Papers in Australian Maritime Affairs

No.13

Future Environmental Policy Trends to 2020

IMPACT ON SHIP DESIGN & OPERATIONS

Edited by
Glenn Kerr & Barry Snushall
SEA POWER CENTRE AUSTRALIA

University of Wollongong

NAVY

FUTURE ENVIRONMENTAL POLICY TRENDS TO 2020

Impact on Ship Design and Operation

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FUTURE ENVIRONMENTAL POLICY TRENDS TO 2020

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Edited by Glenn Kerr & Barry Snushall
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Royal Australian Navy
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Papers in Australian Maritime Affairs

No. 13 *Future Environmental Policy Trends to 2020: Impact on Ship Design and Operation* by the Centre for Maritime Policy, University of Wollongong.

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Glossary

AAT	Australian Antarctic Territory
ABS	American Bureau of Shipping
ADF	Australian Defence Force
ADI	Australian Defence Industries Ltd
AFMA	Australian Fisheries Management Agency
AFZ	Australian Fishing Zone
AMSA	Australian Maritime Safety Authority
AODC	Australian Oceanographic Data Centre
ASLP	Archipelagic Sea Lane passage
BV	Bureau Veritas
BVQI	Bureau Veritas Quality International
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CDM	Clean Development Mechanism
DI(N)	Defence Instruction (Navy)
DI(N) ADMIN	Defence Instruction (Navy) Administration
DI(N) LOG	Defence Instruction (Navy) Logistics
DI(N) OPS	Defence Instruction (Navy) Operations
DMS	Defence Maritime Services Pty Ltd
DMO	Defence Materiel Organisation
DNPS	Directorate of Naval Platform Systems
DNV	Det Norske Veritas
DSTO	Defence Science & Technology Organisation
EAF	Environmental Accountability Framework
EEZ	Exclusive Economic Zone
EMA	Environment Management Agency
EMP	Environment Management Plan
EMS	Environment Management Strategy
EPA	Environment Protection Act
EPBCA	Environmental Protection & Biodiversity Conservation Act 1999
FBE	Fleet Base East
FBW	Fleet Base West
GBR	Great Barrier Reef
GBRMP	Great Barrier Reef Marine Park

GBRMPA	Great Barrier Reef Marine Park Authority
HAZMAT	Hazardous Materials
HF	Hydrogen Fluoride
HMAS	Her Majesty's Australian Ship
HMY	Her Majesty's Yacht
IASC	International Association of Classification Societies
IMO	International Maritime Organisation
ISO	International Organisation for Standardisation
MARMIL	Maritime Environmental Research program
MARPOL	International Convention for the Prevention of Pollution from Ships 1973
MEPC	Marine Environment Protection Committee
MPA	Marine Protected Area
NATO	North Atlantic Treaty Organisation
NEPC	National Environment Protection Council
NIAG	NATO Industry Advisory Group
NGO	Non-Government Organisation
NPI	National Pollutant Inventory
OCS	Offshore Constitutional Settlement
QSCS	Quality Management System Certification Scheme
RAAF	Royal Australian Air Force
RADHAZ	Radiation Hazard
RAN	Royal Australian Navy
RNZAF	Royal New Zealand Air Force
RNZN	Royal New Zealand NAvy
SOLAS	Safety of Life at Sea
SPFWL	Self-propelled Fuel & Water Lighter
SRS	Ship Reporting System
TAMA	Training Area Management Authority
TBT	Tributyltin
UNCLOS	United Nations Law of the Sea Convention
USN	United States Navy
VMS	Vessel Monitoring System
WWF	World Wide Fund for Nature
XA	Exercise Area

Executive Summary

The aim of this report is to provide the Royal Australian Navy with a strategic assessment of trends in international and domestic environmental law, policy and standards over the next 20 years, and the extent to which these may impact on future ship design and naval operation.

Existing Environmental Issues and Degree of RAN Compliance

This chapter examines a series of issues, including those raised in the Terms of Reference for the study. The degree of compliance for each issue, against existing environmental legislation and regulations has been assessed as either high, medium or low. Where compliance is not high recommendations have been made with the aim of increasing the compliance. Overall, the RAN's degree of compliance is generally high. There are some concerns about shipboard air quality. These have been assessed as medium due to the need to run the redundant air conditioning system when in equatorial waters. Water quality was also assessed as medium due to the inability of the existing water purifiers to remove volatile organic substances from the water.

Emerging Trends in Environmental Issues

This chapter examines the known emerging issues and speculates on possible changes that may occur in future. The main change agent for the RAN is public perception. Although all other drivers have featured in initiating changes in RAN policy to meet environmental compliance, the need to be seen to be doing the right thing is assessed as of major importance. Emerging International and Domestic Issues have or will influence the equipment installed in RAN ships and the conduct of naval operations. The section on Enhanced Naval Environmental Compliance—Trends in Selected Countries makes an assessment of the environmental trends in those countries where RAN operations are likely to be undertaken or in whose ports RAN ships will visit. The concept of the Environmentally Compliant Warship, which has been under consideration by a number of different navies, is also examined.

Study Outcomes

This chapter includes a discussion on the possible outcomes and issues that need further consideration, together with a list of actions which should be undertaken. The nature of some of the possible outcomes is varied, but they can be grouped into common areas. These are:

Coordination – A great deal of the information presented in this report, particularly that of a technical nature has been provided by various Defence and Navy organisations. It is apparent that many different Directorates and people have duties relating to environmental issues, but that there is very little coordination or information sharing between them. Similarly, there is little liaison with other Government Departments which have responsibilities in the environmental area undertaken. The formation of an Environmental Working Group including all agencies with environmental responsibilities and stakeholders affected by environmental policies and regulations would improve inter-agency liaison and information dissemination.

Research – A number of areas of emerging technology, where ongoing research is required, have been identified. Most of these are technical in nature and generally will have a minimal individual affect on naval operations. However, if the RAN is to achieve 'best practice' in all aspects of environmental compliance, these areas need to be addressed.

Process changes – The RAN undertakes a large number of processes during the acquisition of new capital equipment and during normal operations. However, there are some processes that are undertaken by other Navies, which the RAN does not undertake. A selection of these processes is discussed. Although adoption of these is not considered essential, there would be an overall improvement in naval operations were they to be introduced. Also, some comments on changes that could be made to acquisition contract documentation are made.

Summary of Actions Required

This summary gives a list of actions or activities that have been identified during the research as needing consideration.

Annex A – International Legal Framework

This annex summarises the key environmental requirements as described in the various International Instruments and discusses the concept of Sovereign Immunity with respect to these Instruments. Sovereign Immunity is a key feature of all of these International Instruments. This principle excludes warships

and naval auxiliary vessels from the application of the environmental protection regimes defined in the instruments. However, there is a requirement for each State to ensure that by adoption of the appropriate measures, not impairing operations or operational capabilities, that such vessels comply, so far as is reasonable and practicable, with the conventions.

Annex B – Australian Commonwealth Domestic Environmental Legislation

This annex examines Australian Commonwealth and State/Territory legislation and its impact on RAN policy

Annex C – Government Agencies - Roles and Policies

Environment Australia and AMSA's Role in maritime environmental issues, the Australian Defence Organisation Environment Policy, the RAN Environmental Policy and the Environmental Management of Australian Defence Establishments are discussed.

Annex D – Environmentally Sustainable Warship Bibliography

This annex provides a list of useful publications that examine the conceptual underpinnings and practical developments in environmentally sound ship design.

Introduction

Background

The vessels of the Royal Australian Navy (RAN) increasingly have to be able to operate without restriction in ports and waters at home and abroad, particularly given Australia's role as a key part of the broad coalition of Western forces. A new and growing area of constraint on this freedom of manoeuvre comes from the broad drive to increase protection of the environment both at home and abroad. With the result that environmental constraints are now an important aspect of operational effectiveness and readiness for the RAN in all contexts including training. Drawing from a particularly perceptive US Navy publication, the strategic challenge as well as opportunities faced by the RAN can be summarised as follows:[1]

- Navy ships and operations are currently viewed by the public and some regulators as no different from commercial vessels and operations – they thus should comply equally with a wide range of laws both nationally and internationally – this trend is likely to increase rather than decrease.
- Environmental requirements continue to grow in scope and complexity requiring effective and flexible long-range planning.
- The long ship design and procurement cycle, combined with the multi-decade service lives of Navy vessels, makes it difficult to forecast environmental requirements and to develop appropriate responses – again effective, imaginative and flexible long-range planning is required.
- The international community is gradually applying a coordinated global approach to marine environmental protection – strategic trends need monitoring and addressing in a pro-active way.
- There is a trend towards tighter restrictions in coastal areas at the same time as restrictions are being expanded on the high seas.
- The Naval approach of backfit-for-compliance cannot meet the complex challenges of environmental compliance in coming years and must give way to a more strategic and forward-looking plan for future ships.
- Backfit-for-compliance approaches are eventually costly and may sometimes endanger the health of service personnel as well as operational effectiveness.

- There are significant operational and cost benefits to be gained from ship designs that will be environmentally compliant throughout their service lives and from ship operations that will not have to rely on shore support for waste management.

It appears as well that there may be operational benefits from sound environmental practices ranging from reducing the signature of vessels through to efficiencies with respect to propulsion and other areas.

The RAN has a strong sense of commitment in upholding the community values of Australia. At the forefront of these values are respect for the environment and a growing need to ensure that naval operations are undertaken by sustainable methods and that the environment is preserved for future generations. The RAN has consequently developed its environmental policy to reflect the community's requirements and Australia's international obligations. This has given the RAN a fine record as an advocate of ecological sustainability and sound environmental stewardship. Even where Australian Defence compliance with environmental guidelines is not compulsory, the RAN endeavours to meet all current restrictions on activities that may cause harm to the environment. However, the standards of sound environmental management are constantly being updated and in many cases are becoming more restrictive. Activities that were previously considered normal can become illegal as a result of new environmental regulatory initiatives both within Australia and in response to international fora.

Aim and Objectives

The aim of this report is to provide the RAN with a strategic assessment of trends in international and domestic environmental policy and standards over the next 20 years, and the extent to which these may impact on future ship design and operation. To achieve its aim, the report examines:

- The variety of international instruments and Australian domestic legislation on environmental issues to determine the extent to which they impact on current RAN operations and the degree to which such operations comply with the environmental requirements.
- Future trends in environmental policy and legislation that may impact of RAN operations. The report seeks to achieve a broad overview of the likely changes in policy, provide some options to be considered to adapt to these trends and define some constraints on how these changes may affect the way Navy does business. This overview will include an examination of the roles and policies of Australian Government Agencies that are stakeholders in preserving the environment.

- The concept of the Environmentally Compliant Warship. Developments being undertaken around the world to achieve the design of such a ship will be reviewed and applications for the RAN will be assessed.

The report outcomes do not account for cost or technology. It should be noted that many technologies that lead to environmental compliance also produce greater cost effectiveness in the long term and may also increase operational efficiency.

Consultation

The following organisations and individuals were consulted in the preparation of this report:

Navy Systems Command. Owen Parker, Ross Wilson, Michael Sim, Simon Fisk & Steve Lawry (Directorate of Naval Platform Systems); Matt MacFarlane, Fiona Brennan (Directorate of Navy Environmental Management); Jeff Cowley (Directorate of Naval Weapons Systems).

Navy Headquarters. Captain Peter Jones, RAN; Lieutenant Commander Steve Cole, RAN, Andrew McKinnon, Craig Shaw (Directorate of Environmental Management - Navy); Andrew Forbes (Directorate of Navy Long-Range Planning).

Defence Science & Technology Organisation. Dr Kevin Johns, John Lewis, Doug Cato.

Defence Materiel Organisation. Dewa Gounder.

Defence Environment & Heritage. Colin Trinder, Gwyneth Beasley, Julie Clifton.

Garden Island (NSW). Michael Mathias (Environmental Section), Commander Will Martin (Master Attendant).

Australian Maritime Safety Authority. Paul Nelson & Annaliese Caston.

Environment Australia. Robyn Bromley, Stephen Powell, Graeme Beech, Peter Taylor & Robyn McCulloch.

Existing Environmental Issues and Degree of RAN Compliance

1

This chapter examines a series of environmental issues, related to ship design and operation. The degree of compliance for each issue, against existing environmental legislation & regulations, has been assessed as either high, medium or low. Where compliance is not high, recommendations have been made with the aim of increasing the compliance. A list of the current RAN policy documentation that has been examined as part of the research for the project is also included.

Sonar Operations

The RAN regularly conducts training exercises off the East and West Coasts of Australia, both areas where whales migrate. Public concerns relating to the impact of these naval exercises on the well-being of whales and other cetaceans have been raised due to a perception that whales are harmed when sonar activities are undertaken. Under the *Environmental Protection and Biodiversity Conservation Act 1999 (EPBCA)*[2], any deliberate operational activity, which has a reasonable probability of causing harassment of whales, requires approval by the Minister of the Environment and Heritage. When planning exercises, care is taken to minimise possible harassment, and Ministerial approval is gained where required.

The RAN is very concerned to ensure that any potential risks, to people and/or wildlife arising from its training exercises, are minimised. To this end, the RAN is introducing mitigation procedures for use when conducting operations in areas frequented by whales. These have been developed to provide guidance to ships and exercise planners, to avoid interference with whales and include establishing safe distances from whales within which certain activities (eg. sonar operations) will not be conducted. The RAN training and whales can, and do, safely use the same marine environment.

Noise in the sea is an emerging issue and will be covered further in Chapter 5.

> *Assessment: The degree of compliance with existing regulations is assessed as high.*

Antifouling Paint Coatings

The International Convention on the Control of Harmful Anti-fouling Systems on Ships was adopted in October 2001. This convention will prohibit the use of harmful organotins in anti-fouling paints used on ships and will establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.

Under the terms of the Convention, Parties to the Convention are required to prohibit and/or restrict the use of harmful anti-fouling systems on ships flying their flag, as well as ships not entitled to fly their flag but which operate under their authority, and all ships that enter a port, shipyard or offshore terminal of a Party. It was agreed to implement an effective date of 1 January 2003 for a ban on the application of organotin-based systems. This convention has not yet been ratified, but the RAN is planning to be able to satisfy its requirements when it comes into force.

DSTO has been undertaking research into alternatives to tributyltin (TBT) as follows:

- *Stainless steel* – will foul and therefore has to be painted. It also pits and is subject to crevasse corrosion unless a very high grade is used. This is not considered cost effective and painting is still required.
- *Ecoloflex* (Cu/Zn pyrethran) – this was approved as an alternative to TBT by the National Registration Authority in 2002. It has a 4-5 year life. Tests are ongoing on merchant ships. The main problem is that it is likely to be outlawed in future as it is also a biocide. Leaching rate studies are not yet available. *HMAS Warramunga* showed no fouling on docking after three years except for the sacrificial anodes. There are some perceived problems with the paint being too soft, but testing is ongoing.
- *Interfleet* (non-toxic silicone/polyurethrane treatment) – this is a non-adhesive surface that does not prevent fouling, but once ship is underway, the fouling slips off. The specifications call for loss of fouling at four knots, but slipping does not occur until around 15 knots. A trial on the bow of a patrol boat was generally successful, but there were some instances of persistent fouling. The coating appears to be successful for commercial shipping such as ferries, liners and tankers as they operate at reasonable speeds and with quick turn around in port. Naval vessels generally spend longer times alongside than commercial vessels so more persistent fouling may restrict the use of this type.

- *Sheathing with Cu/Ni* – this process is acceptable for small craft (eg. workboats and ferries), but is too expensive for warships.
- *Sealcoat* – non-toxic and contains small fibres to limit adhesion, but does not work particularly well.
- *Underwater cleaning* – spreads the fouling and may lead to the spreading of pests.
- There is a need to check US Navy Statements on no heavy metals in five years.

Assessment: The degree of compliance with existing regulations is assessed as high.

Fire Fighting Systems

Halons were banned at the Montreal Conference of 1987. The RAN subsequently removed Halon fire fighting equipment from some ships and replaced it with a different product, FM 200. Another alternative compound is NAFS III. Both cool the fire and take part in the combustion process to stop the fire. Both are supposed to be suitable for occupied spaces. However, in tests in the USA on concentrations required to fight the fire and produce the lowest adverse effect level, NAFS III produced an adverse effect before it reached the firefighting concentration. Another difficulty is the production of hydrogen fluoride (a very potent poison) as a combustion product.

Halon is better than both alternatives. It has lower hydrogen fluoride (HF) production, requires a lower concentration to put out the fire, and is therefore safer for the crew. Halon replacement was suspended after the results of the USN test became known.

DSTO is conducting trials and assessing USN tests. The USN is using a combination of FM200 and water mists. Water mists cool, thereby reducing HF production and also dissolving of the HF. Dissolved HF is still a very dangerous solution. In an incident several years ago a laboratory worker spilled about 100ml of concentrated HF on his trousers. Despite immediately removing his clothing and immersing himself in an emergency shower to remove the acid he died three days later. DSTO trials are not too successful as yet as distribution of mist particles and particle size requirements vary on a ship by ship basis. Trials have been conducted on some Anzac and Collins class vessels.

There are no deadlines for the removal of Existing Halon Fire-Fighting Systems as yet under MARPOL. However, the European Commission has a requirement for removal of systems from ships owned and operated by them by 2003. They are also considering restricting access to Europe for ships with the systems.

South Africa is proceeding along similar lines. While SOLAS used to prohibit HCFCs, it was revised to prohibit Halon 1211, 1301, 2402 or perfluoridehydrocarbons. Hydrochlorofluorohydrocarbons are allowed under MARPOL Annex VI Regulation 12 until 2020.

> *Assessment: The degree of compliance is assessed as high under the existing regulations. However, this assessment may be subject to change if, and when, new regulations concerning existing halon fire-fighting systems fitted in ships come into force.*

Sewage Management

The ship fits in the existing RAN fleet are as follows:

- Anzac Class, *HMAS Success*, *HMAS Tobruk* – Omnipure system which includes storage facility.
- Adelaide Class FFGs – storage for 5 days.
- Collins Class submarines – storage for 2-3 days.
- Landing Craft Heavy – ORCA – generates NaOCl.

These systems, while meeting current requirements, will perhaps have difficulty in achieving the new discharge standards that come into force in September 2003. These discharge standards are discussed under changes to MARPOL Annex IV in Chapter 3. The Royal Navy has trialed a KUBOTA cross flow membrane system. The design specifications were for a 45-day mission period, without the need to discharge sludge, with effluent quality to meet NATO Industrial Advisor Group 2005 discharge standards, and capable of being incorporated into existing systems. The trial was generally successful, with the only parameters not met being dissolved solids (which could be removed by activated charcoal treatment) and chloride. The chloride levels were below those of chlorinated drinking water and were considered acceptable for discharge. This system appears to produce better results than those in service in the RAN. For future ship designs, a cross flow membrane system should be considered.

> *Assessment: The degree of compliance with existing regulations is assessed as high. However, the existing equipment may not meet compliance requirements for future standards.*

Grey Water Management (including recycling)

Grey water includes discharge from galley basins and dishwashers, showers, laundry and hand basins, but not discharge from food macerators. Grey water is generally not regulated on the High Seas, but different States have local

port regulations. It is highly likely that grey water will be included in an update of Annex IV (Prevention of pollution by sewage from ships). The RAN is considering new regulations which will require ships to either treat the grey water or hold untreated grey water for discharge to a shore connection or at sea when the vessel is more than 1nm from the coast or a reef. These regulations should satisfy any short-term requirements that could be introduced in an update of Annex IV.

All ships in the existing fleet store or discharge grey water. The Anzac Class passes grey water through into a black water treatment system, but problems do occur as the capacity of the systems is too small to handle the water volume in peak times. A redesign of the system is in progress.

Assessment: The degree of compliance with existing regulations is assessed as high.

Oily Waste and Bilge Water Management

The current generation of IMO approved oily water separators have difficulty coping with the mixture of compounds routinely used in military vessels. Oily Water treatment in RAN ships currently meets MARPOL Annex 1 requirements, with discharge only if the oil concentration is less than 15 ppm. The discharge stream is monitored, with an alarm if the concentration is too high and an automatic stop of discharge. The existing equipment may have difficulty in meeting more stringent standards.

Assessment: The degree of compliance with existing regulations is assessed as high.

Fuel Transfer Activities

There are two fuel transfer issues that could cause concern. The first is the use of Commonwealth SPFWL (self-propelled fuel and water lighters) and crane stores lighters to transfer fuel and stores. Defence Maritime Services Pty Ltd (DMS) has the contract for both Fleet Base East (FBE) and Fleet Base West (FBW) and is subject to local regulations in each State. However, the lighters used in Sydney Harbour are not subject to NSW survey, which could be a problem. Should a Commonwealth vessel, being operated by a State registered contractor, contravene State environmental regulations, there may be a consequential effect on naval capability.

Secondly, naval regulations for fuel transfers are common at each fuel transfer point, but there does not appear to be a connection with local fuel transfer regulations. This could provide a point of contention potentially affecting naval capability should an accidental oil spill occur.

Assessment: The degree of compliance with existing regulations is assessed as high. It is recommended, however, that Navy regulations be changed so that lighters must be in survey in the State in which they operate and that all fuel transfers in ports comply with local regulations.

Garbage Management Onboard (plastics, paper, cardboard, metals, food waste, medical waste)

MARPOL Annex V, Prevention of Pollution by Garbage from Ships, entered into force on 31 December 1988. This deals with different types of garbage and specifies the distances from land and the manner in which they may be disposed. The requirements are much stricter in a number of 'special areas', but perhaps the most important feature of the Annex is the complete ban imposed on the dumping into the sea of all forms of plastic.

The RAN regulations for the disposal of garbage can be summarised as follows:

- No plastics at sea at any time.
- Ground food waste and general garbage: greater than 3nm from nearest land and the Great Barrier Reef (GBR) Region.
- Unground food waste: further than 12nm from nearest land and the GBR Region.
- Garbage that sinks: when greater than 12nm from nearest land and the GBR Region.
- Garbage that doesn't sink: further than 25nm, from nearest land and the GBR Region.

It should be noted that effective garbage disposal may have an operational benefit. Anecdotal evidence indicates that during the Gulf War all floating rubbish such as plastic bags, boxes and other packaging material had to be treated as potential mines and inspected and/or destroyed. This was very time consuming and restricted operations. Also, a garbage stream can give away a ship's position and direction of advance to the enemy.

The RAN has introduced garbage management systems involving three strategies. The first involves reduction at the source (ie. not taking materials that can become garbage to sea). The second involves changing processes to minimise the garbage generated. The third is a waste management system that reduces and/or destroys the waste at sea. These combined make an extremely efficient and effective garbage management strategy.

There is a need to overcome the perception that working on garbage management is a punishment job. This could be changed by more advanced training on the environmental and operational needs for the treatment processes.

Source reduction strategies limit garbage by reducing the amount of potential waste coming aboard. As nearly 60 percent by weight of garbage in large naval ships is food-associated waste, minimising this waste will reduce costs and release manpower. This can be done by the use of pre-prepared products and eliminating food that contains inedible components (such as bone-in meat/ poultry and corn on the cob). Also, source reduction by bulk buying in reusable containers increases stowage capacity, improves stowage integrity, reduces spoilage, and reduces cardboard and plastic packaging. Coincidental benefits are reduced costs of catering and manpower efficiencies. The amount of waste generated by each meal can also be reduced by minimising over-catering through accurate forecasting of the amount of food required per meal. Reducing the range of cleaning and other products and using only biodegradable products which are delivered in bulk also saves on waste (eg. disposable paper or starch based 'plastic' bags instead of real plastic garbage bags).

Better processes can help to minimise waste. Standard contract clauses have been introduced into purchasing agreements to minimise the amount of unacceptable packaging. This decreases the amount of potential garbage taken onboard. Onboard processes such as compaction and melting of all plastics (volume reduction of 25:1) and the mashing of food waste, paper/cardboard and classified waste followed by waterpressing (volume reduction of 5:1) reduces the volume of the waste stream. This waste can then be stored as semi-dry granules in a cool room for disposal either overboard or to shore.

Onboard incineration of combustible wastes (volume reduction – near 100 percent) has recently been introduced. This give ships an independence from shore which greatly increases their capabilities.

Thermalysis of plastics is a process of decomposing waste plastics into Diesel Fuel using heat and pressure. At least one commercial operator has a process in operation, which converts unwashed, unsorted plastic into a low emission, high efficiency fuel. This fuel can be used in most existing diesel engines without modification. Plastics such as high-density polyethylene (HDPE), low-density polyethylene (LDPE), polypropylene (PP), polyethylene terephthalate (PET) and polystyrene (PS) can be processed. The yield from 10 tonnes of plastics is claimed to be 9000L of fuel at 90 percent efficiency. The installation, at each fleet base, of equipment capable of completing this task should be investigated.

Also, it may be that this equipment may be capable of destroying composite plastic material and could therefore solve the problem of how to dispose of the hulls of ships made of this material.

Assessment: The degree of compliance with existing regulations is assessed as high.

Engine Exhaust Gas Emissions

Regulations on Engine exhaust gas emissions are covered under MARPOL Annex VI. This Annex is not yet in force, and will enter into force twelve months after being ratified by fifteen States whose combined fleets of merchant shipping constitute at least 50 percent of the world fleet. As of October 2002, six States representing 25 percent of the world fleet had ratified the Annex. Latest advice is that Liberia has just signed and Panama is close to signing. It is expected that the Annex will be in force within two years.

Diesel engines in most RAN ships in service at present pre-date the introduction of the new regulations for air emissions. However, where the possibility of non-compliance has been identified, work is being undertaken to rectify the problems and meet compliance requirements. The requirements of the regulations will be factored into the development of designs for new vessels and for those vessels that need new diesel engines to be fitted.

Assessment: The degree of compliance with existing regulations is assessed as high.

Replenishment at Sea

The regulations already in place are considered sufficient to comply with the existing and likely future Conventions.

Assessment: The degree of compliance with existing regulations is assessed as high.

Ozone Depleting Substances

Apart from fire fighting systems (considered separately), refrigerant gases are the most common source of these substances. Generally, all ozone-depleting substances are toxic and flammable. Material Safety Data Sheets are carried for all substances carried onboard and Australian Standards apply. Management of these substances are covered by Defence Instructions.

Assessment: The degree of compliance with existing regulations is assessed as high.

Scrapings from Ship and Paints

State legislations require reduced pollution during painting. Also, when repainting ship's hulls with anti-fouling paint, it is better to remove the old paint. There are requirements to dispose of old paint once removed from the ship and to ensure that no contamination of the dockyard occurs. As such work is undertaken by State registered contractors, processes must comply with State regulations.

> *Assessment: The degree of compliance with existing regulations is assessed as high.*

Ballast Water

It is estimated that about 10 billion tonnes of ballast water are transferred globally each year, potentially transferring from one location to another species of sea-life that may prove ecologically harmful when released into a non-native environment. Such problems have already resulted in instances where infection with introduced marine pests has occurred in Australian ports. The scale of the problem in Australian waters is not known. However, infection of southeastern Australian waters with Northern Hemisphere kelp and the Northern Pacific Sea Star (*asterias amurensis*) are likely to have major economic and ecological impacts. Also, cross-contamination between ports is a problem.

The current guidelines for the control and management of ships' ballast water to minimise the transfer of harmful aquatic organisms and pathogens are covered in IMO Resolution A.868(20), adopted in November 1997. The resolution includes guidelines for both ships and Port States. Every ship that carries ballast water should have a ballast water management plan that details its procedures for ballast water management. The plan should be specific to each ship and should include approval documentation relevant to treatment equipment, details of the records that are kept, and the location of possible sampling points. The guidelines include instructions on how and when ballast water exchanges can be made. Port States are required to notify all ships what their ballast water requirements are and, if possible, should provide reception and treatment facilities for the environmentally safe disposal of ballast tank water and sediments.

The working group on ballast water management which reports to the IMO's Marine Environment Protection Committee (MEPC), has confirmed that ballast exchange on the high seas is the only widely used technique currently available to prevent the spread of unwanted aquatic organisms in ballast water. Its use should continue to be accepted, however, it has been stressed that this technique has a number of limitations. Because it is of variable efficiency in

removing organisms, the percentage removed depends on the type of organism. The discharged water quality depends on the original quality of the water taken up. It also has geographical limits. Existing ships may be subject to operational constraints, but it was recognised that new ships may be designed to accommodate ballast exchange in a much wider range of circumstances.

The impact for Navy will be to ensure that all ballast water transfers are undertaken in accordance with the regulations. In addition, Navy must ensure that civilian contractors, such as ADI, who are involved in the transfer of Navy ballast water, do so in accordance with the regulations. Non-compliance, such as not testing ballast water or the certifications processes before docking ships and releasing the water into the harbour, could result in an adverse effect on capability.

> *Assessment: The degree of compliance with existing regulations is assessed as high. However, changing regulations need to be incorporated into contractor's practices.*

Whales

Interaction with whales is an issue that is drawing increasing public attention within Australia. The RAN regularly conducts training exercises off the East and West Coasts of Australia, both areas where whales migrate. Public concerns relating to the impact of these naval exercises on the wellbeing of whales and other cetaceans have been raised.

The RAN is very concerned to ensure that any potential risks, to people and/or wildlife arising from its training exercises, are minimised. To this end, the RAN is introducing mitigation procedures for use when conducting operations in areas frequented by whales. These have been developed to provide guidance to ships and exercise planners, to avoid interference with whales and include establishing safe distances from whales within which certain activities (eg. sonar operations) will not be conducted. The RAN training and whales can, and do, safely use the same marine environment.

There are two documents that have been produced as guidelines as follows:

- *Prevention of Injury to and/or Harassment of Whales by RAN Vessels and Aircraft – Interim Guidelines for Exercise Coordinators/Planners*. These guidelines are designed to assist Exercise planners/coordinators of the Training Area Management Authority (TAMA) using Offshore Exercise Areas frequented by cetaceans until such time as Environmental Management Plans are completed for each area. Therefore the guidelines are intended to provide: (1) *interim* administrative procedures for those activities in offshore

Exercise Areas (XAs) that may require referrals or permits under the EPBCA and (2) standard operating procedures for those activities in offshore XAs that do not require referral or permits under the EPBCA. These exercise planner mitigation procedures should be read in conjunction with the Interim Mitigation Procedures for RAN ships (SMPs) and aircraft to prevent injury to and/or harassment of whales (Annex A). Adherence to these guidelines will reduce risk to whales to an acceptable level and ensure Defence compliance with the EPBCA.

- *Interim Mitigation Procedures for RAN Ships and Aircraft to Prevent Injury to and/or Harassment of Whales*. This instruction aims to provide guidelines and mitigation procedures to be adopted by RAN ships and aircraft, plus contracted service providers, when conducting specific operations in the vicinity of whales and other cetaceans.

Assessment: The degree of compliance with existing regulations is assessed as high.

Drinking Water

Australian Drinking Water Guidelines are used, however, problems have occurred in some classes of ship. Evaporators do not remove soluble, volatile organic compounds. Also the Collins Class submarines have difficulties with increasing concentrations of the metal cadmium in the drinking water. This can be averted by using different purifying systems that remove dissolved organic and ionic substances. Examples of such systems include reverse osmosis systems and de-ionising activated charcoal systems. Investigation into alternative systems should be undertaken without delay.

Assessment: The degree of compliance with existing regulations is assessed as medium. Recommendation: Assess the existing systems and replace those which do not meet the required standards with alternative technology.

In-door Air Quality

The current air conditioning standard that is applied to RAN ships is the same as that applied for buildings. This sets air flow rates at ten litres per second. Advice from DSTO is that ship systems are designed to produce internal temperature of 29 degrees Celsius in RAN ships. Normally a redundant system is also installed. Common practice is to run both systems to achieve a comfortable environment. Moves are afoot to reduce the design standard to 26.5 degrees Celsius. However, future ship design should include additional air conditioning capability to meet the requirements of equatorial temperatures.

Assessment: The degree of compliance with existing regulations is assessed as medium. Recommendation: Re-assess the existing requirements and install systems which meet the required standards.

Radiation Hazard (Radhaz)

The hazards of exposure to radiation are currently under consideration by the RAN. ABR 2924 (Electromagnetic Radiation Hazards in the RAN) has been re-drafted and is currently undergoing the approval process.

Assessment: The degree of compliance with existing regulations is assessed as high.

Dry Dock Water

ADI Ltd is licensed by the NSW Waterways to release dry dock water (containing TBT and possibly other pollutants) into the Sydney sewerage system and eventually into the sea. This licence is due to expire. New EPA regulations have been introduced which include more stringent standards and ADI has yet to satisfy the new requirements. To meet them they need to install new filtering equipment at a cost of about $3 millions. This treatment will produce effluent that will still contain small amounts of TBT and other pollutants. Discussions regarding the licence are continuing between ADI, NSW EPA and NSW Waterways. A presentation to the Land & Environment Court is pending. Should ADI not gain a new licence or should approval for the licence be significantly delayed, Navy will lose its dry dock capability on the East Coast.

Assessment: The degree of compliance with existing regulations is assessed as high. However, should the licence lapse, Navy capability could be adversely affected. It is recommended that the progress towards attaining the licence be closely monitored.

Encroachment

Some aspects of naval operations are now coming under increasing constraint as a result of environmental and human activities encroaching on traditional naval operational areas. The encroachment issue is a policy and management issue that goes beyond the pure legislative requirements. Currently for the Navy it appears to consist of the following issues, all of which have legislative, scientific, public involvement, economic and strategic management dimensions:

- Growth in marine recreational activities and uses due to increased urban growth in the coastal zone.
- Declaration of marine parks and Marine Protected Areas.

- Air pollution.
- Noise pollution.
- Urban growth around military installations.
- Creeping jurisdiction in various maritime zones (eg. prohibition of naval operations in EEZs of some Coastal States).

These topics will be covered in much more detail in Chapter 3.

Assessment: The degree of compliance with existing regulations is assessed as high.

Double-Hulled Tankers

The regulations concerning the requirements for tankers to be double-hulled are part of MARPOL Annex I. The history of amendments to Annex I is as follows. Amendments which entered into force in July 1993 (Regulation 13F) require all new tankers of 5,000 dwt and above to be fitted with double hulls separated by a space of up to 2 metres (on tankers below 5,000 dwt the space must be at least 0.76m). As an alternative, tankers may incorporate the 'mid-deck' concept under which the pressure within the cargo tank does not exceed the external hydrostatic water pressure. Tankers built to this design have double sides but not a double bottom. Instead, another deck is installed inside the cargo tank with the venting arranged in such a way that there is an upward pressure on the bottom of the hull. Other methods of design and construction may be accepted as alternatives. Provided that such methods ensure at least the same level of protection against oil pollution in the event of a collision or stranding and are approved in principle by the Marine Environment Protection Committee based on guidelines developed by the Organisation. It should be noted that Spain and France have declared that they will ban certain single hulled tankers older than 15 years from their EEZs following the sinking of the *Prestige*.

Tankers that are 25 years old and which were not constructed according to the requirements of the 1978 Protocol to MARPOL 73/78 have to be fitted with double sides and double bottoms. The Protocol applies to tankers ordered after 1 June 1979, which were begun after 1 January 1980 or completed after 1 June 1982. Tankers built according to the standards of the Protocol are exempt until they reach the age of 30. Tankers built in the 1970s, which are at or past their 25th year, must comply with Regulation 13F. If not, their owners must decide whether to convert them to the standards set out in regulation 13F, or to scrap them. Existing tankers are subject to an enhanced program of inspections during their periodical, intermediate and annual surveys. Tankers

that are five years old or more must carry on board a completed file of survey reports together with a conditional evaluation report endorsed by the flag Administration.

The amendments which entered into force in January 2001 (amendments to Regulation 13G) make existing oil tankers between 20,000 and 30,000 tons deadweight carrying persistent product oil, including heavy diesel oil and fuel oil, subject to the same construction requirements as crude oil tankers. Regulation 13G requires, in principle, existing tankers to comply with requirements for new tankers in Regulation 13F, including double hull requirements for new tankers or alternative arrangements, not later than 25 years after date of delivery.

Amendments, which entered into force in September 2002, identify three categories of tankers:

Category 1 oil tanker – oil tankers of 20,000 tons deadweight and above. Carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and of 30,000 tons deadweight and above carrying other oils, which do not comply with the requirements for protectively located segregated ballast tanks (commonly known as Pre-MARPOL tankers).

Category 2 oil tanker – oil tankers of 20,000 tons deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and of 30,000 tons deadweight and above carrying other oils, which do comply with the protectively located segregated ballast tank requirements (MARPOL tankers).

Category 3 oil tanker – oil tanker of 5,000 tons deadweight and above but less than the tonnage specified for Category 1 and 2 tankers.

The RAN Fleet currently includes two tankers, *HMAS Success* and *HMAS Westralia*, both of which are single hulled. *HMAS Success*[3] was launched in 1984 and commissioned in 1986. She is a single-hulled replenishment ship with a gross weight of about 18,000 tonnes full load and is, therefore, a Category 3 tanker. *HMAS Success*, which is due to decommission in 2015, is 16 years old and will reach 25 years in 2011. It is likely that she will need to meet the requirements of Regulation 13F by that date. An assessment of this requirement is recommended.

Figure 1: *HMAS Success*

HMAS Westralia[4] was built in 1974 and is a single-hulled tanker with a gross weight of 40,800 tonnes full load. It can carry over 25,000 tonnes of fuel including several thousands tonnes of aviation fuel. She is a Category 1 tanker and is due to de-commission in 2009. *HMAS Westralia* is now over 25 years old. The amendments to Annex I, which entered into force in July 1993, specify that tankers built in the 1970s which are at or past their 25th must comply with Regulation 13F. If not, their owners must decide whether to convert them to the standards set out in regulation 13F, or to scrap them. An assessment of whether *HMAS Westralia* complies with MARPOL Annex I is required.

Figure 2: *HMAS Westralia*

Studies into the options available for the existing and future RAN tankers are currently being undertaken.

Current Policy Documentation

The following unclassified documents have been examined as part of the compliance assessment process:

- DI(N) LOG 47-3 – Technical Regulation of Naval Materiel.
- DI(N) OPS 19-1 – Disposal of Shipborne Waste.
- DI(N) LOG 21-3 – Management of Ozone Depleting Substances used in Logistical Applications.
- DI(N) ADMIN 39-2 – Management of Ozone Depleting Substances in the Defence Organisation.
- Standard Material Requirements for RAN Ships and Submarines.
- RAN Ship Garbage Management Report.
- DGNMR document A016512 – Standard Materiel Requirements for RAN Ships Volume 2, Part 13 (February 2000).

Emerging Environmental Trends | 2

Drivers for Change

There are numerous sources of environmental pressure on current and future naval operations. Some examples are:

- International Instruments.
- Non-governmental Environmental Organisations.
- Coastal States.
- Public Perceptions.
- 'Greening' of the Commercial Maritime Sector.

International Instruments

Generally, warships and naval auxiliary vessels are excluded from the application of the environmental protection regimes defined in the instruments. However, there is a requirement for each State to ensure that by adoption of the appropriate measures, not impairing operations or operational capabilities, such vessels comply, so far as is reasonable and practicable, with the conventions. RAN policy is to comply.

The RAN also requires diplomatic clearance to visit ports in other Coastal States. If an RAN ship is not in compliance with International Instruments, the coastal State may choose not to grant clearance. An instance of this apparently occurred when *HMY Britannia* was not permitted to visit Canadian ports while it lacked a sewage system. This situation is discussed in the chapter on the International Legal Framework.

Non-Governmental Environmental Organisations (NGOs)

The issue of naval environmental compliance has many aspects; ship-board pollution control, use of ports and bases, military exercises and their impact, conservation of natural resources, to name a few. The composite nature of the issue therefore influences the extent to which NGOs are drivers of change and trends in this sector, with a lot of uneven impact due to the differences in focus and capability of various NGOs. However, it cannot be doubted that in this sector as with all other environmental issues, NGOs have been highly influential in: (1) changing public perceptions of environmental problems, and (2) prompting action by governments and other actors.

NGOs are key actors and drivers in the process of encroachment as described in the chapter on Existing Issues. NGOs may also be active in blocking acceptance by local communities of naval environmental compliance proposals. A factor further complicating the impact and presence of NGOs is the fact that naval environmental compliance also includes issues of the role and status of the armed forces in society. Taking all these factors together, assessment of the NGO aspect as a driver of developments in naval environmental compliance is not an easy task.

The study found the following trends after examining the literature and a range of websites and other forms of public Statements by NGOs:

- *Globally active NGOs* – of the globally active broad spectrum NGOs, only Greenpeace has a consistent program focused on the intersection of defence issues and the environment. Other influential broad-spectrum NGOs, for example the World Wide Fund for Nature (WWF), have no clear focus on defence and the environment or naval environmental compliance specifically. To the extent that environmental NGOs tackle naval environmental compliance at the global level, activity to heighten public awareness and change policies occurs through broad networks of organisations operating at local or national level, and which are primarily concerned with the closure of foreign military bases (principally US bases) and what they see as the improper transport or disposal of hazardous or nuclear waste.
- *National or local NGOs* – the principal way in which NGOs drive changes in naval environmental compliance is more at the local level and in a national context. The context is often proposals to establish or alter the mode of operation of a naval or defence establishment. Concerned citizens either mobilise in a new organisation or enlist the help of established national networks or coalitions to tackle a specific issue or proposal.

The principal implications of NGO activity for naval environmental compliance are:

- The ad hoc and sporadic character of NGO activity and concern means that predicting public response through NGOs is made more difficult.
- The defence establishment often has to periodically re-visit an issue with NGOs across the country even where the same issue has been satisfactorily resolved elsewhere in the country.
- Pro-active and high-performing defence establishments find it difficult to 'partner' with NGOs to provide sustainable or long-term solutions to problems due to the ad-hoc nature of the coalitions that form.

- NGOs may also be active in blocking acceptance by local communities of naval environmental compliance proposals.

Coastal States

The trend towards Coastal States expanding their jurisdiction at sea is addressed in the discussion on 'creeping EEZ compliance' in Annex A. Other aspects of the role of Coastal States as drivers of changes in compliance requirements which deserve specific mention are:

- The role of Coastal State coalitions in international organisations.
- The role of Coastal States in increasing the content of port requirements.

Coastal States have also been a driver of change in the sense that their port capabilities may not be up to the standard required for disposal of shipboard wastes by the more advanced navies. In such situations, greater urgency arises for advanced navies to develop at-sea solutions so as not to burden less capable Coastal States with disposal requirements.

Finally, the political aspect, which is also complicated, should be noted. Good relations may require that the RAN and other technologically sophisticated navies show high levels of environmental compliance in the waters of Coastal States to ensure that the public remains supportive of port visits and military exercises. Shipboard waste disposal and minimal waste disposal may be a more effective way of doing this than the shore-construction of the appropriate facilities. In other situations, construction through aid and other assistance may be appropriate where the commercial maritime sector may also use such shore-based facilities. The role of Coastal State issues as a driver of naval environmental compliance is a complicated issue requiring case-by-case assessment in the light of diplomatic, economic, technological and political considerations. There is, however, every likelihood of Coastal State considerations shaping naval environmental compliance even more especially where good relations need to be maintained with the particular Coastal State.

Public Perceptions

Public perceptions can bring about pressure for the RAN to undertake particular actions that it is not formally required to undertake. For example, MEPC directives (MARPOL, etc) are not compulsory for Defence under sovereign warship exclusion, but Navy is obliged to comply because of the public and Government will. In response to this, the Defence Environment Policy commits the ADF to be leaders in environmental stewardship and to take the lead in environmental matters as Australia's largest shipping fleet owner. This translates

into a need to demonstrate a *genuine* requirement not to comply and to apply for exemptions to compliance (from the appropriate authority) on the infrequent occasions when non-compliance is required.

The major risk for Navy is lack of recognition and therefore lack of action by Navy managers in ensuring that the importance of the environment is included in ongoing planning. Such actions have occurred recently where helicopter operations were undertaken over West Island near Ashmore Reef, which did not comply with the EPBCA. As luck would have it, a staff member of Environment Australia was present, who was able to liaise with Canberra and arrange a clearance. Requirements to ensure that this type of situation does not continue to arise are discussed in the chapter on Project Outcomes.

The value placed on the environment by the Australian community is continuing to increase. This has led to an increasing intolerance of damage to the environment. The RAN's policy has been built upon the Defence Policy and has been developed to decrease the likelihood of damage to the environment by the RAN. It acknowledges that the potential for environmental damage varies with both the scale and intensity of the activities being undertaken, and the degree of risk. In response to this, regulations for RAN ship operations, which may result in an environmental risk, have been developed. These aim to meet the requirements of each of the international conventions for environmental preservation, satisfy domestic regulations and anticipate future changes which may be approved.

'Greening' of the Commercial Maritime Sector

The commercial maritime sector and the associated international organisations have been striving for the attainment of 'best practice' and continuous improvement in that sector for a number of years. It is important that shipbuilding in the RAN keeps pace with these changes for the following reasons:

- Rapid adoption of commercial maritime sector solutions may be facilitated by knowledge of best practice trends and vice-versa.
- Any significant divergence in orientation, focus and technological development between the commercial shipbuilding sector and the naval shipbuilding sector will make it more difficult technologically and financially more costly for navies (including RAN) to build particular technical solutions that navies prefer for specific military and operational reasons.

The main issue of concern for naval environmental is the very broad and diverse drivers behind the 'green shift'. Significant technological and managerial

solutions to key problems will feed fairly rapidly into the various programs of work under the global treaties (Kyoto Protocol in particular) and the non-oil annexes of MARPOL. The classification societies will adopt particular solutions for their classification systems and rules, and these solutions will set the standards for compliance for the global shipping community. Previously, environmental concerns have focussed on controlling and managing pollution of the seas by oil (routine or catastrophic). At present, this focus has broadened such that all environmental issues which could pose a more generalised 'threat' to normal operations in the maritime sector are under consideration.

The International Organization for Standardisation (ISO) – the International Organization for Standardisation (ISO) is a worldwide, non-governmental federation of national standards bodies from over 120 countries, one from each country, established in 1947. The mission of ISO is to promote the development of standardisation and related activities in the world with a view to facilitating the international exchange of goods and services, and to developing cooperation in the spheres of intellectual, scientific, technological and economic activity. ISO's work results in international agreements that are published as International Standards. There are more than 11,000 voluntary International Standards and Guides.

The Role of the Classification Societies – ship classification societies began when insurance companies started to insure ships and their cargoes. Soon they realised they could reduce their risk and improve the industry if they banded together and provided rules of good ship construction. The insurance companies were able to enforce their rules because, if an owner refused to follow their direction, they, the insurance companies, would simply refuse to provide insurance. Modern ship classification societies establish rules for the construction of ships and their agents inspect vessels while they are being built, repaired and in service.

