process.

10. Topsides and Substructure Reuse and Recycling

This phase involves transporting the topsides, substructure and any other removed installation components or by-products of the production process to an onshore site for reuse or recycling. It typically requires a dedicated site in the relevant port to unload and process the removed materials.

[50] Jan Groot, "Engineering Aspects of Decommissioning" at 154.

[51] Jan Groot, "Engineering Aspects of Decommissioning" at 154.

[52] Jan Groot, "Engineering Aspects of Decommissioning" at 155.

11. Monitoring

Any installation components, subsea production infrastructure or material by-products of the production process, such as drill cuttings, that applicable regulation allows to remain *in situ* will require ongoing monitoring to ensure they do not pollute or contaminate the marine environment.[53] Regulatory frameworks will set the degree to which environmental site monitoring is necessary.

Decommissioning Issues

The decommissioning process raises a number of complex issues. An understanding of these issues is necessary to develop best practices in the decommissioning of offshore oil and gas installations. This is especially true of those best practices that effectively and efficiently address health and safety, environmental, socio-economic and political ramifications.

Health and Safety

The health and safety hazards faced by personnel employed in offshore decommissioning operations is rendered considerable by the combination of a number of factors, including: the logistical complexity of decommissioning operations; the condition of aged infrastructure; the scale of decommissioning equipment involved; the scope of interaction between vessels, the aircraft and the installation; and the diversity of the workforce required to carry out each step of the decommissioning process. The offshore environment, characterized by unpredictable fluctuations in wind, wave, air temperature, currents and ice conditions, exposes offshore personnel to a broader set of health and safety hazards: environmental exposure; marine evacuation; and personnel-transfer between aircraft, vessels and the installation. The logistical complexity of offshore operations can produce delays that require personnel to take longer to accomplish each task relative to their counterparts working in an onshore setting, prolonging their exposure to occupational health and safety hazards.

The precise health and safety standards that operators must satisfy will vary across jurisdictions. In general, however, those standards reflect the hazards faced by personnel engaged in offshore decommissioning operations, including those associated with:

- Making safe offshore facilities for removal where a temporal delay between cessation of production and removal operations results in the possible deterioration of platform facilities, such as walkways, stairways and handrails, rendering preparation activities more dangerous.

[53] Paul Elkins, Robert Vanner & James Firebrace, "Decommissioning of offshore oil and gas facilities: a comparative assessment of different scenarios" (2005) 79 *Journal of Environmental Management* 420-438.

- Topsides preparation, which involves the coordination of a large and varied number of personnel working in confined spaces containing dangerous chemicals, materials and substances. The loss of containment of these materials and substances can produce risks of fire, explosion and the release of toxic gases. These risks may be heightened where personnel must use acetylene torches and other metal cutting equipment.
- Topsides removal hazards includes those associated with heavy lifting operations, uncertainties surrounding aged materials and dangers of fallen objects.
- Subsea systems removal, including those associated with diving operations.
- Transporting hazardous waste materials from offshore sites.
- The choreography of marine operations, which may involve vessels and aircraft operating on or in close proximity to the installation.
- Personnel transfer between vessels, aircraft and installations.
- Environmental exposure to seasonally variable weather, ocean, current and ice conditions.
- Offshore emergency response and evacuation procedures.

The presence of these and other hazards will vary according to the installation's location, remoteness, the time of year, prevailing weather conditions, ice conditions and many other factors. The high level of importance that regulators and operators place on ensuring health and safety in an often unforgiving offshore environment makes minimizing these hazards a central factor in developing the optimal decommissioning approach.

Environmental Impacts

Potential environmental impacts flowing from the decommissioning process may be positive or negative. They vary: in scale, scope, longevity, timing of effects and permanence; in the degree to which they can be effectively avoided by preventative measures or mitigated by remedial measures; and depending on the installation's characteristics and location. The marine ecosystems where offshore installations are placed are not static: they are dynamic and evolve in response to changing ecological, oceanographic and climactic patterns. The evolving character of the environment in which offshore installations are placed, and of which they may eventually become a part, means the environmental impacts accompanying decommissioning may also vary over time: a proposed decommissioning method that is appropriate at the outset of an installation's lifecycle may not be appropriate at its conclusion. Moreover, longer-term changes in ocean and climactic conditions, even within relatively confined regions, may make one decommissioning method appropriate for one platform in one decade, but a different decommissioning method appropriate for another.[54]

[54] Michael Vincent McGinnis, Linda Fernandez & Caroline Pomeroy, "The Politics Economics and Ecology of Decommissioning Offshore Oil and Gas Structures", MMS OCS Study 2001-006, Coastal Research Centre, Marine Science Institute, University of California Santa Barbara, California, MMS Cooperative Agreement Number 14-35-00001-30761 at 19.

Determining the optimal decommissioning method will involve a comparative assessment of the environmental impacts of alternative decommissioning approaches. The assessment must be sensitive to specific ecological features of the installation's immediate and broader environment. For these reasons, regulations governing offshore operations and the proposals advanced by project operators should (and generally do) permit a comparative assessment of the environmental effects of alternative decommissioning methods. Impacts on marine pollution, marine species conservation, biomass production, marine biodiversity and atmospheric emissions provide useful categories for undertaking this assessment.

These categories are not exhaustive; they are examples of areas potentially affected by decommissioning activities. The criteria ultimately considered to assess potential environmental impacts of decommissioning operations will depend on site and installation specific considerations, and be determined in the context of consultations with regulators and public stakeholders.[55] The complex and sometimes conflicting interaction between these and other social, economic and health and safety criteria demands an assessment process that weighs and balances the differing effects of decommissioning strategies.[56]

Marine Pollution

The environmental impact of marine pollution will vary according to: the characteristics of the offshore installation slated for decommissioning; its ecological, oceanographic and climactic setting; and the proposed decommissioning method. Marine pollution can originate from various sources, including:

- Hazardous substances released during the decommissioning process, including radioactive materials, storage tank contents and hydrogen sulphide gas.[57]
- Underwater noise produced by various decommissioning activities, including cutting, drilling, pounding, shipping and the use of explosives, that can interfere with the sensory capacities of various fish and cetaceans.[58]
- Rust and other deterioration from the physical abandonment of the installation or its components on the seabed.

These sorts of pollution can produce effects that are limited or far-reaching in time and place. Noise pollution generally affects marine species while decommissioning operations are actually carried out and its effects are generally limited to the installation's immediate vicinity. In

[55] AM Fowler, PI Macreadie, DOB Jones et al, "A multi-criteria decision approach to decommissioning of offshore oil and gas infrastructure" (2014) 87 *Ocean and Coastal Management* 20.

[56] See for an example of a decision making AM Fowler, PI Macreadie, DOB Jones et al, "A multi-criteria decision approach to decommissioning of offshore oil and gas infrastructure" (2014) 87 *Ocean and Coastal Management* 20.

[57] BMT Cordah Ltd, "Environmental Considerations in Offshore Decommissioning and Removal" (June 6 2014) at 19.

[58] DHI Group, "Evaluating the Impacts of Oil Rig Decommissioning Noise on Marine Life" (29 October 2012), online: < http://www.dhigroup.com/global/news/imported/2012/10/29/evaluatingtheimpactsofoilrigdecommissioningnoiseonmarinelife>.

contrast, the improper disposal or accidental release of contaminants is more likely to produce polluting effects that continue after decommissioning operations conclude, and may adversely impact marine ecosystems beyond the installation's immediate vicinity where contaminants are carried by ocean currents or ingested by migratory marine species.

Marine Species Conservation

Determining the environmental impact of offshore decommissioning operations on marine species first requires identifying the range of species potentially affected by those operations, including marine fish, marine birds, marine mammals, cetaceans, crustaceans, molluscs, corals and other aquatic flora and fauna. Second, it requires assessing the scale, scope and longevity of potential impacts on reference species. This assessment will primarily depend on the nature of the aquatic flora and fauna located in the vicinity of the installation slated for decommissioning. However, it will likely also extend beyond the immediate vicinity of the installation and consider impacts on species of migratory fish, birds and mammals that frequent the relevant area, and on distant ecosystems connected by oceanic and atmospheric currents. The presence of marine protected areas, species at risk or equivalent designations will prompt the consideration of environmental impacts on these special areas flowing from decommissioning operations.

In certain locations, satisfactory marine conservation outcomes can be best produced by decommissioning offshore installations through partial disposal or abandonment. This will be the case where the abandoned installation supports robust marine biotic communities, and complete removal would cause lasting disturbance to the seabed and surrounding ecosystems in the form of habitat destruction, noise impacts and more generally adverse impacts on sensitive species and habitats.[59]

Production of Exploitable Biomass

Determining the environmental impact of offshore decommissioning operations involves assessing short and long-term effects of the proposed operations on the production of biomass capable of exploitation by commercial fisheries, aquaculture, and mariculture. This assessment should be undertaken with reference to existing fisheries, aquaculture and mariculture operations. It should also consider and account for future uses of ocean resources to the extent possible.[60]

[59] BMT Cordah Ltd, "Environmental Considerations in Offshore Decommissioning and Removal" (June 6 2014) at 20.

[60] In the Canadian context, an environmental assessment submitted as part of an application to amend the Cohasset-Panuke Development Plan to permit the partial abandonment of flow lines and certain subsea systems ostensibly omitted to consider the environmental impacts of proposed decommissioning operations on a not yet developed quahog fishery. See Letter to the CNSOPB by Clearwater Seafoods (June 22 2004). See also the Environmental Assessment: Jacques Whitford Environmental Limited,"CEAA Screening Level Environmental Assessment Cohasset Panuke Phase II Decommissioning", prepared for Encana Corporation in April 2004.

In certain locations, greater overall production of exploitable biomass can result from decommissioning offshore installations through partial disposal or total abandonment. This will be the case where the abandoned installation supports robust marine biotic communities or where complete removal would result in lasting disturbance to the seabed and the marine organisms it supports. In California, evidence demonstrates that offshore installations are able to serve as habitat for endangered species of juvenile rock fish and other commercially valuable fish species.[61] In cases where there is no evidence the installation supports marine biotic communities, it is less likely that biomass production will influence selection of the optimal decommissioning method.

Marine Biodiversity

Determining the environmental impact of offshore decommissioning operations also involves considering short and long-term effects of alternative decommissioning methods on marine biodiversity. As for environmental impacts on marine species conservation and the production of exploitable biomass, this assessment should consider the site-specific effects of alternative decommissioning methods on marine biodiversity taking into account all species potentially affected by proposed decommissioning operations and the inter-relationships among them.

Atmospheric Emissions

It is necessary to consider the relative contributions of alternative decommissioning proposals to atmospheric pollution, primarily with reference to carbon dioxide, nitrogen oxide and aromatic hydrocarbons.[62]

Decommissioning by complete removal requires significant amounts of energy to power cutting torches, cranes, vessels and other equipment required to remove, transport, recycle or dispose of the offshore installation. Usually, the more extensive operations involved in decommissioning by completely removing an offshore installation will produce greater quantities of carbon dioxide and other atmospheric emissions than partial removal programs.[63] Thus, the atmospheric pollution that intensive complete removal decommissioning plans generate might erode their perceived environmental benefits.

Balancing Environmental Impacts

Environmental impacts vary in scale, scope, longevity and the degree that they can be effectively mitigated by preventative or remedial measures. Moreover, the evolving character of the environment in which offshore installations are placed, and of which they may eventually

[61] Peter I Macreadie, Ashley M Fowler, and David J Booth 2011. Rigs-to-reefs: will the deep sea benefit from artificial habitat? *Frontiers in Ecology and the Environment* 9: 455-461.

[62] SJ Cripps and JP Aabel, "Environmental and Socio-economic impact assessment of a multiple platform rigs-to-reefs development" (2009) *ICES Journal of Marine Science* 59: S300-308.

[63] AM Fowler, PI Macreadie, DOB Jones et al, "A multi-criteria decision approach to decommissioning of offshore oil and gas infrastructure" (2014) 87 *Ocean and Coastal Management* 20.

become a part, means that the environmental impacts associated with decommissioning may vary over time. Determining the optimal decommissioning method will involve a comparative assessment of the environmental impacts of alternative decommissioning approaches. The assessment must be sensitive to specific ecological features of the installation's immediate and broader environment. Impacts on marine pollution, marine species conservation, biomass production, marine biodiversity and atmospheric emissions provide useful criteria for undertaking this assessment. The complex and sometimes conflicting interaction between these and other social, economic and health and safety criteria demands an assessment process that weighs and balances the differing effects of decommissioning strategies.[64]

Socio-Economic Impacts

Diverse socio-economic impacts accompany the decommissioning process and the selection of one decommissioning method over another. The extent to which operators are required to consider the socio-economic implications of decommissioning depends on the regulatory requirements of the jurisdiction in which the operations will be carried out. However, even in jurisdictions that do not regulate these socio-economic implications, operators may realize significant advantages from addressing them in their dealings with regulators and other public stakeholders. Local benefit planning is high on the list of best practices in decommissioning.

Employment and Other Economic Benefits

The primary socio-economic impact of decommissioning is its contribution to local employment. The scale and complexity of decommissioning operations will dictate the range and number of required personnel, including: engineers, biologists, environmental assessors and other consultants engaged during the planning and permitting process; offshore contractors, crane operators, divers, seafarers and masters during the removal process; onshore personnel involved in the processing, recycling and disposal of the recovered components; and monitors of post-decommissioning sites. Accordingly, operators may select decommissioning methods with a view to maximizing local employment benefits. In Canada, legislation requires proponents to submit Benefits Plans before receiving project approvals or work authorizations. The Benefits Plan describes the contributions of proposed works and activities to local employment in the following terms:

> ... [A] plan for the employment of Canadians and, in particular, members of the labour force of the Province and ... for providing manufacturers, consultants, contractors and service companies in the Province and other parts of Canada with a full and fair opportunity to participate on a competitive basis in the supply of goods and services used in any proposed work or activity.[65]

[64] See for an example of a decision making AM Fowler, PI Macreadie, DOB Jones et al, "A multi-criteria decision approach to decommissioning of offshore oil and gas infrastructure" (2014) 87 *Ocean and Coastal Management* 20.

[65] *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*, SC 1988, c 28, s 45 [CNSOPRAIA]; *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act*, SC 1987, c 3, s 45 [CNLAAIA].

Canadian legislation also requires operators to consider qualitative as well as quantitative contributions of decommissioning operations to local employment. Before receiving project approvals or work authorizations, proponents must include in the Benefits Plan provisions for implementing research and development, education and training and affirmative action programs.[66]

Decommissioning operations' contributions to local employment and economies can include: increased business development; infrastructure creation; and government revenue flowing from personal, business and commodity taxes.[67] Additional benefits may include increased education and training, research and development, participation of minority or marginalized groups and more broadly, investments in local capacity.

Decommissioning operations form only a part of an offshore development's lifecycle. Their contribution to the relevant region's economic and social fabric will be smaller than those of a full-scale offshore petroleum development project. However, the scale, scope and duration of decommissioning operations mean they still generate measurable social and economic returns. To the extent that regulatory, engineering and environmental parameters give operators some choice in selecting decommissioning methods, the potential to generate employment and other economic and social returns will be an important consideration in assessing the relative merits of alternative decommissioning approaches. Methods that involve the removal of the installation to a shore-based site for re-use, recycling or disposal generally have the potential to generate greater employment benefits than less labour-intensive proposals to abandon the installation or its components offshore. Accordingly, from a socio-economic perspective those decommissioning operations will be more likely to invite consensus.

Socio-Economic Impacts on Other Marine Users

Decommissioning operations typically occur on the continental shelf or in the exclusive economic zone of maritime nations. Today, these maritime zones host a broad range of economic uses, including shipping, fisheries, aquaculture, mariculture, offshore renewable and non-renewable energy production, and submarine electrical and telecommunications cable-laying. Decommissioning operations have the potential to interfere with these economic uses in a number of ways. As operations requiring a diverse fleet of vessels, including heavy lift vessels, floating cranes, barges and tugs, decommissioning operations have the potential to occupy extensive maritime space for the time required to complete decommissioning. This increases risks of conflict with other marine users, such as shipping and fishing. But the increased vessel traffic associated with decommissioning operations themselves does not typically produce lasting socio-economic impacts on marine users. Rather, decommissioning methods involving the abandonment or disposal of the platform, its substructure, pipelines, flow lines and the by-products of production on the seabed generate greater risks of lasting socio-economic impacts.

[66] CNSOPRAIA, s 45(3)–(4); CNLAAIA, s 45(3)–(4).

[67] See Hebron Project, "Socio-Economic Impact Statement and Sustainable Development Report", prepared by Stantec Consulting Ltd and Keith Storey Consulting for Exxon Mobil Canada Properties (April 2001).

The abandonment or disposal of an offshore installation or its components on the seabed can obstruct present and future fisheries, including those harvesting deep water resources such as crustaceans. It may also preclude the harvest of marine species in the affected areas. Moreover, by increasing risks of net entanglement it increases risks of gear damage and to the safety of fishing vessel crews. In addition, this method may obstruct the development of offshore renewable and non-renewable energy, the laying of submarine cables or pipelines, and deep-draught shipping. The evolving character of offshore uses makes it impossible to predict the range of conflicts stemming from partial decommissioning operations. This uncertainty underlines the likelihood that decommissioning proposals must include provisions for post-decommissioning liability and continuing site monitoring where appropriate.[68] This allows operators to position themselves to address concerns of affected stakeholders head-on and to articulate a precedent that delineates the terms of their future liabilities.

In certain circumstances, alternative decommissioning methods may positively impact other marine users. Where an obsolete installation can remain on site and support a secondary use, this will create additional economic value while satisfying the precept of the waste hierarchy favouring re-use. The partial or total abandonment or disposal of an installation or one of its components as part of a rigs-to-reef program can create habitat that supports commercially and/or recreationally valuable fisheries and recreational diving.[69]

Best practices call for considering and emphasizing the socio-economic benefits generated by a proposed decommissioning plan, increasing the likelihood that the proposed plan achieves consensus among regulators and public stakeholders.

Political Impacts

Political climate will influence the decommissioning process – and the decommissioning process may influence the political climate, as the *Brent Spar* incident illustrates.

