

A stylized map of the Asia Pacific region, showing the outlines of major landmasses including East Asia, Southeast Asia, and Oceania. The map is rendered in a light blue color against a darker blue background.

# OFFSHORE OIL AND GAS SAFETY AND SECURITY IN THE ASIA PACIFIC

THE NEED FOR REGIONAL APPROACHES  
TO MANAGING RISKS

RSIS Monograph No. 26

Lee Cordner



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**S. Rajaratnam School of International Studies**

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Nanyang Technological University

South Spine, S4, Level B4, Nanyang Avenue

Singapore 639798

Telephone: 6790 6982 Fax: 6793 2991

E-mail: [wwwrsis@ntu.edu.sg](mailto:wwwrsis@ntu.edu.sg)

Website: [www.rsis.edu.sg](http://www.rsis.edu.sg)

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# MAP OF THE REGION







## ABOUT THE AUTHOR

Lee Cordner is a strategic analyst who has worked as a policy adviser, consultant, practitioner, researcher and educator on maritime security and international security issues for many years. His interests include maritime security and strategy, international relations, high level policy analysis and development, enterprise risk management, strategic planning and organisational behaviour. Current projects include Indian Ocean maritime security governance and offshore oil and gas safety and security. Lee was co-chair of the Council for Security Cooperation in the Asia-Pacific (CSCAP) Study Group on offshore oil and gas safety and security in the Asia Pacific.

Lee is currently at the Indo-Pacific Governance Research Centre, University of Adelaide, Australia. He was a Principal Research Fellow at the Australian National Centre for Ocean Resources and Security, University of Wollongong, Australia; and formerly CEO of Future Directions International Pty Ltd, an independent strategic think-tank based in Perth, Australia. He served in the Royal Australian Navy for 33 years and commanded several warships; his last Navy position was Director-General Navy Strategic Policy and Futures in the rank of Commodore.

Email: [lgcordner@gmail.com](mailto:lgcordner@gmail.com) or [lee.cordner@adelaide.edu.au](mailto:lee.cordner@adelaide.edu.au).  
Mobile (Cell): +61 (0) 427 333 034.

# EXECUTIVE SUMMARY

This report explores the safety and security risks associated with the massive expansion of offshore oil and gas exploration and exploitation activity in the Asia Pacific region. The pursuit of national and commercial objectives is generating the convergence of wider interests and uncertainties, and therefore significant and often shared risks. Risk mitigating options for action are presented that need to be urgently and collaboratively considered by multiple actors: states, regional cooperative entities, and industry.

Many major offshore oil and gas safety incidents around the world have been attributed to man-induced hazards resulting from human error, technology or equipment failures, regulatory failures, or a combination of these. Further, the Asia Pacific region has the highest incidence of natural hazards in the world from extreme weather events and seismic activity, with the former projected to increase due to climate change. The possibility of armed conflict at sea, law and order issues, increasing maritime user intensity, decommissioned installations, and jurisdictional uncertainty, where the geographical limits of national responsibilities and obligations for safety and security may be unclear, add to security and safety concerns in economically and strategically important, environmentally sensitive areas.

In the Asia Pacific, measures to deal with large-scale offshore oil and gas safety and security incidents are often not well developed. As evident elsewhere in the world, responses to catastrophic accidents with significant environmental and human security consequences are unlikely to be adequate. Vulnerabilities arise from the lack of capacity and the lack of coordination regimes to prevent, respond to and recover from incidents; and the lack of cooperative arrangements for maritime safety and security.

Key messages from the *West Atlas* (Australia, 2009) Commissioner's Report and the *Deepwater Horizon* (United States, 2010) Commission of Inquiry that should resonate across the Asia Pacific include: lax regulation and industrial complacency, combined with driving political and commercial expediency, work together to build cumulative risks that ultimately create circumstances where systemic, organisationally induced accidents are certain to occur; and effective risk management requires partnerships between regulators and those being regulated, between governments and industry, where each partner performs its role diligently and with integrity. Governance arrangements and relationships are critical.

There is little evidence so far that all regional governments and industry are paying attention to the rising, cumulative risks to safety and security that increased offshore oil and gas activity is generating. Regional states appear to be consumed by the rush to claim and exploit as much of the valuable resources as possible. Collaboration between states and other actors, particularly regional cooperative entities and industry, is necessary, presents mutually beneficial opportunities, and is therefore logical. The strategic, economic and environmental interests of regional states and other actors will be enhanced by pursuing cooperative activity at sea; they will remain diminished until this occurs.

Given the extent of the safety and security uncertainties and the lack of cooperative arrangements an uncomfortable conclusion must be drawn: offshore oil and gas disasters in the Asia Pacific are inevitable. The only questions that remain to be answered are where, when and what the scale of the disasters will be, and how effective response and recovery arrangements will prove to be.

The onus lies with regional governments, cooperative entities and industry, supported by extra-regional governments and entities with interests at stake, to ensure that the risks are fully understood and that appropriate mitigation arrangements are put in place. Cooperative mechanisms, arrangements, protocols, policies, equipments and training need to be prepared and tested before major incidents occur.

Asia Pacific regional cooperative bodies and individual states, in concert with industry partners, are urged to consider the following actions:

1. Offshore oil and gas safety and security should feature as a major

and discrete agenda item with regional safety, security, economic, environmental and disaster response cooperative bodies. Entities like ARF, EAS, APEC, ASEAN and SAARC, and relevant subordinate agencies, should commission independent expert working groups directed to review and report recommendations and options to develop regional measures.

2. A significant and essential initial activity of such working groups should be to commission strategic, all-factors offshore oil and gas benchmark risk assessments to establish objective bases for individual and cooperative risk management initiatives.
3. UNCLOS Articles 122 and 123 provide an international legislative foundation for targeted regional cooperative and national initiatives that should be acted upon in the South China Sea, noting the majority of Asia Pacific states covered by this review have ratified UNCLOS (see Chapter 5) and the South China Sea is generally recognised by littoral states as a semi-enclosed sea (see Chapter 3).
4. States should, as a matter of priority, accede to relevant maritime and marine safety, security and environmental protection conventions and protocols. Establishing associated national legislation, regulations and capabilities, and regional cooperative arrangements, would follow. Specifically, regional states should establish and where they already exist, enhance regional cooperative regimes to deal with:
  - a. maritime search and rescue;
  - b. marine environmental protection including pollution, dumping and decommissioning of offshore installations;
  - c. maritime safety and security arrangements to include incidents at sea protocols;
  - d. establishing common, best practice approaches to offshore oil and gas safety and security regulation, to include industry engagement, this may include establishing regional government-industry cooperative agencies to provide advice and coordination;
  - e. develop individual state and collective offshore arrangements and capabilities for disaster management to include preven-

- tion of, recovery from and response to offshore oil and gas incidents; and
- f. enhancing and sharing scientific information that include marine science, oceanographic, hydrographic, seismic, and meteorology data in order to better understand and therefore prevent and prepare responses and recovery arrangements to deal with the environmental impacts of incidents.
  5. Encourage regional states to resolve or agree to set aside maritime boundary delimitation disputes in the interests of mutually beneficial economic, security, safety and environmental outcomes.
  6. Encourage all parties involved in offshore oil and gas safety and security, including states and industry, to adopt internationally recognised and proven, best practice risk management approaches. Effective risk management requires partnerships between the regulator and those being regulated, between government and industry, where each partner performs its role diligently and with integrity.

# OFFSHORE OIL AND GAS EXPLORATION AND EXPLOITATION IN THE ASIA PACIFIC

Massive increases in offshore oil and gas exploration and exploitation activity and investment in the Asia Pacific region are driven by economic growth and the associated rising demand for energy in Asia. Economic growth in China and India is predicted to continue at an average of greater than five per cent per annum through to 2035.<sup>1</sup> While coal and nuclear power will meet much of the energy increase the demand for oil will also rise. The largest increase in demand will be for natural gas with non-OECD Asia,<sup>2</sup> led by China and India, likely to increase its share of world natural gas consumption from 10 per cent in 2008 to 19 per cent in 2035; gas consumption volume is forecast to increase by an average of 3.9 per cent annually.<sup>3</sup>

This review explores the safety and security risks associated with the expansion of offshore oil and gas exploration and exploitation activity. The focus is on Asia Pacific maritime domains, also referred to as the Indo-Pacific region in recognition of the vast and strategically important geographic construct whose central feature is the confluence of the world's two great oceans.<sup>4</sup> The geographical coverage of the Asia Pacific

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- 1 U.S. Energy Information Administration (EIA), *International Energy Outlook 2011 (IEO2011)*, viewed 9 August 2012, <[http://www.eia.gov/forecasts/ieo/pdf/0484\(2011\).pdf](http://www.eia.gov/forecasts/ieo/pdf/0484(2011).pdf)>, p. 19.
  - 2 The only Asian OECD member nations are Japan and the Republic of Korea.
  - 3 EIA, *op. cit.*, p. 48–49.
  - 4 Dennis Rumley, Timothy Doyle and Sanjay Chaturvedi, “Securing’ the Indian Ocean? Competing regional security constructions”, *Journal of the Indian Ocean Region*, Vol. 8, No. 1, June 2012, pp. 1–20. The authors identify three “competing” regional security constructs: an “all-embracing concept of an *Indian Ocean region*”; a more limited “*East Indian Ocean*”; and an “*Indo-Pacific concept* that emphasises the pre-eminence of regional naval power” where India is a dominant player and extra-regional powers like the United States and China play important roles (pp. 2–3).

region addressed here extends from Russia's Pacific coast south through the western Pacific Ocean to the northeast Indian Ocean including waters to the northwest of Australia, the Andaman Sea, Bay of Bengal and India. A primary area of interest is the South China Sea and, to a lesser extent the East China Sea, due to the proliferation of offshore oil and gas activity in waters claimed by numerous littoral states in crowded, environmentally sensitive and strategically important waters.

The analysis is conducted from regional, national and industry governance and risk management perspectives. The aim is to identify the major risks, assess the likelihood and consequences of the risks arising, explore policy and cooperative governance options for mitigating risks and consider the strategic implications for regional safety and security. The analysis draws upon experience with offshore oil and gas safety and security risk management and governance in other parts of the world. This includes reviewing selected major incident lessons and regional policy responses and arrangements.

Some may question the appropriateness of adopting a risk management driven approach to offshore oil and gas safety and security governance rather than more traditional approaches. The following quote from the *Deepwater Horizon* Report to the President of the United States,<sup>5</sup> when referring to the largest offshore oil and gas generated environmental disaster in United States history, points to the answer:

Government agencies that regulate offshore activity should reorient their regulatory approaches to integrate more sophisticated risk assessment and risk management practices into their oversight of energy developers operating offshore.<sup>6</sup>

## GLOBAL ENERGY FORECASTS

Global pressures to find and exploit new energy sources will continue to mount into the foreseeable future due to vast increases in the

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5 National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, *Report to the President, Deep Water The Gulf Oil Disaster and the Future of Offshore Drilling*, January 2011.

6 *Ibid.*, p. 251.



demand for energy, primarily from developing countries. According to the International Energy Agency (IEA) conservative New Policies Scenario, with projections that include the likely impact of policies intended to mitigate climate change, world energy demand is forecast to increase by one-third between 2010 and 2035.<sup>7</sup> Similarly, the U.S. Energy Information Administration (EIA), International Energy Outlook 2011 Reference case, which does not incorporate prospective legislation or policies that might affect energy markets, projects that world marketed energy consumption will grow by 53 per cent from 2008 to 2035.<sup>8</sup> While both IEA and EIA analyses recognise there are uncertainties in their projections, due to global economic growth variations and possible environmental policy changes, the deviations are unlikely to be significant.

Notably, 90 per cent of the projected growth in global energy demand will come from outside OECD countries<sup>9</sup> with China accounting for more than 30 per cent. China will be the world's largest energy consumer, increasing to more than 70 per cent higher than the United States, by 2035. Energy consumption rates in developing Asia Pacific economies, including India and Indonesia, are forecast to grow even faster than China. Fossil fuels (coal, oil and gas) will continue to meet more than 75 per cent of global demand.<sup>10</sup>

According to the IEA, global natural gas demand is forecast to grow at 1.7 per cent per annum, almost twice the rate of oil and coal, with the major demand coming from China and other non-OECD countries.<sup>11</sup> The EIA assesses that world natural gas consumption would likely increase by 52 per cent between 2008 and 2035 and notes that natural gas continues to be the fuel of choice in many regions because its relatively low carbon intensity makes it an attractive option for nations interested in reducing

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7 International Energy Agency (IEA), *World Energy Outlook 2011 Factsheet*, viewed 9 August 2012, <<http://www.worldenergyoutlook.org/media/weowebbsite/factsheets/factsheets.pdf>>.

8 EIA, op. cit., p. 19.

9 There are 34 OECD member countries from North and South America to Europe and the Asia-Pacific region see *OECD Members and Partners*, viewed 9 August 2012, <<http://www.oecd.org/about/membersandpartners/>> .

10 IEA, loc. cit.

11 Ibid.

greenhouse gas emissions, it has relatively low capital costs and is fuel efficient.<sup>12</sup>

The EIA predicts that increased natural gas usage in non-OECD Asia will be led by India and China. China's central government promotes natural gas as a preferred energy source. Natural gas usage in India is forecast to grow by 4.6 per cent per annum, with supply constraints continuing to hold down consumption.<sup>13</sup> The largest increases in import demand are projected for China and India, which together will require imports of 6.0 trillion cubic feet per annum in 2035. By 2035, China will import 40 per cent of its natural gas consumption and India 28 per cent. China is actively pursuing multiple potential sources for natural gas imports. At the end of 2010, China had four liquid natural gas (LNG) import terminals in operation, four under construction, and several more proposed or in various stages of development.<sup>14</sup>

On the supply side, natural gas production in Australia is predicted to grow at an average of 4.5 per cent per annum, the strongest growth among OECD countries.<sup>15</sup> While emerging economies will increasingly dictate energy demand they are also projected to dominate the expansion of natural gas supply with non-OECD countries accounting for 70 per cent of gas production by 2035. Concomitantly, the world will rely increasingly on OPEC<sup>16</sup> oil production that will reach more than half the world total by 2035.<sup>17</sup>

The projected growth in future energy requirements will demand

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12 EIA, op. cit., p. 2.

13 EIA, op. cit., pp. 48–49.

14 EIA, op. cit., p. 62. China is importing natural gas under long-term contracts from four countries, with no single country to provide more than 37 percent of the total contracted volume. Chinese companies have signed contracts to increase imports from Australia, Qatar and Malaysia.

15 EIA, op. cit., p. 52.

16 There are 12 Organization of the Petroleum Exporting Countries (OPEC) member countries: Iran, Iraq, Kuwait, Saudi Arabia, Venezuela, Qatar, Indonesia, Libya, the United Arab Emirates, Algeria, Nigeria and Angola. See *OPEC Member Countries*, viewed 9 August 2012, <[http://www.opec.org/opec\\_web/en/about\\_us/25.htm](http://www.opec.org/opec_web/en/about_us/25.htm)>.

17 IEA, loc. cit.

massive investments in energy-supply infrastructure, estimated at US\$38 trillion from 2011 to 2035, with almost US\$20 trillion required for oil and gas.<sup>18</sup> An important point to note is that climate change policies are not predicted to have a significant impact on the demand for and investment in global energy because so much is predicated upon the needs of rapidly expanding, developing economies. Investment in Asia Pacific offshore oil and gas activity will demand a relatively small proportion of the total investment in energy compared with offshore Brazil or West Africa and onshore investment elsewhere in the World. However, the scale of investment in Asia Pacific offshore oil and gas exploration and exploitation is significant, expanding and will present major and increasing strategic, economic and environmental challenges.

### IMPLICATIONS FOR ASIA PACIFIC OFFSHORE OIL AND GAS

The search for offshore oil and gas in the Asia Pacific region is rapidly expanding and intensifying commensurate with the increasing global and regional demand for energy and as production from mature fields' declines.<sup>19</sup> According to Infield Systems Ltd,<sup>20</sup> total capital expenditure commitments on offshore oil and gas development in the region are expected to exceed US\$90 billion during 2011–2015, a 55 per cent increase from the previous five-year period.<sup>21</sup> Projected offshore field developments for the period 2012–2015, which are based upon industry-sourced contracted commitments, indicate the vast scale of this activity.

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18 IEA, loc. cit.

19 International Energy Agency, *World Energy Outlook 2008*, 39, viewed 15 January 2011, <<http://www.worldenergyoutlook.org>>, pp. 42–43.

20 Infield Systems Ltd. Infield “is an independent energy research and analysis firm that is dedicated to the provision of accurate and up-to-date information, databases, research, market forecasts, mapping, commercial market due-diligence, transaction support, business strategy, analysis and intelligence to the global offshore oil, gas, renewable energy and associated marine industries.” A wealth of detailed energy industry data and analyses are available, mostly for significant fees. See <<http://infield.com/>>.

21 Gene Kliewer, “Asia/Pacific economic growth drives exploration/production offshore”, *Offshore*, Volume 72, Issue 5, 5 February 2012, viewed 8 August 2012, <<http://www.offshore-mag.com/>>.

In South Asia, Southeast Asia, East Asia and Australasia there are 441 projected shallow (less than 300 metres) and deep water (greater than 300 metres) oil and gas fields<sup>22</sup> involving thousands of exploratory drillings. 387 new sub-sea wells are contracted with a combined total of 70 floating production, storage and offloading vessels (FPSOs), floating production systems (FPSs) and floating storage and offloading units (FSOs)<sup>23</sup> plus over 14,000 kilometres of rigid and flexible flow lines.<sup>24</sup> By far the greater proportion of the activity, 237 fields,<sup>25</sup> is occurring in the South China Sea.

### MAJOR OFFSHORE OIL AND GAS FIELDS

Major areas of offshore oil and gas exploration and exploitation covered by this analysis include several new areas offering potential oil and gas production. They range from the Mumbai High Basin off India's west coast, and the Bay of Bengal;<sup>26</sup> the northwest shelf and Timor Basin areas off north-western Australia; the South China Sea where variously Malaysia, Brunei, China, Taiwan, Vietnam and the Philippines are active in the Spratly and Paracel Island areas; Indonesian offshore developments that are progressing in the Makassar

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22 Ibid. Based upon Infield data, the 441 break down is: 397 shallow fields and 44 deep water fields; 75/10 Australasia, 68/6 East Asia, 34/11 South Asia and 220/17 South East Asia.

23 Ibid. The breakdown of the 70 floating facilities is: 31 FPSO, 18 FPS and 21 FSO; with the majority (49) in the South East Asia area.

24 Ibid.

25 Ibid.

26 MBendi Information Services, *Oil and Gas in India – Overview*, viewed 3 September 2012 <<http://www.mbendi.com/indy/oil/as/in/p0005.htm>>. The bulk of India's natural gas production comes from the western offshore regions, especially the Mumbai High field. There have been several large natural gas finds in India over the last five years, predominantly offshore in the Bay of Bengal.

Strait;<sup>27</sup> the Gulf of Thailand;<sup>28</sup> and the East China Sea that includes disputed areas, for example around Senkaku/Diaoyu/Tiaoyutai Islands;<sup>29</sup> and Sakhalin Island off Russia.<sup>30</sup>

The competition for access to new and expanding offshore oil and gas fields is expected to intensify over the next two decades. How well the nations and companies involved are able to manage increasing safety and security risks will be critical to regional stability and will impact economic and energy security, and potentially environmental, human and food security.

## MONOGRAPH OUTLINE

Chapter 2 looks briefly at offshore oil and gas safety and security incidents around the world and considers lessons and implications for the Asian region. The *Deepwater Horizon* incident in the Gulf of Mexico and the *West Atlas* incident off northwest Australia are reviewed as case studies. They are informative, well documented, recent events involving the latest technologies and processes. Reports from thorough investigations by competent authorities offer policy, governance and risk management perspectives that have wider relevance.

Chapter 3 looks at international and industry risk management factors and approaches that warrant wider consideration. The Australian approach to offshore oil and gas industry security is briefly explored as a risk management and governance case study plus regional cooperative approaches to environmental security in enclosed and semi-enclosed seas.

Chapters 4 and 5 focus on Asia Pacific regional safety and security

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27 Energy Files, *Indonesia*, viewed 3 September 2012, <<http://www.energyfiles.com/asiapac/indonesia.html>>. There are new deep water fields in the Makassar Strait off Kalimantan plus gas from the Natuna Sea.

28 Energy Files, *Thailand*, viewed 3 September 2012, <<http://www.energyfiles.com/asiapac/thailand.html>>. The bulk of Thailand's oil production comes from offshore in the Gulf of Thailand, much of it associated with gas.

29 Claimed by Japan, China and Taiwan; with the three names those adopted by each claimant.

30 Energy Files, *Russia*, viewed 3 September 2012, <<http://www.energyfiles.com/eurfsu/russia.html>>.

challenges, governance practices and options in an endeavour to define key strategic risks, identifying what is currently being done to address them, and explores options for improving risk management. Chapter 6 summarises the risks to offshore oil and gas safety and security and outlines recommended risk mitigation options. A realistic assessment of the consequences of current and most likely courses of action are considered in addressing the question: is a disaster inevitable?