Class cooperates with the owner, the flag State and with port State regimes in looking after the safety conditions of ships. Traditionally Class has been the representation that a ship complies at a certain time with rules developed by the Classification Society. This representation of conformity is given to the shipowner for his sole benefit according to a private contract between him and the Classification Society. As for all contracts, good faith is an essential feature. There are dramatic changes in the shipping and shipbuilding industry, with resulting changes also affecting the relation with classification societies.

International Association of Classification Societies (IASC) – International Association of Classification Societies (IASC) members' service to the

international fleet is focused on the setting, updating and monitored application of standards for hull structures and essential shipboard engineering systems, during design and construction and throughout a ship's service life. IACS members have a dual role. They deliver classification services by providing third party engineering analyses, followed by periodic verification of the ship's hull structure and mechanical and electrical systems, and provide statutory certification in accordance with various international and national requirements on behalf of flag administrations. These combined functions of classification and statutory work have the great advantage of one organisation applying the necessary classification and mandatory statutory certification requirements to verify the ship's structural integrity and the fitness for purpose of essential engineering systems, throughout its service life.

To ensure integrity and the highest standards in ship classification practice IACS introduced its Quality Management System Certification Scheme (QSCS) in 1991. The scheme embraces management systems relating to both classification and statutory work on ships and offshore units carried out by IACS members. The main objective of the QSCS is to verify that a Society has developed its own internal quality management system, the system of the Society is in conformity with the requirements laid down by IACS including the 'Code of Ethics' and IACS procedural requirements, and the system of the Society is in operation as described in relevant documents of that Society. Compliance with the QSCS is mandatory for members and associates.

The most environmentally engaged classification societies are in descending order:

- DNV – Det Norske Veritas.
- Bureau Veritas.
- American Bureau of Shipping.

Det Norske Veritas (DNV)

Det Norske Veritas (DNV) is the world leader in practical implementation of environmental solutions in the maritime sector and is the leading company engaged in environmental research. The green orientation of DNV is discernible from the following work program which is undertaken either by DNV itself or in association with other bodies. The main collaborative program is called the MARMIL Program (Maritime Environmental Research Program). MARMIL's institutional structure, goals, program components as well as the content of key programs are described in more detail below. An evaluation is provided of the significance of key program/projects for naval environmental compliance. The MARMIL program includes input from the Norwegian Navy and it is the home for some of the NATO research program. It is funded by the European Union and

includes American universities and the Norwegian Ship owners association. There are three broad programs under MARMIL under the following themes:

- Increased Knowledge – environmental impacts from ships.
- Environmental management and training.
- Technology for reduction of environmental impact from ships.

The detailed work program as at October 2002 is outlined at Table 1.

Increased Knowledge – environmental impacts from ships	**Environmental management & training**	**Technology for reduction of environmental impact from ships**
Improved international statistical data on pollution from ship operation – ongoing	Ship Environmental Accounting System – completed and under commercial implementation by DNV	Methods for determination of sulphur dioxide emissions from vessels – ongoing
Ballast water research programs – EU, global – ongoing	Guidelines on environmental reporting for use by shipping and offshore companies – completed and under commercial implementation by DNV	Alternate fuels for propulsion and power generation – ongoing
Increased knowledge of crude oil during sea transportation – completed	Training programs on environmental issues for maritime personnel – ongoing	Reduction of VOC emissions during offshore loading – completed with participation by leading oil companies – under commercial implementation
Life cycle evaluation – ongoing		Sewage treatment – ongoing
Environmental effects of ship transportation – completed 2001		Efficient arrangement of ship machinery – joint venture between Norway and Finland – ongoing
Ship scrapping		
Greenhouse gas emissions from ships – completed – provided basis for IMO submissions on climate change		

Table 1: MARMIL Work Program – proposed and completed

The DNV/MARMIL sub-programs of most consequence for naval environmental compliance are:

International statistical data on pollution from ship operations

This has the following scope of work:

- Develop the principles for the collection of ship related environmental data such as operational, accidental and avoidable emissions to air and discharges to sea on the basis of ship types, trades and geographical areas.
- Identify the framework and plans for an environmental information system including permanent routines for reporting.
- Identify a system for collection, storage and analysis of environmental data.

Should this project be successfully translated into commercial application it would support more detailed implementation of the various international conventions, especially global conventions such as the Kyoto Protocol. For instance, because of the information generated both by type and geographical area, commercial uptake would provide more effective scope for the Clean Development Mechanism (CDM) to be extended to the shipping sectors of Nation-States parties to the Kyoto Protocol. The CDM aspect of Kyoto envisages that States parties will be able to engage in trading of carbon and other credits to address their obligations under the Protocol. With much more precise information about emissions profiles by shipping trade types and geographical area, the pressure for navies to comply in some way with environmental standards would also increase significantly and would be based on a firmer factual foundation. The sovereign immunity exceptions currently available to navies would thus come under even more pressure.

Greenhouse gas emissions from ships

This topic will be discussed under Emerging International Issues. The DNV project seeks to do the following:

- Evaluate Greenhouse Gas emissions from ships based on current technology as well as the potential for reducing such emissions by using new technical solutions.
- Evaluate operational initiatives for reducing emissions from ships (improved maintenance, weather routing, speed reductions, etc.).
- Evaluate incentive regimes (regulatory, fiscal and other) and how they should be designed to spur implementation of different abatement measures.

- Evaluate potential for emissions reduction through various market-based approaches.

Ship environmental accounting system

The scope of work for this project is to develop a simple system for calculation of operational emissions to air, discharges to sea, and deliveries to shore for the major pollutants onboard a ship during normal operation. The project is now under commercial implementation by DNV. Its usefulness would be in assisting RAN and other navies to implement accounting systems on a fleet-wide basis but would also support integration of commercial non-naval suppliers into the naval system.

Guidelines on environmental management based on the ISM Code

The scope of work for this project is to develop guidelines for environmental management in shipping companies and ship management companies, in the spirit of and in accordance with the format of the ISM Code, and at an ambition level equal at least to that of the ISO 14001 Standard for Environmental Management.

Bureau Veritas (BV)

Bureau Veritas (BV) is different from DNV and ABS since it is more of a general certification and audit company rather than being driven by shipping and marine issues. Thus, as far as maritime environmental performance issues are concerned, BV appears to be driven more by developments in its wide-ranging environmental management portfolio and quality management portfolio generally than by developments in the shipping sector specifically (the situation of ABS) or by in-house R & D (the situation of DNV). The main driver of BV environmental management activity appears to be Bureau Veritas Quality International (BVQI), set up in 1988 in London to respond to the growing demand for third party quality management system certification in the UK. BVQI is currently a world leader in quality management certification with offices in 60 countries, recognition from 24 accreditation bodies and over 30,000 clients in more than 70 countries. BVQI offers a full range of services, including certification. BVQI is a world leader in environmental management certification and audit and is currently recognised by and has offices in the following countries:

- Argentina O.A.A
- Austria AZ
- Brazil INMETRO
- Australia/New Zealand JAS ANZ
- Belgium BELCERT
- China/ Hong Kong HKAS

- Colombia SIC
- France COFRAC
- Italy SINCERT
- Korea KAB
- Netherlands RVA
- Spain ENAC
- Switzerland SAS
- USA/ Canada SCC
- Venezuela SENCAMER
- Denmark DANAK
- Germany TGA
- Japan JAB
- Mexico EMA
- Portugal IPQ
- Sweden SWEDAC
- USA RAB
- UK UKAS

The following BVQI certification programs connected with maritime sector environmental compliance and in which it is a world leader or the dominant global players are:

- ISO 9000 (Quality Management Systems).
- ISO 14001 & EMAS (Environmental Management systems).
- HACCP & BRC (Food Safety).
- SafetyCert® & OHSAS18001 (Occupational Health and Safety).
- Codes of Conduct and SA8000 (Social Accountability).
- Integrated Management Systems certification.

Other international aspects of BV are its membership and in some cases lead role as a representative of the commercial sector in the following organisations concerned with environmental issues:

- European Organisation for testing and Certification (EOTC).
- Independent International Organisation for Certification (IIOC).
- International Accreditation Forum (IAF).
- International Standards Organisation (ISO) Technical committee 207 (TC207).
- Business for Social Responsibility (BSR).
- Institute of Social & Ethical Accountability (ISEA).
- International Association of Electronic Recyclers (IAER).

BV's role in the International Standards Organisation (ISO) Technical committee 207 (TC207) is particularly important since this is the 'home' of ISO 14000 and environmental management issues within the ISO system. Should specific standards for shipboard environmental management emerge, they would likely be driven principally by Technical committee 207 (TC207) and the IMO. BV is present within IMO structures through the permanent representation of IASC in the IMO structures and is highly influential within TC 207.

American Bureau of Shipping (ABS)

The American Bureau of Shipping (ABS) classification society appears to be more focused on:

- Disseminating environmental improvement information to the international shipping industry in an easy to use format.
- Developing a preferential classification of vessels which environmentally driven companies can use to differentiate themselves in the marketplace and respond to the emergent pressure to green the shipping industry.

The focus of the ABS is explained in part by the grass-roots movement and official pressure at State and Federal level to improve the environmental performance of the Cruise Ship sector of the US maritime sector. The key features of ABS activity which demonstrate its increasing contribution to environmental compliance in a US and international context are detailed at Table 2.

Publication/ Research Focus	Contents and Focus
The Class Notation Environmental Safety (ES), American Bureau of Shipping, 2001. Available www.eagle.org.	This Guide has been developed with the objective of promoting environmentally safe design, construction and operation of ABS-classed vessels and marine structures. The requirements as specified in this Guide are additional to all other relevant requirements of ABS Rules and Guides. Vessels and marine structures designed, built and operated in full compliance with the International Regulations, standards, guidelines and recommendations as listed will be assigned a class notation ES, Environmental Safety.
Marine Safety, Quality & Environmental Management, American Bureau of Shipping, 2001. Available www.eagle.org.	This Guide has been developed with the objective of improving safety and environmental performance in the management and operation of ships. This Guide provides the maritime industry with a model for implementation of management systems concerned with these issues.
Prevention of Air Pollution from Ships, American Bureau of Shipping, 1999. Available www.eagle.org.	These Guidance Notes are intended to address sources of air pollution from ships and other marine structures, and indicate options for prevention and/or reduction of such emissions. They provide information for consideration in the design and operation of ships both before and after entry into force of Annex VI of MARPOL 73/78 on Regulations for the Prevention of Air Pollution from Ships.

Table 2: Key Environmental Focus Areas of ABS

Emerging International Issues

This section discusses emerging changes in a variety of International instruments that are currently under consideration. Some of these may not appear to have a bearing on RAN operations, but in the long term could influence public perceptions. Over time, Government policy has been to apply these general maritime instruments to RAN operations, and the progress to date implies that there will be an impact during the next five years or so. It therefore is necessary for these trends in changes to be monitored for possible inclusion in future policy.

The major changes which have occurred and which have/will produce effects for equipment installed in RAN ships, have been related to:

- Anti fouling paints.
- Ballast water.
- Air emissions.
- The Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (the OPRC HNS Protocol).
- International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001 (Bunkers Convention).
- Revision of the Prevention of Pollution by Sewage from Ships (Annex IV of MARPOL 73/78).
- Possible Future Amendments for Sewage Treatments.
- Revision of the International Oil Pollution Compensation Regime.
- Particularly Sensitive Sea Areas.
- Diplomatic Clearance Requirements.

Anti-Fouling Paints

These have been discussed in some detail in Chapter 1. The RAN has been trialing a number of alternatives to organotin based anti fouling paints. One such trial involves a fouling release coating that is designed to form a non-adhesive surface, which is able to shed most fouling at about 12-15 knots. Another alternative coating is a paint that uses a copper based biocide. Trials are ongoing, with the aim of the RAN meeting MARPOL requirements when they come into force. The Convention on Anti-fouling Paints is expected to come into force in the short term. Also, a likely extension to do with hull fouling is under consideration. New standards that will limit trans-location

are likely to be introduced. It is expected that documentation for a Code of Conduct will be developed. This will be particularly important for de-commissioning of ships.

At present, the alternatives to TBT coatings that have been examined do not perform as well as TBT in the extreme operating conditions of submarines. However, this problem is under ongoing consideration. The use of treatments containing any metal-based biocide is already in question. These are generally very potent poisons. Under the present technology, any alternative to TBT will be subject to numerous studies to determine factors such as the minimum concentrations required for effective and the leach rate from the paint. It is expected that requirements for these studies will become mandatory and the use of less potent, shorter-life treatments will be introduced.

One additional treatment that has been trialed is the use of underwater hull cleaning systems, which can be coupled with a coating containing a lower concentration of biocide. The main problem with this process is the potential for dumping invasive pests from the hull into harbour waters. The USN has developed a prototype of a diver-operated vehicle with in-water capture of all effluent from the cleaning operations. This effluent can then be treated separately before discharge. Examination of such a system may prove useful for the RAN.

Ballast Water

This topic has been discussed in some detail in Chapter 1. Ballast Water problems have already resulted in instances where infestation of introduced marine pests has occurred in Australian ports. The scale of the problem in Australian waters is not known. However, infestation of southeastern Australian waters with Northern Hemisphere kelp and the Northern Pacific Sea Star (*asterias amurensis*) are likely to have major economic and ecological impacts.

Updated IMO Regulations that aim to prevent infestation will be considered next year, with possibly more rigid requirements on monitoring and audit of ballast water treatment being introduced. The proposed new instrument is being developed on the basis of a two-tier approach. Tier 1 includes requirements that would apply to all ships, including mandatory requirements for a Ballast Water and Sediments Management Plan, a Ballast Water Record Book, and a requirement that new ships carry out ballast water and sediment management procedures to a given standard or range of standards. Existing ships would be required to carry out ballast water management procedures after a phase-in period, but these procedures may differ from those to be applied to new ships. Tier 2 includes special requirements which may apply in certain areas and

would include procedures and criteria for the designation of such areas in which additional controls may be applied to the discharge and/or uptake of ballast water. The text for Tier 2 remains to be developed.

Cross-contamination between ports is also a problem. At present in Australia a national working group is developing a framework for a unified national system of ballast water management. The Australian Quarantine and Inspection Service (AQIS) is developing a set of guidelines for ballast water management for intrastate travel around Australia. The DNPS is involved in this development. AQIS is also working on different treatment regimes. BHP is trialing a waste heat system that aims to kill all life in the ballast water.

Consistent with its environmental policy, the RAN will develop environmentally sustainable ballast water management plans after considering any national system, which is put in place.

Air Emissions

MARPOL Annex VI: *Prevention of Air Pollution from Ships* was adopted in September 1997. It will enter into force twelve months after being ratified by 15 States whose combined fleets of merchant shipping constitute at least 50 percent of the world fleet. As at October 2002 only six States had ratified the Annex. However, Liberia has just signed and Panama is close to signing. It is expected that the Annex will be in force within two years. The IMO's Marine Environment Protection Committee (MEPC) has been invited to identify any impediments to entry into force of the Protocol, if the conditions for entry into force have not been met by 31 December 2002.

The regulations in this annex, when they come into force, will set limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibit deliberate emissions of ozone depleting substances. This regulation has retrospective application from 1 January 2000. Annex VI includes a global cap of 4.5 percent m/m on the sulphur content of fuel oil and calls on the IMO to monitor the worldwide average sulphur content of fuel once the Protocol comes into force. Annex VI contains provisions allowing for special 'SOx Emission Control Areas' to be established with more stringent control on sulphur emissions. In these areas, the sulphur content of fuel oil used on board ships must not exceed 1.5 percent m/m. Alternatively, ships must fit an exhaust gas cleaning system or use any other technological method to limit SOx emissions. The Baltic Sea is designated as a SOx Emission Control area in the Protocol. Annex VI prohibits deliberate emissions of ozone depleting substances, which include halons and chlorofluorocarbons (CFCs). New installations containing ozone-depleting substances are prohibited on all ships. But new installations containing

hydro-chlorofluorocarbons (HCFCs) are permitted until 1 January 2020. Annex VI sets limits on emissions of nitrogen oxides (NOx) from diesel engines. A mandatory NOx Technical Code, developed by IMO, defines how this is to be done. The Annex also prohibits the incineration on board ship of certain products, such as contaminated packaging materials and polychlorinated biphenyls (PCBs).

The requirements of the IMO Protocol are in accordance with the Montreal Protocol of 1987, as amended in London in 1990. The Montreal Protocol is an international environmental treaty, drawn up under the auspices of the United Nations, under which nations agreed to cut CFC consumption and production in order to protect the ozone layer. Under the National Pollution Inventory, Defence must report to Environment Australia each year if thresh-holds for the 90 odd substances listed, is reached in specific air-sheds.

The Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (OPRC HNS Protocol)

The OPRC HNS Protocol provides a global framework for international cooperation in combating major incidents or threats of marine pollution by substances other than oil. Parties to the OPRC HNS Protocol will be required to establish measures for dealing with chemical pollution incidents, either nationally or in cooperation with other countries. The Protocol will enter into force twelve months after the date on which it is accepted by not less than 15 States. The OPRC Protocol will most probably not be applicable to RAN except for possible inclusion of clean-up equipment in the National chemical spill contingency plan (CHEMPLAN) register.

A major revision of Australia's CHEMPLAN, which forms the basis for Australian implementation of the Protocol, has recently been completed. A detailed proposal for implementation of the Protocol was considered and endorsed by the National Plan Management Committee in March 2002 and by the Australian Maritime Group in May 2002. The proposal will now be forwarded to the Standing Committee on Transport before being considered by the Australian Transport Council in November 2002. It is not anticipated that legislation will be required to give effect to this Protocol.

International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001 (Bunkers Convention)

The International Convention on Civil Liability for Bunker Oil Pollution Damage 2001 (Bunkers Convention) was adopted by an IMO Diplomatic Conference in March 2001. The Convention provides for ship-owners to be strictly liable for

fuel oil spills and requires them to carry compulsory insurance to cover any pollution damage following a fuel oil spill. In accordance with a commitment in the Government's *Oceans Policy*, Australia was closely involved in the development of this Convention. The Convention will enter into force one year after the date on which it is accepted by 18 States, including five States each with ships whose combined gross tonnage is not less than 1 million gross tons.

AMSA, through the Commonwealth Department of Transport and Regional Services, has commenced consultation with interested Commonwealth agencies and industry groups and the States/Northern Territory through the Australian Transport Council. The Australian Maritime Group endorsed Australian acceptance of the Convention at its meeting in November 2001. The Standing Committee on Transport also endorsed the proposal at its meeting in April 2002. Consideration by the Australian Transport Council is expected to occur at its meeting in November 2002. Industry was closely involved in the development of the Convention at IMO, both through direct representation by international bodies and provision of input for Australian delegation briefs. Early indications are that industry is fully supportive of the final text and Australian adoption.

Following the consultation process, it is proposed that legislation to give effect to the Bunkers Convention in Australia be developed as part of the existing 'Protection of the Sea' legislation package giving effect to IMO Conventions. As an interim measure, AMSA has enacted legislation requiring ships entering Australian ports from 6 April 2001 to have documentation on board demonstrating that the ship has insurance coverage, at least to the limit of applicable international treaties. Any regulations arising from this Convention are likely to have little effect on RAN operations. However, in the unlikely event of an oil spill from a RAN ship resulting in a claim for compensation, the RAN should consider the development of a policy position on rules for the payment of compensation.

Revision of the Prevention of Pollution by Sewage from Ships (Annex IV of MARPOL 73/78)

In March 2000, the IMO adopted a revised text of Annex IV of MARPOL 73/78 (*Prevention of Pollution by Sewage from Ships*), which addresses many of the problems identified by IMO member States. Regulations for the prevention of pollution by sewage from ships will enter into force in September 2003 following the ratification by Norway of Annex IV. The Annex sets out in detail how sewage should be treated or held aboard ship and the circumstances in which discharge into the sea may be allowed. It requires Parties to the Convention to provide adequate reception facilities for sewage and contains a model

International Sewage Pollution Prevention Certificate to be issued by national shipping administrations to ships under their jurisdiction. The Annex will apply to ships engaged in international voyages. On entry into force it will have immediate effect on all new ships of 400 gross tonnage and above and new ships of less than 400 gross tonnage which are certified to carry more than 15 people. It will apply to existing ships of 400 gross tonnage and above and of less than 400 gross tonnage and above but certified to carry more than 15 people five years after the date of entry into force.

On 25 May 2001, the Australian Transport Council agreed that Australia should move towards implementation of the revised Annex IV. The Regulatory Impact Statement, National Interest Analysis and drafting instructions are being prepared in conjunction with the Commonwealth Department of Transport and Regional Services. A survey of available waste reception facilities for sewage in Australian ports was completed during December 2001, as part of an international survey being carried out by the IMO. The information provided indicates that sewage discharge facilities are available at most major trading ports and many smaller ports. Geelong, Westernport Hay Point and Port Hedland are the only major ports that have not indicated any plans to install such facilities.

Possible Future Amendments for Sewage Treatment

In the shorter term, it is likely that agreement to prohibit the discharge of untreated sewage at sea will be reached. In the longer term, treatment requirements for discharge are also likely to become more stringent. These agreements will result in amendments to Annex IV – *Prevention of Pollution by Sewage from Ships*. The impact for the RAN is to ensure that the treatment equipment on all ships is capable of meeting the prospective new standards. This will require an ongoing study of each type of equipment in use and perhaps individual assessments of each unit. For new ships, the design specification should define standards that exceed the prospective new standards.

The NATO Industrial Advisory Group (NIAG) has published a liquid discharge standard as detailed at Table 3.[5]

Revision of International Oil Pollution Compensation Regime

As a consequence of the significant costs associated with the *Erika* oil spill, the EU has placed considerable pressure on the International Oil Pollution Compensation Fund to significantly increase available compensation limits. To minimise the possibility that the EU will develop its own separate compensation arrangements, Australia is actively participating in moves to develop a so-called 'Supplementary Fund' Protocol to add the option of an additional 'third tier' of compensation for those States requiring access to higher limits. The draft text

Effluent Constituent	Max Allowable Level
Biological Oxygen Demand	30 mgl^{-1}
Chemical Oxygen Demand	300 mgl^{-1}
Chlorine	
Total Solids	500 mgl^{-1}
Total Suspended Solids	100 mgl^{-1}
Total Dissolved Solids	500 mgl^{-1}
Total Organic Carbon	100 mgl^{-1}
Oil & Grease	5 mgl^{-1}
Total Nitrogen	40 mgl^{-1}
Total Phosphorus	10 mgl^{-1}
pH	6-9
Faecal Coliforms	2 $CFUml^{-1}$
Foreign Organisms	2 $CFUml^{-1}$
Metal Salts	100ppb for certain metals

Table 3: NIAG Liquid Discharge Determinant Standards

of this Protocol, based on an initial draft prepared by Australia, was endorsed by the International Oil Pollution Compensation Fund Assembly in October 2001. The draft Protocol will be considered at a Diplomatic Conference to be held in 2003. In February 2002 an AMSA officer provided a presentation on the new Protocol to the Board of the Australian Marine Oil Spill Centre, and initial indications are that the industry is supportive of Australia adoption of the supplementary protocol.

The Fund Assembly is also undertaking a review of the existing policy regarding compensation for environmental damage. In May 2002 Australia and eight other IOPC Fund Member States submitted a detailed paper proposing guidelines on claims for the costs of measures of reinstatement of the environment and post spill environmental studies. Following lengthy debate, the proposal was endorsed, and will now go forward to the IOPC Fund Assembly in October 2002 for formal adoption. It is hoped that this step will also reduce the threat of regional action being taken on the issue by the European Commission as part of its package of measures designed to address issues related to the *Erika* incident.

Australia is a signatory to both Conventions and AMSA will maintain an active role in this process to ensure Australian interests are taken into account. It is most probable that this Convention will not be applicable to the RAN, but there may be a need to monitor developments.

Particularly Sensitive Sea Areas

The four identified Particularly Sensitive Sea Areas (PSSA) at this time are: the Great Barrier Reef Marine Park, Sebana-Camaguey (Cuba), Malpello Island (Columbia), and the Florida Keys. Emerging trends in this area are the possible proclamation of two new PSSA in the Wedell Sea and Peraccus National Reserve (Peru). There is also a strong possibility that a New Special Area, an Extension of the Gulf SA off Oman will be proclaimed. It should be noted that although the IMO has defined a number of Special Areas, only about half are operating as the required waste reception facilities have not yet been installed. Additionally, the Great Barrier Reef Marine Park is due to be extended to include the Torres Strait. This will likely involve a new main channel and a compulsory pilotage regime. It should be noted that in South Australia's Gulf area, the discharge of garbage is prohibited. Regulations require that dumping of garbage cannot be undertaken within a certain distance of the nearest land. The nearest land definition is based upon the distance from the maritime Baseline, not from the land itself.

Diplomatic Clearance Requirements

There is normally no inherent right of entry for warships to foreign internal waters, including ports, under the United Nations Law of the Sea Convention (UNCLOS). Standard practice is for a visiting warship to obtain diplomatic clearance prior to making a port call. It is within the power of a Port State to refuse diplomatic clearance to an RAN ship on the basis that it does not meet acceptable construction standards for environmental purposes. It is possible that a Port State could refuse entry to a RAN tanker on the basis that it does not comply with MARPOL, even though MARPOL does not apply to warships. There is anecdotal evidence that *HMY Britannia* was not permitted to visit Canadian ports while it did not have a sewage system. Any assessment of the significance of this issue would need to take into account the attitudes and regulations of port States that either *HMAS Westralia* or *HMAS Success* would be likely to visit. Given the recent sinking of the *MV Prestige* (a single-hulled tanker, apparently out of certification) off Spain, it is highly likely that Port States may be less inclined to give a clearance to a tanker which is non-compliant with MARPOL Annex I.

Emerging Domestic Issues

The following emerging domestic environmental issues may affect RAN operations:

- National Oceans Policy.
- Great Barrier Reef Marine Park.
- Noise in the Marine Environment
- Whales.
- Commonwealth Marine Protected Areas

National Oceans Policy

Under UNCLOS, Australia has rights and responsibilities over some 16 million square kilometres of ocean—more than twice the area of the Australian continent. The areas of ocean and seabed adjacent to Australia's External Territories comprise around half of the total area of the Australian EEZ and adjacent continental shelf. As can be seen at Figure 3, the areas around the Antarctic and sub-antarctic territories and the small island territories make up a considerable fraction of the total area.

Australia's Marine Jurisdictional Zones (Preliminary)

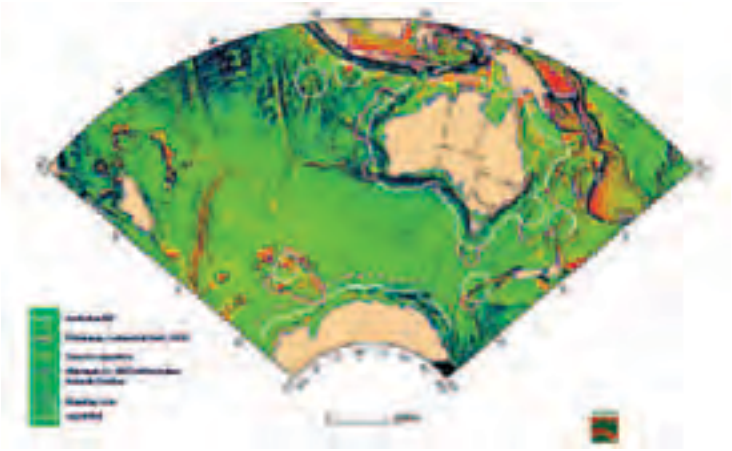

Figure 3: Australia's maritime areas under UNCLOS

The National Oceans Policy commits the Federal Government to develop its oceans sustainably through regional marine planning. The first such region plan is currently being developed for the South-East Marine Region. The Oceans Policy States that the regional marine planning process will comply with relevant international agreements.

The National Oceans Policy defines the ADF's task as 'to safeguard these areas, to control our maritime approaches and to exercise and protect Australia's sovereignty and sovereign rights'. To undertake this task, the RAN maintains a fleet of ships equipped for service in Australian waters and retains the skills and experience necessary to discharge its responsibilities. The Australian Defence Force must be able to operate freely on Australia's oceans. This requires guaranteed access for the ADF to some areas at all times. In other areas periodic access may be needed as part of scheduled training programs, or in response to national security considerations. The ADF is also required to contribute to the development of a National Marine Data Policy. To support this policy the ADF is to collect, collate, manage and distribute marine data in support of ADF and national marine requirements. This involves the operation of the Australian Oceanographic Data Centre (AODC).

The adoption of the National Oceans Policy leads to a much greater area of operation for the ADF, in particular for Navy. Given the political requirement to protect Australia's sovereignty and sovereign rights, the number of other government organisations involved in this task and the limited resources available, it is highly likely that the RAN's role will expand in the future to encompass greater responsibility for maritime enforcement and response.

Great Barrier Reef Marine Park (GBRMP)

Advice from *HMAS Cairns* and AMSA is that the Great Barrier Reef Marine Park Authority (GBRMPA) is currently reviewing its discharge standards. The advice is that the new draft standards will be more stringent than MARPOL requirements. AMSA are liaising with GBRMPA to ensure that the new standards are achievable. As Defence has a memorandum of understanding with Environment Australia to comply, the RAN will need to meet the new standards once they come into force. There is currently no specific provision of the GBRMPA that would prohibit the use of single hulled tankers contrary to MARPOL in the Great Barrier Reef Marine Park. It is important to note however that the GBRMPA does bind the ADF. It would be possible for the GBRMPA Authority to alter zoning plans within the park to give effect to the double-hulled tanker regime under MARPOL that would bind the ADF. This is significant in that a change to a zoning plan would not require an act of Parliament, as would a

change to the *Navigation Act 1912*, and would be therefore easier to effect. Plans are also under way to extend the GBRMP to include the Torres Strait by 2003, which would involve moving the main channel and implementing compulsory pilotage.

Noise in the Marine Environment

Noise in the sea is an emerging issue that requires much more research. Public concerns have already been raised regarding ADF Sonar Operations. Under the EPBCA[6], any deliberate operational activity that has a reasonable probability of causing harassment of whales requires approval by the Minister of the Environment and Heritage. Advice from EA staff is that evidence on harassment noise level shows that at a distance of 3km, 140dB causes avoidance behaviour and visible disturbance with a cow/calf pair, 150dB disrupts feeding and 160dB causes physiological damage. Discussions with Navy staff highlighted that these figures are tenuous and not widely accepted, as the observations were made on one species only. For example, a noise of 140dB at source would be below ambient sound levels at 3km. These two points of view indicate there should be more contact between Environment Australia and Defence so that fundamental data can be agreed. The development of a closer relationship between Defence and EA is discussed in *the chapter on Project Outcomes*.

Whales

The IMO has introduced a resolution on Mandatory Ship Reporting Systems (Resolution MSC.85(70)) for the reporting of whale pods on the West Coast of the USA. It is likely that this resolution will be expanded to cover other ocean areas, possibly including Australian waters. Additionally, Sweden has submitted a proposed resolution that the US and Canada use this information to pursue practical actions to reduce ship strikes on Right Whales, consider appropriate fishery measures to reduce Right Whale mortality from fishing gear, and continue and expand educational programs to help mariners actively avoid collisions with Right Whales.

On the domestic front, the development of regulations arising from the EPBCA may result in more stringent requirements in whale collision avoidance and/or impact reduction. There could also be regulations concerning noise making in critical habitats by either the use of sonar or by ship noise during operations. It is clear that there will be increasing pressure to choose activities which comply with the EPBCA and a decreasing likelihood of gaining exemptions for controlled actions in critical habitats. The main impact on naval operations will be the need for greater coordination between exercise planners and Environment Australia. The opportunity exists for Navy to liaise with

Environment Australia (Marine Species Branch) to seek strategic exemptions for controlled actions under the EPBCA.

Seismic guidelines[7] which were developed to assist proponents of offshore seismic operations address certain of their obligations under the EPBCA relevant to interactions with whales and certain other larger cetaceans are on the web.

Commonwealth Marine Protected Areas

Commonwealth Marine Parks are declared under the EPBCA. There are 13 Commonwealth Marine Protected Areas (MPAs) around the Australian coastline as shown at Figure 4. Numbers of MPAs are likely to increase in future, particularly in the southeastern waters, with the most recent promulgation being for the Macquarie Island Marine Park.

The key drivers for the growth of marine parks in Commonwealth waters are:

- International obligations (eg. Convention on Biological Diversity, the World Heritage Convention, Ramsar Wetlands Convention and bilateral migratory species Convention between Australia and Japan and Australia and China).
- Domestic legislation through the EPBCA.
- The National Oceans Policy (which requires the identification and establishment of representative systems of marine protected areas).

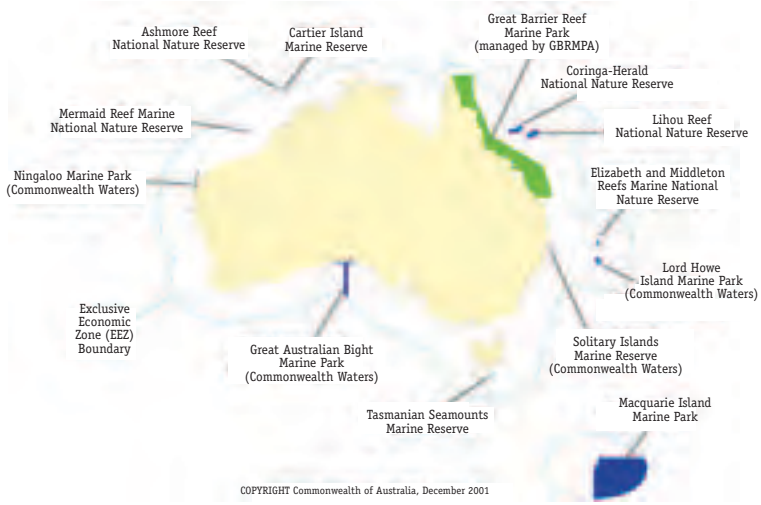

Figure 4: Commonwealth Marine Protected Areas

The EPBCA requires that a Plan of Management be developed for each Park. These Plans are Statutory Instruments under the EPBCA and therefore are legally binding. The regulatory controls in each management Plan are different, reflecting the ecological characteristics of each park and the values for which each park has been created. In general terms, the following activities are regulated in the marine parks:

- Prohibition on anchoring.
- Controls of fishing activities.
- Requirements to keep vessel speed down.
- Prohibition of dumping.
- Prohibition of mining.
- Controls on helicopter operations.

Copies of each of the Management Plans are readily available from Environment Australia.

Staff at the Marine Protected Areas section of Environment Australia are working on draft manuals for operations in Marine Protected Areas. These manuals will be discussed at future meetings of the MPA Stakeholders Reference Group of which the Navy Environment Manager is a member. Marine Protected Areas staffs are willing to discuss permitted activities in each area to decide on which naval activities can be exempted and which will need approvals. The aim of these discussions would be to negotiate the definition of a template for Navy activities approvals. Marine Protected Areas staff advised that Environment Australia has no visibility of promulgated Naval Training Areas at sea, although it should be noted that these are laid down in Commonwealth Gazettes and Notices to Mariners.

Enhanced Naval Environmental Compliance – Trends in Selected Countries

This section of the report assesses current as well as emerging trends with respect to the status of enhanced naval environmental performance as a key item on the public policy agenda in the following countries of strategic importance to RAN:

- United States.
- United Kingdom.
- Canada.

- New Zealand.
- Japan.
- China.
- Singapore.
- Indonesia.
- Malaysia.
- Philippines.

The assessment was based on evaluation of the following drivers and issues:

- Trends in environmental issues and concerns.
- Relevant legislation and institutional capability.
- The attitude of the country towards sovereign immunity for foreign naval vessel and personnel.
- Current focus within the naval and defence establishment on enhanced naval environmental performance.
- Spill-over from commercial sector developments and trends.
- NGO mobilisation and focus.
- Public and Community Concern.

Each country section concludes with a short Statement of prospects and recommendations.

United States

Trends in Environmental Issues and Concerns

Every aspect of the current suite of environmental problems is of concern in the United States. However, marine issues rate very highly with a large number of charitable foundations and grassroots organisations active in this area. There is also a high level of protective legislation with periodic review efforts by governments[8] and powerful NGOs to ensure that both US and global ocean quality are not eroded much further. In response to these pressures the Armed Forces, including the US Navy, have had no option but to develop a comprehensive program of environmental compliance, key elements of which have been described elsewhere in this report.

The drivers of naval environmental compliance in the US are highly diverse ranging from concern with the health impacts of naval activity on human

beings through to the impacts of naval operations on marine mammals. Within the US Navy itself there is also the ongoing issue of possible exposure of Armed Forces personnel to highly toxic substances during training operations and in actual conflicts. Finally the US Armed Forces have made significant material and human investments in enhanced environmental performance and management. There is thus a sector of the Armed Forces firmly committed to the further integration of environmental considerations into defence operations.

Recently, however, a counter-trend which seeks to lower the profile of defence environmental compliance has emerged. Its key target is to achieve comprehensive and permanent exemptions from the requirements of key US environmental laws.[9] From January until September 2002, widely publicised speeches and testimony by higher ranking officials of the US Armed Forces claimed that environmental compliance was crippling the combat readiness of the Armed Forces and compromising Armed Forces ability to effectively train with and use complex, costly military equipment.[10] Legislative proposals to amend key US statutes were also tabled in March-April 2002 as discussed in more detail below.

In response to these claims, the US Congress asked the US General Accounting Office (GAO) to study and report on whether environmental compliance requirements have significantly reduced or have the potential to significantly lower the operational effectiveness of the US Armed Forces. The GAO reported that, in general, combat readiness was not dramatically crippled by environmental requirements.[11] However, the GAO signalled a need for better greater management of the interface between combat readiness requirements and environmental protection requirements.

The package of legislative proposals placed before the US Senate and House of Representatives by the Pentagon in early 2002 was titled the Readiness and Range Preservation Initiative (RRPI). It was put forward as part of the *Defense Authorization Act 2003* and sought to comprehensively exempt the Defence Forces from complying with the provisions of the following environmental laws central to the US environmental management regime:

- The 1990 *Clean Air Act* Amendments.
- The 1973 *Endangered Species Act*.
- The 1972 *Clean Water Act*.
- The 1918 *Migratory Bird Treaty Act*.

- The *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 1980*.
- The *Resource Conservation and Recovery Act (RCRA) 1976*.

To date some limited exemptions have been granted as part of the Defense Authorisation process for 2003, with national security arguments partially prevailing over environmental arguments because of the September 11 attacks. At the time of writing it was not clear how extensive the exemptions granted to the Armed Forces would eventually be. This is because the matter now requires intensive negotiation between the House of Representatives and the Senate as each House had a different response to the exemption proposals.

Whatever the content of the final *Defense Authorization Act 2003* is, it is unlikely that the exemptions granted will significantly decrease the content of the compliance requirements currently applicable to the defence and naval sector. In any case, the US legislative process is structured such that any exemptions granted will be made subject to review and re-authorisation either on a yearly, three-year or five-year basis. They are unlikely to be permanent. Other factors also cumulatively militate against across the board lowering of compliance standards. They are:

- The currently routine nature of many environmental improvement (technical, managerial) requirements.
- The perception that significant operational, financial and technological advantages may be derived from high and constantly improving levels of environmental compliance – the so-called 'green dividend'.
- The new 'high-tech' war environment increases environmental impacts but also makes more impacts subject to simulation and prediction and thus manageability.
- The high reputational and foreign policy costs of poor naval environmental compliance at a time when the US is committed to building broad and flexible coalitions in different parts of the world as part of its offensive against terrorism.

Finally, the recent lobbying process with respect to the RRPI initiative has demonstrated that internal advocates of an environmentally sound US Armed Forces have powerful support in the legislature, the environmental lobby and at State level where many of the practical costs of poor compliance are borne.[12] Soundings of public opinion in the last seven months also show that the grant of permanent exemptions to the military is unpopular. An opinion poll

conducted in late April 2002 (ie. after September 11) found that 85 percent of registered voters did not want any government agency, including the DoD, to be above the country's laws. The survey interviewed 1,002 registered voters, and has an error margin of +/- 3.2 percent.[13]

Relevant Legislation and Institutional Capability

The US has the most extensive regimes of enhanced naval environmental performance and a robust capacity to implement regime requirements. Key legislation that the US Navy must comply with both at home and abroad includes:

- *Marine Mammal Protection Act 1972*.
- *Endangered Species Act 1973*.
- *National Marine Sanctuaries Act 1972*.
- *Coastal Zone Management Act 1972*.
- *National Environmental Policy Act 1973*.
- *Clean Water Act 1972*.
- *Clean Air Act 1970*.
- *Oil Pollution Act 1990*.
- *Resource Conservation and Recovery Act 1976*.
- *Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 1980* – the main law for clean-up of contaminated land.
- *Act to Prevent Pollution from Ships 1990*.
- The essential habitat provisions of the *Magnuson Stevens Fisheries Act 1976*.
- Executive Order 13158 on Marine Protected Areas.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – the US recognises these rights.

Current Official Focus on Naval Environmental Performance

The US Navy owns 1 percent of all federally owned land and has to comply with all environmental laws on such lands. The US Navy also accounts for around 4 percent of all US coastal shipping traffic and has to comply with US shipping rules unless there are specific exemptions in force with respect to particular zones and vessels. The Navy spent $760 million dollars on

environmental programs in 2001. The level of focus on naval environmental performance is probably the highest in the world with equal attention paid to 'at sea' and land-based aspects of environmental compliance and management. There is a range of naval institutions at national, regional and local level all concerned with different aspects of naval environmental compliance. Key institutions include:

- U.S. Chief of Naval Operations, Office of Environmental, Safety and Health.
- The Navy Training Range/Operating Area Organisation (NTROO).
- Department of the Navy Environmental Programme.
- Chief of Naval Operations Environmental Readiness Division.

Maritime Compliance

The principal operational document is OPNAV Instruction 5090.1 Series, 'Environmental and Natural Resources Program Manual'. Chapter 19 of this manual translates the myriad of international and national environmental laws and regulations into a set of requirements known as Navy requirements for Afloat Environmental Protection. Specific guidance converts the legislative and regulatory requirements into distinct actions that ships must accomplish when managing:

- Solid waste, wastewater (sewage, greywater, and oily).
- Ballast water.
- Ozone Depleting Substances (Chlorofluorocarbons (CFC's) and Halon), and Hazardous Materials (HAZMAT).

The most recent change includes a new requirement for each ship to have a designated Afloat Environmental Protection Coordinator (AEPC). The AEPC provides the command organisational support in executing operational aspects of mission performance.

Land-Based Compliance

Navy training ranges and bases generally follow approaches taken by the land-based forces. Recently however a separate organisation called The Navy Training Range Operating Area Organisation has been formed to address use of land and near-shore areas for exercises and training. The US Navy also has extensive programs of cooperation with NATO and other navies including, for instance, the US/Sweden Agreement for Co-operation on Environmental Protection in Defence Matters.

Spill-Over from Commercial Sector Developments and Trends

As indicated in other sectors of the report, commercial sector developments have a significant flow-on effect especially in terms of R&D and developments in managerial practice. It appears that the US Navy looks to the cruise ship sector in the US and internationally as a source of innovation, due to the fact that this sector, with its very large ships and high personnel complement, most closely approximates the large vessels and general personnel profile of the US Navy. Additionally, due to pressure from environmental NGOs and State governments, the cruise ship sector has had to respond in a dynamic way to the trend towards onerous environmental restrictions on cruise ships in the waters of the United States[14].

NGO Mobilisation and Focus

The focus of US NGOs on enhanced naval environmental performance is the highest in the world. A variety of organisations active on this issue are as follows:

- Financially powerful and politically influential charitable foundations (eg. The Packard Foundation and the Pew Charitable Trusts).
- Groups concerned with the environmental impact of commercial shipping (eg. the Coast Alliance; the Bluewater Network http://www.bluewaternetwork.org/index.shtml).
- Groups concerned with base re-alignment and closure (BRAC) both domestically and overseas.[15]
- Groups opposed to US military bases and the extensive reach of the US Armed Forces.
- Groups concerned with the impacts of the military on the environment generally.
- Broad-spectrum environmental NGOs with permanent marine stewardship programs and projects (eg. Greenpeace and WWF).
- Groups concerned with conservation of natural resources and the impact of military activity on natural resources and endangered species (the Sierra Club, the Nature Conservancy, the National Audubon Society).
- Groups concerned with the environmental impact of aviation (Green Skies network).

- Lawyers groups permanently engaged in using the law courts to pursue environmental claims and changes in environmental law (eg. the Natural Resources Defence Council).
- Groups concerned with the humane treatment of animals especially mammals (eg. The Humane Society of the United States).

Public and Community Concern

The literature surveyed indicates that there is a high and steady level of concern in the US public and community on the issue of naval environmental compliance. Groups worried at the impacts of naval sonar on the well-being of marine mammals are as active as groups concerned with the impacts of unexploded ordnance or contaminated Department of Defence sites.

Conclusions and Recommendations – US

Issues of naval environmental compliance will continue to be high on the public policy agenda in the US. Developments in the US will also continue to shape developments elsewhere. There is likely, however, to be a temporary decrease in environmental restrictions on training due to the current concerns about national security. In contrast, technical innovations and improvements in management are unlikely to be halted by 'roll-back' initiatives like the Pentagon sponsored RRPI. It is recommended that developments in the US be monitored quite closely given the central importance of the US fleet in military affairs. Developments in the US, especially technological solutions for medium-sized vessels, would be of interest to Australia. Interoperability in global expeditionary force contexts would also be enhanced by knowledge of American developments. However, given the significant differences between US Defence force structures, managerial approaches and philosophies, approaches from the US would probably require significant study and adaptation to suit the Australian context.

United Kingdom

Trends in Environmental Concerns and Issues

All aspects of the environmental crisis attract attention in the UK. With respect to marine issues particular areas of concern are:

- The health of the North Sea, the State of global and EU fish stocks.
- Dumping of wastes at sea. Membership of the EU has also placed many more issues on the British policy agenda than would otherwise have been the case. The UK has also been implementing 'Greening Government'

approaches over the last seven to eight years. 'Greening Government' initiatives are generally linked to sustainable development and involve a framework comprised of strategy Statements, codes of practice, regulation, and legislation aimed at government agencies. 'Greening Government' focuses on changes to managerial practice in key areas like procurement, design of new policies, projects and technologies, on-going performance management and post project evaluation.