Political climate influences the decommissioning process insofar as the applicable laws are the outcome of a political process. Those laws are shaped by local, regional and international attitudes relating to corporate responsibility, health and safety and the environment. The influence of local attitudes on the decommissioning process can perhaps be felt most strongly in the decommissioning plan permit process.[70] That influence may be exerted by such interested stakeholders as Aboriginal fisheries groups, commercial and recreational fisheries groups, environmental groups, and so on.

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[68] Canada and the UK, among others, require operators to include provisions concerning residual liability and decommissioning legacies with decommissioning proposals. In Canada, see: CNSOPB, "Application to Amend the Cohasset Development Plan: Decision Report".

[69] MS Love, DM Schroeder, W Lenarz et al, "Potential use of offshore marine structures in rebuilding an overfished rockfish species, Boccaccio (Sebastes Paucipinis)" (2006) 104 Fish Bulletin 383-390. See also the public debates surrounding United States' rigs-to-reefs legislation. For example JS Stephens, "Do we support a "Rigs to Reefs" Program for Southern and Central California?" Paper for the UCLA Marine Science Center (1998).

[70] Stakeholder participation is a common feature of decommissioning regimes across jurisdictions, including Canada, the UK, the US, etc.

Furthermore, there is a relationship between the political climate of a jurisdiction and the decommissioning process such that a proposed decommissioning process can engage broad sections of the population. This occurred during the *Brent Spar* incident, when Greenpeace mobilized a broad-based social movement across Europe to convince Shell to reverse its government-approved decision to dump the disused *Brent Spar* installation in a remote location of the North Atlantic (see chapter 1 of this guidebook). This social movement was largely illegal under the then-current law, but better reflected the prevailing concerns of a large portion of the population than did that law. Ultimately, it contributed to the adoption of stricter decommissioning guidelines in the OSPAR region through the 98/3 Decision on the Disposal of Disused Offshore Installations (see chapter 3 of this guidebook).[71]

[71] OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations, OSPAR Convention for the Protectino of the Marine Environment of the North-East Atlantic, Ministerial Meeting of the OSPAR Commission (23 July 1998), available online: <http://www.ospar.org/v_measures/browse.asp?preset=1&menu=00510416000000_000000_000000&v0_0=&v1_0=title,referencenumber,dateofadoption&v2_0=&v0_1=OSPAR+Decision+98/3&v1_1=referencenumber&v2_1=&v0_2=&v1_2=-dateofadoption&v2_2=>;The OSPAR regulations on the decommissioning of offshore installations are explored in greater detail in Chapter III, ss 2.2.

CHAPTER 3

INTERNATIONAL REGULATORY FRAMEWORK

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Beginning with the 1958 *Geneva Convention on the Continental Shelf*, international law has regulated the decommissioning of petroleum installations operating on the continental shelf, evolving along with changes in offshore oil and gas production technology and in public attitudes toward offshore safety and the enviroment.[72] For coastal states that are parties to those treaties, the rules they establish are given legal effect through the adoption of the treaty in national legislation. For coastal states not parties to those treaties, the rules remain relevant because they articulate internationally accepted standards and procedures for offshore decommissioning, potentially rising to the level of customary international law. This chapter surveys relevant international and regional treaties, standards and guidelines governing offshore decommissioning, and concludes with a consideration of the relationship between international law and coastal state practices.

First, this chapter considers the 1958 *Geneva Convention on the Continental Shelf* and the treaty that replaced it: the 1982 *United Nations Convention on the Law of the Sea* ("**UNCLOS**").[73] Often referred to as the constitution for the world's oceans,[74] UNCLOS establishes an international framework governing the uses of the world's oceans and has enjoyed nearly universal ratification.[75] Even for non-party states, it remains relevant because it is generally accepted as reflecting customary international law. UNCLOS gives coastal states sovereign rights to explore, exploit, conserve and manage the living and non-living resources of the seabed, subsoil and waters super-adjacent to the seabed.[76] In doing so, it confirms coastal state rights to engage in offshore oil and gas exploration and production within that part of the continental margin under their jurisdiction. As a corollary to those rights, UNCLOS gives coastal states exclusive jurisdiction over the construction, use and removal of artificial islands installations and structures, including offshore oil and gas installations.[77] However, accompanying that exclusive jurisdiction is the obligation to decommission offshore installations in accordance with the provisions of UNCLOS. This chapter explores the content of that obligation.

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[72] *Geneva Convention on the Continental Shelf*, 29 April 1958, 450 UNTS 11 art 5 (entered into force 10 June 1964) [Geneva Convention].

[73] *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 3 (entered into force 16 November 1994) [UNCLOS].

[74] The phrase "Constitution for the Oceans" is attributable to Tommy T B Koh of Singapore, President of the Third United Nations Conference on the Law of the Sea.

[75] In 2014, 166 countries have ratified the UNCLOS, see: < http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm>.

[76] UNCLOS, art 56(1)(a).

[77] UNCLOS, art 56(1)(b)(ii).

Second, this chapter considers other international treaties applicable to offshore decommissioning, specifically the 1972 *Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter*[78] and the 1996 Protocol that amended it.[79] The 1972 London Convention and the 1996 Protocol limit the ability of state parties to authorize the decommissioning of offshore installations by means of "dumping", defined as the deliberate disposal or abandonment of those installations into the sea.

Third, this chapter considers a set of guidelines and standards issued in 1989 by the International Maritime Organization ("**IMO**"), the United Nations body responsible for the safety, security and environmental performance of international shipping as well as certain aspects of offshore energy sectors. Although the IMO *Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone* (the "**IMO Guidelines**") are recommendations and do not constitute law, they articulate with greater precision minimum international standards for the removal of offshore installations.[80]

Fourth, this chapter considers *The Convention for the Protection of the Marine Environment of the North-East Atlantic* (the "**OSPAR Convention**").[81] The OSPAR Convention is a regional treaty especially relevant to the issue of offshore decommissioning because its provisions on decommissioning reflect the policies of countries such as the UK, Norway, Denmark and the Netherlands, each of which has considerable experience in regulating decommissioning in the North Sea's maturing offshore oil and gas fields. This chapter also considers two binding OSPAR Commission Decisions on offshore decommissioning.

Finally, this chapter considers the hierarchy of international law and coastal state practices.

International Conventions, Standards and Guidelines

International focus on decommissioning began in Geneva in 1958, and has continued to evolve since.

1958 *Geneva Convention on the Continental Shelf* (the "Geneva Convention")

The Geneva Convention confirmed the right of coastal states to construct offshore installations on the continental shelf to explore and exploit its natural resources by providing: [82]

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[78] *Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter*, 29 December1972, 1046 UNTS 120 (entered into force 30 August 1975) [London Convention].

[79] *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter*, 7 November 1997, 36 ILM 1 (entered into force 3 March 2006) [1996 Protocol].

[80] International Maritime Organization, *1989 Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone*, Resolution A. 672(16) [IMO Guidelines].

[81] *Convention for the Protection of the Environment of the North-East Atlantic*, 22 September 1992, 2354 UNTS 67 (entered into force 25 March 1998) [OSPAR Convention]; online:<http://www.ospar.org/>.

[82] Geneva Convention, art 5.

> [T]he coastal state is entitled to construct and maintain or operate on the continental shelf installations and other devices necessary for its exploration and the exploitation of its natural resources.

As a corollary to this right, the Geneva Convention imposed an obligation on coastal states to "remove those installations entirely once they became abandoned or disused."[83]

In 1982, UNCLOS[84] replaced the Geneva Convention and modified this complete removal requirement. This modification reflected the reality that as offshore technologies evolved and the scale of installations became larger, complete removal would not be feasible or even the most environmentally responsible option in all circumstances.

United Nations Convention on the Law of the Sea, 1982 ("UNCLOS")

UNCLOS gives the coastal state the exclusive right to construct, authorize or regulate the construction, operation and use of offshore installations located in its territorial sea, exclusive economic zone and continental shelf.[85] Article 60 enumerates coastal state rights within the exclusive economic zone and provides:

> 1. In the exclusive economic zone, the coastal state shall have the exclusive right to construct and to authorize and regulate the construction, operation and use of:
>
> (a) artificial islands;
>
> (b) installations and structures for the purposes provided for in article 56 and other economic purposes;
>
> (c) installations and structures which may interfere with the exercise of the rights of the coastal state in the zone.
>
> 2. The coastal state shall have exclusive jurisdiction over such artificial islands, installations and structures, including jurisdiction with regard to customs, fiscal, health, safety and immigration laws and regulations.

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[83] Geneva Convention, art 5(5).

[84] *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 3 (entered into force 16 November 1994) [UNCLOS].

[85] Under UNCLOS, article 2, coastal state sovereignty extends to the seaward limits of the territorial sea, which is 12 nautical miles from the baselines measured in accordance with the Convention. Moreover, coastal state sovereignty extends to the airspace above the territorial sea, the water column which makes up the territorial sea, and the sea bed and subsoil beneath it. This sovereignty encompasses the right to construct and regulate the construction of offshore installations in the territorial sea. UNCLOS article 60(3), quoted above, vests coastal states with a set of economic rights in the exclusive economic zone, a maritime zone which spans from the seaward limit of the territorial sea to a maximum of 200 NM measured from the territorial baseline. Those economic rights do not amount to full sovereignty, but do accommodate the economic uses articulated in the provision, such as the right to construct offshore installations to exploit the resources of the seabed and subsoil. Article 80 vests coastal states with a similar set of economic rights articulated in Article 60, on the continental shelf or extended continental shelf, which may extend beyond the 200 NM limit of the exclusive economic zone depending on coastal state geography. Accordingly, UNCLOS support the right of coastal states to construct or regulate the construction of offshore installations in the territorial sea, exclusive economic zone, continental shelf, and on the extended continental shelf where applicable – a right which encompasses the obligation to ensure the decommissioning or removal of such structures in accordance with international standards.

Like the Geneva Convention, UNCLOS affirms the right to construct offshore installations, such as offshore oil rigs, to exploit the living and non-living resources of the seabed and subsoil, such as oil and gas, within waters under coastal state jurisdiction. However, unlike the Geneva Convention, UNCLOS permits the partial disposal of disused offshore installations provided that such disposal complies with the relevant international standards, having due regard to commercial fishing, safety of navigation, marine environmental protection and the rights and duties of other states.[86] Article 60(3) provides:

> Any installations or structures which are abandoned or disused shall be removed to ensure safety of navigation, taking into account any generally accepted international standards established in this regard by the competent international organization. Such removal shall also have due regard to fishing, the protection of the marine environment and the rights and duties of other States. Appropriate publicity shall be given to the depth, position and dimensions of any installations or structures not entirely removed.

This limited retention-in-place or submarine-relocation right is limited by UNCLOS provisions regulating "dumping", defined as "any deliberate disposal of wastes or other matter... platforms or other manmade structures at sea".[87] UNCLOS imposes these restrictions in three primary ways by requiring:

- Coastal state approval of any dumping carried out in the territorial sea, exclusive economic zone or continental shelf.[88] In deciding whether to permit dumping, coastal states must consider potential adverse impacts to neighbouring states.
- Coastal states to ensure that dumping, as an activity under coastal state jurisdiction, is conducted in a way that satisfies its obligation to protect and preserve the marine environment and minimizes the release of "toxic, harmful and noxious substances".[89]
- Both coastal and flag states to adopt and enforce laws and regulations in respect of dumping to prevent marine environmental pollution.[90]

Thus UNCLOS vests coastal states with the right to construct and authorize the use of offshore installations in the territorial sea, exclusive economic zone, continental shelf and on the extended continental shelf where applicable. Unlike the Geneva Convention, UNCLOS permits coastal states to authorize the partial, as opposed to complete, disposal or abandonment of obsolete installations. However, UNLCOS requires coastal states to consider a number of factors in deciding whether to authorize decommissioning by means of partial disposal or

[86] UNCLOS, art 60(3).

[87] UNCLOS, art 1(5).

[88] UNCLOS, art 210(5).

[89] UNCLOS, art 194.

[90] UNCLOS, art 216.

abandonment, including commercial fishing implications, safety of navigation, marine environmental protection and the rights and duties of other states.[91] Any decision to permit partial disposal or abandonment must also comply with UNCLOS' dumping provisions.

Although UNCLOS establishes a framework that requires coastal state approval for proposed offshore decommissioning operations involving partial disposal, abandonment or dumping, it also gives coastal states significant discretion in designing laws governing decommissioning. However, supplemental international instruments narrow this discretion.

Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, 1972 (the "London Convention")

The London Convention[92] limits the ability of contracting states to authorize the decommissioning of offshore installations by means of "dumping", defined as "any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms, or other man-made structures at sea", and "any deliberate disposal at sea of vessels, aircraft, platforms, or other man-made structures at sea".[93] However, this definition of dumping might not encompass the abandonment or alternative use of such structures or platforms on site.[94] The 1996 Protocol (see below in this chapter) supplementing the London Convention addressed this ambiguity by defining dumping as including "any abandonment or toppling at site of platforms or other man-made structures at sea, for the sole purpose of deliberate disposal." [95]

The London Convention prohibits contracting states from dumping certain types of waste.[96] However, it also sets out exceptions to this prohibition and allows coastal states to authorize dumping of non-prohibited matter, including disused or abandoned offshore installations, through the issuance of a permit.[97] It also provides criteria to guide coastal states in their decision to permit ocean dumping, including:

- The characteristics and composition of the matter in question.
- The characteristics of the dumping site.
- The method of deposit.
- Potential effects on marine life and other users of the sea.
- The practical availability of alternative land based methods of disposal.[98]

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[91] UNCLOS, art 60(3).

[92] *Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter*, 29 December1972, 1046 UNTS 120 (entered into force 30 August 1975) [London Convention].

[93] London Convention, art III.

[94] Hossein Esmaili, *The Legal Regime of Offshore Oil Rigs in International Law* (2001: Dartmouth Publishing Company, England) at 201.

[95] See Section 1.4, "1996 Protocol to the London Convention".

[96] London Convention, art IV & Annex I.

[97] London Convention, art IV(c).

[98] London Convention, annex III(C).

1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter (the "1996 Protocol")

The 1996 Protocol makes two key contributions to the London Convention. First, it directly addresses the decommissioning of offshore installations. Negotiated in the wake of the *Brent Spar* controversy, the 1996 Protocol defines "dumping" to include:[99]

.1 any deliberate disposal into the sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea;

.2 any deliberate disposal into the sea of vessels, aircraft, platforms or other man-made structures at sea;

.3 any storage of wastes or other matter in the seabed and the subsoil thereof from vessels, aircraft, platforms or other man-made structures at sea; and

.4 any abandonment or toppling at site of platforms or other man-made structures at sea, for the sole purpose of deliberate disposal.

Like the London Convention, the 1996 Protocol prohibits dumping at sea but creates exceptions for prescribed materials, such as platforms or structures, where the coastal state approves the proposed dumping by issuing a special permit.[100]

Second, the 1996 Protocol elaborates on the criteria guiding the issuance of special dumping permits. Annex II to the 1996 Protocol sets out the criteria and conditions, including a comprehensive impact evaluation and the establishment of a satisfactory ongoing compliance monitoring program, that must be met before a dumping permit can be issued.[101] Of special note is the impact evaluation; it requires a waste prevention audit and consideration of waste management options, including a comparative assessment of the relative risks of alternative strategies that references impacts on human health and the environment.[102]

London Convention and Protocol/United Nations Environment Program Guidelines for the Placement of Artificial Reefs (the "UNEP Guidelines")

In 2006, state parties to the London Convention and other member states of the United Nations Environment Program ("**UNEP**") expressed a shared concern about the inadequacy of extant international standards on the placement of artificial reefs. In the same year, those states endorsed and implemented a work plan prepared by the Scientific Committee of UNEP to address that concern. The result was the *Draft Guidelines on the Placement of Artificial Reefs,*

[99] *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter*, 7 November 1997, 36 ILM 1, art 1(4.1) (entered into force 3 March 2006) [1996 Protocol].

[100] 1996 Protocol, art 4, annex I.

[101] 1996 Protocol, annex II, para 17.

[102] 1996 Protocol, annex II, paras 2, 5, 11, 12.

adopted in 2008 at the Thirtieth Consultative Meeting of the Contracting Parties to the 1972 London Convention (October 27-31, 2008) and the third consultative meeting of the contracting parties to the 1996 Protocol (October 31, 2008)[103]. The UNEP Guidelines were published in their final form in 2009.[104] Their purpose is to:

- Assist those countries that have recognized the need to assess proposals for the placement of artificial reefs on the basis of scientifically sound criteria and to develop an appropriate regulatory framework.
- Assist with the implementation of regulations in those countries where such regulations are already in place, but where there is nevertheless a need for such guidance.[105]

The UNEP Guidelines define "artificial reef" in the following terms:

> An artificial reef is a submerged structure deliberately constructed or placed on the seabed to emulate some functions of a natural reef such as protecting, regenerating, concentrating, and/or enhancing populations of living marine resources.
>
> Objectives of an artificial reef may also include the protection, restoration and regeneration of aquatic habitats, and the promotion of research, recreational opportunities, and educational use of the area.
>
> The term does not include submerged structures deliberately placed to perform functions not related to those of a natural reef – such as breakwaters, mooring, cables, pipelines, marine research devices or platforms – even if they incidentally imitate some functions of a natural reef.[106]

The exclusion of "submerged structures deliberately placed to perform functions not related to those of a natural reef... such as... pipelines... or platforms" from this definition suggests the UNEP Guidelines might not apply to proposed decommissioning operations achieved by the abandonment in place of the installation or substructure. Such operations may therefore continue to be governed by the London Convention and the 1996 Protocol and relevant guidance under them.[107]

The UNEP Guidelines are not binding.[108] However, they do articulate specific recommendations relating to proposed decommissioning programs that involve the partial or complete disposal of

[103] Article 2 of the *Vienna Convention on the Law of Treaties* defines a "Contracting State" as a "State which has consented to be bound by a treaty, whether or not the treaty has entered into force": *Vienna Convention on the Law of Treaties*, 23 May 1969, 1155 UNTS 221 (entered into force 27 January 1980).