# INTERNATIONAL OFFSHORE OIL AND GAS SAFETY AND SECURITY INCIDENTS

There have been surprisingly few major safety and security incidents given the geographical extent, scale and expanding proliferation of offshore oil and gas exploration and exploitation activities and facilities around the world's oceans over the past 50 years. However, numerous well publicised major safety and security incidents have produced significant consequences including loss of human life and environmental disasters. Incidents have also resulted in significant economic impacts with national, regional and global consequences, at least in the short-term.

A chronological list of significant incidents around the world is presented in Annex A. The list is not comprehensive but indicates the extent and impact of the problem. The safety and security implications of a global industry that operates in a high risk environment are evident. Some broad observations can be drawn: only eight of the 48 incidents listed occurred in the Asia Pacific region; this can be expected to increase with the rapid expansion of activity combined with other factors to be analysed later in this report. Twelve incidents were attributed directly to extreme weather events (cyclones, typhoons and storms) with 35 incidents the result of technical failures or operator errors. Only the 2005–2008 incidents off Nigeria, noting there are many incidents under this grouping that have continued since 2008, were directly attributed to security attacks. Not shown on this list were numerous offshore oil and gas industry incidents arising from war and armed conflict. Many offshore rigs, for example, were damaged and massive oil spills at sea resulted during the 1990–1991 Persian (Arabian) Gulf War. Reviewing offshore oil and gas safety and security incidents globally is helpful to defining the general safety and security risk context and for informing judgments on the risks of future incidents in the Asia Pacific region.

## RECENT INCIDENTS – RELEVANT LESSONS

Incidents that occurred in the *West Atlas*, Montara field off the northwest coast of Australia in 2009 and *Deepwater Horizon*, Macondo in the Gulf of Mexico in 2010 have been chosen for analysis because they are recent, the subsequent investigations were well documented and they were both subject to high profile, international media attention. Both incidents involved rig blowouts attributed to technical, operational and regulatory failures. Significant systemic deficiencies were exposed offering lessons for the offshore oil and gas sector worldwide.

Blowouts offshore can have major and long lasting effects. These can include loss of human life, pollution of marine and shoreline ecosystems, substantial commercial losses and reputational damage for companies directly involved, financial losses for third parties affected by the spill, impacts on the global economy (through oil and gas price fluctuations), and reputational damage to the nations involved, and their regulators. Such incidents are relatively rare, although the likelihood must reasonably be expected to be on the rise with the search for new oil and gas discoveries offshore in ever deeper and more remote waters that test the limits of technological capacity, experience and resources of the industry. According to the Commissioner's Report on the *West Atlas*, Montara incident:

Although the likelihood of a major blowout occurring is relatively low, the consequences can be very grave. However, the likelihood is relatively low only because well integrity is (or should be) scrupulously observed by the industry and those who regulate it. At each stage, from exploratory drilling through to production, the systems and technologies in place are designed to be fail-safe, with considerable back-up capability built in to prevent blowouts. The systems and technologies are not new; they are well proven and they do work, if correctly applied.<sup>1</sup>

Many incidents, if allowed to progress to major proportions, reflect failures of both the operators and the regulators, although external factors like weather and security incidents can also play a significant part. A

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1 David Borthwick, Commissioner, *Report of the Montara Commission of Inquiry*, 17 June 2010, p. 5.



brief analysis of the *Deepwater Horizon* and *West Atlas* accidents, from strategic risk and governance perspectives, reveals numerous factors of relevance to the Asia Pacific.

### Deepwater Horizon, Macondo

The *Deepwater Horizon* offshore rig blowout produced the largest accidental marine oil spill in United States history, inducing a severe human and environmental tragedy. The conclusions drawn by the National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling, in their Report to the President of the United States,<sup>2</sup> present sobering and compelling reading for all involved in the offshore oil and gas industry. The Report is written in a graphic, narrative style that paints a vivid picture of the incident, its aftermath and the causal factors involved; and importantly, presents recommended remedies for improved prevention, response and recovery. The risk management issues identified in the Report's overarching findings could be universally applied. They are summarised here:<sup>3</sup>

- The explosive loss of the well could have been prevented.
- The immediate causes of the well blowout can be traced to a series of identifiable mistakes made by the primary companies involved that reveal systematic failures in risk management. They place in doubt the safety culture of the entire industry.
- Deepwater energy exploration and production, particularly at the frontiers of experience and technology, entails risks for which neither industry or government has been adequately prepared.
- Fundamental reform will be needed in regulatory oversight and in internal decision-making processes to ensure political autonomy, technical expertise, and full consideration of environmental protection concerns.
- Because regulatory oversight alone will not be sufficient to ensure

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2 National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, *Report to the President, Deep Water The Gulf Oil Disaster and the Future of Offshore Drilling*, January 2011.

3 *Ibid.*, p. vii.

adequate safety, the oil and gas industry will need to take unilateral steps to dramatically increase safety, including self-policing mechanisms to supplement government enforcement.

- The technology, laws and regulations, and practices for containing, responding to, and cleaning up spills lag behind the real risks associated with deepwater drilling into large, high-pressure reservoirs located far offshore and at great depths. Governments must close the gap and industry must support rather than resist that effort.
- Scientific understanding of environmental conditions in sensitive environments, along coastal habitats, and in areas proposed for more drilling is inadequate. The same is true of the impacts on humans and nature of oil spills.

The *Deepwater Horizon* was drilling the Macondo well in 5,000 feet (more than 1,500 metres) of water and over 13,000 feet (4,000 metres) into the sea floor to the hydrocarbon reservoir below.<sup>4</sup> The scale of the operation and the levels of complexity, employing the latest technological advances in offshore drilling, were immense. Those conducting the operation were highly capable and experienced. However, that experience ironically induced a level of complacency and unwillingness to recognise and treat emerging hazards that increased the risks. It had become an inherently high risk, high reward venture. The scale of the environmental disaster and the response required was also massive, with an estimated 4.9 million barrels of oil spilled into the Gulf of Mexico, requiring responses directed from the highest levels of the United States Government.<sup>5</sup>

*Deepwater Horizon* was operating entirely within United States waters. Regulatory oversight of offshore oil and gas activity was the responsibility of the (Federal) Minerals Management Service (MMS). The Report to the President notes that U.S. regulatory requirements had,

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4 Ibid., p. viii.

5 Office of the Press Secretary, "Statement by President Obama Marking the One-Year Anniversary of the BP Deepwater Horizon Oil Spill", *The White House*, 20 April 2011, viewed 20 August 2012, <<http://www.whitehouse.gov/the-press-office/2011/04/20/statement-president-obama-marking-one-year-anniversary-bp-deepwater-hori>>.

over time, become inconsistently applied, mainly on the “outer continental shelf” and particularly the Gulf of Mexico,<sup>6</sup> primarily for expedient financial and political reasons:

In some offshore regions, oil drilling was essentially banned in response to environmental concerns. Elsewhere, most notably in the Gulf, some environmental protections and safety oversight were formally relaxed or informally diminished so as to render them ineffective, promoting a dramatic expansion of offshore oil and gas production and billions of dollars in federal revenues.<sup>7</sup>

The Report notes that the U.S. Government had the necessary authority required to control how oil and gas resources located on the outer continental shelf was leased, explored, or developed. The real problem was political leaders, both within the Executive Branch and Congress, failed to ensure that the regulator (MMS) had the resources necessary to exercise that authority. The political autonomy and will needed to overcome powerful commercial interests that opposed more stringent safety regulation was lacking.<sup>8</sup> Although regulatory requirements were in place that included promises of layers of environmental scrutiny, U.S. Federal oversight of oil and gas activities in the Gulf of Mexico took a generally minimalist approach. The Government failed to exercise the full scope of its power to ensure the safety of drilling operations. Many aspects of national environmental law were ignored and MMS lacked the resources and technical expertise to demand rigorous safety standards be imposed. In increasingly risky deepwater operations, the U.S. had fallen behind other countries in its ability to move beyond a prescription and inspection system to one based on more sophisticated risk analyses. The safety risks had dramatically increased; however, U.S. leadership had become preoccupied with the enormous revenues generated from offshore oil and gas activity with little focus on safety.<sup>9</sup>

Even though the U.S. jurisdictional context presented the opportunity for tight regulatory control, essential under the prevailing environmental,

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6 National Commission Report, *op. cit.*, pp. 58–67.

7 *Ibid.*, p. 56.

8 *Ibid.*, p. 67.

9 *Ibid.*, pp. 84–85.

safety and technological circumstances in the Gulf of Mexico, the stage was long set for a major, systemic, organisationally induced disaster. The cumulative risks of a major accident had grown. Critically, the Report notes:

With the benefit of hindsight, the only question had become not whether an accident would happen, but when.<sup>10</sup>

The *Deepwater Horizon* oil spill, in the environmentally sensitive and attractive tourism area of the Gulf of Mexico, had major collateral impacts. Tourism and fishing “were highly sensitive to both direct ecosystem harm and, indirectly, public perceptions and fears of tainted seafood and soiled beaches”.<sup>11</sup> Profoundly apparent here are the parallel prospects of similar accidents in the crowded and environmentally sensitive South China Sea where seafood and tourism are vital contributors to food and economic security. The extent of the economic impact of the *Deepwater Horizon* disaster was evident when BP agreed “to place in escrow a US\$20 billion fund to help address financial losses”.<sup>12</sup>

There are other parallels between the Gulf of Mexico situation and parts of the Asia Pacific region. In addition to the United States, both Mexico and Cuba lay claim to parts of the Gulf of Mexico and have expressed interests in deepwater drilling. *Deepwater Horizon*-type spills are likely to put at risk fisheries, coastal tourism and valuable natural resources in adjacent national jurisdictions. The Report to the President of the United States recognised that it is in the U.S. national interest to negotiate with neighbouring countries to produce common standards and regulatory systems for the oversight of safety, along with protocols to cooperate on containment and response strategies and preparedness, in the event of a spill.<sup>13</sup> The extent to which this advice needs to be heeded in the internationally crowded offshore oil and gas jurisdictions in the Asia Pacific region lies at the core of this analysis.

Pressures to provide energy security in the United States, as else-

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10 Ibid., p. 85.

11 Ibid., p. 185.

12 Ibid.

13 Ibid., p. 300.

where in the world, are intense and relentless. Energy security could be characterised as a euphemism for oil and gas exploitation to continue regardless of the risks. The United States Government has demanded expeditious responses to the *Deepwater Horizon* incident primarily to enable oil and gas exploration and exploitation in the Gulf of Mexico to resume. By mid-2012, the U.S. Secretary of the Interior announced that U.S. oil production had increased by 13 per cent during the first three years of the Obama administration. He stated: “Two years ... from the spill, the Gulf of Mexico is back in business ... The total number of active offshore rigs in the United States was higher at the end of April 2012 than the average total in 2009.”<sup>14</sup>

Governments around the world involved in offshore oil and gas sector governance, regulation, risk management and incident response need to carefully analyse the *Deepwater Horizon* incident and the U.S. response. Whether or not the lessons have been learned and effectively applied remains to be seen.

### West Atlas, Montara

On 21 August 2009 the Montara Wellhead Platform (WHP) blew out “with such force that a column of oil, fluid and gas was expelled from the top of the well, through the hatch on the top deck of the WHP, hitting the underside of the *West Atlas* drilling rig and cascading into the sea.”<sup>15</sup> So began Australia’s third largest oil spill and the worst of its kind in the history of Australia’s offshore petroleum industry. Fortunately, all 69 personnel on the rig were safely evacuated.<sup>16</sup> For a period of more than 10 weeks oil flowed unabated into the Timor Sea, at an estimated rate of between 400 and 1500 barrels per day, plus unknown amounts of gas, condensate and water<sup>17</sup> to a total volume of around 29,600

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14 Secretary Ken Salazar, “Responsibly expanding America’s offshore energy development”, *The White House Blog*, 18 July 2012, viewed 20 August 2012, <<http://www.whitehouse.gov/blog/2012/07/18/responsibly-expanding-america-s-offshore-energy-development>>.

15 David Borthwick, loc. cit.

16 Ibid., p. 52.

17 Ibid., pp. 26 and 38.

barrels of oil.<sup>18</sup> The incident occurred 250 kilometres (135 nautical miles) off the northwest coast of Australia. Patches of sheen or weathered oil could have affected, at various times, an area as large as 90,000 square kilometres (50,000 square nautical miles).<sup>19</sup>

Unlike *Deepwater Horizon* Macondo, the Montara oil field is in shallow water (defined in the industry as less than 300 metres). The field is located in the western section of the Bonaparte Basin in water depths ranging between 76 and 90 metres (250 to 300 feet).<sup>20</sup> Between January and April 2009, the *West Atlas* rig was positioned over the Montara WHP in approximately 77 metres of water with the well drilled to a measured depth of 3,796 metres (12,500 feet).<sup>21</sup>

In a similar vein to the *Deepwater Horizon* Commission of Inquiry, the *West Atlas* Commissioner concluded that:

What happened ... was an accident waiting to happen; the company's systems and processes were so deficient and its key personnel so lacking in basic competence, that the Blowout can properly be said to have been an event waiting to occur<sup>22</sup> ...The Blowout serves as an important reminder of the very real risks that come with the substantial economic benefits of petroleum developments, and the need for an effective regulatory and emergency response framework to ensure that sustainable development objectives can be achieved, whilst also ensuring well integrity and maintaining high standards of ... safety ... and environment protection.<sup>23</sup>

Other major findings from the *West Atlas* Inquiry, noting that many are consistent with findings from the *Deepwater Horizon* Inquiry, included:

- The primary operator did not observe sensible oilfield practices. Major shortcomings in the company's procedures were widespread and systemic, directly leading to the blowout.

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18 Ibid., p. 301.

19 Ibid.

20 Ibid., p. 36.

21 Ibid., p. 49–50.

22 Ibid., p. 11.

23 Ibid., p. 33.

- The primary regulator was “not a sufficiently diligent regulator”; did not recognise that the proposed operations did not reflect sensible oilfield practice and “adopted a minimalist approach to its regulatory responsibilities”.<sup>24</sup> The relationship between the company and the regulator “had become far too comfortable”.<sup>25</sup>
- Senior company personnel had limited experience and did not fully comprehend the implications of such operations. The company’s personnel on the rig demonstrated a manifestly inadequate understanding and knowledge of what was required. Senior company personnel on the rig and onshore were deficient in their decision-making and judgments.
- There were systemic failures of communication and responsibility for safety.
- Risks were not recognised when they should have been, and not assessed properly when recognised.<sup>26</sup>
- The biggest environmental risk for offshore developments is the possibility of large blowouts due to a failure of well integrity.<sup>27</sup>
- The overall response objective of preventing oil from impacting on sensitive marine resources (in particular the marine parks of Ashmore Reef and Cartier Island, and the northwest coast of Western Australia) was largely achieved.<sup>28</sup>
- Scientific monitoring of the environmental effects of the spill was late and inadequate.<sup>29</sup>

The *West Atlas* Commissioner commented extensively on regulatory philosophy noting that “the Cullen Report (*Piper Alpha*) recommended that the regulation of the offshore petroleum industry move from a prescriptive to an objective-based safety case regime”.<sup>30</sup> This philosophy had

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24 Ibid., p. 6.

25 Ibid., pp. 10–11.

26 Ibid.

27 Ibid., p. 19.

28 Ibid., p. 22.

29 Ibid., p. 25.

30 Ibid., pp. 177–178.

been largely adopted in the Australian case as it had in many jurisdictions around the world. A risk management approach is required whereby operators accept responsibility and provide a safety case that identifies all the hazards and risks, and defines how risks have been reduced to a level as low as reasonably practicable. The Commissioner noted that the aim is to ensure that those who create risks are responsible for managing them. Continuous improvements in safety, culture and performance need to come from within an operating company, rather than be imposed externally by regulators. The move away from prescriptive legislation provides companies with flexibility to utilise emerging technologies and to manage risk.<sup>31</sup> However, with this latitude comes the requirement for sophisticated risk management processes, the willingness to accept responsibility and to be accountable. The Commissioner noted that, while the movement toward a more objective-based regulatory regime was appropriate, close regulation is required to ensure that what an operator proposes to do “is consistent with good oilfield practice” and subject to “targeted monitoring, audit and compliance activities”. The regulator must be actively engaged and prepared to engage in a technical debate with an operator about what truly is “good oilfield practice”.<sup>32</sup>

Similar to the *Deepwater Horizon* Inquiry, the *West Atlas* Inquiry identified international engagement issues that have resonance with the wider Asia Pacific context. The geographic location of the spill and its spread raised trans-boundary issues due to small patches of weathered oil crossing into Indonesian and Timor-Leste waters. Sheen and weathered oil was observed in Indonesia’s Exclusive Economic Zone (EEZ), reaching to within 94 km of the Indonesian island of Palau Roti. Small amounts of weathered oil were also observed in the Joint Petroleum Development Area (JPDA), established by the 2002 Timor Sea Treaty between Australia and Timor-Leste.<sup>33</sup> The need was recognised for Australia to continue to act consistently with international law and consistent with developing and maintaining strong bilateral relationships.<sup>34</sup>

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31 Ibid.

32 Ibid., p. 195.

33 Ibid., p. 302.

34 Ibid.



## SUMMARY ANALYSIS

The *West Atlas* Commissioner's Report was submitted before the *Deepwater Horizon* Commission of Inquiry had been completed because of the close timing proximity of the two incidents. The Australian Government observed that "The scale and severity of the 20 April 2010 *Deepwater Horizon* incident ... posed new challenges in respect of coordination, international engagement, deepwater technology and the application of science, which were not contemplated at the time of the *Montara Inquiry*".<sup>35</sup> Clearly, both events present lessons for wider consideration and application, and there is considerable convergence. From these two case studies, key factors identified for consideration in developing regional and national approaches to offshore oil and gas safety and security include:

- Offshore oil and gas exploration and exploitation involve risks for which neither industry or government has been adequately prepared.
- Lax regulation and industrial complacency combined with driving political and commercial expediency work together to build cumulative risks that ultimately create circumstances where systemic, organisationally induced accidents are certain to occur; it becomes a matter of when, not if.
- Effective risk management requires partnerships between the regulator and those being regulated, between government and industry, where each partner performs its role diligently and with integrity. Governance arrangements and relationships are critical.
- While the likelihood of major safety and security incidents may be low the consequences can be very high. Consequences can include the major loss of human life and environmental disasters. Significant economic and reputational damage can also result that impact upon commercial, national, regional and global interests.
- The rapid expansion of exploration and exploitation activities,

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35 Australian Government, *Draft Government Response to the Report of the Montara Commission of Inquiry*, 24 November 2010, p. 14.

pushing technology into deeper and more remote waters at the frontiers of human experience, mean that there will be more accidents with ever greater consequences in the future.

- Safety incidents in the offshore oil and gas industry often result from systemic failures in risk management. Imposing effective risk management processes supported by sophisticated risk analysis and governance arrangements at all levels: international, national, industry sector and individual operators, is essential to risk reduction.
- While objective-based regulatory regimes are generally appropriate and widely employed, an effective and proactive regulatory regime must also be in place.
- The technology, laws and regulations, practices and capabilities for responding to the environmental impacts of spills lag behind the real risks associated with large scale and high intensity offshore oil and gas exploration and exploitation.
- Scientific understanding of environmental conditions in sensitive marine and coastal environments is generally inadequate as is comprehension of the human and natural impacts of oil spills.
- Offshore oil and gas incidents will often have significant consequences for neighbouring littoral nations. Major human, environmental and economic security concerns are likely, resulting from risks to fisheries, tourism, and marine ecosystems in adjacent jurisdictions. International engagement issues including joint prevention, response and recovery arrangements and issues like boundary delimitation need to be considered, put in place, resolved and tested, before major incidents occur.

These case studies provide a wealth of information that can be drawn upon when considering appropriate risk management and governance arrangements in the Asia Pacific, particularly in key focal areas like the South China Sea. Neither the *West Atlas* Commissioner nor the *Deep-water Horizon* Commissioner made extensive reference to international regimes or architectures and the extent to which they offer mechanisms for safety and security cooperation between multiple littoral states in

areas like the South China Sea. These and related risk management and governance factors will be explored in the next chapters.

## ANNEX A – A CHRONOLOGICAL SUMMARY OF SIGNIFICANT OFFSHORE OIL AND GAS SAFETY AND SECURITY INCIDENTS

This summary is compiled from several sources:<sup>36</sup>

- 30 June 1964. *C. P. Baker* drilling barge burned and sank in the Gulf of Mexico after a shallow gas blowout. Of the 43 crew on board, eight were confirmed dead with 13 missing, presumed dead and 22 injured.
- 28 December 1965. One of the first drilling rigs in the North Sea, the *Sea Gem* collapsed as a result of metal fatigue, killing 13 of the crew.
- 28 January 1969. A blowout at *Platform A* near Santa Barbara, California led to a spill estimated at up to 100,000 barrels of crude oil, fouling the Californian coastline. The spill led to broad opposition to offshore drilling near California, and helped spur the creation of the U.S. Environmental Protection Agency.
- 2 January 1974. *Transocean III* self-elevating semi-submersible sank in North Sea. The rig suffered progressive structural damage resulting from storm conditions, leading to the evacuation the crew.
- 15 April 1976. *Ocean Express* sank during a storm in the Gulf of Mexico resulting in 13 fatalities.
- June 1977. The *Ocean Master II* sank off West Africa as a result of structural problems and bad weather.