Relevant Legislation and Institutional Capability

The UK has a well-developed system covering both marine and land-based naval compliance issues. The key statutes are:

- *Environmental Protection Act 1990 (EPA)*.
- *Water Resources Act 1991*.
- *Clean Air Act 1993*.
- *Environment Act 1995*.
- *Town and Country Planning Act 1997 (TCPA)*.
- *Countryside and Rights of Way Act 2000*.

Waste management and marine pollution is addressed through a complex of regulations applicable to the Royal Navy as follows:

- Control of Pollution (Landed Ships Waste) Regulations 1987 and 1989.
- Control of Pollution (Special Waste) Regulations (1980).
- The Environmental Protection (Duty of Care) Regulations 1991.
- The Environmental Protection (Controls on Injurious Substances) Regulations 1992.
- The Environmental Protection (Controlled Waste) Regulations 1992.

The Ministry of Defence (MOD) has full Crown Immunity under the TCPA. However, it is now a matter of public policy for all UK Government departments to implement the principles of the TCPA as if the TCPA applies to their activities. The Crown also has a limited immunity under the EPA 1990 relating principally to noise. More recent legislation explicitly removes Crown Immunity and imposes positive duties on the MOD. A good example is the *Countryside and Rights of Way Act 2000*, which is intended to encourage more enjoyment of the countryside, protect rural environment, wildlife and to ensure that landowners can use their land to

its best advantage. This Act specifically requires public bodies, including the MOD, to further the conservation and enhancement of designated Sites of Special Scientific Interest (SSSI) and imposes procedures and restrictions on the MOD with respect to activities that may affect a SSSI. Finally EU environmental law is another source of law affecting the Royal Navy.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – the UK recognises these rights.

Current Official Focus on Naval Environmental Performance

There is a strong focus on both 'at sea' and land-based elements of naval environmental management in the UK.

Maritime Compliance

The Royal Navy has recently approved a policy paper, *The Royal Navy and the Environmental Challenge – A Strategy for the Future*, which outlines the operational and legal issues which drive the need for an environmental strategy afloat and ashore including Naval aviation. This policy paper States that all personnel and employees are to comply as far as possible with all UK legislation, including international treaties and agreements to which HM Government is a signatory. Crown or Defence exemptions from legislation are only to be invoked where it is essential to maintain operational effectiveness. The technical content of the paper closely mirrors the proposals for an 'environmentally sound warship' set out by NATO in the 1980s and discussed in more detail in Chapter 4.

Land-Based Compliance

The Royal Navy's environmental compliance and management program for its shore-based assets is driven by broader Ministry of Defence (MOD) policy and is managed principally by MOD institutions, particularly the Defence Estates Organisation. The starting point for land-based environmental management is the concept of the British Defence Estate comprising 242,900 hectares in the UK together with significant property overseas. The overall profile of the Defence Estate is detailed at Table 3.

UNITED KINGDOM	OVERSEAS
Operational and support facilities	**Garrisons**
3 naval bases	Germany, Cyprus, Falklands Islands, Gibraltar
213 barracks and camps	
33 major airfields	**Major training facilities**
140 storage and supply depots	Canada, Cyprus, Germany, Kenya, Poland, Norway, Canada
21 major armed forces training areas	
39 minor armed forces training areas	**Minor training facilities**
36 small arms ranges	Ascension Island, Belize, Brunei, Nepal, Singapore, US
7 major test and evaluation ranges	
7 aerial bombing ranges	

Table 3: Defence Estate United Kingdom

With respect to environmental and conservation obligations under legislation, Defence Estates manages a significant range of sites and areas on the Defence Estate as follows:

- 196 Sites of Special Scientific Interest (SSSI).
- 24 Ramsar sites.
- 48 Special Protection Areas (meant for wild birds).
- 64 out of 340 Special Areas of Conservation – these are areas required under the EC Habitats Directive 92/43/EEC.
- 18 Species Action Plans out of 391 under the UK Biodiversity Action Plan.
- 7 out of 45 Habitat Action Plans under the UK Biodiversity Action Plan.

Greening the Armed Forces – MOD Environmental Policy

The broader context, historical development and future trends in environmental policy for the British Armed Forces is shown by the following titles of the policy documents and publications:

- Framework for Sustainable Development on the Government Estate July 2002.
- MOD, Strategic Environmental Appraisal of the Strategic Defence Review – 2001.
- MOD, Secretary of State's Policy Statement on Safety and Environmental Protection 2000.

- MOD, A Stewardship Report on the Defence Estate 2001.
- MOD, In Trust & On Trust – The Strategy for the Defence Estate 2000.
- MOD, Cultural Heritage across the Defence Estate 1999.
- MOD, Walks on Ministry of Defence Lands 1999.

These documents reflect the impact within the defence sector of 'Greening Government' initiatives as already described. Key elements of 'Greening Government' in the Defence context include:

- The concept of defence environmental stewardship in which MOD and its sub-units are viewed as *stewards* of the Defence Estate holding it in *trust* for the British people.
- The more systematic use of environmental impact assessments, environmental audits and strategic environmental assessments.
- Public access to parts of the Defence Estate.
- The establishment of environmental management systems approaches at appropriate levels of MOD and its operational as well as managerial sub-units.

Management of Safety and Environmental Protection in the Ministry of Defence 2000 – A Policy Statement

This document is also crucial to understanding the current direction and emerging trends within British naval environmental compliance. The most relevant elements are:

- Responsibility for all safety and environmental matters is vested in the Secretary of Defence.
- It is now established policy within the UK that MOD will:
  - In the UK, comply with the *Environmental Protection Act 1990*, the Environment Act 1995 and other relevant statutory provisions and any additional requirements arising from international treaties and protocols to which the UK is a signatory.
  - In the UK, comply with the Government's strategy for sustainable development.
  - Apply UK standards overseas where reasonably practicable and in addition comply with relevant host nation standards.

  - Maintain a corporate Environmental Management System based on ISO 14001.
  - Carry out environmental policy appraisals of all new or revised policies and equipment acquisition programmes and environmental impact assessments of all new projects and training activities.

- Other aspects are:
  - Where the Minister has been granted specific exemptions, disapplications or derogations from legislation, international treaties or protocols, Department standards and arrangements are to be introduced which will, so far as is reasonably practicable, be at least as good as those required by the legislation.
  - The Secretary of Defence will only invoke any powers given to him to disapply legislation on the grounds of national security when such action is absolutely essential for the maintenance of operational capability.
  - Where there is no relevant legislation, internal standards will aim to optimise the balance between risks and benefits to the Ministry and employees.
  - In the acquisition of materiel and equipment of all kinds, safety and environmental management is to begin at the requirement definition stage and is to be carried forward through service to disposal.
  - A Chief Environment and Safety Officer (MOD) has been appointed with the following functions under this Policy Statement: 1) Monitor and review the application of arrangements under this Policy Statement within all areas of the Ministry; and 2) Report annually to the Defence Environment and Safety Board on performance and the results of audits of compliance with this Policy Statement.

Defence Stewardship in the UK – Key Management Instruments

Defence environmental stewardship is being implemented through the internal and external mechanisms detailed at Table 4.

Instrument Type	Explanation
Internal MOD Structures (including operational arms – RN, RM, RAF, Army)	
Managerial	• Progressive establishment of an Environmental management systems (EMS) approach throughout MOD structures.
Compliance with statutory obligations	• Complying with statutes where Mod is not exempt. • Where exempt – complying at the levels of best practice applied by comparable enterprises and sectors which are not exempt.
Support for R&D	• Trial programmes for pollution control equipment on RN vessels. • Programmes with industry to develop alternative solutions for RN ships.
	External Stakeholders
Relations with central government agencies	• Memorandum of Understanding between MOD and UK. Department of Environment, Food and Rural Affairs (DEFRA). • MOU with English Nature (statutory body with cultural heritage and countryside conservation functions). • Integrated Land Management Plans (ILMPS).
Relations with local government agencies and environmental	• Safeguard MOUs & Protocols. • Joint monitoring MOUs & Protocols. • ILMPs.
Relations with NGOs	• Funding • Joint monitoring programmes of parts of the Defence Estate • ILMPs • Regular communication and consultation with supportive NGOs • Regular magazine –Sanctuary[16]
Relations with the public and affected communities	• Permitting public access to the Defence Estate as appropriate[17] • ILMPs • Communication and consultation as appropriate

Table 4: Ministry of Defence stewardship mechanisms

MOUs and Protocols

Current MOUs recognise the priority of Defence interests including training interests. The most interesting MOU or Protocol used by the MOD covers the so-called 'safeguarding' procedure and is typically entered into between the MOD and a local authority. It provides for joint ad-hoc reviews by the two bodies of planning applications affecting the Defence Estate or military operations. It would appear that the MOD is an equal partner with the relevant agency or statutory authority under this procedure. A good example of when 'safeguarding' is likely to be used is where applications are made to a statutory planning authority to undertake a project or development which might affect flight safety, such as the building of a new open water or land-fill site close to an RAF or RN airfield. Safeguarding comes into play since approval of the application might lead to an increase in the number of birds, with possible impacts on flight safety.

Integrated Land Management Plans (ILMPs)

Integrated Land Management Plans (ILMPs) are prepared with comprehensive input from local authorities and NGO interests and are intended to maximise the training potential of sites and areas, whilst paying attention to all aspects of the sustainability of relevant land and environment. ILMPs show all areas subject to protective designation and give guidance on how to manage any potential conflict between training needs and features of the site. ILMPs also involve monitoring programs against baseline criteria. The target of the MOD is to have 14 ILMPs in place by end 2002. Eight out of 14 ILMPs were complete by July 2002.

Spill-Over from Commercial Sector Developments and Trends

Yes. There is likely to be a significant level of spill over. Effective innovations in the commercial sector are likely to be known quite quickly in the military sector, given the status of the UK as a world centre for commercial maritime activity.

NGO Mobilisation and Focus

Mobilisation on environmental issues and marine issues is not as high as in the US. For instance, sharp decreases in the level of UK forces permanently stationed overseas has led to significant numbers returning to the UK, with a consequent expansion of military bases and barracks. There has been minimal mobilisation by British environmental NGOs in response to these developments.

The comparative process in the US (BRACS – Base Re-alignment and Closure) has generated significant and on-going NGO pressure and has thrown up a large number of environmental and public interest issues[18].

Public and Community Concern

The level of public concern is moderate to high on the State of the North Sea environment and the threat to fish stocks in UK waters and EU waters.

Conclusions and Recommendations– United Kingdom

Enhanced naval environmental performance is likely to be a permanent item on the UK policy agenda. The 'at-sea' aspects of naval environmental performance are likely to be closely related to NATO initiatives in this area. Compared with the US, UK developments are driven more by governmental initiatives than by public pressure. For the foreseeable future, public pressure in the UK is likely to be less given:

- The limited number of naval bases (three).
- Their centuries-old existence and recognised historical and cultural status (eg. Portsmouth).
- Their strong integration into local/regional economies. Agreements at local level between the MOD and concerned interests also appear to be much easier to achieve, with few NGOs seriously active in this arena. Poor naval environmental compliance is also likely to be accommodated and dealt with locally.

It is recommended that developments in the area of enhanced naval environmental performance in the UK should be watched very closely, because developments in the UK have a high adaptability to Australia given the similarity of force structures, doctrines and philosophies. The degree of interoperability between UK and Australian forces is already high and would be further enhanced by a sound understanding of trends and emerging issues in this area. Aspects of the Defence Estate approach to managing land-based assets also seem applicable to Australia and would merit further investigation.

Canada

Trends in Environmental Concerns and Issues

Concern in Canada covers the entire spectrum of environmental issues, with the marine environment and the protection of fragile environments (ie. the Arctic) key issues of public concern. Fisheries conservation and the State of

fish stocks is another area of concern due to recent catastrophic fish stock collapses in the Canadian Atlantic. Canada, like the UK, has also attempted to implement 'Greening Government' initiatives, with flow-on effects for the Armed Forces.

Relevant Legislation and Institutional Capability

Key statutes applicable to the Canadian Navy are:

- *Canadian Environmental Protection Act 1999*.
- *Canada Wildlife Act 1985*.
- *Coastal Fisheries Protection Act 1985*.
- *Fisheries Act 1985*.
- *Canada Shipping Act 1985*.
- *Navigable Waters Protection Act 1985*.
- *Marine Transportation Security Act 1994*.
- *Arctic Waters Pollution Prevention Act 1970*.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – Canada recognises these rights.

Current Official Focus on Naval Environmental Performance

Under recent amendments to the *Auditor General Act 1985*, each Canadian federal government department and its sub-units is now required to prepare a Sustainable Development Strategy (SDS) that outlines how the department will contribute to sustainable development. Each department is required to update its respective SDS every three years, with the goals, objectives and targets of each SDS required under law to be audited by the Office of the Auditor General. A recent review of the SDS program of the Department of National Defence (DND) rated it as excellent.[19]

For the Canadian Armed Forces, the relevant SDS States that the DND will implement an ISO 14001 compatible Environmental Management Strategy (EMS) for all units of the DND. The Canadian Navy, as a sub-unit of the DND, falls under these requirements. The latest guidance document for the Canadian Armed Forces, *Canadian Defence Planning Guidance 2001* requires the Assistant Deputy Minister (Infrastructure and Environment) to develop and implement a national level EMS in order to fulfil the Department's obligations with respect

to environmental due diligence. The guidance document specifically requires DND to link its EMS with its business planning process in order to ensure that the resources necessary to address any environmental issues discovered by the EMS are available.

DND has set goals, objectives, and targets for environmental conservation in the following areas: ecosystems; pollution prevention; hazardous materials; climate change; and cultural resources. To achieve these goals, objectives, and targets, DND has established guiding principles that focus on environmental stewardship, training personnel on pollution prevention and conservation, and partnerships within Canada and with other militaries. The DND also has an Alternative Service Delivery (ASD) mechanism to ensure that environmental considerations are adequately addressed in contracts. It provides that where activities with significant levels of environmental risk are included in a Statement of Work (SOW), the SOW must require that potential service providers submit an environmental management plan as part of their proposal. For ASD projects considered to have a high level of environmental risk, the ASD team should also require the service provider to develop and implement an EMS consistent with the requirements of ISO 14001.

Canada is also active within NATO work programs on maritime environmental protection.

Spill-Over from Commercial Sector Developments and Trends

Yes – there is likely to be some spillover. However the Canadian ship-building sector is very small and dependent on the larger US sector.

NGO Mobilisation and Focus

The level of mobilisation and focus of NGOs on marine issues is high but there is no specific focus on naval environmental compliance.

Public and Community Concern

High levels of concern exist as argued above.

Conclusions and Recommendations- Canada

Enhanced naval environmental performance is a permanent item on the policy agenda. It has moved to implementation stage with many preliminary issues resolved. Canadian practice is likely to follow the US closely as far as technical solutions are concerned. Development and improvement of the managerial dimension may differ given the historical orientation of the Canadian military

as a British origin force and its greater openness to NATO and French military approaches. In overall terms, the Canadian approach to management of the human resource element is more likely to be independent and innovative given that Canada is a world-leader in the development and application of new environmental management approaches to the resources sector. Canadian developments are of relevance to Australia given the position of both countries as medium power countries with similar naval profiles. Periodic scanning of Canadian developments in the area of EMS systems would be of particular benefit.

New Zealand

Trends in Environmental Issues and Concerns

Most environmental problems are of concern in New Zealand. Official and public concern about the health of the New Zealand and South Pacific marine environments is very high. Marine sector environmental health is taken seriously in New Zealand.

Relevant Legislation and Institutional Capability

New Zealand has a highly developed regulatory system for management of the oceans and has recently developed an Oceans Policy approach to integrate management of the marine sector. Key statutes include:

- *Conservation Act 1987*.
- *Continental Shelf Act 1964*.
- *Fisheries Act 1996*.
- *Hazardous Substances and New Organisms Act 1996*.
- *Health Act 1956*.
- *Biosecurity Act 1993*.
- *Marine Mammals Protection Act 1978*.
- *Maritime Transport Act 1994*.
- *Resource Management Act 1991* with specific regulations for marine pollution.
- *Territorial Sea, Contiguous Zone and Exclusive Economic Zone Act 1977*.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – New Zealand recognises these rights.

Current Official Focus on Naval Environmental Performance

New Zealand has a small naval establishment that does not impose much stress on the marine environment. Despite the high level of public concern, there is no systematic or official policy on naval compliance. The various defence establishments have ad-hoc programs of environmental management which are currently being formalised into more far-reaching compliance programs. The Royal New Zealand Navy (RNZN) has to undergo the same resource consent approval processes as other users of the marine zone

Spill-Over from Commercial Sector Developments and Trends

New Zealand has a very limited domestic commercial maritime sector that does not drive any significant environmental developments.

NGO Mobilisation and Focus

New Zealand has a very well organised and highly politically influential environmental sector organised through an umbrella organisation called ECO. The main focus of New Zealand NGOs is conservation of natural resources, including marine resources and endangered species, especially marine mammals. No targeted campaigns on naval environmental compliance have ever been run by New Zealand NGOs, although they would probably be highly effective in restricting naval room for manoeuvre given the well-established antipathy to nuclear-powered warships.

Public and Community Concern

Public and community concern over naval pollution by nuclear vessels is extremely high and has led all governments to support the earlier declaration of New Zealand as a nuclear-free State prohibiting port visits by vessels carrying nuclear weapons. Naval environmental compliance issues of a non-nuclear character would attract the same sort of public concern. Defence exercises in New Zealand waters would also not be permitted by public opinion.

Conclusions and Recommendations – New Zealand

Naval environmental compliance issues in New Zealand are very tightly bound up with nuclear warship issues. As such, there is likely to be strong negative reactions to incidents or issues in New Zealand waters. There is, however, likely to be very little public concern with events elsewhere. Trends in legislative development are parallel with Australia and in some cases may run ahead given the smaller and more integrated character of New Zealand law and legal systems. New Zealand developments require a much lower level of monitoring

and attention given the very small size of the RNZN. However, the much more tightly integrated legislative regime may well offer insights to resolution of similar issues in the Australian context. The existence of a range of consultative arrangements between the two countries means however that information can be easily assembled when required.

Japan

Trends in Environmental Issues and Concerns

Marine sector environmental health is an important issue in Japan due to the high level of degradation and overuse of the marine environment. The trend is for companies, governments and the public to highlight technical solutions rather than structural changes to the economy and society to address environmental problems. There is no discernible trend to isolate and identify naval environmental performance as an issue requiring attention. However, to the extent that naval environmental compliance is an issue on the public agenda, it is tied closely to the question of US bases in Japan and their future uses should the US withdraw from these bases. Environmental compliance is thus a core theme in the campaigns against US bases in Okinawa[20] and is a theme of the Japanese peace movement. It is not, however, a clearly articulated and differentiated environmental issue.

Relevant Legislation and Institutional Capability

Japan has a well-developed environmental framework including laws such as the *Basic Environmental Law* of 1993 and the *Environmental Impact Assessment Law* of 1997. An interesting law that is currently used to support R&D is the *Japan Environment Corporation Law*. Extensive subsidies are available under this law to encourage environmental protection developments. It can easily be applied to fund research and development on maritime environmental compliance issues. Although this study was unable to confirm it, there may well be a program of administrative guidance from relevant Ministries requiring attention to environmental matters by the Japanese Navy. This is likely because of the extensive and historically well-established use of administrative guidelines and instructions to achieve desired objectives.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – Japan recognises these rights.

Current Official Focus on Naval Environmental Performance

The study has not been able to gather any reliable evidence on trends with respect to this issue. A highly reliable source of information on this issue is reporting on naval procurement available through the publications of *Jane's Defence Review*.[21] A scan over the last five years showed no procurement or other activity related to environmental compliance, although it is to be expected that the latest innovations in Japanese ship-building would likely be incorporated into Japanese naval vessels.

Spill-Over from Commercial Sector Developments and Trends

Maritime environmental compliance is not a major area of focus for the Japanese commercial shipping sector. However, Japan generally follows well-established trends, especially where these are taken up by other commercial sectors in Europe and the United States. The Japanese commercial sector would be able to rapidly transfer its environmental technology to the military sector. It does not appear that much extensive research on environmental aspects and issues is being undertaken by the Japanese commercial sector. Two research projects of note which are currently being conducted by the Japanese Maritime Research Institute in collaboration with various government agencies and Ministries and which are likely to have spill-over effects are: (1) Behaviours of Antifouling Compounds for Ship Hull Paint in Sea Water (Special Project for Pollution Prevention: Fiscal Year 2001-2003); and (2) LCA (Life Cycle Assessment) Study on Ships (Special Project for Pollution Prevention: Fiscal year 2001-2003).

NGO Mobilisation and Focus

There are very few NGOs active on environmental issues in Japan. The poor state of the coastal and marine areas (highly polluted, endemic algal bloom, etc) makes the State of health of the marine and costal environment an area of concern for the few NGOs that are active. Over the last decade WWF and Greenpeace have attempted to activate NGO concern around marine issues but have failed to have any impact.

Public and Community Concern

As Stated above environmental issues are important to the public but are not as pressing as in other highly industrialised countries.

Conclusions and Recommendations– Japan

Naval environmental compliance is unlikely to be an item on the pubic policy agenda for quite a few years to come. Given the highly sophisticated Japanese

industrial policy system, any issues identified can be addressed at the technical level extremely rapidly. It is recommended that periodic reviews be undertaken of environment related developments in the Japanese commercial maritime sector as a proxy for evaluation of developments in the military sector.

China

Trends in Environmental Issues and Concerns

Concern at the poor state of China's environment has been rising in recent years. The health of the marine environment (especially problems caused by land-based pollution) has emerged as a major area of concern, as rapid industrialisation and population growth have emerged in major cities like Shanghai and in the export-oriented Special Economic Areas, all of which are in the coastal zone. The high levels of international shipping entering Chinese waters have also heightened fears that oil pollution disasters may occur. However, economic growth issues still take precedence over environmental considerations.

Relevant Legislation and Institutional Capability

There is a highly developed set of environmental protection laws and regulations covering all marine environmental issues in China including a sector specific law, the *Marine Environment Protection Law* of 1982. There is, however, very little effective implementation of the laws, and the Defence establishment in China is also very much 'above the law'. It should be noted, however, that the institutional capability to make the environmental performance of foreign navies an issue exists at all levels. China has the scientific and technical capabilities to provide evidence of poor naval environmental compliance in Chinese waters and in areas outside Chinese waters, should the authorities decide to make naval environmental compliance an issue (satellite imaging, GPS, monitoring at sea, etc). Political considerations rather than routine institutional developments will drive naval environmental compliance being demanded from foreign navies by the Chinese authorities. Chinese law of the sea legislation also requires foreign ships and navies to inform the Chinese authorities of their intention to enter the Territorial Sea to exercise rights of innocent passage. Non-compliance with Chinese territorial sea laws can easily be made a reason for requiring that vessels exit the Chinese Territorial Sea and possibly even the EEZ.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – China recognises these rights.

Current Official Focus on Naval Environmental Performance

This is not an area of priority in naval policy. The advanced age of many Chinese warships also makes implementation of policy in this area difficult. There is also no evidence that environmental considerations are taken into account in the design and operation of the newer classes of warships.[22]

Spill-Over from Commercial Sector Developments and Trends

Maritime environmental compliance is not a major area of focus for the Chinese commercial shipping sector. However, China generally follows well-established trends, especially where these are taken up by other commercial sectors in Europe, Japan and the United States. The time lag is generally in the order of 10-15 years, but this lag will decrease considerably after China's entry into the World Trade Organisation, with its imperative that dominant Western standards be met more rapidly. A large part of the Chinese commercial fleet is State-owned, which also influences developments in this sector considerably.

NGO Mobilisation and Focus

There are very few active environmental NGOs in China. The poor state of the coastal and marine areas is a matter of some domestic concern. Over the last decade, WWF and Greenpeace have tried to activate NGO concern around marine issues but have failed to have any impact. The increased official concern with the environment as a prelude to the Beijing Olympics may change the context for environmental NGO activity to some degree.

Public and Community Concern

Community concern is low compared to the scale of problems, as economic growth considerations predominate over ecological concerns.

Conclusions and Recommendations – China

Naval environmental compliance is unlikely to be an item on the pubic policy agenda for quite a few years to come. It is recommended that attention be paid to the legislative regime that China proclaims for its sea areas.

Singapore

Trends and Issues in Environmental Concerns

Marine sector environmental issues are of high concern in Singapore given the economic importance of Singapore as a port and the congested and environmentally fragile character of the Straits of Malacca. Concern is more in official circles than amongst the public at large, given the general passivity of

political culture in Singapore. However, dramatic pollution incidents that have a wide-ranging impact can easily galvanise public opinion and very rapidly raise naval or maritime environmental compliance issues. The recent incidents of trans-boundary air pollution originating from Indonesia provide an example of rapid public sensitisation to a pollution issue.

Environmental Trends and Issues in Singapore

Singapore is uniquely vulnerable to environmental disasters due to its small size, large and highly concentrated population and highly vulnerable water supply. Environmental policy has been more or less integrated into key Government policies, including harbour and port management policies, since the late 1960s. Environmental policy, especially management of urban environmental problems, is taken extremely seriously by the government. A key part of Singapore's success is due to land use plans that were formulated and carefully implemented to: establish a financial urban centre; protect Singapore's water catchment (which provides some 30 to 40 percent of drinking water); and create an industrial area outside the water catchment, zoned and managed for industrial development. These land use plans have been backed by a strong regulatory and enforcement structure developed around sophisticated monitoring and highly efficient government agencies.

The areas of current concern in Singapore official policy which intersect with naval environmental compliance are:

- Elimination of odours from sewage treatment plants (odours require a larger buffer zone and land is at a premium in Singapore).
- Marine pollution, especially dumping of sewage.
- Air pollution, including from ships – Singapore has one of the world's busiest ports. In these areas technological requirements and innovation are highly valued and are likely to be pursued by government, either directly or through imposing requirements on users of Singapore's ports and shore-based facilities.

Over the next five years, the authorities intend taking environmental management to an even higher level and will be spending approximately S$3 billion upgrading the city's environmental infrastructure. New investment will be focused on rehabilitating old sewers and constructing sewers for new housing, waterfront developments, and towns. Singapore is expanding its sewage treatment works and the treatment capacity of three existing facilities. The government has vigorous waste-recycling scheme for residences and commercial sectors and waste

minimisation efforts with industry. Singapore is also investing in relevant facilities for waste management and disposal under MARPOL, and other statutes and will be requiring all vessels using the port to use these facilities.

Relevant Legislation and Institutional Capability

Singapore has a comprehensive array of laws covering air, water, hazardous waste and marine resource management issues as follows:

- *Merchant Shipping Act 1995*.
- *Merchant Shipping (Civil Liability and Compensation for Oil Pollution) Act 1998*.
- *Maritime and Port Authority of Singapore Act 1997*.
- *Prevention of Pollution of the Sea Act 1999*.
- *Environmental Pollution Control Act 1999*.

It also has a strong planning system. Singapore's Ministry of Environment is quite influential within the Ministerial structure and works hand-in-hand with the powerful Ministry of Trade and Industry and its Economic Development Board. The institutional capability to require, implement and monitor extremely high environmental standards exists and is well developed. Its use is strategic and depends on issues regarded as significant by the authorities. However, the relative even-handedness of Singaporean administrative policy means that naval exceptions from general maritime compliance in the ports and harbours of Singapore will be harder to procure in the years ahead, especially if technical solutions are known to be available and are used by civilian vessels using Singapore's ports.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – Singapore recognises these rights.

Current Official Focus on Naval Environmental Performance

The study found no evidence that naval environmental compliance is of significant concern to the Singaporean Navy or to the Singapore government generally. However, very high standards of environmental compliance are maintained in the port areas of Singapore used by the Singaporean Navy, and there appear to be no exceptions from the application of general environmental laws to the Navy. Additionally, the strong financial health of the government means that naval procurement can upgrade the Singaporean Navy very rapidly,

as opposed to using extensive retrofitting to achieve the same objective. The existence of a local shipbuilding industry also facilitates the quick uptake of higher naval environmental compliance requirements, should this be viewed as strategically important.

Spill-Over from Commercial Sector Developments and Trends

There is a well-developed local shipbuilding, repair, recycling and retrofitting capability. The latest trends in environmentally sound construction will be known and can be easily adopted in response to commercial pressures or at the direction of government.

NGO Mobilisation and Focus

There is virtually no local NGO movement, so pressure for naval environmental compliance is likely to come from the government rather than the public.

Public and Community Concern

There is a generalised public concern with air and water pollution and the public has internalised the government driven concept of Singapore as a 'Green City'. The public supports active government efforts to differentiate Singapore from Hong Kong, which is viewed as a successful but 'dirty' city. Recent air pollution from Indonesia has further fuelled public concern. The mass media regularly reports pollution incidents and problems. There is, however, no political movement articulating public concerns.

Conclusions and Recommendations – Singapore

Users of Singapore's ports and waters for commercial and naval activity should expect to see tighter environmental restrictions. The more intensive application of traffic separation schemes in the Straits and in buffer zones outside the Straits is to be expected. More stringent requirements for all MARPOL regulated substances are also to be expected. Experiments in Scandinavia (Norway, Sweden) in which cleaner or 'green' ships pay lesser fees for use of ports and harbours are likely to be looked on favourably in Singapore, provided the economic consequences are neutral or positive. Singapore already uses economic instruments in other areas of transportation and is trialing their more extensive use in the area of sewage and waste management. Singapore is unlikely to use broad proclamations of legislative authority. Detailed regulations or broad economic incentive schemes are more likely and would pose a much sharper constraint on the high seas freedoms and immunities currently enjoyed by friendly navies. It is recommended that periodic review be undertaken of the legislative and management regime that Singapore uses for its ports and sea areas.

Indonesia

Trends and Issues in Environmental Concerns

With respect to the marine environment, a number of contradictory trends are discernible, as detailed at Table 5.

Finally, it should be noted that nationalistic considerations can easily lead to a heightened emphasis on the requirement that foreign navies fully respect the high environmental protection standards currently set out in national laws. This would lead, in the worst case, to foreign navies being placed in a situation where they are viewed as guilty of 'environmental imperialism' and wilful damage to Indonesian natural and ecological resources whilst passing through Indonesian waters including Archipelagic Waters and Straits.

Factors supporting heightened standards and requirements	Trends militating against high marine environmental protection standards
• A significant level of official and public concern at the degradation of the marine environment, especially the near-shore regions next to large cities. • A high level of foreign aid effort (UNDP, USAID, World Bank, Asian Development Bank etc) directed at supporting improved environmental management performance in Indonesia with US NGOs playing a watchdog and advocacy role with respect to iconic or ecologically significant aspects of the maritime environment. (eg. mangroves, coral reefs etc.)	• An economic growth bias still predominates. • Economic resources are limited due to the economic crisis. • The will to implement environmental laws and policies is hindered by pervasive corruption and lack of technical and enforcement capacity. • The bureaucracy is in a State of inertia due to the political impasse between reformist forces and forces and groups aligned to the Soeharto era.

Table 5: Trends in the Indonesian Marine Environment

Relevant Legislation and Institutional Capability

There has recently been a significant modernisation of Indonesia's legislation with passage of the following environmental laws, which, however, currently have limited practical effect due to absence of institutional capacity:

- *Environmental Management Act 1997*.
- Presidential Decree No 61 of 1993.
- Act No. 5 of 1983.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – Indonesia recognises these rights.

Current Official Focus on Naval Environmental Performance

There is currently no discernible focus on naval environmental compliance issues. However, nationalistic considerations can easily lead to demands that foreign navies respect the high standards Stated in national laws.

Spill-Over from Commercial Sector Developments and Trends

Commercial shipbuilding is not well developed in Indonesia.

NGO Mobilisation and Focus

Indonesian NGOs are currently more focused on social, political and civil rights in a broad sense than on environmental rights.

Public and Community Concern

Public concern is highly diffuse.

Conclusions and Recommendations – Indonesia

The principal concern would be that a nationalistic dimension could drive the passage of environmentally demanding legislation affecting foreign naval use of Indonesian waters. It is recommended that close attention continue to be paid to the legislative regime that Indonesia proclaims for its sea areas.

Malaysia

Trends and Issues in Environmental Concerns

There is widespread understanding of the consequences of poor environmental management. However, the government rather than the public is the main driver of environmental regulation, seeking to balance this with its economic growth objectives. With respect to the marine sector, there is an extremely high level of official as well as domestic concern at the high rates of collisions, groundings and oil pollution incidents in the Straits of Malacca.

Relevant Legislation and Institutional Capability

Relevant statutes are:

- *Environmental Quality Act 1974*.
- Merchant Shipping Ordinance 1952.

- *Merchant Shipping Oil Pollution Act 1994*.
- *Exclusive Economic Zone Act 1984*.
- *Fisheries Act 1985*.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – Malaysia recognises these rights.

Current Official Focus on Naval Environmental Performance

There appears to be no specific focus on performance requirements for foreign navies or the Malaysian Navy. However given Malaysia's highly independent foreign policy, official attention to this issue must be presumed to exist, especially with respect to passage through the Straits of Malacca and other parts of Malaysia's waters.

Spill-Over from Commercial Sector Developments and Trends

There is a developing commercial ship-building sector and a well developed port and shipping sector which aims to rival Singapore in the coming decade as one of the premier ports in the world. Commercial developments in environmental technology would be easily adopted should this be required, with flow-on effects on the profile of naval environmental compliance. No such trend is currently discernible.

NGO Mobilisation and Focus

Malaysian NGOs are focused more on consumer rights issues and third world developmental issues than environmental issues.

Public and Community Concern

Diffuse and high levels of concern.

Conclusions and Recommendations – Malaysia

Given the Malaysian government's independent foreign policy stance, attention should be paid to legislative pronouncements on innocent passage in Malaysian waters, freedom of navigation in the EEZ and directives for use of the Malacca Straits.

Philippines

Trends and Issues in Environmental Concerns

There is widespread public concern at the State of the environment, including the marine environment, especially the State of fish stocks and near-shore resources such as mangroves and coral reefs. The large population (circa 80 million) is understood to be a major source of stress on the environment with widespread and diffuse concern around this issue. However, economic considerations far outweigh environmental considerations.

Relevant Legislation and Institutional Capability

There is an elaborate network of laws currently totalling over 20 that impact on environmental issues. However, enforcement is ad-hoc and crisis driven rather than on a programmed basis, and all institutions lack the requisite capacity to implement relevant legislation.

Recognition of Sovereign Immunity for Foreign Naval Vessels

Yes – the Philippines recognises these rights.

Current Official Focus on Naval Environmental Performance

There is currently no focus on this issue both in terms of requirements for the Philippines Navy or for foreign navies in Filipino waters. Strict standards exist in law but there is no indication that they are enforced.

Spill-Over from Commercial Sector Developments and Trends

There is no commercial shipbuilding sector in the Philippines.

NGO Mobilisation and Focus

Two groups within the NGO sector impact on naval environmental compliance: the anti-US military base movement and the environmental movement generally. With respect to military bases, it should be noted that there has historically been a high level of focus amongst left-wing political parties and social action groups on US military bases in the Philippines. With the closure of these bases, these groups have now shifted attention to the former bases and whether the US should have responsibility for the full costs of their remediation. More generally, the country has strong NGOs focused on environmental issues but, until recently, much of the emphasis has been on natural resource conservation such as forest management. Marine issues are only now gaining in profile. This may lead to more pressure to enforce the environmental laws.

Public and Community Concern

Generally, this is high but diffuse.

Conclusions and Recommendations- Philippines

Naval environmental compliance issues are not high on the Filipino political agenda. However, the fragile nature of the coastal zone and nationalistic considerations to do with archipelagic State claims may lead to high compliance requirements being imposed on foreign navies following accidents and other incidents. The strong relationship with the US will provide a basis for necessary exemptions provided the public mood supports this.

Implications for the RAN

This section summarises issues for the RAN arising from the discussion in this chapter. Only those issues of concern to the RAN are raised. Those issues or Conventions that most probably will not be applicable to the RAN are not included.

Diplomatic Clearance

When planning overseas visits, ship compliance with International Instruments may be important in gaining diplomatic clearance to visit ports in other coastal States. Requesting clearance for non-complying ships may result in a potentially embarrassing refusal.

Risk Analysis

The value placed on the environment by the Australian community is continuing to increase. Activities where there is a likelihood of damage to the environment should be carefully assessed to avoid or ameliorate the concerns.

Environmental Considerations

The major risk for the RAN concerning the environment is that Navy managers will fail to recognise its importance and therefore, by lack of action to ensure that environmental considerations are included in ongoing planning, either not comply with the EBPCA or attract adverse public comment.

Pollution Control Requirements

Recent and upcoming changes to the International Conventions will result in a requirement for an ongoing assessment of ship's systems and equipment to continue to maintain compliance with the international standards. This will

require an ongoing study of each type of equipment in use and perhaps individual assessments of each unit. For new ships, the design specification should define standards that exceed the prospective new standards.

Anti-fouling Paints

The Convention on Anti-fouling Paints is expected to come into force in the short term. Also, a likely extension to do with hull-fouling is under consideration. New Standards that will limit translocation are likely to be introduced. It is expected that documentation for a Code of Conduct will be developed. This will particularly important for decommissioning of ships.

Ballast Water

Cross-contamination between ports is a problem. Implementation of the guidelines for ballast water management for intrastate travel currently under development by AQIS and others, including DNPS, should be undertaken as soon as possible.

Air Emissions

The entry into force of MARPOL Annex VI may have implications for recently acquired diesel engines with power output greater than 130kW. Although entry into force may not occur for some time, it is likely that it will be effective retrospectively to 01 January 2000. Air emission standards will apply to nitrogen oxides (to do with engine efficiency) and sulphur oxides (to do with fuel purity). Engines commissioned since 01 January 2000 will need to be assessed for compliance.

Oil Spill Compensation

It is most probable that any regulations arising from this Convention will have little effect on RAN operations. However, in the unlikely event of an oil spill from a RAN ship resulting in a claim for compensation, the RAN should consider the development of a policy position on rules for the payment of compensation.

Marine Protected Areas (MPAs)

New discharge standards for the GBRMP are likely to be more stringent than those currently operating. Their introduction may require changes to RAN operations procedures within the GBRMP. AMSA are liaising with GBRMPA and will advise when the new standards are finalised.

Operational Guidelines for MPAs

Environment Australia has a strong interest in negotiating such guidelines with Navy. Also, MPA staffs are willing to negotiate the definition of a template for Navy activities' approvals and to decide which naval activities can be exempted automatically.

Whales

The main impact on naval operations will be a decrease in the likelihood of gaining exemptions for controlled actions in critical habitats. This will result in the need for greater coordination between exercise planners and Environment Australia. The opportunity exists for Navy to liaise with Environment Australia (Marine Species Branch) to seek strategic exemptions for controlled actions under the EPBCA. The IMO has introduced a resolution on Mandatory Ship Reporting Systems (Resolution MSC.85(70)) for the reporting of whale pods on the West Coast of the USA. It is likely that this resolution will be expanded to cover other ocean areas, possibly including Australian waters. Should this occur, RAN procedures would need to be altered.

Naval Training Areas

It should also be noted that Marine Protected Areas staff advised that Environment Australia has no visibility of promulgated Naval Training Areas at sea. To prevent future confusion, the RAN should ensure the relevant Commonwealth gazettes and NOTAMS are updated to reflect the current state and re-promulgated as necessary.

Speculation on Trends Out to 2020

This section deals with those areas which are not likely to have an effect during the next five years or so, but which will need to be considered for long-term planning. The discussion will include speculation on changes that may occur in existing international instruments and likely new instruments, which may be introduced. Comments on domestic regulations and other issues that may affect naval operations will also be made. Comments on issues that may affect ship design will be made in the chapter on the environmentally compliant warship.

Changes to Existing International Instruments

During recent years, there has been much activity in upgrading the MARPOL Annexes. It is expect that the rate of change will decrease over the next few years as industry catches up to the changes. This hiatus will likely be followed by a period with an accelerated rate of change once again. Speculation on possible future changes to the MARPOL Annexes and Provisions is very subjective. However, the authors believe that the following changes are highly likely.

Over the next twenty years or so, amendments to *Annex I – Prevention of Pollution by Oil* will likely lead to a decrease in the concentration of oily water which can be discharged from a ship underway. It is likely that this will allow concentration decrease from 15ppm to 5ppm. In the longer term (about fifty years), regulations will likely prohibit the mixing of water and fuel. Ship design that prevents this will become mandatory.

Over the next twenty years or so, amendments to *Annex II – Control of Pollution by Noxious Liquid Substances* will likely result in dumping or discharge of these substances being prohibited. In the shorter term, the list of substances banned from discharge will be extended beyond the present 250 and the discharge proximity distance of 12 miles from the nearest land will be extended. Also, the restrictions on concentrations and conditions for discharge of their residues to reception facilities will be made more stringent.

Annex III: Prevention of Pollution by Harmful Substances in Packaged Form is likely to be amended such that no dumping of anything, including non-corrosive materials like glass, will be allowed. Recently, concerns on the corrosion or decay of containers of these materials in the sea have been raised. This has been part of the more general concerns on leakages of fuels and other substances from sunken ships. It is likely that, as well as the limitation on dumping, conventions on defining responsibility for clean up and compensation will be negotiated.

An amendment to *Annex IV – Prevention of Pollution by Sewage From Ships* will enter into force in September 2003. Details are discussed above under Possible future amendments for Sewage Treatment.

Amendments to *Annex V – Prevention of Pollution by Garbage from Ships* to prohibit the dumping of non-degradable material (eg. Glass) are expected in the longer term.

It is expected that in the longer term, *Annex VI – Prevention of Air Pollution from Ships*, will be amended to further reduce emissions from all sources. This will include emissions of particulates, CO, NO, and SO. Ratification of MARPOL Annex 6 will lead to further Greenhouse provisions being implemented. It could also lead to a requirement to use a more refined grade of fuel in diesel generators. Alternatively, different sources of electricity may be used or the whole ship propulsion train may be made electric.

Grey Water is generally not regulated on the high seas, but different States have local port regulations. It is highly likely that grey water will be included in an update of *Annex IV (Prevention of Pollution by Sewage from Ships)*. It is

expected that during the next few years discharge of untreated grey water will be prohibited close to land. In the longer term, it is expected that restrictions on the proximity to land and in the quality of the water that can be discharged will be increased. The RAN is considering new regulations which will require ships to either treat the grey water or hold untreated grey water for discharge to a shore connection or at sea when the vessel is more than 1nm from the coast or a reef. However, this treatment has been shown to place a heavy burden on the sewage treatment equipment. To circumvent this, a policy on minimisation of grey water is needed.

New International Conventions

A range of new international conventions are being considered which may have some bearing on future RAN equipment and operations are detailed below.

Wreck Removal Convention

The Legal Committee is developing a draft wreck removal convention. This convention would move to put the obligation of the removal of wrecks back to the owner of the vessel. It is also likely that the owner would be responsible to clean up and make good any damage caused by the wreck. It is anticipated that a draft will be ready for consideration by a Diplomatic Conference in the 2004-2005 biennium. It is most probable that this Convention will not be applicable to the RAN, but there may be a need to be aware of its provisions.

Safe Havens for Ships Convention

This convention deals with a set of guidelines or procedures for coastal States, flag States and owners for dealing with ships in distress. A very good example is the recent sinking of the *Prestige*. Anecdotal evidence indicates that no authority was willing to take the responsibility for assessing the ship to establish whether it could be saved. It was merely towed to sea and allowed to founder. Were procedures for the assessment of the vessel for towing to a safe haven available the ship and cargo may have been saved. Draft guidelines for ships and Coastal States are under consideration. It is most probable that this Convention will not be applicable to the RAN, but there may be a need to be aware of its provisions.

Human Elements in Incidents

An IMO maritime safety committee is looking at the human factors such as fatigue, training, experience etc, involved in the causes of incidents at sea. This study may lead to a more detailed assessment of these factors and perhaps in the longer term, to some guidelines on working conditions.

Anti-fouling Paints

Developments in the longer term will be controlled by the emerging technology. Until suitable alternatives to the existing treatments are developed, conventions which limit the use of the existing treatments will not be brought into force. However, once a treatment that does not containing a leaching biocide is developed, it highly likely that this treatment will be made mandatory.

Ballast Water

The Marine Environment Protection Committee of the IMO will hold a diplomatic conference during late 2003 to adopt the new measures for ballast water management to prevent the transfer of harmful aquatic organisms in ballast water. These measures may take some time to come into force, depending on the ratification process which is set in place. As discussed above, it is expected that the new regulations will introduce more rigid requirements on monitoring and audit of ballast water treatment on ships at sea. In the longer term, the introduction of ballast water exchange with shore will become mandatory. This will mean that no ballast water will be discharged at sea, thereby removing the chance of infestation of port State waters by marine pests. The ballast water will be exchanged with water from the shore. The ballast water will be treated to kill all organisms present and re-circulated for later exchange.

Greenhouse gases

Future directions in measures for Greenhouse gases are currently under consideration by a Working Group. The group will examine the viability of recommendations to limit production particularly of CO_2. It is expected voluntary measures will be introduced to start, with an environmental index likely to be added to Annex VI. It is most probable that any voluntary measures will apply to diesel ships and they will not be applicable to the RAN in the short term, but there may be a need to be aware of the provisions.

Domestic Issues

A range of domestic issues that may have some bearing on future RAN equipment and operations are detailed below.

Commonwealth Marine Protected Areas (MPAs)

There will be a growth in the number of MPAs. There will be increased restrictions on activities that will be allowed within them. The need to regulate and enforce Australia's sovereignty over these areas may result in an expansion in Navy's role. This could include increased cooperation with other agencies as limited resources are organised more effectively.

Encroachment

The term encroachment has been coined by the United States Armed Forces to describe the steady and growing impact of non-military requirements on the ability of the US Armed Forces to use the assets and resources under their formal control for combat training[23]. A recent definition of encroachment describes it as 'Any non-military activity or requirement affecting the military that has the potential to impede military readiness.'[24] The concept of encroachment covers both environmental and non-environmental developments and issues as follows:

- Growth in demand for residential land due to urban population growth.
- Growth in demand for recreational space due to increased urban sprawl.
- Commercial Development.
- Requirements to protect indigenous and non-indigenous cultural heritage.
- Air quality requirements.
- Noise abatement requirements.
- Endangered species protection and rehabilitation requirements.
- Restrictions on use of air-space.
- Encroachment on military use of the radio-frequency spectrum by commercial users following the information technology revolution.

The principal impact of encroachment appears to be on training. It does not impact directly on actual combat situations because the public accepts that during combat military activity should take priority over all other activity. However, it would appear that encroachment does have a degree of indirect impact on combat since imposing restrictions on training means that the final use of equipment and tactics in combat is likely to be much poorer. The proponents of the concept of encroachment argue that encroachment is:

- Causing major problems in actual readiness.
- Leading to a waste of taxpayer funds, since defence personnel are operating their equipment at less than optimal levels due to reduced levels of training.
- Endangering the lives of US defence personnel by reducing their ability to use their complex equipment. Critics of the concept of encroachment argue that the case is over-Stated.