[104] Robert Beckman, "Global Legal Regime on Decommissioning" in Myron H Nordquist, John Norton Moore, Aldo Chircop and Ronan Long, The Regulation of Continental Shelf Development: Rethinking International Standards, (Leiden, Boston: Martinus Nijhoff Publishers, 2013) 259 at 277.

[105] London Convention and Protocol/ UNEP, "Guidelines for the Placement of Artificial Reefs" 2009 [UNEP Guidelines], 1.2.

[106] UNEP Guidelines, 1.3.

[107] UNEP Guidelines, 2.1.1.

[108] UNEP Guidelines, 1.2.

offshore oil and gas installations through artificial reef programs. The UNEP Guidelines provide a reference point to help states design and implement regulatory procedures for assessing proposed artificial reef programs, and incorporate scientific and socio-economic criteria into the assessment process.[109] They will undoubtedly be regarded as baseline requirements by public interest groups, which assess the decommissioning plans proposed by operators in specific real-life situations. Accordingly, the UNEP Guidelines are a valuable tool to assist states and operators navigate potentially controversial proposals to decommission offshore oil and gas installations using an artificial reef program.

Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone (the "IMO Guidelines")[110]

To elaborate on the content of UNCLOS Articles 60 and 80, in 1989 the IMO's Maritime Safety Committee considered and ultimately approved the IMO Guidelines. The IMO Guidelines go beyond the subject matter of "dumping" dealt with in the London Convention and 1996 Protocol by providing standards and guidelines tailored to decommissioning offshore oil and gas installations. They establish minimum international standards for the removal of disused offshore installations. They, too, are non-binding, amounting to a recommendation to be considered by coastal states when making decisions about removing abandoned or disused offshore installations or structures.

The IMO Guidelines require complete removal of abandoned or disused installations except where non-removal or partial removal is consistent with IMO-recommended guidelines or standards[111] and endorse a case-by-case approach to this assessment.[112] They recommend that coastal states take into account the following factors in determining decommissioning options for offshore installations located on the coastal state's continental shelf or within its exclusive economic zone:

- Any potential effect on the safety of surface, subsurface navigation or other uses of the sea.
- The rate of deterioration of the material and its present and possible future effect on the marine environment.
- The potential effect on the marine environment, including living resources.
- The risk that the material will shift from its position in the future.

[109] UNEP Guidelines, 2.3.

[110] International Maritime Organization, *1989 Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone*, Resolution A. 672(16) [IMO Guidelines].

[111] IMO Guidelines, Annex I (1).

[112] IMO Guidelines, 2.1.

- The costs, technical feasibility and risks of injury to personnel associated with removal of the installation or structure.
- The determination of a new use or other reasonable justification to allow the installation or structure (or parts of them) to remain on the sea-bed.[113]

The IMO Guidelines articulate two categories of installations that must be removed without exception:

- Abandoned or disused installations that no longer serve the primary purpose for which they were designed and that are located in proximity to international navigation routes.[114]
- Abandoned or disused installations standing in less than 75 m of water and weighing less than 4,000 tonnes in air, excluding the deck and superstructure.[115] The water depth requiring complete removal increases to 100 m for infrastructure installed after January 1, 1998.[116]

The IMO Guidelines provide that where an installation is partially removed, the part remaining in place should not jeopardize the safety of navigation or obstruct the water column to a depth of at least 55 metres.[117] They set out additional criteria specifying when a coastal state may permit a disused or abandoned offshore installation or structure to remain standing, such as where it may be employed for an alternative use or its removal would involve extreme cost or unacceptable risk to human life or the environment.[118] The IMO Guidelines prescribe additional standards for the continued maintenance of disused or abandoned offshore installations or structures and the navigational marking on them. Finally, they make provision for the continuing legal and financial responsibility of the owner of partially disposed offshore installations.[119]

The IMO Guidelines articulate standards governing the decommissioning of offshore installations with greater precision, supplementing UNCLOS articles 60 and 80 by defining when coastal states can and cannot authorize decommissioning through partial disposal or abandonment. They are also valuable in defining how coastal states can authorize decommissioning through partial disposal or abandonment in a way that satisfies their obligation to ensure that activities under their jurisdiction do not pollute the marine environment or interfere with the navigational rights of other states.

However, the IMO Guidelines have been subject to the criticism that they do not address several issues either at all, or strongly enough. First, they do not address the decommissioning of subsea

[113] IMO Guidelines, 2.1.

[114] IMO Guidelines, 3.7.

[115] IMO Guidelines, 3.1.

[116] IMO Guidelines, 3.2.

[117] IMO Guidelines, 3.6.

[118] IMO Guidelines, 3.5.

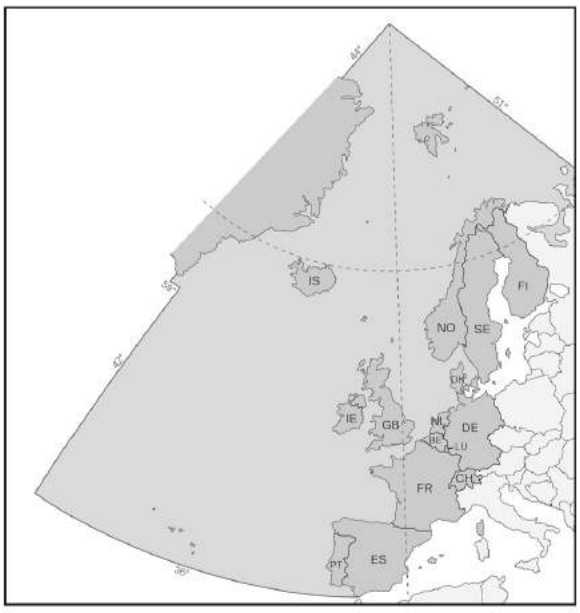
[119] IMO Guidelines, 3.10 & 3.11.

pipelines or other similar infrastructure associated with offshore installations. Second, they do not address the disposition, treatment or handling of drill cuttings or pilings accumulated on the seabed.[120] Third, they do not adequately address fishing interests. And finally, commentators suggest they do not provide adequate environmental protection measures insofar as they do not require an environmental impact assessment, site rehabilitation or site monitoring.[121]

OSPAR and Other Regional Conventions, Standards and Guidelines

The Convention for the Protection of the Environment of the North-East Atlantic (the "**OSPAR Convention**"), largely negotiated in Oslo and Paris, establishes the modern framework for the environmental protection and conservation of the North-East Atlantic.[122] It was opened for signature during the Ministerial Meeting of the Oslo and Paris Commissions in September 1992. Today, the OSPAR Convention has been signed and ratified by the state parties to the Oslo and Paris Conventions that preceded it, and that it replaced.[123]

The Maritime Area the OSPAR Convention covers includes the North Sea. Therefore, its area features a mature oil and gas industry and, given the 1,340 offshore installations currently positioned in the North Sea, has been and will continue to be the location of numerous decommissioning operations.[124]



OSPAR Commission area map.svg by Eric Gaba (Wikimedia Commons user: Sting) https://commons.wikimedia.org/wiki/File:OSPAR_Commission_area_map.svg, reproduced under license at https://creativecommons.org/licenses/by-sa/2.5/deed.en.

[120] IMO Guidelines, 3.10 & 3.11.

[121] IMO Guidelines, 3.10 & 3.11.

[122] *Convention for the Protection of the Environment of the North-East Atlantic*, 22 September 1992, 2354 UNTS 67 (entered into force 25 March 1998) [OSPAR Convention]; online:<http://www.ospar.org/>.

[123] Contracting parties to the OSPAR Convention include Belgium, Denmark, the European Union, Finland, France, Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland, as well as Luxembourg and Switzerland.

[124] Of the 1,340 offshore installations currently located in the North Sea, 735 are sub-sea steel installations such as pipelines and 522 are fixed steel installations: OSPAR Commission, 2013 Update of the Inventory of Oil and Gas Offshore Installations in the OSPAR Maritime Area (2013).

Accordingly, the OSPAR Convention offers perhaps the best insight into decommissioning best practices because it reflects the most current policies of countries with significant experience in regulating decommissioning operations, such as the UK, Norway and Denmark.[125] Two important supplements have followed the 1992 OSPAR Convention: the 1998 OSPAR Decision and the 2006 OSPAR Recommendation.

OSPAR Convention

The OSPAR Convention defines dumping as any deliberate disposal in the maritime area of wastes or other matter, including offshore installations or pipelines.[126] However, it qualifies this definition with two significant exclusions from its definition of "dumping":

- "[P]lacement of matter for a purpose other than the mere disposal thereof" where that placement conforms to OSPAR Convention provisions.[127] This permits the placement of a disused offshore installation for a secondary purpose, such as establishing an artificial reef. However, such placement must be authorized by the competent authority of the responsible state, and conform to additional criteria established by the OSPAR Commission.[128]
- "[T]he leaving wholly or partly in place of a disused offshore installation or disused offshore pipeline, provided that any such operation takes place in accordance with any relevant provision of the Convention and with other relevant international law".[129] Under the OSPAR Convention, operations such as leaving a disused offshore installation in place require a permit.[130] However, other operations, such as leaving a disused offshore pipeline in place, may not.[131]

The OSPAR Convention does not prohibit "dumping" outright, but it does require the contracting state to first issue a permit. The coastal state may not issue a permit if the "disused offshore installation or pipeline contains substances which result or are likely to result in hazards to human health, harm to the living resources and the marine ecosystems, damage to amenities or interference with other legitimate users of the sea."[132] Furthermore, contracting states intending to issue a permit allowing the disposal of a disused installation or pipeline at sea must inform the OSPAR Commission of its reasons for reaching such a decision, creating a channel for consultation and dialogue.[133]

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[125] Contracting parties to the OSPAR Convention with offshore oil and gas installations located on their continental shelves are Denmark, Germany, Ireland, the Netherlands, Norway, Spain and the United Kingdom. See OSPAR Commission, 2013 Update of the Inventory of Oil and Gas Offshore Installations in the OSPAR Maritime Area (2013) at 4.

[126] OSPAR Convention, art 1(f).

[127] OSPAR Convention, art 1(g)(ii).

[128] OSPAR Convention, Annex III, arts 8 & 10.

[129] OSPAR Convention, art 1(g)(iii).

[130] OSPAR Convention, annex III, art 5.

[131] OSPAR Convention, annex III, art 5.

[132] OSPAR Convention, annex III, art 5(3).

[133] OSPAR Convention, annex III, art 5(4).

OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations (the "OSPAR Decision 98/3")

In the wake of the 1995 *Brent Spar* controversy, at the 1998 OSPAR Commission Ministerial Meeting, OSPAR Convention members reached unanimous agreement on new rules for de-commissioning. The agreement produced binding regulations known as "OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations".[134]

The OSPAR Decision 98/3 prohibits "the dumping, and the leaving wholly or partly in place of disused offshore installations within the maritime area".[135] However, the relevant state party may derogate from this general prohibition and permit partial removal for certain categories of installations (Annex I to the Decision) conditional on an assessment (Annex II to the Decision), consultation with other OSPAR members (Annex III to the Decision) and ongoing implementation reporting (Annex IV to the Decision).[136]

The competent authority of a coastal state may issue a permit for the partial removal of:

- All or part of the footings of a steel installation in a category listed in Annex I, placed in the maritime area before February 9, 1999, to be left in place.
- A concrete installation in a category listed in Annex I or constituting a concrete anchor base, to be dumped or left wholly or partly in place.
- Any other disused offshore installation to be dumped or left wholly or partly in place, when exceptional and unforeseen circumstances resulting from structural damage or deterioration, or from some other cause presenting equivalent difficulties, can be demonstrated.[137]

Annex I to the OSPAR Decision 98/3 lists the categories of installations, excluding topsides, where it is permissible for a state to derogate from the general prohibition:

- Steel installations weighing more than 10,000 tonnes in air.
- Gravity based concrete installations.
- Floating concrete installations.
- Any concrete anchor-base that results, or is likely to result, in interference with other legitimate uses of the sea.[138]

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[134] OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations, OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, Ministerial Meeting of the OSPAR Commission (23 July 1998), available online: http://www.ospar.org/v_measures/browse.asp?preset=1&menu=00510416000000_000000_000000&v0_0=&v1_0=title,referencenumber,dateofadoption&v2_0=&v0_1=OSPAR+Decision+98/3&v1_1=referencenumber&v2_1=&v0_2=&v1_2=dateofadoption&v2_2= [OSPAR Decision 98/3].

[135] OSPAR Decision 98/3, s 2.

[136] Luisa Rodriguez Lucas, "OSPARs decommissioning policy" in Marc Hammerson, ed, *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013) at 52-53.

[137] OSPAR Decision 98/3, para 3.

[138] OSPAR Decision 98/3, annex I.

To justify derogation, the state party must show, through the assessment process established under Annex II, that "there are significant reasons why an alternative disposal... is preferable to reuse or recycling or final disposal on land of the disused offshore installation."[139] Annex II provides a comprehensive suite of technical, environmental and socio-economic factors the contracting state must consider in assessing derogation cases. Annex III requires the contracting party to consult with other OSPAR Convention members in deciding to issue a permit allowing the disposal at sea of an offshore installation.[140] Annex IV establishes terms and conditions to be set out in a disposal permit, including provisions for assessing and ensuring compliance with the proposed terms of the disposal[141] and for ensuring the continuing legal and financial responsibility of the owner of the parts of the installation remaining in the maritime area.[142]

The OSPAR 98/3 Decision provides for the periodic revision of exceptions supporting derogation from the prohibition on dumping in light of evolving technological development surrounding decommissioning offshore installations, research and other information.[143] However, those conditions have remained stable since 1998.[144]

OSPAR Recommendation 2006/5 on a Management Regime for Offshore Cuttings Piles (the "OSPAR Recommendation 2006/5")

In 2006, the OSPAR Commission adopted its "Recommendation on a Management Regime for Offshore Cuttings Piles".[145] The OSPAR Recommendation 2006/5 applies to contracting members with cuttings piles derived from offshore drilling within their internal waters, territorial sea or continental shelf. It establishes a framework for assessing the polluting effects of cuttings piles and for monitoring and removing those with polluting effects above the prescribed threshold. In addition, the Recommendation provides a set of criteria for assessing alternative disposal methods of pile cuttings as part of a decommissioning plan.[146]

It is of note that offshore Eastern Canada, cuttings produced in a drilling process that uses water-based mud may be deposited on the sea floor; cuttings produced with oil-based mud may not. And cuttings produced with synthetic or enhanced mineral oil-based mud may be deposited on the sea floor if they cannot be practically reinjected in the well and are treated to reduce their concentration of drilling fluids to a prescribed degree.

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[139] OSPAR Decision 98/3, s 3.

[140] OSPAR Decision 98/3, annex 3.

[141] OSPAR Decision 98/3, annex 4, s 1.

[142] OSPAR Decision 98/3, annex 4, s 2(g).

[143] OSPAR Decision 98/3, para 3.

[144] Luisa Rodriguez Lucas, "OSPARs decommissioning policy" in Marc Hammerson, ed, *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013) at 54-56.

[145] Meeting of the OSPAR Commission, OSPAR Recommendation on a Management Regime for Offshore Cuttings Piles, 26-30 June 2006, Stockholm [OSPAR Recommendation].

[146] OSPAR Recommendation, 3.14.3.

Other Regional or Bilateral Treaties

The 1992 OSPAR Convention, the 1998 OSPAR Decision 98/3 and the 2006 OSPAR Recommendation 2006/5 are the most significant international rules on offshore decommissioning. However, other regional or bilateral treaties, including the following, may affect the decommissioning regime on a country or region specific level.

1976 *Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft* (the "Barcelona Convention")[147]

The provisions of the Barcelona Convention were adopted by 16 states bordering the Mediterranean Sea to prevent marine pollution caused by dumping from ships or aircrafts. Although the Barcelona Convention does not capture the dumping of platforms or substructures themselves, it does include "platforms and other man-made structures at sea and their equipment" in its definition of "ships". Accordingly, it governs the dumping of wastes from offshore installations positioned in the Mediterranean Sea. Further, the *Protocol for the Protection of the Mediterranean Sea Against Pollution Resulting From Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil* (the "**Barcelona Protocol**"),[148] adopted under the Barcelona Convention, provides state parties with additional guidance for ensuring that offshore oil and gas activities, including decommissioning, in the Barcelona Convention area are conducted in a manner that prevents and minimizes pollution. Moreover, Article 20 of the Barcelona Protocol prescribes detailed requirements for the removal of disused or abandoned platforms and pipelines as follows:[149]

> 1. The operator shall be required by the Competent Authority to remove any installation which is abandoned or disused, in order to ensure safety of navigation, taking into account the guidelines and standards adopted by the competent international organization. Such removal shall also have due regard to other legitimate uses of the sea, in particular, fishing, the protection of the marine environment and the rights and duties of other Contracting Parties. Prior to such removal, the operator under its responsibility shall take all necessary measures to prevent spillage or leakage from the site of the activities.
>
> 2. The competent authority shall require the operator to remove abandoned or disused pipelines in accordance with paragraph 1 of this article or to clean them inside and abandon them or to clean them inside and bury them so that the neither cause pollution, endanger navigation, hinder fishing, threaten

[147] *1976 Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft*, 16 February 1976, 1102 UNTS 27 (entered into force 2 December 1978).

[148] *Protocol for the Protection of the Mediterranean Sea Against Pollution Resulting From Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil*, 14 October 1994 (entered into force 24 March 2011).

[149] *Protocol for the Protection of the Mediterranean Sea Against Pollution Resulting From Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil*, art 20, 14 October 1994 (entered into force 24 March 2011).

> the marine environment, nor interfere with other legitimate uses of the sea or with the rights and duties of other Contracting Parties. The competent authority shall ensure that appropriate publicity is given to the depth, position and dimensions of any buried pipeline and that such information is indicated on charts and notified to the Organization and other competent international organizations and the Parties.
>
> 3. The provisions of this Article apply also to installations disused or abandoned by any operator whose authorisation may have been withdrawn or suspended in compliance with Article 7.
>
> 4. The competent authority may indicate eventual modifications to be made to the level of activities and to the measures for the protection of the marine environment which had initially been provided for.
>
> 5. The competent authority may regulate the cession or transfer of authorized activities to other persons.
>
> 6. Where the operator fails to comply with the provisions of this Article, the competent authority shall undertake, at the operator's expense, such action or actions as may be necessary to remedy the operator's failure to act.

