Civil Liability and Financial Security for Offshore Oil and Gas Activities

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Contents

1. Introduction

The background for this research on civil liability and financial security for offshore oil and gas activities constitutes no doubt the explosion of the mobile deepwater offshore rig Deepwater Horizon on 20 April 2010 in the Gulf of Mexico with an estimated 4.9 million barrels of oil that were spilled in the sea as a result. Estimated damages first ranged between 1 billion and 3.5 billion dollar.[1]

Luckily, at the place where the Deepwater Horizon incident occurred, US law applied, in this particular case the US Oil Pollution Act 1990 (OPA 90). OPA 90 does have a liability regime for offshore facilities. However, at the same moment, the international community also realized that the international regime for oil spills had in fact largely focused on vessel source pollution. Famous incidents with e.g. the Torrey Canyon (1976), Amoco Cadiz (1978), Exxon Valdez (1989) and Erika (1999) led to the development of an impressive international liability regime.[2] Indeed, at international level a compensation regime for vessel-source oil pollution was already established in 1969-1971 through the adoption of two international conventions, the International Convention on Civil Liability for Oil Pollution Damage, 1969 (also referred to as the CLC 1969), and the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971 (the Fund Convention 1971).[3] These conventions went through many evolutions as a result of which, most importantly, the amounts were increased after every incident that had again challenged the financial limits on the liability of the tanker owner. Interestingly, the European Commission was dissatisfied with the measures taken at the international level by the International Maritime Organisation (IMO) and therefore strived for a better protection of the European waters from the risks of oil pollution. In principle, the EU relied on the Member States to ratify various international maritime conventions, but, being dissatisfied with the IMO, the European Commission also started to take its own initiatives for legislation at the European level.[4] The European Commission subsequently adopted the so-called Erika I and Erika II packages in which it *inter alia* proposed to set up a European fund (referred to as the Cope fund) with an updated ceiling of € 1 billion (instead of the € 200 million that was then applicable under the international conventions).[5] Interestingly, this European activism led the IMO to increase the limits of the 1992 CLC and the Fund Convention by 50%, with effect from November 2003. This led to the adoption of a supplementary fund for oil pollution damage, leading to a total amount of compensation (again, only in case of vessel source pollution) of 750 million Special Drawing Rights (SDR), which at the time of adoption corresponded to approximately US $ 1 billion. Hence, one could notice that the European activism led to actions at the international level where the IMO basically took over the initiative proposed by the European Commission which obviously made European initiative in that domain no longer necessary.[6] Whereas EU activism hence led to a widely satisfying liability and compensation regime in case of vessel source pollution, the incident with the Deepwater Horizon[7] again led to a shock, realizing that huge damage can also be caused by offshore facilities of which the liability and financial security is largely left to Member State law. More particularly, given the often transboundary character of spills and accidents taking

[1] Hearing House of Representatives of the US, Committee on transportation and infrastructure, 8 June 2010, p. 15-16. Later cost estimates were increased and were nearer to $ 30 billion. It was considered the largest marine oil spill in American history.

[2] For a discussion of this international liability regime see *inter alia* Verheij (2007).

[3] The civil liability and fund conventions will be discussed in further detail below in Chapter 4.

[4] See in this respect more particularly the publication on 24 February 1993 of the long-awaited communication on safe seas, COM(93) 66 final.

[5] See the amended proposal for a regulation of the European Parliament and of the council on the establishment of a fund for the compensation of oil pollution damage in European waters and related measures, *Official Journal* C227 E/487 of 24 September 2002.

[6] For a sketch of these developments, see Wang (2007).

[7] For a detailed analysis of the Deepwater Horizon case, see also Perry (2011).

place from an offshore facility, there is a strong argument for a transnational regulation of civil liability and financial security, hence at least for EU action and (perhaps following the example of vessel source pollution) eventually for IMO action as well.

There are, also as far as Europe is concerned, quite a few reasons for concerns with respect to damage which may be caused by offshore incidents. As we will show below, there is in fact, internationally, quite an impressive record of offshore incidents, but also the North Sea has experienced many offshore accidents. Just to name a few: Alexander Kielland (1980), Piper Alpha (1988), Forties Alpha (2003), Gullfaks C (2010) and most recently Gannet Alpha (2011) are incidents that occurred in the North Sea and have increased concerns on consequences of those incidents in Europe. Although, as we already mentioned, there is until now no formal European regime dealing particularly with offshore pollution issues, there is surely relevant legislation that comes to mind. Undoubtedly, the Marine Strategic Framework Directive plays an important role.[8] This Directive "requires addressing the cumulative impacts from all activities on the marine environment" and "is relevant to offshore oil and gas operations as it requires linking the particular concerns from each economic sector with the general aim of a comprehensive understanding of the oceans, seas and coastal areas, with the objective to develop a coherent approach to the seas taking into account all economic, environmental and social aspects through the use of Maritime spatial planning and Marine knowledge."[9]

When the Deepwater Horizon accident occurred on 20 April 2010 in the Gulf of Mexico, the Commission immediately launched a Communication to assess the risks in the offshore oil and gas industry in European waters.[10] The Commission has explored a wide range of problems including the licensing, controls by public authorities and spill response. In particular, when it addressed the liability issue, the Commission considered the possibility of extending the Environmental Liability Directive(ELD)[11] to cover environmental damage to all marine waters as defined in the Marine Strategy Framework Directive,[12] and the applicability of the Waste Framework Directive.[13] The Commission also realized that the possibilities of a financial cap on the liability and mandatory financial security are worth further analysis.[14] The Commission was not only concerned with offshore activities in EU waters, but also showed concerns to the EU based offshore industry operating in other parts of the world, and it called on the industry's international obligation as responsible operators.[15]

On 27 October 2011, the Commission initiated two proposals, one for a Regulation on safety of offshore activities,[16] and the other for the accession of the EU to the Offshore Protocol of the Barcelona Convention.[17] The proposed Regulation (COM (2011) 688 final) follows on the principal issues raised in the Communication in 2010, and will impose stricter safety standards for offshore activities in Europe and will give national regulators more power to inspect their operations. It also extends 16-fold the zone in which companies will be held liable for environmental damage.It specifies that the licensee shall be held "liable for the

[8]Directive 2008/56/EC.
[9]COM(2011) 688 final, p. 14.
[10] COM(2010) 560 final, Communication from the commission to the European Parliament and the Council Facing the Challenge of the Safety of Offshore Oil and Gas Activities, 12 October 2010.
[11]Directive 2004/35/EC.
[12]Directive 2008/56/EC.
[13]COM(2010) 560 final, p. 8.
[14]COM(2010) 560 final, p. 8.
[15]COM(2010) 560 final, p. 13.
[16] COM(2011) 688 final, Proposal for a Regulation of the European Parliament and of the Council on Safety of Offshore oil and Gas Prospection, Exploration and Production Activities, 27 October 2011.
[17] COM(2011) 690 final, Proposal for a Council Decision on the Accession of the European Union to 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, 27 October 2011.

prevention and remediation of environmental damage" pursuant to the Environmental Liability Directive.[18] Meanwhile on 21 February 2013 MEPs and Member States reached a provisional agreement on (what has now become) a Directive to improve the safety of offshore oil and gas activities in the EU. The Directive was signed by the Council on 12 June 2013 and just published in the Official Journal on 28 June 2013.[19]

This evolution shows that various proposals now lay on the table, but questions arise as to which direction the civil liability and financial security for offshore oil and gas activities should take. An impressive impact assessment which accompanied the Proposal for a Regulation of the European Parliament and of the Council on Safety of Offshore Oil and Gas Exploration and Production Activities (as EC (2011) 1293 final) also sketched not only the justification for EU action, but also the various policy options, more particularly with respect to clarifying the scope of liability.

The sketch of the factual and legal evolutions so far clearly justifies a thorough study of civil liability and financial security for offshore oil and gas activities, more particularly in European waters. Summarizing:

- Many incidents with offshore facilities have taken place in European waters;
- The Deepwater Horizon incident of April 2010 showed the potentially enormous amount of damage which could result from such an incident;
- Many offshore incidents can have a transboundary character, thus justifying the need for European action;
- Whereas an elaborate international (IMO founded) regime exists for vessel source marine pollution, such a regime is absent for damage resulting from offshore facilities;
- This justifies the need to examine how a potential European liability and financial security regime for damage caused by offshore activities could be shaped.

Examining how a potential European liability and financial security regime for damage caused by offshore installations could be shaped is precisely the goal of the current study.

This paper is built up as follows: after this introduction we first provide an assessment of the extent of the problem (2), then we provide an analysis of existing legal regimes (3); we address existing risk pooling schemes (4) and then elaborate on the use of financial market instruments to cover traditional liabilities following a major offshore incident (5). Next, the potential of financial and insurance instruments to cover liability following a major offshore accident is addressed (6) as well as the various scenarios that could be followed for civil liability regimes and financial security mechanisms (7). The paper concludes with a few recommendations for actions at EU-level (8).