Table 6 outlines the observable impacts of encroachment on naval training activities, drawing on a number of recent studies carried out by different segments of the US Armed Forces.

Restriction type	Explanation	At sea	Land-based
Area restrictions	Particular areas placed off limits to training activities.	• Yes – may impact on all training. • Excessive area restrictions lead to fragmented training profiles and effectiveness. • Increased costs due to efforts to create a collage of training sites which replicates opportunities offered by one multi-faceted site.	Yes – impacts on all training particularly restricts joint exercises between Naval forces and other services.
Activity restrictions (time, personnel, etc)	Types of permitted military training activities are reduced.	• Yes – may impact on all training. • Excessive activity restrictions leads to fragmented training profiles and decreased effectiveness.	Yes – all training.
Intensity Restrictions	Number of times an activity may be repeated.	• Yes. • fragmented training profiles and decreased effectiveness.	Yes.
Duration Restrictions	Length of time an activity may last.	• Yes. • fragmented training profiles and decreased effectiveness. • financial costs of training increase. • retention of lessons learnt decreases.	Yes – same for sea-based activity.

Restriction type	Explanation	At sea	Land-based
Permanent deactivation of training area	Complete ban on training.	• Yes – substitute areas may be found but may not be suited for multipurpose training.	Yes – affects Naval forces particularly strongly where Navy depends on area belonging to other Forces and cannot substitute its own areas.
Periodic de-activation of training area	Periodic bans on use of all part of training area.	• Yes. • fragmented training profiles and decreased effectiveness. • financial costs of training increase. • retention of lessons learnt decreases.	Yes – affects Naval forces particularly strongly where Navy depends on area belonging to other Forces and cannot substitute its own areas.
Restrictions on live firing	Self-explanatory.	• Yes – decreased effectiveness.	Yes – affects Naval forces particularly strongly where Navy depends on area belonging to other Forces and cannot substitute its own areas.
Restrictions on rehabilitation of training area	Self-explanatory.	• Yes. • May pose threats to safety at sea for vessels and recreational users	Yes – affects Naval forces particularly strongly where Navy depends on area belonging to other Forces and cannot substitute its own areas.
Temporary loss of use for range activities	Self-explanatory.	• Fragmented training profiles and outcomes.	Fragmented training profiles and outcomes.
Restrictions on range modernisation		• Yes – presents a major problem due to increasing prominence of 'high-tech' war scenarios.	Yes – affects Naval forces particularly strongly where Navy depends on area belonging to other Forces and cannot substitute its own areas.

Table 6: Overview of Effects of Encroachment on Naval Training[25]

Efforts to manage encroachment are converging towards the use of comprehensive Broad-Scale Long-Range Plans with stakeholders. These are known in the UK as Integrated Land Management Plans (ILMPS) and in the US as Range Sustainability Initiatives or Management Plans. The concept is applicable both 'at sea' and on-land. In the Australian context, long-range broad scale plans would fit in well with the concept of Regional Marine Plans under the Oceans Policy process. They may also fit within the kinds of agreements for environmental management envisaged under the EPBCA.

Composite Materials and Their Disposal

There are no international regulations concerning the disposal of composite materials at present, apart from the general MARPOL requirement that garbage dumped at sea contains no plastics. However, it is expected that this issue will become much more important towards 2020.

Whales

By 2020, given the ever-increasing requirements to protect Australia's sovereignty with limited resources, it is highly likely that Navy's role will continue to expand beyond pure warfighting. One possible initiative, which could use Navy's technology, would be to gather data on whales and their migration habits. This data could then be made available for research into cetacean activities, with Navy then being able to have input into the development of regulations for the use of the available technology or the introduction of different technology.

An Expanded Role for the RAN

Given the political requirement to protect Australia's sovereignty and sovereign rights, the number of other government organisations involved in this task and the limited resources available, it is highly likely that the RAN's role will expand in future to encompass greater responsibility for maritime enforcement and response.

An Environmentally Sustainable Ship | 3

The Concept of the Environmentally Compliant Warship

The concept of the Environmentally Compliant Warship has been under consideration by a number of different navies. Research and development work has being carried out by the RN, the USN, and NATO (particularly Norway). The focus of the ship-related work has been on identifying the waste streams, and proposing processes by which these streams can be managed to comply with the environmental requirements. In some cases, output discharge limits have been defined and studies of equipment requirements to meet these limits undertaken. The processes followed by the RAN have included these principles. Similar technology for waste stream management has been employed, together with a focus on reducing waste volumes. Additionally, the RAN has been examining other aspects of environmental compliance. The range of these aspects is vast, from anti-fouling treatments, to the use of fire retardant materials in cabin fit-outs. The following discussion will look at the development of different applications that have been employed to attain environmental compliance.

Warship Design Factors

Warships do not operate in the same manner as commercial vessels. They must be self-sufficient at sea for extended periods of time. Therefore, warship design must include a variety of factors that allow for these different operating requirements. Table 7 lists factors that apply to warship design for the USN.

Waste Management Equipment Design Factors[26]

❑ Performance

- Process Rate
- Operability/Reliabiltiy/ Maintainability/Survivability
  - Shock and Vibration
  - Ship motions
  - Repairable by ship's forces with minimal training
  - Marine atmosphere/environment
- Military mission/operations/readiness
- Easy to secure for general quarters
- Emissions
- Secondary waste stream handling and disposal
- HAZMAT usage/requirements
- Excess HAZMAT generations

❑ Weight

❑ Ship Integration

- Structural modifications
- Equipment breakdown or ship cutouts
- Rigging requirements
- Ship services
  - Electrical power systems
  - HVAC systems
    - Equipment heating/cooling
    - Space heating/cooling
    - Process exhaust
    - Waste odor exhaust
  - Fluid systems

❑ Health and Safety

- Process or product creates fire/ explosion hazard
- Uses toxic/hazardous substances
- Mechanical/physical hazards
- Process creates toxic/hazardous by-product
- Generates excessive noise
- Firefighting requirements for process/ by-product

❑ Manning

- Equipment operation and maintenance
- Waste sorting, movement, stowage and offload
- System management
- Skill level/training requirements
- Crew turnover
- Human engineering factors
- Habitability & morale
- General quarters manning requirements

❑ Costs and Risks

- Technology development including logistics
  - New technology
- Conversion to marine/Navy use
- Ship alteration/integration design
- Procurement
- Installation
- Operations
  - Manning
  - Utilities/consumables

- – Water (fresh/sea, hot/cold)
- • Process
- • Cooling
- • Maintenance
  - – Fuel
  - – Hydraulics
  - – Steam and condensate
  - – Pneumatics
  - – Drainage
- ❑ **Commonality of systems/components**
  - • Within this piece of equipment
  - • Within the Navy
  - – Secondary product disposal
  - – Maintenance/repair/overhaul
  - – Logistics
- • Programmatic/Political
- ❑ Arrangements
  - • Footprint, height, volume
  - • Number of decks
  - • Waste pre-process staging
  - • Waste pre-process storage
  - • Secondary waste storage
- ❑ **Ship signatures (infrared, acoustic, electromagnetic)**
- ❑ **Electromagnetic compatibility (EMI/EMC)**

Table 7: USN Warship Design Factors

Design Parameters

To ensure that any future ships acquired by the RAN meet the concept of the Environmentally Compliant Warship, design parameters for the ships will have to be based on the following attributes:

- Comply with all applicable environmental laws and regulations.
- Have a flexible design so that future or anticipated changes in environmental regulations can be accommodated.
- Operate with no significant environmental impacts.
- Treat or destroy wastes onboard to the maximum extent practicable.
- Be reasonably independent on shore facilities for waste offload and disposal.
- Have minimal logistical costs for waste management
- Use minimum of hazardous materials throughout the ship's life cycle (cradle to grave).

A possible shipboard environmental technology strategy is shown in Figure 5.[27]

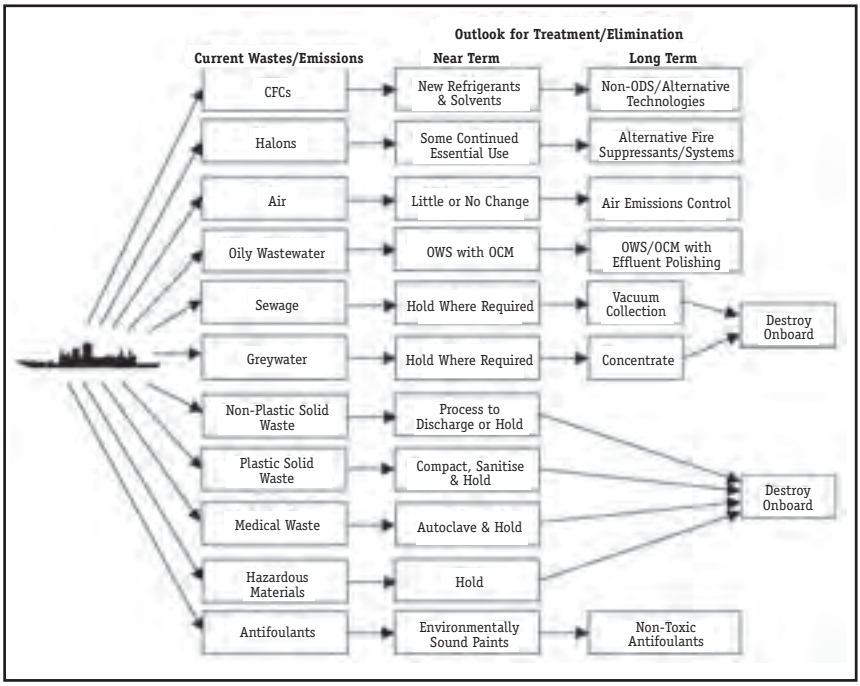

Figure 5: Shipboard Environmental Strategy for Environmentally Sound Ship of the 21st Century

Although this strategy was developed in 1997, most of the control streams are still applicable in 2003. More stringent discharge requirements can be fitted into this strategy by the upgrade of treatment equipment and new technology can be added to the strategy as required

Additionally, proposals by various authors have included a requirement for a change in culture in Navies to accommodate the introduction of Environmentally Compliant Warships. One such culture change was proposed by Markle, Gill and McGraw[28] for the USN as follows:

- Change in operational procedures.
- Education of all personnel.
- Source reduction and pollution prevention measures.
- Installation of shipboard pollution control equipment.

It should be noted that many technologies that lead to environmental compliance also produce greater cost effectiveness in the long term and may also increase operational efficiency.

NATO Developments

In the early 1990s, NATO commissioned a study to assess the requirements to design and maintain an environmentally sound ship for the 21st century. Such prototypes would ensure that NATO naval vessels designed and constructed in the 21st century would be environmentally sound and capable of operating in all the world's oceans and harbours within compliance of present and future environmental regulations.

NATO therefore commissioned an industrial advisory group, NIAG SG/50, composed of representatives from 20 companies from seven NATO nations. The group was tasked with assessing the feasibility of total shipboard waste management and treatment that would be fully compliant with 21st century maritime environmental regulations. The group examined relevant existing and emergent technologies, assessed their risks and costs, and organised this information into a shipboard waste treatment equipment database. The group also quantified pertinent IMO and national environmental regulations and regulatory trends. From this base of equipment capabilities and regulatory requirements, the group developed three example approaches to shipboard waste management systems, one each for the following size of naval vessel: small, medium, and large. The group also developed a methodology to help navies select the most appropriate environmental equipment for their particular ships (this aspect of the project is classified information). Generally, the regulations and technologies used as a basis for assessment were those projected to be in place by the year 2005, which would make them applicable to new construction of vessels and the refitting of existing ships.

The NIAG Group concluded that the development of an environmentally sound ship for the 21st century is feasible. This project has led to further research projects and implementation programs being conducted within a number of NATO navies, notably, the US, UK, Norway, France and Holland. The waste streams that were addressed in the study were:

- Liquid waste.
- Solid waste.
- Gaseous waste.

The study did not consider nuclear waste.

UK – Netherlands Developments

The UK and the Netherlands are working on a combined project to develop an environmentally sound warship design. The goal is to enable the ship to undertake sustained unrestricted world-wide operations, including ports access, littoral areas and in MARPOL special and restricted areas, free from the constraints of national and international environmental legislation. The benefits of such as design are seen as:

- Unrestricted and unhampered 45 day plus missions.
- Port independence.
- Markedly reduced off-load costs, reduced on-board storage requirements.
- Significantly reduced harbour hassle.
- Reduced manpower for waste management/disposal.
- Improved retrofit capability.

A study of design feature requirements was completed in July 2001. This recommended an integrated system utilising commercial-off-the-shelf (COTS) equipment. The project program called for an association between the Navies and industrial and academic partners to develop the most suitable methods for waste treatment. The processes examined included:

- Advanced REDOX treatment (liquid wastes).
- Wet air catalytic oxidation (all wastes).
- Super critical wet air oxidation (all wastes). The proposed system includes shredder/pulpers, pyrolysis of sanitary waste, membrane bio-reactors, ceramic bilge water separators and two stage incineration, as detailed at Figure 6.

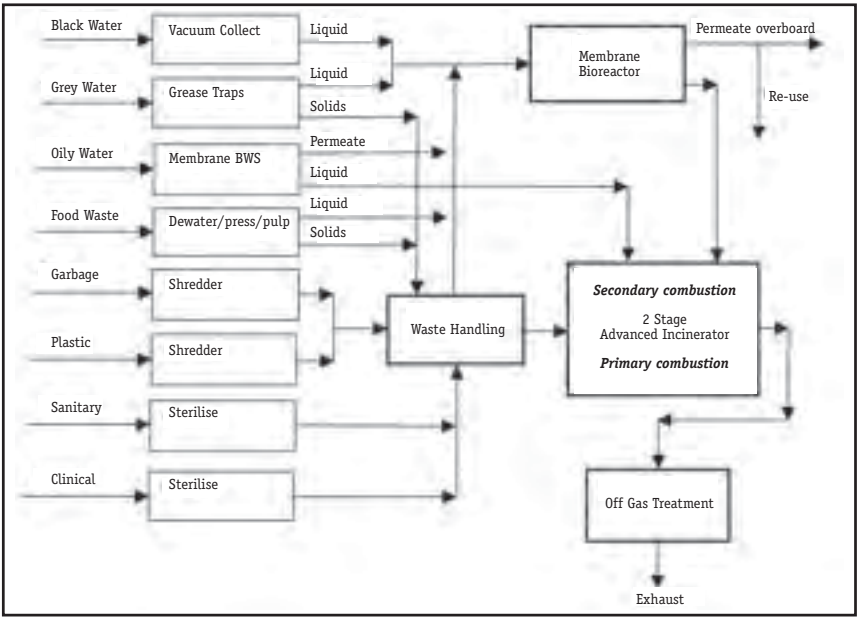

Figure 6: An Indicative Integrated Waste Management System

US Efforts to Meet Environmentally Sound Warship Requirements

The US Department of Defense (DoD) has issued acquisition guidance that establishes five mandatory Environmental, Safety and Health program elements. Commonly referred to as the 'Five Pillars,' policy and procedural requirements are given as 'All programs, regardless of acquisition category, shall comply with Environmental, Safety and Health, and be conducted in accordance with applicable federal, state, interstate and local environmental laws and regulations, Executive Orders, treaties and agreements. The Program Manager shall ensure that the system can be tested, operated and repaired in compliance with environmental regulations.'[29] The Five Pillars are:

- Compliance with the *National Environmental Policy Act,* which requires analysing proposed actions for effects on the environment.
- Compliance with all current and foreseeable environmental regulations.
- Identify and evaluate *System Safety and Health Hazards* by defining risk levels and developing a program that manages the probability and severity of all hazards associated with system development, use and disposal.

- Establish a *Hazardous Material Management Program* that ensures appropriate consideration is given to eliminating and reducing the use of hazardous materials in processes and products rather than simply managing pollution created.
- In designing, manufacturing, testing, operating, maintaining, transporting, and disposing of systems, all forms of *Pollution shall be Prevented* or reduced at the source whenever feasible.

US Navy Sea Systems Command is developing a system of equipment and procedures to manage ship waste based on an integrated system similar to that developed in the UK-Netherlands project. Additionally, the USN is focussing on the restriction of the use of dangerous substances such as:

- *Ozone depleting substances* for refrigeration and fire-fighting.
- *Hazardous materials* such as paints, solvents and miscellaneous chemicals
- *Alternative hull treatment processes*.

Control and management of the environmental risks which impact on USN operations is being vested in a geographic information system based Environmental Information Management System. Access to this system is available to fleet planners and schedulers on-line and to ship's Commanding Officers by CDROM.

Specific Elements of Ship Design

The following items have been identified as deserving of consideration in the preparation of future user requirements for design development.

Electric Ship Drive

A number of recently written papers on power generation from gas turbines instead of diesel generators have been proposing the introduction of a full electric ship. It is recommended that DSTO be directed to examine these designs and assess their applicability for future RAN ships.

Defining Hull Life as a Design Parameter

It has been identified that certain ship types, with hulls designed specifically to undertake particular capability roles, have been made redundant before their time by changing capability requirements. This outcome could be avoided by defining the expected life of the ship's hull in the initial user requirements. The hull design would then include a retrofit capability for each of its equipment systems so that as new technology is developed it can be inserted into the existing hulls.

Design Hull to Allow for Future Capability Changes

Additionally, a design that allows for changes in technology to meet changing capability roles should be specified. This will likely result in a specification for a larger ship, but this has numerous advantages and can be amortised over a longer hull life. Larger hulls do not necessarily lead to significant cost increases, as the major cost of warship construction lies in the systems fit rather than the basic fabric. The saying 'steel is cheap, air is free' contains a large element of truth.

Peacetime/Wartime Switch

This idea has been incorporated into the design of some sonar units fitted to RN ships. The idea is that for peacetime operations the equipment works at reduced power settings, so that the impact on the environment is minimised. However, in the event of war-fighting operations, the equipment can be switched to full power operation. Inclusion of such a device may be warranted to ensure environmental compliance for peacetime operations.

Electronic Monitoring & Auditing

With changing regulations the inclusion of these devices into ship design may allow for ready proof of compliance.

Fire Fighting Systems

Design the fire suppression system so that it does not use a chemical that burns to form a toxic combustion product. The RMN has a water mist system that is claimed to work effectively. Design and build ships that contain minimal amounts of combustible material. In reality, ship design should try to limit materials which combust to produce volatile organics (MARPOL Annex 6) or toxic gases.

Dry Bilge Concept

This minimises the generation of oily waste, thus reducing one waste stream that will, in all probability, require storage in the future.

Fuel/Water Contact

Design ships so that there is no contact between water and fuel. This removes the requirement for water compensating fuel tanks and further reduces the production of oily waste. Alternatively, where possible, ship design should alleviate the need for water ballast.

Sewage Management

The NATO Industrial Advisor Group 2005[30] has developed discharge standards for effluent quality which are more stringent than those required under MARPOL. Future ship design should incorporate sewage treatment systems that meet these more stringent standards, as they are likely to be incorporated in upcoming amendments to MARPOL. These amendments and their implications are discussed in the chapter on Emerging Environmental Trends.

Ship recycling

The IMO is addressing the issue by developing guidelines in cooperation with the International Labour Organisation and the secretariat of the Basel Convention on the Trans-boundary Movement of Hazardous Wastes. Draft guidelines have been prepared for consideration, probably in July 2003. The shipping industry has addressed this subject with the publication of an Industry Code of Practice on Ship Recycling in August 2001. The Code addresses those issues that might reasonably be considered to be within the control of the shipowner when a ship is sold for scrapping. It outlines the procedures followed in selling a vessel for recycling, giving a framework of 'good practice' for both the industry as a whole and individual owners, both now and in the future. Furthermore, the Code calls on shipowners to minimise any potentially hazardous substances onboard and to make an inventory of those that remain. This will be in the form of a 'green passport' with every new ship. The passport will list the materials used in the construction of the ship, and will be carried by the ship throughout its working life and updated as necessary. Adherence to this code and any future IMO Convention should be mandatory in defining designs for future RAN ships.

Waste Streams

Ship design needs to include an integrated waste management system. This system must provide port independence, mission sustainability, low offload costs, and waste destruction. The design should also be such that, as future legislation introduces tighter discharge standards, individual items of equipment can be readily upgraded or new equipment retrofitted to increase the capability of the system. The design should minimise the total life cycle cost of compliance with the relevant regulations. Also, a design decision must be made to incorporate rapid shutdown of equipment to a safe condition when ship goes to 'Action Stations'.[31]

Study Outcomes 4

This chapter includes a discussion on the possible outcomes and issues that need further consideration, together with a list of actions which should be undertaken by Defence. The nature of some of the possible outcomes is varied, but they can be grouped into four broad areas:

- Coordination.
- Areas of research in emerging technology.
- Process changes.
- Contract requirements.

Coordination

A great deal of the information presented in this report, particularly that of a technical nature, has been provided by various Defence and Navy organisations. It is apparent that many different Directorates and people have duties relating to environmental issues, but that there is very little coordination or information sharing between them.

To ensure that value is obtained from this project, the formation of an Environmental Working Group including all agencies with environmental responsibilities and stakeholders affected by environmental policies and regulations is recommended. This group would allow for:

- Coordinated liaison with outside agencies such as Environment Australia and AMSA.
- Distribution of environmental information to all members.
- Monitoring of processes to ensure complete compliance with environmental legislation and regulations is achieved.
- Future planning on environmental issues to be undertaken in a timely manner.
- Environmental policies to be developed in anticipation of changing international and domestic requirements.

Environment Australia

EA would welcome a formal liaison with Navy to discuss environmental issues including the following:

- Strategic assessments for areas such as Rottnest Trench, Shoalwater Bay, Beecroft Peninsula and South Australian waters. The aim of these discussions would be to negotiate the granting of recognition of compliance for those areas, and/or a template to enable quick approvals, as required, for Navy activities.
- Liaison for exercise planning.
- The negotiation of specific guidelines for Navy use of sonar.
- Expand involvement in training on environmental issues, particularly the *EPBCA*, beyond that already involved with the CO/XO Designate courses.
- Developing guidelines for operations in Marine Protected Areas. A draft manual has been developed and will be discussed at the MPA Stakeholders Reference Group.
- Developing long-range broad scale plans to manage encroachment of the general population onto Naval training areas and establishments.

National Oceans Office

Liaison with the National Oceans Office should be established so that long-range broad scale plans to manage the integration of the Regional Marine Plans under the Oceans Policy with naval operations can be developed.

Areas of Research in Emerging Technology

A number of areas of emerging technology have been identified where ongoing research is required. Some of these have only been recently identified and time did not allow for a complete study to be undertaken. Many of these are technical in nature and generally will have a minimal individual affect on naval operations. However, if the RAN is to achieve 'best practice' in all aspects of environmental compliance, these areas need to be addressed in the future.

Regular Updates

The studies undertaken during this study identified a number of issues and concerns where the answer is not yet available. Regular updates are required to ensure Navy planners remain abreast of changing trends including the Disposal of Composite Materials and emerging conventions on radiation hazards.

Disposal of waste plastics

DNPS[32] have estimated that shipborne plastic waste is generated at a rate of about 0.13 kg per person per day. This equates to about 5 tonnes per week of plastic waste from the Fleet. Conversion of this amount to diesel would produce about 5 tonnes of fuel. It is recommended that the feasibility of acquiring equipment to undertake this conversion be investigated.

Grey Water

DNPS is developing policy for the implementation of treatment for grey water in RAN ships.[33] This will require grey water to be treated before disposal or to be stored onboard for discharge to shore or away from land. Both of these requirements would benefit from a reduction in the amounts of water to be treated or stored. It is recommended that a plan to minimise the production of grey water be developed and instituted.

Sonarbuoys

The Director Environmental Management has advised that obtaining exemption certificates to drop large numbers of sonarbuoys in particular areas may become difficult in future. This would interfere with exercises, particularly in sensitive areas such as Shoalwater Bay. One option to circumvent this possibility is to design sonarbuoys that do not pollute. It is recommended that DSTO be directed to design and develop a biodegradable sonobuoy with saltwater batteries. Alternatively, an association between a university and an industrial partner could be formed to undertake this work.

Process Changes

The RAN undertakes a large number of processes during the acquisition of new capital equipment and during normal operations. However, there are some processes that are undertaken by other navies, which the RAN does not undertake. A selection of these processes is discussed. Although adoption of these is not considered essential, there would be an overall improvement in naval operations were they to be introduced. Also, some comments on changes that could be made to acquisition contract documentation are made.

Defining Hull Life as a Design Parameter

It has been identified that certain ship types, with hulls designed specifically to undertake particular capability roles, have been made redundant before their time by changing capability requirements. This outcome could be avoided by defining the expected life of the ship's hull in the initial user requirements.

Design Hull to Allow for Future Capability Changes

Additionally, a design that allows for changes in technology to meet changing capability roles should be specified. This will likely result in a larger ship being specified, but this has numerous advantages and can be amortised over a longer hull life.

Definition of Mission Endurance

The RN has specified a mission endurance parameter of 45 days for each of its ships. This allows for the operational endurance for all equipment onboard, including waste stream treatment equipment, to be properly defined. The benefit arising is that only one piece of equipment (of whatever capability) can assessed as to its suitability for use, and tested under varying conditions, before acquisition for all ships is undertaken.

The RAN does not specify a mission endurance parameter for its ships. This means that each class of ship has a different standard and in some cases, different ships of the same class have different standards. Installation of common equipment within ships without full understanding of its capabilities and drawbacks can lead to increased maintenance requirements and extended downtime. It is recommended that a common mission endurance parameter be specified for all RAN ships.

First of Class Trials

To meet changing MARPOL and other standards, the most cost-effective solution is often to purchase and install commercially available equipment. However, previous experience in the RAN (and the RN) is that some commercial equipment does not meet performance criteria under Navy operating conditions. Therefore, before procurement, it would be good practice to assess the performance and suitability of these equipments. The RN solution is to undertake first of class trials to make such assessment. However, acquisition project managers are not funded to undertake such trials so, in some cases, unsuitable equipment has been fitted. It is recommended that funding for acquisition projects where the installation of commercially available equipment is involved, include the provision for first of class assessments for this equipment.

Organic Pollutants

Ongoing examination and assessment of the use of persistent organic pollutants and products that result in the emission of volatile organic pollutants, need to be undertaken. Changes in practice can minimise the release of volatile organic

solvents, for example, the use of paints with a high solid content reduces the release of solvents. Also, conducting painting activities only during self-maintenance periods and assisted maintenance periods (ie. only when alongside) would remove the need for paint lockers onboard, reducing OH&S concerns and reducing the fire risk.

Education on Environmental Requirements

To circumvent the risk that Navy managers will fail to recognise the importance of the environment, and therefore fail to include environmental issues in their ongoing planning, an appropriate education regime is required. There are a number of pathways that need to be implemented so that naval personnel are prepared to operate under more restrictive environmental regulations including the need to:

- Preate a culture where sustainable environmental management is an integral element of all operations.
- Establish clear lines of accountability for environmental outcomes.
- Incorporate environmental knowledge into the competency standards of the workforce.
- Integrate environmental education into training programs.
- Modify procedures and regulations to incorporate the Defence Environmental Management System.
- Provide for ongoing liaison with Environment Australia.

Contract Requirements

A number of changes to acquisition and contracting processes, which would improve current and future maritime environmental compliance, are detailed below.

DMO

DMO should be included as one of the environmental stakeholders to ensure that all project managers are familiar with the technical documents before user specifications commence definition.

Acquisition Documentation

The documentation should detail all aspects of the ship's service from design and construction, through ongoing maintenance and refits, to disposal of the hull after decommissioning.

Disposal of the Existing Fleet

A project should be initiated to develop plans for the disposal of the existing fleet. This project should be innovative in its approach looking at all alternatives including ship recycling. One possible difficulty could be the mine warfare vessels, which could be deemed to be 'plastic', as MARPOL already prohibits the dumping of all plastics at sea.

Acquisition of Diesel Engines

The tender documentation for diesel engines should include the requirements that all tenders must have MARPOL Annex VI certification processes in place for any tender to be compliant.

Summary of Actions Required

This summary provides a comprehensive list of actions or activities that have been identified during the research as needing consideration.

Strategic Activities

The *Environment Protection and Biodiversity Conservation Act (1999)* binds the Crown, including all Commonwealth agencies, and in particular any vessel that is flying the Australian Flag. Under Chapter 2, Part 3, Division 2, Subdivision B, Section 28 (page 44), the Commonwealth or a Commonwealth agency must not take inside or outside the Australian jurisdiction an action that has, will have, or is likely to have, a significant impact on the environment inside or outside the Australian jurisdiction. However, under this section, the Minister is able to make a written declaration that all actions, or a specific class of actions, taken by a specified Commonwealth agency are actions to which this section does not apply. The RAN should liaise with Environment Australia to assess which of its activities may be considered under this provision and to prepare a submission to have an appropriate declaration made by the Minister.

The development and implementation of a plan to modify RAN culture to include an understanding of sustainable environmental management is essential. Sustainable environmental management must be an integral element of capability development, equipment acquisition, through life support and operations. This plan should include an Environmental Working Group to ensure appropriate coordination and sharing of information.

Specific Activities

The following specific activities are recommended.

1. Liaise with EA to develop guidelines for operations within Marine Protected Areas.
2. Liaise with EA to develop guidelines for planning naval exercises, particularly when underwater noise making will be involved.
3. Continue activities to identify a replacement for TBT anti-fouling paint.
4. Investigate the use of diver-operated hull cleaning vehicles with in-water capture of all effluent from the cleaning operations.
5. Liaise with AMSA and monitor development under International Instruments (MARPOL and SOLAS) regarding the use of Halon fire fighting systems. As yet there is no requirement for their removal.
6. Examine the replacement of black & grey water treatment systems, including consideration of the cross flow membrane system being trialed by the RN.
7. Examine the replacement of oily waste and bilge water separators, as expected future standards will be difficult to meet with current equipment.
8. Examine complying with State regulations for booms when transferring fuel.
9. Re-assess current garbage management equipment, as anecdotal reports indicate that it is manpower intensive, prone to breakdown, inefficient and offensive smelling.
10. Re-assess all waste stream management equipment with the view of reinstalling the most up-to-date technology.
11. Ensure all Project Directors are aware of impending air emission requirements for diesel engines.
12. Emphasis should be placed on environmental training particularly with respect to the need to manage waste streams effectively.
13. Most waste management in establishments is now done by a contractor who will be required to adhere to State regulations (eg. disposal of ship's bottom scrapings and discharge of dry dock water).
14. Assess alternatives to evaporators for drinking water.
15. Improve air conditioning units in ships.
16. Investigate alternative methods of waste treatment such as thermalysis of plastics.

17. Investigate whether equipment for the thermalysis of plastics could be capable of destroying composite plastic material and could therefore solve the problem of how to dispose of the hulls of ships made of this material.
18. Investigate other methods of disposal of composite material.
19. Monitor emerging IMO issues and modify policy as necessary to incorporate impending changes.
20. Note that the GBRMP is likely to be extended to include Torres Strait, with a change in the track for the SLOC, and potential requirement for compulsory pilotage.
21. Liaise with the National Oceans Office and AMSA to ensure that naval training areas at sea are incorporated into their plans.
22. Liaise with DSTO to develop and implement a research programs into waste streams management technology.
23. Sponsor the design and development a biodegradable sonarbuoy with saltwater batteries, via DSTO or an association between a university and an industrial partner.
24. Investigate the following aspects in Ship Design:
    a. Electric Ship Drive.
    b. Peace-time/War-time Switch.
    c. Electronic monitoring & auditing.
    d. Non-combustible ships.
    e. Dry Bilge Concept.
    f. No contact between Fuel/Water.
    g. Definition of Mission Endurance.
    h. Definition of Ship's Hull Life.
    i. Design Ship's Hull to Allow for Changes in Capability Requirements.
    j. Bigger is Better.
25. Implement First of Class Trials for all new equipment.
26. Examine and assess the need to use persistent organic pollutants and products that result in the emission of volatile organic pollutants.
27. Ensure DMO is included as one of the environmental stakeholders.
28. Include Cradle to Grave considerations in all Acquisition Documentation.

29. Initiate a project to develop plans for the disposal of the existing fleet.
30. Ensure tender documentation for diesel engines includes the MARPOL Annex VI certification processes.
31. Assess both HMA Ships SUCCESS and WESTRALIA for compliance with MARPOL Annex I.
32. Amend Navy regulations so that fuel and stores lighters must be in survey in the State in which they operate.
33. Amend Navy regulations so that all fuel transfers in ports comply with local regulations.
34. Ensure that changing regulations are incorporated into the practices undertaken by contractors such as ADI and DMS.
35. Assess the existing systems for Potable Water and replace those that do not meet the required standards with alternative technology.
36. Re-assess the existing requirements for In-door Air Quality in ships and install systems that meet the required standards.
37. Closely monitor the progress towards ADI attaining the licence to discharge dry-dock water into Sydney's sewerage system.
38. Institute an education regime on Environmental Requirements.
39. Develop a policy on minimisation of grey water.
40. Undertake the activities discussed in the chapter on Project Outcomes.
41. Initiate a regime of regular updates to Defence environmental policy.
42. Develop contingency plans for an expansion to Navy's role in the regulation and enforcement of Australia's sovereignty.
43. Plan to allow for future encroachment on Navy's establishments and sea training areas, liaising with EA, the National Oceans Office, and other relevant environmental agencies.
44. Consider the development of an Environmental Information Management System to be available to fleet planners and ship's Commanding Officers.
45. Consider implementing ship environmental accounting systems currently being implemented in commercial ships by DNV.

International Legal Framework | Annex A

This chapter examines the application of International Instruments that impose environmental requirements on RAN operations. The chapter also discusses the concept of Sovereign Immunity with respect to these Instruments. The following International Instruments are discussed:

- *United Nations Convention on the Law of the Sea* (UNCLOS) 1982.
- *International Convention for the Prevention of Pollution from Ships* (MARPOL) 1973/78.
- *United Nations Framework Convention on Climate Change* 1994.
- *Montreal Protocol* 1989.

Of these instruments, by far the most significant to naval ship design and operations is MARPOL. However, issues arising from each of these instruments will be considered.

Law of the Sea Convention Issues

UNCLOS represents one of the most complex and all embracing framework conventions in the world. It intends to regulate all aspects of marine related activity. UNCLOS is divided into 17 Parts and nine Annexes, containing provisions governing. Amongst other things—the limits of national jurisdiction over ocean space access to the seas; navigation protection and preservation of the marine environment; sustainable management of marine living resources; non-living marine resources exploitation; marine scientific research; and the settlement of disputes. A number of issues arising from UNCLOS that may have implications for naval operations. These issues are discussed below.

Creeping Jurisdiction and Naval Environmental Compliance.

From the point of view of the powers of States under UNCLOS and other rules of international law, it is possible for law of the sea powers and rights of coastal States in the various zones of jurisdiction to be used to impose requirements on foreign warships. Indeed in terms of future threats and pressures, this is one of the issues. The use of creeping jurisdiction to demand naval environmental compliance is most likely to come in a formalistic way from States seeking to use such claims to attempt to restrict the technological

advantage and freedom of manoeuvre currently enjoyed by Western navies. Such claims of jurisdiction may also be driven by deep-seated domestic pressures and concern.

The discussion below covers the following themes to provide adequate legal and policy coverage of this complex topic:

- A classification and description of the claim types.
- A description of the rules regarding the various zones and their scope of applicability to the issue of naval environmental compliance in times of peace.
- Current areas of dispute about the rules.
- The ways in which naval environmental compliance can be made a focus of the promulgation of laws and policies by coastal States.
- An assessment of current and projected trends in jurisdictional claims in the region adjacent to Australia referred to in this report as Australia's Adjacent Maritime Region (AAMR).

Jurisdictional Claims and Demands for Naval Environmental Compliance

Jurisdictional claims can be classified as follows:

- Creeping jurisdiction claims over 'old' resources (oil, fisheries, etc) which are then extended to issues of naval environmental compliance.
- Creeping jurisdiction over 'new' resources – energy from the sea, marine bio-technology, marine bio-prospecting – which are then extended to issues of naval environmental compliance.
- 'Thickened jurisdiction' such as increased management of navigation by techniques that are defacto forms of notification and prior approval. These include vessel traffic management schemes, GPS, and satellites, which are then extended to issues of naval environmental compliance.

The more specific claim types would include:

- Territorial sea claims greater than 12nm.
- Other claims to jurisdiction over maritime areas in excess of 12nm, such as security zones, including environmental security zones that attempt to restrict high-seas freedoms.

- Contiguous zones at variance with Article 33 of UNCLOS.
- Exclusive economic zone (EEZ) claims not consistent with Part V of UNCLOS.
- Continental shelf claims inconsistent with the Part IV of UNCLOS especially in an effort to prevent use of the seabed for military purposes.
- Territorial sea claims which impose restrictions on the innocent passage of military and commercial vessels, allegedly to secure naval environmental compliance with the rules of the coastal State or international treaty rules.
- Territorial sea claims which impose restrictions on the innocent passage of nuclear-powered warships or warships and naval auxiliaries carrying nuclear weapons or specific cargoes.
- Laws requiring advance notification or authorisation for innocent passage of warships and naval auxiliaries through the territorial sea or EEZ or applying discriminatory requirements to such vessels.
- Territorial sea claims that overlap straits used for international navigation thereby changing the status of such straits to impose passage requirements in contravention of UNCLOS requirements. For example, UNCLOS allows user States military vessels to undertake:
  - submerged submarine transit.
  - overflight by military aircraft.
  - non-notified surface transit of warships and auxiliaries.
  - surface transit of warships and auxiliaries without prior authorisation of the littoral State.
  - Archipelagic claims which are not in conformity with UNCLOS and which are justified by environmental compliance reasons.

Ongoing Pressures on the Classical Innocent Passage Regime

In evaluating the extent to which innocent passage can be reshaped to drive naval environmental compliance, it is crucial to bear in mind that all vessels in the territorial sea are currently subject to intensive measures of regulation driven by a range of considerations, including safety at sea, environmental concerns and the need to protect vessels from armed robbery in the territorial sea. Such regulation emanates principally, if not exclusively from IMO or passes through IMO channels of approval. These measures place considerable stress on the broad principle of freedom of innocent passage of foreign ships. Indeed,

in many cases, measures to ensure safety at sea are functionally and practically equivalent to requiring advance notification of passage or even prior permission before passage – both of which may be construed as infringements of the right of innocent passage.

The Territorial Sea and Naval Environmental Compliance

The basic territorial sea rules, found in UNCLOS Article 3, provide that every State has the right to establish a territorial sea of up to 12nm measured from baselines determined in accordance with the Convention. Within this zone the coastal State is sovereign but is required under international law to grant a right of innocent passage to foreign vessels. The majority of States (whether party to UNCLOS or not) maintain a territorial sea of 12nm or less. Currently out of 146 coastal and Island States, the status of the breadth of the zone at Table A-1 clearly demonstrates State practice that Article 3 represents customary international law:

3 nm	4-11 nm	12 nm	Over 12 nm	Total
5	5	119	17	146

Table A-1: Territorial Sea Claims under UNCLOS

The Right of Innocent Passage in the Territorial Sea

It is established under customary and conventional international law that all ships enjoy the right of *innocent passage* through the territorial sea.[34] Passage is defined as navigation through the territorial sea for the purpose of traversing that sea, proceeding to or from internal waters and 'shall be continuous and expeditious'.[35] Under UNCLOS passage is innocent 'so long as it is not prejudicial to the peace, good order or security of the coastal State.'[36] UNCLOS further elaborates on what may be considered 'non-innocent' passage.[37] Non-innocent passage involves:

- Any threat or use of force against the sovereignty, territorial integrity or political independence of the coastal State, or in any other manner in violation of the principles of international law embodied in the Charter of the United Nations.
- Any exercise or practice with weapons of any kind.
- Any act aimed at collecting information to the prejudice of the defence or security of the coastal State.

- Any act of propaganda aimed at affecting the defence or security of the coastal State.
- The launching, landing or taking on board of any aircraft.
- The launching, landing or taking on board of any military device.
- The loading or unloading of any commodity, currency or person contrary to the fiscal, immigration or sanitary laws and regulations of the coastal State.
- Any act of wilful and serious pollution contrary to this Convention.
- Any fishing activities.
- The carrying out of research or survey activities.
- Any act aimed at interfering with any systems of communication or any other facilities or installations of the coastal State.
- Any other activity not having a direct bearing on passage.

Under UNCLOS, a coastal State cannot impose requirements that have the practical effect of denying or impairing passage.[38] UNCLOS also lists matters in respect of which a coastal State may adopt laws and regulations relating to *innocent passage* through the territorial sea, including:[39]

- The safety of navigation and the regulation of maritime traffic.
- The protection of navigational aids and facilities and other facilities or installations.
- The protection of cables and pipelines.
- The conservation of the living resources of the sea.
- The prevention of infringement of the fisheries laws and regulations of the coastal State.
- The preservation of the environment of the coastal State and the prevention, reduction and control of pollution thereof.
- Marine scientific research and hydrographic surveys.
- The prevention of infringement of the customs, fiscal, immigration or sanitary laws and regulations of the coastal State.

Foreign ships exercising the right of *innocent passage* are required to comply with any such laws and regulations.[40] The prescriptive power of a coastal State is limited with regard to the design, construction, manning and maintenance

of foreign vessels in that any regulations must conform to generally accepted international rules or standards,[41] except in ice covered areas, where coastal State regulation may be stricter.[42] No explicit provision for enforcement of these provisions is included, but it is implied,[43] and in certain instances a coastal State has criminal or civil jurisdiction.[44]

A coastal State can arrest a vessel or escort it out of the territorial sea, providing that the action taken is proportional to the threat posed by the foreign vessel and consistent with the 'infringement' of the coastal State's laws that may have occurred.[45] A coastal State can also steer a ship through safe routes.[46] *Innocent passage* can also be interfered with where there has been a breach of any conditions for the admission of the ship to the coastal State's internal waters or a port facility outside the internal waters.[47] For example, article 220(2) allows inspection of a ship where there has been pollution. It has also been argued that any force necessary may be used to compel warships engaged in *non-innocent passage* to leave the territorial sea.[48]

The list of areas where coastal State enforcement is allowed closely mirrors that of article 19, detailing examples of *non-innocent passage*. This suggests that coastal State regulations form an inherent part of the concept of *innocent passage*, with the effect that an infringement of such regulations would be prejudicial to the 'peace, good order or security' of the coastal State, and hence that such passage would be rendered non-innocent.[49]

Although fewer States claim explicit enforcement powers than not, it can be argued that as such rights are widely recognised in customary international law there is no need for written confirmation in national legislation.[50] It is clear that State practice does not really distinguish between innocent and non-innocent vessels, as would be expected on the basis of UNCLOS.[51] The fact that many coastal States claim broader powers to interfere in relation to foreign vessels threatening the environment suggests interpretations of UNCLOS more favourable to coastal States than were envisaged when UNCLOS was adopted.[52]

A coastal State can also temporarily suspend innocent passage in certain circumstances. The coastal State may, without discrimination in form or in fact among foreign ships, suspend temporarily in specific areas of its territorial sea the innocent passage of foreign ships if such suspension is essential for its security, including weapons exercises.[53] This 'national security' exemption is open to widely varying interpretations, and it has been argued that the test that will be applied is that national security, as defined by the coastal State, will prevail over the interests of foreign vessels seeking to exercise the right of *innocent passage*.[54] This makes the right of *innocent passage* potentially fragile,

as was demonstrated in the 1995 declaration of an exclusion zone by France around Mururoa Atoll for the purpose of nuclear tests.[55] Despite the fact that this exclusion zone was to last for a year, and thus could not be characterised as 'temporary' for the purposes of UNCLOS article 25(3), it failed to draw any international protest.[56] This demonstrates that States value the latitude granted by UNCLOS to completely close their territorial sea to foreign vessels in certain circumstances, making State practice a more accurate guide to the State of international law than the strict terms of UNCLOS.[57] It does appear, however, that the provision allowing temporary suspension of innocent passage is limited to military security, and could not be used for other reasons such as economic or environmental reasons.[58]

It is important also to note that government vessels, including warships, enjoy *sovereign immunity*. A government vessel in non-innocent passage can be diverted from the territorial sea but may not be interfered with for the purpose of inspection, detention or the institution of legal proceedings against it.[59] In the future, the extension of national jurisdiction, and enclosure of the seas as provided by UNCLOS may encourage and stimulate coastal States to further strengthen controls in their territorial seas.[60]

Passage of Warships in the Territorial Sea

There has been a long-standing debate as to whether or not a coastal State can require prior notification or authorisation as a prerequisite for the enjoyment of *innocent passage* by warships of a foreign State. Such a requirement is not present in either the Convention on the Territorial Sea and Contiguous Zone or in UNCLOS, although such a provision was proposed for both Conventions.[61] State practice on this issue has been mixed, with some maritime States contesting any such regime.[62] However, it must be cautioned that 'one may hardly expect a quick consensus on this issue'.[63]

One argument in support of a requirement of notification or authorisation rests on the interpretation of article 19(1) of UNCLOS: 'such passage shall take place in conformity with this Convention *and with other rules of international law*' (emphasis added). It could be argued that such a requirement exists at customary international law, as demonstrated by State practice (see Table A-4), and is not specifically prohibited by either UNCLOS or the Convention on the Territorial Sea and Contiguous Zone.[64] A contrast is also drawn between the provisions in relation to *transit passage* (see below), which refer to 'all ships', and the provisions in relation to *innocent passage*, which refer only to 'ships'.[65]

In contrast, it is argued that there are strong textual reasons for asserting that a requirement for either authorisation or notification would be inconsistent with UNCLOS. A requirement for prior authorisation would be in clear conflict with the prohibition on coastal States imposing requirements that have the effect of 'denying or impairing the right of innocent passage'.[66] Furthermore, articles of both UNCLOS and the Convention on the Territorial Sea and Contiguous Zone relate to the navigation of submarines and non-compliance by warships with laws and regulations of coastal States, implying such a right of *innocent passage*.[67] Indeed, the list of *non-innocent passage* contained in article 19(2) clearly indicates that the activities in (a)-(f) are concerned primarily with warships, and would be superfluous if such a right of *innocent passage* did not exist.[68]

Although the textual arguments outlined above would appear to indicate that a requirement for prior notification is contrary to UNCLOS. Nevertheless, as can be seen, there is some State practice for such a requirement, present in both domestic legislation and declarations on the signature or ratification of UNCLOS, although these actions have not gone unchallenged (see Table A-4). The diversion in State practice may lead to the conclusion that there is no customary rule for the *innocent passage* of warships, although a consensus is not required for such a rule to emerge.[69]

Coastal State Territorial Sea Powers and Naval Environmental Compliance

From the point of view of naval environmental compliance with coastal State powers and possible conflict with the freedom of navigation principle, the key issues are:

- How coastal States interpret the content of the right of innocent passage as set out in UNCLOS and the extent to which these rules can be interpreted to demand enhanced naval environmental compliance.
- Permissible restrictions on innocent passage to ensure improved naval environmental compliance.
- Enforcement measures with respect to 'non-innocent' passage where such 'non-innocent' passage includes issues of claimed non-compliance with environmental rules.
- Excessive general restrictions on innocent passage which go beyond UNCLOS norms and which can be justified on the basis that they contribute to enhanced naval environmental compliance.