1989 Protocol Concerning Marine Pollution Resulting From Exploration and Exploitation of the Continental Shelf (the "Kuweit Protocol")[150]

The Kuweit Protocol was enacted under the 1988 *Kuweit Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution* (the "**Kuweit Convention**") and binds the eight state parties to the Kuweit Convention: Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. The Kuweit Protocol permits the partial removal of disused or abandoned offshore platforms or pipelines, but compels state parties to ensure the competent state authority has the power to require the operator of an offshore installation to:

> In the case of a pipeline... flush and remove and residual pollutants from [it], and bury the pipeline, or remove part and bury the remaining parts thereof, so as to eliminate for the foreseeable future any risk of hindrance to navigation or fishing, taking all circumstances into account and]
>
> In the case of platforms and other sea-bed apparatus and structures, to remove the installation in whole or in part to ensure the safety of navigation and in the interests of fishing [and]

[150] *1989 Protocol Concerning Marine Pollution Resulting From Exploration and Exploitation of the Continental Shelf*, 29 March 1989 (entered into force 9 February 1990) [Kuweit Protocol].

> ...take all practicable measures to ensure that the operator has sufficient resources to guarantee that any such requirements can be met.
>
> ...take all practicable steps to enforce, measures to ensure that no offshore installation which in use has floated at or near the sea surface, and no equipment from an offshore installation, shall be deposited on the sea-bed of the continental shelf when it is no longer needed.[151]

Protocol for the Prevention of Pollution of the South Pacific Region by Dumping (the "South Pacific Convention")[152]

The South Pacific Convention applies to the South Pacific Region and requires state parties to "take all appropriate measures to prevent, reduce and control pollution in the Protocol Area by dumping."[153] The South Pacific Convention also provides that "[d]umping within the territorial sea and the exclusive economic zone or onto the continental shelf of a Party as defined in international law shall not be carried out without the express prior approval of that Party, which has the right to permit, regulate and control such dumping."[154] The South Pacific Convention mirrors the requirements imposed by other contemporary international instruments. Its provisions cover the dumping of substances or other wastes from fixed or floating platforms,[155] but they do not cover the dumping of disused or abandoned offshore installations or pipelines.

The Relationship between International Law and Coastal State Practices

The international instruments outlined in this chapter establish global regulations, standards and guidelines on the decommissioning of offshore oil and gas installations. The general principle is that rights and obligations under international treaties and ancillary conventions, guidelines and recommendations are not enforceable within a coastal state's jurisdiction until that state has enacted internal legislation or regulation restating those rights and obligations.

In general, the international instruments dealing with decommissioning, which must be incorporated into a coastal state's domestic law to be enforceable, require that the coastal state approve most decommissioning operations. They adopt complete removal of offshore

[151] Kuweit Protocol, art XIII(1)(b).

[152] *The 1986 Convention for the Protection of the Natural Resources and Environment of the South Pacific Region*, 25 November 1986 (entered into force 22 August 1990).

[153] *The 1986 Convention for the Protection of the Natural Resources and Environment of the South Pacific Region*, 25 November 1986, art 3.1.

[154] *The 1986 Convention for the Protection of the Natural Resources and Environment of the South Pacific Region*, 25 November 1986, art 3.3.

[155] *The 1986 Convention for the Protection of the Natural Resources and Environment of the South Pacific Region*, 25 November 1986, art 12.

installations as the starting point, then permit partial disposal under circumstances that have become narrower and more specific over time, and provide criteria to guide coastal states in deciding the circumstances under which decommissioning through partial disposal will be acceptable.

The breadth of these instruments gives the coastal state significant discretion in crafting the domestic regulatory framework surrounding decommissioning. The scope of this discretion is evidenced by the few, if any, provisions concerning stakeholder participation, financial security requirements, environmental assessment processes and other matters significant to decommissioning best practices. Between countries, the non-universal adoption or ratification of these instruments augments the states' discretionary power to design decommissioning regimes.

The discretionary power of coastal states to design decommissioning regulations is a strength insofar as it permits them to create regulations that are more responsive to local concerns, though many of these concerns are common. Politically, public interest constituencies may exert pressure on governments to import international best practices into local decommissioning practices. Technically, the international character of the offshore petroleum industry, the influence of industry standards and cooperation between national petroleum regulators may import greater uniformity into the domestic legal frameworks governing offshore decommissioning operations.[156]

[156] See, for example, decommissioning guidelines produced by the UK Offshore Industry Group Oil and Gas UK. The guidelines deal with stakeholder engagement, well plugging and abandonment activities, cost estimations, topside and pipeline facilities decommissioning, and decommissioning security agreements. Available online: http://www.oilandgasuk.co.uk/knowledgecentre/decom_guidelines.cfm; In the Atlantic Canadian Context, see: International Association of Drilling Contractors, online: http://www.iadc.org/. See also the "International Regulators Forum" for initiatives designed to enhance the safety in the offshore through information sharing and joint programs, online: http://www.irfoffshoresafety.com/.

CHAPTER 4

CANADA'S REGULATORY FRAMEWORK

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This chapter sets out decommissioning practices in the Canadian offshore, noting where they conform to and where they depart from international standards in identifying current decommissioning best practices.

Country Background

Canada's coast borders three major oceans: the Atlantic, the Arctic and the Pacific. The offshore area beyond this extensive coastline carries considerable potential for offshore oil and gas production – potential that has been and continues to be realized in Canada's Atlantic region, but that remains to be realized in Canada's Arctic and Pacific regions.

Atlantic Region

Newfoundland and Labrador

Exploration for hydrocarbon resources on Newfoundland and Labrador's Grand Banks began in the early 1960s. Currently, three petroleum production projects operate in Newfoundland and Labrador's offshore and one is under development:[157]

- **Hibernia.** The Hibernia oil field was discovered in 1979, with first production in 1997. Positioned approximately 300 km east southeast of St. John's, the field comprises two primary reservoirs. The Hibernia installation consists of a 550,000 tonne concrete GBS that sits on the ocean floor. The structure supports a 37,000 tonne topside deck, featuring drilling and production facilities, and accommodations for up to 185 people. Crude oil extracted by the Hibernia installation is stored in tanks located in the GBS, which have a storage capacity of 1.3 million barrels of oil. Oil recovered by the installation is collected by tankers through an offshore loading system and either shipped internationally or brought to a Newfoundland transhipment facility.
- **Terra Nova.** The Terra Nova field was discovered in 1984, with first production in 2002. Positioned approximately 350 km east south east of St. John's, the field comprises one primary reservoir. The Terra Nova installation consists of a 292 m long floating production, storage and offloading ("**FPSO**") vessel, one of the largest of its kind and the first of its kind to be deployed in the hostile North Atlantic environment. The vessel produces from a series of subsea wells connected via flexible flow lines. Tankers collect the oil recovered by the FPSO for shipment.

[157] Canada-Newfoundland and Labrador Offshore Petroleum Board, "Offshore Activities: Current Projects", online: < http://www.cnlopb.ca/offshore/>.

- **White Rose.** The White Rose field was discovered in 1984, with first production in 2005. Positioned approximately 350 m east of St. John's, the field comprise one primary reservoir, the Ben Nevis Avalon, as well as several satellite reservoirs. The White Rose installation consists of a FPSO vessel, connected to a series of subsea wells by a network of flexible flowlines.[158] Tankers collect the oil recovered by the FPSO for shipment. Satellite extensions of the White Rose field include North Amethyst, West White Rose and South White Rose.
- **Hebron.** The Hebron Project is currently under development. Discovered in 1980, the Hebron field is located 350 km southeast of St. John's at a water depth of 93 metres. It is estimated to contain 700 million barrels of recoverable resources. The Hebron installation is currently under construction in Bull Arm, Newfoundland. The project proponents anticipate commissioning the installation in 2016 and first oil in 2017. The installation is a concrete GBS, which will sit on the ocean floor and have the capacity to store 1.2 million barrels of crude oil. The GBS will support a topside deck featuring drilling and production facilities and accommodations for up to 220 persons. The height of the GBS is 120 m, its lower diameter is 130 m, and it will support topsides with a height of 40 m (excluding the derrick and the flare) and width of 64 metres.[159] The Hebron installation will also feature an offshore loading system.

Nova Scotia

Oil and gas exploration began off Nova Scotia's coast in 1959. Since then operators have drilled over 200 wells, primarily for exploration purposes, on the province's continental shelf. Three commercial production projects have operated or currently operate in Nova Scotia's offshore:

- **Cohasset Panuke.** The Cohasset Panuke Project is the prime example of a decommissioned offshore oil installation in Canadian waters.[160] Canada's first offshore project, it produced oil from 1992 to 1999. The Cohasset Panuke Project was positioned 41 km southwest of Sable Island, in the comparatively shallow water depth of 45 metres. It comprised a mobile offshore drilling unit that contained the processing equipment and accommodation facilities necessary to produce from two separate wells at the Cohasset and Panuke reservoirs. Steel jacket structures fixed to the seabed protected the well equipment. Subsea flowlines and connected both wells to a CALM buoy that permitted recovered oil to be loaded onto a floating storage tanker and later collected by a shuttle tanker.

[158] Canada Newfoundland and Labrador Offshore Petroleum Board, Producing Projects, online: <http://www.cnlopb.ca/offshore/>.

[159] http://www.hebronproject.com/project/platform.aspx.

[160] Operated by Pan Canadian (now Encana Corporation) and partners; For details on the Deep Panuke decommissioning process, read Alan Harvie & Wylie Spicer, "Canada" in Marc Hammerson, ed, *Oil and Gas Decommissioning: Law, Policy and Comparative Practice* (London: Globe Law and Business, 2013) 271 at 280 281.

- **Sable.** The Sable Offshore Energy Project ("SOEP") has produced natural gas since 1999.[161] Positioned approximately 225 km off Nova Scotia's east coast, SOEP is designed to develop six natural gas fields. It comprises multiple platforms mounted on fixed steel jacket structures positioned in water depths of 20 to 80 metres.[162] A 200 km pipeline carries the natural gas recovered by SOEP to an onshore production plant at Goldboro, Nova Scotia.[163] Exxon Mobil, the SOEP operator, has announced its intention to cease production at SOEP, though it has not announced the dates of cessation or the start of decommissioning.
- **Deep Panuke.** The Deep Panuke Offshore Gas Project began producing natural gas in 2013.[164] It is located 250 km southeast of Halifax on the Scotian Shelf. The installation is a mobile offshore production unit, positioned in water depths of approximately 45 metres. A 176 km pipeline carries the natural gas recovered by the Deep Panuke project to an onshore production site at Goldboro, Nova Scotia.[165]

Currently, Shell Canada and BP are engaged in exploration activities in deep water portions of Nova Scotia's offshore.[166]

Arctic Region

In the Canadian Arctic, companies have engaged and continue to engage in offshore oil and gas exploration, primarily in the northwestern Mackenzie Delta and Beaufort Sea regions. Offshore drilling began in the region during the 1970s. By the 1980s, significant oil and gas reserves had been identified beneath the region's shallow waters. But harsh environmental conditions and fragile ecosystems rendered commercial exploitation of offshore oil and gas in the Arctic challenging. Other factors also contributed to decreased enthusiasm for Arctic oil and gas exploration, including declining global oil prices in the 1980s and the public sentiment opposing Northern petroleum exploration following the *Exxon Valdez* oil spill in Prince William Sound, Alaska in March 1989.

Currently, commercial development of offshore petroleum resources has not occurred in the Canadian Arctic. However, Aboriginal Affairs and Northern Development Canada, the federal government department responsible for issuing exploratory drilling licenses in Canada's Arctic, continues to encourage development in the area through the issuance of exploration licenses.

[161] Operated by Exxon Mobil and partners.

[162] http://www.noia.ca/Industry-Info/Projects/Sable-Offshore-Energy-Project/.

[163] See the Deep Panuke project website, online: <https://www.encana.com/operations/canada/deep-panuke.html>.

[164] Operated by Encana Corporation and partners.

[165] See the Deep Panuke project website, online: <https://www.encana.com/operations/canada/deep-panuke.html>.

[166] Canada-Nova Scotia Offshore Petroleum Board, "Offshore Actiity: Projects", online: <http://www.cnsopb.ns.ca/offshore-activity/offshore-projects>.

Pacific Region

Moratoria on offshore drilling have been in place in Canada's Pacific region since 1972, restraining the development of an offshore oil and gas industry in the region. Both the federal and the British Columbia governments imposed the moratoria due to concerns relating to proposed Alaskan oil tanker traffic in the region. Before 1972, operators had drilled 14 wells off British Columbia's coast, encountering non-commercial natural gas reserves off Vancouver Island and non-commercial oil reserves off the Queen Charlotte Islands.[167] British Columbia's provincial government is currently reviewing these moratoria to assess whether offshore oil and gas production can be carried out in an environmentally sound manner.[168]

International Obligations

Canada is a signatory to the international treaties and instruments listed below. These instruments will help define the decommissioning process in Nova Scotia, Newfoundland and Labrador and other parts of Canada:[169]

- 1958 *Geneva Convention on the Continental Shelf.*[170]
- 1982 *International Convention on the Law of the Sea*[171] ("**UNCLOS**").
- 1972 *Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter*[172] (the "**London Convention**").
- *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter*[173] (the "**1996 Protocol**").

Offshore Jurisdiction

Jurisdiction under International Law

As a signatory to UNCLOS, Canada enjoys the right recognized at international law to explore for, exploit and manage the living and non-living resources of the seabed and subsoil below its internal waters, territorial sea, exclusive economic zone, continental shelf and extended

[167] Royal Roads University, Science and Technology Divisions, "British Columbia Offshore Oil and Gas Socio-Economic Impacts Papers" (May 2004) at 7.

[168] British Columbia Ministry of Energy, online: http://www.empr.gov.bc.ca/OG/OILANDGAS/PETROLEUMGEOLOGY/CONVENTIONALOILANDGAS/Pages/OffshoreBasins.aspx.

[169] *Canada Shipping Act*, 2001, SC 2001, c 26, schedules I-III.

[170] Signed 29 April 1958, Ratified 6 February 1970.

[171] Signed 10 December 1982, Ratified 7 November 2003.

[172] See online: <http://www.ec.gc.ca/iem-das/default.asp?lang=En&n=D45BF295-1>.

[173] See online: <http://www.ec.gc.ca/iem-das/default.asp?lang=En&n=D45BF295-1>.

continental shelf.[174] Further, Canada enjoys the right to construct or regulate the construction of artificial islands, offshore installations and structures for carrying out those purposes. Accordingly, international law confirms Canada's right to construct and regulate the construction of offshore petroleum installations to explore for and develop offshore petroleum resources in waters under its jurisdiction.

International law does not elaborate on how a coastal state exercises those international rights and obligations. The division of legislative power between Canada's federal and provincial governments over the regulation of offshore activities is a matter strictly of internal state constitutional jurisdiction and is determined, ultimately, by the Supreme Court of Canada.

Offshore Jurisdiction under Canadian Federalism

In 1967, the Supreme Court of Canada addressed the question of the ownership of the mineral resources of the seabed located off British Columbia's coast in the *Reference Re Offshore Mineral Rights*.[175] A unanimous Court held that as between Canada's federal government and British Columbia's provincial government, the federal government owns the mineral resources of the seabed and subsoil of both the territorial sea and the continental shelf. Further, the Court held that the federal government enjoyed the sovereign right to explore for and exploit the mineral resources of the territorial sea and the continental shelf. Finally, the Court held that the federal government enjoyed exclusive legislative jurisdiction in respect of those resources.[176]

In 1984, the question of the ownership of the mineral resources of the continental shelf off the coast of Newfoundland and Labrador and the level of government that enjoys legislative jurisdiction in respect of those resources came before the Supreme Court of Canada in the *Reference Re Newfoundland Continental Shelf*.[177] This Reference was the outcome of longstanding disagreement between Newfoundland and Labrador and the federal government regarding the ownership and management of the mineral resources of the continental shelf off Newfoundland and Labrador's shores. The federal government argued that the 1967 *Reference Re Offshore Mineral Rights* was equally applicable to the Atlantic coast. Newfoundland and Labrador's provincial government countered that international law vested the province with ownership of the resources of its continental shelf before the province joined Confederation in 1949. According to Newfoundland and Labrador's argument, property in those resources remained with the province even after it joined the Canadian Federation. Ultimately, the Supreme Court of Canada held in the federal government's favour, deciding that ownership of and legislative jurisdiction over the mineral resources of the seabed and subsoil of the continental shelf off Newfoundland and Labrador, like that of the West Coast, resides exclusively with the federal government. This 1984 Reference dealt only with a portion of the

[174] Canada signed UNCLOS on 10 December 1982, and ratified the Convention on 7 November 2003.

[175] [1967] SCR 792.

[176] *Reference Re Offshore Mineral Rights* at 793.

[177] [1984] 1 SCR 86.

continental shelf off the coast of Newfoundland and Labrador; however, it is inconceivable that its effect does not extend to all of Newfoundland and Labrador's and Nova Scotia's continental shelves.[178]

Following this 1984 Supreme Court decision, Newfoundland and Labrador's provincial government renewed negotiations with the federal government, producing the "*Canada-Newfoundland Atlantic Accord*".[179] The Atlantic Accord settled issues concerning the ownership, management and revenue-sharing of oil and gas reserves located on Newfoundland's continental shelf. The Atlantic Accord was implemented through the enactment of federal legislation and mirror provincial legislation: the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* (C-NLAAIA)[180]; similarly, in Nova Scotia, federal legislation and mirror provicial legislation implemented the terms of the Atlantic Accord in the form of the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act* (C-NSOPRAIA)[181] (together the "**Accord Acts**"). The federal and provincial versions of these Accord Acts are virtually identical.