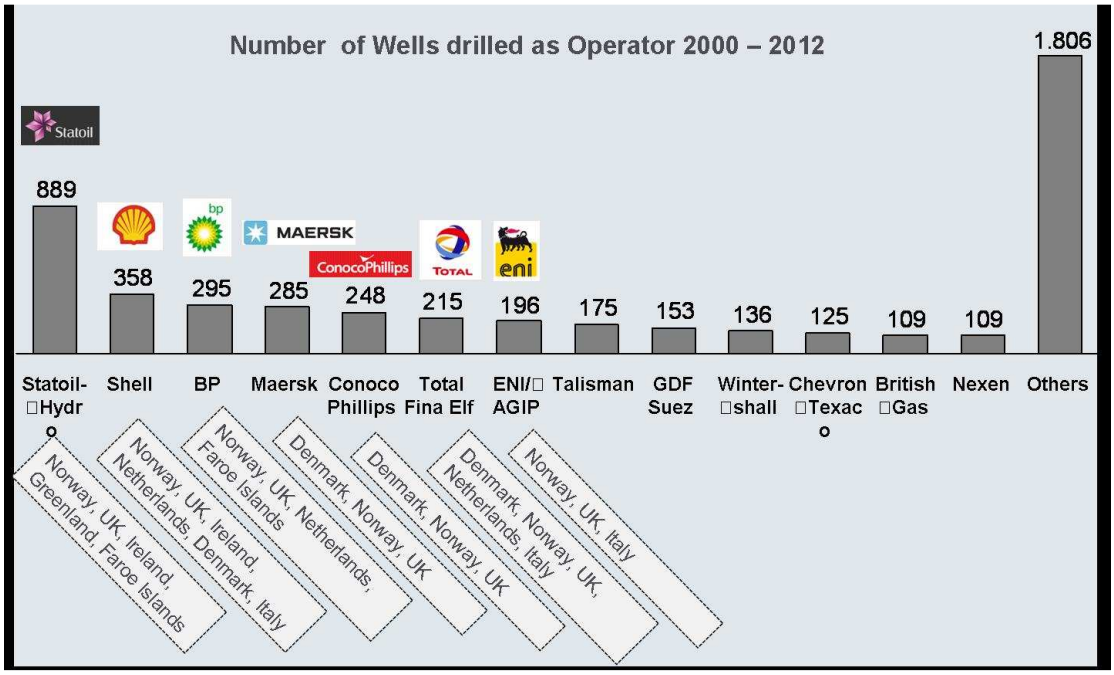
2. An assessment of the extent of the problem

The following figure provides an overview of the oil companies with explorations/production licences in Europe:

[18]COM(2011) 688 final, Article 7.

[19]Directive 2013/30/EU of the European Parliament and of the Council of 12 June 2013 on Safety of Offshore Oil and Gas Operations and Amending Directive 2004/35/EC, Official Journal L 178/66-101, 28 June 2013. This Directive will be discussed in further detail below in 3.4.2.6.

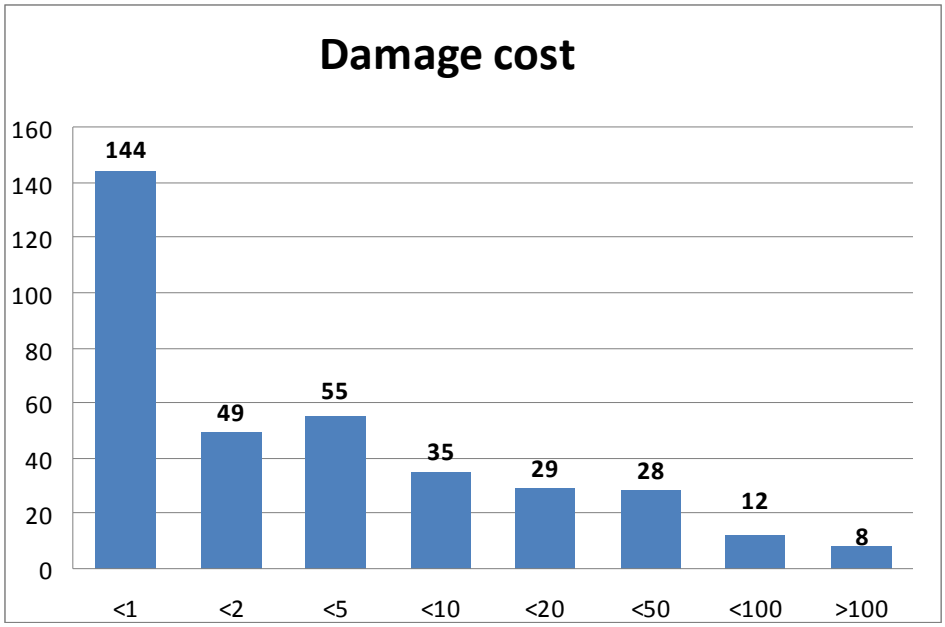
Actors



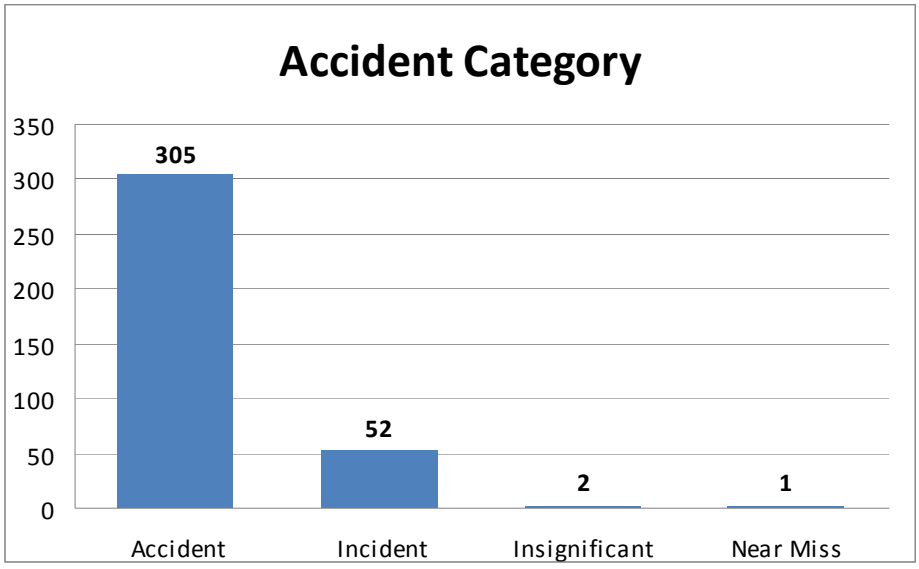
This figure shows that there are on the one hand a few major companies that have quite an importance in offshore activities in Europe, but that there is also a substantial number of wells (1806) drilled by other (often smaller) operators. This hence shows that the market for offshore activities is in a way very diversified.

An important part deals with the extent to which information is available on offshore incidents.

Some information in that respect can be found in the Worldwide Offshore Accident Databank (WOAD) which is operated by DET Norske Veritas (DNV). It contains more than 6000 incidents since the year 1975. However, from all those incidents information on damage costs exists in only 360 i.e. at only 5,83% of the records. In more than 1/3 of the incidents (38%), for which costs data are available, the costs were limited: less than 0,5mio. US$. 45% of the incidents on which cost data were available had a cost of less than 1 mio. US$ and for only 1,4% of the incidents damage costs exceeded 100 mio. US$. This is represented in the following table which is drafted by the Joint Research Center, based on the WOAD database.



WOAD also provides an overview of the events which are classified into various categories as follows:

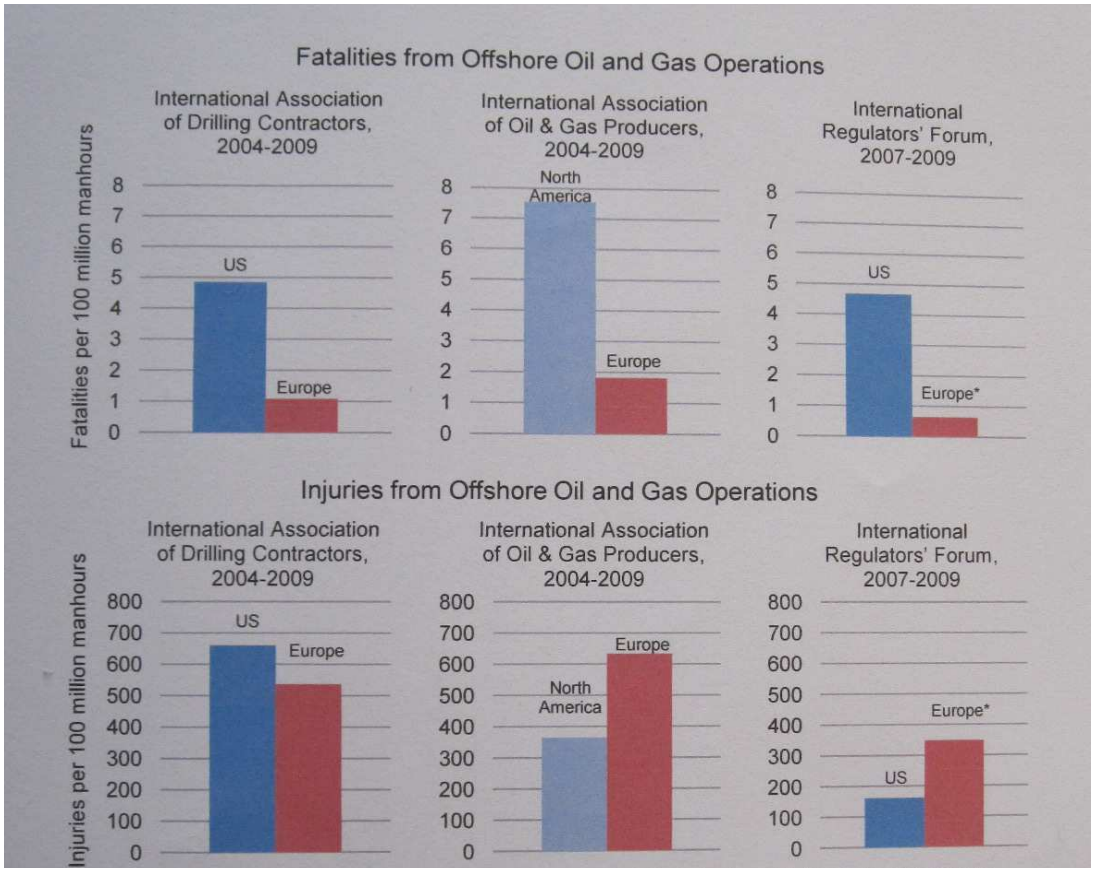


Data are also provided by other stakeholders.