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36 Reuters, “Timeline: Major offshore accidents in the global oil industry”, *Reuters online*, 13 May 2010, viewed 15 June 2011, <<http://uk.reuters.com/article/idUKTRE64C57O20100513>>; Australian Government, *Petroleum (Submerged Lands) (Management of Well Operations) Regulations 2004*, 1 December 2004, viewed 17 August 2012, <<http://www.comlaw.gov.au/Details/F2004B00402/Explanatory%20Statement/Text>>; and Rigs World, “Offshore Drilling Accidents”, viewed 17 August 2012, <<http://www.rigsworld.com/Offshore-Accidents.htm>>. A modified version of the information provided at the references, amplified by information from a range of sources, is presented here.

- 3 June 1979. The *Ixtoc I* offshore well in Campeche Bay, Mexico suffered a blow out, eventually discharging up to three million barrels of crude oil in one of the worst offshore spills in North American history. Though various efforts were undertaken to lessen the amount of leakage, the spill was not contained until March of 1980.
- 25 November 1979. The *Bohai 2* rig capsized and sank in a storm while on tow off the coast of China killing 72 crew.
- 17 January 1980. Whilst working off Nigeria the *Sea Quest* suffered extensive fire damage after a blowout and was then deliberately sunk.
- 27 March 1980. The *Alexander Kielland*, a floating platform for off-duty workers, capsized in the North Sea, killing 123 people.
- 27 August 1981. The *Petormar V* drillship sank after a shallow gas blowout in the South China Sea.
- 15 February 1982. The *Ocean Ranger* semi-submersible drilling rig sank off the coast of Newfoundland, Canada, while operating the Hibernia oil field. The accident occurred during a sudden Atlantic cyclone. Rescue efforts were disastrous; the unit sank and all 84 crewmembers were killed.
- 1 September 1983. The *Key Biscayne* capsized and sank off Australia's west coast after flooding and towline failure.
- 25 October 1983. The U.S. drillship *Glomar Java Sea* capsized and sank due to Typhoon Lex in the South China Sea 63 nautical miles southwest of Hainan Island, China and 80 nautical miles east of Vietnam killing all 81 persons onboard.
- 16 August 1984. A blowout on the *Enchova* platform, operated by Brazilian state oil company Petrobras in the Campos Basin, caused an explosion and a fire that led to the death of 44 workers.
- January 1985. Two men were killed and two injured in a pump room explosion on *Glomar Arctic II* rig in the North Sea.
- 6 October 1985. *West Vanguard* suffered an explosion and fire off Norway with one fatality.

- 24 April 1988. Petrobras *Enchova* again suffered a gas blowout while being converted from oil to gas. The resulting fire burned for 31 days. The platform was abandoned without casualty.
- 6 July 1988. Occidental Petroleum's *Piper Alpha* oil production platform exploded in the North Sea, after a series of malfunctioning parts and a small gas leak ignited under pressure. Eventually, the pipeline connecting *Piper* to the *Claymore* platform burst and *Piper* slipped into the sea. Of the 224 crewmembers, 165 were killed and two rescue vessel crewmen also perished. At the time of the accident, *Piper Alpha* was contributing approximately 10 per cent of the North Sea's oil and gas production. Resulting financial losses were estimated at US\$3.4 billion.
- 22 September 1988. A North Sea rig blowout on the *Ocean Odyssey* resulted in the death of the radio operator.
- September 1988. Four workers were killed when an oil rig owned by Total Petroleum of France exploded and sank off the south-eastern coast of Borneo.
- 15 December 1988. The *Rowan Gorilla I* was crossing the North Atlantic when it capsized and sank after structural failure caused by bad weather.
- 28 April 1989. Santa Fe's *Al Baz* jack-up rig burned and sank after a blowout with the loss of five lives.
- May 1989. Three people were injured in an explosion and fire on an offshore oil platform owned by Union Oil of California. The rig was operating southwest of Anchorage, Alaska.
- 8 November 1989. After a dramatic crew rescue, the *Interocean II* sank in a North Sea storm, due to towline failure.
- 3 November 1989. The drilling ship *Seacrest* capsized and floated for several days on the surface before sinking during Typhoon Gay in the Gulf of Thailand. 91 of the 97 crewmembers were killed.
- 23 August 1991. A design error resulted in the structural failure of the *Sleipner A* platform.
- 29 September 1992. Blake IV and Greenhill Petroleum *Well 250*

blew out in the Gulf of Mexico. The well ignited after two days and took 11 days to cap.

- January 1995. 13 people were killed and many injured in an explosion on a Mobil oil rig off the coast of Nigeria.
- January 1996. Three people were killed and two injured in an explosion on a rig in the Morgan oil field in the Gulf of Suez.
- 16 Nov 1996. A punch-through caused extensive damage to the *Maersk Victory* while working in Australian waters in St. Vincent's Gulf, South Australia.
- June 1998. *Mr Bice*, a jackup drilling rig, sank in the Gulf of Mexico after structural failure and flooding.
- July 1998. Two men died in an explosion on the *Glomar Arctic IV* rig.
- 15 April 2000. *Al Mariyah Rig/NDC Al Mariyah* jack-up rig collapsed and lost its derrick in the Umm Shaif Field, United Arab Emirates with four fatalities.
- January 2001. Two workers died from a fire on a Petrobras offshore natural gas platform in Campos Basin.
- 20 March 2001. Explosions on *P-36* offshore production platform, operated by Brazilian state oil company Petrobras, killed 11 people. It sank off the coast of Rio de Janeiro five days later, spilling some of the 10,000 barrels of fuel and crude it was storing into the Atlantic.
- 30 September 2002. A leg punch-through led to a blowout and fire which sank both the *Arabdrill 19* and a production platform in Saudi's Khafji Field, with three fatalities.
- 10 August 2004. The *Adriatic IV* was on location over the Temsah gas production platform, off Port Egypt in the Mediterranean. The rig was drilling a natural gas well when a gas blowout occurred. More than 150 workers were evacuated with no casualties. The *Adriatic IV* as sunk and not salvageable.
- 27 July 2005. A multi-purpose support vessel crashed into the Indian government owned *Mumbai High North* platform off

India's west coast. An explosion and massive fire resulted. The platform was evacuated and completely destroyed within two hours. 22 of the 384 workers onboard were killed. 123,000 barrels of crude production, 15 per cent of India's domestic output, was affected.

- 2005–2008. A large number of incidents of armed attacks have been documented on offshore oil facilities off the coast of Nigeria, perpetrated by local militant groups. These have resulted in deaths, injuries and abductions, rig or vessel explosions and oil pollution. They had national and global economic consequences.<sup>37</sup>
- 2007. During stormy weather, the *Usumacinta* rig collided with the *Kab-101* platform off the coast of Mexico, causing fuel leaks and killing 21 workers in one of state oil company Pemex's worst accidents.
- 21 August 2009. The *West Atlas* mobile drilling rig leaked oil and gas into the Timor Sea from the Montara oil field off the northwest coast of Australia, and later sank after a fire. The spill continued for months before relief wells were drilled to plug the leak, depositing millions of gallons of crude into a sensitive marine ecosystem. All 69 workers were evacuated. The resulting oil slick spread over approximately 50,000 square miles, killing marine life in affected areas. The leak was not plugged until 1 November 2009.
- 20 April 2010. BP's *Deepwater Horizon* drilling rig exploded off the coast of Louisiana, United States and burned for 36 hours before sinking. 11 crewmembers died and more were seriously injured. Environmental damage to the surrounding Gulf shore was extensive. It was one of the worst environmental disasters of all time.
- 13 May 2010. The exploration rig, *Aban Pearl*, a Venezuelan natural gas exploration rig sank in the Gulf of Paria, near Trinidad and Tobago in the Caribbean Sea. All 95 workers on the rig were rescued and there was no gas leak.

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37 Mikhail Kashubsky, "Offshore energy force majeure: Nigeria's local problem with global consequences", *Maritime Studies*, Vol. 160, May/June 2008, pp. 20–25.

- 2 September 2010. Mariner Energy's *Vermillion Oil Rig 380* exploded off the coast of Louisiana, 200 miles east of where the *Deepwater Horizon* tragedy occurred. All 13 crewmembers were rescued by a supply ship. None were seriously injured.
- November 2011. A deepwater well in the Chevron-operated *Frade* field offshore Brazil leaked 2,400 barrels of oil from the seabed. The leak was halted within four days and the oil did not reach the shoreline.
- 17 December 2011. An oil rig capsized and sank as it was being towed in a storm in the Sea of Okhotsk 200 kilometers off Russia's remote eastern island of Sakhalin. More than 50 Russian crew members were reported to be dead or missing.
- 16 January 2012. Chevron Nigeria Limited oil rig *KS Endeavour* experienced an explosion six miles off the coast of Nigeria with two fatalities. Fire was still burning three days later. Environmental damage to sea life was significant.



## INTERNATIONAL RISK MANAGEMENT APPROACHES

As outlined in Chapter 1, the selected methodology for this analysis is to consider national and regional strategic risk management approaches to governance. The case studies in Chapter 2 demonstrated that managing risks to safety and security in the offshore oil and gas sector requires effective partnerships between governments and industry. This chapter further explores approaches to managing risks to safety and security in the offshore oil and gas sector. An Australian security risk case study will be considered along with regional environmental risk approaches employing collaborative and cooperative regimes for mitigating risks, based upon international conventions, protocols, codes and standards.

A fundamental aspect of effective partnerships is sound communication, a challenging prospect in the offshore oil and gas context where government and industry partners have diverse perspectives, priorities and cultures. Finding a common medium to facilitate effective communication about and approaches to managing risk is an essential starting point. The International Standard *ISO 31000:2009 Risk management – Principles and guidelines*,<sup>1</sup> and associated documents, provide mechanisms for risk management communication and cooperation. The Standard presents internationally accepted best practice frameworks and guidelines for action on risk management. *ISO 31000* is widely used by industry around the world, is mandated for use in many jurisdictions and by international industry bodies, and is increasingly being adopted for use by governments.<sup>2</sup>

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1 *ISO 31000:2009 Risk management – Principles and guidelines* published 13 November 2009.

2 *ISO 31000*, with its recommended approaches to risk management, is widely used by government departments and agencies in Australia, for example.

## WHAT ARE THE BENEFITS OF FORMAL RISK MANAGEMENT APPROACHES?

Risk management is fundamentally about adopting a structured approach to dealing with uncertainty. *ISO 31000* presents a framework that is intended to help “ensure that risk is managed effectively, efficiently and coherently...in a systematic, transparent and credible manner”<sup>3</sup> Major offshore oil and gas safety and security incidents will have security, economic, environmental and human consequences that are likely to be felt beyond individual national jurisdictions and company operations.<sup>4</sup> This scenario is particularly likely in the interconnected littoral geography found in parts of the Asia Pacific region. Managing the risks to major offshore oil and gas activity has regional, national and industry dimensions.

The risk management framework presents a systemised way to identify, analyse, evaluate and treat risks to support strategies for major safety and security incident prevention, response and recovery. Formal risk management approaches to offshore oil and gas security are already in place in some regional jurisdictions, for example Australia,<sup>5</sup> but are not yet widely embraced in Asia. A significant benefit of governments adopting formal risk management approaches is that they are well understood and widely used by industry; effective communication and shared responsibilities for managing risk is, therefore, facilitated.

## EFFECTIVE RISK MANAGEMENT REQUIREMENTS

The requirements of effective risk management at the regional and national level includes, in summary:

- Defining the risk context;
- Identification of key risks and vulnerabilities that may impact safety and security;
- Rigorous and ongoing assessments by competent and experienced

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3 *ISO 31000*, op. cit., p. iv.

4 See Lee Cordner, “Managing regional risk: offshore oil and gas safety and security in the Asia-Pacific region”, *Australian Journal of Maritime & Ocean Affairs*, Vol. 3, No. 1, 2011, pp. 15–24.

5 Lee Cordner, “Offshore Oil and Gas Industry Security Risk Assessment: An Australian Case Study” in Rupert Herbert-Burns, Sam Bateman and Peter Lehr (Eds.), *Lloyd’s MIU Handbook of Maritime Security*, 2009, pp. 169–183.

individuals and responsible organisations of the likelihood and consequences of the risks arising;

- The formulation of policy and actions to mitigate risks so that they are reduced to as low as reasonably practicable;
- The acceptance of residual risk (i.e. risk that is unable to be fully mitigated) by responsible authorities, where necessary;
- Formulation of risk prevention, response and recovery options, arrangements, processes and mechanisms; and
- Consideration of regional collaborative arrangements and mechanisms to deal with cross-jurisdictional and multi-jurisdictional risk management and incident prevention, response and recovery.

Other risk management elements that require consideration at the regional and national levels include enterprise risk management (ERM)<sup>6</sup> and the difficult area of understanding and managing cumulative, accumulated or aggregated risks<sup>7</sup> in the offshore oil and gas sector. ERM

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- 6 The (U.S.) Committee of Sponsoring Organisations of the Treadway Commission (COSO) defines enterprise risk management (ERM) as: “a process, effected by an entity’s board of directors, management and other personnel, applied in strategy setting and across an enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.” HM Treasury (U.K.) defines ERM as: “All the processes involved in identifying, assessing and judging risks, assigning ownership, taking actions to mitigate or anticipate them and monitoring and reviewing progress.” Implicit in these ERM definitions is recognition that it presents a strategic decision support framework for management designed to improve the quality of decision-making at all levels of an organisation or entity.
- 7 How risks combine and potentially magnify due to cumulative and/or aggregated risk factors, which often appear to be discrete and diverse but in fact impact on each other, presents challenges to risk management at national and organisational levels. Evaluations of aggregated and accumulated risk at larger organisational levels that involve complex interactions require access to good data and the application of experienced judgment employing a largely qualitative approach. Effective quantitative assessment of aggregated and accumulated risk in organisations has generally proven elusive. Various approaches, models and technology driven systems have been tried. The results have been useful for calculating aggregated risk at a tactical level where largely technical, routinised processes are employed. Reasonable confidence in qualitative approaches to assessing aggregated and accumulated risk at the enterprise or organisational level requires sound organisational constructs, good risk and safety management processes, systems and information, and the engagement of suitably experienced and responsible management oversight.

entails managing the regional, national and/or organisational risks that can impact upon the viability of an enterprise. ERM requires strategic perspectives that comprehend linkages between diverse and inter-related aspects of an endeavour, for example: political, economic, security, environmental, social, cultural, safety, technological, and international relations factors. In the complex world of offshore oil and gas activity all of these areas are relevant as they present risks to the attainment or protection of national and commercial objectives and interests.

### SECURITY RISK MANAGEMENT – AUSTRALIAN CASE STUDY

A comprehensive review of the effectiveness of Australia's approach to offshore oil and gas security was commissioned by the Australian Government in 2011–2012,<sup>8</sup> some eight years after imposition of a mandatory security-regulated regime. The outcome of that review was released to the public on 25 June 2012<sup>9</sup> and provides timely information to support this analysis. The *Offshore Oil and Gas Resources Sector Security Inquiry Report*<sup>10</sup> advised that a risk-based, intelligence-led approach to security oversight<sup>11</sup> underpins Australia's offshore oil and gas security regime.<sup>12</sup>

Although Australia is a relatively small player in the global oil and gas equation it has significant offshore oil and gas interests, primarily to the

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8 The Hon Anthony Albanese MP, Minister for Infrastructure and Transport, "Inquiry into the security of the offshore oil and gas sector", *Media Release*, 1 February 2011, viewed 11 September 2012, <[http://www.minister.infrastructure.gov.au/aa/releases/2011/February/aa012\\_2011.aspx](http://www.minister.infrastructure.gov.au/aa/releases/2011/February/aa012_2011.aspx)>.

9 The Hon Anthony Albanese MP, Minister for Infrastructure and Transport, "Retirement of the Inspector of Transport Security; Tabling of the Offshore Oil and Gas Resources Sector Security Inquiry Report", *Ministerial Statement*, Parliament House, Canberra, 25 June 2012, viewed 11 September 2012, <[http://www.minister.infrastructure.gov.au/aa/speeches/2012/AS24\\_2012.aspx](http://www.minister.infrastructure.gov.au/aa/speeches/2012/AS24_2012.aspx)>.

10 Office of the Inspector of Transport Security, *Gas Resources Sector Security Inquiry*, Australian Government, Department of Infrastructure and Transport, June 2012, viewed 11 September 2012, <[http://www.infrastructure.gov.au/transport/security/oits/files/Offshore\\_Oil\\_and\\_Gas\\_Resources\\_Sector\\_Security\\_Inquiry.pdf](http://www.infrastructure.gov.au/transport/security/oits/files/Offshore_Oil_and_Gas_Resources_Sector_Security_Inquiry.pdf)>.

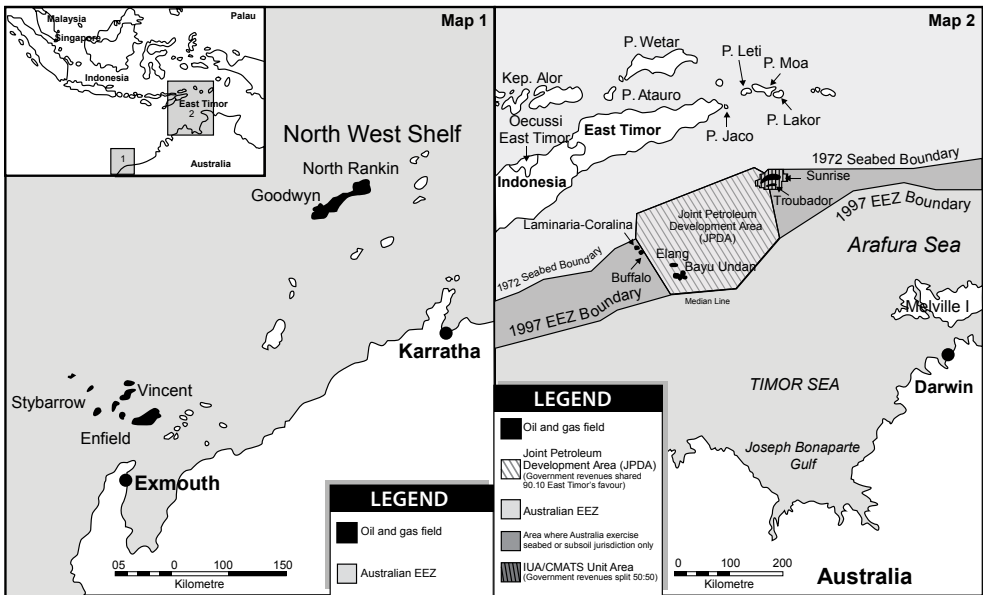
11 *Ibid.*, p. 3.

12 Lee Cordner, "Offshore oil and gas", 2009, loc. cit. A comprehensive analysis of the Australian Government's risk management based approach to offshore oil and gas security in Australia's jurisdiction, including legislation, regulation and government-industry engagement, is presented here.

north of the country, and is expanding exports of liquefied natural gas (LNG). Australia's identification as a terrorist target by Al Qaida, geographic location next to Southeast Asia and strong alignment against Islamist supported terrorism have compelled the Australian Government, along with the key industry players involved, to take a proactive and determined stance to address terrorist security risks to its offshore oil and gas industry.

Significant gas reserves are located offshore to the northwest and north of Australia in Australia's Exclusive Economic Zone (EEZ) and in the Joint Petroleum Development Area (JPDA)<sup>13</sup> with East Timor.

FIGURE 1  
North Western Australia Offshore Oil and Gas Areas<sup>14</sup>



13 Australian Government, *Australia-East Timor Maritime Arrangements*, viewed 3 September 2012, <[http://www.dfat.gov.au/geo/east\\_timor/fs\\_maritime\\_arrangements.html](http://www.dfat.gov.au/geo/east_timor/fs_maritime_arrangements.html)>. A useful summary is provided here of the 2006 Treaty on Certain Maritime Arrangements in the Timor Sea (CMATS Treaty) and 2003 International Unitisation Agreement for Greater Sunrise (IUA) that Australian and East Timor brought into force on 23 February 2007.

14 Lee Cordner, "Offshore oil and gas", 2009, op. cit., p. 170.

Australia's major customers are Japan, South Korea and China. LNG is shipped by tanker, passing through the archipelagic waters of Southeast Asia. Domestic energy needs in parts of Australia are also largely met by natural gas, with the State of Western Australia heavily reliant upon gas piped overland from the North West Shelf. The JPDA offers vastly increased potential for natural gas production when fully operational.