Such restrictions on innocent passage can be further classified as follows:

- Imposition of time limits on passage to enhance naval environmental compliance.
- Imposition of 'prohibited zones' to enhance naval environmental compliance.
- Requirements of compulsory pilotage for vessels subject to sovereign immunity to enhance naval environmental compliance.
- Restrictions of passage to specified sea-lanes to enhance naval environmental compliance.
- Prior notification requirements for warships to enhance naval environmental compliance.
- Prior permission requirements for warships to enhance naval environmental compliance.
- Limitations on warship presence in the Territorial Sea to enhance naval environmental compliance.
- Restrictions on presence and passage of nuclear-powered warships to enhance naval environmental compliance.
- Controls over hazardous, ultra-hazardous and radioactive cargoes to enhance naval environmental compliance.

Innocent Passage: State Practice in the AAMR

Table A-2 provides examples of State practice (reflected through legislation) in the AAMR with regard to *innocent passage*.[70] It is important to note that the right of innocent passage is such a fundamental rule of customary international law that many States do not set it out in legislation. Setting it out in legislation is in some ways a short step towards being able to modify it through amendments in legislation, hence our focus here is on identifying those States which actually specify it in legislation, although they do not claim to do anything more than specify it in legislation.

State	Innocent Passage in Legislation
Bangladesh	Simply recognises *innocent passage*
Fiji	Simply recognises *innocent passage*
Indonesia	As required by UNCLOS
Kiribati	Simply recognises *innocent passage*
Marshall Islands	Simply recognises *innocent passage*
Myanmar	As under the Convention on the Territorial Sea and Contiguous Zone
Solomon Islands	Simply recognises *innocent passage*
South Korea	As required by UNCLOS
Sri Lanka	As under the Convention on the Territorial Sea and Contiguous Zone
Thailand	Simply recognises *innocent passage*
Tuvalu	Simply recognises *innocent passage*
United States	Simply recognises *innocent passage*
Vanuatu	Simply recognises *innocent passage*

Table A-2: *Innocent Passage* in National Legislation in the AAMR

Table A-3 sets out non-conforming legislative Statements.

State	Enforcement Power Claimed
Bangladesh	General enforcement power over ships in *innocent passage* and *non-innocent passage*.
Canada	Specific power of enforcement over *innocent passage* including diversion.
China	Enforcement right over *non-innocent passage*, including diversion
Russian Federation	Specific power of enforcement over *innocent passage* including diversion.
South Korea	Specific power over *non-innocent passage*, not including diversion.
Sri Lanka	Specific power over *non-innocent passage*, not including diversion.
South Africa	Specific power of enforcement over *non-innocent passage*, not including diversion.
United States	Specific power of enforcement over *innocent passage*, including diversion.

Table A-3: Non-conforming Territorial Sea provisions in the AAMR

Table A-4 sets out non-conforming restrictions on the *innocent passage* of warships.

State	State Practice for Restrictions on Passage	Protest
Bangladesh	Requires prior authorisation	United States
Cambodia	Requires prior authorisation	United States
China	Requires prior authorisation	United States
India	Requires prior notification	United States
Myanmar	Requires prior authorisation	United States
Philippines	Requires prior authorisation	United States
Sri Lanka	Requires prior authorisation	United States
Taiwan	Requires prior notification	
Vietnam	Requires prior authorisation	United States

Table A-4: *Innocent Passage* of Warships:
Non-Conforming State Practice in the AAMR [71]

Transport of Hazardous and Ultra-Hazardous Substances

International law regarding the transportation of hazardous and ultra-hazardous substances through the territorial sea of coastal States is in a State of continual development. There is a wide body of international instruments that regulate parts of the transport of such material.[72] However, there are no international agreements or regulations restricting the passage of nuclear powered vessels, oil tankers or the carriage of nuclear weapons, radioactive material or other hazardous cargo through the various maritime zones of jurisdiction. Accordingly, the navigation of such vessels is free and cannot be regulated under article 211 of UNCLOS.[73] Coastal States can, in the territorial sea, require such vessels to confine their passage to sea-lanes, carry documents, and observe precautionary measures.[74] There appears to be a trend towards the recognition of a right of prior notification for transportation of such substances through the territorial sea.[75] Such a right is recognised in the *Basel Convention on the Control of Trans-boundary Movement of Hazardous Waste and their Disposal* in relation to the movement of wastes.[76] Other international instruments,[77] and growing sympathy for coastal State concerns over shipments, suggest a trend towards recognition of such a right.[78] Further support is also argued to stem from the precautionary principle (see below).[79] Table A-5 provides an illustration of the range of State practice in regard to the requirements for transportation of hazardous substances through the territorial sea.

Although UNCLOS does not require that foreign vessels carrying hazardous cargo are to submit to a regime of prior consent, the developing opposition to, and the wide range of protests made against shipments of ultra-hazardous wastes. Prohibitions at the movement of such wastes through State waters, may indicate an emerging regime requiring notice, consultation and assessment.[80]

State	Action Regarding Hazardous Substances
Canada	Claims right of prior notification
Haiti	Prohibits such cargoes
Japan	Opposes both notification and authorisation
Malaysia	Claims right of prior authorisation
Philippines	Prohibits such cargoes
Russian Federation	Opposes both notification and authorisation
Thailand	Opposes both notification and authorisation
United States	Opposes both notification and authorisation

Table A-5: State Practice with Regard to Rights over Ships Carrying Hazardous Cargoes in the Asia-Pacific/Indian Ocean Regions[81]

An emerging principle that may one day govern the transport of ultra-hazardous materials is the *precautionary principle*. This principle requires ocean users to exercise caution where there is scientific uncertainty. However, the principle as yet lacks a defined content and consistency in interpretation, and is present mainly in non-binding international instruments. Such as, the *Rio Declaration on Environment and Development* and *Agenda 21*, indicating that it is still considered mainly as a principle of guidance (rather than 'hard' binding international law). Nevertheless, some writers argue that the principle lays down specific responsibilities, such as, undertaking relevant research, developing non-polluting technologies, notifying a State through which such material shall pass, and consulting with such a State to enable precautions to be taken and avoiding activities that present uncertain risks to the marine environment.[82]

Ship Reporting Systems and Vessel Monitoring Systems

Another emerging issue is whether a coastal State can mandate either a Ship Reporting System (SRS) or Vessel Monitoring System (VMS) in the territorial sea and international straits.

Regulation V/8-1[83] adopted under the *Safety of Life at Sea Convention* authorises the IMO to adopt SRSs. The wording of this Regulation mimics that of Regulation V/8,[84] which requires IMO approval for mandatory routeing systems (though it is doubtful that this Resolution intended to modify the Convention regime, where the final decision rests with the State).[85] Since coastal State jurisdiction on the regulation of maritime traffic is explicitly recognised under UNCLOS the identity of texts may imply unilateral rights over SRSs. Regulation V/8-2[86] allows for VTSs to be mandatory only in the territorial sea, and does not require IMO approval.[87] It has also been argued that a VMS or SRS is justified by the provisions of UNCLOS defining the term *innocent passage* (see above), as a monitoring system would enable a coastal State to ensure compliance with these provisions.[88] However, some doubt exists as to whether coastal States can unilaterally impose such systems within the territorial sea.[89]

Transit Passage through Straits Used for International Navigation and Naval Environmental Compliance

UNCLOS establishes a *sui generis* regime of *transit passage* for straits of international navigation.[90] *Transit passage* is:

> The exercise in accordance with this Part (Part III) of the freedom of navigation and overflight solely for the purpose of continuous and expeditious transit of the strait between one part of the high seas or an exclusive economic zone and another part of the high seas or an exclusive economic zone.[91]

The regime of transit passage is not applicable to straits that have a high sea or EEZ corridor or straits governed by long term agreements.

The most important aspect of the transit passage regime for maritime States is that it is non-suspensible.[92] In contrast with *innocent passage*, it also provides a right of overflight.[93] Marine scientific research and hydrographic survey cannot be undertaken during such passage without the consent of the States bordering the strait.[94]

Straits used for international navigation are of significant strategic importance in the Indian Ocean and Pacific regions. The Straits of Malacca, Singapore, Sunda, Lombok and Ombai-Wetar, located in the eastern part of the Indian Ocean, provide the critical link with the Pacific.[95] The Straits of Hormuz are the most important waterway in the Indian Ocean region, through which the majority of oil and gas supplies are shipped, followed by the Strait of Malacca and Singapore.[96]

The pre UNCLOS position was that *innocent passage* existed in international straits, (ie. those forming a communication between two parts of the high seas) for all ships, including warships.[97] In the *Convention on the Territorial Sea and Contiguous Zone* this was recognised as non-suspensible: there shall be no suspension of innocent passage through straits which are used for international navigation between one part of the high seas and another part of the high sea or the territorial sea of a foreign State.[98] Under the pre UNCLOS regime this right of *innocent passage* does not include a right of overflight, which is governed by other rules of international law (*Chicago Convention on International Civil Aviation, 1944*).[99]

Several ongoing problems remain with regards to the *transit passage* regime through straits used for international navigation.[100] These include:

- The scope of 'routes of similar convenience'.
- The right of warships during transit passage.

Routes of Similar Convenience

Under UNCLOS the regime of *transit passage* does not apply where there is a route through the high seas or through an EEZ in a strait that contains similar convenience in respect of navigational and hydrographical characteristics.[101] *Freedom of navigation* exists in the middle of such a strait. Ships entering the territorial sea within such a strait are subject to the legal regime of *innocent passage*.[102] As the maximum width of the territorial sea is 12nm, such a strait would need to be greater than 24nm to permit *freedom of navigation*.

Of 256 international straits, 60 have such a width. In the Asian region, the Formosa Strait between China and Taiwan is an example of such a strait.[103] Fifty-two straits had a breadth of less than 6nm. As no State claims a territorial sea of less than 3nm, these straits have no high seas passage.[104] Fifty-three Straits are between six and 24nm. Although territorial seas overlap most of these straits, some coastal States claim a territorial sea breadth of less than 12nm such that there still exists a high seas/EEZ route. In the Asian region, such straits include:[105]

- Korea (Tsushima) Strait, West, South Korea/Japan, route 7nm wide.
- Osumi-kaikyo, Japan, route 11nm wide.
- Soya-kaikyo (La Perouse Strait), Japan/Sakhalin, Russia, route 7.7nm wide.
- Tsugaru-kaikyo, Japan, route 4nm wide.

It appears, however, that no routes of 'similar convenience' exist to which this provision could apply.[106] Furthermore, UNCLOS provides no criteria for determining what navigational and hydrographical characteristics should be used.[107] There is also no minimum width for an alternative route.[108] The IMO may play a crucial role in resolving these issues.[109]

Archipelagic Sea Lanes Passage

The legal entity of an archipelagic State and the legal regime of *archipelagic sea lanes passage* (ALSP) constitute important innovations under UNCLOS.[110] UNCLOS allows an archipelagic State to draw straight baselines around the outmost islands of the archipelago, including the main islands of the archipelago. The ratio of the area of water to the area of land must be between 1:1 and 9:1.[111] An archipelagic State has sovereignty over its archipelagic waters that 'extends to the air space over the archipelagic waters as well as the subsoil and the resources contained therein'.[112] Seven of the 14 States of the world claiming archipelagic status (Indonesia, the Philippines, Kiribati, Papua New Guinea, Solomon Islands, Tuvalu and Vanuatu), and one of the potential claimants (Tonga), are situated in the Asia-Pacific region.[113]

The archipelagic State concept is an idiosyncratic one with no basis in history or doctrine, in contrast to the 12nm territorial sea, which has historical antecedents and widespread representative participation in its creation.[114] However, it may be the case that widespread designation, use of, and acquiescence to designated archipelagic sea lanes may see the crystallisation of archipelagic sea lanes passage into customary international law, without a customary definition of an archipelago.[115]

Under UNCLOS, the archipelagic State may designate sea lanes and air routes that are suitable for the continuous and expeditious passage of foreign ships and aircraft through or over its archipelagic waters or adjacent territorial sea.[116] Such lanes are to be 'defined by a series of continuous axis lines' from entry to exit,[117] require the approval of a 'competent international organisation'[118] and should 'include all normal routes used as routes for international navigation or overflight'.[119]

Archipelagic sea lanes passage (ASLP) is defined as the right of navigation or overflight 'between one part of the high seas or exclusive economic zone and another part of the high seas or exclusive economic zone'.[120] Article 54 of UNCLOS incorporates articles 39, 40, 42 and 44 of the *transit passage* regime into the ASLP regime. Use of the designated sea-lanes is mandatory for the exercise of ASLP, although when no such lanes have been promulgated ASLP can still be utilised 'through routes normally used for international navigation'.[121] Archipelagic States can designate traffic separation schemes.[122] Archipelagic States may not suspend or hamper ASLP, in contrast to *innocent passage*.[123]

Ships or aircraft in ASLP must 'operate in the normal mode solely for the purpose of continuous, expeditious and unobstructed passage' and not 'deviate more than 25 nautical miles off the axis lines'.[124] The fact that passage is allowed 'in the normal mode' has been regarded as of particular significance for warships as it allows them to conduct manoeuvres, carry out flying operations and, for submarines, conduct submerged transit.[125] However, the fact that the phrase 'normal mode' is qualified by '*solely* for the purpose of continuous, expeditious and unobstructed passage' (emphasis added) indicates that there are some limits to the extent to which such activities can be undertaken.

Aircraft enjoy the right of overflight through all normal routes that traverse the archipelago, unless sea-lanes have been designated, when overflight is restricted to routes above the sea-lanes.[126]

Concerns over the risks to the marine environment posed by shipping and increased shipping traffic in the Asian region are likely to lead to more extensive regulation at both the international and national levels. One probable result of this is that the freedom of navigation through international straits and archipelagic waters is likely to become more restricted as coastal States seek to extend their control over adjacent waters on environmental grounds.[127]

Naval Environmental Compliance and the Exclusive Economic Zone

The Exclusive Economic Zone (EEZ), which represents one of the major modifications of the freedom of the seas brought about by UNCLOS, remains a developing area. Although the concept of an EEZ is now recognised as customary international law, the content of the rights and duties associated with an EEZ have not yet crystallised into custom, as many States claim powers beyond or different to those contained in the relevant provisions of UNCLOS.[128]

The EEZ gives a coastal State 'sovereign rights' for the purpose of economic exploration and exploitation of the resources of the zone. Despite these ostensible limitations on coastal State jurisdiction, some claim rights beyond this, including prohibiting foreign military uses of the sea. The EEZ, coastal States also have 'jurisdiction' to protect and preserve the marine environment. UNCLOS does not elaborate on the scope of this jurisdiction.

The EEZ cannot extend beyond 200 nautical mile from the baselines used to measure the territorial sea. The EEZ subjects a vast area of what previously constituted the high seas to some form of coastal State jurisdiction and removes the freedoms to fish and conduct scientific research previously granted under the 1958 Conventions.

The EEZ regime ostensibly maintains many aspects of the freedom of the seas by preserving 'the freedoms referred to in article 87 of navigation and over-flight and of the laying of submarine cables and other internationally lawful uses of the sea related to these freedoms, such as those associated with the operation of ships, aircraft and submarine cables and pipelines and compatible with other provisions of this Convention.'[129] Where rights are not allocated, any conflict is to 'be resolved on the basis of equity in light of all the relevant circumstances, taking into account the respective importance of the interests of the parties involved as well as to the international community as a whole'.[130]

UNCLOS is clear on the point that navigation in the EEZ comes under the high seas freedoms. Article 58(1) of UNCLOS provides that:

> In the exclusive economic zone, all States whether coastal or land-locked, enjoy subject to the relevant provisions of this Convention. The freedoms referred to in article 87 of navigation and overflight and of the laying of submarine cables and pipelines. Other internationally lawful uses of the sea related to these freedoms, such as those associated with the operation of ships, aircraft and submarine cables and pipelines and compatible with the other provisions of this Convention.

However, in practice, the high seas freedoms granted in the EEZ are qualified by the sovereign rights of coastal States over the living and non-living resources in the EEZ and by the coastal State's power of pollution control (although warships enjoy sovereign immunity) in the EEZ under Part XII of UNCLOS. Thus, according to Article 58(3) of UNCLOS:

> In exercising their rights and performing their duties under this Convention in the EEZ. States shall have the rights and duties of the coastal State and shall comply with the laws and regulations adopted by the coastal State in accordance with the provisions of this Convention and other rules of international law as far as they are not incompatible with this Part.

Rights for naval exercises in the EEZ are not specifically allocated under UNCLOS. Some States argue that military uses of the EEZ by foreign States is prohibited by Article 58(1) as they are either incompatible with the reservation of the highs seas for peaceful purposes or not 'lawful uses' of the sea.[131]

In relation to non-navigation uses of the sea, the freedom of the seas is reduced in the EEZ in that a coastal State is given exclusive jurisdiction for the construction of artificial islands and installations and structures concerned solely with resource, marine scientific research or environmental purposes, or if such structures may interfere with the exercise of the rights of the coastal State in its EEZ. However, this does not necessarily prohibit the construction of military installations or devices, unrelated to the environment, resources or research.[132]

Navigation on the High Seas

The concept of freedom of the high seas was one of the foundation stones of international law. It is based on the perceived characteristics of ocean space as indivisible and available. With the exception of a narrow belt of territorial sea close to a coastal State, it was impracticable for a State to claim or hold vast expanses of ocean territory. Similarly, until recently, the main uses of the ocean were fishing and navigation, neither of which had an adverse impact on uses of the ocean by other States, largely due to technological limitations. From the twin premises of indivisibility and availability, two conclusions followed:

- The oceans must not be appropriated.
- They should be freely accessible.

These conclusions are the foundation of the 'freedom of the seas', which basically allowed any State free access to or use of the seas, especially for navigation, providing such use did not adversely impinge on the rights of others.

However, technological advance, the growth of populations, national and international environmental consciousness and consequential pressure on food and energy and intensified nationalism of countries have brought about substantial changes in how the seas are regulated. This has resulted in reductions to the premise of freedom of the seas and an increasing reliance on regulation by coastal States and trends, in some geographical and subject matter areas, to international regulation of ocean spaces.

Prior to UNCLOS, the most significant instruments defining the extent of freedom of the seas were the four 1958 Geneva Conventions[133], which were largely reflective of customary international law at the time. Under the 1958 regime, the territorial sea is a belt of water, including air space above and seabed below, adjacent to the coast of a State (although the *Territorial Sea and Contiguous Zone Convention* left the breadth of the territorial sea undefined because of disagreement among States). No 'freedoms of the sea' as such may be exercised by other States within the territorial sea. What other States do enjoy in this zone is the right of *innocent passage*.[134]

Under the 1958 regime, the high seas are the paradigm for the freedom of the seas. No State may validly purport to subject any part of them to sovereignty (indivisibility) and the freedom of the high seas can be exercised by all States (accessibility).[135] The Convention on the High Seas lists four freedoms in a non-exhaustive list of the activities that comprise the 'freedom of the high seas':

- Freedom of navigation.
- Freedom of fishing.
- Freedom of laying submarine cables and pipelines.
- Freedom to fly over the high seas.

These freedoms are not unlimited, but must be 'exercised by all States with reasonable regard to the interests of other States in their exercise of the freedom of the high seas'. The determination as to whether an activity can be categorised as a freedom of the high seas essentially requires a judgment as to whether:

- It involves an attempt to subject part of the seas to sovereignty.
- It is exercisable with reasonable regard to other users.[136]

The *Convention on the High Seas* contains the beginning of limitations on the freedom of the high seas in relation to pollution, including provisions requiring national regulations to prevent the pollution of the seas by oil and by radioactive

waste, radioactive materials and other harmful agents.[137] The trend to limit environmental damage from the exercise of high seas freedoms is also evidenced by the *Convention on Fishing and Conservation of the Living Resources of the High Seas*, which imposes limitations on the freedom of the high seas to fish to exhaustion by requiring States to adopt measures to conserve living resources.[138]

UNCLOS substantially curtailed the traditional concept of freedom of the seas as a result of the impact of the various zones of jurisdiction created. Part VII of the UNCLOS continues the tradition of the high seas, however, the list of high seas freedoms is more extensive than under the 1958 *Convention on the High Seas*. According to Article 87 of UNCLOS, the freedoms of the high seas include:

- Freedom of navigation.
- Freedom of overflight.
- Freedom to lay submarine cables and pipelines (subject to Part VI).
- Freedom to construct artificial islands and other installations (subject to Part VI).
- Freedom of fishing.
- Freedom of scientific research (subject to Part VI and XIII).

Again, no part of the high seas can be subjected to sovereignty and the freedoms must be exercised with due regard to other States in the exercise of their freedoms.[139] However, these high seas freedoms are attenuated by the fact that the area of high seas is greatly reduced due to the expansion of the territorial sea and the creation of archipelagic waters.[140] This has effectively subtracted about 40 percent of ocean space from the high seas as defined under the 1958 *Convention on the High Seas*.[141] The UNCLOS provisions on fishing and pollution control also represent new restrictions on what activities are free from control on the high seas.[142]

UNCLOS purports to reserve the high seas 'for peaceful purposes' and also prohibits the threat or use of force against the territorial integrity or political independence of any State.[143] This raises the question as to whether military uses of the sea, previously encompassed within the freedom of the high seas, are now prohibited. The logical and realistic interpretation, however, is that these articles merely reiterate the customary prohibition on the use of force contained in Article 2(4) of the UN Charter. UNCLOS accepts military activities at sea as a normal fact of life.[144] The existence of warships is accepted and they are granted privileged status. Military activities are listed among those constituted as 'non-innocent'—implying that such activities are lawful outside

the territorial sea. Finally, there is an optional exclusion from compulsory judicial settlement of disputes involving military activities.[145]

In addition to the impact of the various zones of jurisdiction recognised by UNCLOS, special mention needs to be made of the environment as an area of international law having a strong impact on navigation through the various maritime zones of jurisdiction. The influence of this could be seen in 1958 with the provisions of the *Convention on the High Seas* dealing with oil and radioactive waste and the *Convention on the Conservation of the Living Resources of the High Seas*, restricting the high seas freedom to fish. Concern for the environment has resulted in other conventions also, including the *International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties*, the *Convention on the Prevention of Pollution from Ships* and the *London Dumping Convention*. Part XII of UNCLOS also contains extensive provisions on the marine environment. While many of these conventions create an 'enclave' for military uses of the sea, exempting them from the application of the provisions (eg. UNCLOS Article 236), this 'enclave' status may be under threat. There are certainly 'civil society' pressures for military uses of the sea to come under regulation, which is spilling over into State backed pressure.

Diplomatic Clearance Requirements

There is normally no right of entry for warships to foreign internal waters, including ports, under UNCLOS. Standard practice is for a visiting warship to obtain diplomatic clearance prior to making a port call. It is within the power of a Port State to refuse diplomatic clearance to a warship on the basis that it does not meet acceptable construction standards for environmental purposes. It is possible that a Port State could refuse entry to a warship on the basis that it does not comply with MARPOL, even though MARPOL does not apply to warships. There is anecdotal evidence that *HMY Britannia* was not permitted to visit Canadian ports while it lacked a sewage system.

Pollution of the Marine Environment

In relation to the issue of environmental concerns, Article 1(4) of UNCLOS defines pollution of the marine environment as:

> The introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.

The definition of pollution of the marine environment serves as the underpinning concept for many provisions within UNCLOS and provides the basis on which coastal States may stop foreign vessels from passing through territorial waters. For instance, the right of innocent passage is guaranteed by UNCLOS Article 17 except in cases where passage of a foreign ship is prejudicial to the peace, good order or security of the coastal State. Any act of wilful and serious pollution contrary to the provisions expounded in the Convention is considered as an act of a prejudicial nature under Article 19(h).

Also, a coastal State may adopt measures in conformity with UNCLOS and other rules of international law relating to innocent passage through the territorial sea, in respect of the preservation of the environment of the coastal State and the prevention, reduction and control of pollution within the environment of the coastal State (Article 21(1)(f)). Importantly, it must be noted that these measures are not to apply to the design, construction manning or equipment of foreign ships unless they are giving effect to generally accepted international rules or standards under Article 21(2).

As mentioned before, UNCLOS sets up a general duty on the coastal State not to hamper the innocent passage of foreign vessels within territorial seas except in accordance with its provisions. It is clearly stated in Article 24(1)(a) that the coastal State is not to impose requirements on foreign ships, which have the practical effect of denying or impairing the right of innocent passage.

If a warship does not comply with the laws and regulations of the coastal State concerning passage through the territorial sea and disregards any request for compliance, which is made to it, the coastal State may require the vessel to leave the territorial sea immediately under Article 30. Clearly, this means that where certain environmental laws apply to vessels passing through the territorial sea, and the vessels fail to comply with these laws, the coastal State has power to expel the vessel immediately from the area concerned. This right, amongst other exceptions, prevails notwithstanding the general immunities of warships and other government ships operated for non-commercial purposes (Article 32).

Straits used for International Navigation

Ships enjoy the right of transit passage through straits used for international navigation. States bordering straits may adopt laws and regulations relating to transit passage through straits. These measures may relate to the prevention and control of pollution, by giving effect to applicable international regulations regarding the discharge of oil, oily wastes and other noxious substances in the strait (Article 42). It is also a requirement that States and States bordering a

strait should, by agreement, cooperate for the prevention, reduction and control of pollution from ships (Article 43).

Ships in transit passage through archipelagic sea lanes are to comply with generally accepted international regulations, procedures and practices for the prevention, reduction and control of pollution from ships (See reference to Article 39 in Article 54). Moreover, archipelagic States may generally adopt laws and regulations relating to transit passage through archipelagic areas for the prevention, reduction and control of pollution, by giving effect to applicable international regulations regarding the discharge of oil, oily wastes and other noxious substances in archipelagic areas.

Coastal States have sovereign rights, within the EEZ, for the purpose of conserving and managing the natural resources of waters, whether living or non-living (Article 56(1)(a)). Clearly, the right to conserve and manage entails the right to bring about measures for the prevention and control of pollution, if such pollution affects the natural resources of waters. In addition, it is stipulated that the coastal State has jurisdiction, as provided for in the relevant provisions of the Convention, with regard to the 'protection and preservation of the marine environment' (Article 56(1)(b)(iii)). The rights given to coastal States must be exercised with due consideration of the rights and duties of other States, acting in a manner compatible with the provisions of this Convention (Article 56(1)(b)(iii)). Further, coastal State legislation pursuant to its sovereign rights must be in conformity with UNCLOS.

Protection and Preservation of the Marine Environment – General Provisions

Part XII of UNCLOS is dedicated specifically to the issue of the protection and preservation of the marine environment. Importantly, it begins by setting up a general obligation on States to protect and preserve the marine environment (Article 192).

The Convention goes on to outline the measures, which must be taken to prevent, reduce and control pollution of the marine environment. In particular, it broadly provides that States are to take, individually or jointly as appropriate, all measures consistent with the Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities. States are to endeavour to harmonise their policies in this connection (Article 194(1)). In addition, States are to take all measures necessary to ensure that activities under their jurisdiction or control

are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control do not spread beyond the under their jurisdiction in accordance with the Convention (Article 194(2)).

Measures undertaken under by States to protect the marine environment are to generally deal with all sources of pollution of the marine environment. Under Article 194(3) such measures are to be designed in such a way so as to minimise, to the fullest possible extent, the following:

- The release of toxic, harmful or noxious substances, especially those which are persistent, from land-based sources, from or through the atmosphere, or by dumping.
- Pollution from vessels, in particular measures for preventing accidents and dealing with emergencies, ensuring the safety of operations at sea, preventing intentional and unintentional discharges, and regulating the design, construction, equipment, operation and manning of vessels.
- Pollution from installations and devices used in exploration or exploitation of the natural resources of the seabed and subsoil, in particular measures for preventing accidents and dealing with emergencies, ensuring the safety of operations at sea, and regulating the design, construction, equipment, operation and manning of such installations or devices.
- Pollution from other installations and devices operating in the marine environment, in particular measures for preventing accidents and dealing with emergencies, ensuring the safety of operations at sea, and regulating the design, construction, equipment, operation and manning of such installations or devices.

Importantly, UNCLOS also states that in taking measures regarding pollution of the marine environment, States are to refrain from unjustifiable interference with activities carried out by other States in the exercise of their rights and in pursuance of their Convention duties (Article 194(4)). Measures taken in accordance with Part XII are to include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life (Article 194(5)). UNCLOS also points out that in taking measures to prevent, reduce and control pollution of the marine environment, States have a duty to act in such a way so as not to transfer, directly or indirectly, damage or hazards from one area to another, or transform one type of pollution into another (Article 195).

Article 196 provides that States are to take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction or control, or the intentional or accidental introduction of species, alien or new, to a particular part of the marine environment, which may cause significant and harmful changes to the environment.

UNCLOS Article 210(1) requires States to adopt laws and regulations to prevent, reduce and control pollution of the marine environment by dumping. Also, Article 210(2) requires States to take measures as may be necessary to prevent, reduce and control such pollution. The laws, regulations and measures are to ensure that dumping is not carried out without the permission of the competent authorities of States (Article 210(3)). States, acting especially through competent international organisations or diplomatic conference, are to attempt to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control such pollution. These rules, standards and recommended practices and procedures are to be re-examined from time to time when necessary (Article 210(4)).

Dumping within the territorial sea and the EEZ or onto the continental shelf is not to be undertaken without the express prior approval of the coastal State. The coastal State has the right to permit, regulate and control such dumping after due consideration of the matter with other States which by reason of their geographical situation may be adversely affected by the activity (Article 210(5)). Lastly, domestic measures regulating dumping are to be no less effective in preventing, reducing and controlling pollution through dumping than the international rules and standards (Article 210(6)).

Pollution from Vessels

It is incumbent on States, acting through the competent international organisation or general diplomatic conference, to establish international rules and standards to prevent, reduce and control pollution of the marine environment from vessels. In addition, States are to promote the adoption, in the same manner, wherever appropriate, of routeing systems designed to minimise the threat of accidents that might cause pollution of the marine environment. In particular, States are to adopt measures, at least having the same effect as generally accepted international measures, for the prevention, reduction and control of pollution of the marine environment from vessels flying their flag or of their registry (Article 211(2)).

If measures taken in regards to an area are considered inadequate to deal with the special needs of the area, and the coastal State has reasonable grounds to believe that special mandatory measures are to be taken for the area, then, after due consultation with the competent organization (IMO), the area will be termed a 'special area'. Special areas have specific requirements for the prevention, reduction and control of pollution (Article 211(6)). Such requirements may relate to discharges or navigational practices but are not to require foreign vessels to observe design, construction, manning or equipment standards other than generally accepted international rules and standards (Article 211(6)(c)).

Under Article 211(3), States are to give due publicity to measures or requirements taken by States for the prevention, reduction and control of pollution of the marine environment as a condition for the entry of foreign vessels into their ports or internal waters or for a call at their off-shore terminals. These measures must be communicated with the competent international organisation. Coastal States may, in the exercise of their sovereignty within their territorial sea, adopt laws and regulations for the prevention, reduction and control of marine pollution from foreign vessels, including vessels exercising the right of innocent passage. Such laws and regulations are not to hamper innocent passage of foreign vessels (Article 211(4)). Measures may also be adopted by coastal States for the purpose of enforcement in respect of their EEZ (Article 211(5)).

Protection and Preservation of the Marine Environment – Enforcement

States are also to adopt laws and regulations and take other measures necessary to implement applicable international rules and standards established through competent international organisations or diplomatic conferences. These international rules and standards are to prevent, reduce and control pollution of the marine environment arising from or in connection with seabed activities subject to their jurisdiction and from artificial islands, installations and structures under their jurisdiction (Article 214).[146]

In relation to the enforcement of pollution by dumping, Article 216 States that laws and regulations adopted in accordance with the Convention, and applicable international rules and standards established through competent international organisations or diplomatic conferences are to be enforced by:

- The coastal State with regard to dumping within its territorial sea or EEZ or onto its continental shelf.
- The flag State with regard to vessels flying its flag or vessels or aircraft of its registry.

- By any State with regard to acts of loading of wastes or other matter occurring within its territory or at its offshore terminals.

UNCLOS also provides for Port State enforcement powers: When a vessel is voluntarily within a port or at an offshore terminal of a State, that State may undertake investigations and, where the evidence warrants, institute proceedings in respect of any discharge from that vessel outside the internal waters, territorial sea or EEZ of that State. This discharge must be in violation of applicable international rules and standards established through the competent international organisation or general diplomatic conference (Article 218(1)). This gives port States the broad power to prosecute those responsible for causing pollution within State waters and even areas adjacent to the EEZ of the State.

Article 219 of UNCLOS provides that where a vessel is in violation of applicable international rules and standards relating to seaworthiness of vessels, and as a result, threatens to damage the marine environment, a State may take administrative measures to prevent the vessel from sailing. A State may permit the vessel to proceed only to the nearest appropriate repair yard and, upon removal of the causes of the violation, is to permit the vessel to continue immediately.

When a vessel is voluntarily within a port or at an offshore terminal of a State, that State may generally institute proceedings in respect of any violation of its laws and regulations adopted in accordance with the Convention or applicable international rules and standards for the prevention, reduction and control of pollution from vessels when the violation has occurred within its territorial sea or EEZ (Article 220(1)).

Physical inspection may be undertaken where there is a clear basis for believing that a vessel, navigating in the territorial sea of a State, has violated laws and regulations of that State adopted in accordance with the Convention or applicable international rules and standards for the prevention, reduction and control of pollution from vessels. Additionally, where the evidence so warrants, the State may institute proceedings, including detention of the vessel, in accordance with its laws.

A State may request information from a vessel regarding its identity and port of registry, the last and next port of call, and other relevant information, where there are clear grounds for believing that a vessel navigating in the EEZ or the territorial sea of the State has, in the EEZ, committed a violation of applicable international rules and standards for the prevention, reduction and

control of pollution from vessels (Article 220(3)). Flag States are to take measures to ensure that vessels flying their flag comply with such requests for information (Article 220(4)). If a vessel has provided false information or has refused to give information requested by a State, the State has the power to undertake physical inspection of the vessel for matters relating to the violation (Article 220(5)).

Proceedings may be instituted by a coastal State if there is clear, objective evidence that a vessel navigating in the EEZ or the territorial sea of a State has, in the EEZ, committed a violation resulting in a discharge causing major damage or threat of major damage to the coastline or related interests of the State, or to any resources in its territorial sea or EEZ (Article 220(6)).

The right of States to take and enforce measures beyond the territorial sea proportionate to the actual or threatened damage to protect their coastline or related interests from pollution or threat of pollution following upon a maritime casualty or related acts, is not prejudiced by the provisions of Part XII dealing with the protection and preservation of the marine environment. Measures to protect coastal State interests may only be taken when it is reasonably expected that a maritime casualty or related acts are likely to result in major harmful consequences (Article 221(1)). Maritime casualty is defined as collision of vessels, stranding or other incident of navigation, or other occurrence on board a vessel or external to it resulting in material damage or imminent threat of material damage to a vessel or cargo (Article 221(2)).

MARPOL

The *International Convention for the Prevention of Pollution from Ships* (MARPOL) is the main international convention dealing with vessel-sourced pollution, both accidental and that occurs during a ship's normal operations. MARPOL establishes the international rules and standards referred to in UNCLOS concerning vessel-based sources of marine pollution (Articles 194, 211, 218, 220). MARPOL replaced the 1954 *Convention for the Prevention of Pollution of the Sea by Oil* and was adopted on 2 November 1973. It was subsequently modified by the *Protocol Relating to the International Convention for the Prevention of Pollution from Ships 1978 (Protocol I)* which was adopted on 17 February 1978. MARPOL entered into force generally on the 2nd of October 1983. States that ratify the Protocol must also give effect to the provisions of the Convention. Thus, the Protocol and the Convention should be read as one instrument.

Summary of MARPOL Provisions

MARPOL imposes a general obligation to give effect to both its provisions and annexes so as to prevent the pollution of the marine environment by harmful substances or effluents (Article 1). Article 3 regulates ships of Parties on all areas of the ocean. Any violation of the Convention within the jurisdiction of any Party to the Convention is punishable either under the law of that Party or under the law of the flag State vide Article 4.[147]

Annex	Category of Pollutant	Entry into force (International)	Entry into force (Domestic)	Number of Contracting States	Percent World Tonnage
A	B	C	D	E	F
I	Oil	2 October 1983	14 January 1998	119	95.90
II	Noxious liquid substances	2 October 1983	14 January 1988	119	95.90
III	Harmful substances in packaged forms	1 July 1992	10 January 1995	100	81.46
IV	Sewage	Not yet in force	Not yet in force	84	46.34
V	Garbage	31 December 1988	14 November 1990	104	87.86
VI (Protocol of 1997)	Air Pollution	Not yet in force	Not yet in force	4	14.05

Table A-6: Applicability of MARPOL annexes[148]

MARPOL establishes both the operative framework and the scope of the Convention, while its six annexes cover regulations that are designed to achieve the prevention of pollution from ships. Each Annex relates to particular noxious substances and sets up a regime prohibiting, preventing and regulating the discharge of the particular substances, according to its toxicity and to the proximity of the ship to land. It is mandatory that ratifying States accept Annexes I and II, while acceptance of all other Annexes is optional.

Protocol I introduced stricter regulations for ships and stipulates that a ship may be cleared to operate only after surveys and the issuing of an International

Oil Pollution Prevention (IOPP) Certificate. With the exception of very small vessels, ships engaged on international voyages must carry on board valid international certificates that may be accepted by foreign ports as prima facie evidence that the ship complies with the requirements of the Convention.[149]

The six annexes relate to different categories of pollutant. The nature of the pollutant dealt with by each annex and the entry into force of each Annex at international and domestic levels are detailed at Table A-6: Annexes I, II, III and V have entered into force internationally. Annexes IV and VI have not yet entered into force. Eighty-four parties have accepted Annex IV representing 43.44 percent of the world's tonnage. Annex VI, air pollution from ships, has been accepted by only four parties that constitute 14.05percent of the world's tonnage. Annexes IV and VI will only enter into force 12 months after the acceptance by at least 15 parties of the Convention with not less than 50percent of the gross tonnage of the world's merchant shipping fleet.[150] In an effort to address aspects that might be slowing the entry into force of Annex IV, the text of the Annex is under review by the IMO.[151]

Annex I: Regulations for the Prevention of Pollution by Oil[152]

Annex I, which entered into force on 2 October 1983, predominantly maintains the oil discharge criteria prescribed in the 1969 amendments to the 1954 *Oil Pollution Convention*. It provides that operational discharges of oil are allowed only when all of the following conditions are met:

- The total quantity of oil which a tanker may discharge in any ballast voyage whilst under way must not exceed 1/15,000 of the total cargo carrying capacity of the vessel.
- The rate at which oil may be discharged must not exceed 60 litres per mile travelled by the ship.
- No discharge of any oil whatsoever must be made from the cargo spaces of a tanker within 50 miles of the nearest land.

Moreover, an oil record book must be kept. This book must record the movement of cargo oil and residues from loading to discharging on a tank-to-tank basis.

Besides various technical guidelines, Annex 1 contains the concept of 'special areas' which are considered to be vulnerable to pollution by oil. The Mediterranean Sea, the Black Sea, and the Baltic Sea, the Red Sea and the Gulfs area are designated as these 'special areas'. Discharges of oil within them have been completely prohibited, with minor well-defined exceptions.

A number of changes have been introduced to Annex I since its inception. The major changes have been brought about by the 1978 Protocol and the 1992 amendments to Annex I, which require that vessels must adopt design features that protect cargo in the event of a collision or grounding. For example, Annex I now requires that oil tankers have segregated ballast tanks and crude oil washing equipment. These changes have been significantly responsible in bringing about the documented decline in pollution by oil tankers.[153]

Annex II: Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk[154]

Annex II, which entered into force on 6 April 1987, outlines the discharge criteria and measures for the control of pollution by noxious liquid substances carried in bulk. It subdivides substances and contains detailed operational standards and procedures with respect to the movement of these substances. Some 250 substances were evaluated and included in the list appended to the Convention. The discharge of their residues is allowed only to reception facilities until certain concentrations and conditions (which vary with the category of substances) are compiled with. In any case, no discharge of residues containing noxious substances is permitted within 12 miles of the nearest land. More stringent restrictions apply to 'special areas'.

Annex III: Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form[155]

Annex III, which entered into force on 1 July 1992, contains general requirements for the issuing of detailed standards on packing, marking, labelling, documentation, stowage, quantity limitations, exceptions and notifications for preventing pollution by harmful substances. This Annex should be implemented through the International Maritime Dangerous Goods (IMDG) Code, which has been amended to include marine pollutants. The amendments entered into force on 1 January 1991.

Annex IV: Regulations for the Prevention of Pollution by Sewage from Ships[156]

Annex IV, which will enter into force in September 2003, details requirements to control pollution of the sea by sewage from ships. Specifically, it provides that the discharge of sewage is prohibited unless:

- The ship discharges disinfected sewage in a manner approved by the Convention at a distance of more than 4nm from the nearest land.

- In cases where the sewage is not disinfected, sewage is discharged at a paced rate at a distance of more than 12nm from the nearest land.

The above, however, does not apply when the discharge is necessary for the sake of saving lives or when the discharge occurs as a matter of mitigating the incidence of a larger escape.

Annex V: Regulations for the Prevention of Pollution by Garbage from Ships[157]

Annex V, which entered into force on 31 December 1988, regulates the disposal of different types of garbage into the sea. Generally, the disposal into the sea of garbage must be conducted at a specified distance from land in a way provided for by the provisions of the Annex. However, a total ban is imposed on the disposal of any form of plastic into the sea. The general requirements given for the disposal of garbage are much stricter in a number of 'special areas'. For example, countries which border these 'special areas' must undertake to ensure, in an efficient and timely way, that adequate reception facilities are provided in accordance with the provisions of the Annex. Exceptions to the requirements apply when the discharge is necessary for the sake of saving lives, when the discharge occurs as a matter of mitigating the incidence of a larger escape or when the discharge is accidental, but when reasonable precautions were taken to avoid the accident.

Annex VI: Regulations for the Prevention of Air Pollution from Ships[158]

Annex VI, which has not yet entered into force, contains requirements to control air pollution from ships. Annex VI will enter into force 12 months after being ratified by 15 States whose combined fleet of merchant ships constitute at least 50 percent of the world fleet. Presently, four contracting States have ratified Annex VI, which merely constitutes 14.3 percent of the world tonnage.

The Annex outlines guidelines and provisions for the emission of different substances and specifies the requirements for the testing, survey and certification of marine diesel engines to ensure they comply with the NOx limits. For instance, when the provisions of the Annex come into force, they will prescribe limits on the emission of sulphur oxide and nitrogen oxide emissions from ship exhausts and will prohibit deliberate emissions of ozone depleting substances.

Amendments to Annex VI are made regularly. Generally, these amendments are intended to facilitate the implementation of annexes, extend the concept

of 'special areas', establish more sea areas as 'special areas', replace list of substances, design new construction standards for ships, precise reporting requirements and reduce the amount of oil which can be discharged into the sea from ships. The conference which adopted Annex VI has also adopted a resolution to invite the IMO's Marine Environment Protection Committee (MEPC) to identify any further impediments to entry into force of the Annex, if the conditions for entry into force have not been met by 31 December 2002.

Synopsis of Operation of MARPOL

Main Organs[159]

The main organs of the MARPOL system are broken down into: (a) political decision-making bodies, and (b) scientific/technical decision-making bodies. These are outlined in more detail below.

Political decision-making bodies

International Maritime Organisation (IMO)

In 1948 an international conference in Geneva adopted a convention formally establishing IMO (the original name was the Inter-Governmental Maritime Consultative Organisation, or IMCO, but the name was changed in 1982 to IMO).

The IMO Convention entered into force in 1958 and the new Organisation met for the first time the following year. The purposes of the Organisation, as summarised by Article 1(a) of the Convention, are:

- To provide machinery for cooperation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade.
- To encourage and facilitate the general adoption of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and prevention and control of marine pollution from ships.

The Organisation is also empowered to deal with administrative and legal matters related to these purposes. The IMO currently comprises 162 member States.

Maritime Environment Protection Committee (MEPC)

The MEPC, which consists of all member States of the IMO, was established as a main forum for activities relating to the Convention. It is responsible for coordinating work with other IMO conventions and with UN Environment Program (UNEP) conventions such as the 1989 Basel Convention. The MEPC meets biannually and is empowered to consider any matter within the scope

of IMO concerned with prevention and control of pollution from ships. In particular it is concerned with the adoption and amendment of conventions and other regulations and measures to ensure their enforcement. The MEPC was first established as a subsidiary body of the Assembly in 1973 and was raised to full constitutional status in 1985. NGOs which have granted consultative status with IMO and IGOs that have concluded agreements of cooperation with IMO are also represented at MEPC sessions.

Conference of the Parties

Article 16(3) of the Convention provides that an amendment to the Convention may be made by a conference of the parties where requested by one party and supported by a one-third majority of the Parties.

Scientific/technical decision-making bodies

Sub–Committees on Bulk Liquids and Gases and Flag State Implementation are considered important subsidiary bodies of the MEPC, however, the MEPC can also refer issues it considers appropriate to the other IMO sub-committees.

Implementation Milestones[160]

An important and effective procedure in implementing provisions of MARPOL, developed by the IMO in the early 1970s, has been the tacit acceptance procedure. Under this system, an amendment to an IMO treaty enters into force on a date selected unless it is rejected by a specified number of Contracting Parties (typically one-third or by Parties whose merchant fleets represent at least 50 percent of world merchant tonnage). Amendments that serve to improve implementation or build upon existing annexes have eventuated as a result of the operation of this procedure.