However, these organizations collect data with different criteria and compile their data with different approaches, which may lead to difficulties when comparing these various data directly. For instance, a study carried out by some members of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling compared the fatalities and injuries from offshore facilities in Europe with the US. Various data sources suggest slightly different results.

These differences in data can be illustrated by putting accident data together on incidents in the US and Europe that come from on the one hand the International Association of Drilling

Contractors (IADC), the International Association of Oil and Gas Producers (OGP) and the International Regulators Forum.[20]



Source:*IADCIncidentStatisticsProgram*,InternationalAssociationofDrillingContractors,http://www.iadc.org/asp.htm;*Safetyperformanceindicators*,InternationalAssociationofOil&GasProducers,http://www.ogp.org.uk/;*IRFCountryPerformanceMeasures*, International Regulators'Forum,http://www.irfoffshoresafety.com/country/performance/.

*EuropefortheInternationalRegulators'ForumdatarepresentstheUnitedKingdom,Norway,andtheNetherlands.

Overviews of upstream losses in the energy sector are also provided in the Willis Energy Loss Database. They provide the following tables for 2011 and 2012:

Table 4: Upstream losses XS USD 50M 2011[21]

Type	Cause	Country	PD USD	OEE USD	BI USD	Total Actual USD
MOPU	Heavy weather	UK	534,000,000		500,000,000	1,034,000,000
MOPU	Heavy weather	UK	193,000,000		227,000,000	420,000,000
Rig	Capsize	Mexico	230,000,000			230,000,000
SSCS	Unknown	Nigeria	230,000,000			230,000,000
Well	Blowout	Israel		200,000,000		200,000,000
MOPU	Mechanical failure	USA	150,000,000			150,000,000
MOPU	Corrosion	Nigeria	120,000,000			120,000,000

[20] DatafromtheInternationalAssociationofOil&GasProducersincludeshelicopter-related incidents. DatafromtheInternationalAssociationofDrillingContractorsandtheInternational Regulators'Forumincludehelicopter-relatedincidents onlyifitisatornearanoffshoreinstallation.
[21] Source: Willis Energy Loss Database as at April 2013 (figures include both insured and uninsured losses).

Well	Faulty design	Norway	115,000,000			115,000,000
Well	Subsidence/landslide	Israel		115,000,000		115,000,000
Platform	Unknown	China	106,000,000			106,000,000
Rig	Heavy weather	Russia	100,000,000			100,000,000
Rig	Faulty design	Singapore	8,500,000		80,840,000	89,340,000
MOPU	Mechanical failure	Nigeria	82,000,000			82,000,000
MOPU	Unknown	Brazil	80,000,000			80,000,000
Rig	Collision	Venezuela	25,000,000		47,250,000	72,250,000
						3,143,590,000

Table 5: Upstream losses XS USD 50M 2012

Type	Cause	Country	PD USD	OEE USD	BI USD	Total USD
Rig	Blowout	Nigeria	175,000,000	277,000,000		452,000,000
Well	Blowout	UK		400,000,000		400,000,000
Well	Blowout	Nigeria		200,000,000		200,000,000
Well	Bowout	India		150,000,000		150,000,000
Rig	Grounding	USA	90,000,000			90,000,000
Pipeline	Unknown	Venezuela	65,300,000			65,300,000
Well	Blowout	USA		60,000,000		60,000,000
Well	Blowout	Canada		54,850,000		54,850,000
Rig	Faulty design	Brazil			54,488,000	54,488,000
Platform	Fire/lightning/explosion	Mexico	54,200,000			54,200,000
						1,580,838,000

These charts show the major loss records for the upstream energy industry in 2011 and 2012. However, the reported losses of course not only refer to offshore incidents (although many do) and in many cases the losses reported did not cause damage to third parties, but for example related to the costs for reinstating a platform. The charts, however, provide an indication of the fact that in the upstream energy industry on a yearly basis all over the world still substantial losses occur.

The Deepwater Horizon incident obviously triggered European action with respect to civil liability and financial security for offshore oil and gas activities.

The case of the Macando/Deepwater Horizon incident shows that, at least in the US, a operator, like in this particular case BP, but also other contractors involved in the operation of the rig, can be confronted with a large variety of claims.

Although the total amounts of payments by BP and the other contractors is yet (May 2013) unknown it is important to stress that payments from BP took place at at least three different levels:

- an amount of $4 billion was paid as a criminal penalty settlement;
- an amount of $20 billion was paid to the Gulf Coast Claims Facility (GCCF) by BP;
- substantial amounts were already paid by BP in civil penalties, but precisely on the amount of civil penalties there still is debate between the parties on two crucial issues:
    - the total amount of oil released;
    - whether there was gross negligence or not. Although BP waived its right to call on the limit under OPA the question whether there is gross negligence or not is still relevant to determine the civil fine under the CWA since that is

four times as high ($4,300) in case of gross negligence than when there is no gross negligence ($1,100).[22]

Although the total amounts to be paid by BP (and some of the other contractors) were hence still unknown (in May 2013) estimates by experts hold that total payments by BP could easily amount to $40 billion.

There is a lot of debate on the likelihood of a Deepwater Horizon-type accident in the EU. Many point at the fact that there are differences between the Gulf of Mexico and European waters.Others point at the fact that these differences should not be overstated and that hence, also in Europe, when a large scale disaster would happen, the potential damage can be substantial. The estimate of the potential damage caused by a disaster scale incident is of course very important, especially when it comes to the question how much financial capacity should be available to cover the risks from a major offshore accident.

The goal that was pursued in executing this first task (making an assessment of the extent of the problem) was to sketch the offshore industry in Europe and to analyse the details of the incidents that occurred in Europe, especially focusing on the amount of damage caused by these incidents and the type of damage caused by them.

The following can be concluded:

- reliable data on the actual number of offshore facilities in the EU are not readily available and existing data are in some cases contradictory;
- the most important fact is that the number of offshore facilities is likely to rise in the (near) future, with oil and gas discoveries offshore Norway, in the Mediterranean and in the Black Sea. Furthermore, although not definitive yet, there are ideas to built offshore facilities in the Artic, which is a much more difficult and risky environment to work in;
- although many point at differences in the drilling conditions between the Gulf of Mexico (where the Deepwater Horizon incident happened) and the EU, data show that in the EU and Norway incidents happen regularly;
- data of Norway and the UK show that personal injuries as well as hydrocarbon releases decreased over the last decade. Nevertheless, a few significant releases happened as well in the last decade;
- due to fortunate circumstances (e.g. Statfjord A or Gannet Alpha) these releases did not cause severe personal or environmental damage;
- it therefore is difficult to examine insurance claims over the last decade;
- an analysis of recent incidents (last 5 years), shows that the reasons for these incidents have similar explanations in Norway and in the UK and that these explanations might be reasons to worry. Both PSA as HSE investigation reports identify a backlog of maintenance, deficient maintenance management, inadequacies in risk identification and deficient barrier management as causes of the incidents;
- up to now, this has not lead to incidents leading to severe environmental and personal damage, but we should not wait for a severe accident to happen, in order to develop proper regulation.

[22] See *supra* 2.5.5.2.1. and see Daily Report for Executives 20 February 2013, available at <http//dailyreport.bna.com/drpt/display/batch_print_display.adp> last accessed on 21 February 2013.

3. Analysis of existing legal regimes

3.1. International and sectoral arrangements

There are some international conventions that may have some relevance for offshore related risks, but that the impact of those conventions (like UNCLOS and MARPOL 73/78) mostly focus on safety regulation, but less on liability and compensation issues. The IMO does currently not consider that it has competence to make a convention concerning compensation for damage related to offshore related risks. The IMO, however, stimulates the creation of bilateral or regional arrangements. Various of those regional arrangements, such as OSPAR (for the North Sea) and the Barcelona Convention (for the Mediterranean) have been created.

However, most attention was paid to the legal regime in Member States with a strong interest in offshore oil and gas activities. Attention was also paid to Australia and the US, since both have witnessed some major offshore incidents. The legal analysis took place on the basis of a checklist that allows a comparability of the results.