Regulation of Offshore Decommissioning in Atlantic Canada Under the Accord Acts

This guidebook refers only to the federal versions of the Accord Acts. Before exploring them and their impact on decommissioning, it is important to note that the federal *Oceans Act* (which entered into force in 1997) formally incorporates the provisions of UNCLOS that confirm Canadian sovereignty and sovereign rights in its respective maritime zones.[182] Moreover, the *Oceans Act* asserts the constitutional reality of exclusive federal legislative control over offshore oil and gas activities. It does provide for the possible application of provincial laws offshore, but no regulation in that regard has been passed.[183] The federal Accord Acts themselves make certain provincial laws (relating to offshore royalties and other revenues and to certain "social" legislation concerning the employment relationship and health and safety) applicable in the respective offshore areas of Nova Scotia and of Newfoundland and Labrador.

Offshore Petroleum Boards

The Accord Acts establish Offshore Petroleum Boards in each province responsible for administering the legislation's provisions and managing offshore resources on behalf of

[178] Van Penick, "Legal Framework in the Canadian Offshore", Dalhousie Law Journal, volume 24, number 1 (Spring, 2001), 1-22.

[179] Signed on 9 February 1985.

[180] SC 1987, c 3; the provincial mirror legislation is *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act*, RSNL 1990, c C-2 (as amended).

[181] SC 1988, c 28; the provincial mirror legislation is the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act*, SNS 1987, c 3.

[182] *Oceans Act*, SC 1996, c 31.

[183] *Oceans Act*, s 9 & 21.

Canada's federal and provincial governments. In Newfoundland and Labrador, the Accord Act legislation establishes the Canada-Newfoundland and Labrador Offshore Petroleum Board (the "**CNLOPB**")[184]; in Nova Scotia, the Accord Act legislation establishes the Canada-Nova Scotia Offshore Petroleum Board (the "**CNSOPB**")[185] (the "**Board(s)**"). Each Board is responsible for:

- Offshore health and safety.
- Marine environmental protection.
- Petroleum resource management and conservation.
- Regional industrial and employment benefits requirements.
- Offshore licensing.
- Issuing regulations.[186]

Overview of Regulatory Approval and Authorization Process

The Accord Acts establish the general conditions an operator must satisfy to develop offshore petroleum projects in the Atlantic offshore area and to carry out specific activities in the context of those projects. Project proponents or operators require two tiers of approval to operate offshore:

- First, proponents must submit a "Development Plan" to the Board setting out the basic terms of the proposed development project, and obtain Board approval.
- Second, proponents must submit an application for authorization to carry out specific works or activities in the context of the proposed development project and obtain Board authorization. Such authorizations are usually referred to as "work authorizations".

Board approval for the development of a project requires the proponent to include provisions for decommissioning and abandonment in the Development Plan. Decommissioning operations are also a work or activity requiring a specific "Authorization to Install/Remove" type of work authorization.

The Development Plan application process begins after a significant discovery and before the start of production. It is triggered by the project proponent's submission of a letter of intent to the relevant Board providing a preliminary description of the proposed development. Once the Board receives the letter of intent, it will determine whether a public review is required and how any such review will be conducted (see "Public Review" below in this chapter). During the public review process, the Board assumes a lead role in coordinating the activities of other

[184] C-NLAAIA, s 9. See online: < http://www.CNLOPB.ca/>.

[185] C-NSOPRAIA, s 9. See online: < http://www.cnsopb.ns.ca/>.

[186] Alan Harvie & Wylie Spicer, "Canada" in *Oil and Gas Decommissioning: Law Policy and Comparative Practice*" ed. Marc Hammerson (2013: Global Business Publishing, London) 280; Accord Act, s 18(2).

government agencies, departments or public stakeholders with a regulatory authority or a potential interest in the proposed development. To facilitate the public review process, the Board may require the proponent to submit a preliminary Development Plan, an Environmental Impact Statement, a socio-economic impact statement, a preliminary regional Benefits Plan and any other plan the Board specifies.[187] The contents of these supporting documents are explored in greater depth below in this chapter.

Following completion of the public review process, the project proponent submits to the Board its revised Development Plan application. The content of that application and its treatment of decommissioning activities are also described below. Once the Board receives the Development Plan application, the review process commences and the Board reviews the application in cooperation with other government departments or agencies with regulatory authority over the activities proposed in the application. Following the review, the Board issues a Decision Report through which it can conditionally approve, unconditionally approve, or reject the Development Plan and attached regional Benefits Plan. As part of its approval of the Development Plan application, the Board invariably prescribes conditions that will bind the proponent/operator during the lifecycle of the proposed project.

Following the Board approval of the Development Plan, the project proponent must apply for specific work authorizations or approvals as required. The following works require specific authorizations:

- Operating License (renewable annually).
- Geophysical Work Authorization.
- Diving Program Authorization.
- Geotechnical/Geological/Engineering/Environmental Program Authorization.
- Operations Authorization – Drilling Application.
- Operations Authorization – Install/Remove Application.
- Operations Application – Production Application.
- Well Approval – Approval to Alter the Condition of a Well.

Concurrently, the project proponent will submit an application for a Declaration of Commercial Discovery and an application for a Production License. The Board specifies the necessary supporting documentation to be included in applications for authorization or approvals.

[187] C-NSOPRAIA, s 44(2)(d); C-NLAAIA, s 44(2)(c).

Table 2 Overview of Regulatory Approvals Process for Offshore Development Projects or Works

Step 1: Letter of Intent	Step 2: Public Review
Proponent submits to the relevant Board a Letter of Intent providing a preliminary description of the proposed project	The Board determines if a public review will be required and how it will be conducted The Board assumes lead role in coordinating agencies, departments and public stakeholders with regulatory authority or an interest in the proposed development

Step 3: Development Plan Application	Step 4: Board Review of Plan
Proponent submits to the Board a Development Plan application, including: 1. Development Plan 2. Benefits Plan 3. Environmental Impact Statement	The Board reviews the Development Plan application in cooperation with interested departments, agencies, public stakeholders The Board may conduct public hearings The Board may request additional information if necessary

Step 5: Board Decision Report	Step 6: Authorization/Approval for Specific Works Activities
The Board prepares and issues Decision Reports for the Development Plan and the Benefits Plan The Board may prescribe conditions as part of its Decision Report	Proponent applies to the Board for authorization or approvals to carry out specific works or activities Supporting documents must accompany applications Proponent will concurrently apply for Declaration of Commercial Discovery/Production License

Development Plan Application

Proponents require a production license to produce petroleum resources in Atlantic Canada's offshore. To qualify for a license, proponents must submit a Development Plan to the Board unless this requirement is waived with the consent of both federal and provincial governments.[188] A Development Plan is the basic document governing the development of an offshore reservoir. The Accord Acts define the content of the Development Plan as follows:

- Part I of the Development Plan contains a general description of the approach for developing the pool or the field with respect to:
  - The scope, purpose, timing and nature of the proposed development.
  - The production rate, evaluations of the pools or field, estimated amounts of petroleum proposed to be recovered, recovery methods, production monitoring methods, costs and environmental factors in connection with the proposed development.
  - The production system and any alternative production systems that could be used for the development of the pool or field.[189]
- Part II of the Development Plan contains more technical information necessary for the review and evaluation of the proposed development.[190]

The proponent must also submit the Development Plan to both federal and provincial governments.[191] Following the submission of Parts I and II of the Development Plan, the Board may request additional information, if required. If approved by the Board, no amendment to that Development Plan may be made unless the Board approves the amendment.[192]

The Development Plan will require provisions for the proposed installation's eventual decommissioning. Section 42 of the *Canada-Nova Scotia* and the *Canada-Newfoundland and Labrador Offshore Petroleum Installations Regulations* provides:

> Where the removal of a fixed production installation is a condition of a development plan approval, **the operator shall incorporate in the design of the installation such measures as are necessary to facilitate its removal from the site without causing a significant effect on navigation or the marine environment** [emphasis added].[193]

[188] C-NSOPRAIA, s 143(1); C-NLAAIA, s 139(1).

[189] C-NSOPRAIA, s 143(3)(a)(i)—(iii); C-NLAAIA, s 139(3)(a)(i)—(iii).

[190] C-NSOPRAIA, s 143(3)(b); C-NLAAIA, s 139(3)(b).

[191] C-NSOPRAIA, s 19(3); C-NLAAIA, s 19(3).

[192] C-NSOPRAIA, s 140; C-NLAAIA, s 137.

[193] *Nova Scotia Offshore Petroleum Installations Regulations* SOR/95-191, s 42; *Offshore Petroleum Installations Newfoundland and Labrador Regulations*, NLR 20/97, s 42.

This requires proponents to incorporate measures into the design of a fixed installation to facilitate its eventual removal as a precondition for Development Plan approval. Section 42 speaks to this requirement. However, CNSOPB-issued "Guidelines on Plans and Authorizations Required for Development Projects" suggest a broader requirement to include a "Decommissioning and Abandonment Program" as part of the Development Plan.[194] These Guidelines provide that the Development Plan:

> ...should describe the provisions in the design to facilitate decommissioning and abandonment of the production installation at the end of its production life. **An overview of the decommissioning and abandonment program and a discussion of the feasibility of the proposed procedures should be included.** The suspension and abandonment of the wells should also be briefly discussed [emphasis added].[195]

These Guidelines also require the decommissioning and abandonment portion of the Development Plan to include supporting studies or data. Guidelines issued by the CNLOPB in 2006 similarly require Development Plans to include provisions for decommissioning and abandonment and for post-abandonment and decommissioning monitoring.[196]

The Development Plan, as the basic document governing the development of a significant discovery, includes provisions on decommissioning. Accordingly, as part of the Development Plan, the proposed decommissioning operation must address and satisfy the three regulatory components to obtain Development Plan approval: the regional Benefits Plan, the Environmental Impact Statement and the public review.

Regional Benefits Plan

Before the relevant Board can approve a Development Plan, it must first approve a regional Benefits Plan submitted by the project proponent unless this requirement is waived by federal and provincial Ministers.[197] The Accord Acts define the regional Benefits Plan as:

> [A] plan for the employment of Canadians and, in particular, members of the labour force of the Province and ... for providing manufacturers, consultants, contractors and service companies in the Province and other parts of Canada with a full and fair opportunity to participate on a competitive basis in the supply of goods and services used in any proposed work or activity referred to in the benefits plan.[198]

[194] CNSOPB, "Guidelines on Plan and Authorizations Required for Development Projects" (August 6 1995) Appendix A at para 5.8.

[195] CNSOPB, "Guidelines on Plan and Authorizations Required for Development Projects" (August 6 1995) Appendix A at para 5.8.

[196] CNLOPB, "Development Plan Guidelines" (February 2006) at paras 3.12 & 5.4.8.

[197] C-NSOPRAIA, s 45(2); C-NLAAIA, s 45(2).

[198] C-NSOPRAIA, s 45(1); C-NLAAIA, s 45(1).

Accordingly, project proponents must turn their mind to the way in which proposed decommissioning methods will enrich local economies in deciding between decommissioning approaches. Proponents or operators need not provide targets or quotas for regional participation in offshore projects; the Benefits Plan need only give "first consideration ... to services provided from within the Province and to goods manufactured in the Province, where those services and goods are competitive in terms of fair market price, quality and delivery."[199] Moreover, the Board may require the project proponent to include in regional Benefits Plans:

> [P]rovisions to ensure that disadvantaged individuals or groups have access to training and employment opportunities and to enable such individuals or groups or corporations owned or cooperatives operated by them to participate in the supply of goods and services used in any proposed work or activity referred to in the benefits plan.[200]

The CNSOPB provides additional information on the requirements of the Canada-Nova Scotia Benefits Plan in its "Industrial Benefits Plan Guidelines."[201] The CNLOPB provides similar guidance in its version of Benefits Plan Guidelines.[202]

Typically, as a condition of its approval of a Benefits Plan the Board will require that operators submit annual Benefits Reports that describe the project's socio-economic impacts covering initiatives relating to research and development, diversity and inclusion, capacity development, and community education and participation.[203]

Environmental Impact Statement

The Accord Acts require the Boards to approve only those projects, works or activities capable of being conducted in an environmentally sound manner.[204] To fulfill this requirement, the Boards require the project proponent to submit an Environmental Impact Statement ("**EIS**") providing a detailed description of the environmental setting of the proposed development project. The EIS must identify and evaluate interactions between the proposed project and its environmental setting, articulate the policies and procedures the proponent intends to follow to identify and mitigate adverse environmental effects, and evaluate the significance of environmental effects.[205] The EIS must also consider the socio-economic aspects of the proposed work or activity.

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[199] C-NSOPRAIA, s 45(3)(d); C-NLAAIA, s 45(3)(d).

[200] C-NSOPRAIA, s 45(4); C-NLAAIA, s 45(4).

[201] CNSOPB, "Canada Nova Scotia Benefits Plan Guidelines" (May 2011).

[202] Canada-Newfoundland and Labrador Offshore Petroleum Board, "Canada Newfoundland and Labrador Benefits Plans Guidelines" (February 2006).

[203] Exxon Mobil Canada Properties, "Sable Offshore Energy Project: 2014 Canada Nova Scotia Benefits Report" (March 31 2015).

[204] CNSOPB, "Canada Nova Scotia Benefits Plan Guidelines" (May 2011) at para 2.3.

[205] CNLOPB, "Development Plan Guidelines" (February 2006) at para 1.3.2.

An environmental assessment ("**EA**") will be the foundational document of the EIS. Certain offshore petroleum projects or activities will trigger an EA under the *Canadian Environmental Assessment Act, 2012* ("**CEAA 2012**").[206] Other projects or activities that do not trigger an EA under CEAA 2012 remain subject to an EA completed in accordance with the process chosen by the Board in consultation with the public and other regulatory authorities, which typically mirrors that prescribed by the Canadian Environmental Assessment Agency.

The proponent starts the EA process by submitting a letter of intent to the Board providing a preliminary description of the proposed project. The Board then determines the type of EA required and assumes the lead role in coordinating with other government agencies, departments or stakeholders with an interest in the proposed project or activity. Once the Board selects the required type of EA, it issues a scoping document to the proponent describing the factors the EA must consider and the depth of consideration it must give to those factors. The proponent then submits the prescribed EA to the Board, which typically invites additional public or regulatory consultation in relation to the EA.

To the fullest extent possible, the EA and the Development Plan application review processes take place concurrently. Memoranda of understanding emerging from the Atlantic Energy Roundtable signal the intent of key government actors involved in offshore regulation, including the CNSOPB and the CNLOPB, to coordinate and consolidate all aspects of the regulatory approvals process.[207]

To follow is a more detailed consideration of the two components of the EIS: the EA and the socio-economic impact statement.

- **Environmental Assessments under CEAA 2012.** At the project development phase, proposals to construct offshore installations or to undertake exploratory drilling will trigger an EA under CEAA 2012.[208] The *Regulations Designating Physical Activities* prescribe that the following works may trigger an EA under CEAA 2012:[209]

> 10. The drilling, testing and abandonment of offshore exploratory wells in the first drilling program in an area set out in one or more exploration licences issued in accordance with the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* or the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*.

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[206] *Canadian Environmental Assessment Act*, 2012, SC 2012, c 11, s 52 [CEAA 2012].

[207] See Canadian Environmental Assessment Agency, "Proposed Memoranda of Understanding on Effective Coordinate and Concurrent Environmental Assessment and Regulatory Process for Offshore Petroleum Development Projects in Accord Act Areas" (September 2013), online: <http://www.ceaa.gc.ca/default.asp?lang=En&xml=3CFD8813-CD7C-4189-B945-2B43B77369E2>.

[208] CEAA 2012, s 52.

[209] *Regulations Designating Physical Activities*, SOR/2012-147, ss 10 - 13. Note that sections 39 - 42 of the Physical Activities Regulations reproduce sections 10 - 14 as activities regulated under the *National Energy Board Act* or the *Canada Oil and Gas Operations Act*.

> 11. The construction, installation and operation of a new offshore floating or fixed platform, vessel or artificial island used for the production of oil or gas.
>
> 12. The decommissioning and abandonment of an existing offshore floating or fixed platform, vessel or artificial island used for the production of oil or gas that is proposed to be disposed of or abandoned offshore or converted on site to another role.
>
> 13. The construction, operation, decommissioning and abandonment of a new offshore oil and gas pipeline, other than a flowline.

Accordingly, proposed development projects and specific works in the context of those projects, such as well abandonments or certain decommissioning activities, may trigger an EA under section 13 of CEAA 2012.

In February 2015, Canada's Parliament modified the EA process under the Accord Acts through the *Energy Safety and Security Act* ("**ESSA**").[210] When ESSA provisions regarding EAs enter into force on February 26, 2016, the Board will qualify as a "federal authority that performs regulatory functions, that may hold public hearings and that is prescribed by regulations made under paragraph 83(b)" within the meaning of section 15(b) of CEAA 2012. Accordingly, the Board will be competent to conduct EAs for designated projects in accordance with CEAA 2012.[211]

Section 19 of CEAA 2012 specifies that the assessment must consider the following ten factors:

> (a) the environmental effects of the designated project, including the environmental effects of malfunctions or accidents that may occur in connection with the designated project and any cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out;
>
> (b) the significance of the effects referred to in paragraph (a);
>
> (c) comments from the public – or, with respect to a designated project that requires that a certificate be issued in accordance with an order made under section 54 of the *National Energy Board Act*, any interested party – that are received in accordance with this *Act*;
>
> (d) mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the designated project;

[210] SC 2015, c 4 ("ESSA").

[211] In addition to the Nova Scotia, and Newfoundland and Labrador Boards, other agencies designated as responsible authorities under CEAA 2012, competent to conduct EAs for designated projects include the National Energy Board ("NEB"), the Canadian Environmental Assessment Agency, and the Department of Fisheries and Oceans Canada ("DFO").

(e) the requirements of the follow-up program in respect of the designated project;

(f) the purpose of the designated project;

(g) alternative means of carrying out the designated project that are technically and economically feasible and the environmental effects of any such alternative means;

(h) any change to the designated project that may be caused by the environment;

(i) the results of any relevant study conducted by a committee established under section 73 or 74; and

(j) any other matter relevant to the environmental assessment that the responsible authority, or – if the environmental assessment is referred to a review panel – the Minister, requires to be taken into account.