### Applicability of the ISPS code to offshore oil and gas

The December 2002 International Maritime Organization (IMO) Conference of Contracting Governments adopted *The International Code for the Security of Ships and of Port Facilities* (ISPS Code) and *International Convention for the Safety of Life at Sea, 1974* (SOLAS 74) amendments to Chapter XI-1 and a new Chapter XI-2, to be implemented by 1 July 2004. SOLAS 74 was extended to cover port facilities noting that "provisions relating to port facilities should relate solely to the ship/port interface".<sup>15</sup>

Of direct relevance to the oil and gas industry was the inclusion of cargo ships of 500 gross tonnage and upwards, mobile offshore drilling units and requirements that Ship Security Plans should contain provisions for a ship when interfacing with "fixed or floating platforms or a mobile drilling unit on location".<sup>16</sup> IMO Conference Resolution 7 recognised the need to establish measures to enhance the security of mobile offshore drilling units on location and fixed and floating platforms not covered by Chapter XI-2 of SOLAS 74. However, the ISPS Code and SOLAS 74 fell short of encompassing such offshore facilities. The IMO encouraged Contracting Governments, when exercising their responsibilities for mobile offshore drilling units and for fixed and floating platforms operating on their Continental Shelf or within their Exclusive Economic Zone, to ensure that security arrangements applying to offshore facilities would allow interaction with ships covered by the Convention. Governments were requested to inform the IMO of any

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15 International Maritime Organization, *ISPS Code 2003 Edition: International Ship & Port Facility Security Code and SOLAS Amendments 2002*, London 9 to 13 December 2002, Annex 1 pp. 3 and 9.

16 *Ibid.*, Annex 1 pp. 6, 63 and 83.

actions they have taken in this respect.<sup>17</sup>

The IMO, in responding to requests for advice on the application of SOLAS Chapter XI-2 and the ISPS Code to FPSOs and FSUs reiterated the view that such facilities were not “ships subject to the provisions of the ISPS Code”. However they should have security procedures in place to prevent contamination of ships and port facilities subject to the Code.<sup>18</sup> Further, the IMO advised that:

As FPSOs and FSUs operate as part of offshore oil production facilities, it can be expected that the State on whose continental shelf or within whose Exclusive Economic Zone the activity is being undertaken will have developed appropriate security measures and procedures under its national law to protect offshore facilities.<sup>19</sup>

The onus is clearly placed on nations to provide legislation that addresses security arrangements for offshore oil and gas facilities operating within a national EEZ or on a continental shelf.

### The SUA treaties

The United Nations *Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation* (SUA 1988)<sup>20</sup> and *Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms Located on the Continental Shelf* (SUA Protocol 1988)<sup>21</sup> were initially developed in response to the *Achille Lauro* hijacking in 1985. The SUA Convention (SUA 2005) and Protocol (SUA Protocol 2005) resulted from

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17 Ibid., Annex 2 pp 8–9 Conference Resolution 7.

18 International Maritime Organization, *Guidance Relating to the Implementation of SOLAS Chapter XI-2 and the ISPS Code*, MSC/Circ.1097, London 6 June 2003, viewed 3 September 2012, <<http://www.imo.org/>>.

19 International Maritime Organization, *Guidance Relating to the Implementation of SOLAS Chapter XI-2 and the ISPS Code*, MSC/Circ.1111, London 7 June 2004, viewed 3 September 2012, <<http://www.imo.org/>> .

20 United Nations, *Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation* (SUA Convention), Australian Treaty Series 1993 No. 10, Australian Government Publishing Service, Canberra, 1995.

21 United Nations, *Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms Located on the Continental Shelf*, Australian Treaty Series 1993 No. 11, Australian Government Publishing Service, Canberra, 1995.

an IMO Conference in London in October 2005<sup>22</sup> and came into force on 28 July 2010.<sup>23</sup> The main purpose of the SUA Treaties is to provide an international legal basis for ensuring that appropriate action can be taken against persons committing unlawful acts.

The 2005 amendments to the SUA Treaties impose an expanded range of provisions specifically targeted at international terrorism. The SUA 1988 Protocol (and the SUA protocol 2005 amendments) extends the provisions of the SUA Treaties, as they apply to shipping, to offshore oil and gas platforms on the continental shelf. Contracting Governments are authorised to enact legislation for dealing with unlawful acts of violence against such platforms. The inconsistency of the IMO's approach with the ISPS Code and SOLAS 74 amendments, in not including offshore platforms, is underlined by the SUA Treaties.

The SUA Treaties provide the international basis for responding to acts or threats of terrorism and other criminal acts against ships and fixed offshore platforms. They do not provide the basis for prevention or recovery. In Australia, the SUA Treaties are enacted in the *Crimes (Ships and Fixed Platforms) Act 1992*<sup>24</sup> which provides the legal basis for authorities to respond to such crimes under Australian jurisdiction, and to bring offenders to justice.

## The Australian response

The Australian response to offshore oil and gas industry security must be seen in the context of broader, whole of government approaches to dealing with the threat of terrorism. The responsibilities, authorities and mechanisms to prevent, and if necessary manage acts of terrorism and their consequences are outlined in the *National Counter-Terrorism*

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22 International Maritime Organization, *Final Act of the International Conference on the Revision of the SUA Treaties*, LEG/CONF.15/23, London 19 October 2005, viewed 3 September 2012, <<http://www.imo.org/>> .

23 IMO, viewed 22 August 2012, <<http://www.imo.org/About/Conventions/StatusOfConventions/Pages/Default.aspx>>.

24 Australian Government, *Crimes (Ships and Fixed Platforms) Act 1992*, Act No. 173 of 1992 as amended, Commonwealth of Australia, Canberra, May 2001.



*Plan* (NCTP).<sup>25</sup> Security of the Australian offshore oil and gas industry is affected by many aspects of the NCTP and related arrangements, summarised as follows:

- Australian Government responsibilities include maintenance of counter-terrorism capabilities, prevention strategies and operational responses to threats, leading the management of intelligence, and determining and promulgating the national counter-terrorism alert level.
- The Australian Government regulates security arrangements for Australian ports, port facilities, ships and offshore oil and gas facilities.
- Responsibilities for critical infrastructure (CI) protection are outlined. These apply to offshore oil and gas facilities that contribute significantly to meeting Australia's energy needs and/or contribute significantly to export income. A National Committee on Critical Infrastructure Protection (NCCIP) coordinates arrangements with a Critical Infrastructure Advisory Council (CIAC) that includes Energy industry advice. A Business Government Advisory Group on National Security is also in place.<sup>26</sup>
- A Trusted Information Sharing Network (TISN) has been established to facilitate the sharing of security information (including intelligence, where necessary) between the Australian Government and owners and operators of CI.<sup>27</sup>

### Arrangements specific to the offshore oil and gas industry

The Australian Government responded in a timely and proactive manner to implementation of the ISPS Code and SOLAS 74 amendments. In

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25 Australian Government, *National Counter-Terrorism Plan*, Second Edition, Commonwealth of Australia, Canberra, September 2005, Plus amendments relating to National Counter-Terrorism Alert System introduced on 1 October 2008, viewed 22 August 2012, <<http://www.nationalsecurity.gov.au>> .

26 Australian Government, *Protecting Australia Against Terrorism 2006: Australia's National Counter-Terrorism Policy and Arrangements*, Commonwealth of Australia, Canberra 2006, pp. 16 and 29.

27 *National Counter-Terrorism Plan*, op. cit., p. 3:6.

2004, an Australian Government Task Force on Offshore Maritime Security concluded that there was a need for security regulations that apply to ports and shipping to be extended to the offshore oil and gas industry. The amended *Maritime Transport and Offshore Facilities Security Act* (MTOFSA) 2003<sup>28</sup> and *Maritime Transport and Offshore Facilities Security Regulations 2003*<sup>29</sup> provided the remedy. The Act and Regulations require that ISPS Code requirements similar to those for ships and port facilities apply to offshore oil and gas facilities and offshore service providers operating under Australian jurisdiction.

The MTOFSA and Regulations established the regulatory framework for Australian offshore oil and gas security. Compliance by offshore industry participants is mandatory, just as Australia, as a Contracting Government, is obliged to set in place arrangements to comply with the ISPS Code and SOLAS 74 amendments. All offshore industry participants<sup>30</sup> are required to have Government approved offshore security plans in place. Failure to comply satisfactorily is an offence. Approval for offshore security plans that are deemed to be inadequate can be cancelled. Cancellation of an offshore security plan effectively means the industry participant can no longer operate.<sup>31</sup>

### Security risk assessment and management

Risk management fundamentally underpins the offshore oil and gas industry security processes in the Australian context. Offshore facility operators are required to have a valid security risk assessment as part of an offshore security plan that must include: (i) details of the risk

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28 Australian Government, *Maritime Transport and Offshore Facilities Security Act 2003*, Act No. 131 of 2003 as amended, Commonwealth of Australia, Canberra 2006.

29 Australian Government, *Maritime Transport and Offshore Facilities Security Regulations 2003*, Statutory Rules 2003 No. 366 as amended, Commonwealth of Australia, Canberra 27 March 2007.

30 *Maritime Transport and Offshore Facilities Security Act 2003*, op. cit., p 16. "Offshore industry participant means: an offshore facility operator; a contractor who provides services to an offshore facility operator; or a person who: conducts an enterprise connected with a security regulated offshore facility; and is prescribed by the regulations."

31 Australian Government MTOFSA Act and Regulations, op. cit.

management process adopted; (ii) the risk context or threat situation for each facility; (iii) identification of possible risks or threats, with the likelihood and consequences of their occurrence; and (iv) identification of possible risk treatments and their effectiveness in reducing risks and vulnerabilities.

The Australian Government issues and updates *Offshore Oil & Gas Risk Context Statements* (OGRCS)<sup>32</sup> and the *Offshore Security Assessments Guidance Paper* (OSAGP).<sup>33</sup> The OGRCS provides a contextual and dynamic overview of the transnational terrorism security environment relevant to the Australian oil and gas industry. The document is intended only to supplement threat and risk assessment information from other sources. The onus remains upon specific owner/operators to determine their own security risks utilising risk assessment processes.

These documents outline a coordinated approach to security risk management from a national level through enterprise and organisational levels down to individual operations and operators. Specific risk management guidance for the oil and gas sector is provided utilising generic approaches defined by Australian and New Zealand risk management standards and guidelines,<sup>34</sup> which are effectively the same as *ISO 31000*.

### Offshore security risk assessments

The OSAGP provides concise guidance on security risk assessment processes to assist offshore oil and gas operators to meet the security assessment requirements of the MTOFSA and Regulations. Clearly it is in the interests of industry participants to follow the processes outlined. They are obliged to submit offshore security plans to the Australian Government for approval. Notably, the prescribed process is consistent

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32 Australian Government, Department of Infrastructure and Transport, *Offshore Oil & Gas Risk Context Statement* can be obtained by industry participants upon request, viewed 22 August 2012, <[http://www.infrastructure.gov.au/transport/security/maritime/security\\_plans/offshore\\_facility.aspx](http://www.infrastructure.gov.au/transport/security/maritime/security_plans/offshore_facility.aspx)>.

33 Australian Government, Department of Infrastructure and Transport, *Preparing Offshore Security Plans*, April 2009, viewed 22 August 2012, <<http://www.infrastructure.gov.au/>>.

34 Published as Standards Australia AS/NZS ISO 31000:2009 – *Risk Management – Principles and Guidelines*

with risk management processes practiced across the industry for other aspects of operations, including safety.

The OSAGP recognises that risk analyses can be qualitative, quantitative or semi-quantitative. It advises that qualitative risk analyses are sufficient for offshore oil and gas security risk assessments as they provide satisfactory indicators of risk levels. Guidance is provided on risk categories, likelihood and consequence estimates, and risk treatments and other factors in the risk management process, along with basic templates that may assist those preparing risk assessments.

### Industry response

The Australian Government mandated counter-terrorism security arrangements have been welcomed by the principal companies operating in the Australian offshore oil and gas industry.<sup>35</sup> At an earlier stage, offshore facility operators were concerned about the potential vulnerability of their facilities to terrorist attack. However, they were not in a position to fully understand and assess the risks themselves, nor do they have the authority or security capabilities to effectively treat the risks. Intelligence, surveillance and response capabilities and the authority for their employment primarily lies with Australian Government agencies. The *Gas Resources Sector Security Inquiry Report* noted the ongoing constructive relationship between industry and government agencies. The need to enhance mutual levels of understanding, particularly in the security space, and to clarify and improve incident reporting, response and command and control was also identified.<sup>36</sup>

Both government and industry recognise that they have vital interests in a secure oil and gas industry and an effective partnership is required to ensure this is provided. Offshore industry participants are very familiar with, and in many cases deeply experienced in the application of risk management processes. Risk management in the oil and gas sector has been driven by the need to comply with stringent occupation health and safety requirements, as well as the need to address political, technical and

35 Lee Cordner, "Offshore oil and gas", 2009, op. cit.

36 Office of the Inspector of Transport Security, *Gas Resources Sector Security Inquiry*, op. cit., pp. 5–6.

financial risks for projects often requiring significant investment outlays seeking large returns over extended timeframes.

Embracing formal risk management approaches in some parts of the government sector in Australia lagged behind industry and it has taken time for this situation to be redressed. Oil and gas companies initially found themselves interfacing with public organisations less proficient in risk management processes than themselves.<sup>37</sup> There are also diverse organisational culture, priority and perception differences that have to be managed. In the Australian context, establishing coordinating entities that facilitate industry-government security interfaces have improved communication and understanding. Similarly, the establishment of an intelligence and information network has been an essential development, important to counter-terrorism efforts.

The Australian case study is useful for informed understanding about the application of risk management processes at national and enterprise levels to the offshore oil and gas industry. While geographical, political, cultural, environmental and other factors will vary greatly around the world there is a common requirement to effectively manage security risks.

## ENVIRONMENTAL PROTECTION RISK MANAGEMENT – REGIONAL CASE STUDIES

Offshore oil and gas risk management includes the need to protect the environment from massive damage. Collaborative and cooperative regional regimes for protecting the environment and mitigating risks of marine pollution, based upon international conventions and codes in the Mediterranean Sea and the Persian (Arabian) Gulf, are considered noting that both are connected to the northwest Indian Ocean. These areas meet UNCLOS<sup>38</sup> criteria for “enclosed or semi-enclosed seas”<sup>39</sup> that encourages littoral states to cooperate either “directly or through an appropriate regional organisation”<sup>40</sup> to co-ordinate such matters as

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37 Lee Cordner, “Offshore oil and gas”, 2009, loc. cit.

38 United Nations (1982), *United Nations Convention on the Law of the Sea* of 10 December 1982, entered into force 16 November 1994.

39 *Ibid.*, Article 122.

40 *Ibid.*, Article 123.

the management, conservation, protection and preservation of living resources and the marine environment.<sup>41</sup>

### South China Sea – A semi-enclosed sea

Notably, the environmentally sensitive and hydrocarbon rich South China Sea also falls under the UNCLOS definition of a large semi-enclosed sea. The northern and southern extremities are “connected to another sea or the ocean (the Pacific and Indian Oceans) by a narrow outlet”.<sup>42</sup> There are several narrow outlets: the Taiwan Strait, Luzon Strait, Malacca Strait and the Sunda Strait plus other, narrower outlets to the Philippine, Celebes and Java Seas. The South China Sea is also “surrounded by two or more States” and eventually, subject to resolution of delimitation disputes, may consist “entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal states”.<sup>43</sup>

The 2002 Declaration on the Conduct of Parties in the South China Sea (DoC) provides for cooperative activities, consistent with those prescribed by UNCLOS Article 123 to occur “pending a comprehensive and durable settlement of the (territorial and jurisdictional) disputes”.<sup>44</sup> Progress so far has been minimal; related factors, including the willingness of Asia Pacific states to embrace international codes and conventions, will be further addressed in Chapter 5. The UNCLOS semi-enclosed sea regime requirements

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41 Ibid.

42 United Nations 1982, *op. cit.*, Article 122.

43 Ibid.

44 ASEAN, Declaration on the Conduct of Parties in the South China Sea, 4 November 2002, viewed 4 September 2012, <<http://www.aseansec.org/13163.htm>>. Article 6 states “Pending a comprehensive and durable settlement of the disputes, the Parties concerned may explore or undertake cooperative activities. These may include the following: a. marine environmental protection; b. marine scientific research; c. safety of navigation and communication at sea; d. search and rescue operation; and e. combating transnational crime, including but not limited to trafficking in illicit drugs, piracy and armed robbery at sea, and illegal traffic in arms.”

in the South China Sea<sup>45</sup> lay behind the decision by the Council for Security Cooperation in the Asia-Pacific (CSCAP)<sup>46</sup> to convene a Study Group that produced a Memorandum on this matter.<sup>47</sup> The Memorandum provides general guidance and lacks detail because regional sensitivities have to be accommodated for even modest cooperative progress to be made with Asia Pacific regional dialogue, even through non-binding discourse via Track II entities like CSCAP.

### Marine pollution and environmental protection – Mediterranean Sea and Persian Gulf

In addition to UNCLOS as the overarching regime for sea law, there are conventions and protocols that specifically address marine pollution and have significance for the offshore oil and gas sector. The *1972 London Convention*,<sup>48</sup> *1996 Dumping Protocol*<sup>49</sup> and the *International Convention on Oil Pollution Preparedness, Response and Co-operation 1990*

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45 Lee Cordner, “The Spratly Islands dispute and the Law of the Sea”, *Ocean Development and International Law*, Volume 25, 1994, pp. 61–74. An analysis of the South China Sea claimants’ positions relevant to UNCLOS is presented here with a brief overview of the merits of the South China Sea being determined as a semi-enclosed sea at pp. 70–71.

46 The Council for Security Cooperation in the Asia Pacific (CSCAP) provides an informal mechanism for scholars, officials and others in their private capacities to discuss political and security issues and challenges facing the region. CSCAP comprises 21 full members: Australia, Brunei, Cambodia, Canada, China, Europe, India, Indonesia, Japan, DPR Korea, Korea, Malaysia, Mongolia, New Zealand, Papua New Guinea, Philippines, Russia, Singapore, Thailand, United States of America and Vietnam and one associate member (Pacific Islands Forum Secretariat). Viewed 4 September 2012, <<http://www.cscap.org/>>.

47 Council for Security Cooperation in the Asia-Pacific (CSCAP), *Guidelines for Maritime Cooperation in Enclosed and Semi-Enclosed Seas and Similar Sea Areas of the Asia Pacific*, Memorandum 13, June 2008, viewed 4 September 2012, <<http://www.cscap.org/index.php?page=cscap-memoranda>>.

48 *Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matters 1972 (1972 London Convention)*, adopted 29 December 1972 (entered into force generally 30 August 1975).

49 *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (1996 Dumping Protocol)*, adopted 7 November 1996 (entered into force generally 24 March 2006).

(OPRC 1990)<sup>50</sup> are relevant to marine pollution prevention, response and recovery. OPRC 1990 presents mandatory requirements for pollution emergency plans for vessels, offshore drilling units, production platforms, and onshore facilities. Offshore units include both floating and fixed structures engaged in exploration, production, loading and unloading of oil.<sup>51</sup> States are encouraged to cooperate and establish regional as well as national systems for oil pollution preparedness and response.<sup>52</sup>

The 1972 *London Convention* addresses dumping from offshore platforms and other manmade structures, including deliberate disposal of offshore platforms. The 1996 *Dumping Protocol* recently entered into force and superseded the 1972 *London Convention* and is more restrictive as it adopts a “precautionary approach”<sup>53</sup> and a “reverse list approach.”<sup>54</sup>

Agreements have been struck in many regions around the world<sup>55</sup> that specifically impose regional arrangements consistent with those

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50 *International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 (OPRC 1990)*, adopted 30 November 1990 (entered into force generally 13 May 1995).

51 *Ibid.*, Article 3.

52 *Ibid.*, Article 6.

53 *1996 Dumping Protocol*, *op. cit.*, Article 3(1). The precautionary approach requires that appropriate preventive measures are taken when there is reason to believe that wastes or other matter introduced into the marine environment are likely to cause harm, even when there is no conclusive evidence establishing a link between inputs and their effects.

54 *Ibid.*, Article 4(1). The reverse list approach prohibits all dumping unless it is explicitly permitted in the approved list. This effectively limits a range of waste materials that may be disposed of at sea and presents a new approach to regulating the use of the sea as a depository of wastes.