In most countries with a strong offshore petroleum interest, there is at least a national legal regime on civil liability, although it may consist of various pieces of legislation, some less developed than others. In some countries, such as the UK, the civil liability for offshore activities consists of different layers from the industry arrangement OPOL to statutory liability; and in the US, the liability for offshore incidents may arise from federal laws and state laws. In other countries, the liability derives from rather easily identifiable primary and secondary legislation. Nevertheless, given that the offshore oil and gas activities involve many complications (technological development, various stakeholders involved, various contracts and subcontracts), and that the damages of an offshore incident may result in personal injury/fatalities, property damage, and/or environmental damage, it is at least difficult and perhaps virtually impossible for any jurisdiction to cover all of these aspects in one single piece of legislation.

It appeared from the legal analysis that, differently than e.g. in the case of marine oil pollution resulting from vessels (where most countries have implemented the international conventions) there is relatively little regulation as far as liability for damage resulting from offshore installations is concerned. As the table below will show, in most Member States there is at best a brief mention of a liability of the operator based e.g. on a Petroleum Act and a provision on financial responsibility, but a detailed regulation of liability for damage resulting from offshore related activities is in fact only present in the US and to some extent in the UK, which relies on OPOL. However, given the large differences between the legal systems that were discussed it is not possible to make a sweeping statement claiming that e.g. one particular legal system would constitute a “best practice”.

Given the fact that there are only few legal systems where liability resulting from offshore related activities is explicitly addressed it is not possible to draw strong normative conclusions based on this comparative analysis.

The legislative framework of the countries that were analysed can be summarized as follows:

	UK	Norway	Denmark	US	Australia	Canada
Causation	Proof on victim	Burden on claimant + in causal uncertainty: J&S	-	-	-	-
Attribution	J&S [23] under OPOL for insolvency	Channelling to licensee or operator. Joint venture: J&S toward third parties	Channelling to licensee. If several parties: J&S	Liab. on responsible party and lessee. If more: J&S	Liab. on title holder + J&S	Licensee is liab. + J&S.
Damages	Pollution damage (if direct) + remedial measures. OPOL not personal injury.	Also: losses to fishermen	All.	Removal costs + damages	Costs of public auth	Actual loss + costs of public auth.
Cap	OPOL $ 250 mio.	No cap.	Only for MOD's	75 mio. + removal costs. Loss of cap if gross negligence or viol of REG + no preemption of state law.	No cap.	Cap.
Compensation mechanism	OPOL membership mandatory	Rapid claims settlement for fishermen. Mandatory security for production licence, not exploration licence + detailed regulation of what insurance should cover	Financial capacity condition for licence.	Fin. Security max. 150 mio. + details and different methods can be used. Fund (OSLTF): 1 bio. financed via tax.	Mandatory insurance condition for licence	Proof of financial responsibility required.

3.2. Comparative analysis

This table allows to make a few generalizations on the liability regimes in the legal systems that we discussed.

First,the basis of liability is in general strict and the liability is imposed on the holder of a licence/permit/lease or the operator.

Second, the relationship with regulation: In most countries, there are regulations aiming at safety standards for offshore operations and aiming at the prevention of incidents during

[23] J&S stands for Joint & Several Liability.

offshore oil and gas activities. However, the compliance with regulations in most countries we have studied does not constitute a defence to exempt the responsible party from assuming liability. Only the Australian law is not clear on that point, as it includes a vague provision which could lead to the situation that compliance with regulation may be used as a legal defence.

Third, as to causation, it is mostly the occurrence of an incident that triggers the liability. Most statutes we examined are silent on the causation issue.

Fourth, attribution of liability: in case of multiple tortfeasors, most jurisdictions follow a joint and several liability. In some jurisdictions, there is no specific provision concerning this issue.

Fifth, as to the amount of compensation, in most countries examined, there is no upper limit on the amount to be compensated by the responsible party. Hence in theory the liability will be unlimited. The US and Canadian regimes are the only ones with financial caps. However, in the US the liability is limited only in the federal law OPA, which leaves open the possibility of state laws to impose additional liability. OPA does not pre-empt state law. Moreover, such a financial cap concerns only the damages, the removal costs remain uncapped. Although the liability is in theory unlimited in most legal regimes, it is important to realize that without the security of a financial guarantee the unlimited liability cannot provide adequate compensation.

Sixth, applicability in time (rapid claims settlement): The strict liability with a financial guarantee can be considered as a mechanism in the interest of rapid claims settlement, since it avoids the need for victims to prove negligence as the primary test of liability which can be rather difficult and time consuming.[24] This is adopted in all of the liability regimes we examined. However, looking at the specific compensation mechanisms in each national law, it is difficult to find useful instruments in addition to the strict liability and compulsory financial guarantee to provide rapid compensation to the pollution victims.

Seventh, as to the compensation mechanisms, there is always some requirement on the financial capacity of the applicant. In some countries, e.g. in the UK, the financial capability proved by OPOL is a precondition for the granting of a licence. The amount of such a financial guarantee is in most jurisdictions (with the exception of the US) not specified in the regulations, but assessed on a case by case basis by the national authority responsible for issuing licences. The US system provides for detailed requirements on the financial guarantee a responsible party has to take out. This is based on the so-called worst case scenario.The forms of financial guarantee can be different.

In addition to the financial guarantee, in the US regime, there exists a compensation fund contributed by the oil industry, the OSLTF, which provides compensation up to $1 billion per incident.

Eighth, jurisdictional issues: Offshore activities often take place in the continental shelf where the jurisdiction is granted to the coastal state through UNCLOS. However, in some federal systems like the US and Australia, there is a distinction between states' jurisdiction and the jurisdiction of the federal laws. As far as offshore activities are concerned, they mostly fall within the federal jurisdiction.

3.3. Another high risk sector: the nuclear

Like damage resulting from offshore installations, damage caused by a nuclear accident can potentially be quite large. Hence, the nuclear liability conventions have a few features that are

[24]King (2010), 6.

worth studying. For example there is a limitation (so-called financial cap) on the liability and the liability is channelled to the licensee of the nuclear power plant. Moreover, in a second and third layer, compensation is provided by government as a result of which doctrine holds that the nuclear industry is (at least partially) subsidized. The regime is, however, quite different in the US under the so-called Price Anderson Act, since no legal channelling applies and since there is no state intervention.

The literature criticized the international regime from an economic perspective. The criticism was rather straightforward:the legal channelling of liability in the international conventions has the major disadvantage that many parties, other than the nuclear operator, who could equally influence the risk of a nuclear accident are not exposed to liability.[25] Also, the financial limit on the liability of the licensee of the nuclear plant remains too low, which, in combination with the large public funds made available in the international regime, leads to a substantial subsidization of nuclear energy, and thus to an insufficient cost internalization.[26]

Even though we have indicated that it is hard to make a final, positive judgment on the U.S. compensation regime given the fact that the real costs of a nuclear damage can still be higher than the compensation available, the U.S. regime seems in many respects to be more in line with the law and economics literature with respect to nuclear liability.

A first advantage of the U.S. regime is that it seems far more dynamic than the international regime. The Price-Anderson Act started in 1957 with a relatively low financial limit – $60 million – on the liability of the operator, but a large amount of government intervention – $500 million. But by 1975, the Price-Anderson Act already provided for a dynamic system whereby the relationship between private and public funding could change, taking into account inter alia developments in the insurance market. The fact the Price-Anderson Act organized insurers at the federal level and not at the state level as most U.S. insurance markets, the U.S. nuclear insurance market could create substantially higher amounts of compensation. Today, the coverage of the nuclear risk in Europe still takes place via the nuclear insurance pools, which are organized at a national, Member State level, and therefore, not surprisingly, have generated amounts of insurance coverage that are too low. The U.S. federal government has systematically removed itself from covering the nuclear risk such that by 1982 the $560 million of required compensation was entirely financed by private funds.

It is striking that in the beginning, the international regime and the American nuclear compensation scheme were very similar, but today the differences between the two systems are quite spectacular. Today, in the U.S., the total amount of compensation available is $12.2 billion, of which $75 million is financed through the individual liability of the nuclear operator and the remainder through the collective responsibility of all operators financed through retrospective premiums. Today, the NEA regime requires a total amount of available compensation of 300 million SDRs (roughly €310.35 million; $493.08 million). Once the Protocols to the Paris and Brussels Supplementary Conventions enter into force, the total amount of compensation available will be €1.5 billion ($2.383 billion), of which €700 million ($1.112 billion) will be financed by the nuclear operator and €800 million ($1.271 billion) by public funds. Of course, the Contracting Parties have the freedom to charge the cost of their obligation to the nuclear operators and thus, indirectly contributing to more internalisation. But even if the Contracting Parties were to do so, thereby imposing a liability limit of €1.2 billion ($1.907 billion), a part of the damage would still be paid by public funds. Unless all Contracting Parties opt for unlimited liability of the nuclear operator, no one will be liable for damage in excess of €.1.5 billion ($2.383 billion).

[25] See Trebilcock and Winter (1997).
[26] See, e.g., Faure and Fiore (2006).