Section 5 of CEAA 2012 provides that environmental effects to be taken into account as part of the EA process of a physical activity or a designated project include:

(a) a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:

(i) fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*,
(ii) aquatic species as defined in subsection 2(1) of the *Species at Risk Act*,
(iii) migratory birds as defined in subsection 2(1) of the *Migratory Birds Convention Act*, 1994, and
(iv) any other component of the environment that is set out in Schedule 2;

(b) a change that may be caused to the environment that would occur:

(i) on federal lands,
(ii) in a province other than the one in which the act or thing is done or where the physical activity, the designated project or the project is being carried out, or
(iii) outside Canada; and

(c) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on:

(i) health and socio-economic conditions,
(ii) physical and cultural heritage,
(iii) the current use of lands and resources for traditional purposes, or
(iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.[212]

[212] CEAA 2012, s 5.

Therefore, section 5 of CEAA 2012 confirms that EAs must consider the effects of the proposed decommissioning operations on: fish and fish habitat; aquatic species; migratory birds; changes to the environment on federal lands, including the seabed and subsoil of the Canadian continental shelf; changes to the environment outside of Canada; and in relation to Aboriginal Peoples, changes that result in effects to health and socio-economic conditions or the current use of lands or resources for traditional purposes.

Recent legislative changes introduced by ESSA give the Board the authority to hold public hearings as part of the EA process.[213] The language of the amendments is permissive and thus does not compel the Board to do so. Until the amendments take effect, it is uncertain whether the Board will integrate public hearings into the EA process and if it does, how it will do so. Currently, as a responsible authority, each Board is required to accept written public comments during the EA process. Additionally, CEAA 2012 requires that all documents pertaining to the EA be made available in a public registry.[214] The presence and conduct of public hearings as part of the EA process will likely be a function of the strength of public interest in a proposed development or work. Other legislative changes ESSA introduced include participant funding programs[215] and timelines for carrying out the EA process.[216]

- **Environmental Assessments under the Board's Internal Process.** For projects, works or activities that do not engage CEAA 2012, the relevant Board will determine the scope of the EA required in consultation with other regulatory agencies, the proponent and the public. Once the Board selects the type of EA required, it issues a scoping document to the proponent describing the factors the EA must account for and the scope of consideration the EA must give those factors. Both the Nova Scotia and the Newfoundland and Labrador Development Plan Guidelines specify that EAs for works or activities that do not engage CEAA 2012 will mirror the process prescribed by the former *Canadian Environmental Assessment Act*.[217] Earlier Canadian EA legislation required proponents to complete a comprehensive study report considering the following factors:
    - The project's purpose.
    - The project's environmental effects and their significance, including malfunctions or accidents and cumulative environmental effects from the project, individually and in combination with other projects.
    - Technically and environmentally sound measures for mitigating significant adverse environmental effects.
    - Alternative means that are technically and environmentally sound and the environmental effects of any such alternative means.

[213] ESSA, s 44.1.

[214] CEAA 2012, s 78(1).

[215] ESSA, ss 5.0002 & 87.

[216] ESSA, ss 5.0002.

[217] *Canadian Environmental Assessment Act*, SC 1992, c 37; CNSOPB, "Guidelines on Plans and Authorizations Required for Development Projects" (August 16 1995) at para 2.3; CNLOPB, "Development Plan Guidelines" (February 2006) at para 5.0.

- The requirement for ongoing follow-up in respect of the project.
- The capacity of the renewable resources likely to be significantly affected by the project to meet the needs of the present and those of the future.
- Public comments.
- Any other relevant matter.[218]

Neither the Nova Scotia nor the Newfoundland and Labrador Development Plan Guidelines reflect the changes introduced to the EA process by ESSA. Accordingly, when ESSA provisions come into effect on February 26, 2016, each Board will be a competent authority to conduct EAs for projects that trigger CEAA 2012, as well as for projects that do not trigger the legislation yet nevertheless require an EA. For this reason, the EA process is currently indeterminate. However, it is reasonable to expect that it will more closely follow the process prescribed by CEAA 2012.

- **Socio-Economic Impact Statement.** Each Board also requires the EIS to consider the socio-economic aspects of the proposed work or activity in accordance with the Accord Acts.[219] Nova Scotia's Development Plan Guidelines suggest that consideration of the socio-economic effects of a proposed project may accompany the EIS. Newfoundland and Labrador's equivalent Guidelines provide that a socio-economic impact statement must be included as a separate component of the Development Plan application.

The Newfoundland and Labrador Development Plan Guidelines articulate the socio-economic impact statement's purpose as:

> [T]o set out a proponent's analysis of the effects the proposed project is anticipated to have on a variety of social, demographic and labour market factors, as well as on public infrastructure and other land and resource uses.[220]

These Guidelines continue by stating that the socio-economic impact statement's purpose is to assess the proposed project's relationship to the sustainable development of the local economy, ecosystems and community:

> The proponent should describe its corporate commitment and approach for an inclusive, planned and transparent strategy whereby its activities and investment will contribute to a better quality of life for the current and future generations. The proponent should prepare a framework to address how it intends to improve the community and maintain a safe and healthy environment, together with a set of business practices, and policies that will contribute to sustainability in the long-term.[221]

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[218] CNSOPB, "Guidelines on Plans and Authorizations Required for Development Projects" (August 16 1995); CNLOPB, "Development Plan Guidelines" (February 2006) at para 5.0.

[219] C-NSOPRAIA, s 44(2)(d); C-NLAAIA, s 44(2)(c).

[220] CNLOPB,"Development Plan Guidelines" (February 2006) at para 1.3.3.

[221] CNLOPB,"Development Plan Guidelines" (February 2006) at para 1.3.3.

Public Review

Section 44 of each of the Accord Acts empowers each Board to "conduct a public review in relation to the exercise of any of its powers or the performance of any of its duties where the Board is of the opinion that it is in the public interest to do so."[222] The Board currently exercises this power in relation to proposals for major development projects, especially projects that include pipelines, and requires public review as a precondition for Development Plan approval.[223] Depending on the scale of the proposed project and the degree of public interest it engages, the Board may conduct the review through a request for written public submissions or through the appointment of a commission responsible for conducting a public hearing. The Accord Acts empower the Board to:

- Establish terms of reference and a timetable that will permit a comprehensive review of all aspects of the review process, including those aspects within the authority of Parliament or of the Legislature of the Province.[224]
- Appoint one or more commissioners to conduct the review.[225]
- Require the commissioners to complete public hearings in the province or elsewhere and report the outcome of those hearings to the Board, the Federal Minister and the Provincial Minister.[226]
- Where the public review is conducted in relation to any potential development of a pool or field, require the proponent to submit and make available for public distribution a preliminary Development Plan, an Environmental Impact Statement, a socio-economic impact statement, a preliminary regional Benefits Plan and any other plan specified by the Board.[227]

The public review process typically starts by the project proponent submitting a letter of intent to the relevant Board providing a preliminary description of the proposed project or work. Once the Board receives the letter of intent, it can then determine the appropriate procedures for public review based on the project's scale and scope, potential impacts on public stakeholders and the requirement for inter-agency or governmental cooperation.

To improve regulatory efficiency and cooperation between the Offshore Petroleum Boards of the Atlantic region and other regulatory bodies, the Atlantic Energy Roundtable proposed a series of Memoranda of Understanding to coordinate all aspects of the regulatory approvals process for offshore developments in the Accord Act areas.[228] At the project development phase, the existence of such Memoranda of Understanding means the public review process will also encompass the EA process flowing from the Accord Acts or CEAA 2012.

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[222] C-NSOPRAIA, s 44(1); C-NLAAIA, s 44(1).

[223] C-NSOPRAIA, s 44(1);); C-NLAAIA, s 44(1); CNSOPB, "Canada Nova Scotia Benefits Plan Guidelines" (May 2011) para 2.4.

[224] C-NSOPRAIA, s 44(1)(a); C-NLAAIA, s 44(1)(a).

[225] C-NSOPRAIA, s 44(1)(b); C-NLAAIA, s 44(1)(b).

[226] C-NSOPRAIA, s 44(1)(c); C-NLAAIA, s 44(1)(c).

[227] C-NSOPRAIA, s 44(1)(d); C-NLAAIA, s 44(1)(d).

[228] http://www.ceaa.gc.ca/default.asp?lang=En&xml=3CFD8813-CD7C-4189-B945-2B43B77369E2.

The most recent public review for a proposed development project was in Newfoundland and Labrador for the Hebron Project. The CNLOPB appointed a Commission to complete a public hearing over a 180-day period between August 25, 2011 and February 28, 2012.[229] The Commission's terms of reference included considerations of human health and safety, environmental protection provisions incorporated into the project's design and operation, the general approach to the development and exploitation of the petroleum resources within the development area, and socio-economic benefits.[230] Significantly, in relation to decommissioning the Commission recommended, on the basis of the preliminary Development Plan application the proponent submitted, that the installation's design "may not fully meet the expectations of the CNLOPB in terms of sustainable development or legacy of the platform during decommissioning and post-production." This finding formed the basis for Commission Recommendation 3.2:

> The Commissioner recommends that the C-NLOPB review the specific categorization of structural and mechanical systems for all of the components of the Hebron platform (GBS, topsides, OLS etc.) to ensure the legacy value of the Hebron platform has been achieved adequately in the design.[231]

Motivating the Commission's recommendation was the requirement that the GBS and platform be designed and constructed for the "planned life of the Hebron field which is currently estimated at 30+ years, and that the platform be capable and be maintained for operation beyond this planned period of time."[232] Equally, the Commission articulated "specific concerns about construction safety and lack of risk assessment for the construction and removal phases of the project" as points requiring the attention of both the proponent and the Board. The Commissioner's recommendations suggest that the Board will conduct a comprehensive assessment of all aspects of the Hebron Project during its lifecycle, including proposed decommissioning operations.

Conclusions on Decommissioning Description in the Development Plan

At the project development phase, proponents must consider the eventual decommissioning of offshore installations and their accompanying systems, including wells, pipelines and flow lines, by incorporating provisions for the installation's eventual removal into its design and including

[229] "Report of the Hebron Public Review Commissioner for the Hebron Development Application" (February 2012) Executive Summary at ii.

[230] "Report of the Hebron Public Review Commissioner for the Hebron Development Application" (February 2012) Executive Summary at ii. See also "Commissioners Terms of Reference for the Proposed Hebron Project Public Review", online: http://hebronpublicreview.ca/wp-content/uploads/2011/09/COMMISSIONERS-TERMS-OF-REFERENCE-July-6-2011-Final-2.1.pdf.

[231] "Report of the Hebron Public Review Commissioner for the Hebron Development Application" (February 2012) Executive Summary at ii. See also "Commissioners Terms of Reference for the Proposed Hebron Project Public Review", online: http://hebronpublicreview.ca/wp-content/uploads/2011/09/COMMISSIONERS-TERMS-OF-REFERENCE-July-6-2011-Final-2.1.pdf at 40.

[232] "Report of the Hebron Public Review Commissioner for the Hebron Development Application" (February 2012) Executive Summary at ii. See also "Commissioners Terms of Reference for the Proposed Hebron Project Public Review", online: http://hebronpublicreview.ca/wp-content/uploads/2011/09/COMMISSIONERS-TERMS-OF-REFERENCE-July-6-2011-Final-2.1.pdf.

an overview of the decommissioning and abandonment program. The level of detail must be such that the Board can discharge its regulatory obligations to ensure the project is capable of being developed in a safe and environmentally sound manner. Yet, because a proponent might submit a Development Plan as many as 30 years in advance of decommissioning operations, the chosen decommissioning provisions must be sufficiently flexible to accommodate the undoubted reality of changes in technology and regulatory practices. Further, because Development Plan amendments require additional approvals accompanied by duplication in regulatory procedures, such as Benefits Plans, EAs and public reviews,[233] proponents have an incentive to draft the decommissioning provisions broadly enough to accommodate change.

The balance that operators must achieve is illustrated by the following specific examples of decommissioning provisions from Development Plans:

- **Cohasset-Panuke.** On March 7, 1990, the project proponent submitted its Cohasset-Panuke Development Plan – nine years before the actual start of decommissioning operations. The relevant provisions of the Plan provided:

  > When the Cohasset and Panuke fields have been depleted, the production facilities will be removed. Wells will be abandoned in accordance with all regulations, and well jackets removed to a level below the seabed. Residual hydrocarbons in the flowlines will be flushed out to the Cohasset facility, and the flowlines recovered for possible future use. Hydrocarbons from the condensate will be flushed out to the storage vessel and recovered for possible future use.[234]

  This total removal commitment reflected the earlier international law provisions of the Geneva Convention, and not the more flexible provisions of UNCLOS or the London Convention.

  On December 11, 2003, Encana, which had become the project operator in 1996, submitted an application to the CNSOPB to amend the original Development Plan. The application triggered an EA under earlier Canadian environmental assessment legislation and a 45 day consultation period where the public was given the opportunity to provide written comments to the Board on the proposed amendments.

- **Deep Panuke.** In contrast, the Deep Panuke Development Plan, submitted in November 2006, illustrates a more flexible and anticipatory nature of decommissioning provisions by providing:

  > **The decommissioning and abandonment of these facilities will be performed in accordance with the regulatory requirements applicable at the time such activities are undertaken. Potential changes in technology, regulations and accepted industry practices over the time between initial consultation and**

[233] C-NSOPRAIA, s 142(5); C-NLAAIA, s 142(5).

[234] LASMO, "Cohasset Panuke Development Plan" (submitted to the CNSOPB March 7 1990) at 5.8.2.

> **decommissioning make it difficult to commit to a specific course of action at this time.** At the time of decommissioning, an action plan will be submitted to the regulatory authorities for approval prior to the commencement of decommissioning and abandonment activities. [emphasis added][235]

The proponent included in its Development Plan a "typical action plan" as an example of potential decommissioning procedures to be followed when the installation completed production:

> Decommissioning of the MOPU will essentially be a reverse of the installation process. The processing equipment will be systematically shutdown, flushed, and cleaned. The MOPU will then be disconnected from the subsea infrastructure, jacked down, and removed from the site.
>
> **Wells will be abandoned in compliance with applicable drilling regulations and according to standard industry practices.**
>
> Subsea equipment, such as wellhead trees and manifolds, will be purged, rendered safe, and recovered. Trenched flowlines and umbilicals will be flushed and left *in situ* below the seafloor. All other subsea facilities above the seafloor, including protection structures, will be purged and decommissioned in accordance with applicable regulations at the time.
>
> The offshore export pipeline will be abandoned "in place" after it is flushed and filled with seawater.[236]

The Deep Panuke Development Plan also referenced decommissioning as an activity that would be covered by its proposed Safety Environmental Protection and Emergency Response Plan.[237]

- **Hebron.** The most recent Development Plan submitted in Atlantic Canada is that of the Hebron Project, submitted to the CNLOPB in September 2011. The Hebron installation, currently under construction in Bull Arm, Newfoundland, consists of a concrete GBS measuring 120 m high and 130 m wide at its base, containing 132,000 cubic metres of concrete and approximately 51,800 tonnes of rebar and other steel components.[238] The project's expected lifecycle is 30 years. Its Development Plan provides the following regarding decommissioning:

> The actual need for removal of the Hebron Platform will depend on the regulatory requirement and analysis conducted when the decision to abandon the field is made. In any case, before the platform is abandoned and before any decommissioning activities begin, all wells will be plugged and abandoned.

[235] Encana Corporation, "Deep Panuke Offshore Gas Development: Development Plan: Volume 2" (November 2006) 4.10.

[236] Encana Corporation, "Deep Panuke Offshore Gas Development: Development Plan: Volume 2" (November 2006) 4.10.

[237] Encana Corporation, "Deep Panuke Offshore Gas Development: Development Plan: Volume 2" (November 2006) 4.10 at 8.11 and 9.6.

[238] http://www.hebronproject.com/project/platform.aspx.

> All systems will be purged of hydrocarbons and other hazardous, flammable or explosive materials. At the time of abandonment, permanent power and utilities will be unavailable.
>
> The Gravity Base Structure will be designed to be removable at the end of the field life. The procedures for platform removal/ decommissioning will be developed during front-end engineering and design.
>
> Procedures could include the following:
>
> Identification of appropriate regulatory bodies;
>
> Assessment of floating the GBS by itself or together with the topsides;
>
> Abandonment design considerations including stability, tow route survey, water de-ballasting, such effect consideration, and various structural loads;
>
> Decontamination and cleaning requirements;
>
> Limiting weather criteria.
>
> Several methods for decommissioning the topsides could be available at the end of the production facility's operational life. These methods are subject to the technology and or availability of heavy lift vessels and equipment at the time of removal.[239]
>
> The Hebron Development Plan provisions on the removal of the topsides specify the use of heavy lift vessels to remove them either in components or in one piece, or the option of floating both the GBS with the topsides intact to a shore side location for removal.

Development Plan excerpts demonstrate the highly anticipatory nature of decommissioning provisions and the extent to which proposed decommissioning procedures are conditional on changes in technology, regulations and other factors, including safety and the environment. Indeed, recent legislative amendments introduced by ESSA confirm the evolving character of offshore environmental regulation. The anticipatory character of the Hebron Development Plan provisions on decommissioning confirms that the bulk of regulatory and public scrutiny will be on proposed decommissioning operations at the work authorization stage – in perhaps 30 years when cessation of production from the Hebron reserves has been determined.

[239] Exxon Mobil Canada Properties, "Hebron Project Development Plan" (September 2011) at 12.

Authorizations or Approvals for Specific Works and Decommissioning

After approval of the Development Plan, operators must seek the Board's authorizations or approvals to conduct specific works or activities relating to the exploration, drilling, production, processing or transportation of petroleum in the offshore area.[240] The specific authorization required will vary according to the proposed activity.[241]

To receive authorization to undertake decommissioning operations, the operator must submit to the Board an "Application to Install/Remove." Moreover, the operator may be required to submit to the Board additional applications, such as an "Approval to Alter the Condition of a Well", depending on the nature of the decommissioning operations proposed.

Operators must include the following supporting documents as part of their application for authorization or approval of decommissioning activities:

- Summary of the proposed operations.
- Regional Benefits Plan.
- Development Plan (for Development Related Activities).
- Safety Plan.
- Environmental Assessment.
- Environmental Protection Plan.
- Spill Contingency Plan.
- Financial Security.
- Certificate of Fitness (if applicable).
- Declaration of Operator.