The 1984 (Annex I) amendments

The 1984 amendments were adopted on 7 September 1984 and entered into force on 7 January 1986 (through tacit acceptance). These amendments were introduced, not only to improve existing provisions, but also to make implementation of the provisions more efficient and effective. Existing provisions were improved by introducing requirements that were designed to prevent oily water being discharged in special areas. Discharge of oily substances in 'special areas' were now to be conducted using special equipment and specified procedures because of the special environmental problems particular to these areas. [161] However, in some cases provisions were eased, provided that various conditions were met: some discharges were now permitted below the waterline, for example, which helps to cut costs by reducing the need for extra piping.

The 1985 (Annex II) amendments

The 1985 amendments were adopted on 5 December 1995 and entered into force on 6 April 1987. One of the significant effects of these amendments was to make the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) mandatory for ships built on or after 1 July 1986. This is important because the Annex itself is concerned only with discharge procedures—the Code contains carriage requirements. The Code was revised to take account of anti-pollution requirements and therefore make the amended Annex more effective in reducing accidental pollution

The 1991 (Annex I) amendments

The 1991 amendments, which were adopted on 4 July 1991 and entered into force on 4 April 1993, added a new chapter IV to Annex I, requiring ships to carry an oil pollution emergency plan.

The 1992 (Annex I) amendments

The 1992 amendments were adopted on 6 March 1992 and entered into force on 6 July 1993. Introduced the requirement that tankers must adopt or endeavour to reasonably adopt, design and construction standards, which provide a designated level of protection against oil pollution in the event of a collision or stranding. Also, the level of oil permitted to be discharged into the sea was significantly reduced.

The 1994 amendments

The 1994 amendments, which were adopted on 13 November 1994 and entered into force on 3 March 1996, involve four of the Convention's five technical annexes (II III, V, and I) and are all designed to improve the way it is implemented. They make it possible for ships to be inspected when in the ports of other Parties to the Convention to ensure that crews are able to carry out essential shipboard procedures relating to marine pollution prevention.

The Protocol of 1997 (Annex VI – Regulations for the Prevention of Air Pollution from Ships)

The 1997 protocol was adopted on 26 September 1997 and will enter into force 12 months after being accepted by at least 15 States with not less than 50percent of world merchant shipping tonnage. The Protocol was adopted at a Conference held from 15 to 26 September 1997 and adds a new Annex VI on Regulations for the Prevention of Air Pollution from Ships to the Convention. This Annex, upon entry into force, will set limits on sulphur oxide (SOx) and nitrogen

oxide (NOx) emissions from ship exhausts and prohibit deliberate emissions of ozone depleting substances. It will serve to further tighten the regime for control of ship-sourced marine pollution.

The requirements established by this Annex are in accordance with the Montreal Protocol of 1987, as amended in London in 1990. Under the Montreal States agreed to cut CFC consumption and production in order to protect the ozone layer.

The 2001 (Annex I) amendments

The 2001 amendments, which were adopted on 27 April 2001 and entered into force on 1 September 2002, set a new global timetable for accelerating the phase-out of single-hull oil tankers. The timetable will see most single-hull oil tankers eliminated by 2015 or earlier. Double-hull tankers offer greater protection for the environment from pollution in certain types of accident. All new oil tankers built since 1996 are required to have double hulls.

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

The Convention on the Prevention of Marine Pollution by Dumping was adopted on 29 December 1972 in London, Mexico City, Moscow and Washington, D.C., and entered into force on 30 August 1975. The key objective of this Convention is to promote the effective control and management of all sources of marine pollution. Specifically, it aims to control pollution, which creates hazards to human health, harms living resources and marine life, damages amenities, and interferes with other legitimate uses of the sea. It also encourages regional agreements supplementary to the Convention. It provides that Parties to the Convention are to take effective measures to prevent pollution of the marine environment brought about by dumping at sea (Articles 1, 2).

Dumping is defined as any deliberate disposal at sea of wastes or other matter from vessels or any other man-made structures as well as the vessels or other man-made structures themselves (Article 3). Notably, the difference between MARPOL and the London Convention, is that the former deals with technical aspects of operational and accidental discharges whilst the latter deals with the control and management of dumping at sea. Also, the London Convention provides for the management of pollution arising from exploration and exploitation of seabed mineral resources.

'Black and grey list' Approach

Broadly speaking, the London Convention establishes a 'black and grey list' approach to the management of wastes, which then may be considered for disposal at sea according to the hazard they present to the environment (See Article 4). Dumping of substances or materials falling within the black list is prohibited. Dumping of the grey-listed materials requires a special permit from a designated national authority under strict control and provided certain specifications are satisfied. Materials not falling within either list may be dumped after a general permit has been issued. These 'lists' are contained within the three Annexes to the Convention: dumping of matter listed in Annex I is prohibited (black list), dumping of matter listed in Annex II is allowable only by special permit (grey list); dumping of matter listed in Annex III is allowable only by general permit.

Exceptions

Exceptions to complying with the provisions of the London Convention apply where an imminent danger to human life or vessel or other man-made structures at sea exists. Dumping may occur in these circumstances if it is the only way of averting the danger or threat and where there is every probability that the damage consequent upon such dumping will be less than would otherwise occur. Such dumping is to be conducted so as to minimise the likelihood of damage to human or marine life and must be reported to the IMO (Article 5). Additionally, the London Convention provides for exempted vessels. For instance, the provisions of the Convention do not apply to ships and vessels entitled to sovereign immunity under international law (Article 7). So, any dumping from warships or ships operated by a State for non-commercial government service does not require prior permission. Nonetheless, the manner in which the military or State-operated vessel and aircraft act must be consistent with the provisions of the Convention and must be notified to the IMO.

Designated National Authority

A designated national authority is to issue special permits under Annex II to the Convention. In addition to this responsibility, the Authority must also issue general permits for the dumping of all other matter; keep records of the matter to be dumped and the way in which the dumping occurs; and monitor individually, or in collaboration with other Parties and competent international organisations, the condition of the seas for the purposes of the Convention (Article 6).

Support to Other Parties

The Convention gives some scope to Contracting Parties in the implementation of the measures relating to the scientific, technical and economic capabilities of the State. In this instance, those Contracting States that enjoy a high level of scientific, technical and economic capability (in most cases, industrialised and developed countries) are encouraged to give assistance to less capable Parties (developing countries) in promoting the spirit of the Convention (Article 9).

Liability, Settlement of Disputes and Measures for Protection of the Environment

State parties must also undertake to develop procedures for the assessment of liability and the settlement of disputes regarding dumping (Article 10). Contracting Parties also pledge themselves to promote, within competent specialised agencies and other international bodies, measures to protect the marine environment against pollution caused specifically by:

- Hydrocarbons, including oil, and their wastes.
- Other noxious or hazardous matter transported by vessels for purposes other than dumping.
- Wastes generated in the course of operation of vessels, aircraft, platforms and other man-made structures at sea.
- Radio-active pollutants from all sources, including vessels.
- Agents of chemical and biological warfare.
- Wastes or other matter directly arising from, or related to the exploration, exploitation and associated off-shore processing of sea-bed mineral resources.

Parties are also to promote, within the appropriate international organisation, the codification of signals to be used by vessels engaged in dumping (Article 12).

1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972

This Protocol was adopted on 7 November 1996 and will enter into force thirty (30) days after ratification by 26 States, of which 15 must be Contracting parties to the 1972 London Convention. As at 31 July 2002, 16 parties overall have ratified the Convention, which constitute approximately 10.65 percent of the world's tonnage.

Unlike other protocols, which are generally subsidiary instruments to conventions, the 1996 Protocol is a separate, free-standing instrument. States, which are not parties to the London Convention, may become parties to the 1996 Protocol without first becoming a party to the London Convention 1972. Once the Protocol comes into force, there will be an indefinite parallel application of the London Convention 1972 and the 1996 Protocol regime by those States which are Parties to either instruments.

The Protocol to the London Convention represents a major change of approach to the issue of how to regulate the use of the sea as a depository for waste materials. Rather than listing prohibited substances for dumping, it creates a list of materials that may be dumped, prohibiting the dumping of all materials not falling within the list. So, the Protocol takes a much more restrictive stance on dumping that the original Convention. However, it retains the objectives and essential measures provided for by the Convention to prohibit dumping at sea; being mindful of developments in technology for waste management that have developed over the years, along with those anticipated for the future.

Annexes of the Protocol

The 1996 Protocol has 29 Articles and the following three annexes:

- Annex I covers `Wastes or Other Matter That May Be Considered For Dumping'.
- Annex 2 covers 'Assessment of Wastes or Other Matter That May Be Considered For Dumping'.
- Annex 3 is on 'Arbitral Procedure' for the establishment of an Arbitral Tribunal at the request of the Parties in dispute.

Precautionary Approach

One of the key innovations in the Protocol is the introduction of what is known as the 'precautionary approach' (Article 3). This requires that appropriate preventative 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 to prove a causal relation between inputs and their effects. Moreover, the Protocol requires that the polluter should generally bear the cost of pollution. It stresses the fact that Contracting Parties should ensure that the Protocol should not simply result in pollution being transferred from one part of the environment to another.

Measures for Dumping

As briefly canvassed before, the Protocol establishes a list of materials/substances which may be discharged at sea, this list being kept to a minimum. Specifically, Article 4 States that Contracting Parties 'shall prohibit the dumping of any wastes or other matter with the exception of those listed in Annex 1.' Substances listed in Annex 1 are:

- Dredged material.
- Sewage sludge.
- Fish waste or material resulting from industrial fish processing operations.
- Vessels and platforms or other man-made structures at sea.
- Inert, inorganic geological material.
- Organic material of natural origin.
- Bulky items primarily comprising iron, steel, concrete and similar non-harmful materials for which the concern is physical impact and limited to those circumstances, where such wastes are generated at locations, such as small islands with isolated communities, having no practicable access to disposal options other than dumping.

Notably, though the Protocol accepts the dumping of materials/substances falling within Annex 1, this does not itself mean that the activity of dumping remains unregulated. A permit is first required to undertake such an activity. Moreover, a lengthy, detailed description of the assessment procedures for wastes or other matters is provided for in Annex 2 of the Protocol. Also, all assessments and evaluation are to include screening for potential effects that the candidate waste might have on human health and the marine environment. Contracting Parties are also to adopt administrative or legislative measures to ensure that issuance of permits and permit conditions comply with provisions of Annex 2.

The 1996 Protocol has done away with the concept of black and grey lists under the London Convention 1972. Also, the Protocol reiterates the Convention's provisions that all material dumped must not pose a serious obstacle to fishing or navigation. Significantly, the Protocol discourages as far as possible any dumping at sea. Incineration at sea for the deliberate disposal of waste or other matter via thermal destruction is prohibited (Article 5). Environmentally preferable land-based alternatives are encouraged in order to avoid unwanted disposal of wastes or other matter at sea (Article 4).

Exemptions

The only exemptions made to the measures established for dumping are in cases of *force majeure* or in circumstances where there is danger to human health or a real threat to vessels, aircraft, platforms or other man-made structures at sea. The Contracting Party may issue an emergency permit for the dumping of substances on the Annex 1 list, or for the incineration of wastes or other matter. Notwithstanding those provisions, the Contracting Party may waive its right to issue emergency permits at the time of, or subsequent to, becoming a Party to the Protocol.

Designated National Authority

Again, a designated national authority is to issue permits for materials/substances listed under Annex 2 to the Convention. Other responsibilities incumbent on this authority include the keeping of records of pertinent details relating to the material/substance being dumped and monitoring the condition of the sea for the purposes of the Protocol. State Parties are required to submit reports to the IMO on these things and other such issues as the administrative and legislative measures adopted by a State Party and whether or not these measures have been effective (Article 9).

Support to Other Parties

The Protocol extends the issues on which Parties may request support or assistance. Such issues include:

- Training of scientific and technical personnel for research, monitoring and enforcement.
- Advice on implementation of the Protocol.
- Information and technical co-operation relating to waste minimisation and clean production processes.
- Information and technical cooperation relating to the disposal and treatment of waste and other measures to prevent, reduce and where practicable eliminate pollution caused by dumping.
- Access to and transfer of environmentally sound technologies and corresponding know-how, on favourable terms, as mutually agreed, taking into account the need to protect intellectual property rights as well as the special needs of developing countries and countries in transition to market economies.

Compliance Time-limit

A key provision is the so-called transitional period (Article 26) which allows new Contracting Parties to phase in compliance with the Protocol over a period of five years. This provision is supported by extended technical assistance provisions.

International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention)

The *International Convention on the Control of Harmful Anti-fouling Systems on Ships* was adopted by the IMO in October 2001. The Convention will enter into force 12 months after 25 States representing 25 percent of the world's merchant shipping tonnage have ratified it. There are currently no signatories to the AFS Convention. The main objective of this Convention is to prohibit the use of harmful organotins in anti-fouling paints used on ships. Moreover, the Convention will establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.

Ships of 400 gross tonnage and above engaged in international voyages (excluding fixed or floating platforms, Floating Storage Units (FSUs) and Floating Production Storage Off-take Units (FPSOs)) will be required to undergo an initial survey before the ship is put into service or before the International Anti-fouling System Certificate is issued for the first time, and a survey when the anti-fouling systems are changed or replaced. Ships of 24 metres or more in length but less than 400 gross tonnage engaged in international voyages (excluding fixed or floating platforms, FSUs and FPSOs) will have to carry a Declaration on Anti-Fouling Systems signed by the owner or authorised agent. The Declaration will have to be accompanied by appropriate documentation such as a paint receipt or contractor invoice.

Annex 1 of the Convention provides that by 1 January 2003, all ship are not to apply or re-apply organotins compounds which act as biocides in anti-fouling systems. It is envisaged that by 1 January 2008 ships either:

- Shall not bear such compounds on their hulls or external parts or surfaces.
- Shall bear a coating that forms a barrier to such compounds leaching from the underlying non-compliant anti-fouling systems. This applies to all ships (including FSUs and FPSOs).

The Convention also provides for the establishment of a technical group, to include people with relevant expertise, to review proposals for other substances used in anti-fouling systems to be prohibited or restricted. Article 6 dealing with the process for proposing amendments to controls on anti-fouling systems

sets out how the evaluation of an anti-fouling system should be carried out. Importantly, amongst the resolutions adopted by the Conference dealing with this Convention was Resolution 3. This resolution is about the approval and test methodologies for anti-fouling systems on ships. It invites State parties to approve, register or license anti-fouling systems applied in their territories. In addition, it urges States to continue the work, in appropriate international fora, for the harmonisation of test methods and performance standards for anti-fouling systems containing biocides. This resolution goes a long way in promoting the coordination of mechanisms for the monitoring and control of anti-fouling systems, urging proactive responses by State parties to the issues at hand.

Emerging Issues Considered by the IMO

Access for Inspections[162]

The Sub-Committee has decided to draft a MSC resolution for the adoption of technical provisions for means of access for inspections. These provisions would be made compulsory under the SOLAS provisions dealing with access to and within spaces in the cargo area of oil tankers and bulk carriers. Under this regulation, space would need to be provided within the cargo area so as to enable a permanent means of access for inspections and thickness measurements of the ship's structures. These inspections are carried out by the Administration, the Company, as defined in regulation IX/1 and the ship's personnel and others as necessary. The regulation would apply to new oil tankers of 500 gross tonnage and over and bulk carriers of 20,000 gross tonnage and over, constructed on or after a date to be decided.

With regard to oil tankers, the Sub-Committee recognised that a means of access to the overhead structure was required for detecting corrosion as well as fatigue cracks. Moreover, the most critical area for fatigue cracks was at the transverse bulkheads where the relative deformation is largest. It was considered that rafting is the most practical means of access for close-up surveys and thickness measurements of the overhead structure of tanks, provided the depth of the deck transverse webs is less than 1.5 metres. In relation to bulk carriers, it was decided that hold frames represent the most vulnerable structure. In light of this, it was considered necessary to provide permanent means of access to the hold frames and their upper brackets, covering at least 25 percent of the total number of frames in all cargo holds. For access to lower brackets, it was contemplated that portable means of access were sufficient.

Anchoring, mooring and towage equipment[163]

The Sub-Committee agreed in principle to a draft amendment to SOLAS geared towards ensuring adequate provision of anchoring, mooring and towage arrangements on ships. The impetus for this proposal is the concern voiced by a number of State Parties that failure of ships mooring fittings and/or their associated structure, when manoeuvring with tugs, has jeopardised the safety of the ship and, amongst other things, the marine environment. The draft amendment put forward to SOLAS chapter II-1 (Construction—Subdivision and stability, machinery and electrical installations) would require appropriate arrangements to be provided on all ships for anchoring, mooring and towage operations conducted as part of their normal and emergency operations. It was also decided that this issue will be discussed in future sessions, including the idea that this amendment apply to new and existing ships.

Fuel oil sampling[164]

The MEPC is working on 'Guidelines for the Sampling of Fuel Oil for Determination of Compliance with Annex VI of MARPOL 73/78'. These guidelines will serve to progress the implementation of Annex VI of MARPOL 73/78. Specifically, these regulations will set limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibit deliberate emissions of ozone depleting substances.

Greenhouse gas emissions[165]

An MEPC working group looked at issues relating to greenhouse gas emissions during its 47th Session in March 2002. Though it is conceded that ships greenhouse gas emissions are relatively small, because ships operate worldwide it has been considered imperative that the IMO consider emissions from ships under the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC). The MEPC decided to create a correspondence group to collate information received, and in so doing, prepare an IMO strategy/policy document on greenhouse gases from ships. This would inevitably lead to the development of a draft Assembly resolution on the issue. It was noted that one possible approach would be the concept of environmental indexing systems for ships, to assess the environmental performance of each individual ship in relation to greenhouse gas emissions.

On-board NOx monitoring and recording devices[166]

The Sub-Committee on Ship Design and Equipment has been working on developing draft Guidelines for onboard NOx monitoring and recording devices. Compliance with Regulation 13 of Annex V of MARPOL dealing with air pollution

is at the centre of this task. The Sub-Committee came to the conclusion that further works must be done on these Guidelines at future sessions. Further, the Sub-Committee has once again formed the correspondence group on Guidelines for on-board NOx monitoring and recording devices tasked to submit a report to the 46th Sub-Committee meeting.

Pollution prevention equipment for machinery space bilges[167]

The Sub-Committee has made significant inroads in revising MEPC Resolution 60(33) on guidelines and specification for pollution prevention equipment for machinery space bilges. At this point, however, an agreed text has not been finalised. The key issues at the heart of ongoing discussions relate to the test fluids specifications and test procedures. It was agreed at the 45th Session of the Sub-Committee on Ship Design and Equipment that a draft text would be offered to the 46th Session so as to obtain comments from State Parties and international organisations. In a similar vein, the Sub-Committee indicated that substantial progress had been made towards finalising the revision of resolution A.586(14) on Guidelines and Specifications for Oil Discharge Monitoring and Control Systems for Oil Tanker. It was agreed that the Secretariat would submit the draft revision to the 46th Session and Member Governments and international organisations were invited to submit comments. In addition, the Sub-Committee approved the view that the concept of whole bilge water treatment systems (WBTS) should be included in a possible future revision of MEPC/Circ.235 Guidelines for systems for handling oily wastes in machinery spaces of ships. The Sub-Committee agreed to consider the matter at the 46th Session with a view to preparing a justification for such a revision.

The Sub-Committee also noted that MEPC had decided that the use of a recording device to record the oil concentration in bilge water should be made tamper-proof and mandatory for new ships. It is known that most States have a test method for the determination of the oil content in water incorporated into national legislation, so State parties may include differing test methods, which cause discrepancies in standards worldwide. As a result, it was concluded that it would be advantageous to have a single ISO test that would provide a means of comparing the results.

ISO had pointed out that the infrared spectrophotometry (IR) method for determining oil content described in resolution MEPC.60(33) depends on the use of carbon tetrachloride. This method is no longer acceptable given that carbon tetrachloride is listed in Annex B of Group II as a Controlled Substance under the Montreal Protocol on Substances that Deplete the Ozone Layer. It is envisaged that ISO standard 9377-2, which uses a Gas Chromatography (GC)

method, and has been adopted by some States for use in offshore applications, may be suitable for application to shipboard bilge water monitoring. This approach, termed the 'determination of hydrocarbon oil index—method using solvent extraction and gas chromatography' was advocated as a uniform method for the determination of oil content.

Pollution prevention from cargo ships (including bulk carriers)

Various measures have been taken in relation to tankers and bulk carriers intending to reduce accidents and pollution. For instance, in 1997 IMO adopted a new SOLAS Chapter XII on additional safety measures for bulk carriers, as well as amendments to the enhanced program of inspections for tankers and bulk carriers (resolution A.744(19) as amended). Also, in April 2001 IMO assumed a revised global timetable for accelerating the phase-out of single-hull oil tankers. This is intended to have major positive effect in mitigating pollution by oil tankers. Single-hull tankers will be done away with earlier than previously envisaged and the phase out years for single-hull oil tankers will terminate at 2015. Tankers complying with relevant requirements of the revised regulation 13G of MARPOL Annex I may be allowed to continue operation until their anniversary date in 2017 or they reach 25 years of age, whichever is the earlier date.

In addition, the Sub-Committee on Ship Design and Equipment has agreed 'in principle' to the first draft of amendments to SOLAS Chapter XII (Additional Safety Measures for Bulk Carriers). These amendments will require the installation of high level alarms and level monitoring systems on all bulk carriers, in order to detect the abnormal ingress of water. The proposed new regulation 12 entitled 'Hold, ballast and dry space water ingress alarms' will be submitted to the Maritime Safety Committee (MSC) at its 76th session in December 2002. It will be incumbent on the MSC to examine this preliminary draft so as to decide whether such alarms should be fitted and, if so, the appropriateness and adequacy of the proposed regulation.[168] The Sub-Committee has also agreed in principle to a proposed new regulation 13 on 'Availability of Pumping Systems' which would call for the means for draining and pumping dry space bilges and tanks located forward of a collision bulkhead to be capable of being brought into operation from a readily accessible enclosed space.

Standards for ship manoeuvrability[169]

The Sub-Committee agreed to a draft MSC resolution on standards for ship manoeuvrability, for submission to the MSC for adoption. The standards update

resolution A.751(18) Interim standards for ship manoeuvrability adopted in 1993. The interim standards were adopted in response to the lack of manoeuvring performance standards which has led to some ships being built with very poor manoeuvring qualities, resulting in marine casualties and pollution. Ship designers had been dependent on the shiphandling abilities of human operators to compensate for any deficiencies in inherent manoeuvring qualities of the hull. The putting into practice of manoeuvring standards is intended to ensure that all ships are designed to a uniform, general standard so as to alleviate the undue burden on shiphandlers to compensate for inherent deficiencies in ship manoeuvrability. The Sub-Committee agreed a draft MSC circular on Explanatory notes to the Standards for ship manoeuvrability, updating and replacing MSC/Circ.644 on Explanatory notes to the interim standards. The revisions to the interim standards are based on experience and research carried out by Member States.

Ship recycling

IMO is currently working on developing international guidance to ensure safer and more environmentally friendly ways to recycle ships. The IMO, as lead agency, is accompanied in its efforts by the International Labour Organisation (ILO) and the Secretariat of Basel Convention (on the Control of Transboundary Movements of Hazardous Waste and their Disposal) in recycling matters. The United Nations Commission on Sustainable Development (CSD), established at UNCED 1992, called for the IMO to look into the issue of ship recycling.

Wreck removal

At present, the IMO is creating an instrument to secure environmentally sound management and adequate compensation regarding shipwrecks. The aim is to hold an International Diplomatic Conference to bring an instrument to conclusion in 2003.

Montreal Protocol

The Montreal Protocol was drawn up under the auspices of the United Nations, under which nations agreed to cut consumption and production of ozone-depleting substances in order to protect the ozone layer. It is a Protocol to the *Vienna Convention for the Protection of the Ozone Layer, 1985*. The Protocol lists certain gases that are harmful to the ozone layer and sets specific dates by which they are to be banned or production and use curtailed. The Protocol

was adopted at Montreal on 16 September 1987 and entered into force on 1 January 1989. The specific measures undertaken in relation to ozone depleting substances are as follows:

- CFCs and carbon tetrachloride were banned effective January 1, 1996.
- Halons, used for fire suppression, were banned effective January 1, 1994.
- Methyl chloroform (trichloroethane—$C_2H_3Cl_3$) was phased out on January 1, 1996.
- A gradual phaseout of HCFCs began on January 1, 1996 and will be completed on January 1, 2030 (a relatively lengthy time period was established because of the long life of the equipment that uses these substances and the time required to develop substitutes).
- Hydrobromofluorocarbons were phased out on January 1, 1996.
- Methyl bromide will be gradually phased out. By the year 2010, phase out will have been completed in developed countries, but developing countries will be permitted up to 15 percent of their 1991 production.

United Nations Framework Convention on Climate Change

The *United Nations Framework Convention on Climate Change* addresses potential human-induced global warming by pledging countries to seek 'stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system' (Article 2). It is proposed by the Convention that such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. Though Stated only in general terms, the parties to the Climate Change Convention agreed to limit emissions of greenhouse gases, mainly carbon dioxide (CO2) and methane (CH4). The fact that the treaty is a framework convention means that specific commitments to target emission levels are not included.

Under the Convention, contracting parties offered to:

- Formulate, implement, publish and regularly update national and, where appropriate, regional programs containing measures to mitigate climate change.
- Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not

controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors.

- Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions.

Sovereign immunity

Sovereign Immunity is a key feature of all of these International Instruments. This principle excludes warships and naval auxiliary vessels from the application of the environmental protection regimes defined in the instruments. However, there is a requirement for each State to ensure that by adoption of the appropriate measures, not impairing operations or operational capabilities, that such vessels comply, so far as is reasonable and practicable, with the conventions. For example, UNCLOS Part XII, dealing with the protection and preservation of the marine environment, does not apply to any State owned or operated vessel or aircraft used on government non-commercial service. However, States are to ensure, by the adoption of appropriate measures that such vessels or aircraft act in a manner consistent, so far as is reasonable and practicable, with the provisions of the Convention. Note that the measures adopted are not to impair operations or operational capabilities of vessels or aircraft (Article 236).

Australian Commonwealth Domestic Environmental Legislation

Annex B

Australian Commonwealth Domestic Legislation – Overview

Australia is a federal system comprising the Commonwealth government, six State governments and two territory governments. Each State government has the right to enact maritime legislation relating to its internal waters and the first 3nm of the territorial sea. Each State has enacted environmental legislation regarding discharge and emissions in its area of authority. Commonwealth legislation has been formulated to comply with Australia's international obligations and to meet the needs of the Australian community.

The Crown and the RAN

It is a rule of long standing in the common law in all countries following the Westminster system and retaining the Crown, that while the Crown is subject to laws made by Parliament, the application of law to the Crown will be different to the rest of the community. An excellent example of why this should be so can be seen in the application of the criminal law. It is constitutionally not possible for the Crown to commit criminal offences, because all prosecutions to uphold the criminal law are brought in the name of the Crown. Similarly, it is not possible for a court to order payment of moneys by the Crown, as the courts are convened in its name, and the authority to order the payment of funds is a function of the Crown. The problem is resolved by Government voluntarily submitting to judgment rather than being compelled, but the issue illustrates some difficulties inherent in the situation.

The issues surrounding the application of law to the Crown are of direct relevance to the Australian Defence Forces (ADF). The military has always been regarded as an arm of the executive, and been placed under the authority of the Crown. In terms of the Navy, this is most obviously illustrated with the appellation 'HMAS' to the name of all Australian warships. The acronym denotes the ship is 'Her Majesty's Australian Ship', and the British practice upon which it is based is over 400 years old. Similarly officers in the ADF hold commissions, issued by the Crown, through which they draw their authority. British practice

as to the source of authority for the Navy is also reflected in the Commonwealth Constitution. The Governor-General is formally vested with the command of the ADF, on the basis that the individual filling the position is the representative of the Queen. While it is clear that this power vested in the Governor-General is exercisable only on the advice of the Executive Council, that is the Cabinet, it is also clear the armed forces lie within the ambit of the authority of the Crown.

As such, the ADF, including the RAN, are at law treated as the Crown, for the purposes of the application of law. This situation is unlikely to alter in the foreseeable future.

Application of State Environmental Requirements to RAN Operations

State Environmental Law and RAN Ships

The leading case in the area of State law affecting the Commonwealth is *Re The Residential Tenancies Tribunal of New South Wales v Henderson ex parte The Defence Housing Authority* (1997) 190 CLR 410. In that case, the Court held that the Defence Housing Authority was subject to the NSW legislation applicable to rental accommodation, and the immunity from State law expounded by the High Court in *Commonwealth v Cigamatic Pty Ltd (in liquidation)* (1962) 108 CLR 372 did not apply. Prior to the *Defence Housing Authority Case*, the application of State law to the Commonwealth was essentially restricted to the so-called 'affected by' doctrine, where the Commonwealth was deemed to be behaving in concord with State law because it had voluntarily chosen to undertake some activity which was regulated by State law. Alternatively, the High Court had interpreted section 64 of the *Judiciary Act 1903 (Cth)* expansively, to apply relevant State law to the Commonwealth when it was engaged in civil litigation [eg. *Maguire v Simpson* (1977) 139 CLR 362, *Dao v Australian Postal Commission* (1985) 3 NSWLR 565*; Commonwealth v Evans Deakin Industries Ltd* (1986) 161 CLR 254]. Outside of these two situations, the Commonwealth was deemed not to be subject to State law by virtue of the immunity conveyed under the *Cigamatic* doctrine.

What is significant from the *Defence Housing Authority Case* is that while the Court close not to apply the *Cigamatic* principle, they did not overturn the decision. Rather, its impact was substantially limited, and the nature of the limitation was touched upon by a number of members of the Court. For example, per Brennan CJ:

> … the question arises as to the true operation and effect of *The Commonwealth v Cigamatic Pty Ltd (In Liquidation)*. Like their Honours,

I would draw a distinction between the capacities and functions of the Crown in right of the Commonwealth and the transactions in which that Crown may choose to engage in exercise of its capacities and functions. By 'capacities and functions' I mean the rights, powers, privileges and immunities which are collectively described as the 'executive power of the Commonwealth' in s 61 of the Constitution. The executive power of the Commonwealth, being vested in the Queen and exercisable by the Governor-General, derives its content mediately or immediately from the Constitution. Executive power may be conferred by a law of the Commonwealth or it may be the power which, at least in earlier times, was seen as part of the Royal prerogative. The executive power of the Commonwealth may be modified by valid laws of the Commonwealth but it is beyond the legislative reach of the States. The States have no legislative power that can modify a grant of power to the Crown in right of the Commonwealth by a law of the Commonwealth nor any legislative power that can modify a prerogative power conferred by the Constitution. In *Cigamatic*, Dixon CJ clearly distinguished between the prerogatives of the Crown in right of the Commonwealth and transactions into which the Crown may choose to enter. Speaking of the common law priority of the Crown in the payment of debts, he said: 'If you express the priority belonging to the Commonwealth as a prerogative of the Crown in right of the Commonwealth, the question is whether the legislative powers of the States could extend over one of the prerogatives of the Crown in right of the Commonwealth. If, as in modern times I think it is more correct to do, you describe it as a fiscal right belonging to the Commonwealth as a government and affecting its Treasury, it is a question of State legislative power affecting to control or abolish a federal fiscal right. It is not a question of the authority of the power of a State to make some general law governing the rights and duties of those who enter into some description of transaction, such as the sale of goods, and of the Commonwealth in its executive arm choosing to enter into a transaction of that description. It is not a question of the exercise of some specific grant of power which according to the very meaning of the terms in which it is defined embraces the subject matter itself: for it is not the plan of the Constitution to grant specific powers to the States over defined subjects. It is, I think, a question which cannot be regarded as simply governed by the applicability of the principles upon which *Melbourne Corporation v The Commonwealth* depended' (at 424-425).

Per Dawson, Toohey and Gaudron JJ:

> The States, on the other hand, do not have specific legislative powers which might be construed as authorising them to restrict or modify the executive capacities of the Commonwealth. The legislative power of the States is an undefined residue which, containing no such authorisation, cannot be construed as extending to the executive capacities of the Commonwealth. No implication limiting an otherwise given power is needed; the character of the Commonwealth as a body politic, armed with executive capacities by the Constitution, by its very nature places those capacities outside the legislative power of another body politic, namely a State, without specific powers in that respect. Having regard to the fundamental principle recognised in *Melbourne Corporation v The Commonwealth*, only an express provision in the Constitution could authorise a State to affect the capacities of the Commonwealth executive and there is no such authorisation (at 440).

From these extracts, it is evident that the immunity from State law enjoyed by the Commonwealth extends to the exercise of executive power. Where the Commonwealth engages in activities ordinarily undertaken in the wider community, these ought not to be categorised as exercises of executive power, and accordingly State law must be complied with.

Distinguishing the activities of the Navy from that of the Defence Housing Authority is also significant. Per Dawson, Toohey and Gaudron JJ:

> Nothing has emerged in this case to indicate any purported alteration or denial of the executive capacity of the Crown in right of the Commonwealth by the provisions of the *Residential Tenancies Act*. The DHA is the creature of the *Defence Housing Authority Act* and that Act is predicated upon the existence of a legal system of which the *Residential Tenancies Act* forms a part. The latter Act does nothing to alter or deny the function of the DHA, notwithstanding that it regulates activities carried out in the exercise of that function in the same way as it regulates the same activities on the part of others. If, and to the extent that, the DHA in carrying out its functions is acting in the exercise of the executive capacity of the Commonwealth, the *Residential Tenancies Act* neither alters nor denies that capacity notwithstanding that it regulates its exercise (at 447).

In the present situation of State environmental law and ships' operations, it would be reasonable to distinguish the *Defence Housing Authority Case* on the basis that while renting property is an activity engaged in by the community

as a whole, and is essentially incidental to the operation of the ADF, operating a warship is still an exercise of executive power, in its most pure form. Such a characterisation is implicitly supported by the Constitution, which, in section 68, vests command of the military forces of the Commonwealth in the Governor-General, thus indicating that the ADF's operation is, from a Constitutional perspective, an exercise of the prerogative of the Crown. Logically, the defence of Australia will, from time to time, require actions to be taken that are inconsistent with State law. The possession and discharge of weapons and firearms, the operation of tracked vehicles on public roads, and such like are examples that immediately spring to mind. The States ought not to be able to restrict or prevent these activities, or cause substantial modification of them. If they cause damage or injury, then it is for the Commonwealth to establish a regime for liability, and under Commonwealth law that this be determined. To do otherwise would give a State the ability to affect military operations—an area of legislative power effectively denied to them by section 114 of the Constitution.

The protection that the *Cigamatic* principle provides to the Commonwealth as a whole should also be deemed to extend to the officers and sailors operating the vessel. It would be impossible for the Commonwealth to exercise its executive power to operate a warship without State interference, if there could be consequences under State law falling on to those individuals obliged by orders to physically carry out the executive's will. While *A v Hayden* (1984) 156 CLR 532 does require the executive power of the Commonwealth to be exercised lawfully by its servants, this assumes that the State law does not purport to restrict the Commonwealth from fulfilling its functions. The practical consequences of an exercise of power by a State or the Commonwealth parliaments are what the courts will give regard to, and this should extend to providing protection to personnel from prosecution under State law.

One difficulty in avoiding the application of State law is the decision in *Pirrie v MacFarlane* (1925) 36 CLR 170 where Victorian motor traffic legislation was held to apply to a sergeant in the RAAF driving a car while in the exercise of his duty. If applied to the waterborne operations on the same basis, it would seem to make the relevant State regulations applicable to HMA Ships. However, there are grounds about which *Pirrie v MacFarlane* can be distinguished. Firstly, it related to the operation of a motor vehicle, which is an activity undertaken by the community at large. The operation of attack aircraft, tanks and warships are not activities that the community can readily undertake. Secondly, the nature of the activity was incidental to defence rather than being directly

associated with it. The operation of a warship more directly impacts upon national defence than the car trip of an individual member of the ADF. Finally, international law, and to a lesser extent domestic law, have recognised that warships have special status in terms of rights and obligations and the operation of law to them. They are not treated in the same way as other vessels, in terms of a whole host of provisions, including registration, sovereign immunity when abroad, freedom from arrest and so on. None of these matters pertain to motor vehicles, regardless of who owns them, and therefore *Pirrie v MacFarlane* can be distinguished.

A final point to note is that State law has a limited operation extraterritorially. The States have jurisdiction out to 3nm by virtue of the *Offshore Constitutional Settlement and the Coastal Waters (State Powers) Act 1980 (Cth)* which in part implements it. For events that take place beyond 3nm, the State would need to establish a link between the event concerned and its territory. The nature of nexus and its requirement post the *Australia Act 1986 (Imp)* was considered in *Union Steamship v King* (1988) 166 CLR 1. Obviously, activities that are geographically remote from the coast will be increasingly unlikely to be within State legislative competence, making a large proportion of Navy activities free from any State interference. The difficulties faced for a State are further increased when one considers the statutory presumption that legislation is not intended to operate extraterritorially, unless this is evident from its content (eg. *ex parte Iskra* (1964) 80 WN(NSW) 925; *Jumbunna Coal Mine NL v Victorian Coal Miners' Association* (1908) 6 CLR 309 at 363 per O'Connor J. This would certainly limit the volume of State law applicable, in the event that any can be applied to operations.

State Environmental Law and RAN Establishments

The same legal principles are applicable to RAN shore establishments as to HMA Ships, with the exception of extraterritoriality. Further, the scope of activities undertaken at an establishment are far more likely to fall foul of the *Defence Housing Authority Case*, as they will encompass a greater range of matters that would not be regarded as directly related to defence. In this regard, it could be anticipated that State environmental regulations for buildings, and possibly for ship maintenance would apply. In the event that in a particular case the impact of State law cannot be avoided, then the next question is whether the particular State law concerned can apply to the Crown in right of the Commonwealth. There is a statutory presumption that unless indicated, explicitly or by necessary implication, that legislation does not apply to the Crown: *Bropho v Western Australia* (1990) 171 CLR 1, see also

Defence Housing Authority Case per Dawson, Toohey and Gaudron JJ at 444–445. In addition, where there is a reference to the Crown, it is deemed to be in the capacity of the relevant jurisdiction, unless otherwise indicated on the basis noted above: *Bradken Consolidated Ltd v BHP Co Ltd* (1979) 145 CLR 107. This was considered in greater detail above.

Impact of Section 64 of the Judiciary Act

One mechanism that has been used to substantially erode the Commonwealth's immunity from State law has been section 64 of the *Judiciary Act 1903 (Cth)*. This provision provides that the Commonwealth, in civil litigation, should be treated like an ordinary litigant, insofar as this is possible given the position it occupies in Australian law. The High Court in a series of cases (*Maguire v Simpson* (1977) 139 CLR 362; *Commonwealth v Evans Deakin Industries Ltd* (1986) 161 CLR 254) has interpreted this to mean that the Commonwealth is subject to the same law that any other civil litigant would be subject to, including the laws of a State. In practical terms, it makes the Commonwealth subject to State law, but only in the context of civil litigation. This has been widely interpreted by the High Court, and therefore means that once litigation commences the Commonwealth may be liable for failing to comply with State law, in the same fashion as any other individual, even though constitutionally, the State may have struggled under the *Cigamatic* doctrine to bring the Commonwealth under the legislation.

There are a number of limitations with section 64 being used as a vehicle by a State to bind the Crown in right of the Commonwealth. Firstly, the reaching out of State law only occurs when civil litigation takes place, meaning that unless an action joining the Commonwealth as a party is brought, the Commonwealth is not affected under the section. This too has been generously interpreted by the High Court, as all that will be required is a suit against the Commonwealth, even under the State law in question (*Evans Deakin*). Secondly, the provision only applies to civil matters. Therefore any State law that might have some form of penalty attaching to it would not be regarded as civil, and therefore does not fall within the ambit of the section. As such, a State prosecution of the Commonwealth for a hypothetical oil spill in Sydney Harbour would not succeed by virtue of section 64 of the *Judiciary Act 1903 (Cth)*, as it would not be civil in character. By contrast, an attempt to make the Commonwealth liable under a State based compensation regime for environmental harm caused might well bind the Commonwealth, as it would be civil in character.

Crown Immunity and the Commonwealth

The basic position with respect to the application of Commonwealth law to the Crown in right of the Commonwealth is that the Crown must comply with the law, although there will be a presumption in statutory interpretation that the Crown will only bind itself explicitly, or by necessary implication. Traditionally, this restriction was generously applied, meaning that most Commonwealth statutes did not impact upon the Crown, as no reference to the Crown being bound existed. As noted above, this basic position still exists, and has been supported in a number of High Court cases in the last decade. That said, there has also been a trend to treat the reach of what might be described as the Crown more narrowly. As such, various statutory authorities and similar organisations that might once have fallen under the ambit of what might be described as the Commonwealth Crown are now treated as being outside it, limiting the reach of the protection available. However, as noted above, most Defence activities would clearly still fall under the definition of the Crown.

Another change that has occurred, along with the more expansive attitude to State power over the Commonwealth has been a trend in Commonwealth statutes to a Statement that the Crown will be bound. Increasingly Commonwealth statutes do purport to bind the Crown, and therefore explicitly apply Commonwealth law. A good example relevant to marine matters is the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (Cth)*. Section 4 of the Act explicitly binds the Crown, and therefore would appear to apply the provisions of the Act to the RAN. However, the content of the Act purports to give affect to the MARPOL Convention, which grants naval vessels sovereign immune status. This means that given the application of the Act is to be consistent with the Convention, the Act will not apply to HMA Ships, even though it does explicitly bind the Crown.

Section 4 of the EPBCA does explicitly bind the Crown in right of the Commonwealth and in all capacities, and therefore its provisions, insofar as they can be constitutionally applied to the Crown, will operate to affect HMA Ships and Establishments. This potentially has a tremendous reach on the operation of Navy assets, to ensure that Navy meets the objects of the Act in Section 5 as part of the Crown in right of the Commonwealth. While the criminal penalty provisions cannot have any application to Navy, by virtue of the constitutional impossibility of the Crown prosecuting itself, there is still an obligation upon the ADF to comply with the EPBCA's provisions.

Impact of Naval Waters and Defence Practice Areas

The *Defence Act 1903 (Cth)* and the *Control of Naval Waters Act 1918 (Cth)* both provide for the establishment of training areas for the use of the ADF. The provisions in relation to these areas are relatively straightforward, allowing the ADF to close off certain areas, in order to use them for training purposes. The provisions do not indicate the scope of the activities that might take place, but rather indicate the measures in relation to excluding individuals from the areas, and compensation payable for land resumed. These areas do potentially interact with other activities in ocean and land areas, but from an environmental point of view, of themselves they do not raise issues, except insofar as any Commonwealth activity is subject to the EPBCA. The application of the EPBCA for exercises will be relevant regardless of whether an exercise takes place in a Defence Practice Area or in naval waters, or outside these areas.

Commonwealth Legislation and its Impact on RAN Operations

The Environmental Protection and Biodiversity Conservation Act (1999) (EPBCA)

The EPBCA sets up a national framework for the protection of the environment by focussing on protecting matters of national environmental significance and also on the conservation and protection of Australia's biodiversity. Amongst the many worthwhile objects of the Act is the preoccupation to promote a cooperative approach to the protection and management of the environment, specifically involving governments, the community, land-holders and indigenous peoples and assisting in the cooperative implementation of Australia's international environmental responsibilities. Importantly, in the realm of Commonwealth/State relations, it is explicitly stated that the Act is not intended to exclude or limit the concurrent operation of any law of a State or Territory, except so far as the contrary intention is expressed within its provisions (section 10).

The EPBCA binds all Australian Commonwealth agencies, including the RAN, to environmental best practices, regardless of where they operate in the world. Where ADO activities are likely to have a significant impact on a matter of national environmental significance, the activity will require the approval of the Environment Minister. If the activity is declared a controlled action, restrictions may be imposed on when and how the activity can be conducted.

Prohibitions on Activities Having 'Significant Impact'

The EPBCA establishes a general prohibition on all actions, which have or may have significant impact on certain areas of the environment. An action includes a project, development, undertaking, activity or series of activities. The certain areas, which are protected and are relevant for our discussion include:

- World heritage property listings.
- Ramsar wetlands of international importance.
- Nationally threatened species and communities.
- Migratory species protected under international agreements.
- Commonwealth marine environment.

The Commonwealth Minister for the Environment has issued administrative guidelines on whether an impact is likely to be significant. Actions are permitted in a series of circumstances. The main exception is where the action has been given governmental approval under Part 9 of the Act. Specifically, the action must be consistent with an approval from another Commonwealth decision-maker under a management plan accredited by the Commonwealth Minister for the Environment (section 33). Apart from Commonwealth governmental approval, the other exceptions to the general prohibition are:

- Approval from a State in accordance with a management plan accredited by the Commonwealth Environment Minister for the purposes of a bilateral agreement (section 46).
- Action is taken in the Great Barrier Reef Marine Park and is authorised by certain instruments issued under the *Great Barrier Reef Marine Park Act 1975* (section 43).
- Authorisation by a Government decision on which the Commonwealth Environment Minister's advice has been sought (section 160).

An action may not require approval where all the following criteria are met (section 29):

- The action is taken in a State or Territory.
- The action is declared not to require approval under a State/Territory and Commonwealth bilateral agreement.
- The provision of the bilateral agreement making the declaration is in operation in relation to the action.

- The bilaterally accredited management plan is in force under a law of the State or Territory identified in or under the bilateral agreement.
- The action is taken in accordance with the bilaterally accredited management plan.

The Commonwealth Environment Minister can also grant an exemption for a particular action that would otherwise require approval under the Act where it is in the national interest to do so, for example, in a national emergency. Note that permits, which are discussed below, are required for an activity affecting or having affected protected species.

Assessments and Approvals

Actions that are likely to have a significant impact on a matter of national environmental significance are subject to a stringent and thorough referral, assessment, and approval process. The Act's assessment and approval provisions apply to actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land) and actions taken by the Commonwealth that will have a significant impact on the environment anywhere in the world.

The first step in determining whether an action may require approval is for a person or entity to refer the proposal to the Commonwealth Environment Minister.[170] At this stage, it is determined whether or not a proposed action requires approval under the Act. If the Minister determines an approval is required, the proposed action will proceed through the assessment and approval processes. The Commonwealth Environment Minister is required to decide within twenty business days whether the action requires approval. The period within which the Minister must make this decision is reduced to ten business days if the person making the referral States that the action will require approval.