The conclusion, therefore, is rather straightforward. The economic goal of cost internalization can hardly be reached in the international regime for two main reasons. In the NEA regime, the individual liability of the nuclear operator seems at first blush high – €700 million ($1.112 billion) compared to $75 million in the U.S. Price-Anderson Act-but is only a small fraction of the potential costs of a nuclear accident, estimating the damage to be between $10 billion and $100 billion.[27] Second, the second layer of compensation in the international regime is entirely provided through public funds whereby no risk related financing takes place whatsoever. The second and third layer of public funds in the NEA regime and the second layer under CSC are a pure subsidy to the nuclear industry and contribute nothing to cost internalization. This criticism can be partially addressed if the Contracting Parties charge the operators for the costs of making public money available. However, these costs should be market reflective and should take into account risk differentiation. It is far from certain that any governmental institution is well equipped to assume this difficult task, let alone in a more efficient manner than an insurance company or mutual insurance scheme.

On the other hand, in the U.S. the second layer is not only considerably higher than in the international regime ($12.2 billion compared to €800 million, $1.271 billion, in the NEA regime), but it is also financed through the collectivity of the nuclear operators and hence contributes to a cost internalization. The situation is, moreover, only worse if one compares the Price-Anderson Act with the regime under the Vienna Convention where the amounts are even dramatically lower than in the NEA regime. An important feature of the U.S. regime is that, indeed, a system has been developed whereby the second layer of compensation does not merely consist of public funding, but is the collective responsibility of industry. The task of the government in this respect is limited to pre-financing the compensation to the victim and collecting the retrospective premiums from the operators. Moreover, in order to limit the risk exposure of the operators, the annual retrospective premiums are determined by law. However, in the end, it is the nuclear operators that contribute to finance the second layer of $12.2 billion through these retrospective premiums.

The lesson seems, therefore, to be rather clear: the U.S. Price-Anderson Act and its recent amendments seem to have understood and incorporated the lessons from economic analysis. The various parties who contribute to nuclear risk are exposed to substantial amounts of liability which may provide incentives for prevention and cost internalization.

3.4. Conclusions concerning the existing legal regimes

The conclusions as far as the current legal regimes for offshore liability can be summarized as follows:

- there is no international legal framework dealing with liability for offshore related incidents; the IMO will not take action in this respect.
- there are various regional arrangements related to offshore safety. Most of those contain general principles and do usually not contain provisions with respect to liability or compensation.[28]
- the specific countries that were examined usually do not have specific legislation aiming at damage resulting from offshore activities. If it is the case usually a strict

[27] See United States General Accounting Office, Report To Congressional Committees, Nuclear Regulation: A Perspective On Liability Protection For Nuclear Accident 18 (1987), available at: <http://archive.gao.gov/d28t5/133093.pdf>; Dubin and Rothwell 1990, p. 73-79; Heyes and Liston-Heyes 1998, p. 122-124. This is also the case in the IAEA regime, where the revised liability amount is 300 million SDRs ($493.083 million). SeeInternational Atomic Energy Agency, Status: Convention On Supplementary Compensation For Nuclear Damage 1 (May 21, 2008), available at: <http://www.iaea.org/Publications/-Documents/Conventions/supcomp_status.pdf>.

[28] See the summary *supra* in 3.3.6.

liability rule applies. Many legal systems do have a requirement that financial security is proven as a precondition for granting a licence.

- the regime concerning liability for nuclear accidents in international conventions may not constitute an example for a potential future liability regime for offshore related accidents in the EU. The financial cap on liability, legal channeling of liability to the nuclear operator (thus excluding liability of others) and the compensation via public funds lead to insufficient cost internalization.
- many of those negative features of the international regime are absent in the US Price-Anderson Act. Although there is a liability limit the amounts are substantially higher and the second layer will not be paid through public funds but it is a collective responsibility of industry, financed via retrospective premiums charged to the nuclear industry. The US Price-Anderson Act hence shows how high amounts of compensation can be generated without ex ante immobilization of capital and without public funding.

4. Risk pooling mechanisms

4.1. Advantages of pooling

There are a few major advantages of pooling via a risk sharing agreement:

- it creates strong incentives for mutual monitoring since the members are dependent on each other; i.e. a bad risk can create the likelihood that the pool will have to intervene;
- for highly technical and complicated (often new) risks operators themselves may have better information (compared to insurers) on optimal preventive technologies which they can reflect in a differentiation of the contribution to the pool (or excluding membership for bad risks);
- a risk sharing agreement does not require actuarial information *ex ante* on the probability of an accident and the scope of the damage for the simple reason that no *ex ante* premium has to be fixed. Only information is needed on the relative contribution of each member to the risk, but this does not necessarily have to be translated into a premium. *Ex ante* costs to administer a risk pool can hence be lower, especially in cases where actuarial information (for example because the risk is new and statistical information is lacking) may not be available;
- since*ex ante* premiums do not have to be paid, risk sharing creates less liquidity problems. It can be based on an agreement of the members to share in case the risk emerges;
- differently than with insurance when the risk would not emerge there are no premiums paid to an insurance company that are (at least in the view of the operator) “lost”. If the risk for which the risk sharing agreement is concluded does not emerge the members of the risk pooling scheme simply do not have to contribute;
- this also points at the relative flexibility of a risk pooling mechanism: when during a particular period many accidents happened the risk pool can *ex post* ask additional contributions from the members on an ad hoc basis;
- however, such a risk pooling mechanism may have all these advantages if the number of members in the pool is relatively restricted; the comparative benefit (compared to insurance) mostly applies to highly technical (new) risks. When, however, the members of the pool would be very large (e.g. all car drivers in a particular area) the administrative costs of running the pool would become huge and the comparative benefits vis-à-vis insurance would disappear.

4.2. OPOL

The discussion of one pooling mechanism in the offshore sector today, OPOL, showed that OPOL is not a risk sharing agreement in the sense discussed in this chapter. It is a pooling mechanism, but in fact only the solvency risk is pooled. OPOL undoubtedly has strengths in the sense that it e.g. forces all its members to provide financial security up to the amount of compensation guaranteed by OPOL. In some member states, such as the UK, membership of OPOL is moreover a condition for obtaining a license. In those member states, via the membership of OPOL, there is hence a guarantee of financial security. However, the sufficiency of the guarantee is controlled via OPOL and not by regulatory authorities (at least in those countries where membership of OPOL is not a condition for obtaining a license). Moreover, since OPOL is not a risk sharing agreement, the benefits of mutual monitoring leading to increased prevention will not exist. Members of OPOL only have an incentive to monitor the solvency of the other members. But given mandatory guarantees which have to be proven *ex ante*, they should not necessarily constitute a large problem. That may also explain why in practice OPOL never had to intervene and in fact only played its "silent" role of forcing its members to provide guarantees up to the limits of OPOL. One could, with a view to the future, of course consider the possibility of reconstructing OPOL to a true risk sharing agreement, but that would fundamentally change the nature of OPOL in its current structure.

4.3. P&I Clubs

Today, compensation for damage caused by offshore facilities is guaranteed via a variety of financial and market mechanisms. One risk sharing agreement which in that respect plays a (modest) role is the so-called Protection and Indemnity Club. The Protection and Indemnity Club is a true risk sharing agreement and consists of ship-owners that mutually cover each other's losses. Hence, this arrangement does provide incentives for mutual monitoring and in the area of vessel based pollution in fact functions as insurance. The P&I clubs play a much more important role in vessel based pollution and only a relatively modest role as far as the coverage of pollution coming from offshore installations is concerned. However, a discussion of their structure and functioning was of interest since they are a pooling mechanism in an area closely related to the offshore sector.

4.4. CLC & Fund

The (international) regulation of vessel based pollution shows a few other interesting aspects which are surely worth considering in developing a compensation and liability mechanism in the offshore sector. One interesting aspect is that the liability of the operator (in the case of vessel based pollution the tanker owner) is capped. This of course contrasts with the liability of operators of offshore facilities which is, as the overview in chapter 3 showed, largely unlimited. However, an important evolution has taken place in the sense that the amounts of the financial limit have increased over time, mostly as a result of new incidents which time after time showed that existing limits in the international conventions were too low. The international conventions are for that reason seriously criticized in the literature, arguing that limits on liability do not provide correct incentives to potential injurers (in that case the tanker owners).

4.5. OPA

The US example of the Oil Pollution Act 1990 constitutes an interesting example. Not only is it relatively easy to break the limits (financial caps) under OPA (as also the case of the Deepwater Horizon showed). Moreover, OPA does not preempt state law. Hence, many state legislations have unlimited liability, thus fully exposing tanker owners to liability for all damage resulting from their actions. Moreover, another interesting aspect of the US Oil Pollution Act is that the limit on liability depends on the safety measures taken. Limits are

hence substantially higher for single hull tankers (which are considered more risky) than for double hull tankers. Hence, the US OPA shows that the liability regime can be structured in such a way that it provides operators incentives for investment in preventive technology.

Another interesting feature of the compensation regime for vessel based solution is its multi-layered aspect. Indeed, a brief look at the legal history showed that the CLC Convention of 1969, which introduced the capped strict liability of the tanker owner was combined with the Fund Convention 1971 to which the oil industry contributes. As a result of this, compensation awarded for vessel based pollution is partly awarded by the shipping industry (via the strict liability under CLC) and partially by the oil industry (via the Fund Convention). This hence has led to relatively large amounts being now available after the adoption of the latest convention on supplementary funding. Currently approximately one billion euro is available for compensating damage resulting from vessel based pollution. This of course constitutes an important difference with the offshore sector since, differently than in the area of vessel based pollution, there are not two different industry sectors (shipping industry and oil) that could contribute to the compensation and thus share the burden.