The Board does not require proponents to submit a new regional Benefits Plan or Development Plan for each application for authorization or approval, provided the proposed works or activities are conducted in accordance with the original Development Plan.

Summary of Proposed Works

Before authorizing specific works or activities, the Board requires applicants to submit a summary of the proposed operations describing the processes, equipment and personnel involved in the proposed works or activities and the schedule in which they will occur.[242]

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[240] C-NSOPRAIA, ss 140 & 142; C-NLAAIA, ss 137 & 138.

[241] See page 79 for a list of specific authorizations, one of which is an "Install/Remove Application".

[242] *Nova Scotia Offshore Petroleum Drilling and Production Regulations*, SOR/2009-317, s 6(a) - (b); *Newfoundland Offshore Petroleum Drilling and Production Regulations*, SOR/2009-316, s 6(a) - (b).

Safety Plan

The safety plan establishes "the procedures, practices, resources and sequence of key safety related activities and monitoring measures necessary to ensure the safety of the proposed work."[243] Section 8 of the *Offshore Petroleum Production Regulations*, which apply in Nova Scotia and Newfoundland and Labrador, requires that safety plans include:

> (a) a summary of and references to the management system that demonstrate how it will be applied to the proposed work or activity and how the duties set out in these Regulations with regard to safety will be fulfilled;
>
> (b) a summary of the studies undertaken to identify hazards and to evaluate safety risks related to the proposed work or activity;
>
> (c) a description of the hazards that were identified and the results of the risk evaluation;
>
> (d) a summary of the measures to avoid, prevent, reduce and manage safety risks;
>
> (e) a list of all facilities, structures, equipment and systems critical to safety and a summary of the system in place for their inspection, testing and maintenance;
>
> (f) a description of the organizational structure for the proposed work or activity and the command structure on the installation, which clearly explains
>
> (i) their relationship to each other, and
> (ii) the contact information and position of the person accountable for the safety plan and of the person responsible for implementing it;
>
> (g) if the possibility of pack sea ice or drifting icebergs exists at the drill or production site, the measures to address the protection of the installation, including systems for ice detection, surveillance, data collection, reporting, forecasting and, if appropriate, ice avoidance or deflection; and
>
> (h) a description of the arrangements for monitoring compliance with the plan and for measuring performance in relation to its objectives.

Operators must submit a safety plan in support of the Authorization to Install/Remove required for decommissioning operations. The safety plan must:

- Demonstrate the existence of a management system capable of covering all aspects of the proposed decommissioning.
- Describe all relevant hazards and safety risks and the measures necessary to prevent, reduce and manage those risks.

[243] *Nova Scotia Offshore Petroleum Drilling and Production Regulations*, s 8; *Newfoundland Offshore Petroleum Drilling and Production Regulations.*

- List all facilities, structures, equipment and systems critical to safety and the procedures in place for their inspection testing and maintenance.
- Describe the procedures in place for responding to environmental threats, such as those posed by sea ice.
- Include compliance monitoring arrangements for measuring the safety plan's performance in relation to its objective.[244]

Environmental Assessment

Under the Accord Acts, each Board requires operators to conduct an EA as part of an application for authorization or approval to undertake works or activities.[245] The type of EA required will depend on the proposed works or activities. Those specified in the *Regulations Designating Physical Activities* will engage an EA under CEAA 2012;[246] those not specified will require an EA completed in accordance with the Board's internal procedure. See the section entitled "Environmental Impact Statement" earlier in this chapter for an elaboration of the content and process of EAs applicable for development projects and for authorizations for specific works or activities alike.

For example, the CEAA Screening Environmental Assessment for Phase II of the Cohasset Panuke Decommissioning Project was the unique EA prepared in advance of decommissioning operations.[247] In accordance with CNSOPB Recommendations, the EA assessed the environmental impacts of Encana's proposed decommissioning plan, which involved disconnecting the subsea flow lines, cables and manifold ends from the installation and leaving them in place on the seabed. Additionally, to facilitate a comparative assessment of alternative decommissioning methods, the CNSOPB required the scope of the EA to include the environmental impacts of removing all subsea components. The EA employed five valued ecosystem components to evaluate and compare the effects of the alternate decommissioning methods: marine benthos, or the community of marine organisms living near the seabed; marine fish; marine mammals; marine birds; marine special areas; and commercial fisheries. The EA incorporated feedback from relevant government departments, agencies and public stakeholders. Ultimately, the EA concluded that potential adverse effects from the proposed decommissioning plan would be short-term and limited to the area on the seabed. It further concluded that the partial disposal option would be less disruptive for the environment than complete removal.

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[244] *Nova Scotia Offshore Petroleum Drilling and Production Regulations, s 8; Newfoundland Offshore Petroleum Drilling and Production Regulations.*

[245] C-NSOPRAIA, s 142(4)(b); C-NLAAIA, s 138(4)(b).

[246] *Regulations Designating Physical Activities*, SOR/2012-147, ss 10-13. Note that sections 39-42 of the Physical Activities Regulations reproduce sections 10 - 14 as activities regulated under the *National Energy Board Act* or the *Canada Oil and Gas Operations Act.*

[247] Jacques Whitford Environmental Limited,"CEAA Screening Level Environmental Assessment Cohasset Panuke Phase II Decommissioning", prepared for Encana Corporation in April 2004.

The EA attracted written public comment from a range of commercial fishery and Aboriginal associations, including the following:

> To what extent and level of legally binding long term liability and compensation is EnCana or its legal successors prepared to commit to the CNSOPB Management Board Nova Scotia, and shared users of the ocean environment?[248]

In response, the CNSOPB required the applicant to submit to the Board an adequate plan addressing post-abandonment ongoing liability as a condition of its approval of the partial decommissioning proposal.[249]

Commercial fishing companies and industry associations articulated strong reservations about Encana's proposal to abandon the flow lines, mattresses and other equipment on the seafloor. Written comments noted potential negative impacts on exploitable biomass (quahog),[250] hazards to fishing gear and obstruction of fisheries.[251]

Aboriginal groups expressed concern that the EA and public consultation process failed to address the decommissioning proposal's impacts on the Aboriginal rights to present and future access to fisheries resources. The Native Council of Nova Scotia wrote to the CNSOPB that: "the EA was devoid of information as to our Native Council of Nova Scotia Community of Mi'kmaq/Aboriginal Peoples issues, concerns, interests and needs, and our current use of resources and future uses."[252] In 2004, when the Native Council raised these concerns, Aboriginal Peoples in Nova Scotia participated in the fishery as an Aboriginal right and as part of the "Aboriginal Communal Commercial Fishery" program administered by the Department of Fisheries and Oceans. The Council wrote that failure of the EA and public consultation process to sufficiently address Aboriginal interests amounted to a failure to discharge the "duty to consult".[253] Under Canadian constitutional law, the Crown has a duty to consult with, and where appropriate to accommodate, Aboriginal Peoples in relation to conduct that may adversely impact potential or established Aboriginal treaty rights.[254] Because offshore oil and gas activities, including decommissioning, carry the potential to adversely affect Aboriginal treaty rights such as those relating to fishing, government agencies responsible for offshore oil and gas approvals will be subject to a duty to consult.[255] The Crown, acting

[248] Letter to the CNSOPB by the Netukuliemkewe'l Commission (July 21 2004).

[249] CNSOPB, "Application to Amend the Cohasset Development Plan: Decision Report" at para 7.8.

[250] Letter to the CNSOPB by Clearwater Seafoods (June 22 2004).

[251] Letter to the CNSOPB by Seafood Producers Association of Nova Scotia (June 23 2004).

[252] Letter from the Native Council of Nova Scotia to the CNSOPB (November 18 2004).

[253] See *Haida Nation v British Columbia (Minister of Forests)*, [2004] 3 SCR 511.

[254] Government of Canada, "Aboriginal Consultation and Accommodation: Update Guidelines for Federal Officials to Fulfill the Duty to Consult" (March 2011) at 6.

[255] Government of Canada, "Aboriginal Consultation and Accommodation: Update Guidelines for Federal Officials to Fulfill the Duty to Consult" (March 2011) at 19.

through various government agencies, cannot delegate the duty to consult in its entirety to project proponents. Yet it can require proponents to consult with Aboriginal groups in relation to certain aspects of the proposed activity, as a precondition to regulatory approval.[256]

Regardless of whether the duty to consult falls on the Crown or project proponents, this 2004 experience confirms the value of incorporating Aboriginal consultation into the approvals process. Since 2004, Canadian jurisprudence has confirmed and strengthened the duty to consult.[257] Guidelines released by the federal government in March 2011 on "Aboriginal Consultation and Accommodation" provide that ultimately, the legal duty to consult will reside with the Crown. However, the Crown may:

> ...discuss with industry proponents early in the process about the possibility and extent to which it may rely on the proponent's engagement with Aboriginal groups as part of the formal consultation and accommodation process. Creating this understanding early in the planning stages of a project could help to define each party's roles and responsibilities and expectations.[258]

The Board sought written public opinion on the Cohasset Panuke decommissioning proposal in May 2004. On December 17, 2004, the Board conditionally approved the partial decommissioning proposal. It concluded it was not likely to cause significant adverse environmental effects based on an EA, a previously submitted Canada-Nova Scotia Benefits Plan, written public comment collected over approximately seven months, and numerous other factors. The approval was subject to the conditions that the applicant undertake mitigation and follow-up measures, remove the topsides of the PLEM installation, and submit to the Board an adequate plan addressing post-abandonment ongoing liability.[259]

Environmental Protection Plan

The environmental protection plan establishes the "procedures, practices, resources and monitoring necessary to manage hazards to and protect the environment from the proposed work or activity."[260] Section 9 of the *Nova Scotia Offshore Petroleum Drilling and Production Regulations* requires that the environmental protection plan include:

> (a) a summary of and references to the management system that demonstrate how it will be applied to the proposed work or activity and how the duties set out in these Regulations with regard to environmental protection will be fulfilled;

[256] Government of Canada, "Aboriginal Consultation and Accommodation: Update Guidelines for Federal Officials to Fulfill the Duty to Consult" (March 2011) at 19.

[257] See *Tsilquot'n Nation v British Columbia*, 2014 SCC 44.

[258] Government of Canada, "Aboriginal Consultation and Accommodation: Update Guidelines for Federal Officials to Fulfill the Duty to Consult" (March 2011) at 19.

[259] CNSOPB, "Application to Amend the Cohasset Development Plan: Decision Report".

[260] *Nova Scotia Offshore Petroleum Drilling and Production Regulations*, SOR/2009-317, s 9.

> (b) a summary of the studies undertaken to identify environmental hazards and to evaluate environmental risks relating to the proposed work or activity;
>
> (c) a description of the hazards that were identified and the results of the risk evaluation;
>
> (d) a summary of the measures to avoid, prevent, reduce and manage environmental risks;
>
> (e) a list of all structures, facilities, equipment and systems critical to environmental protection and a summary of the system in place for their inspection, testing and maintenance;
>
> (f) a description of the organizational structure for the proposed work or activity and the command structure on the installation, which clearly explains
>
> (i) their relationship to each other, and
>
> (ii) the contact information and position of the person accountable for the environmental protection plan and the person responsible for implementing it;
>
> (g) the procedures for the selection, evaluation and use of chemical substances including process chemicals and drilling fluid ingredients;
>
> (h) a description of equipment and procedures for the treatment, handling and disposal of waste material;
>
> (i) a description of all discharge streams and limits for any discharge into the natural environment including any waste material;
>
> (j) a description of the system for monitoring compliance with the discharge limits identified in paragraph(i), including the sampling and analytical program to determine if those discharges are within the specified limits; and
>
> (k) a description of the arrangements for monitoring compliance with the plan and for measuring performance in relation to its objectives.[261]

The CNSOPB, CNLOPB and the National Energy Board (the "**NEB**") developed joint guidelines to provide additional assistance to operators formulating environmental protection plans. These Guidelines summarize the purpose of the environmental protection plan as a means:

> ...to demonstrate that the operator has taken all reasonable and practicable steps to achieve environmental protection for the proposed work or activity, taking into account the interaction of all components, including structures, facilities, equipment, operating procedures and personnel.[262]

[261] *Nova Scotia Offshore Petroleum Drilling and Production Regulations*, SOR/2009-317, s 9.

[262] CNSOPB, CNLOPB & NEB, "Environmental Protection Plan Guidelines" (March 30 2011) at 3 - 4.

The focus of the environmental protection plan is on operations to avoid, prevent, reduce and manage the risks of identified environmental risks, rather than the environmental risks themselves. In the plan, the operator should demonstrate it has anticipated and effectively addressed the environmental risks attending all phases of the decommissioning process from planning, to platform preparation, to the removal, transport and unloading of installation components, to site remediation and monitoring.

Spill Contingency Plan

For drilling and production activities, operators must file a spill contingency plan outlining the procedures to be followed in the event of an oil spill.[263] The contingency plan must provide for coordination measures with relevant municipal, provincial, territorial or federal emergency response plans, and "in an area where oil is reasonably expected to be encountered, identify the scope and frequency of the field practice exercise of spill countermeasures".[264]

A spill contingency plan will be less relevant for decommissioning operations than for drilling and production operations. However, the presence of hydrocarbons in storage reservoirs, pipelines, flow lines and other installation components mean that a spill contingency plan will remain an important part of decommissioning proposals.

Financial Responsibility

Before issuing an authorization for a work or activity, the Accord Acts and the *Canada Oil and Gas Operations Act*[265] require the Boards to ensure applicants for authorizations for the drilling for or production of oil or gas have complied with two distinct financial responsibility requirements: proof of financial resources and financial responsibility.[266]

First, effective February 2016 when ESSA comes into force, applicants will have to provide proof of financial resources of $1 billion to ensure they have the capacity to pay the maximum absolute liability. Operators will be liable up to this amount without "proof of fault or negligence" in the event of a spill or damages caused by debris.[267] Notably, prior to ESSA, the absolute liability amounts were $30 million for offshore petroleum activities in Canada and $40 million in the Arctic.[268]

Applicants for authorizations for other works or activities, which may include decommissioning, must provide proof in the prescribed form and manner that they have adequate financial resources to pay an amount determined by the Board.[269]

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[263] *Nova Scotia Offshore Petroleum Drilling and Production Regulations*, SOR/2009-317, s 6(1)(j).

[264] *Nova Scotia Offshore Petroleum Drilling and Production Regulations*, SOR/2009-317, s 6(1)(j), s 6(1)(j)(i)—(ii).

[265] *Canada Oil and Gas Operations Act*, RSC 1985, c O-7 [COGOA].

[266] C-NSOPRAIA, 142(4)(a) & 142.3; C-NLAAIA, s 138(4)(a) & 138.3.

[267] ESSA, s 19(1) amending s 26(1)(a)—(b) of COGOA.

[268] Oil and Gas Spills and Debris Liability Regulations, SOR/87-331, s 3.

[269] ESSA, s 20, amending s 26(2) of COGOA.

Applicants are required to submit to the Board a statement explaining how their net assets or funding arrangements satisfy the financial resources requirements, accompanied by acceptable proof. Currently, the Board accepts the following proof:

- Audited financial statements (with credit rating where applicable).
- Promissory note.
- Insurance policy or certificate of insurance.
- Escrow agreement.
- Letter of credit.
- Undrawn line of credit.
- Guarantee.
- Security bond or pledge, or indemnity bond or suretyship.[270]

Second, applicants must provide proof of financial responsibility in the form of a letter of credit, guarantee or indemnity bond or in any other form satisfactory to the Board, in the amount of $100 million or greater if the Board considers it necessary.[271] ESSA introduces some flexibility into the financial responsibility amounts by authorizing the Minister to accept a lesser amount than the prescribed minimum on the Board's recommendation.[272] For other activities, including decommissioning, the Board may specify an amount greater or lesser than $100 million.[273] Accordingly, for authorization for decommissioning operations, the financial responsibility requirements will be a function of the anticipated risks, losses, damages, costs and expenditures associated with the proposed works.

As an alternative to providing a deposit, applicants may demonstrate proof of financial responsibility by confirming their membership in an industry pooled fund maintained at a minimum of $250 million.[274] Regulations governing the administration of pooled funds are currently being developed within the parliamentary consultation process.

Certificate of Fitness

Under the Accord Acts, before a Board can authorize certain works or activities, the applicant must first submit a declaration in the prescribed form affirming:

> [T]he equipment and installations that are to be used in the work or activity to be authorized are fit for the purposes for which they are to be used, the operating procedures relating to them are appropriate for those uses, and the personnel who are to be employed in connection with them are qualified and competent for their employment.[275]

[270] Dan Watt, Memorandum Re Meeting with Shanti Dogra and Christine Bonnell-Eisnor re CNSOPB Initiatives (June 10 2015).

[271] ESSA, s 21(1) amending s 27(1)(a) of COGOA.

[272] ESSA, s 22 amending s 27 of COGOA.

[273] ESSA, s 21(1) amending s 27(1)(b) of COGOA.

[274] ESSA, s 21(1) amending s 27 of COGOA.

[275] C-NSOPRAIA, s 143.1; C-NLAAIA, s 139.1.

That declaration must be filed in the form of a Certificate of Fitness issued by a certifying authority.[276] Certifying authorities are those bodies that have met the regulatory requirements, and are named in the *Offshore Certificate of Fitness Regulations*.[277] The installations requiring a Certificate of Fitness include: production, accommodation and diving installations positioned at a production site; and drilling, diving and accommodation installations at a drill site.[278] It is unlikely that obtaining a Certificate of Fitness will be necessary to receive authorization for decommissioning operations unless infrastructure will be remaining in place to carry out a different function.

Declaration of Operator

A Declaration of Operator is required for all activities. The Declaration is a signed statement by the operator's senior officer affirming that: the operator has undertaken, or has caused to be undertaken, sufficient work to be satisfied that the equipment and installation are fit for their purpose; and the personnel employed in connection are qualified and competent, such that the work can be performed safely.[279]

Conclusions on Decommissioning Under the Accord Acts and Best Practices

Under the Accord Acts, operators must receive Board approval for decommissioning operations at two distinct stages: at the Project Development phase through the inclusion of provisions on decommissioning and abandonment in the Development Plan, and at the authorization stage before undertaking the specific decommissioning operations. In addition, operators may be required to seek Board approval for operations that depart from the original provisions of the Development Plans.