55 See United Nations Environment Programme (UNEP), <<http://www.unep.ch/regionalseas/legal/conlist.htm>>, viewed 6 September 2012, for a listing of regional treaties.



international treaties. These include the *Barcelona Convention*<sup>56</sup> and the *Madrid Protocol*<sup>57</sup> in the Mediterranean Sea that deal with pollution resulting from exploration and exploitation of the continental shelf and the seabed and its subsoil,<sup>58</sup> requires parties to cooperate in dealing with pollution emergencies,<sup>59</sup> and to engage in scientific and technological co-operation.<sup>60</sup> Similarly, the objectives of the *Kuwait Convention*<sup>61</sup> and

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- 56 United Nations Environment Programme (UNEP), *Convention for the Protection of the Mediterranean Sea against Pollution 1976* (Barcelona Convention) revised in Barcelona, Spain, 10 June 1995 and replaced by the *Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean*, entered into force 9 July 2004, viewed 6 September 2012, <[http://www.unep.ch/regionalseas/regions/med/t\\_barcel.htm](http://www.unep.ch/regionalseas/regions/med/t_barcel.htm)>. The Contracting Parties are: Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, European Community, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Morocco, Serbia and Montenegro, Slovenia, Spain, Syria, Tunisia, and Turkey.
- 57 United Nations Environment Programme (UNEP), *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 1994* (Madrid Protocol), adopted 14 October 1994 in Madrid, Spain, has not yet entered into force, viewed 6 September 2012, <<http://www.unep.org/regionalseas/programmes/unpro/mediterranean/instruments/default.asp>>.
- 58 UNEP, *Barcelona Convention*, op. cit., Article 7 requires “Contracting Parties shall take all appropriate measures to prevent, abate and combat pollution of the Mediterranean Sea area resulting from exploration and exploitation of the continental shelf and the seabed and its subsoil”
- 59 Ibid., Article 9 states “Contracting Parties shall co-operate in taking the necessary measures for dealing with pollution emergencies in the Mediterranean Sea area, whatever the causes of such emergencies and reducing or eliminating damage resulting therefrom.”
- 60 Ibid., Article 11.
- 61 United Nations Environment Programme (UNEP), *Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution* (Kuwait Convention); adopted 24 April 1978, in force 1 July 1979, Contracting Parties: State of Bahrain, Iran, Republic of Iraq, State of Kuwait, Sultanate of Oman, State of Qatar, Kingdom of Saudi Arabia and the United Arab Emirates, viewed 6 September 2012, <<http://www.unep.org/regionalseas/programmes/nonunep/ropme/instruments/default.asp>>.

associated Protocols<sup>62</sup> in the Persian Gulf include cooperation in preventing and dealing with pollution of the marine environment from various sources including “exploration and exploitation of the bed of the territorial sea and its subsoil and the continental shelf ... (and) co-operation in dealing with pollution Emergencies”<sup>63</sup>

These Agreements include the formulation of regional action plans for protecting the coastal and marine environment and for dealing with pollution.<sup>64</sup> Such agreements do not yet exist in the northeast Indian Ocean and western Pacific Ocean to address the need for cooperative, regional approaches in areas like the South China Sea and the East China Sea. Associated risk management implications are addressed in Chapter 5.

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62 United Nations Environment Programme (UNEP), *Protocol Concerning Regional Co-operation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency*; adopted 1978, in force 1979; and *Protocol concerning Marine Pollution resulting from Exploration and Exploitation of the Continental Shelf*; adopted 1989, in force 1990, viewed 6 September 2012, <<http://www.unep.org/regionalseas/programmes/nonunep/ropme/instruments/default.asp>>.

63 UNEP, *Kuwait Convention*, loc. cit.

64 See the United Nations Environment Programme (UNEP) website <<http://www.unep.org/>> for details.

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# ASIA PACIFIC

## REGIONAL SAFETY AND SECURITY CHALLENGES

**T**he immense scale and geographic extent of offshore oil and gas activity in the often crowded waters of the Asia Pacific means there are many safety and security challenges. This chapter will consider a range of safety and security risks that confront regional and extra-regional actors: regulatory/man-induced; the prospect of armed conflict; law and order at sea issues; increasing maritime user intensity; natural hazards; and decommissioned installations.

### MAN-INDUCED RISKS AND REGULATORY FAILURES

The significant majority of major offshore oil and gas safety incidents around the world, as indicated by the summary at Annex A to Chapter 2, have been attributed to man-induced hazards resulting from human error, technology or equipment failures, regulatory failures, or a combination of these. As discussed in detail at Chapter 2, increasing production pressures are compelling the offshore oil and gas sector into deeper and more remote waters at the leading edge of human experience and technological capacity. Political, commercial and financial pressures combine to promote risk taking and to undermine regulatory regimes that are inadequately constituted, resourced and experienced. Cumulative risks mount to present circumstances where systemic safety incidents are certain to occur.

The massive expansion of offshore oil and gas exploration and exploitation activity in the often busy waters of the Asia Pacific region presents an increasing likelihood of man-induced safety incidents that pose significant collective risks to the region. The incidence of well blowouts and leaks for example, is likely to increase. There will be more accidents with ever greater consequences in the future, exacerbated in areas like the South China Sea by peculiar vulnerabilities resulting from regional geography and ecology, and multinational companies operating across

multiple regulatory regimes and sometimes doubtful national jurisdictions. The conclusions drawn from an analysis of incidents elsewhere, and summarised at Chapter 2, will generally apply and are not repeated here. Asia Pacific states, regional cooperative entities and companies have the opportunity to learn from experiences elsewhere and to impose appropriate risk mitigation strategies.

### **Regional Armed Conflict**

As energy demand rises and the scramble to access offshore resources increase so do tensions among countries that claim ownership to various parts of the region's waters. The heightened significance for regional security of increasing offshore oil and gas activities can be seen in escalating boundary delimitation disputes and claims between states, particularly in the South and East China Seas. The prospect of regional tensions degenerating into armed conflict cannot be discounted.

The efforts of the multiple protagonists to promote claims to sovereignty are indicated by the various applications of national names to significant geographical features. For example, the semi-enclosed sea that lies in the southwest corner of the Pacific Ocean (the Southeast Asian corner), and is bounded and to various extents claimed by multiple littoral states, is referred to as the South China Sea by China (and the West), the West Philippine Sea by the Philippines, and the East Sea by Vietnam.

### **Escalating tensions**

The competition for access to undersea resources is intense in the South China Sea, particularly around the Spratly Islands and the Paracel Islands. There are also significant and growing tensions in the East China Sea, as evinced by numerous ongoing sovereignty disputes, for example: between Japan and South Korea over islands known as Takeshima (Japan) and Dokdo (South Korea),<sup>1</sup> the Kuril Islands dispute between Japan and

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1 Kang Hyun-kyung and Chung Min-uck, "Lee's Dokdo trip presses Japan", *Korea Times*, 11 August 2012, viewed 20 August 2012, <[http://www.koreatimes.co.kr/www/news/nation/2012/08/116\\_117130.html](http://www.koreatimes.co.kr/www/news/nation/2012/08/116_117130.html)>. South Korean President Lee Myung-bak's visit to the disputed Dokdo (Takeshima) Islands in August 2012 caused a significant diplomatic incident indicative of wider territorial antipathy in the East China Sea.

Russia,<sup>2</sup> and the Senkaku (Japan)/Diaoyutai (China/Taiwan) Islands dispute between China, Japan and Taiwan.<sup>3</sup>

China, Vietnam and Taiwan claim all of the Spratly Islands area (also called Nansha Islands by China and Taiwan), while Malaysia, the Philippines and Brunei variously occupy and lay claim to some of the islands and isolated features.<sup>4</sup> See Cordner (1994)<sup>5</sup> for an assessment of the various claimants' positions and their validity in respect of UNCLOS.<sup>6</sup>

Efforts to put aside sovereignty claims to facilitate mutually beneficial exploration for offshore oil and gas have been made, as proposed by the 2002 ASEAN-China Declaration on the Conduct of Parties in the South

2 Russian Prime Minister Dmitry Medvedev reportedly visited the islands on 3 July 2012 creating a diplomatic incident between Russia and Japan, see RT.com, "Medvedev visits Kuril Islands – 'important part of Russian land'", 3 July 2012, viewed 7 September 2012, <<http://rt.com/politics/medvedev-kuril-islands-visit-284/>>. An historical summary of the Kurile Islands dispute can be found at <<http://www1.american.edu/ted/ice/KURILE.HTM>>, viewed 7 September 2012. Link copied to clipboard

3 For a summary of the Senkaku/Diaoyutai recent disputes and history see GlobalSecurity.org, "Senkaku/Diaoyutai Islands", August 2012, Viewed 7 September 2012, <<http://www.globalsecurity.org/military/world/war/senkaku.htm>>.

4 China occupies seven areas (Cuarteron, Fiery Cross, Gaven, Hughes, Johnson, Mischief, and Subi); Taiwan occupies one (Itu Aba, also known as Taiping Island); Vietnam 21 areas (Alison, Amboyan, Barque Canada, Central London, Cornwallis South, East London, Da Gri-san, Da Hi Gen, Great Discovery, Ladd, Landsdowne, Pearson, Petley, Sand, Sin Cowe, South Reef, South West Cay, Spratly, Tennent, and West London); parts are claimed by Malaysia (which occupies 3- Ardasier, Mariveles and Swallow Reefs); and the Philippines (which occupies 8 areas- Loaita, Nanshan, West York, Lamkian Cay, Thitu, North East Cay, Flat, and Commodore Reef); in 1984, Brunei established an exclusive fishing zone that encompasses Louisa Reef in the southern Spratly Islands but has not publicly claimed the island.

5 Lee G. Cordner, "The Spratly Islands Dispute and the Law of the Sea", *Ocean Development and International Law*, Volume 25, 1994, pp. 61–74.

6 United Nations, *United Nations Convention on the Law of the Sea (UNCLOS)* of 10 December 1982, entered into force 16 November 1994.

China Sea (DoC).<sup>7</sup> Article 6<sup>8</sup> was used as the basis for a primarily commercial agreement to conduct joint research for petroleum resources between oil companies from Vietnam, China, and the Philippines in 2005.<sup>9</sup> In announcing the arrangement, the Parties were careful not to compromise sovereignty claims.<sup>10</sup> Progress since the agreement and the DoC was signed has not been smooth with numerous allegations of transgressions. Parties are invited to “exercise self-restraint in the conduct of activities that would complicate or escalate disputes and affect peace and stability including ... refraining from action of inhabiting on ... uninhabited islands ... and other features and to handle their differences in a constructive manner”.<sup>11</sup> Alleged transgressions of the DoC, along with major development activity on many tiny, low lying South

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7 ASEAN, *Declaration on the Conduct of Parties in the South China Sea*, 4 November 2002, Phnom Penh, Cambodia, viewed 7 September 2012, <<http://www.aseansec.org/13163.htm>>.

8 Ibid. Article 6 invites Parties to “explore or undertake cooperative activities” including marine scientific research.

9 Ministry of Foreign Affairs of the Peoples Republic of China, press release “Oil companies of China, the Philippines and Vietnam signed Agreement on South China Sea Cooperation”, SRC-241, 15 March 2005. A Tripartite Agreement for Joint Marine Seismic Undertaking in The Agreement Area in the South Sea was signed on 14 March 2005 in Manila, Philippines, by and among China National Offshore Oil Corporation (CNOOC), Vietnam Oil and Gas Corporation (PetroVietnam), and the Philippine National Oil Company (PNOC), viewed 15 August 2012, <<http://www.fmprc.gov.cn/eng/wjb/zwjg/zwbd/t187333.htm>>.

10 Ibid. China stated that the agreement “will not undermine the basic positions held by their respective Governments on the South China Sea issue and will contribute to the transformation of the South China Sea into an area of peace, stability, cooperation, and development in accordance with the 1982 United Nations Convention on the Law of the Sea”.

11 ASEAN, *Declaration on the Conduct of Parties in the South China Sea*, op. cit.

China Sea islands and other features<sup>12</sup> plus major increases in military and naval activity in the area are clearly at odds with the spirit and intent of the DoC.<sup>13</sup>

### Increasing maritime force capabilities

Adding to security concerns arising from strident diplomatic exchanges between the South China Sea protagonists is the significant and sustained increase in military expenditure by several Asian countries. Whether this can be typified as a general regional arms race is not clear, with Asia and Oceania reported to have increased overall military spending by 2.3 per cent in 2011.<sup>14</sup> China, India and Vietnam have each increased military spending massively over the past decade and Russia and Indonesia have also significantly increased

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- 12 There are a large number of reports of new structures and military outposts on low lying islands, atolls and reefs on the Spratly and Paracel Island areas. For example: in September the Philippines accused China of building new structures on Mischief Reef, which lies close to the Philippines and within the area of overlapping claims (Alexis Romero, "China expanding Mischief structures", *The Philippine Star*, 3 September 2012, viewed 6 September 2012, <<http://www.philstar.com/Article.aspx?articleId=844730&publicationSubCategoryId=63>>). Similarly, Taiwan is reported to have created significant structures on the largest Spratly feature, Itu Aba (Taiping) Island; and China is reported to be establishing a "prefectural-level city named Sansha based on Woody (Yongxing) Island in the Paracels (Xisha) archipelago" with a "division-level garrison" (see Dennis J. Blasko and M. Taylor Fravel, "Much ado about the Sansha Garrison", *The Diplomat*, 23 August 2012, viewed 25 August 2012, <<http://thediplomat.com/2012/08/23/much-ado-about-the-sansha-garrison/>>).
- 13 ASEAN, *Declaration on the Conduct of Parties in the South China Sea*, op. cit. Article 7 states that Declaration has the "purpose of promoting good neighbourliness and transparency, establishing harmony, mutual understanding and cooperation, and facilitating peaceful resolution of disputes".
- 14 Stockholm International Peace Research Institute (SIPRI), "Background paper on SIPRI military expenditure data, 2011", 17 April 2012, viewed 10 September 2012, <<http://www.sipri.org/research/armaments/milex>>.

expenditure.<sup>15</sup> Much of the arms expenditure continues to be on quantitative increases and qualitative improvements to naval capabilities, particularly in acquiring modern surface combatants, submarines, large amphibious vessels and aircraft carriers, sea and air based missile systems and electronic warfare systems.<sup>16</sup> One analyst noted that “Asia has now been involved in a sustained build-up of defence capabilities for two decades”<sup>17</sup> while another analyst optimistically suggests qualitative and quantitative improvements in naval capabilities’ across the region could result in improved maritime security cooperation.<sup>18</sup>

### What are the risks of armed conflict?

Armed conflict risk assessments require consideration of both capability and intent. In the South China Sea, and indeed other parts of the Asia Pacific, the capability of many nations to wage war at sea is improving and, when combined with efforts to stake claims over the oceans resources, generate valid perceptions of increasing intent to use armed force. The likelihood of armed conflict at sea is increasing while the consequences of armed exchanges, given qualitative and quantitative capability improvements, are also significantly increasing.

The prospect of regional, or extra-regional, states using armed force to protect territorial and resource interests must be weighed against broader mutual interests in maintaining peace and good order at sea, particularly to sustain the uninterrupted flow of maritime trade essen-

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15 Ibid. China is reported to have increased military expenditure by 170 per cent since 2002, consistently maintaining approximately 2 per cent of GDP; India has increased spending by 66 per cent since 2002; Vietnam has increased military spending by 82 per cent since 2003; Indonesian military spending has increased by 82 per cent since 2002; and Russia, also a Pacific power, has increased military spending by 16 per cent in real terms since 2008, including a 9.3 per cent increase in 2011.

16 Desmond Ball, “Asia’s naval arms race: Myth or reality?”. Paper prepared for the 25th Asia-Pacific Roundtable, Kuala Lumpur, Malaysia, 29 May – 1 June 2011, p. 5, viewed 10 September 2012, <[http://www.isis.org.my/files/25APR/paper\\_cs\\_2\\_desmond\\_ball.pdf](http://www.isis.org.my/files/25APR/paper_cs_2_desmond_ball.pdf)>.

17 Ibid, p. 15.

18 Sukjoon Yoon, “The dilemma of naval modernisation in East Asia”, *RSIS Commentaries*, No. 168/2012, 11 September 2012, viewed 12 September 2012, <<http://www.rsis.edu.sg/publications/>>.



tial to regional and extra-regional economies. On balance, given the mutually negative impacts for regional countries of war, armed conflict between states over maritime boundary delimitation claims and alleged transgressions of offshore oil and gas activity are more likely to be local and contained than to degenerate into wider regional conflict. That said, the risks of armed conflict due to miscalculation by overly aggressive local commanders is increasing as protagonists in the South China Sea expand deployed naval capabilities and reinforce military garrisons on remote, tiny islands and other features.

Apart from the immediate risks of damage to oil and gas facilities and vessels, the attendant loss of life and environmental damage, and global economic impacts, the possibility of a local conflict widening to regional conflict cannot be discounted. The related importance of global and regional conflict resolution regimes and internationally agreed mechanisms for managing the consequences are emphasised; the low levels of accession of regional nations' to such agreements and arrangements must be viewed with concern.

## LAW AND ORDER AT SEA RISKS

In the increasingly congested waters of the Asia Pacific, particularly in areas like the South China Sea, a rise in law and order incidents could reasonably be expected. However, so far there have been no appreciable increases in piracy and armed robbery or maritime terrorism in the region. The risks to offshore oil and gas safety and security arising from law and order at sea incidents are generally low although the consequences could be severe.

### Piracy and armed robbery

The major areas of piracy attacks are off parts of Africa, particularly Somalia and Nigeria.<sup>19</sup> Piracy remains a concern in Asia with the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) Information Sharing Centre (ISC)

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19 United Nations Conference on Trade and Development (UNCTAD), *Review of Maritime Transport 2011*, viewed 10 September 2012, <[http://unctad.org/en/Docs/rmt2011\\_en.pdf](http://unctad.org/en/Docs/rmt2011_en.pdf)>, pp. 119–121.

reporting a reduced incidence of piracy and armed robbery against ships in Asia during January-June 2012 compared to the same periods of 2010 and 2011.<sup>20</sup> Of particular relevance was a reduction in the incidence of piracy and armed robbery in the South China Sea, including Malaysian waters and the Malacca and Singapore Straits.<sup>21</sup> There were no reported incidents in the Arabian Sea and the Bay of Bengal.<sup>22</sup> The vast majority of incidents involved petty theft primarily against vessels at anchor; incidents related to the oil and gas sector were primarily against small, slow local oil tankers.<sup>23</sup>

Large fixed oil and gas installations are difficult targets for pirates although significant attacks have been reported elsewhere in the world, particularly off Nigeria, where local militants have been intent upon disrupting the oil industry.<sup>24</sup> FPSOs, FSUs and tankers, particularly when fully laden, and oil tender vessels, present easier targets and are more likely to be targets for piracy and armed robbery.

### Maritime terrorism

The likelihood of terrorist attacks on the global energy sector, although low, continues to be of concern. Similar to the piracy case, large fixed offshore oil and gas installations present difficult targets for terrorists, although the risks must be viewed as real and credible, as major damage can be inflicted that will have global security and economic consequences.<sup>25</sup> The 2008 Mumbai terrorist attacks in India have required govern-

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20 ReCAAP ISC, "Piracy and armed robbery against ships in Asia, half yearly report, January to June 2012", viewed 10 September 2012, <<http://www.recaap.org/>>.

21 *Ibid.*, p. 3. Malaysia reported the lowest number of incidents during compared to the same period in the past four years. The South China Sea and the Straits of Malacca and Singapore reported a 71 per cent and 50 per cent decrease in the number of incidents during January-June 2012 compared to the same period in 2011.

22 *Ibid.*, p. 11.

23 *Ibid.*, pp. 9–10, 24–25 and 28–29.

24 Mikhail Kashubsky, "Offshore energy force majeure: Nigeria's local problem with global consequences", *Maritime Studies*, 160, May/June 2008, viewed 15 January 2011, <<http://www.austlii.edu.au>> .

25 S. Bajpai and J. P. Gupta, "Securing oil and gas infrastructure", *Journal of Petroleum Science and Engineering*, 55 (2007), 174–186.

ments to re-focus attention upon maritime areas as presenting both potential terrorist targets and being a source of projecting terrorism ashore.<sup>26</sup> The risks to regional facilities must be considered, including from non-conventional attacks intended to disrupt operations.<sup>27</sup>

### RISKS ASSOCIATED WITH INCREASING MARITIME USER INTENSITY

In addition to rapidly increasing offshore oil and gas exploration and development activity, the incidence of shipping operations, after Global Financial Crisis setbacks in 2009, grew by seven per cent in 2010 with the major increases in Asia.<sup>28</sup> Shipping traffic density through the western Pacific remains high, particularly through the key Straits to the south and north of the South China Sea (Singapore, Malacca, Taiwan and Luzon Straits), and regional fishing activity remains intense. More than 70,000 vessels annually transit the Malacca Strait and the figure could be considerably higher according to informed calculations.<sup>29</sup>

A busier and more crowded maritime environment raises the likelihood of man-induced safety incidents arising from human errors and technological malfunctions, like collisions and oil spills. Intense rivalry between South China Sea claimants and protagonist for resources has already led to tense incidents,<sup>30</sup> including reported

26 V. K. Shashikumar, "Gaps in Maritime Security-1", *Indian Defence Review*, Vol. 24 No. 1, January – March 2009, 27 November 2010, viewed 15 January 2011, <<http://www.indiandefencereview.com>> .

27 For example: cyber-attacks.

28 UNCTAD, *Review of Maritime Transport 2011*, op. cit., pp. 7–12. Asia is by far the most important loading and unloading area for maritime trade globally with 40 per cent of total goods loaded and 55 per cent of goods unloaded.

29 Definitive data on Malacca Strait shipping activity is difficult to find. One informed estimate, compiled from a variety of sources, suggests that approximately 126,000 vessel transit, arrivals and departures occur annually. Figures commonly quoted are between 50,000 and 70,000 shipping transits per annum but these are considered to be incomplete estimates.