Finally, it should be mentioned that, similarly to OPOL, also in the area of vessel based pollution voluntary mechanisms (previously CRISTAL and TOVALOP and currently TOPIA and STOPIA) exist. However, their role is totally different and relatively limited. These voluntary agreements in fact only provide an additional layer of compensation by the tanker owner or oil industry to supplement the amounts available under the international conventions. Their role is hence relatively limited.

An issue which we did not cover so far but which has to be taken into account when devising pooling mechanisms is that pooling between either insurers or industrial operators may violate principles of competition policy. In EC competition law specific conditions have been elaborated explaining the requirements for those pools to be compatible with competition policy. It is an aspect that remains further undiscussed within the scope of this report, but that should be taken into account when analyzing the usefulness of pools.[29]

4.6. Summary

In sum, this analysis of pooling mechanisms in other sectors shows that there are a variety of features, both of the liability regime as well as of the available financial security that could provide inspiration for a liability and compensation mechanism for the offshore sector. In that respect, lessons can be learned (positive as well as negative) from compensation mechanisms in the nuclear and vessel based pollution sectors as well as from risk pooling mechanisms in other sectors. These lessons, summarized in this section, will of course be further developed in the next chapters when discussing various scenarios and possibilities of compensation for damage resulting from offshore installations. In that respect, the question will of course again be asked to what extent risk pooling mechanisms could play an important role in compensating damage resulting from offshore incidents. The lessons learned from this chapter have provided some insights on conditions that will have to be fulfilled to make risk pooling mechanisms work.

[29]See on these aspects inter alia Faure and Hartlief (2003), 90-94 and see the recent study by Ernst & Young, Study on co(re)insurance pools and on ad-hoc co(re)insurance agreements on the subscription market, EC Commission, Luxembourg, February 2013. See: <http://ec.europa.eu/competition/sectors/financial_services/insurance.html>.

4.7. Conclusions concerning the use of risk pooling mechanisms

- Pooling (in the sense of risk sharing between operators) has many theoretical advantages compared to insurance, especially for highly technical risks like the offshore related damage.
- OPOL has many advantages, but is not a risk-sharing agreement; only the risk of insolvency is shared. Until now the OPOL guarantee has never been used.
- The only real existing pooling mechanisms for offshore related damage are OIL and OCIL.
- The CLC and Fund Convention provide an interesting combination of financing of compensation by the tanker owner (CLC) and the oil industry (Fund), but have disadvantages as well, e.g. the limitation of liability and the financial cap.
- The US OPA has a limit on liability, but this can be set aside in case of gross negligence or violation of regulations. OPA, moreover, does not preempt state law.
- P&I Clubs are an interesting example of a risk-sharing agreement for marine related risks.
- The US Price-Anderson Act provides an interesting example of an *ex post* risk pooling via a retrospective premium scheme.
- The emergence of a European-wide pooling system for nuclear risks in Europe is not likely given the absence of EU-wide harmonized safety standards and highly different risks created by various operators.
- The CLC/Fund Convention provide mechanisms for rapid claims settlement and so does the GCCF. This allows speedier compensation than the traditional compensation via tort law and civil procedure.

5. The use of financial market instruments to cover traditional liabilities following a major offshore incident

5.1. Available instruments

The following financial market instruments are currently used to cover liability following a major offshore incident::

- self-insurance
- the use of the capital market
- bank guarantees
- (re)insurance
- risk pooling schemes
- OPOL

In each case the theoretical advantages and possibilities of the particular instrument were sketched; then the use of the particular instrument in practice was explained and an analysis followed, analysing the pros and cons of the particular instrument.

In practice it is rare that only one type of instrument would be used. In fact this may only be the case for the majors who effectively only use self-insurance or captives. Others *de facto* often use a combination of different hedging strategies whereby, logically, the comparative benefits of the various instruments are used for an optimal combination.

As an example: a middle sized operator may choose a retention (self-insurance) of for example 5 million and choose insurance or a risk pooling scheme to cover the excess risk. Moreover, he could (and in the case of the UK must) also be a member of OPOL in which case he would use the self-insurance and insurance in combination as proof of financial security.

The type of combinations that will be chosen by operators in practice may of course to an important extent depend upon their size, and hence their assets but also the type of risks to which they are exposed on the one hand and on the other hand the relative costs of various strategies to transfer risk, like the relative costs of insurance versus risk pooling.

5.2. Conclusions

Summarizing, the following instruments are currently used to cover liability following a major offshore accident:

- Self-insurance, largely by the majors, who in some cases create captives as well.
- The capital market, although actually today only to a very limited extent.
- Guarantees are possible in theory, but are not that often used in practice. Bank guarantees or letters of credit are simply considered too costly and hence not used.
- (re)Insurance is undoubtedly the most often used mechanism of financial security for offshore related risks.
- Risk pooling schemes like OIL and OCIL are mostly used by middle-size players.
- OPOL is not as such a system of financial security, but OPOL is important in the UK where membership of OPOL is mandatory for offshore operators in order to obtain a licence.
- In practice, depending upon their size, balance sheet, assets and risks to which they are exposed, operators may use a combination of any of the financial instruments mentioned above.

6. Potential of financial and insurance instruments to cover liability following a major offshore accident

6.1. Expected costs of various incidents

For smaller incidents (defined as those with a magnitude of damage up to 250 million €) OPOL coverage would be available. However, one should remind that OPOL is limited to the North Sea and that, moreover, membership of OPOL is only mandatory in the UK. It therefore *de facto* only covers UK operators. OPOL hence cannot provide a guarantee against insolvency outside of the North Sea area (like in the Mediterranean where offshore operations are increasing). Moreover, for non-UK operators in the North Sea, it depends on whether the national regulators require membership of OPOL or another type of financial responsibility as guarantee.

For middle-size accidents (defined as having an accident magnitude between 250 million and the maximum insurance coverage available on the market, for these purposes assumed to be 750 million €) to the extent that operators took insurance coverage, there should be no problem. However, a problem from a policy perspective is that there may not be a uniform regulation across Europe. Hence, this only works to the extent that regulators *de facto* force operators *ex ante* to take financial coverage (like insurance or membership of OIL or OCIL) to provide coverage up to the maximum amount available.

For large accidents, *de facto* only the majors could provide coverage beyond the limits of commercial insurance coverage available on the market, via self-insurance.

6.2. SOS-Proposal

Two major proposals were formulated to expand cover. One proposal is formulated by Munich Re Insurance and is referred to as SOS (Sudden Oil Spill). It is a model that has been developed for the Gulf of Mexico and could there provide coverage up to 10 to 20 bio. US$.

On paper the proposal by Munich Re seems to correspond with essential principles of risk distribution. So far a detailed proposal has only been worked out for the Gulf. Munich Re holds that a similar proposal can also be developed for European waters, if additional information is provided. Whether this can constitute a realistic option to cover offshore-related risks is by the end of course not a theoretical question, but will depend on the reaction of the market. The amount of retention to be held is still considerable and majors may therefore probably still prefer (as they apparently argue) to self-insure or look for alternative solutions. For that reason the proposal has, although it was already developed in 2010, never worked in practice. That can of course hardly be blamed to Munich Re, but is due to the fact that operators (for a variety of reasons) have apparently no longer an interest in investing in this facility. Munich Re therefore holds that developing such a mechanism will de facto only be possible if there is a regulatory solution (i.e. a duty) to join such a mechanism.

6.3. Noble Energy-Proposal

A different, probably competing, proposal has been launched by Noble Energy, which is based on risk pooling by industry.

Evaluating this proposal of Noble one can argue that it complies largely with the benefits of mutual monitoring which would be inherent in a risk pooling scheme as has been explained above. However, understandably, major operators held that the arguments for such a comprehensive risk pooling scheme may be stronger in the US where the plaintiff bar American style leads to much higher amounts of compensation than is generally the case in Europe. Still, Noble Energy rightly mentions that such a risk pooling model could in theory also be attractive for EU operators, especially for small and medium size operators who may be exposed to large risks as well. However, that is to some extent countered by the argument of the majors that (e.g. differently than with P&I clubs) in the offshore business operators and risks are of a totally different nature which makes risk differentiation very hard and the danger of cross-subsidization and negative redistribution very realistic. Hence, from the perspective of the majors, one can understand that they fear that such a mechanism could be used as an instrument of externalization by (potentially higher risk) smaller and medium size operators who could then (in case of mutualization via a pool) free ride on the balance sheet of the majors. This would, also from a social policy perspective, be undesirable since it could reduce incentives for care of higher risk operators.

One potential weakness/point to be addressed is (like in the Price-Anderson Act) how one monitors the solvency risk with individual operators. There needs obviously to be serious monitoring, not only of safety but also of solvency of individual operators since otherwise they could externalize their risk still to the group and simply go out of business. That may, however, not necessarily be a huge problem and could be accounted for.