In determining whether an action needs approval, the Commonwealth Environment Minister will identify the provisions for which approval is required (eg. the Ramsar provision). If the Commonwealth Environment Minister decides that an action needs approval, he or she must designate a proponent for the action, who is responsible for preparing assessment documentation. Generally, the person proposing to take the action will be the proponent for the action. A decision that another person should be the proponent can only be made where both that person and the person proposing to take the action agree. If the Minister decides that an action does not need approval, the Act ensures certainty for proponents by providing that a person does not contravene the Act if he or she relies on the Minister's decision.

Commonwealth Marine Environment

As mentioned above, one of the certain areas from which actions having a significant impact may not be undertaken is the Commonwealth marine environment. The areas that constitute the Commonwealth marine environment include waters, seabed and airspace over the sea lying inside the seaward boundary of the EEZ (section 24). Those areas that are covered under the Coastal Waters State and territory legislation and waters within the limits of a State or the Northern Territory, fall outside the ambit of Commonwealth territory. Waters over the continental shelf, or any seabed under or airspace over waters over the continental shelf, are considered part of the Commonwealth marine environment. Areas covered by State legislation and defined as falling specifically within State and Territory areas are also excluded from the Commonwealth marine environment.

Permits for Dealing with Cetaceans and Other Activities

Permits are necessary to engage in the following activities:

- Research, commercial and certain recreational activities in a Commonwealth park or reserve.
- Whale-watching (this includes whales, dolphins and porpoises) in Australian Commonwealth waters or outside Australian waters.
- Other activities that may affect cetaceans (whales, dolphins and porpoises) in Australian Commonwealth waters or outside Australian waters.
- Activities in Commonwealth areas that may affect listed species or ecological communities.
- Activities outside Commonwealth parks or reserves that may affect protected species in the Territories of Christmas Island, Cocos (Keeling) Islands or Coral Sea Islands and activities involving the movement of wildlife or product made from wildlife, into or out of Australia.

Notably, it is an offence to kill, injure, take, trade, keep or move with a cetacean or a member of a listed species or ecological community without a permit. Interfering with a cetacean also comes within this prohibition. Where an individual or other entity desires to carry out activities within the Great Barrier Reef Marine Park, a separate Great Barrier Reef Marine Park Authority permit is required.

Permits may be obtained from Environment Australia, on the payment of a permit application fee. The fee charged varies depending on the type of proposed

activity. As soon as practicable after receiving the application, the Minister must cause notice of the application to be given to each person and body registered under section 266A. The notice must (section 200):

- State that an application for a permit has been made.
- Set out details of the application.
- Invite persons and bodies to make written submissions to the Minister about whether a permit should be issued.
- Specify an address for lodgement of submissions and a day by which submissions must be lodged.

Cetacean Surveys

It is incumbent on the Commonwealth Minister for the Environment to prepare surveys that identify and state the extent of the range of cetaceans present in Commonwealth marine areas and the listed threatened species. Listed threatened ecological communities, listed migratory species and listed marine species in Commonwealth marine areas (section 173(1)). Moreover, all Commonwealth marine areas must be covered generally within 10 years after the area became a Commonwealth marine area (section 173(2)). Importantly, where a Commonwealth agency has an interest in a Commonwealth marine area, it is to provide all reasonable assistance in connection with the preparation of a survey that is to cover the area (section 173(3)).

Guidelines on the Application of the Environment Protection and Biodiversity Conservation Act to Interactions between Offshore Seismic Operations and Larger Cetaceans[171]

Guidelines have been prepared with the objective of assisting proponents of offshore seismic operations to address certain obligations under the EPBC Act which are relevant to interactions with whales and certain other larger cetaceans. The guidelines are generally applicable only to larger cetaceans and they do not relate to interactions with small cetaceans (such as dolphins) or to her marine species (such as turtles or dugong). A proposed seismic operation would be considered a 'controlled action' under the Act and so would require the approval of the Minister for the Environment and Heritage in the following circumstances:

- Where a proposed seismic operation, whether in Commonwealth waters or in coastal waters, would be likely to have a significant impact on any threatened or migratory cetacean species (a full list of threatened or migratory cetacean species is listed in Attachment 3 to the Guidelines).

- Where a seismic operation in Commonwealth waters would be likely to have a significant impact on any cetacean species.

Seismic operations will be regarded as being likely to have a significant impact on a cetacean species (including threatened and migratory cetacean species) where the seismic operation is to be carried out in, or within 20 kilometres of, a feeding, breeding or resting area for a relevant cetacean species during the period when cetaceans are present.

Proponents should consider referring relevant proposed operations in or near migratory paths to the Minister for decision on a case-by-case basis. Factors that may be relevant to making a decision include: whether the migratory species is endangered; whether the seismic operations would be in a migratory path adjacent to a feeding, breeding or resting area; whether young calves or pregnant females may be affected; whether significant numbers (relative to the species or populations) of migrating cetaceans may be affected. Should a proponent wish to remove uncertainty whether the action is a controlled action, the proposed action can be referred to the Minister for a decision about whether the action is a controlled action. Such a decision must be given within 20 days (see section 75(5) of the Act).

Protection of the Sea (Prevention of Pollution from Ships) Act 1983

The overall purpose of the Act is to impose measures, which are designed to protect the sea from pollution by oil and other harmful substances discharged from ships. In 1994, the Act was amended by the provisions of the *Transport and Communication Legislation Amendment Act No 64* so that the Act now applies not only to the Australian territorial sea but also to the EEZ. The amendments also empower the Australian Maritime Safety Authority (AMSA) to require the master of a foreign ship to provide certain information where the ship is navigating in the territorial sea or the exclusive economic zone and there are clear grounds for believing that through an act or omission a substantial discharge or disposal causing or threatening to cause significant pollution of the marine environment has occurred. This latter direction was inserted in order to ensure that the powers of inspection authorised by the legislation do not exceed those permitted at international law pursuant to UNCLOS, in particular, the provisions of Article 220.[172]

Importantly, the Act contains a 'roll-back' clause which provides that the provisions of the Commonwealth Act will not apply to the extent that a law of

a State or a Territory makes provision giving effect to the MARPOL (section 33(2)). So the provisions of the Commonwealth Act will cover any gaps that exist in legislation introduced by States to implement MARPOL provisions.[173]

Each Part of the Act implements a specific annex of the *International Convention for the Prevention of Pollution from Ships* (MARPOL) *1973/1978*, excluding Annex IV and VI. The technical requirements of MARPOL, such as certification and construction of vessels, are given effect by the *Navigation Act 1912*.

Domestic Implementation of MARPOL

Australia has ratified all MARPOL Annexes except Annex VI.[174] The legislative arrangement between the Commonwealth and State Governments for the implementation of obligations under MARPOL 73/78 is governed by the Offshore Constitutional Settlement (OCS). Adopted in legislation in 1980,[175] the OCS provided that States and Territories are given jurisdiction over 3nm of the territorial sea and the Commonwealth is given jurisdiction from 3nm. Australia's maritime zones are depicted at Figure B-1.

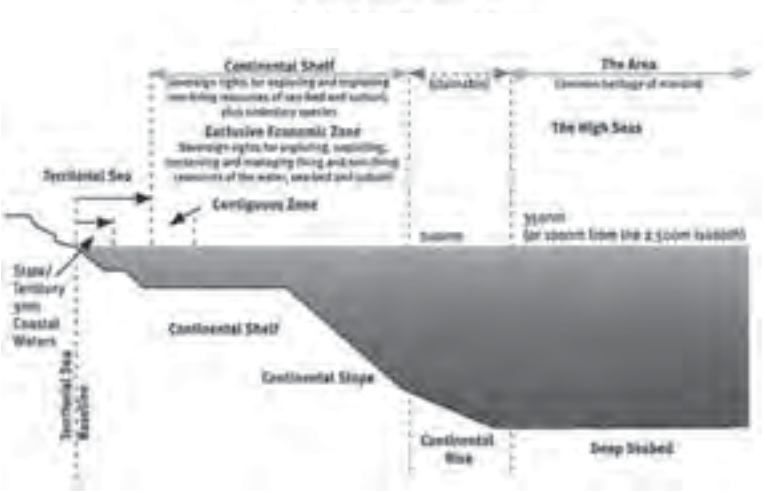

Figure B-1: Australia's Maritime Zones

A feature of the OCS was a recognition by the States that a mechanism was needed to enable Australia to become a party to key international maritime conventions without the need for legislation in every State/Territory to be in compliance at the time of ratification. The concept of the 'savings clause' was introduced whereby Commonwealth law giving effect to the Conventions would apply in all jurisdictions, but would 'step back' if and when a State enacted the provisions itself. This clause would give States time to enact parallel legislation at their own pace or, indeed, choose not to do so at all. The *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*, the principal legislation for the domestic implementation of MARPOL 73/78 contains such a provision (Section 5). As a result, where States have given effect to the provisions of the Convention through their own legislation, the Commonwealth legislation is seen as being in addition to and not taking away States jurisdiction.

Commonwealth legislation has been more extensive in its coverage of MARPOL 73/78 than State legislation. Where specific State legislation does not wholly implement the five Annexes of MARPOL 73/78 general environmental legislation may be depended on to regulate pollutants not covered by the legislation. On a State level, the legislation of NSW, Tasmania and Western Australia give similar effect to MARPOL 73/78 by explicitly implementing Annexes I and II of the Convention. All other States appear to have implemented the provisions of MARPOL 73/78 to a greater extent. Relative to other States, Queensland has been more extensive in its coverage of MARPOL 73/78, implementing Annexes I, II, III, V.

Australian MARPOL Legislation (L) and Policies (P)

The following table illustrates whether or not MARPOL obligations have been implemented. Note that the Northern Territory has legislation in place to implement MARPOL 73/78 but the provisions of this legislation have not yet commenced. As the ACT is not bordered by coastline it is not in any position to enact legislation which deals with vessel-sourced pollution.

MARPOL Implementation Obligations	CTH	NSW	NT	QLD	SA	TAS	VIC	WA
Annex I Oil	L/P	L/P	P	L/P	L/P	L/P	L/P	L/P
Annex II Noxious Substances	L/P	L		L/P	L/P	L		L/P
Annex III Harmful Packaged Substances	L/P			L/P	P			
Annex IV Sewage (not in force)				P	P			
Annex V Garbage	L/P			L/P	P		L	
Annex VI Air Pollution (not in force)								

Table B-1: MARPOL Implementation in Australia

Commonwealth

The main pieces of legislation governing the prevention of pollution from ships are the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* and the *Navigation Act 1912*.[176] These pieces of legislation give effect to the 'core' provisions of the MARPOL Convention. Technical requirements, such as certification and construction of vessels, are given effect to by the *Navigation (Protection of the Sea) Amendment Act 1983*.

Legislation

Protection of the Sea (Prevention of Pollution from Ships) Act 1983
Administering Authority: Minister for Transport and Regional Services
Implementing Authority: Australian Maritime Safety Authority

The overall purpose of the Act is to impose measures that are designed to protect the sea from pollution by oil and other harmful substances discharged from ships.

Annex I: ***Oil***: Annex I is implemented by Part II (sections 8-14) of the Act. In particular, section 9 prohibits the discharge of oil or oily mixtures other than in the various circumstances allowed under the Convention. There is a duty to report incidents involving the discharge of oil or oily mixtures (section 11).

Annex II: ***Noxious Liquid Substances in Bulk***: Annex II is implemented by Part III (sections 15-26) of the Act. Section 21 prohibits the discharge of such substances into the sea other than in particular circumstances. There is a duty to report incidents involving the discharge of such substances (section 22).

Annex III: ***Packaged Harmful Substances***: Annex III relating to pollution by packaged harmful substances is implemented by Part IIIA (sections 26A-26B) of the Act. The jettisoning of such substances is prohibited other than in very limited circumstances (section 26AB) and there is a duty to report the discharge of harmful packaged substances (section 26B).

Annex IV: ***Sewage***: Annex IV will be implemented by Part IIIB (sections 26C-26DA) of the Act, however it has not been proclaimed as yet. The discharge of sewage other than in the circumstances allowed by the Convention is prohibited (section 26D).

Annex V: **Garbage**: Annex V is implemented by Part IIIC (sections 26E-26F) of the Act. Section 26F of the Act prohibits the disposal of garbage at sea other than in specified circumstances.

Prohibitions relating to the discharge of the various categories of pollutant apply both to Australian and foreign ships in the sea near a State, the Jervis Bay Territory or an external Territory or in the EEZ (sections 9(1B)), 21B, 26B(2), 26F(4), 26D(4)).

In 1994, the Act was amended by the provisions of the *Transport and Communication Legislation Amendment Act No 64* so that the Act now applies not only to the Australian territorial sea but also to the EEZ. The amendments also empower the Authority to require the master of a foreign ship to provide certain information where the ship is navigating in the territorial sea or EEZ and there are clear grounds for believing that through an act or omission a substantial discharge or disposal causing or threatening to cause significant pollution of the marine environment has occurred. This latter direction was inserted in order to ensure that the powers of inspection authorised by the legislation do not exceed those permitted at international law pursuant to UNCLOS, in particular, the provisions of article 220.[177]

Importantly, the Act contains a 'roll-back' clause which provides that the provisions of the Commonwealth Act will not apply to the extent that a law of a State or a Territory makes provision giving effect to MARPOL (section 33(2)). The provisions of the Commonwealth Act will therefore cover any gaps that exist in legislation introduced by States to implement MARPOL provisions.[178]

A concern with the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* is that MARPOL is attached as a Schedule to the Act but, in reference to the Convention as a Schedule, the Act does not say words to the effect of 'as amended from time to time'. Thus whenever the Convention is amended, the Act must go before Parliament to be similarly updated. AMSA has recognised this problem and has proposed that the Act be amended to allow for periodic alteration of the Convention by the IMO's MEPC without the need to update the Schedule of the Act.[179]

Violation Penalties

The *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* states that if any of the provisions are contravened, then an indictable offence has been committed. Notwithstanding that such an offence has been committed, a court of summary jurisdiction may hear and determine proceedings in respect of such an offence if the court is satisfied that it is proper to do so and the defendant and the prosecutor consent. The court may impose a fine which varies according to what provision of the Act has been contravened (section 28).

Navigation Act 1912

Administering Authority: Minister for Transport and Regional Services

Implementing Authority: Australian Maritime Safety Authority

This Act covers navigation, construction and certification of ships, the crew of ships, cargo carried by ships, accidents, management of wrecks and salvage operations. The Navigation Act implements those provisions of the MARPOL relating to ships, including ship construction, and survey. For example:

- *Annex I* of the Convention concerning the survey of ships is implemented by the provisions in Part 4 of the Act. Steamships (section 206A), sailing ships (section 206B), ships carrying or using oil (section 267), ships carrying or using noxious liquid substances in bulk (section 267T), ships carrying packaged harmful substances (Part 4 Division 12B) are to be surveyed periodically.
- *Annex IV* to MARPOL 73/78, details regulations for the prevention of pollution by sewage from ships. As yet this Annex has yet to enter into force. At the time of writing, twenty-five out of a total of fifty-three Australian ports were not yet able to offer sewage waste reception facilities to ships.[180]

Policy

The National Plan to Combat Pollution of the Sea by Oil and other Noxious and Hazardous Substances ('the National Plan')[181]

The objective of the National Plan is to provide a national integrated system for responding efficiently and effectively to marine oil or chemical pollution incidents by designating competent national and local authorities. It also establishes:

- A national contingency plan for preparedness and response, which includes the organisation of a number of private and public entities.
- An adequate level of pre-positioned spill combating equipment, commensurate with the risk involved, and programs for its use.
- A comprehensive national training program to familiarise personnel at all levels with the requirements of planning and responding to the needs arising from an oil or chemical spill. This program includes conducting frequent exercises.
- Detailed national, State, local and industry plans and communications arrangements for mobilising resources and responding to an oil or chemical pollution incident.
- An awareness by Governments, media and the community of the limitations inherent in a response to a major oil or chemical spill.[182]

The National Plan was put into place in 1973. It originally dealt only with the prevention of oil spills, however, in April 1998 it was extended to also deal with chemical spills. The plan is occasionally reviewed, resulting in a significant increase in the capability of the plan.[183]

Australian Capital Territory

Given that the ACT is found within the perimeters of NSW, and thus is not bordered by coastline, legislation that deals with vessel-sourced pollution comes within the purview of NSW and not the ACT. However, pollution affecting any waters within the ACT is primarily governed by the *Environment Protection Act 1997*.

Legislation

Environment Protection Act 1997
Administering Authority: Minister for Urban Services
Implementing Authority: Environment Management Authority (EMA)

The general purpose of the Act is to provide for the protection of the environment. An object of the Act is to preserve the water environment, which flows through the ACT, thus, having a potential application to pollution of the marine environment. In short, the Act provides a platform for more effective and sophisticated environmental management which departs from an 'end of pipe' philosophy to solving pollution problems before they occur. Management of the environment in the future will largely be achieved by cooperative measures that focus on good environmental management practices rather than penalties as a means of deterrent.

New South Wales

Pollution of waters in NSW is generally regulated by the *Clean Waters Act 1970,* which operates in conjunction with the *Protection of the Environment Administration Act 1991* and is supplemented by the *Environmental Offences and Penalties Act 1989*.[184] The *Clean Waters Act 1970* deals mainly with land-sourced pollution and leaves ship-sourced pollution to be regulated by the *Marine Pollution Act 1987*. The *Clean Waters Act* does not apply so far as it is inconsistent with the *Marine Pollution Act 1987*. Only Annexes I and II of MARPOL 73/78 Convention are implemented through the *Marine Pollution Act 1987*. Ancillary legislation such as the *Petroleum (Submerged Lands) Act 1982*, *Ports Corporatisation and Water Management Act 1995* and *Protection of the Environment Operations Act 1997* further serve to regulate marine pollution in a more structured and specific manner.

Legislation

Marine Pollution Act 1987
Administering Authority: Minister for the Environment
Implementing Authority: The Waterways Authority

The overall purpose of the Act is to provide for the protection of the sea and certain waters from pollution by oil and other noxious substances discharged from ships. The *Marine Pollution Act 1987* provides measures for controlling ship-sourced pollution (oil and other noxious substances) and the risks associated with carrying cargo in ships. The 1991 Amendment to the Act provides for the detention of a vessel if there are reasonable grounds to suspect that it

has caused pollution, for security to cover the cost of clean-up and penalties to be lodged with the Maritime Services Board.[185] The Act implements MARPOL 73/78 Convention as follows:

Annex I: ***Oil***. Annex I is implemented by Part II of the Act. In particular, the Act makes it an offence to discharge oil, an oily mixture or oily residue into State waters (sections 8, 9, 10). Discharge of oil or an oily mixture from an oil tanker or large vessel is permissible within prescribed limits, provided the discharge does not contain chemicals or other substances in quantities or concentrations that are hazardous to the marine environment (section 8).[186] Further, there is a duty to notify of incidents involving the discharge of oil (section 11) and there is also a duty for an occupier to notify if any discharge of oil or of an oily mixture occurs from a place on land into State waters (section 12). Moreover, certain vessels, including oil tankers, are required to keep an oil record book (section 13).

Annex II: **Noxious Substances**. Annex II is dealt with by Part III of the Act. Liquid substances may be designated and categorised as Category A, B, C or D, in accordance with Appendix II to Annex II of the Convention (section 18) or listed in Appendix III to Annex II (section 19). It is an offence to discharge a liquid substance other than a discharge necessary to save life or secure the safety of the ship at sea; escape as a result of accidental damage to the ship; or discharges authorised to combat and minimise specific pollution incidents (section 20). There is a duty to report if such a discharge occurs (section 22). As with oil, a cargo book must be carried and maintained by trading ships on an intrastate voyage carrying liquid substances in bulk (sections 23-25).

The Act is enforced through the empowering inspectors to board ships and take samples where there is a prohibited discharge (section 29).

Violation Provisions

The Minister may issue a notice to the ship owner or master requiring them to do certain things so as to prevent further pollution of NSW waters by oil or noxious substances (section 48). Non-compliance with a notice issued by the Minister renders an individual liable to a fine (maximum of 2,000 penalty units). Alternatively, violation may result in the taking of such force as is necessary to:

- Enter, take and retain possession of any ship, place, apparatus, facility or pipeline.

- Take and retain possession of any substance or thing.
- Use and operate any apparatus or machinery.

Port Corporatisation and Water Management Act 1995

Administering Authority: Minister for Transport

Implementing Authority: Port Corporations. For example, the Newcastle Port Corporation (section 6), the Port Kembla Port Corporation (section 7), and the Sydney Port Corporation (section 8). Functions may be conferred or imposed on a Corporation under this or any other Act or law. Also, the Marine Ministerial Holding Corporation and the Waterways Authority.

The overall objectives of the Act are to establish statutory State owned corporations to operate the State's major port facilities and waterways. Responsibility for management of the waterways and other marine safety functions is vested in the Minister. The Waterways Authority is created to manage the waterways including the provision of port charges, pilotage and other marine matters.

The *Ports Corporatisation and Water Management Act 1995* implicitly endorses the spirit of MARPOL 73/78 by establishing a legislative and administrative framework for the management of State ports and waterways. Such a framework will serve to facilitate the acceptance of Annex IV and V given that these provisions require Australia to establish facilities at ports and terminals for the reception of sewage and the reception of garbage for quarantine handling. Presently, reception of sewage from ships cannot be offered by twenty-nine out of a total of fifty-two Australian ports. Also, not all Australian ports are able to accept garbage that necessitates quarantine handling. Consequently, the ports that can handle garbage that necessitates quarantine handling (eg. Dampier Port in Western Australia) are strained to capacity to handle considerable tonnage each year (see AMSA, Waste Reception Facilities in Australian and New Zealand Ports, May 1997). Inevitably, because of lack of appropriate facilities to accept such garbage, many ships dump the garbage at sea.

Reception Facilities

Below is a representation of the Port facilities available for NSW and assessment of whether these facilities can receive waste of the type described.

Port	Oily Mixtures Containing Chemicals	Other Oil Pollutants	NLS (Cat A, B, C and D)	Sewage	Quarantine	Garbage
Eden	Yes	Yes	No	No	No	No
Newcastle	Yes	Yes	Yes	Yes	Yes	Yes
Port Kembla	Yes	Yes	Yes	Yes	Yes	Yes
Sydney/ Botany	Yes	Yes	Yes	Yes	Yes	Yes
Yamba	No	Generally Yes	No	No	Yes	Yes

Table B-2: Reception facilities at NSW Ports[187]

Policy[188]

A contingency plan is in place for dealing with oil spills however no structured policy plan exists in NSW for dealing with pollution by other substances mentioned in MARPOL 73/79. However, committees are in place which deal with specific types of incidents. During major spills these organisations work together to minimise damage to human health and the environment.

In the case of oil spills, national and State oil pollution committees work together to provide the necessary planning, management, resources and training to combat oil spills in their areas of jurisdiction; for example, the NSW Oil Pollution Committee has developed an oil spill contingency plan. Within the NSW three-nautical-mile boundary, and within estuaries, the following organisations are responsible for spill management:

- Newcastle Port Corporation—from the NSW/Queensland border to Newcastle.
- Sydney Ports Corporation—the Sydney region.
- Port Kembla Port Corporation—from the NSW/Victoria border to Wollongong.

In the case of general marine pollution, various organisations are responsible for responding to the incident. For example, task groups working under the Australian and New Zealand Environment and Conservation Council's Marine Accidents and Pollution Implementation Group have developed several documents to manage aspects of marine pollution. These documents cover a whole range of topics including anti-fouling and hull-cleaning practices and waste management at ports.

The NSW Oil Pollution Committee is currently developing a marine chemical-

spill contingency plan. The committee consists of representatives from the Office of Marine Safety, Australian Maritime Safety Authority, ports corporations, NSW Environmental Protection Authority (EPA), Royal Australian Navy, State Emergency Management Committee and the petroleum industry.

Northern Territory

The *Marine Pollution Act 1999* generally gives effect to the MARPOL 73/78 Convention by regulating ship-sourced pollution in accordance with its provisions. This Act will replace the *Prevention of Pollution of Waters by Oil Act 1962* which gave effect to the 1954 International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL), the forerunner to the MARPOL Convention. On a general level, pollution of waters in the Northern Territory is also dealt with by the *Water Act 1992* and the *Darwin Port Authority Act 1983*.

Legislation

Marine Pollution Act 1999
Administering Authority: Minister for Transport and Works
Implementing Authority: Department of Transport and Works

Section 5(1) provides that the overall purpose of the Act is to protect the Territory's marine and coastal environment by minimising intentional and negligent discharges of ship-sourced pollutants into coastal waters. Section 5(2) States that the above mentioned purpose is to be achieved primarily by giving effect to relevant provisions of the following annexes of MARPOL:

The *Marine Pollution Act 1999* specifically implements MARPOL 73/78 as follows:

Annex I: ***Oil***. Annex I is implemented by Part II of the Act (section 13). In particular, the Act makes it an offence to discharge oil, either intentionally or negligently, into coastal waters where serious or material harm results and the individual(s) discharging the oil know or ought reasonably be expected to know that serious or material environmental harm will or might result from the discharge (section 14). However, certain exemptions are permitted in prescribed circumstances and depend on the rate, total amount and location of the discharge (sections 15 & 17).

Annex II: ***Noxious Liquid Substances***. Annex II is implemented by Part III of the Act (section 18). In particular, the Act makes it an offence to discharge or permit the discharge, either intentionally or negligently, of noxious liquid substances in bulk, if serious or material environmental harm ensues

and the person committing the offence knows, or ought reasonably be expected to know, that serious or material environmental harm will or might result from the discharge (section 21). Certain defences are provided and include, *inter alia*, that the discharge was necessary for the purpose of securing the safety of a ship or saving life at sea; the discharge was for the purpose of combating specific pollution incidents to minimise the damage from pollution and was approved by an authorised officer (section 22).

Annex III: ***Packaged Harmful Substances***. Annex III is implemented by Part IV of the Act (section 25).[189] Specifically, the Act makes it an offence to jettison or permit the jettisoning, either intentionally or negligently, of a harmful substance in a packaged form, if serious or material environmental harm ensues and the person committing the offence knows, or ought reasonably be expected to know, that serious or material environmental harm will or might result from the jettisoning (section 27).

Annex IV: ***Sewage***. Part V of the Act deals with the subject of pollution by sewage. The Act makes it an offence to discharge or cause the discharge, either intentionally or negligently, of sewage if serious or material environmental harm ensues and the person committing the offence knows, or ought reasonably be expected to know, that serious or material environmental harm will or might result from the discharge (section 31). The defences provided include, *inter alia*, that the discharge resulted from damage, other than intentional damage, to the ship or its equipment; all reasonable precautions were taken after the damage happened or the discharge was discovered to prevent or minimise the discharge of the sewage (section 32).

Annex V: ***Garbage***. Annex V is implemented by Part 6 of the Act (section 36). In particular, the Act makes it an offence to discharge or permit the discharge, either intentionally or negligently, of garbage if serious or material environmental harm ensues and the person committing the offence knows, or ought reasonably be expected to know, that serious or material environmental harm will or might result from the discharge (section 38). The defences provided include, *inter alia*, that the discharge was necessary for the purpose of securing the safety of a ship or saving life at sea; the disposal happened because of damage to the ship or its equipment and all reasonable precautions were taken before and after the damage happened to prevent or minimise the disposal; the disposal was the accidental loss at sea of a synthetic fishing net, or synthetic material used in the repair of a synthetic fishing net, and all reasonable precautions were taken to prevent the loss (section 39).

The Act makes further provision to regulate the prevention of pollution. First, Part 7 of the Act provides that the discharge of a noxious liquid substance, occurring during transfer operations, is prohibited (section 43) other than in certain circumstances (section 44). Second, Part 8 of the Act provides that a notice may be given by the CEO to the proprietor of a port or terminal to establish appropriate reception facilities (section 49(1)) and that failure to comply with such a notice attracts sanctions (section 49(4)). Third, Part 9 creates the obligation for the ship's master and/or agent to report discharges unless a reasonable excuse exists (section 50).

Darwin Port Corporation Act 1983
Administering Authority: Minister for Territory Ports
Implementing Authority: Darwin Port Corporation

The overall purpose of the Act is to establish the Darwin Port Corporation, which is given the responsibility of controlling and managing the ports of the Northern Territory. This Act applies to the Port area, the parameters of which are set out in detail in Schedule 1 to the Act. The Darwin Port Authority is empowered to make by-laws with respect to the prevention of pollution (section 48). Furthermore, it is an offence under the Act to put an undesirable substance into or on a part of the Port, or to allow it to fall or flow into or on the Port (section 34). An undesirable substance includes: rubbish, gravel, earth, stone or wreck; flammable, corrosive or offensive substances, including dangerous goods, and an article, thing or substance capable of constituting a hazard to navigation, or hindering use of the Port (section 5). 'Undesirable substance' does not, however, include oil. The Port Authority may take such actions as it thinks fit to remove, destroy, disperse or mitigate the effect of an undesirable substance which is put, falls or flows into the port. The Port Authority also has power to seize, remove, attach or dispose of a vessel, hulk, or hull which is unsafe, sunk or stranded within the Port (section 17).[190]

Defences under the Act include the necessity of securing the safety of the vessel, preventing damage to the vessel or cargo or saving life, where the action was reasonable in the circumstances; and damage to a vessel resulting in the flow, followed by the taking of all reasonable steps to minimise the escape of the substance (section 35).

Reception Facilities

Table B-3 identifies the Port facilities available in the Northern Territory and assesses whether these facilities can receive waste of the type described.

Port	Oily Mixtures Containing Chemicals	Other Oil Pollutants	NLS (Cat A, B, C and D)	Sewage	Quarantine	Garbage
Darwin	Yes	Yes	Yes	Yes	Yes	Yes
Gove	No	No	No	No	No	No

Table B-3: Reception facilities at ports in the Northern Territory[191]

Policy

NT Marine Oil Pollution Contingency Plan[192]

The Marine Branch, on behalf of the Department of Infrastructure, Planning and Environment, is responsible for the NT Marine Pollution Contingency Plan which supports the National Plan to Combat Pollution of the Sea by Oil and other Noxious and Hazardous Substances. Participants in the Plan include Government Departments, port corporations, oil and chemical industry representatives and the Police and Emergency Services. To support the Plan, the Marine Branch:

- Provides administrative support for the NT Marine pollution Advisory Committee (State Committee).
- Coordinates oil spill exercises.
- Maintains oil spill response equipment.
- Conducts oil spill courses.

Queensland

Annexes I, II, III and V of MARPOL 73/78 Convention are implemented through the *Transport Operations (Marine Pollution) Act 1995*, whose objective is to regulate ship-sourced pollution running into Queensland's coastal waters. Out of all of the Australian States, Queensland's implementation of MARPOL obligations has been the most extensive. On a broader level, the *Environmental Protection Act 1994* provides for the regulation of all forms of pollution, regardless of source. It also empowers the creation of Environmental Protection Policies (EPPs) such as the Water EPP, whose general purpose is to protect Queensland's water while allowing for ecologically sustainable development. The *Environmental Protection Act 1994* does not apply where the *Transport Operations (Marine Pollution) Act 1995* applies.

Legislation

Transport Operations (Marine Pollution) Act 1995
Administering Authority: Department of Transport and Main Roads
Implementing Authority: Minister of the Department of Transport and Main Roads

The general purpose of the Act is to protect Queensland's marine and coastal environment by minimising deliberate and negligent discharges of ship-sourced pollutants into coastal waters (section 3(1)). The purpose of the Act is to give effect to the relevant provisions of MARPOL 73/78.

The *Transport Operations (Marine Pollution) Act 1995* implements MARPOL 73/78 in the following manner:

*Annex I**: Oil***. Annex I of MARPOL is implemented by Part IV of the Act (section 23). The Act makes it an offence to discharge oil or oily residues from a ship into coastal waters (sections 26-27). The ship's master and its owner are both held responsible for the offence. Certain defences are available and include: that the discharge was necessary for the purpose of securing the safety of a ship, or saving life at sea; that the discharge resulted from unintentional damage to the ship and all reasonable precautions were taken to prevent or minimise the discharge. That the discharge was made to combat specific pollution incidents to minimise the damage from pollution and was approved, or the discharge was authorised for training purposes (section 28). Ships are required to have an onboard oil pollution emergency plan. Failure to comply with this requirement constitutes an offence by both the ship's owner and master (section 30). The regulations may exempt discharges from the operation of the Act. However, a regulation will only be valid if it gives effect to an exemption permitted by MARPOL 73/78 (section 29).

*Annex II**: Noxious Liquid Substances***. Annex II of MARPOL is implemented by Part V of the Act (section 31). It is an offence to discharge a noxious liquid substance from a ship into coastal waters (section 35). Again, the ship's master and owner are held liable for the offence. Defences are that the discharge was necessary for the purpose of securing the safety of a ship, or saving life at sea. That the discharge resulted from unintentional damage to the ship and all reasonable precautions were taken to prevent or minimise the discharge, and that the discharge was made to combat specific pollution incidents to minimise the damage from pollution and was approved (section 36). The regulations may exempt discharges from the operation of

the Act. However, a regulation will only be valid if it gives effect to an exemption permitted by the provisions of MARPOL 73/78 (section 37).

Annex III: ***Packaged harmful substance***. Annex III of MARPOL is implemented by Part VI of the Act (section 39). It is an offence to jettison a harmful substance carried as cargo in packaged form from a ship into coastal waters (section 42(1)). This includes a leakage of the substance (s42(2)). Defences are that the jettisoning was made for the purpose of securing the safety of a ship or saving life at sea. That the jettisoning was the washing of leakages overboard, where jettisoning in accordance with procedures prescribed by regulation would have impaired the safety of the ship or persons on board (section 43). The regulations may exempt discharges from the operation of the Act (section 44).

Annex IV: ***Sewage***. Annex IV of MARPOL is dealt with, but not explicitly Stated to be implemented by, Part 7 of the Act. Areas of coastal waters can be characterised as high, moderate or low sensitivity zones. It is an offence to discharge sewage from a ship into a high, moderate or low sensitivity zone (section 47). Defences are that the discharge happened because of damage to the ship or its equipment, and all reasonable precautions were taken before and after the damage happened to prevent or minimise the escape of the sewage (section 48). The regulations may exempt discharges from the operation of the Act (section 49).

Annex V: ***Garbage***. Annex V of MARPOL is given effect to by Part 8 of the Act (section 52). The Act makes it an offence to dispose of garbage (including plastics) from a ship into coastal waters (section 55). Defences are that the disposal was made for the purpose of securing the safety of the ship and persons on board the ship or saving life at sea. That the disposal happened because of damage to the ship or its equipment and all reasonable precautions were taken before and after the damage happened to prevent or minimise the disposal. That the disposal was the accidental loss at sea of a synthetic fishing net or repair material, and all reasonable precautions were taken to prevent the loss (section 56). Exemptions may be granted under regulations, provided that they are consistent with MARPOL, or relate to fishing or tourism operations (section 57).

Part 9 prohibits pollution of coastal waters during transfer operations (this is consistent with Annex I and II of MARPOL). It is an offence to discharge a pollutant into coastal waters during a transfer of pollutants between a ship and another ship or place (section 61). Defences include operator error, or fault in apparatus, where all reasonable precautions were taken after the

discharge occurred to prevent or minimise the damage (section 62). Night transfer operations require authorisation (section 63). Records of transfer operations must be kept (section 64).

Part 10 of the Act provides for reception facilities for waste under Regulation 12 of Annex I, Regulation 7 of Annex II and Regulation 7 of Annex V to MARPOL (section 66).

Part 11 of the Act contains reporting requirements according to which a ship's master, owner or owner's agent must notify and report on a 'reportable incident'[193] to an authorised officer. Failure to comply with this requirement is an offence (section 67).

Part 12 contains provisions for supervision and enforcement of the provisions of the Act. It gives authorised officers[194] the power to, *inter alia*, inspect places or ships, seize evidence, detain a ship, and to require a person to produce a document or to give information. Failure to assist an officer by producing a document, give information or obey a direction is an offence (sections 102-104). It is also an offence to give misleading information, false documents or otherwise obstruct an authorised person's exercise of power (sections 105-107).

An authorised officer has emergency powers where he/she is satisfied that a discharge of pollutant into coastal waters has occurred or is likely to occur and urgent action is required to prevent or minimise the discharge and its effect on Queensland's marine and coastal environment. The officer can do what is necessary to remove, destroy or disperse a discharged pollutant; to prevent the pollutant from reaching a Stated place on water or land, and to mitigate damage or injury caused to a Stated place or thing on water or land by the pollutant (section 95). An authorised officer may direct the emergency release of a pollutant into coastal waters if it is necessary and reasonable to release the pollutant because of an emergency, and there is no practicable alternative. The release must be accompanied by all reasonable and practicable precautions to prevent or minimise harm being caused to Queensland's marine and coastal environment (section 96).

Where grave and imminent danger exists, following a maritime casualty, to the Queensland coastline, or to related Queensland interests, from the discharge or threat of discharge of pollutant into coastal waters that may reasonably be expected to result in major harmful consequences, the chief executive has powers to intervene to prevent, minimise or eliminate the danger (section 98). Unless the power to intervene must be exercised urgently, the chief executive before exercising the power of intervention, must have regard to

Australia's obligations under the *International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties* (section 100).

Part 13 of the Act deals with expenses to the State or a port authority as a result of a discharge. The polluter is responsible for expenses as defined by section 111 of the Act. An offending ship may be detained until costs are paid (section 113).

Violation penalties

Where an offence is committed against the Act, both the ship owner and master are liable to pay a fine based on a number of penalty units decided by the court hearing the matter.

Environmental Protection Act 1994 (EPA)
Administering Authority: Minister for Environment, Heritage and Natural Resources
Implementing Authority: Environment Protection Agency

The objective of the Act is to protect Queensland's environment, while allowing for development that improves the total quality of life, both now and in the future, in ways that maintain the ecological processes on which life depends (section 3). The *Environmental Protection Act 1994* provides for the regulation of all forms of pollution regardless of source. Pollution of Queensland's marine environment from land sources is regulated through the general environmental control afforded by the *Environmental Protection Act 1994*. The Act does not apply where the *Transport Operations (Marine Pollution) Act* applies (section 20).

Briefly, the Act creates a general environmental obligation (section 36) that an individual must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm. A range of offences constitutes unlawful environmental harm (section 119). These include: causing serious environmental harm (section 120) or material environmental harm (section 121). Environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration and frequency), on an environmental value (the quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety – section 9). It may be caused as a direct or indirect result of activity; or from the combined effects of the activity and other factors (section 14). There is also a duty to notify the threat or occurrence of serious environmental harm (section 37).

Policy

Environmental Protection (Water) Policy 1997
Administering Authority: Minister for Environment, Heritage and Natural Resources
Implementing Authority: Environment Protection Agency

The objective of the Environmental Protection Policy (EPP) is obviously to protect Queensland's environment through prohibiting the emission of substances perceived as damaging to the environment.[195] Breach of an EPP is an offence under the EPA.[196] EPPs have the status of subordinate legislation.[197]. National Environmental Protection Measures will be adopted as EPPs if approved by regulation.[198]

The object of the Water EPP is to protect Queensland's water while allowing for ecologically sustainable development.[199] The purpose shall be achieved *inter alia,* by the provision of a framework for identification of environmental values for Queensland waters and by determination of water quality guidelines and objectives for the protection of environmental values.[200] The determination of environmental values is important since it is the basis for environmental harm under the EPA and thus for the offences relating to unlawful environmental harm. In addition, conditions of licences, approvals and environmental management programs often use the term environmental value. [201] Some waters are listed in Schedule 1 to the EPP and their environmental values are identified in column 2 of that Schedule. Other environmental values of water, which are to be enhanced or protected by the EPP are listed in section 7. They include the biological integrity of aquatic ecosystems, suitability for recreational, agricultural and industrial use and suitability for minimal treatment before supply as drinking water.[202] These values are protected when the measures for all indicators do not exceed the relevant water quality guidelines.[203] An indicator for an environmental value is something that is capable of being measured in a quantitative way (eg. the concentration of dissolved oxygen in the water). Site-specific documents, the Australian Water Quality Guidelines for Fresh and Marine Waters (AWQ Guidelines), and documents published by a recognised entity are used to determine indicators for an environmental value and guidelines for those indicators.[204]

Reception Facilities

Table B-4 provides a summary of the Port facilities available for Queensland and assesses whether these facilities can receive waste of the type described.

Port	Oily Mixtures Containing Chemicals	Other Oil Pollutants	NLS (Cat A, B, C and D)	Sewage	Quarantine	Garbage
Abbots Pt.	Yes	Yes	No	Yes	Yes	Yes
Brisbane	Yes	Yes	Yes	Yes	Yes	Yes
Bundaberg	Yes	Yes	No	No	Yes	Yes
Cairns	Yes	Yes	Yes	Yes	Yes	Yes
Cape Flattery	No	No	No	No	No	No
Gladstone	Yes	Yes	Yes	Yes	Yes	Yes
Hay Point	Yes	Yes	No	Yes	Yes	Yes
Karumba	Yes	Yes	No	Yes	No	Yes
Lucinda	Yes	Yes	No	No	No	Yes
Mackay	Yes	Yes	No	Yes	Yes	Yes
Mourilyan	Yes	Yes	No	No	Yes	Yes
Port Alma	Yes	Yes	Yes	Yes	Yes	Yes
Thursday Island	Yes	Yes	No	No	Yes	Yes
Townsville	Yes	Yes	Yes	Yes	Yes	Yes
Weipa	Yes	Yes	No	Yes	Yes	Yes

Table B-4: Reception facilities at ports in Queensland[205]

South Australia

Late in 2000, the South Australian Government renamed the *Pollution of Waters by Oil and Noxious Substances Act 1987* the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*. The former title to the Act clearly suggests that the Act's ambit was restricted to the regulation of oil and noxious substances. The renamed Act symbolises a commitment to abide by the international standards established by MARPOL 73/78. However, the Act only explicitly implements Annexes I and II of MARPOL. Pollution of waters is also generally regulated by the *Environment Protection Act 1993, Harbors and Navigation Act 1993* and the *Coast Protection Act 1972*.

Legislation

Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987
Administering Authority: Minister for Transport and Urban Planning
Implementing Authority: Marine Branch, Transport SA

The overall purpose of the Act is to make provision for the protection of the sea and certain waters from pollution by oil and other substances.

The Act specifically gives effect to Annex I and II of MARPOL 73/78 as follows:

Annex I: ***Oil***. Annex I is implemented by Division 2 of the Act. In particular, the Act prohibits the discharge of oil or oily mixtures unless a defence applies. Defences to this offence include: that the discharge occurred for the purpose of securing the safety of a ship or saving life at sea; that the oil or oily mixture escaped from the ship in consequence of unintentional damage to the ship or its equipment, and all reasonable precautions were taken after the occurrence of the damage or the discovery of the discharge for the purpose of preventing or minimising the escape of oil or oily mixture; in the case of an oily mixture, that the discharge was for the purpose of combating specific pollution incidents in order to minimise the damage from pollution and was approved by a prescribed officer. There is a duty to report incidents involving the discharge of oil or oily mixtures. Also, ships are required to have an onboard oil pollution emergency plan.

Annex II: ***Noxious Substances***. This Annex is implemented by Division 3 of the Act. The Act prohibits the discharge of noxious substances into the sea, making the ship's owner and master liable for the offence. Defences to this offence include that the discharge was for the purpose of securing the safety of a ship or saving life at sea; that the substance or the mixture escaped from the ship in consequence of damage, other than intentional damage, to the ship or its equipment, and all reasonable precautions were taken after the occurrence of the damage or the discovery of the discharge for the purpose of preventing or minimising the escape of the substance or the mixture; or that if the discharge was for the purpose of combating specific pollution incidents in order to minimise the damage from pollution and was approved by a prescribed officer.

Environment Protection Act 1993
Administering Authority: Minister for Environment and Heritage
Implementing Authority: Environment Protection Authority – Marine Pollution Division

The purpose of the Act is to provide for the protection of the environment, promote principles of ecologically sustainable development (ESD) and ensure that all reasonable and practicable steps are taken to protect, restore and enhance the quality of the environment having regard to ESD principles (section 10). The Act does not apply to circumstances in which the *Environment Protection (Sea Dumping) Act 1984, Pollution of Waters by Oil & Noxious Substances Act 1987* (now the *(Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*) and *Radiation Protection and Control Act 1982* apply (section 7), which implicitly leaves the regulation of packaged harmful substances, sewage and garbage within the Act's ambit.[206] The Act protects the environment, including the marine environment, from pollution generally. It applies to the coastal waters of the State, and the air above and earth beneath these waters (section 9). Coastal waters here comprise that part of the sea that is from time to time included in the coastal waters of the State by virtue of the *Coastal Waters (State Powers) Act 1980 (Cth)* (section 3). The Act states that a person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm (section 25). It is an offence to cause serious or material environmental harm by polluting the environment intentionally or recklessly (Part 9, sections 79-80). The Act also provides for the formulation of environment protection policies containing directly enforceable mandatory provisions (Part 5).

It is a defence that an alleged offence did not result from any failure on the defendant's part to take all reasonable and practicable measures to prevent the commission of the offence or offences of a similar nature, or that an act was justifiable on the basis of the need to protect life, the environment or property in a situation of emergency, and that the defendant took all reasonable and practicable measures to prevent or deal with such an emergency (section 124).

Enforcement of the Act is by authorised officers empowered under Part 10. In addition, the Environment Protection Authority may issue clean-up orders where the Act is contravened, to make good any resulting environmental damage (section 99).

Harbours and Navigation Act 1993

Administering Authority: Minister for Transport and Urban Planning and Transport SA.

Implementing Authority: Department of Transport.

The purpose of the Act is to provide for the administration, development and management of harbours. On a broad level, the Act creates general powers to protect navigation and to restrict the use of waters (Part 4), for example by providing for the restriction on use of waters by requiring a licence for certain aquatic activities (section 26) or providing for restricted areas (section 27). It also regulates the control of harbours and vessels and pilotage (Part 5). The Act creates an obligation not to discharge offensive material onto waters or land under the control of Transport SA (offensive material includes oil, tar, flammable material, refuse, wire, rope, plastic, carcasses, sludge from ballast tanks, and any other material causing pollution, nuisance or offence). The duty is incumbent on both the owner and operator of a vessel. Spillage of cargo onto a wharf, which causes a nuisance or offensive condition, must be cleaned up, and the spillage reported to the Transport SA facility manager.

Reception Facilities

Table B-5 provides a representation of the Port facilities available for South Australia and whether these facilities can receive waste of the type described.