30 Jason Miks, "China, Philippines in standoff", *The Diplomat*, 11 April 2012, viewed 12 April 2012, <<http://thediplomat.com/the-editor/2012/04/11/china-philippines-in-standoff/>>.

loss of life, between naval forces and fishing vessels.<sup>31</sup> Placing a definitive risk value on the implications for the offshore oil and gas sector of increased maritime user intensity is not feasible however interactions and competition between multiple users of the maritime space can be expected to grow, increasing the likelihood of accidents and incidents.

### Safety zones

The increased likelihood of unauthorised activities in close proximity to oil and gas installations (e.g. fishing, diving or tourism) presenting safety and security risks, is a concern in many areas. The internationally mandated 500 meter safety zones<sup>32</sup> are not wide enough to provide adequate space to warn or intercept intruders. This matter was considered at the 56<sup>th</sup> session of the International Maritime Organization (IMO) Sub-Committee on Safety of Navigation in July 2010, with guidelines to increase awareness and routing around the zones proposed, but not to increase the size of safety zones.<sup>33</sup>

The Australian *Gas Resources Sector Security Inquiry*,<sup>34</sup> completed in June 2012, confirmed the inadequacy of safety zones in the Australian offshore oil and gas context. The inquiry found that zones are too small to be effective, breaches are largely unenforceable and facility operators do not have realistic opportunities to implement defensive measures or evacuation strategies; “a graded multi-layered security zone approach,

31 GMA News Online, “Victims from ‘Chinese’ ramming now 1 dead, 1 injured, 4 missing”, 24 June 2012, viewed 24 June 2012, <<http://www.gmanetwork.com/news/story/263018/news/regions/victims-from-chinese-ramming-now-1-dead-1-injured-4-missing>>.

32 United Nations, *UNCLOS*, op. cit., Article 60.

33 IMO Sub-Committee on Safety of Navigation, 56<sup>th</sup> session: 26–30 July 2010, *IMO Media Release*, 30 November 2010, <<http://www.imo.org>> (3 March 2011).

34 Office of the Inspector of Transport Security, *Gas Resources Sector Security Inquiry*, Australian Government, Department of Infrastructure and Transport, June 2012, viewed 11 September 2012, <[http://www.infrastructure.gov.au/transport/security/oits/files/Offshore\\_Oil\\_and\\_Gas\\_Resources\\_Sector\\_Security\\_Inquiry.pdf](http://www.infrastructure.gov.au/transport/security/oits/files/Offshore_Oil_and_Gas_Resources_Sector_Security_Inquiry.pdf)>, pp. 4–5.

which would provide more effective protection” was recommended.<sup>35</sup> Rig operators are very limited in the enforcement powers they can legally apply; this remains an area of significant vulnerability for both safety and security.

### RISKS ARISING FROM NATURAL HAZARDS

The Asia Pacific region is identified as “the most hazard prone region in the World”<sup>36</sup> due primarily to the high indigence of typhoons, cyclones and earthquakes. Risks to safety from natural hazards, particularly extreme weather events and seismic activity, are growing as the offshore oil and gas sector in the Asia Pacific region expands and the incidence of extreme weather events increases due to climate change. Consequences that must be addressed in risk management strategies include the prospect of massive environmental disasters that transcend national boundaries. In crowded regional waters the results of incidents can quickly extend beyond individual national jurisdictions.<sup>37</sup>

Food security may be profoundly affected by massive marine pollution, which is of major concern across most of Asia where seafood is a major source of protein in local diets, and where the livelihood of coastal communities may be severely affected.<sup>38</sup> Significant financial conse-

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35 Ibid., p. 5.

36 See “adpc strategy 2020: *Towards a Safer Asia – Building resilience through innovation and partnerships*”, viewed 24 January 2013, <<http://www.adpc.net/2012/?>>.

37 As was reported to have occurred in the *Montara* case off northern Australia where the spill was alleged to have spread into Indonesian waters. WWF Australia, “One year after Montara spill Indonesia advancing claims”, 26 August 2010, viewed 15 January 2011, <<http://www.wwf.org.au>>.

38 Jenny Blinch, Benjamin McCarron and Katie Yewdall; Lucy Carmody (Ed.), “The future of fish in Asia”, *Responsible Research*, September 2011, viewed 10 September 2012, <[http://www.responsible-research.com/The\\_Future\\_of\\_Fish\\_in\\_Asia-Issues\\_for\\_Responsible\\_Investors.pdf](http://www.responsible-research.com/The_Future_of_Fish_in_Asia-Issues_for_Responsible_Investors.pdf)>, p. 2. The Asian region dominates the global fishing industry in capture quantities, number of people employed, consumption and number of vessels in operation. Over 85 percent of all fishers and fish farmers in 2008 were Asian, as were six of the top ten producer countries in capture fishing.

quences that may be incurred include: increased insurance premiums, clean-up costs, compensation, and (usually short-term) impacts on world oil and gas prices.<sup>39</sup>

## Weather and earthquakes

Typhoons or tropical cyclones cause costly and deadly natural disasters affecting much of South Asia, East Asia, Southeast Asia and Australasia. Typhoons are particularly prevalent in the East and South China Seas, with the northwest Pacific Ocean recognised as the area with the most numerous and intense tropical cyclones globally, while northern Australia is also prone to frequent and intense cyclonic activity. The climate change induced increase in the incidence and severity of extreme weather events is likely to have major impacts in Asia Pacific tropical and sub-tropical areas.<sup>40</sup> Earthquakes and tsunamis also present major risks as much of the region falls within two of the world's major seismic activity areas, the Circum-Pacific Belt and the Alpide Belt, that extend east from the Mediterranean Sea through Indonesia and around the western Pacific Rim from New Zealand to Russia.

The high likelihood of extreme natural events present major risks of catastrophic incidents in Asia Pacific offshore oil and gas sectors that may have regional as well as national implications. Around the world, installations have sustained significant weather damage that has caused major environmental and other hazards on numerous occasions.<sup>41</sup> Much research continues into how offshore oil and gas exploration and exploitation facilities will cope with extreme weather events in waters that are deeper and further offshore. The current practice of shutting down rigs and evacuating personnel in the event of approaching typhoons or

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39 As occurred in the *Deepwater Horizon* incident. See U.S. Government Accountability Office (GAO) Report, *Deepwater Horizon Oil Spill: Preliminary Assessment of Federal Financial Risks and Cost Reimbursement and Notification Policies and Procedures*, 12 November 2010, viewed 15 January 2011, <<http://www.rfflibrary.wordpress.com>>.

40 Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Synthesis Report*, viewed 15 January 2011, <<http://www.ipcc.ch>>.

41 See the summary in Annex A to Chapter 2.

cyclones may not be sufficient to avert catastrophe in the future. Oil and gas support vessels and attending tankers are also at risk.

### **RISKS FROM DECOMMISSIONED PLATFORMS**

The numbers of decommissioned offshore oil and gas platforms in the Asia Pacific will increase as existing, older platforms near their end of life. The incidence of derelict facilities will significantly increase into the future due to the large number of new installations. The risks posed by abandoned rigs include hazards to navigation and other users of the area, and increased environmental hazards. Abandoned or disused installations or structures are required to be removed under international law<sup>42</sup> and IMO guidelines specify how this is to occur.<sup>43</sup> It is incumbent upon regional governments to have regulatory regimes in place to ensure that decommissioned installations are properly dealt with.

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42 UNCLOS, Article 60.

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

## POLICY RESPONSE PRACTICES AND OPTIONS

This chapter explores Asia Pacific regional maritime safety and security policy response practices and options, as they apply to the offshore oil and gas sector. A key feature is the low incidence of accession by regional countries to international regimes designed to help manage risks and aid coordination of incident prevention, response and recovery, along with an associated lack of region-wide maritime security and safety cooperation. Another key issue is the vulnerability resulting from jurisdictional uncertainty where the geographical limits of national responsibilities and obligations for safety and security may be unclear. The criticality of these issues was recognised by the Council for Security Cooperation in the Asia Pacific (CSCAP), which convened a multi-national, regional Study Group that resulted in CSCAP Memorandum No. 16 Safety and Security of Offshore Oil and Gas Installations, published in January 2011, the full text of which, including Annex A “List of Relevant International Conventions, Regional Instruments and Other Documents”, is attached at Annex A to this Chapter.<sup>1</sup> Annex B to the CSCAP Memorandum, “Table of Ratification or Accession of Treaties by ARE/CSCAP Member States”, has been updated and is included as Table 1 in this chapter.

### COMPLIANCE WITH INTERNATIONAL REGIMES AND REGIONAL COOPERATION

Regional governments are understandably keen to exploit their offshore resources. Exercising rights to resource access generates obligations for responsible management, including adoption and implementation of relevant international regimes. Given the crowded geography and shared vulnerabilities, regional governments should derive considerable benefit

1 Lee Cordner was co-chair for this Council for Security Cooperation in the Asia Pacific (CSCAP) Study Group.



from entering into cooperative arrangements with neighbouring littoral states, and regional and extra-regional maritime user states, to protect convergent interests. Offshore incidents are likely to have national, regional and global consequences that transcend national boundaries.

Table 1 presents a summary of ratification or accession by regional states of key treaties. The adoption rate among many states prominent in offshore oil and gas activity in the region is low, and related regional cooperative arrangements and architectures are lacking. This is of particular concern in regard to the security, safety of life at sea, and marine environmental protection regimes that have special significance for this industry.

### Marine pollution and environmental protection

Chapter 3 considered cooperative regional approaches to marine pollution prevention, response and recovery utilising UNCLOS,<sup>2</sup> the 1972 *London Convention*<sup>3</sup> and 1996 *Dumping Protocol*,<sup>4</sup> and the *International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 (OPRC 1990)*.<sup>5</sup> Regional agreements drawn from these international conventions and protocols generally do not yet exist in the Asia Pacific region. Rectifying this deficiency should become a priority for regional governments and regional cooperative entities as they seek to mitigate safety and security risks from offshore oil and gas activity.

### Maritime safety and security

Many Asia Pacific regional states are also not parties to international conventions and protocols on maritime safety and security. Many states have not ratified or acceded to: the *International Convention on Mari-*

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2 United Nations, *United Nations Convention on the Law of the Sea (UNCLOS)* of 10 December 1982, entered into force 16 November 1994.

3 *Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matters 1972 (1972 London Convention)*, adopted 29 December 1972, entered into force generally 30 August 1975.

4 *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (1996 Dumping Protocol)*, adopted 7 November 1996, entered into force generally 24 March 2006.

5 *International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 (OPRC 1990)*, adopted 30 November 1990, entered into force generally 13 May 1995.

*time Search and Rescue, 1979*;<sup>6</sup> *Safety of Life at Sea (SOLAS)*<sup>7</sup> and the *International Ship and Port Facility Security (ISPS) Code Amendments*;<sup>8</sup> and the *Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA 1988)*,<sup>9</sup> the related *1988 SUA Protocol (Protocol, 1988)*<sup>10</sup> on fixed platforms, or the *2005 SUA Protocols*.<sup>11</sup> There has been recent progress with Indonesia formally acceding to the *International Convention on Maritime Search and Rescue (SAR Convention)*.<sup>12</sup> While there are numerous bilateral and multilateral security arrangements in the region, region-wide, multi-lateral maritime safety and security regimes are not in place.

### Maritime boundary delimitations

Regional cooperation is difficult because many maritime boundaries between littoral states have not been delimited. Until recently, offshore oil and gas activity has primarily been in areas where national jurisdiction is not contested. Increasingly, as outlined in Chapter 4, offshore oil and gas activity is occurring in the South and East China Seas where maritime boundary delimitation disputes abound.<sup>13</sup> Unresolved maritime

6 *International Convention on Maritime Search and Rescue, 1979*, adopted 27 April 1979, entered into force generally 22 June 1985.

7 *International Convention for the Safety of Life at Sea, 1974 (SOLAS)*, adopted 1 November 1974, entered into force generally 25 May 1980.

8 *Amendments to the Annex to the International Convention for the Safety of Life at Sea (SOLAS), 1974 Contained in Resolutions 1, 2, 6 and 7 of The Conference of Contracting Governments and The International Ship and Port Facility Security (ISPS) Code*, London, 12 December 2002, entered into force 1 July 2004.

9 *Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA 1988)*, adopted 10 March 1988, entered into force generally 1 March 1992.

10 *Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms located on the Continental Shelf 1988 (1988 SUA Protocol)*, adopted 10 March 1988, entered into force generally 1 March 1992.

11 *2005 Protocol to the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (2005 SUA Protocols)*, entered into force generally 28 July 2010.

12 International Maritime Organization (IMO), "Indonesia ratifies several IMO instruments", *Briefing*: 33, 28 August 2012, viewed 11 September 2012, <<http://www.imo.org/Pages/home.aspx>>.

13 See Victor Prescott and Clive Schofield, "Undelimited Maritime Boundaries of the Asian Rim in the Pacific Ocean", in S. Furness (Ed.), *Maritime Briefing*, Volume 3 Number 1, 2001.

boundary issues present points of extreme sensitivity between regional states, particularly in East Asia and Southeast Asia; they are complex and there are no easy solutions. Notably, even in Track II diplomacy there is unwillingness among some national delegations to discuss sovereignty and boundary issues.<sup>14</sup> Regional maritime cooperation dialogue and arrangements are significantly complicated by seemingly irresolvable sovereignty issues. This is of particular concern given the proliferation of offshore oil and gas activity where the geographical limits of national responsibilities and obligations for safety and security may be unclear.

Regional commentators continue to urge protagonists to adopt conciliatory and compromise approaches to disagreements. It has variously been suggested that international arbitration or adjudication be sought to resolve sovereignty disputes;<sup>15</sup> that a cooperative management regime be established for the South China Sea comprised of all bordering countries;<sup>16</sup> and that UNCLOS provisions be used to clarify the areas of overlapping maritime claims that would lead to negotiations for provisional arrangements, including joint development agreements.<sup>17</sup> So far, there has been little appetite for negotiation or compromise, particularly using UNCLOS.<sup>18</sup> Perhaps the need for regional approaches to offshore oil and gas safety and security will, in the future, present a catalyst for increased regional cooperation?

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14 During Council for Security Cooperation in the Asia-Pacific (CSCAP) Study Group deliberations, hosted by Vietnam in Da Nang 6–8 October 2010, some delegates refused to countenance sovereignty issues. They had to be put aside to enable agreement to be attained on CSCAP Memorandum No. 16, *Safety and Security of Offshore Oil and Gas Installations*, January 2011, viewed 3 March 2011, <<http://www.cscap.org/>> .

15 Dato' Muthiah Alagappa, "Rethinking territorial disputes in the South China Sea: Transforming problem into opportunity", *RSIS Commentaries*, No. 166/2012, 5 September 2012, viewed 11 September 2012, <<http://www.rsis.edu.sg/>>.

16 Sam Bateman, "Increasing competition in the South China Sea – Need for a new game plan", *RSIS Commentaries*, No. 157/2012, 21 August 2012, viewed 24 August 2012, <<http://www.rsis.edu.sg/>>.

17 Robert Beckman, "The South China Sea disputes: How states can clarify their maritime claims", *RSIS Commentaries*, No. 140/2012, 31 July 2012, viewed 12 August 2012, <<http://www.rsis.edu.sg/>>.

18 See Lee Cordner, "The Spratly Islands dispute and the Law of the Sea", *Ocean Development and International Law*, Volume 25, 1994, pp. 61–74 for an analysis of claimants' positions relevant to UNCLOS.

TABLE 1  
Ratification or Accession of Treaties by Asia Pacific States<sup>19</sup>

States	Treaties	1982 UNCLOS <sup>1</sup>	1974 SOLAS <sup>2</sup>	1988 SUA <sup>2</sup>
ASEAN Member States	Brunei	1996 <sup>f</sup>	1986 <sup>a</sup>	2003 <sup>f</sup>
	Cambodia	s	1994 <sup>a</sup>	2006 <sup>a</sup>
	Indonesia	1986 <sup>f</sup>	1981 <sup>a</sup>	
	Laos	1998 <sup>f</sup>		
	Malaysia	1996 <sup>f</sup>	1983 <sup>a</sup>	
	Myanmar	1996 <sup>f</sup>	1987 <sup>a</sup>	2003 <sup>a</sup>
	Philippines	1984 <sup>f</sup>	1981 <sup>a</sup>	2004 <sup>f</sup>
	Singapore	1994 <sup>f</sup>	1981 <sup>a</sup>	2004 <sup>a</sup>
	Thailand	2011 <sup>f</sup>	1984 <sup>a</sup>	
	Vietnam	1994 <sup>f</sup>	1990 <sup>a</sup>	2000 <sup>a</sup>
ASEAN Dialogue Partners	Australia	1994 <sup>f</sup>	1983 <sup>a</sup>	1993 <sup>a</sup>
	Canada	2003 <sup>f</sup>	1978 <sup>a</sup>	1993 <sup>f</sup>
	China	1996 <sup>f</sup>	1980 <sup>f</sup>	1991 <sup>f</sup>
	European Union	1998 <sup>fc</sup>		
	India	1995 <sup>f</sup>	1976 <sup>a</sup>	1999 <sup>a</sup>
	Japan	1996 <sup>f</sup>	1980 <sup>a</sup>	1998 <sup>a</sup>
	New Zealand	1996 <sup>f</sup>	1990 <sup>a</sup>	1999 <sup>f</sup>
	Republic of Korea	1996 <sup>f</sup>	1980 <sup>f</sup>	2003 <sup>a</sup>
	Russia	1997 <sup>f</sup>	1980 <sup>pp</sup>	2001 <sup>f</sup>
	United States		1978 <sup>f</sup>	1994 <sup>f</sup>
ASEAN Observer	Papua New Guinea		2012 <sup>n</sup>	
	Bangladesh	2001 <sup>f</sup>	1981 <sup>a</sup>	2005 <sup>a</sup>
	DPR of Korea	s	1985 <sup>a</sup>	
	East Timor			
	Mongolia	1996 <sup>f</sup>	2002 <sup>a</sup>	
	Pakistan	1997 <sup>f</sup>	1985 <sup>a</sup>	2000 <sup>a</sup>
	Sri Lanka	1994 <sup>f</sup>	1983 <sup>a</sup>	2000 <sup>a</sup>

<sup>1</sup> United Nations Division for Ocean Affairs and the Law of the Sea. Chronological lists of ratifications of, accessions and successions to the Convention and the related Agreements 3 June 2011.

19 CSCAP, Memorandum No. 16, op. cit. Table from the Memorandum adapted and updated, current at 31 August 2012, viewed 11 September 2012, <<http://www.imo.org> and <<http://www.un.org>>.

1988 SUA Protocol <sup>2</sup>	1990 OPRC <sup>2</sup>	1972 London Convention <sup>2</sup>	1996 Dumping Protocol <sup>2</sup>	1979 Search and Rescue <sup>2</sup>
2003 <sup>r</sup>				
2006 <sup>a</sup>				2012 <sup>a</sup>
	1997 <sup>a</sup>			
2003 <sup>a</sup>				
2004 <sup>r</sup>	s	1973 <sup>r</sup>	2012 <sup>n</sup>	
	1999 <sup>a</sup>			1997 <sup>a</sup>
	2000 <sup>a</sup>			
2002 <sup>a</sup>				2007 <sup>a</sup>
1993 <sup>a</sup>	1992 <sup>a</sup>	1985 <sup>r</sup>	2000 <sup>r</sup>	1983 <sup>a</sup>
1993 <sup>r</sup>	1994 <sup>a</sup>	1975 <sup>r</sup>	2000 <sup>a</sup>	1982 <sup>a</sup>
1991 <sup>r</sup>	1998 <sup>a</sup>	1985 <sup>a</sup>	2006 <sup>r</sup>	1985 <sup>ar</sup>
1999 <sup>a</sup>	1997 <sup>a</sup>			2001 <sup>a</sup>
1998 <sup>a</sup>	1995 <sup>a</sup>	1980 <sup>r</sup>	2007 <sup>a</sup>	1985 <sup>a</sup>
1999 <sup>r</sup>	1999 <sup>a</sup>	1975 <sup>r</sup>	2001 <sup>r</sup>	1985 <sup>a</sup>
2003 <sup>a</sup>	1999 <sup>a</sup>	1993 <sup>a</sup>	2009 <sup>a</sup>	1995 <sup>a</sup>
2001 <sup>r</sup>	2009 <sup>a</sup>	1975 <sup>r</sup>		1988 <sup>r</sup>
1994 <sup>r</sup>	1992 <sup>r</sup>	1974 <sup>r</sup>	s	1980 <sup>r</sup>
		2012 <sup>n</sup>		2012 <sup>n</sup>
2005 <sup>a</sup>	2004 <sup>a</sup>			
2005 <sup>a</sup>				
2000 <sup>a</sup>	1993 <sup>a</sup>	1995		1985 <sup>a</sup>

<sup>2</sup> International Maritime Organization. Status of Multilateral Conventions and Instruments in respect of which the IMO or its Secretary-General Performs Depositary or other functions 31 August 2012.