6.4. Expanding OPOL

A third option to provide more cover is to expand the functioning of OPOL. There are various ways in which OPOL could be expanded:

1. One possibility would be to make OPOL membership mandatory in more legal systems. That would hence mean that the OPOL solvency guarantee would expand and e.g. also extend to Norway, Denmark or the Netherlands. Ultimately, this would

obviously be something for the local regulators to decide and is beyond the decision of OPOL. Still, one would have to take into account the limits of OPOL: since it is not a true risk sharing agreement, it only provides a solvency guarantee and moreover only up to 250 million US$ which is in our definition only for the smallest incidents.

2. A second possibility is to expand the amount of coverage of OPOL. That would e.g. mean that the current solvency guarantee would be increased from 250 million US$ to, say, 500 million US$. Again, the majors are opposed to such a proposal for the same reason as they would not like to join risk pools like OIL or OCIL: it increases the mutualization and hence increases the risk which they would not desire.
3. A third possibility would be to expand the scope of the current OPOL beyond the North Sea (to which its application is currently limited). Not surprisingly, many are opposed against such an idea for the same reasons as why they do not want to increase the amount: increasing the current OPOL to an EU wide model, e.g. including the Mediterranean or the Black Sea, would mean that for the current members (who may not at all be active in the Mediterranean) risks would increase, whereas the members may not have sufficient possibilities to monitor the solvency of operators in those other areas. For that reason, they would be opposed against such a territorial expansion.
4. A fourth possibility is that different regional agreements, like OPOL, would be created, e.g. for the Baltic, the Black Sea and the Mediterranean. In that case, there would be no risk sharing (as far as insolvency is concerned) between the operators active in the current OPOL (in the North Sea) and e.g. operators active in the Mediterranean. A new OPOL would then be created specifically e.g. for Mediterranean risks. That is a model that all stakeholders seem to subscribe to for the simple reason that the risks of mutualization and cross-subsidization are then limited. Moreover, mutual monitoring (of the insolvency risk) is easier when new regional risk pools would be created.
5. A fifth possibility would be to transform OPOL altogether from the current model (whereby it merely guarantees the solvency of its members) to a truly risk sharing agreement like OIL and OCIL. Again, it may not surprise that for the same reasons why the majors did not want to join OIL and OCIL they would also not be in favour of such a transformation of OPOL from merely guaranteeing the solvency of its members to a true risk sharing agreement. Again, the fear for mutualization and cross-subsidization would inhibit such a model.

In sum, the only option to expand OPOL which was positively received by stakeholders, was the fourth option mentioned above, i.e. to create other regional risk pools for other sea areas than the North Sea along the lines of OPOL: a pooling agreement where members share the insolvency risk of their members. Still, it would have to be recalled that this 1/ does not have the benefits of mutual monitoring; 2/ would only provide limited amounts of coverage and 3/ would only intervene to guarantee solvency up to the limited OPOL amounts. Still other arrangements would have to be developed to cover for medium and large accidents.

6.5. Conclusions

The analysis in this section hence shows that there are no easy solutions to increase the coverage available for offshore related risks in European waters, compared to the status quo we have described in the previous section. Various proposals do exist, both using insurance or industry pooling, but all have their disadvantages as well and are therefore understandably opposed by industry. The opposition can, moreover, also be understood, taking into account economic principles since a forced mutualization could even lead to increased safety risks which should obviously at all price be avoided. When addressing the question whether there is a need for some regulatory action compared to the status quo, the starting point should be

whether there is a problem in the current situation. The answer is that that strongly depends on the type of accident and the solutions that could be envisaged:

1. For the smaller accidents (defined as with a maximum of 250 million euro damage) the current OPOL mechanism may work. However, one has to recall the limits of OPOL:
   - only applicable to the North Sea;
   - only mandatory in the UK;
   - only providing solvency guarantees;
   - never applied in practice and hence no practical experience;
   - no risk differentiation and hence no incentives for prevention.

OPOL relies on a variety of instruments (like self-insurance, insurance or guarantees), but a solution will hence be necessary even for this lower category of accidents for the cases and territories where OPOL does not apply.

2. That is certainly also the case for the medium-size accidents (between 250 and 750 million euro). Even though they go beyond the limit provided by OPOL insurance solutions available on the commercial market can still be used as well as pooling arrangements like OIL and OCIL.

3. Only for the category of large accidents (damage higher than 750 mio €) insurance may either not or only partially (with large retentions) be available. In those cases, only majors would be able to provide cover based on the balance sheets via either self-insurance or captives.

As was mentioned, this could either lead to a regulatory recommendation (as for example already applied by DECC and following from the UK oil and gas guidelines on financial responsibility) to use risk assessment in order to determine the potential damage resulting from particular operations. This could lead to the consequence of only allowing majors to engage in activities that could lead to large damage or suggesting smaller and medium-size operators to engage in joint ventures with majors.

There only seems scope for developing other regional pools like OPOL (solvency guarantee pools) e.g. for the Mediterranean. However, it should be clear that such pooling schemes will only develop under a regulatory duty to show financial responsibility; otherwise, operators may lack any incentives to develop such a scheme. That would hence be a strong argument in favour, as we will also argue below, a regulatory duty to show financial coverage. Moreover, if the government were to stimulate further going risk pooling arrangements between operators (going beyond the solvency guarantees provided in OPOL) an important condition would be to impose high safety standards for offshore installations through regulation, in order to facilitate the mutual monitoring inherent in risk pooling schemes.

7. Scenario analysis for civil liability regimes and financial security mechanisms

The argument is made that there are reasons to introduce strict liability to offshore related risks, but to combine it with a contributory negligence rule in order to take the victims influence on the accident risk into account as well. Legal channelling of liability (thus excluding the liability of other parties than the one to whom the liability is channelled) should be avoided. The same is the case for a financial limit (a so-called financial cap) on liability. It not only leads to undercompensation of victims and underdeterrence of operators, but also

would constitute an indirect subsidisation of the industry enjoying a particular limit on liability.

7.1. Role of safety regulation

Although liability rules may play an important role in providing incentives to operators of offshore installations, it was held that also safety regulation can play an important role as well. This led to the following conclusions:

- Based on theoretical starting points, safety regulation should play an important role in the prevention of offshore related risks;
- Liability rules remain important to fulfill a complementary role where safety regulation remains suboptimal or is inadequately enforced;
- Given the informational advantages (especially of the majors in the offshore sector) safety regulation could also take the form of self-regulation or private regulation, but should anyway be supervised by government in a kind of "conditional self-regulation". The covenant that was concluded in the Netherlands between regulators and industry as well as the collaboration in the UK between Oil and Gas UK and DECC may constitute examples of such a public-private partnership in standard setting;
- It is in the interest of industry (especially those willing to comply with high safety standards) and regulators to have high and stringent safety standards; there is still room for improvement in that respect in the EU;
- The question however arises whether setting those standards should be a task for the EU Commission; it seems preferable that e.g. via EU guidance notes agreements on targets and safety standards are promoted to be concluded between industry (given higher technical knowledge) and (a conglomerate of) national regulators. This recommendation of course to a large extent complies with the creation of the European Maritime Safety Agency which was precisely established for the purpose of ensuring a high, uniform and effective level of maritime safety and prevention of pollution by ships within the Community as well as ensuring a response to marine pollution caused by oil and gas installations. In addition mutual learning and collaboration (via networking) between national inspection agencies in the Member States should be encouraged as well.

7.2. Mandatory financial security

Next it was held that small and medium size operators could constitute a serious insolvency risk as a result of which mandatory financial security may be indicated. This led to the following recommendations:

- It seems indicated to mandate financial coverage for offshore related risks, especially for the cases where smaller and medium size operators may create a risk of major damage and hence an insolvency risk would emerge.
- To the extent possible, also at the licensing level it should be avoided that operators would engage in offshore operations of which the risks in case of an accident would outweigh their personal assets. In that case, a joint venture with OGPs with larger financial capacity may be indicated.
- It seems indicated to issue a guidance note at EU level, guiding local licensing authorities in Member States on the required amount and form of financial security for offshore related risks.
- As far as the amount is concerned, this guidance note should be based on an objective assessment of the risk taking into account technical criteria that relate a specific operation and operator to particular amounts of potential damage.
- The guidance should allow sufficient flexibility as far as the forms of financial security are concerned and should not necessarily limit those to insurance. The only

condition would be that local regulators accurately verify whether the form and amount of the financial security offered by the operator would be adequate to cover the potential damage emerging from that particular offshore installation.

- The guidance could hence take into account location specific circumstances on which local regulators in Member States can base their assessment of the amount and form of financial security.

7.3. Compensation via Government?

Subsequently the question was asked whether there should be a role for government in providing compensation.

First the question was addressed whether there should be direct compensation by government. It was held that this should never be a preferred option to deal with offshore related damage.

This is not to say that there should be no role whatsoever for government in the aftermath of a disaster caused by an offshore-related incident. Relief measures and coordinating disaster management in the immediate aftermath of the disaster are undoubtedly tasks where the government can play an important role. However, an important condition would be that if steps would be taken, either in clean-up e.g. of polluted beaches or providing immediate relief to victims, that via liability rules the price for those interventions are ultimately allocated to the liable operator. This corresponds to sound economic principles of costs internalization and to the polluter-pays-principle.