Legislation, regulations and guidelines dictate the supporting documents required for Development Plan approval or for authorizations for specific works or activities. Several of those supporting documents will also require consultation with government departments, agencies or other stakeholders, such as the regional Benefits Plan, EIS and accompanying EA, and socio-economic impact statement where applicable.

The anticipatory nature of Development Plan provisions on decommissioning confirm that greater scrutiny will be focused on proposed decommissioning operations at the work authorization stage, where they are at the centre of attention of the relevant Boards, other regulatory agencies, government departments, stakeholders and the public. However, decommissioning operations remain an important component of a proposed offshore development project. They engage significant safety and environmental considerations.

[276] C-NSOPRAIA, 143.2; C-NLAAIA, s 139.2.

[277] *Nova Scotia Offshore Certificate of Fitness Regulations*, SOR/95-187; *Newfoundland and Labrador Certificate of Fitness Regulations*, SOR/95-100.

[278] *Nova Scotia Offshore Certificate of Fitness Regulations*, s 4; *Newfoundland and Labrador Certificate of Fitness Regulations*, s 4.

[279] See CNSOPB, Declaration of Operator Form (Mar 23 2011); See CNLOPB, Declaration of Fitness Form (July 27, 2003).

Moreover, decommissioning operations carry the potential to generate lasting environmental and socio-economic impacts both onshore and offshore. These considerations suggest that proposed decommissioning operations included in Development Plans will be subject to certain regulatory scrutiny. Indeed, the commission convened to conduct the public review component of the proposed Hebron Project Development Plan application confirmed that proposed decommissioning operations can form the basis for conditions to Plan approval. The Hebron Commissioner ultimately expressed concern that the contingency plans included within the concept safety analysis submitted by the proponent in its preliminary materials inadequately addressed major risks to human safety during the tow out, construction and abandonment phases of the project.[280]

For these reasons, at both the Development Plan application stage and the work authorization stage, operators must be alert to decommissioning best practices. Best practices emerging from Newfoundland and Labrador and Nova Scotia include:

- The Hebron Project in Newfoundland and the Sable Offshore Energy Project in Nova Scotia confirm the importance of incorporating decommissioning operations into the components of the Development Plan dealing with safety analysis, risk assessment and contingency planning as fully as possible, but with appropriate cautions as to the changes in conditions which will invariably arise in the intervening decades before decommissioning activities will take place.
- The public consultation process accompanying the application to amend the Cohasset Panuke Development Plan to permit the abandonment of subsea flow lines on the sea floor confirms the value of anticipating and addressing the interests of stakeholders in proposed decommissioning operations.
- Where proposed decommissioning operations have the potential to impact Aboriginal rights or treaty rights of Aboriginal Peoples to the present or future use of a resource, engaging in direct consultation with Aboriginal groups may be an effective method of achieving consensus in selecting decommissioning operations.
- Where proposed decommissioning operations carry the potential to impact fishery interests, anticipating and addressing those impacts through the EA process may be an effective method of achieving consensus in selecting decommissioning operations. Monitoring environmental changes as well as changes in fishing technology will enhance the extent to which proposed decommissioning operations respond to the present and future interests of the fishery.

[280] "Report of the Hebron Public Review Commissioner for the Hebron Development Plan Application" (February 2012) recommendation 4.2. The Recommendation provides: "As a condition of the fundamental decision, the Commissioner recommends that contingency plans be provided within the CSA for the major hazards chosen for assessment in the CSA and any potential accidents resulting thereof, and that the conditions for updating the CSA be defined by the Proponent. The Commissioner also recommends that the CSA consider major risks to human safety during saturation diving operations, and during the tow-out/construction and abandonment phases of the Project."

- The public consultation process accompanying the application to amend the Cohasset Panuke Development Plan suggests that where proposed decommissioning operations contemplate the partial abandonment of certain components of the installation, anticipating and establishing terms of continuing liability and financial responsibility early may provide an effective means of achieving consensus with relevant stakeholders.

Regulation of Offshore Decommissioning in the Arctic

The regulatory framework governing offshore oil and gas exploration and production in the Canadian Arctic mirrors the regulatory framework governing oil and gas activities in Atlantic Canada's offshore.

NEB Authority

The NEB exercises primary regulatory responsibility over offshore oil and gas activities in the Canadian Arctic. Unlike its counterparts in Atlantic Canada, the NEB does not manage the issuance of exploration or drilling rights, tenures or royalty payments; these are the responsibility of Aboriginal Affairs and Northern Development Canada. However, like the federal-provincial boards under the Accord Acts, the NEB exercises regulatory authority over offshore health and safety, marine environmental protection and emergency response and preparedness for the full spectrum of offshore oil and gas activities, from seismic surveys to drilling and production to decommissioning, under the *Canada Oil and Gas Operations Act* ("**COGOA**") and its regulations.

NEB Approval Process

Before the NEB can approve an offshore oil and gas project, proponents or operators are required to submit a Development Plan together with supporting documents.[281] The COGOA provisions governing the form, content and approvals process for Development Plans mirror those of the Accord Acts. Similarly, before the NEB can approve specific works or activities carried out within the context of a development project, proponents must submit an application for authorization together with the supporting documents.[282]

Regulations enacted under COGOA elaborate on the requirements of the approval and authorizations process by providing prescriptive and performance-based regulations for proponents and operators. The primary regulations enacted under COGOA are virtually identical to those applicable in Atlantic Canada, and include: the *Canada Oil and Gas Installations Regulations*,[283] the *Canada Oil and Gas Operations Regulations*,[284] the *Canada*

[281] COGOA, s 5.1(1).

[282] COGOA, s 5(1).

[283] SOR/96-118.

[284] SOR/83-149.

Oil and Gas Drilling and Production Regulations,[285] the *Canada Oil and Gas Diving Regulations*,[286] the *Canada Oil and Gas Certificate of Fitness Regulations*[287] and the *Oil and Gas Spills and Debris Liability Regulations*.[288] As on the Atlantic coast, these regulations govern all aspects of offshore activity, including those pertaining to decommissioning. Section 43 of the *Canada Oil and Gas Installations Regulations* provides:

> Where the removal of a fixed offshore production installation is a condition of a development plan approval, the operator shall incorporate in the design of the installation such measures as are necessary to facilitate its removal from the site without causing a significant effect on navigation or the marine environment.[289]

To account for the unique operating conditions encountered in Canada's Arctic, the NEB developed "Filing Requirements for Offshore Drilling in the Canadian Arctic" in 2011.[290] The Filing Requirements are the result of an Arctic Offshore Drilling Review commissioned in the wake of the 2010 BP Macondo – *Deepwater Horizon* incident, where a surge of natural gas from the Macondo reservoir caused an explosion aboard the *Deepwater Horizon* producing 11 casualties. The explosion eventually caused the rig to sink. The failure of the well's blow out preventer led to the release of as many as 4.9 million barrels of oil daily over a three month period.[291] The Filing Requirements provide a non-exhaustive outline of information the NEB will require in assessing applications for proposed offshore oil and gas activities. Again those requirements closely mirror those applicable in Atlantic Canada for Development Plans, including an EIS, a regional Benefits Plan and public review.[292] For authorizations for specific works or activities, the Filing Requirements prescribe that applicants must include a declaration of fitness, a Certificate of Fitness, a description of management systems that incorporates risk assessment and consideration of human factors, a safety plan, provisions for ice management, provisions for transportation and helicopter safety, a waste management plan, an environmental protection plan, pollution monitoring and response, a contingency plan for an uncontrolled release, a spill contingency plan, and emergency response procedures.[293]

Although the requirements for regulatory approval or authorization in the Canadian Arctic closely mirror those of Atlantic Canada, applicants must ensure that all supporting documents reflect the unique environmental and socio-economic conditions of Canada's North. This is achieved in part by prescriptions of regional legislation that requires proponents to consult with regulatory bodies unique to the Northwest Territories, Nunavut and the Yukon.

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[285] SOR/2009-315.

[286] SOR/88-600.

[287] SOR/96-114.

[288] SOR/87-331.

[289] *Canada Oil and Gas Installations Regulations*, s 43.

[290] National Energy Board, "Filing Requirements for Offshore Drilling in the Canadian Arctic" (2011).

[291] https://www.neb-one.gc.ca/nrth/rctcffshrdrllngrvw/2011fnlrprt/index-eng.html.

[292] COGOA, s 5.2.

[293] National Energy Board, "Filing Requirements for Offshore Drilling in the Canadian Arctic" (2011).

Through that consultation process, proponents and operators will be required to ensure that proposed projects or activities reflect the interests of local stakeholders.

Furthermore, proponents or operators seeking approval or authorization for offshore oil and gas activities in Canada's Arctic must comply with additional legislation and regulations, including:

- *Arctic Waters Pollution Prevention Act.*
- *Canada Shipping Act.*[294]
- *Fisheries Act.*[295]
- *Nunavut Land Claims Agreement Act and Nunavut Water Regulations.*[296]
- *Oceans Act.*[297]
- *Western Arctic Inuvialuit Claims Settlement Act.*[298]

Additional Legislation and Regulations

In addition to the Accord Acts (governing offshore activities in Atlantic Canada) and the *Canada Offshore Oil and Gas Act* and associated regulations, project proponents, operators and sub-contractors contemplating decommissioning operations in Canada's offshore may also be responsible to obtain approvals and authorizations under additional legislation regulating areas including the environment, the import and export and disposal of hazardous wastes, marine safety, immigration, customs and excise duties and taxation. The specific approvals and authorizations ultimately required will depend on the nature of the decommissioning activities proposed and the area where decommissioning activities are carried out. A non-exhaustive list of the approvals and authorizations relevant to decommissioning operations includes:

- Requirements for the transportation of hazardous goods under the *Canadian Environmental Protection Act, 1999* ("**CEPA**"), which regulates the movement of hazardous wastes and hazardous recyclable materials within Canada.[299] The requirement to obtain a permit would likely be engaged by operations involving removing hazardous materials from an installation on Canada's continental shelf and transporting them to either a Canadian or a non-Canadian location. Specific permitting requirements will be dictated by the *Interprovincial Movement of Hazardous Waste Regulations*[300] and the *Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations.*[301]

[294] SC 2001, c 26.
[295] RSC 1985, c F-14.
[296] SC 1993, c 29; SOR/2013-69.
[297] SC 1996, c 31.
[298] SC 1984, c 24.
[299] *Canadian Environmental Protection Act*, 1999, SC 1999, c 33, s 189.
[300] SOR/2002-301.
[301] SOR/2005-149.

- Requirements for the disposal of wastes at sea under Part 7 of CEPA. The requirement to obtain a permit would likely be triggered by decommissioning operations proposing the partial removal of the disused installation or its components. Relevant permitting requirements are dictated by the *Disposal at Sea Regulations*[302] and *Disposal at Sea Application Permit Regulations.*[303]
- Additional permitting requirements under other Canadian environmental legislation. These include an "Authorization of Works or Undertakings Affecting Fish Habitats" under section 35(2) of the federal *Fisheries Act.*[304] Depending on the location of the proposed decommissioning operations, specific legislation may also apply, including the *Canada Wildlife Act*,[305] the *Canadian Marine Conservation Areas Act*,[306] and the *Migratory Birds Convention Act, 1994.*[307]
- Requirements for vessels engaged in decommissioning to comply with applicable marine safety and pollution prevention documentation requirements imposed by the *Canada Shipping Act, 2001*, more specifically, the *Vessel Certificate Regulations.*[308]
- Requirements for vessels engaged in sustained decommissioning operations to apply to Canadian authorities for a determination of whether the proposed "work" is likely to substantially interfere with navigation under the *Navigation Protection Act.*[309]
- Requirements for the temporary importation of foreign vessels for use in Canada's coasting trade under the *Coasting Trade Act.*[310]
- Immigration requirements and requirements to obtain temporary work permits for foreign personnel employed as crew aboard decommissioning vessels operating in waters under Canadian jurisdiction under the *Immigration and Refugee Protection Act.*[311]
- Requirements for vessels engaged in decommissioning activities to comply with the relevant taxation rules provided under the *Excise Tax Act.*[312]

[302] SOR/2001-275.

[303] SOR/2014-177.

[304] *Fisheries Act*, RSC 1985, c F-14, s. 35.

[305] *Canada Wildlife Act*, RSC 1985, c W-9, s 4.1.

[306] *Canadian National Marine Conservation Areas Act*, SC 2002, c 18, s 29(1).

[307] *Migratory Birds Convention Act*, 1994, SC 1994, c 22.

[308] SC 2001, c 26; SOR/2007-31.

[309] *Navigation Protection Act*, RSC 1985, c N-22, s 5 as amended.

[310] SC 1992, c 31; See Canada Border Services Agency, "Temporary Importation of Vessels" Memorandum D 3-5-7, Ottawa, December 6, 2011, online: http://www.cbsa-asfc.gc.ca/publications/dm-md/d3/d3-5-7-eng.html.

[311] SC 2001, c 27.

[312] SC 1997, c 36; RSC 1985 c E-15.

CHAPTER 5

DECOMMISSIONING BEST PRACTICES

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DECOMMISSIONING BEST PRACTICES

To identify decommissioning best practices in 2016, this guidebook has undertaken a three-part analysis, offering:

- A technical description of decommissioning methods, process and the issues that flow from the decision to select one decommissioning method over another; issues related to offshore occupational health and safety and marine environmental protection; and the socio-economic and political dimensions of decommissioning operations.
- A description of the international, regional and national regulations governing decommissioning operations, focusing on those applicable to decommissioning operations carried out under Canadian jurisdiction.
- An examination of the widely publicized and dramatic *Brent Spar* incident, previously completed decommissioning operations in Canada, and the decommissioning and abandonment sections of five East Coast Canada Development Plans.

The following recommendations capture the best practices distilled from this analysis and seek to provide overarching guidance to companies or consultants as they navigate the decommissioning process.

1. **Draft your Development Plan with care.** Draft carefully the decommissioning and abandonment sections of your project's Development Plan. Sensitive drafting may minimize regulatory and hearing time. The Deep Panuke model is a good one:
   - Avoid firm commitments. Do not commit, for instance, to remove all infrastructure from the subsea. Actual decommissioning might not take place for decades and what appears to be the best option at the time of the Development Plan may be superseded by safer, more environmentally satisfactory and/or less expensive options. To alter a firm Development Plan commitment will undoubtedly require a time-consuming, expensive and uncertain amendment application.
   - Do commit to decommission in accordance with best industry practice and regulations existing at the time of decommissioning.
   - Set out the specifics of a hypothetical decommissioning plan that assumes regulations existing at the time of decommissioning are the same as those when the Development Plan is drafted. This permits a high degree of specificity to show the seriousness with which you take decommissioning, but without a commitment to what might not be the best strategy when your project winds up.

And consider the extent, if any, to which your decommissioning plan will cover:

- Any Aboriginal treaty and non-treaty rights, including the broad procedural right to meaningful consultation, that any aspect of the decommissioning plan may potentially affect.
- The local benefits that will flow from decommissioning and ongoing monitoring obligations.
- Royalty and tax issues that may be affected by the treatment of decommissioning costs.
- The duration and extent of the operator's continuing liability for environmental and other damage that may be alleged to arise in connection with the decommissioning process.

2. **Keep this in mind: the decommissioning of your offshore project's infrastructure might attract world-wide attention.** Anything affecting the oceans might attract attention from anywhere on the globe. Public opinion outside your project's jurisdiction could play a role in the way your decommissioning plan is received.
3. **Be familiar with International Conventions on decommissioning.** This need to expect world-wide attention to your decommissioning plan means you need to be familiar with what the world has adopted as best practices. Some treaties may have been incorporated into the law of your jurisdiction, in which case you will know them. But unincorporated treaties, protocols and guidelines, although not binding in your jurisdiction will give you a sense of what the world considers minimum best practices in decommissioning strategies.
4. **Keep an eye on the environmental fringe.** Planning for world-wide attention also means you always need to have a sense of what lies on the fringes of environmental movements. Groups advocating what seem to be extreme environmental positions today may, for good or ill, presage the environmental law of the future. If Shell had been able to predict that Greenpeace's illegal occupation of the *Brent Spar* would receive the strong public approval that it did, it might have been better prepared to respond to the blanket fear of ocean dumping that underlain public sentiment at the time.
5. **Create a comprehensive communications strategy.** In case of unexpected developments, it will be important to know who will deliver the corporate response in order to avoid inconsistent messaging and to best control whatever situation develops. This strategy may involve such micro matters as avoiding inflammatory language; for example, "Gravity Induced Relocation" may be less inflammatory than "Dumping".
6. **Stay in touch with your regulator.** This is no doubt obvious and good practice for all aspects of project development, but it is important to know who and where your allies are and what reactions you are likely to expect from them, especially if a proposed activity – decommissioning for example – attracts unwelcome attention. This requires a regular assessment of the cooperation and expertise levels of the applicable regulator and government officials.

7. **Conduct a mid-point check.** Perhaps not as early as the mid-point of the projected life cycle of your project, but at least five years before its estimated completion, check the decommissioning commitments and other provisions set out in your Development Plan. In particular, check for any changes in the law and for any technological developments that might point to better ways to accomplish decommissioning and abandonment. Determine early on whether you should be planning to amend your Development Plan so you will have enough time to properly prepare the amendment application.

8. **Monitor actual environmental changes.** Any environmental change – in ocean temperature, extreme weather incidents, air temperature, fish populations, migration patterns, current direction and strength and so on – over the decades between project initiation and completion may affect the continuing usefulness and validity of earlier environmental studies undertaken in connection with your project's Development Plan, including any that supported your early decommissioning strategy.

9. **Always be aware of potential alternate or secondary uses for your project installation and related infrastructure.** It will be important to keep a regularly updated checklist of possible secondary uses because the post-production use of an offshore installation, at the top of the hierarchy of waste principles, may well be the most efficient and environmentally sensible alternative in its decommissioning. Today, it is wind farm and cell phone tower; tomorrow, who knows.

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