<sup>r</sup> ratification <sup>a</sup> accession <sup>ap</sup> acceptance <sup>fc</sup> formal confirmation <sup>ar</sup> approval <sup>s</sup> signatory <sup>n</sup> accession date not known

## RISK MANAGEMENT CONSEQUENCES

The low incidence of accession or ratification and therefore compliance with and implementation of international regimes in the region combined with maritime boundary delimitation uncertainty is of major concern to offshore oil and gas safety and security risk management. The readiness and willingness of regional states to set necessary regulatory standards and attend to international obligations for maritime safety, security and environmental protection are in doubt. Boundary and therefore jurisdictional uncertainty could be used by nations and industry to avoid obligations in the event of major crises.

There have been allegations of major oil spill incidents being reported late or where an event has been denied despite evidence to the contrary. A case in point was an offshore rig oil spill reported to have occurred in June 2011 in China's largest offshore oil field in Bohai Bay "equivalent to the disaster in the Gulf of Mexico" that spread over 320 square miles. The Chinese government reported the spill at a press conference a month after the incident and claimed it had already been cleaned up.<sup>20</sup> Subsequent reporting suggested further leaks, massive environmental and fishing industry damage.<sup>21</sup> A major concern here was the lack of timeliness and transparency with an incident that reportedly had significant environmental impact, serious implications for industry, and potentially, consequences for neighbouring states. The inference of a culture of secrecy in such circumstances does not bode well given the increasing likelihood and massive consequences of such incidents in the Asia Pacific, particularly in the crowded waters of the South and East China Seas.

Importantly, industry may be presented with opportunities to

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20 The incident was subject to various media reports: Andrew Jacobs, "China offshore oil spill spreads 320 square miles", *New York Times*, 6 July 2011; Chosun Media, "China admits massive oil spill in Bohai Bay", *The Chosunilbo*, 6 July 2011, viewed 12 September 2012, <[http://english.chosun.com/site/data/html\\_dir/2011/07/06/2011070601098.html](http://english.chosun.com/site/data/html_dir/2011/07/06/2011070601098.html)>; and RFI English, "U.S. oil giant admits to massive China oil spill", 12 August 2011, viewed 12 September 2012, <<http://www.english.rfi.fr/asia-pacific/20110812-us-oil-giant-admits-massive-china-oil-spill>>.

21 People's Daily Online – English, "ConocoPhillips admits discovery of new oil spill source in China's Bohai Bay", 13 August 2011, viewed 12 September 2012, <<http://english.peopledaily.com.cn/90882/7568346.html>>.

exploit jurisdictional and regulatory uncertainties and inconsistencies, and political rivalries, between neighbouring states. Many offshore oil and gas companies operate in multiple jurisdictions, consistent standards of compliance are highly desirable from an industry perspective. States that have poorly developed regulatory regimes are opening the way for unscrupulous operators to apply lesser standards of safety and security, thereby increasing risks. As discussed in Chapter 2, even in jurisdictions like the U.S. and Australia that have well developed regulatory regimes, mature oil and gas industries, and where jurisdiction is clear there have been and will continue to be major incidents resulting from regulatory, technical or operational failures, weather events and accidents at sea.

At regional and international levels, the possibility for misunderstandings between states are raised if they are not operating from commonly derived legislative bases and within clearly defined geographical boundaries. Regional, national and industry prevention, response and recovery arrangements and measures are unnecessarily complicated and inefficient due to inconsistent approaches combined with the lack of cooperation.

### Damage to reputation

Another consequence that must be considered by regional governments, and the industry, is the damage to reputation if major incidents occur, particularly if prevention, response and recovery arrangements are found to be wanting. In both the *West Atlas* and *Deepwater Horizon* cases, under Australian and U.S. jurisdictions respectively, significant shortcomings in regulatory, response and recovery arrangements were revealed. The reputation of some regional states as good citizens of the world are likely to be significantly diminished by low levels of adoption and compliance with international regimes and their lack of preparedness to provide a safe and secure environment for the conduct of relatively hazardous offshore oil and gas operations.

### RISK MITIGATION AND TREATMENT OPTIONS

Risk mitigation and treatment options that should be considered by Asia Pacific states at regional and national levels are outlined below. The

suggested options are aimed at addressing multiple risks across multiple jurisdictions.

### Strategic risk assessment

The most compelling initial requirement is to fully understand the Asia Pacific offshore oil and gas integrated all risks context, and to establish strategic risk management frameworks. *ISO 31000:2009* provides proven, internationally accepted guidance. Effective risk management partnerships between government and industry are highly desirable as outlined in Chapter 3. An initial regional strategic risk assessment would aim to establish the risk context. Subsequent steps could then be taken to identify, analyse and evaluate the risks leading to the development of regional and national risk treatment options.

Such a risk assessment process could be coordinated under the auspices of regional consultative bodies like the ASEAN Regional Forum (ARF),<sup>22</sup> East Asian Summit (EAS)<sup>23</sup> or South Asian Association for Regional Cooperation (SAARC).<sup>24</sup> Participation by regional states could be voluntary with the intent of gaining mutually beneficial understanding of the scope of the risk context that would inform judgments about cooperative and individual state approaches to managing the risks.

An important part of the process, when identifying risks and vulnerabilities, and the likelihood and consequences of certain risks arising, is to be clear from whose perspective the analysis is being conducted. The outcomes of risk assessments may be quite different when coming from a regional perspective, purely national perspectives, or from industry or company perspectives. Each entity will have different priorities, stakeholders, cultures, and appetite for risk; and the implications and options for mitigating risk may be quite different. A company may simply take

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22 ASEAN Regional Forum (ARF), viewed 3 March 2011, <<http://www.aseanregionalforum.org>>.

23 ASEAN, "About the East Asia Summit", viewed 3 March 2011, <<http://www.aseansec.org/aadcp/repsf/abouteastiasummit.html>>.

24 South Asian Association for Regional Cooperation (SAARC), viewed 13 September 2012, <<http://www.saarc-sec.org/>>. The member states are: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.



out insurance cover to mitigate a particular risk while a state may need to ensure international arrangements, regulatory regimes, and response measures are in place.

Once an initial risk assessment has been conducted and a risk baseline established regular and comprehensive update assessments of the offshore oil and gas safety and security strategic risk profile would be required. Adopting a consistent approach to risk management and establishing viable risk management frameworks would be helpful to all parties participating in the risk management process. At an Asia Pacific regional level, a regional strategic risk management framework would provide the necessary cooperative bases to assist common risk understanding leading to the development of effective, cooperative approaches to mitigating and treating risks.

### **Government and industry cooperation**

An essential requirement of effective risk management in the offshore oil and gas sector is recognition of the roles and responsibilities of industry and governments. Effective government-industry cooperative partnerships need to be encouraged that includes appropriate sharing of responsibilities for prevention, response and recovery. At a minimum, the following matters require consideration:

- A common appreciation of the real risks associated with offshore oil and gas needs to be developed;
- The responsibilities of governments and industry need to be defined so that individual and shared regional, national and industry obligations are recognised and evaluated to ensure that there are no gaps; and
- Effective cooperation and consistency is required regionally, nationally and with industry in dealing with issues like decommissioned platforms, disaster and emergency response arrangements, and security cooperation.

### **Mutually beneficial cooperation**

Developing joint strategies, arrangements, regimes and mechanisms to deal with offshore oil and gas safety and security risks presents a positive

and necessary opportunity for regional governments, in collaboration with industry, to develop mutually beneficial cooperation. Cooperation in this non-threatening context, in order to protect mutual interests, could improve goodwill and lead to wider maritime safety and security cooperation. Regional governments, with the support from affected extra-regional governments, need to find ways of putting aside sovereignty disputes in order to focus upon mutual interests that include reducing the likelihood of regional conflict and regional environmental and economic disasters.

### **INTERNATIONAL REGIME ADOPTION AND REGIONAL COOPERATION**

The emerging offshore oil and gas situation in the Asia Pacific region presents an important catalyst for encouraging regional governments and regional entities to make significant progress toward adopting and implementing relevant international regimes. International regimes have evolved over many years and are based upon experiences in many parts of the world. Collectively, they reinforce objectives of enhancing maritime safety and security, and marine environmental protection. It is in the national interests of Asia Pacific regional governments to proactively engage as this will support offshore oil and gas exploitation opportunities while addressing responsibilities and obligations, and managing risk.

#### **International regime adoption**

Regional governments are urged to ratify, observe and effectively implement a range of international conventions, regional instruments and other documents as a matter of priority. A consistent level of regional ratifications and accessions of international regimes would provide a sound, common basis for developing regional cooperation and setting consistent standards for industry. There are many international regimes that require attention. Listed in Table 1 are some of the key conventions and protocols that should be considered by regional governments.

#### **Regional cooperative arrangements**

The development of regional cooperative arrangements should be given very high priority. The potentially large scope and scale of offshore oil

and gas safety and security incidents, and the likelihood that the impacts will transcend national boundaries, support this imperative. This is particularly relevant in the crowded geography of parts of the Asia Pacific where littoral states will almost certainly require assistance in dealing with major incidents.

There has recently been qualified progress in parts of the region although regional non-cooperation has been the more common practice. For example, the 2002 ASEAN China Declaration on the Conduct of Parties in the South China Sea (DoC)<sup>25</sup> affirms the commitment of the Parties to pursue peaceful means and international law in settling disputes. It also encourages Parties<sup>26</sup> to undertake cooperative activities. However, there has been little practical progress with cooperation so far and China and ASEAN member states have alleged multiple transgressions of the DoC. ASEAN's commitment to establishing a Regional Code of Conduct in the South China Sea (CoC), in order to operationalise the DoC, was belatedly reaffirmed after the July 2012 ASEAN meeting was initially unable to reach agreement to release a joint communiqué.<sup>27</sup> However, China has indicted that this is a longer-term goal so agreement and compliance with a CoC appears unlikely in the short-term.<sup>28</sup> The DoC and the draft CoC emphasise resolving disputes through ASEAN frameworks and international law, however the positions of the South China Sea protagonists suggest little likelihood of acquiescence to independent international mediation.

Attempts to set aside boundary delimitation disputes and undertake cooperative oil and gas exploration have not been very successful. A Tripartite Agreement for Joint Marine Seismic Undertaking in the Agreement Area in the South China Sea between China, Vietnam and the Philippines national oil companies in 2005 was initially greeted as

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25 ASEAN, Declaration on the Conduct of Parties in the South China Sea, 4 November 2002, 11 September 2012, <<http://www.aseansec.org/13163.htm>>.

26 *Ibid.*, the *ASEAN Declaration* does not include Taiwan, a key participant in South China Sea territorial claims and oil exploration activities.

27 ASEAN, Statement of ASEAN Foreign Ministers 20/07/2012, viewed 12 September 2012, <<http://www.mfaic.gov.kh/mofa/default.aspx?id=3206>>.

28 Ian Storey, "Little hope of effective South China Sea conduct code", *South China Morning Post*, 27 July 2012.

offering much promise.<sup>29</sup> However, little cooperative activity has been reported; the agreement has mainly served to underscore and inflame existing territorial disputes.<sup>30</sup>

## REGIONAL DISASTER RESPONSE MECHANISMS

There are numerous regional mechanisms in the Asia Pacific that engage in aspects of disaster management and emergency response, either as their key focus or as part of broader regional engagement. Principal among these are ASEAN, ARE, EAS, the Asia-Pacific Economic Community (APEC)<sup>31</sup> and SAARC. There are also sub-regional entities and organisations within the larger groupings focusing on one or more disaster management elements.<sup>32</sup> Most regional countries have established national disaster management mechanisms supported by variable levels of associated legislation, regulations and resources; including access to military capabilities.

The massive scale and frequency of natural disasters resulting from extreme weather events and seismic activity, and the underdeveloped status of many Asia Pacific nations, has resulted in national and regional disaster response and recovery resources often being found wanting. Resources were deployed from around the world and the region in

29 Ministry of Foreign Affairs People's Republic of China, *Media Release*, "Oil companies of China, the Philippines and Vietnam signed agreement on South China Sea cooperation", 15 March 2005, viewed 3 March 2011, <<http://www.fmprc.gov.cn>>.

30 Ian Storey and Carl Thayer, "The South China Sea dispute: A review of developments and their implications since the 2002 Declaration on the Conduct of Parties", in K. V. Kesavan and Daljit Singh (Eds.), *South and Southeast Asia: Responding to Changing Geo-Political and Security Challenges* (2010), 57–72, viewed 15 January 2011, <<http://www.scribd.com>>.

31 See APEC, *Emergency Preparedness*, viewed 12 September 2012, <<http://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Emergency-Preparedness.aspx>>.

32 Examples of regional non-government disaster coordination and training entities include: the Asian Disaster Response & Cooperation Network, the Secretariat is based in Malaysia, <<http://www.adrrn.net/>>; Asian Disaster Preparedness Center (ADPC), based in Thailand, <<http://www.adpc.net/2012/>>; and the Asian Disaster Reduction Center, based in Japan, <<http://www.adrc.asia/>>.

response to the December 2004 Asian tsunami in the Indian Ocean, including large scale military support from India, the United States, Australia and many other countries.<sup>33</sup> In May 2008, when Cyclone Nargis devastated much of the Irrawaddy Delta area in Myanmar/Burma and caused tens of thousands of deaths and suffering for millions, international humanitarian assistance efforts were blocked and hampered by the Burmese government and military regime.<sup>34</sup> In both cases, as in many others, the inadequacies of national disaster response mechanisms and capabilities were exposed. Few Asia Pacific countries have the independent capability to deal with disasters on land and even fewer with disasters that will originate from offshore oil and gas incidents at sea.

There are practical regional cooperative initiatives in place designed to help respond to the many natural disasters that beset the Asia Pacific. For example, the 2005 ASEAN Agreement on Disaster Management and Emergency Response (AADMER),<sup>35</sup> which entered into force on 24 December 2009<sup>36</sup> urges parties to “take appropriate measures to identify disaster risks in its respective territories covering, among others, the following aspects: natural and human-induced hazards; risk assessment; monitoring of vulnerabilities; and disaster management capacities”.<sup>37</sup> An ASEAN Coordinating Centre for Humanitarian Assistance for disaster management known as “the AHA Centre”<sup>38</sup> has been

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33 Sharon Wiharta, Hassan Ahmad, Jean-Yves Haine, Josefina Löfgren and Tim Randall, “The effectiveness of foreign military assets in natural disaster response”, *Stockholm International Peace Research Institute (SIPRI) Report*, 2008, viewed 13 September 2012, Annex C, pp. 86–105, <[http://reliefweb.int/sites/reliefweb.int/files/resources/236476AD3257088DC125741000474F20-sipri\\_mar2008.pdf](http://reliefweb.int/sites/reliefweb.int/files/resources/236476AD3257088DC125741000474F20-sipri_mar2008.pdf)>.

34 Asia-Pacific Centre for the Responsibility to Protect, “Cyclone Nargis and the responsibility to protect Myanmar/Burma Briefing No. 2”, 16 May 2008, viewed 12 September 2012, <[http://www.r2pasiapacific.org/documents/Burma\\_Brief2.pdf](http://www.r2pasiapacific.org/documents/Burma_Brief2.pdf)>.

35 ASEAN Agreement on Disaster Management and Emergency Response (AADMER), Vientiane, 26 July 2005, viewed 15 January 2011, <<http://www.aseansec.org>> .

36 See <<http://www.aseanpostnargiskm.org/home-mainmenu-1> >, viewed 13 September 2012, for information about AADMER and its implementation.

37 *Ibid.*, Article 5.

38 *Ibid.*, Article 20.

established in Jakarta. AADMER has continued to evolve and Standard Operating Procedures for joint disaster response operations (SASOP) were promulgated in November 2009.<sup>39</sup>

The inadequate response to Cyclone Nargis acted as a catalyst to move AADMER forward.<sup>40</sup> The AADMER Work Programme 2010–2015<sup>41</sup> deals extensively with disaster risk management including Prevention and Mitigation, Preparedness and Response, Recovery and the promotion of international engagement.<sup>42</sup> AADMER does not make specific mention of offshore disaster management and emergency response;<sup>43</sup> somewhat surprising given the quintessentially maritime nature of the ASEAN region. AADMER provides for Parties to seek assistance to deal with events within their territory, which potentially could include territorial seas, and could possibly extend to exclusive economic zones although this is unclear from the documentation.

The Asian Disaster Preparedness Center (ADPC), established under United Nations auspices and based in Bangkok, Thailand with outreach centres in some other Asian countries, is designed to assist Asian countries in formulating their policies and developing their capabilities in all aspects of disaster management; they provide training, advice and

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39 ASEAN, *SASOP Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations*, Jakarta, ASEAN Secretariat, November 2009.

40 ASEAN, *Charting a New Course: ASEAN-UN Post-Nargis Partnership*, ASEAN Secretariat 2010, viewed 10 September 2012, <<http://www.asean.org/resources/publications>>.

41 ASEAN, *Asean Agreement on Disaster Management and Emergency Response Work Programme for 2010–2015*, viewed 10 September 2012, <<http://www.asean.org/resources/publications>>.

42 *Ibid.*, p. 7. “Foster closer partnerships and more collaborative initiatives with partner organisations, international organisations, civil society, academia, and the military, among others, to promote disaster resilience in ASEAN from regional to local levels”

43 *Ibid.*, Annexes 1 and 2, pp. 105–107 and 109. In the type and frequency of disasters listings no mention is made offshore incidents like oil spills and Search and Rescue appears to only be considered for incidents on land.

conduct theme programs.<sup>44</sup> Implementation is left to individual countries. There is no mention of offshore disaster management in the ADPC strategic plan or programs.<sup>45</sup>

In a similar vein, SAARC has been progressing cooperative frameworks for dealing with natural disasters in South Asia. A SAARC Disaster Management Centre (SDMC) was established in New Delhi in October 2006 and in November 2011 a SAARC Agreement on Rapid Response to Natural Disasters was signed, with India becoming the first SAARC member state to ratify it on 21 August 2012.<sup>46</sup>

There are some long-standing regional arrangements in place that deal with marine pollution. For example, the “Project on Oil Spill Preparedness and Response in the ASEAN Seas Area” (ASEAN-OSPAR Project),<sup>47</sup> has the aim of improving the capability of ASEAN countries to deal with large-scale oil and hazardous and noxious substance spill incidents in the ASEAN region. It is based on the ASEAN Oil Spill Response Action Plan (OSRAP). ASEAN-OSPAR pools ASEAN oil spill response resources. In 1994, an ASEAN Cooperation Plan on Transboundary Pollution was agreed to “enhance cooperation to manage natural resources and control transboundary pollution within ASEAN, to develop a regional early warning and response system, and to improve the capacity of member countries in these areas”.<sup>48</sup> It provides for assistance to be called upon from external sources like Australia and Japan; it includes

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44 ADPC was originally established as an outreach centre of the Asian Institute of Technology after a feasibility study conducted jointly by two agencies of the United Nations, the Office of the United Nations Disaster Relief Coordinator (current the UN Office for the Coordination of Humanitarian Affairs) and the World Meteorological Organization in January 1986, viewed 24 January 2013, <<http://www.adpc.net/2012/?>>.

45 See “adpc strategy 2020: *Towards a Safer Asia* Building resilience through innovation and partnerships”, viewed 24 January 2013, <<http://www.adpc.net/2012/?>>.

46 SAARC, “India ratifies the Agreement on Natural Disasters”, 21 August 2012, viewed 13 September 2012, <<http://www.saarc-sec.org/>>.

47 ASEAN-OSPAR Project, “Project on oil spill preparedness and response in the ASEAN seas area”, <<http://www.nmc.com.sg>> (15 January 2011).

48 *ASEAN Cooperation Plan on Transboundary Pollution*, 21 October 1994, <<http://www.aseansec.org>> (15 January 2011).

“transboundary ship borne pollution”<sup>49</sup> but makes no mention of pollution from offshore oil and gas installations. There would appear to be potential for these arrangements to be extended to cover such incidents.

### RECOMMENDATIONS TO PROGRESS REGIONAL COOPERATION

Despite the initiatives outlined above, there remains a concerning lack of regional cooperative arrangements designed to deal with large scale offshore oil and gas safety and security incidents. Regional states, through regional consultative entities like the ARE, EAS, APEC and SAARC, need to consider formulating enhanced regional cooperative arrangements. Such arrangements should address the following key areas:

- maritime safety, security and environmental protection cooperative activities, including dialogue and consultation;
- consistent and cooperative approaches to offshore oil and gas safety and security risk management;
- maritime disaster response and emergency management;
- regional maritime search and rescue, including training and exercises;
- establishing regional standards on marine pollution, including dumping and environment/ seabed management (this could take the form of a treaty as is the case in many other regions);
- establishing a regional approach to decommissioned platforms;
- creating cooperative regional environmental disaster response measures, procedures, standards, training and equipment reserves;
- developing consistent cooperative approaches, standards and procedures between governments and industry involved in the offshore oil and gas sector; and
- benchmarking against global best practices to underpin improvements to regional, national and industry arrangements.

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49 Ibid.