Next the question was asked whether government should play a role as reinsurer of last resort. It was held that for the case of offshore-related damage the arguments in favour of such an intervention by government as reinsurer of last resort do not seem very compelling. One important condition for such an intervention would be that a market solution is largely failing. That may be the case for terrorism and natural hazards but it is doubtful that this is the case for third party liability risks created by industry generally and related to offshore activities more specifically. Uninsurability on traditional insurance markets may only arise for the third category of incidents (with a damage above 750 mio. Euros) which may not or be difficult to insure on the traditional commercial insurance market. However, as we have explained above, various proposals have been formulated by commercial entities to create market solutions which would enable coverage also for these disastrous types of offshore-related incidents. In this respect we can refer both to the proposal formulated by Noble Energy as well as to the proposal formulated by Munich Re. Even though these proposals may not have materialized yet the regulatory answer to that would obviously not be an intervention of government as reinsurer of last resort, but rather a duty imposed on industry to provide adequate coverage as a result of which industry will and shall develop market solutions to provide appropriate coverage.

Finally the question was also asked whether a compensation fund for offshore related damage should be created. Again, it was argued that we do not see a lot of scope for introducing a fund solution for offshore related risks. It seems preferable, given the necessity of a compensation mechanism to provide incentives for prevention, to rely on insurance and other mechanisms where contributions can reflect risk. The only role one could imagine for a compensation fund would be as an upper layer e.g. beyond 750 million euro or any limit on the insurance amount available in the market. However, not only would this create a very complicated system to administer. In the second layer, there would be no risk related contributions and hence no positive effect on incentives. Moreover, it would *de facto* mean that operators would have to pay twice: first for insurance or contributions to a guarantee or pooling system and second a tax for the fund that would constitute the second layer. Moreover, (this constitutes again a major difference with vessel-based pollution) given the large differences in the offshore market, for some operators contributing to such a (costly)

fund would be meaningless since they could easily take charge of the costs above the insurance limit through self-insurance. For them, a duty to contribute to a fund would hence only create additional costs without compensating benefit. This would then amount to a situation whereby the duty to compensate to the fund would only be imposed on some (presumably smaller) operators (since they may be exposed to an insolvency risk) and not to others. That would obviously be politically unfeasible. For those reasons, we argue that the difficulties that prevent the creation of a compensation fund in the area of environmental liability may also inhibit the creation of a compensation fund for offshore related risks.

7.4. Three scenarios

Based on the evaluation and analysis in Chapter 7 three possible scenarios were worked out with different solutions, depending on whether OPOL (or a similar regime for other areas than the North Sea could be developed) is applicable (1), for situations where the damage is higher than the OPOL-limit (250 mio.), but still insurable on the commercial market (2) and finally the situation where no financial cover via the regular commercial can be obtained (3).

Starting point for each scenario is that mandatory financial security should in each case be provided, but that the instruments used can differ. We will here merely suffice by sketching the scenarios in a table; the conditions for the specific instruments to work have been discussed in detail in the main text of the report.

Scenario 1: damage max. 250 mio.

UK/North Sea OPOL	Other areas: Other regional arrangements (to be developed)
Mandatory financial security via: self insurance insurance industry pooling (like OIL/OCIL or comparable pooling mechanisms) (guarantees) other	

Scenario 2: damage between 250 mio. and 750 mio.

UK/North Sea OPOL	Other areas: Other regional arrangements (to be developed)
Mandatory financial security via: self insurance insurance industry pooling (like OIL/OCIL or comparable pooling mechanisms) (guarantees) other	

Scenario 3: damageabove 750 mio. euros

Mandatory financial security until risk related amount
First best: Majors: self-insurance/captives Others: less risky activities
Second best:

Possibly: Munich Re facility Noble Proposal (generally: industry pooling) Fund with risk-related contributions A retrospective pooling scheme Government as reinsurer of last resort

8. Recommendations for action at EU-level

Finally, recommendations were made for action by the Commission to ensure strengthened provisions for financial security and a comprehensive civil liability regime in the event of a major offshore accident in Union waters.

8.1. General

- Data on incidents related to damage resulting from offshore oil and gas activities are either difficult to obtain or not publically disclosed. It would be recommendable that an institution at EU-level would centrally collect those data, also in order to increase the insurability of offshore-related damage.
- It would be recommendable to urge Member States to invite the offshore oil and gas producers within their jurisdiction to collaborate in the provision of those data to the central European institution.
- It would be recommendable that the EU takes initiative (eventually via a specialised UN agency or other institutions) to come to an international agreement especially focusing on the offshore-related incidents with a transboundary character.
- In order to promote (international) risk pooling by industry mandatory safety standards should be implemented guaranteeing a minimum level of offshore safety in the EU. Safety regulation should play a more important role than liability rules in the prevention of offshore-related risks.
- Given higher technical knowledge of industry on optimal safety standards the EU could promote (inter alia via guidance notes) industry agreements (eventually with national regulators) on targets and safety standards, but striving for high harmonized EU-wide safety standards).

8.2. Efficient liability rules

An EU-wide regime for damage caused by offshore-related risks could be shaped along the following lines.

- Liability for damage caused by offshore-related risk should be strict.
- Liability should take into account the behaviour of the victim as well, meaning that the claim on compensation should in principle be reduced to the extent that the victim has contributed to the loss.
- A legal channelling of liability should be avoided.
- A joint and several liability of various parties who contributed to the offshore-related risk can be installed.
- Systems of so-called “economic channelling”, implying that the financial security of a licensee or operator also covers the liability of subcontractors should be promoted.
- Financial caps on liability should be avoided in order to expose operators and others who contribute to offshore-related risks fully to the social costs created through their activity.
- Compliance with a regulatory standard should not automatically exclude liability for damage resulting from offshore-related risks.

- It is recommendable to provide an integrated liability regime for damage caused by offshore-related risks. The proposal to integrate damage caused by offshore-related risks into the ELD could hence be reconsidered.

8.3. Mandatory financial security

- It seems indicated to mandate financial coverage for offshore related risks, especially for the cases where smaller and medium size operators may create a risk of major damage and hence an insolvency risk would emerge.
- To the extent possible, also at the licensing level it should be avoided that operators would engage in offshore operations of which the risks in case of an accident would outweigh their personal assets. In that case, a joint venture with OGPs with larger financial capacity may be indicated.
- It seems indicated to issue a guidance note at EU level, guiding local licensing authorities in Member States on the required amount and form of financial security for offshore related risks.
- As far as the amount is concerned, this guidance note should be based on an objective assessment of the risk, taking into account technical criteria that relate a specific operation and operator to particular amounts of potential damage.
- The guidance should allow sufficient flexibility as far as the forms of financial security are concerned and not necessarily limit those to insurance. The only condition would be that local regulators accurately verify whether the form and amount of the financial security offered by the operator would be adequate to cover the potential damage emerging from that particular offshore installation.
- The guidance could hence take into account location specific circumstances on which local regulators in Member States can base their assessment of the amount and form of financial security.
- Such an approach allows sufficient flexibility, avoids unnecessary costs (e.g. forcing majors to transfer risks to lower rated insurance companies), encourages a level playing field for operators and avoids an externalization of social costs (and thus a market failure) in case of insolvency.
- The EU could promote the development of other regional pools like OPOL (solvency guarantee pools) for other areas than the North Sea, e.g. for the Mediterranean. The imposition of a regulatory duty to show financial responsibility, as recommended here, should also promote the development of those regional pools.

8.4. A role for government?

The EU could consider either initiating itself or suggesting the Member States particular initiatives to facilitate the provision of compensation for offshore-related risks where the damage would be higher than an amount which is insurable on the commercial market. However, such a role for government should correspond with a few fundamental principles:

- Government intervention would only be indicated for those risks for which none of the financial market solutions are available.
- To the extent that market solutions (such as self-insurance or captives) are available a government intervention should remain absent.
- Government should hence only intervene as a last resort in the hypothetical situation that catastrophic losses could not be covered by any mechanism available on the market.
- In that case the government intervention should still be based on premiums or contributions that reflect the actual risk in order to provide adequate incentives for prevention.

When these (exceptional) conditions would be met the following types of government intervention would be envisable:

- The creation of a compensation fund for offshore-related risk, only providing an upper layer for catastrophic damage and financed with risk-related contributions.
- A retrospective pooling scheme, whereby a government institution (agency) prefinances the loss and *ex post* (after the accident) claims back the moneys paid to the victims on the basis of retrospective contributions to be paid by operators. The retrospective contributions should be risk-dependent.
- A reinsurance by government as last resort. Again, risk-dependant (re)insurance premiums should be charged by government.

8.5. Rapid claims mechanism

The EU should invite Member States to develop a mechanism allowing to make early compensation payments to particular vulnerable groups of victims (more particularly fishermen and hotel/restaurant owners in coastal areas) that may be negatively affected by an offshore-related incident. The following mechanisms could be envisaged:

- An obligation imposed on the provider of the financial security or the liable person to formulate an offer for payment to the victim within a fixed period of time after the victim has presented his claim.
- The development of a (rapid) claims settlement mechanism via OPOL or similar regional pooling schemes.
- The potential construction of a facility allowing the prepayment to the particular vulnerable group of victims on the basis of a rapid evaluation of the validity of the claim and subsequent recourse of the facility against the person(s) liable for the damage caused by the offshore-related incident.