## ANNEX A – CSCAP MEMORANDUM NO. 16 SAFETY AND SECURITY OF OFFSHORE OIL AND GAS INSTALLATIONS

### Introduction

The number of offshore oil and gas installations in the waters of the Asia Pacific region continues to grow rapidly, driven by the increasing demand for energy. Significant activities, including surveying and thousands of exploratory drillings, are underway or planned. This is expected to result in hundreds of new operational offshore oil and gas facilities.

Major safety incidents or attacks on the security of offshore facilities would have wider security, economic and environmental implications for the Asia Pacific region. There have been many incidents involving offshore installations elsewhere in the world. Response and recovery efforts have required considerable application of resources and a high level of cooperation between neighboring countries. The increasing risks of similar incidents occurring in the Asia Pacific region must be recognized. Cooperative arrangements for the prevention, response and recovery from offshore oil and gas safety and security incidents in the Asia Pacific region need to be reviewed and further developed.

This Memorandum identifies emerging safety and security issues and potential consequences due to Asia Pacific offshore oil and gas proliferation. Risk mitigation and treatment options to be further explored and developed, as a matter of priority, are recommended. Regional governments need to give close attention to ensuring that industry, state and region-wide cooperative measures for the safety and security of offshore oil and gas installations are adequate. Regional disaster and emergency prevention, response and recovery measures also require urgent attention.

### Emerging Issues and Potential Consequences

Emerging issues with potential safety and security consequences that arise from offshore oil and gas activity in the Asia Pacific region include:

1. The proliferation of offshore oil and gas exploration and exploi-

tation activities coupled with increasing maritime traffic in the region is resulting in increased maritime user intensity in some areas. Potential consequences include:

- a. The likelihood of safety incidents is increased (e.g. collisions, oil spills, human errors, technological malfunctions, natural hazards);
  - b. The likelihood of terrorist attacks on the global energy sector, although low, remains. The increased risk to regional facilities must be considered, including non-conventional attacks intended to disrupt (e.g. cyber-attacks);
  - c. The likelihood of law and order at sea issues is increased (e.g. piracy/armed robbery); and
  - d. The likelihood of unauthorized activities in close proximity to installations (e.g. fishing within safety zones) is increasing, presenting safety and security risks.
2. There is uneven adoption, compliance and interpretation of international regimes across the region. Annex A lists relevant international conventions, regional instruments and other documents. Annex B presents a summary of ratification or accession of key treaties by ARE/CSCAP Member States. Potential consequences include:
- a. The possibility for misunderstandings between states in the region is increased;
  - b. Cooperative regional, national and industry prevention, response and recovery arrangements and measures are unnecessarily complicated and inefficient due to inconsistent approaches; and
  - c. Some regional states reputations as good citizens of the world are diminished by low levels of adoption and compliance.
3. The risk of catastrophic incidents resulting from natural hazards (e.g. typhoons/cyclones) and man-made accidents that may have regional as well as national implications is increasing. Potential consequences include:
- a. The likelihood of massive environmental disasters that transcend national boundaries is increased;

- b. Food security may be impacted by massive marine pollution;
  - c. Significant financial consequences may be incurred (e.g. increasing insurance premiums, clean-up costs, compensation, impact on world oil and gas prices); and
  - d. Damage to the reputation of regional states and industry, particularly if prevention, response and recovery arrangements are found to be wanting.
4. Industry, national and regional cooperative measures to deal with large scale offshore oil and gas safety and security incidents are generally not well developed. Potential consequences include:
- a. The lack of capacity to prevent, respond and recover from security attacks presents significant vulnerabilities;
  - b. Cooperative arrangements for maritime safety and security, including maritime traffic, are impacted;
  - c. Search and rescue, disaster management and emergency response arrangements and measures are impacted; and
  - d. Regional capacities to deal with catastrophic accidents, including emergency preparedness, response and recovery arrangements are unlikely to be adequate.
5. The prospect of decommissioned offshore oil and gas platforms is increasing as older platforms near end of life. This will significantly increase in the future with the proliferation of new installations. Potential consequences include:
- a. Hazards to navigation and other uses of the area will increase; and
  - b. Environmental hazards will increase.

### **Risk Mitigation and Treatment Options**

Risk mitigation and treatment options recommended for further development to address emerging offshore oil and gas safety and security issues in the Asia Pacific region are as follows:

1. A regular and comprehensive assessment of the offshore oil and gas safety and security risk profile in the region is required. ISO 31000:2009 Risk management - Principles and guidelines provides useful guidance and is widely used by industry. Adopting

a consistent approach to risk management would help to ensure that risk treatment, prevention, response and recovery arrangements and capabilities are in place and practiced before major incidents occur.

2. Regional states and consultative entities, like the ARE, are strongly encouraged to develop enhanced regional cooperative arrangements to include the following:
  - a. Maritime safety and security cooperative activities, including dialogue and consultation;
  - b. Disaster response and emergency management;
  - c. Regional search and rescue, including training and exercises;
  - d. Establish regional standards on marine pollution including dumping and environment/seabed management (this could take the form of a treaty as is already the practice in many other maritime regions);
  - e. Establish a regional approach to decommissioned platforms;
  - f. Regional environmental disaster response measures; and
  - g. Reference global best practices to improve regional arrangements.
  
3. Regional governments are urged to ratify, observe and effectively implement international conventions, regional instruments and other documents as a matter of priority. Matters requiring attention include:
  - a. 1982 UNCLOS;
  - b. 1988 SUA Convention and Protocol, 2005 SUA Protocol;
  - c. 1972 London Convention and 1996 Protocol for Prevention of Marine Pollution by Dumping of Waste;
  - d. 1974 SOLAS, including the ISPS Code;
  - e. OPRC 1990;
  - f. IMO Resolution A.672 (16) Guidelines for the removal of offshore installations;
  - g. 1979 International Convention on Maritime Search and Rescue;
  - h. 2002 ASEAN-China Declaration on the Conduct of Parties in the South China Sea; and

- i. 2005 ASEAN Agreement on Disaster Management and Emergency Response.
4. Encourage government-industry cooperative partnerships with appropriate sharing of responsibilities for prevention, response and recovery with the following considerations:
    - a. The responsibilities of governments and industry need to be fully addressed so that individual and shared regional, national and industry obligations are recognized and evaluated to ensure that there are no gaps;
    - b. Effective cooperation and consistency is required regionally, nationally and with industry in dealing with decommissioned platforms;
    - c. Disaster and emergency response arrangements; and
    - d. Security cooperation (to deal with issues like fishing within platform safety zones).

### Previous CSCAP Memorandums

The previous relevant CSCAP Memorandums are:

- CSCAP Memorandum No. 4 – Guidelines for Regional Maritime Cooperation (December 1997)
- CSCAP Memorandum No.5 – Cooperation for Law and Order at Sea (February 2001) CSCAP Memorandum No. 6 – The Practice of the Law of the Sea in the Asia Pacific (December 2002)
- CSCAP Memorandum No.8 - The Weakest Link? Seaborne Trade and the Maritime Regime in the Asia Pacific (April 2004)
- CSCAP Memorandum No.13 - Guidelines for Maritime Cooperation in Enclosed and Semi-Enclosed Seas and Similar Sea Areas of the Asia Pacific (June 2008)

### Recommendations

It is recommended that this Memorandum be put forward as a CSCAP initiative for consideration by the ARF. Specifically, given the emerging priority of the issues addressed, it is recommended that ARF consideration of the issues raised in the Memorandum be included in the ARF

work plan on maritime security, which will be prepared for endorsement by ARF ministers in July 2011. As a first step toward inclusion in the ARF work plan, the Memorandum could be presented for discussion at the next ARF Inter-Sessional Meeting (ISM) on Maritime Security in Japan on 14-15 February 2011. A dedicated ARF desk-top exercise or workshop, for fuller consideration of the issues and options, may also be worthy of consideration, upon inclusion in the ARF work plan.

Annexes:

- A. Offshore Oil and Gas safety and Security – List of Relevant International Conventions, Regional Instruments and Other Documents
- B. Table of Ratification or Accession of Treaties by ARF/CSCAP Member States

#### *Annex A*

Offshore Oil and Gas safety and Security – List of Relevant International Conventions, Regional Instruments and Other Documents

1. United Nations Convention on the Law of the Sea 1982 (UNCLOS), adopted 10 December 1982 (entered into force generally 16 November 1994). Relevant articles include: 56, 60, 74, 98, 100, 123, 138, 194, 197, 208 and 214.
2. International Convention for the Safety of Life at Sea, 1974 (SOLAS), adopted 1 November 1974 (entered into force generally 25 May 1980)
3. International Convention on Maritime Search and Rescue, 1979, adopted 27 April 1979 (entered into force generally 22 June 1985)
4. Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA 1988), adopted 10 March 1988 (entered into force generally 1 March 1992)
5. Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms located on the Continental Shelf 1988(1988 SUA Protocol), adopted 10 March 1988 (entered into force generally 1 March 1992)
6. 2005 Protocol to the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (2005 SUA Protocols) (entered into force generally 28 July 2010)

7. Amendments to the Annex to the International Convention for the Safety of Life at Sea (SOLAS), 1974 Contained in Resolutions 1, 2, 6 and 7 of The Conference of Contracting Governments and including The International Ship and Port Facility Security (ISPS) Code, London, 12 December 2002 (entered into force 1 July 2004)
8. Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matters 1972, adopted 29 December 1972 (entered into force generally 30 August 1975)
9. 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972, adopted 7 November 1996 (entered into force generally 24 March 2006)
10. International Convention for the Prevention of Marine Pollution from Ships 1973, adopted 2 November 1973 (entered into force generally 2 October 1983), amended by Protocol of 1978 Relating to the International Convention for the Prevention of Marine Pollution from Ships 1973 ('MARPOL 73/78'), adopted 17 February 1978 (entered into force generally 2 October 1983)
11. International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 ('OPRC 1990'), adopted 30 November 1990 (entered into force generally 13 May 1995)
12. Guidelines and Standards for the Removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone 1989, (1989) IMO Resolution A.672(16)
13. Convention on Civil Liability for Oil Pollution Damage resulting from Exploration for and Exploitation of Seabed Mineral Resources 1977 ('CLEE'), adopted 1 May 1977 (not generally in force)
14. ISO 31000:2009 Risk management - Principles and guidelines published 13 November 2009
15. ASEAN – China Declaration on the Conduct of Parties in the South China Sea, 2002
16. ASEAN Agreement on Disaster Management and Emergency Response, 2005

## REGIONAL RISK REALITIES

### IS A DISASTER INEVITABLE?

Offshore oil and gas exploration and exploitation activity is booming in the Asia Pacific region. The global thirst for energy, particularly for oil and gas, is driving regional and extra-regional powers to search for and access hydrocarbons in deeper and more remote waters; and in the case of the South and East China Seas, increasingly crowded and strategically important waters. The pursuit of individual national and commercial interests to exploit offshore resources is generating the convergence of wider interests, and risks to those interests, between often competing regional littoral states.

Regional actors in the Asia Pacific would be advised to consider developing collective arrangements and mechanisms to protect mutual objectives and interests. Possibly inadequate safety and security risk management and regulation in the offshore oil and gas sector combined with jurisdictional uncertainties and the escalating possibility of regional conflict over offshore resources increases the risks and will result in sub-optimal and perhaps disastrous outcomes for all interested parties. Convergent interests in offshore oil and gas exploration and exploitation means that collaboration between states and other actors, particularly regional cooperative entities and the oil and gas industry, is necessary, presents opportunities that are likely to be mutually beneficial, and therefore logical. This circumstance provides an opportunity, a potential catalyst, for wider regional maritime security, economic and environmental collaboration that has so far not been significantly explored. The strategic interests of regional states and other actors will be enhanced by pursuing cooperative activity at sea; they will remain diminished until this occurs.

The risk-based approach to the offshore oil and gas industry in the Asia Pacific employed in this analysis has proven useful in highlighting the



many factors that combine to present largely uncalculated and unmitigated cumulative and aggregate risks to safety and security. Key risk factors, response options and recommended actions are summarised below.

## **RISK FACTORS**

There are a range of factors that need to be considered either by individual states or in concert through regional entities, and in collaboration with industry, that should shape risk judgments in the offshore oil and gas sector. These factors include:

### **Strategic risk context**

1. Offshore oil and gas activity in the Asia Pacific is rapidly expanding with massive investment in new fields and large numbers of new wells. The increasing intensity of activity in the medium term means that the likelihood of incidents is increasing.
2. The search for oil and gas into deeper and more remote waters is increasing risk by pushing the boundaries of technology, operational experience and technical extraction competence.
3. Powerful political and commercial pressures to access oil and gas are at play that drive governments and industry to either ignore or accept significant risks in that pursuit.
4. The efficacy of regulatory arrangements have been brought to question in numerous international incidents; getting the balance right and applying appropriate resources and controls to ensure government-industry rights, obligations and responsibilities are met is highly problematic with many uncertainties.
5. Regulatory oversight alone will not be sufficient to ensure adequate safety, the oil and gas industry will need to take unilateral steps to dramatically increase safety, including self-policing mechanisms to supplement government enforcement.
6. International experience has shown that the technology, laws and regulations, practices and capabilities for responding to the environmental impacts of oil spills lag behind the real risks

associated with large scale and high intensity offshore oil and gas exploration and exploitation; there is no evidence to suggest that the Asia Pacific situation is any different.

7. Scientific understanding of the marine environment in sensitive oceanic and coastal areas has been found to be inadequate in other parts of the world, as has comprehension of the human and natural impacts of oil spills; there is little evidence to suggest that the Asia Pacific will be any different.
8. In the Asia Pacific case jurisdictional uncertainty, deep-seated traditional distrust and strategic competition promotes secrecy and undermines the likelihood of cooperative activity between states to prevent, respond to and recover from incidents.

### **Increasing risks**

9. The rising intensity of sea use activities in much of the Asia Pacific, including shipping, fishing, tourism and other sea surface, water column and seabed exploitative activities in and around areas where oil and gas activity is also occurring, increases the risk of accidents and incidents.
10. Offshore oil and gas activity in the Asia Pacific largely occurs in waters that are subject to extreme weather events and destructive seismic activity; weather induced incidents in other parts of the world have resulted in loss of life and damage to the environmental.
11. There are mounting concerns of armed conflict at sea between protagonists in parts of the Asia Pacific; while the likelihood of major regional or state on state conflict remains low the prospect of minor skirmishes that could impact on the safety and security of oil and gas installations and vessels is real and increasing. Many regional states are investing in qualitative and quantitative improvements to their maritime forces, which increase uncertainty about security intentions and the potential consequences of conflict at sea.

12. Incidents arising from law and order at sea problems, including maritime terrorism, piracy and armed robbery, must also be considered in the Asia Pacific region with the impact on associated vessels more likely than major oil and gas installations that have proven to be difficult targets.

### Consequences are significant

13. Offshore oil and gas incidents generate major negative human, environmental and economic security outcomes that are likely to affect other industries like fishing and tourism, and impact marine ecosystems.
14. Offshore oil and gas incidents will often have significant consequences for neighbouring littoral nations; this concern is magnified in the crowded waters of the Asia Pacific, amplified by boundary delimitation disputes and uncertain jurisdictional controls and responsibilities in some cases.
15. Hazards arising from decommissioned offshore oil and gas installations, including submerged wellheads, will grow as increasing numbers of wells are exhausted and abandoned.
16. The low incidence of accession or ratification of Asia Pacific nations to international treaties designed to facilitate individual and cooperative activity in vital areas including maritime safety, security and environmental protection combined with the lack of regional cooperative agreements for matters like marine pollution, including dumping and environment/seabed management reduce the likelihood of individual states and cooperative prevention, response and recovery arrangements.
17. While onshore disaster response arrangements and capabilities in individual states and cooperatively have received considerable attention in recent years under the auspices of regional bodies like ARE, EAS, APEC, SAARC and ASEAN little attention has so far been paid to disaster response at sea, particularly regarding offshore oil and gas.

## RISK RESPONSE OPTIONS

In the Asia Pacific region, industry, national and regional cooperative measures to deal with large scale offshore oil and gas safety and security incidents are often not well developed. Potential consequences that present significant vulnerabilities include: the lack of capacity and coordination regimes to prevent, respond to and recover from security attacks; cooperative arrangements for maritime safety and security, including maritime traffic, are underdeveloped; search and rescue, disaster management and emergency response arrangements and measures are not adequately developed; and regional capacities to deal with the environmental consequences of catastrophic accidents are unlikely to be adequate.

There is little evidence so far that regional governments and industry participants are paying attention to the rising, cumulative risks to safety and security that increased offshore oil and gas activity is generating. Similar to the Gulf of Mexico case in the United States, regional states appear to be consumed by the rush to claim and exploit as much of the valuable resources as possible. While the regulatory context and effectiveness will vary across Asia Pacific maritime domains experience elsewhere in the world has shown that arrangements are often found to be inadequate.

## URGENT ACTIONS REQUIRED

As a matter of urgency, Asia Pacific regional cooperative bodies and individual states, in concert with industry partners, should consider pursuing the following actions:

1. Offshore oil and gas safety and security should feature as a major and discrete agenda item with regional safety, security, economic, environmental and disaster response regional cooperative bodies. Entities like ARF, EAS, APEC, ASEAN and SAARC, and relevant subordinate agencies, should commission independent expert working groups directed to review and report recommendations and options to develop regional cooperative measures.
2. A significant and essential initial activity of such working groups should be to commission strategic, all-factors offshore oil and

gas benchmark risk assessments to establish objective bases for individual state and cooperative risk management initiatives.

3. UNCLOS Articles 122 and 123 provide an international legislative foundation for targeted regional cooperative and national initiatives that should be acted upon, noting the majority of Asia Pacific states covered by this review have ratified UNCLOS (see Chapter 5) and the South China Sea is generally recognised by littoral states as a semi-enclosed sea (see Chapter 3).
4. States should, as a matter of priority, accede to relevant maritime and marine safety, security and environmental protection conventions and protocols. Establishing associated national legislation, regulations and capabilities, and regional cooperative arrangements, would follow.
5. Specifically, regional states should establish and where they already exist, enhance regional cooperative regimes to deal with:
  - a. maritime search and rescue;
  - b. marine environmental protection including pollution, dumping and decommissioning of offshore installations;
  - c. maritime safety and security arrangements to include incidents at sea protocols;
  - d. establishing common, best practice approaches to offshore oil and gas safety and security regulation, to include industry engagement, this may include establishing regional government-industry cooperative agencies to provide advice and coordination;
  - e. develop individual state and collective offshore arrangements and capabilities for disaster management to include prevention of, recovery from and response to offshore oil and gas incidents; and
  - f. enhancing and sharing scientific information that include marine science, oceanographic, hydrographic, seismic, and meteorology data in order to better understand and therefore prevent and prepare responses and recovery arrangements to deal with the environmental impacts of incidents.

6. Encourage regional states to use international regimes and mechanisms, like UNCLOS and the International Court of Justice, to resolve or agree to set aside maritime boundary delimitation disputes in the interests of mutually beneficial economic, security, safety and environmental outcomes.
7. Encourage all parties involved in offshore oil and gas safety and security, including states and industry, to adopt internationally recognised and proven risk management approaches. Effective risk management requires partnerships between the regulator and those being regulated, between government and industry, where each partner performs its role diligently and with integrity.

## CONCLUDING REMARKS

As the Commissioners' charged with investigating the *Deepwater Horizon* and *West Atlas* disasters concluded it is not a matter of if major disasters will occur in the offshore oil and gas sector but when; there is every reason to extend those judgments to the Asia Pacific. Given rapidly rising offshore oil and gas activity in the Asia Pacific, the extent of the safety and security uncertainties and the lack of cooperative arrangements to prevent, respond to and recover from incidents, an uncomfortable conclusion must be drawn: offshore oil and gas disasters in the Asia Pacific are inevitable. The only questions that remain to be answered are where, when and what the scale of the disasters will be, and how effective response and recovery arrangements will prove to be.

The onus lies with regional governments, cooperative entities and industry, supported by extra-regional governments with interests at stake, to ensure that the risks are fully understood and that appropriate mitigation arrangements are put in place. Industry, national and regional cooperative mechanisms, arrangements, protocols, equipments and training to prevent, respond to and recovery from incidents need to be prepared and tested before major incidents occur. Unfortunately, realistic and uncomfortable expectations must be faced. Sovereignty concerns and distrust between national governments combined with greed for access to resources and commercial benefit are likely to remain dominant; unmitigated risks will continue to mount and the likelihood of offshore oil and gas safety and security disasters in the Asia Pacific, with major consequences, will continue to rise.



## ABOUT THE AUTHOR

This monograph explores the safety and security risks associated with the massive expansion of offshore oil and gas exploration and exploitation activity in the Asia-Pacific region. The pursuit of national and commercial objectives is generating the convergence of wider interests and uncertainties, and therefore significant and often shared risks. Risk mitigating options for action are presented that need to be urgently and collaboratively considered by all stakeholders.



several warships, his last Navy P  
Strategic Policy and Futures in  
Email: [lgcordner@gmail.com](mailto:lgcordner@gmail.com)  
Mobile (Cell): +61 (0) 427 333



**S. RAJARATNAM SCHOOL  
OF INTERNATIONAL STUDIES**  
A Graduate School of Nanyang Technological University