Port	Oily Mixtures Containing Chemicals	Other Oil Pollutants	NLS (Cat A, B, C and D)	Sewage	Quarantine	Garbage
Ardrossan	No	No	No	No	No	No
Adelaide	Yes	Yes	No	No	No	Yes
Bonython	No	Yes	No	No	No	Yes
Port Giles	No	No	No	No	No	No
Port Lincoln	No	No	No	No	Yes	Yes
Port Pirie	Yes	Yes	Yes	Yes	Yes	Yes
Port Stanvac	No	Generally Yes	No	No	Yes	Yes
Thevenard	No	No	No	No	Yes	Yes
Wallaroo	No	No	No	No	Yes	Yes
Whyalla	No	No	No	No	Yes	Yes

Table B-5: Reception facilities at ports in South Australia[207]

Tasmania

Pollution of water by oil and noxious substances is governed by the *Pollution of Water by Oil and Noxious Substances Act 1987*. The regulation of all other pollutants is left to the *Environmental Management and Pollution Control Act 1994*, which deals with pollution of the environment at a general level. The former act explicitly overrides the latter Act in relation to pollution from ships. Legislation only implements Annexes I and II of MARPOL.

Legislation

Pollution of Water by Oil and Noxious Substances Act 1987

Administering Authority: Minister for Primary Industries, Water and Environment.

Implementing Authority: Department of Primary Industries, Water and Environment

The purpose of the Act is to provide for the protection of the sea from pollution by oil and other harmful substances discharged from ships. This Act solely implements Annex I and II of MARPOL 73/78. The Act applies principally in State coastal waters, however its ambit extends outside such waters where pollutants enter State coastal waters from a discharge outside coastal waters (section 6) and where interventions are necessary on the high seas to control the spread of oil pollution from maritime casualties (section 37).

The Act specifically implements Annexes I and II of MARPOL 73/78 as follows:

Annex I: ***Oil.*** Annex I is implemented by Part II of the Act. In particular, the Act prohibits the discharge of oil or oily mixtures unless a defence applies (section 8). Both the ship's owner and master are held responsible for the offence. Defences to this offence include: that the discharge occurred for the purpose of securing the safety of a ship or saving life at sea; that the oil or oily mixture escaped from the ship in consequence of unintentional damage to the ship or its equipment, and that all reasonable precautions were taken after the occurrence of the damage or the discovery of the discharge for the purpose of preventing or minimising the escape of oil or oily mixture, as the case may be; in the case of an oily mixture, that the discharge was for the purpose of combating specific pollution incidents in order to minimise the damage from pollution and was approved by a prescribed officer. There is a duty to report incidents involving the discharge of oil or oily mixtures (section 10). Failure to comply with this requirement constitutes an offence by both the ship's owner and master.

Annex II: ***Noxious Substances***. Annex II is implemented by Part II of the Act. The Act prohibits the discharge of noxious substances into the sea. The ship's owner and master are both liable for the offence (section 20). Defences to this offence include that the discharge was for the purpose of securing the safety of a ship or saving life at sea; that the substance or the mixture, as the case may be, escaped from the ship in consequence of damage, other than intentional damage, to the ship or its equipment, and all reasonable precautions were taken after the occurrence of the damage or the discovery of the discharge for the purpose of preventing or minimising the escape of the substance or the mixture, as the case may be; or that the discharge was for the purpose of combating specific pollution incidents in order to minimise the damage from pollution and was approved by a prescribed officer.

The Act establishes a duty to report incidents involving the discharge of such substances (section 22) failure of which constitutes an offence under the Act.

The Act is enforced through the empowering inspectors to board ships and take samples where there is a prohibited discharge (section 26). Moreover, the act also deals with the construction of ships that carry oil or noxious substances in bulk. The Act also imposes various obligations that the ships master and owner must comply with (Part III). The provisions, *inter alia*, state that the ship or chemical tanker must carry a construction certificate, otherwise the ship owner and master commit an offence under the Act, and that the ship or chemical tanker must be periodically surveyed so as to comply with Annex II of MARPOL 73/78.

Environmental Management and Pollution Control Act 1994

Administering Authority: Minister for Primary Industry Water and Environment.

Implementing Authority: Department of Primary Industries, Water and Environment

The Act sets up an environmental management and pollution control system, with objectives which include: to protect and enhance the quality of the Tasmanian environment; to prevent environmental degradation and adverse risks to human and ecosystem health by promoting pollution prevention; to regulate, reduce or eliminate the discharge of pollutants and hazardous substances to air, land or water consistent with maintaining environmental quality; and to control the generation, storage, collection, transportation, treatment and disposal of waste with a view to reducing, minimising and where practicable eliminating harm to the environment (Schedule 1, Part 2). The Act covers coastal waters of the State, as defined under the *Coastal Waters*

(State Powers) Act 1980 (Cth), and deals with pollution of the environment generally, including water. Under this Act, 'environment' means components of the earth including land, air and water. The Act does not apply, however, where the *Environment Protection (Sea Dumping) Act 1987 (Tas)* and the *Pollution of Waters by Oil and Noxious Substances Act 1987* apply.

The Act regulates pollution through planning, assessment and management measures. Pollution is defined widely in terms of capacity for causing environmental harm, Environmental harm is any adverse effect on the environment, regardless of the degree or duration of the effect. This is broad enough to include any adverse effect on the marine environment in the coastal waters of Tasmania where the source of harm is a land use.

The Act creates the general offences of causing: (a) serious environmental harm by polluting the environment intentionally or recklessly and with the knowledge that serious environmental harm will or might result (section 50); or, (b) material environmental harm (section 51). Defences include the need to protect life, the environment or property in a situation of emergency, where all reasonable and practicable measures were taken to prevent or deal with such an emergency (section 55). There is a duty to notify incidents causing or threatening serious environmental harm (section 33).

The Act also sets up a Board of Environmental Management and Pollution Control (section 12), whose functions include protecting the environment of Tasmania, and ensuring the prevention or control of any act or emission which causes or is capable of causing pollution (section 14). The Board assesses applications for permits to undertake Level 2 activities, in accordance with Environmental Impact Assessment principles (section 25). Level 2 activities are listed in Schedule 2. They include pulp and paper works, waste treatment and disposal works, and food production and processing works.

Regulations can be made under the Act with respect to: (1) the management of waste, including classification, removal, transport and disposal of waste; (2) prohibiting or regulating the disposal of things that are or contain pollutants; and, (3) the use and operation of places that will or may cause or increase pollution of the environment (section 102). The ambit of the Act is wide enough to cover all forms of pollution affecting the marine environment.

Reception Facilities

Table B-6 provides a representation of the Port facilities available for Tasmania and whether these facilities can receive waste of the type described.

Port	Oily Mixtures Containing Chemicals	Other Oil Pollutants	NLS (Cat A, B, C and D)	Sewage	Quarantine	Garbage
Burnie	Yes	Yes	No	Yes	Yes	Yes
Devonport	Yes	Yes	No	Yes	Yes	Yes
Hobart	Yes	Yes	Yes	Yes	Yes	Yes
Port Latta	No	No	No	No	No	No
Spring Bay	Yes	Yes	No	No	No	Yes
Stanley	No	No	No	No	Yes	Yes

Table B-6: Reception facilities at ports in Tasmania[208]

Victoria

In Victoria, Annex I and II of MARPOL 73/78 have been given effect through two separate Acts. The first is the *Pollution of Waters by Oil and Noxious Substances Act 1986*. The second is the more general *Marine Act 1988*, Part V of which is designed to protect State Waters from any discharge of oil, and oily mixture or of an undesirable substance. The latter Act governs land-sourced pollution whereas the former Act regulates vessel-sourced pollution. The provisions of these Acts may overlap in certain areas. The *Environment Protection Act 1970* also deals with the regulation of the prevention of pollution on a broad level and adopts an extensive and comprehensive approach to environmental protection. The *Marine Act 1988* overrides the *Environment Protection Act 1970* where any inconsistency arises.

Legislation

Pollution of Waters by Oil and Noxious Substances Act 1986
Administering Authority: Minister for Conservation and Land Management
Implementing Authority: Environment Protection Agency

The purpose of this Act is to make provisions for the protection of the sea and certain waters from pollution by oil and other noxious substances and to implement MARPOL 73/78.[209]

The Act implements MARPOL as follows:

Annex I: ***Oil***. Annex I is implemented by Part 2 of the Act. It is an offence to discharge oil or an oily mixture from a ship into State waters (section 8), unless: the discharge occurred for the purpose of securing the safety of a ship or saving life at sea; or in consequence of damage to the ship or its equipment, all reasonable precautions were taken to prevent or minimise the escape of the oil or oily mixture; or the oily mixture was discharged to combat specific pollution incidents in order to minimise the damage from pollution and was authorised. It is also an offence to discharge oil residues (section 9). Discharge of oil or an oily mixture from an oil tanker or large vessel is permissible within prescribed limits and conditions, provided the discharge does not contain chemicals or other substances in quantities or concentrations that are hazardous to the marine environment (section 8). There is a duty to notify incidents involving the discharge of oil or an oily mixture into State waters in relation to a ship (section 10).

Annex II: ***Noxious Substances***. Annex II will be implemented by Part 2 of the Act as the provisions of the Act have not yet been proclaimed. With regard to pollution by noxious substances, regulations may categorise a liquid substance under Appendix II or III to Annex II to the Convention (sections 16 & 17). Liquid substances may be designated and characterised as Category A, B C, or D, in accordance with Appendix II to Annex II of the Convention (section 16), or listed in Appendix III to Annex II (section 17). The Act makes it an offence to discharge a liquid substance, or a mixture containing a liquid substance. A liquid substance is defined as a substance or mixture carried as cargo or part cargo in bulk, from a ship into State waters, in excess of prescribed quantities or concentrations. A liquid substance includes a discharge necessary to save life or secure the safety of the ship at sea; escape as a result of accidental damage to the ship; or discharge authorised to combat and minimise specific pollution incidents (section 18). There is a duty to report if such a discharge occurs (section 19). A cargo book must be carried and maintained by trading ships on an intrastate voyage carrying liquid substances in bulk (sections 20-22).

Annex III: ***Packaged harmful substances.*** Annex III will also be covered in Part 2. Harmful substances are those which are identified as a marine pollutant in the International Dangerous Goods Code (IDMG) (section 23C). There is a duty to report prescribed incidents in State waters (section 23D). This means a discharge or the probable discharge from the ship of a harmful substance carried as cargo in a packaged form or in a freight container,

portable tank or road and rail tank wagon, other than the substance being washed overboard in accordance with regulations (section 23D). Discharge by jettisoning of a packaged harmful substance from a ship into State waters, is an offence (section 23E). Defences are that the discharge occurred for the purposes of securing the safety of the ship or saving life at sea, or a leakage washed overboard in accordance with regulations or that compliance with regulations would have impaired the safety of the ship or persons on board (section 23E).

Annex IV: ***Sewage.*** The Act deals with the prevention of pollution of State waters by sewage, which will give effect to MARPOL Annex IV (section 23F). This section has not been proclaimed as yet. It is an offence to discharge sewage from a ship into State waters (section 23G). Exceptions are a discharge necessary to save life or secure the safety of the ship at sea; or the escape of sewage as a result of accidental damage to the ship or its equipment, where all reasonable precautions were taken before and after the occurrence of the escape to prevent or minimise the escape of sewage (section 23G). This does not apply where the sewage has been comminuted and disinfected, or treated in a sewage treatment plant on the ship, in accordance with regulations, complying with Regulation 3 of Annex IV to the Convention; or the ship is at least 12nm from land, or it is discharged at a prescribed rate.

Annex V: ***Garbage.*** MARPOL Annex V is dealt with in Part 2. It is an offence to dispose of garbage from a ship in State waters, unless it is for the purpose of securing the safety of the ship and persons on board or saving life at sea (section 23B). This does not apply to the disposal of garbage[210] from a ship into the sea if the ship is not within a special area; where the disposal takes place when the ship is as far as practicable, and at least 25nm, from the nearest land, and is not within 500 metres of a platform for seabed exploration. The ship can be at least 12nm from land if the garbage is not dunnage, lining or packing materials which will float, or plastics or food wastes, or at least 3nm of land if it is then passed through a fine grinder. Food wastes can be discharged at least 12nm if ground (section 23B). It is not an offence if the garbage escaped because of damage to the ship or its equipment, and all reasonable precautions were taken to prevent or minimise the escape. If the garbage is mixed with matter, the disposal of which attracts more stringent conditions, those conditions must be complied with (section 23B).

The Act is enforced through empowering inspectors to board ships and take samples where there is a suspected prohibited discharge (section 24). A Port Authority may provide reception facilities, in accordance with Regulation 12 of Annex I, Regulation 7 of Annex II, Regulation 10 of Annex IV, and Regulation 7 of Annex V to MARPOL (section 24E).

Part 3 of the Act deals with the application of Annex I of MARPOL to ships carrying or using oil. It applies to trading vessels on an intrastate voyage, Australian fishing vessels on a non-foreign voyage, and pleasure vessels (section 34). Regulations may be made under this Part to give effect to regulations 13-19 and 22-25 of Annex I to the Convention (section 36). Ships must be constructed in accordance with Annex I requirements, and carry ship construction certificates as required (sections 37, 38 & 40). Certain ships must be surveyed regularly to ensure their compliance with Annex I requirements (section 39).

Section 42 authorises regulations to be made to give effect to Regulation 13 of Annex II (section 42). Certain ships must be constructed in accordance with the requirements of Annex II, and have a chemical tanker construction certificate (sections 43, 44, 46). Such ships must be surveyed regularly to ensure their compliance with Annex II requirements (section 45). Certain ships must be constructed in accordance with the requirements of Annex II, and have a chemical tanker construction certificate (sections 43, 44, 46). Such ships must be surveyed regularly to ensure their compliance with Annex II requirements (section 45).

Marine Act 1988

Administering Authority: Department of Infrastructure. Minister for Roads and Ports.

Implementing Authority: Marine Safety Victoria and Regional Port Authority (RPA).

The purpose of the Act is to protect State waters from any discharge of oil, an oily mixture, or an undesirable substance, including a discharge from any place on land. A discharge of oil or any oily mixture onto or into land is taken to be a discharge into State waters if it eventually enters State waters from its source in or on land (section 3). A prohibited discharge is a discharge into State waters of oil, an oily mixture or an undesirable substance which includes any solid ballast, rubbish, gravel, earth, stone or wreck, any dangerous, flammable, corrosive or offensive substance, whether solid, liquid or gas, and any article or thing or any substance capable of constituting a hazard to navigation or of preventing or hindering the proper use of State waters (section 3). It is an offence for a prohibited discharge into State waters to

occur from any place on land (section 36) unless the discharge occurred through an unforeseeable accident, and all reasonable steps were taken for the prompt discovery of the discharge and, after the discovery, for stopping or reducing the discharge (section 36).

If such a prohibited discharge occurs, the appropriate authority may take such action as it deems reasonable or appropriate to remove, disperse, destroy or mitigate the pollution or to reinstate or restore any land, building, structure or vessel that has been damaged by the pollution (section 38).

Regulations may require records to be kept by the occupier of a place, relating to the transfer of oil, an oily mixture, a liquid substance, or a mixture containing a liquid substance from or to any vessel and to, from or through that place on land; and the operation of facilities at that place on land for the disposal of oil residues (section 40). There is a duty to report if a prohibited discharge occurs from any place on land or any vessel (section 41). Authorised officers may enter any place on land or a vessel to take samples if they suspect a prohibited discharge has occurred (section 41). Oil must not be transferred in State waters from or on to a vessel, whether to or from a place on land or to or from another vessel, without authorisation (section 42).

Environment Protection Act 1970

Implementing Authority: Environment Protection Authority (EPA)

Administering Authority: Department for Natural Resources and Environment.

The Act establishes an Environment Protection Authority (EPA), prescribes the powers, duties, and functions of that Authority, and makes provisions relating to improving water quality, and controlling noise and pollution. The Act deals generally with pollution of the environment. The provisions of the *Environment Protection Act 1970* prevail if there is any inconsistency between that Act and provisions of the *Marine Act 1988* (section 35).

It is an offence to pollute any waters so that the condition of the waters is so changed as to make those waters noxious or poisonous; harmful or potentially harmful to the health, welfare, safety or property of human beings; poisonous, harmful or potentially harmful to animals, birds, wildlife, fish, other aquatic life, plants or other vegetation; or detrimental to any beneficial use made of those waters (section 39). This includes causing or permitting any pollutant to be placed in or on any waters or in a place where it may gain access to any waters any matter whether solid, liquid or gaseous which is prohibited under the Act, or does not comply with any standard prescribed under the Act.

The Act makes it an offence to cause or permit waste to be placed in any position whereby it could reasonably be expected to gain access to any waters in circumstances where if access was gained the waste would be likely to result in those waters being polluted. It is also an offence to cause or permit waste to be discharged or deposited onto the dry bed of any waterway in circumstances where, if the waterway had contained waters, the discharge or deposit would be likely to result in those waters being polluted (section 39). Land-sourced pollution is also dealt with in the regulation of 'Schedule 2 premises'. Schedule 2 premises are those from which waste is or is likely to be discharged or deposited onto any land or into any waters (section 4). The occupier of schedule 2 premises shall not install, construct or modify any equipment for the discharge or deposit of waste onto any land or into any waters, or for the treatment of waste prior to and for the purpose of the discharge or deposit of waste onto any land or into any waters; or do anything which is likely to cause the discharge or deposit of waste or an increase or alteration in the discharge or deposit of any waste onto any land or into any waters unless authorised or licensed (sections 19A, 20). A discharge or deposit of waste into any waters includes a discharge, deposit or other disposal of waste so that the waste gains access or is likely to gain access to any waters or onto the dry bed of any waterway (section 19A).

Specific defences are available and include: that the discharge, emission or deposit of waste occurred in an emergency to prevent danger to life or limb in the absence of negligence, and the EPA was notified as soon as reasonably practicable (section 30B). The EPA may serve an abatement notice requiring the occupier of premises from which waste is being discharged into the works of a sewerage, to limit, modify or monitor the waste discharged from those premises (section 28B).

The Act creates an offence of aggravated pollution. It is an offence to intentionally, recklessly or negligently pollute the environment or cause or permit an environmental hazard which results in serious damage to the environment, a serious threat to public health, or a substantial risk of these (section 59E). Officers have emergency powers to deal with pollutants where there is actual or likely imminent danger to life, limb or the environment (section 62B).

There is an extensive regulation-making power which includes waste and pollution control, regulations and prohibition, including specifying the quality and quantity of waste discharged into waters; specifying the maximum permissible concentrations of any matter that may be present in or discharged

in to waters; regulating the construction, installation, operation and maintenance of any plant, equipment or facility so as to prevent or minimise the pollution of waters; prescribing the processes to be used for the treatment of waste so as to prevent or minimise the pollution of waters; and prohibiting or regulating bathing, swimming, boating or other aquatic activity in or around any waters that may be detrimental to health or welfare or for preventing pollution (section 71).

Reception Facilities

Table B-7 provides a representation of the Port facilities available for Victoria and whether these facilities can receive waste of the type described.

Port	Oily Mixtures Containing Chemicals	Other Oil Pollutants	NLS (Cat A, B, C and D)	Sewage	Quarantine	Garbage
Geelong	Yes	Yes	No	No	Yes	Yes
Hastings	Yes	Yes	No	No	Yes	Yes
Lakes Entrance	No	No (exc Bilge water)	No	No	No	Yes
Melbourne	Yes	Yes	Yes	Yes	Yes	Yes
Portland	Yes	Yes	Yes	Yes	Yes	Yes

Table B-7: Reception facilities at ports in Victoria[211]

Policy

Victorian Marine Pollution Contingency Plan

The Marine Pollution Contingency Plan was introduced in response to the inter-government agreements, of which Victoria was a party. This led to the establishment of the National Plan to Combat Pollution of the Seas by Oil and Other Noxious and Hazardous Substances (NATPLAN). Responsibility for the plan and for responding to marine pollution incidents lies on the Marine Board of Victoria now known as Marine Safety Victoria.[212] Incidents, which involve any other substance regulated by MARPOL, are responded to under the general emergency manual of Victoria.

Western Australia

Pollution of water by oil and noxious substances are covered by the *Pollution of Waters by Oil and Noxious Substances Act 1987* which specifically implements Annexes I and II of MARPOL. The regulation of the dumping of other material covered by MARPOL is left to the *Environmental Protection Act 1986*.

Legislation

Pollution of Waters by Oil and Noxious Substances Act 1987
Administering Authority: Minister for Transport
Implementing Authority: Department of Transport.

The overall purpose of the Act is to prohibit the discharge of oil and noxious substances into State waters. Cross-sectoral integration exists between the Act and a number of related Port Authority Acts which define the jurisdiction of Port Authorities to undertake clean up operations for spills of oil (section 27) and noxious substances (section 28). These include: *Ports (Functions) Act 1993; Albany Port Authority Act 1926; Bunbury Port Authority Act 1989; Dampier Port Authority Act 1985; Esperance Port Authority Act 1968; Fremantle Port Authority Act 1902; Geraldton Port Authority Act 1968; Port Headland Port Authority Act 1970*. The Act applies to State waters, which means the territorial sea adjacent to the State, the sea on the landward side of the territorial sea adjacent to the State that is not within the limits of the State; and waters within the limits of the State (section 3). A discharge of oil or of an oily substance or liquid substance on to or into any land, waters or structure, resulting in all or part of the oil, oily mixture or liquid substance eventually entering State waters, is deemed to be discharge into those State waters (section 3).

The Act specifically implements MARPOL 73/78 annexes as follows:

Annex I: ***Oil.*** Annex I is implemented by Part II. The Act makes it an offence to discharge oil or an oily mixture from a ship into State waters (section 8). Section 10 creates the offence of discharging oil residues into State waters. Moreover, it an offence to discharging oil residues into State waters and to discharge oil or oily mixtures into any State waters by reason of a wrongful or a negligent act or omission in a transfer operation, involving transfer of oil or an oily mixture to or from a ship or a place on land (section 9). Certain exceptions apply, for example, where the discharge occurred for the purpose of securing the safety of a ship or

saving life at sea; or in consequence of damage to the ship or its equipment where all reasonable precautions were taken to prevent or minimise the escape of the oil or oily mixture (section 8). Discharge of oil or an oily mixture from an oil tanker or large vessel is permissible within prescribed limits, provided the discharge does not contain chemicals or other substances in quantities or concentrations that are hazardous to the marine environment (section 8). The Act creates a duty to notify of incidents involving the discharge of oil (section 11). There is also a duty for an occupier to notify if any discharge of oil or of an oily mixture occurs from a place on land into State waters (section 12). Also, certain vessels, including oil tankers, are required to keep an oil record book (section 13).

Annex II: ***Noxious Substances***. Annex II dealing with pollution by noxious substances is implemented by Part III. Liquid substances may be designated and categorised as Category A, B, C or D, in accordance with Appendix II to Annex II of the Convention (section 18) or listed in Appendix III to Annex II (section 19). The Act makes it an offence to discharge a liquid substance, in prescribed quantities or concentrations from a ship into State waters, other than a discharge necessary to save life or secure the safety of the ship at sea; escape as a result of accidental damage to the ship; or discharges authorised to combat and minimise specific pollution incidents (section 20). There is a duty to report if such a discharge occurs (section 22). As with oil, a cargo book must be carried and maintained by trading ships on an intrastate voyage carrying liquid substances in bulk (sections 23-25).

The Act is enforced through empowering inspectors to board ships and take samples where there is a prohibited discharge (section 29).

Environmental Protection Act 1986 (WA)

Administering Authority: Minister for the Environment.

Implementing Authority: Department of Environment Protection and Environment Protection Authority

The general purpose of the Act is to deal with the protection of the environment and the prevention of pollution. The environment is defined broadly to cover waters. 'Waters' refers to any waters whatsoever, whether in the sea or on or under the surface of the land (section 3). `Pollution' means direct or indirect alteration of the environment, to its detriment or degradation, to the detriment of any beneficial use, or of a prescribed kind.

Part V of the Act deals with the control of pollution. The Act makes it an offence to cause or allow to be caused pollution (section 49). It is also an offence to cause or allow waste to be placed in any position from which the waste could reasonably be expected to gain access to any portion of the environment and be likely to result in pollution (section 50). This encompasses land-sourced pollution of waters. An occupier of any premises (including water) must comply with any prescribed standard for the discharge of waste and take all reasonable and practicable measures to prevent or minimise the discharge of waste from those premises (section 51). The discharge of waste from prescribed premises requires authorisation (section 56). An application to discharge waste into a designated area, which includes a catchment area, public water supply area or irrigation district, requires approval from the Water Authority (section 57). It is a defence to these offences that a discharge occurred to prevent danger to human life or health or irreversible damage to a significant portion of the environment, or as a result of an accident not caused by the person's own negligence (section 74).

The Act creates a duty to notify where a discharge of waste occurs as a result of an emergency, accident or malfunction, or breaches a licence or pollution abatement notice, and has caused or is likely to cause pollution (section 72). The Chief Executive Officer can arrange to remove, destroy, disperse, dispose of or otherwise deal with the waste that is discharged, and prevent, control or abate resultant pollution (section 73). Moreover, it is an offence to construct, manufacture, assemble or sell a vehicle or vessel capable of discharging into any waters any matter that does not comply with standards prescribed, or a device required by the Act to prevent or minimise the discharge, unless exempted by regulations (section 76).

Part VI deals with enforcement of the Act and authorises inspectors to enter premises and take samples to assess and monitor the effects of discharge of waste. Breaches of the pollution provisions are enforced through the issue of Pollution Abatement Notices (section 65). Regulations can be made under the Act for the control, prevention or abatement of pollution generally (Schedule 2, section 123).

Reception Facilities

Table B-8 provides a representation of the Port facilities available for Western Australia and whether these facilities can receive waste of the type described.

Port	Oily Mixtures Containing Chemicals	Other Oil Pollutants	NLS (Cat A, B, C and D)	Sewage	Quarantine	Garbage
Albany	Yes	Yes	No	Yes	Yes	Yes
Broome	No	No	No	Yes	Yes	Yes
Bunbury	Yes	Yes	Yes	Yes	Yes	Yes
Dampier	Yes	Yes	No	Yes	No	Yes
Esperance	No	No	No	Yes	Yes	Yes
Fremantle	Yes	Yes	Yes	Yes	Yes	Yes
Geraldton	Yes	Yes	No	Yes	Yes	Yes
Port Hedland	Yes	Yes	Yes	No	No	Yes
Wyndham	No	No	No	No	No	No

Table B-8: Reception facilities at ports in Western Australia

Policy

The Western Australian Marine Pollution Contingency Plan (West Plan) was introduced in response to the establishment of the National Plan to Combat Pollution of the Seas by Oil and Other Noxious and Hazardous Substances (NATPLAN). It only deals with responses to oil and noxious substances incidents.

A Case Study on Sydney Harbour – Garden Island Dockyard

There is a myriad of marine transport and environmental protection legislation in each State and territory. To give an appreciation of the impact of this legislation, a case study of Fleet Base East and its operations in Sydney Harbour will be used to illustrate the impact of the State legislation on operations.

RAN ships in Australian ports and coastal waters are not required by law to comply with State legislation, local port authority or local government regulations. However, it is RAN policy to comply with all levels of legislation unless operational capability will be significantly compromised. When visiting foreign ports, RAN ships are to comply with the legislation and regulations of the host country or RAN policy, whichever is the more stringent. In foreign ports any special requirements should be advised by the local representatives / authorities in advance of the ship visit.

The Department of Defence released a revised Defence Environmental Policy in August 2001. This policy included an Environmental Accountability Framework (EAF) that aims to establish clear lines of accountability for environmental outcomes at all Defence sites. The EAF charges the Commanding Officer of Garden Island and Fleet Base East (based at *HMAS Kuttabul*) with this responsibility. Part of this responsibility was the development and implementation of an Environment Management Plan (EMP). The EMP identifies the environmental issues on site and their associated risk, and defines a strategy to address each issue so as to minimise environmental risks at the Base. The EMP also defines responsibilities for the development and implementation of the strategies to address the issues identified. The main issues identified were:

- Soil and Groundwater Contamination Assessment.
- Stormwater Management Assessment.
- Noise Assessment.
- Hazardous Materials Assessment.

Garden Island and Fleet Base East provide docking, maintenance and re-fuelling facilities for the Royal Australian Navy. The main operational facilities at Garden Island include:

- Fleet Base East.
- West Dock Wharf.
- Oil Wharf.
- Captain Cook Graving Dock (dry dock).
- East Dock Wharf.
- Cruiser Wharf.
- Boat Pound.
- Garden Island Parklands.

The majority of the buildings are connected with industrial activities on the island while others are used for administrative or residential purposes.

The Captain Cook Graving Dock, East Dock Wharf and Cruiser Wharf are leased and operated by Australian Defence Industries Ltd (ADI). ADI was sold in 1998 to a private consortium and now operates as a commercial contractor and leases its dockyard facilities from the Department of Defence.

Of the fifteen Strategic Action Plans developed for Garden Island and Fleet Base East, only three are applicable to this study. These are:

- Non-Hazardous Waste Management
- Wastewater and Sewage.
- Atmospheric Emissions (incorporates Ozone Depleting Substances).

The Environmental Strategy (ES) has been written to address environmental risks and issues on Navy managed areas at Garden Island and Fleet Base East. ADI leases significant areas of the base including the loading dock and larger workshops. Environmental management at ADI is through an EMS developed by ADI. Where appropriate in the ES, this overlap has been addressed in each of the Strategic Action Plans, whilst keeping the context of the ES distinct from ADI environmental management initiatives.

Garden Island and the Fleet Base is presently the home port for one fleet resupply vessel (AOR), two amphibious ships (LPA), three guided missile frigates (FFG), and one heavy landing ship (LSH). The facilities for two Collins Class submarines are provided at the West Dock Wharf, although all submarines are home ported at Fleet Base West. Use of Fleet Base East berths 1 to 5 for naval surface vessels is expected to continue for the next 20 years. The dockyard services both naval and commercially operated vessels as the largest naval facility on the east coast of Australia (Schwager Brooks, 1994).

Legislative and Policy Obligations

As a Commonwealth organisation, Commonwealth legislation, policy and international agreements bind Defence. The Commonwealth is not generally bound by State legislation, in strict legal terms, however, certain Commonwealth actions can be subject to State environment legislation. Where an inconsistency exists between the State and Commonwealth legislation, the latter prevails. It should be noted, however, that the Commonwealth Minister for the Environment has committed the Commonwealth to comply with State environmental legislation, a fact also reflected in the Defence Environment and Heritage Policy.

National Environment Protection Measures

The National Environment Protection Council (NEPC) has established by all levels of Australian Government to harmonise environmental standards across the nation. The principal regulatory vehicle of the NEPC are National Environment Protection Measures (NEPMs), which aim to set standards, goals, guidelines and protocols which are legally binding throughout Australia.

Complementary legislation at State and Territory level has been introduced to facilitate this. NEPMs are binding on Commonwealth agencies. The Environment Protection Authority (EPA) applies them at a State level in NSW. NEPMs developed to date address assessment of contaminated sites, trans-State movement of scheduled wastes, the National Pollutant Inventory (NPI), waste minimisation through reduction of packaging materials and ambient air quality. Defence was scheduled to commence participation in the NPI in 2000, but this was postponed so that trials could be conducted in early 2001 at a few facilities to determine security implications.

NSW Legislation

The Defence Environment and Heritage Policy includes a commitment to comply with the intent or spirit of Australian State and Territory environmental legislation, policy or standards, where Commonwealth legislation, policy or standards do not exist or are less stringent.

Contractors

All Contractor personnel are responsible for adherence to environmental requirements identified and stipulated in the EMP, a general duty to observe Defence environmental policies and requirements, as well as applicable Commonwealth and NSW legislation. Some environmental provisions exist in some contracts. The major contractors on Garden Island are Defence Maritime Services (DMS) and Australian Defence Industries (ADI).

Defence Maritime Services (DMS)

Defence Maritime Services Pty Ltd (DMS) are a company contracted by the RAN Port Services section to manage support vessels, including the lighter vessels (Wombat and Wallaby) used to refuel ships. The lighter vessels are filled from Chowder Bay Oil Fuel Installation prior to refuelling ships at Garden Island. The lighter vessels are owned by the Navy but operated and maintained by DMS.

DMS has the contract for both Fleet Base East and Fleet Base West. Although DMS is subject to local regulations, they do use Commonwealth equipment to transfer self-propelled fuel and water lighters (SPFWL) and crane stores lighters. Those in Sydney harbour are not subject to NSW survey, which could be a problem. Should a Commonwealth vessel, being operated by a State-registered contractor, contravene State environmental regulations there may be a consequential effect of naval capability.

Also, common practice is that the Commanding Officer of *HMAS Kuttabul* has the choice whether to rig oil booms before fuel transfers or not. State regulations say that this must be done for all fuel transfers. Although, some ship Commanding Officers insist on the booms, others do not. Once again, an accidental oil spill would contravene State regulations and could affect naval capability.

Australian Defence Industries (ADI)

Australian Defence Industries (ADI) lease a large proportion of the site from the Navy. The areas leased include the Captain Cook Graving Dry dock and associated facilities, the West Dock and Cruiser Wharf. ADI also maintains the services to Garden Island including the power, water and compressed air system. ADI has its own environmental management system, in accordance with the requirements of the lease agreement held with the Commonwealth at Garden Island (a lease agreement was observed which expired June 2001). This agreement States that the lessee (ADI) must prepare an Environmental Plan to ensure that the Lessee's occupation and its use of the land complies with environmental laws. The agreement also states that the lessee must take all necessary steps to ensure compliance with the Environmental Plan. ADI has a Trade Wastewater service agreement with Sydney Water. This agreement allows the discharge of black and grey sewage water only to the sewerage system from the buildings and ships in the dry dock alongside Fleet Base East and ADI wharves. Communication reviewed from Sydney Water to ADI States that 'in using Sydney Waters trade waste services; ADI and the Commonwealth agree to be bound by these conditions'. ADI have an Environment Protection Licence (ref: 4333, review date, 01 July 2002) with the NSW EPA. The Licence permits the discharge of waters from the Captain Cook Dock and the floating Dock.

The EPA has introduced more stringent discharge requirements since the issue of the lapsed licence. Negotiations are under way for a new licence to be issued. This will require the fitting of filtration equipment to ensure that the discharge water meets the new requirements. Failure to secure the licence would have a consequential effect on naval capability.

Antarctica

The Australian Antarctic Territory (AAT) was established in 1933 and was the largest single claim (42 percent) made by any country to sovereignty of Antarctica. An imperial Order in Council of 7 February 1933 placed under Australian authority all the islands and territories other than Ade'lie Land south of 60 S. lat. and lying between 160 E. long and 45 E. long. The Order came into force with a Proclamation issued by the Governor-General on 24 August 1936 after the passage of the *Australian Antarctic Territory Acceptance*

Act 1933. The boundaries of Ade'lie Land were definitively fixed by a French Decree of 1 April 1938 as the islands and territories south of 60 S. lat. lying between 136 E. long and 142 E. long. The Australian Antarctic Territory Act 1954 declared that the laws in force in the Australian Capital Territory are, so far as they are applicable and are not inconsistent with any ordinance made under the Act, in force in the Australian Antarctic Territory. The area of the territory is estimated at 6,119,818 square kilometres. On 13 February 1954 the Australian National Antarctic Research Expeditions (ANARE) established the Mawson station on MacRobertson Land. Australia has had a continuous scientific presence since that time, including bases at Casey, Davis and Macquarie Island.

Maritime Zones within the Area of Operations

The present Area of Operations (AO) extends over a vast area, and contains a variety of areas where national or international jurisdiction could be asserted. Firstly, in territorial waters, that is, all waters not less than 12nm from the coast, Australian law will operate as it does around mainland Australia. All Australian land territory will generate a territorial sea, including off the AAT. Around Macquarie Island, there is a 3nm belt of waters subject to Tasmanian jurisdiction, while all other territorial waters south of 45 degrees south are subject only to Commonwealth jurisdiction.

Aside from some small territorial sea baselines along the western coast of Macquarie Island, there are no territorial baselines proclaimed by Australia in waters south of 45 degrees south. This means that the territorial sea is measured from the low water mark along the coast. Australia has yet to take a position as to the location of the low water mark along an ice-covered coast, such as the AAT. Moves to clarify the Australian position are presently under consideration, with the option of the outer edge of ice shelves being the favoured position at present.

Since the territorial sea baseline will determine those areas subject to national jurisdiction, the location of these points is of tremendous importance for enforcement operations. It will be essential for the Australian position with respect to baselines around the AAT to be clarified before enforcement operations can be undertaken, as failure to do so may render an arrest unlawful after the event.

Outside the territorial sea are the Australian EEZ and the Australian Fishing Zone (AFZ). Both occupy the same space, beyond the territorial sea, to a distance of 200nm from territorial sea baselines around all Australian territory. The EEZ is presently only used in fisheries enforcement with the *Whale*

Protection Act 1980 (Cth). The AFZ operates off all territory, but all the waters off the AAT have been exempted since 1979, so the *Fisheries Management Act 1991 (Cth)* has no application to them. As such, in the present legislative situation, the AFZ operates only off Macquarie Island and Heard Island, in what is known at the HIMI. This situation could be changed by a proclamation of the Governor-General.

Outside the EEZ and AFZ are the high seas. In some instances, there may be Australian seabed under the high seas, however, these areas are unlikely to raise enforcement issues. Australia would only be able to take action against vessels drilling the seabed, or harvesting seabed dwelling creatures, a scenario that is extremely unlikely given the waters in issue. A formal Statement to the UN asserting the areas of Australian continental shelf beyond the EEZ will be submitted within the next 12 months.

High seas areas are not subject to Australian jurisdiction, and in these areas HMA Ships may only board vessels subject to certain conditions. In ordinary fisheries enforcement operations, this would be limited to Australian flag vessel, vessels that were Stateless, or vessels whose States had authorised Australia to act on their behalf. This last situation occurred off the South Tasman Rise when Belize authorised Australia to act on its behalf in 1999. Unfortunately, the Belize-flagged trawler departed the area before it could be apprehended. Implicitly this sort of authorisation would be received by Australia under Articles 21 and 22 of the UN Straddling Fish Stocks and Highly Migratory Fish Stocks Agreement, to which Australia is a party. There is a limited right to board, inspect, and even enforce arrangements undertaken by a Regional Fishing Organisation (RFO). In the region in question, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) would be the applicable RFO. The CCAMLR Area extends through all Antarctic waters south of 60 degrees South, and certain other waters north of that parallel, in a manner approximating the Antarctic Convergence.

Extent of the AO

In relation to legal issues and the proposed AO, some extension of the AO would be advisable. Firstly, the AO should include all waters subject to CCAMLR, at least between the meridians appurtenant to the AAT. This would see an extension to the westernmost portions of the AO to the north, from 60 degrees South, to 45 degrees South. This is because of the possibility of CCAMLR functioning as a regional fisheries organisation under the United Nations Straddling Fish Stocks and Highly Migratory Fish Stocks Agreement. Since

there is capacity for inspection and limited enforcement on the high seas under Articles 21 and 22 of the Agreement, an Australian vessel might wish to stop and inspect a vessel north of the existing AO in the CCAMLR Area.

Secondly, the eastern extremity of the AO may not be sufficient. The EEZ generated by Macquarie Island would extend almost 200 nautical miles due east of the island. This may well extend beyond 163 degrees east. The meridian for the eastern edge of the AO should take in all of the Australian EEZ, and therefore ought to be moved eastward to permit this to occur if necessary.

Thirdly, an Australian capacity in the Southern Ocean might encourage the formation of a treaty relationship with New Zealand to address far southern mutual enforcement. In that event the AO would need to be extended to the CCAMLR Area appurtenant to the Ross Dependency (in this instance the CCAMLR Area extends only to 60 degrees South) to the 150th meridian West of Greenwich. In addition, the EEZ generated by the Auckland Islands, and Campbell Island would also have to be included.

Legal Difficulties for Operations in the AO

The principal difficulty in Antarctic operations from a legal perspective is found in Article I of the Antarctic Treaty. Article I provides:

> Antarctica shall be used for peaceful purposes only. There shall be prohibited, inter alia, any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military maneuvers (sic), as well as the testing of any type of weapons.

The issue here is whether the operation of one of HMA Ships in waters in the Treaty Area would infringe Article I. Certainly the presence of naval vessels in southern waters alone will not infringe Article I. A number of States have consistently use naval and air force aircraft to support their Antarctic operations, including the RAAF and RNZAF. *HMS Endurance* (both the previous and the current vessel) has operated in waters south of 60 degrees south on a regular basis, in the years before the Falklands Conflict and subsequently. What will be crucial in determining legality will be the activities undertaken by the vessel.

It is clear that a number of activities would be denied to an RAN vessel in the Treaty Area. It could not undertake 'military measures' or weapons testing or 'military maneuvers'. This may limited the kind of exercises or activities the vessel can validly engage in. It would also not be able to be supported from a

commissioned establishment in the AAT. The Treaty does recognise an exception, which is found in Article I(2):

> The present Treaty shall not prevent the use of military personnel or equipment for scientific research or for any other peaceful purpose.

This provision would permit the use of a commissioned vessel in support of Antarctic operations, provided that it was in support of scientific research, or 'any other peaceful purpose'. Clearly enforcement operations would not be related to scientific research, and therefore would have to be regarded as peaceful purposes. The use of a ship in a law enforcement role could be argued as being consistent with peaceful purposes. The maintenance of public order might be argued as being consistent with peaceful purposes.

However, it would be unlikely if the use of all weapons to affect an arrest would be permissible. In the Red Crusader Case, the Anglo-Danish Commission of Enquiry found that the firing of solid shot into the trawler Red Crusader by a Danish fisheries patrol vessel 'exceeded the legitimate use of armed force'. This would mean an enforcement action in the Treaty Area could not undertake any action that might fall outside a 'peaceful purpose', and likely this would preclude firing a ship's gun. Whether armed boarding parties could be employed and possibly open fire would be a matter of some debate. It is submitted a stronger case could be made for the deploying of boarding parties with non-lethal weapons only in waters south of 60 degrees South. Were a hot pursuit to extend north of 60 degrees south, then boarding teams armed with lethal weapons, or the use of the ship's armament, may be possible, albeit in the latter case extremely rarely.

Another difficult operational constraint found in the Treaty is Article VII(5), which provides:

> Each Contracting Party shall, at the time when the present Treaty enters into force for it, inform the other Contracting Parties, and thereafter shall give them notice in advance, of:
>
> a) All expeditions to and within Antarctica, on the part of its ships or nationals, and all expeditions to Antarctica organized in or proceeding from its territory.
>
> b) All stations in Antarctica occupied by its nationals.
>
> c) Any military personnel or equipment intended to be introduced by it into Antarctica subject to the conditions prescribed in paragraph 2 of Article I of the present Treaty.

This provision requires Australia to notify other Antarctic Treaty States of all military personnel and equipment entering the Treaty Area in advance of their deployment. This requirement would oblige Australia to inform a large number of other States, including (but not restricted to) Argentina, Belgium, Brazil, Chile, China, Ecuador, Finland, France, Germany, India, Japan, Korea, New Zealand, the Netherlands, Norway, Peru, Russia, South Africa, the UK, the USA, and Uruguay. This notification cannot be avoided, and would potentially threaten operational effectiveness if it were to lead to a failure of security. Given the large number of States to be notified, the potential for leakage of information to IUU vessels is high, thereby decreasing effectiveness.

One possible response might be that Australia could be vague as to the areas being patrolled, creating uncertainty as to the likely location of the vessel. Such a response might conceivably generate protest from the other Antarctic Treaty States, who might view Australia's lack of openness as being inconsistent with the spirit of the Treaty, and with international practice over 40 years of its operation.

Sovereignty Protection

Australia claims sovereignty over in excess of 40 percent of the Antarctic continent, and sovereign rights over an adjacent sea and seabed area of over 500,000 square nautical miles. It has been occasionally asserted in the media that Australia does not need to undertake measures to preserve Australian sovereignty by virtue of the Antarctic Treaty. While having some basis in fact, this does not accurately describe the situation. In order to avoid international conflict over Antarctica, arising out of efforts at sovereignty protection, the various parties to the Antarctic Treaty included Article IV of the Treaty. Article IV provided that no act by a State party would diminish or harm its sovereignty while the Treaty was in force. In this way Australia could allow American, Russian and Chinese bases on its claimed territory without giving permission, on the basis that this failure of control would not harm Australian sovereignty. This has been popularly described as 'freezing the claims'.

A number of observations need to be made concerning Article IV. Firstly, it only applies between parties to the Antarctic Treaty. Therefore failing to enforce Australian law as against the nationals or vessels of third States would damage an Australian claim to the AAT. Since many IUU fishing vessels are flagged by States that are not parties to the Antarctic Treaty, failure by Australia to take action against these vessels harms Australia's claim to jurisdiction. Secondly, while Article IV is intended to provide some protection, academic views vary as to the width of protection provided, particularly if the Treaty should ever

come to an end. Therefore, there is no legal impediment upon Australia seeking to enforce its law, providing this is done in a manner consistent with the Antarctic Treaty, and with due regard to Australia's relations with other Antarctic Treaty States.

The impact of enforcement on action upon Australia's international relations could be substantial. Non-claimant parties to the Antarctic Treaty would certainly protest such action by Australia. In addition, unless the vessel apprehended was flagged in Britain, France, Norway or New Zealand, one could anticipate protest by the flag State of the vessel. This could lead to international litigation involving Australia before the International Tribunal for the Law of the Sea, which might have undesirable consequences for Australia. The decision to enforce Australian law in waters off the AAT would therefore need to be taken at the highest level.

While the decision to enforce Australian law might cause some controversy, it would be welcomed by environmental NGOs as a significant step forward in the protection of the marine living resources of the Antarctic. This would certain limit the extent of international criticism that might occur in Europe or the United States.

CCAMLR

The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), based in Hobart, has responsibility for the international management of much of the Southern Ocean. CCAMLR manages fisheries, but sees its role in wider terms, with responsibility for managing the whole of the ecosystem in all waters south of the Antarctic Convergence. In practical terms, the Commission's present capacity leaves it with nothing else but the management of fisheries.

CCAMLR can adopt conservation measures for the protection of fisheries. These measures are adopted at the annual meetings of the Commission, and are on a consensus basis. That is to say, any member State has a veto on any new conservation measure. Given the infrequency of the meetings, and the existence of a veto in the hands of any member State, CCAMLR is ill-suited at responding quickly to crises. Nevertheless, conservation measures have been directed at the Patagonian Toothfish fisheries in the Southern Ocean. Such members are to be enforced by the flag State, unless a breach occurs in waters subject to national jurisdiction.

The CCAMLR Area covers all of the Southern Ocean south of 60 degrees south, as well as certain areas south of the Antarctic Convergence that are north of

the 60th parallel. The Area includes the waters around HIMI and Kerguelen, but not around Macquarie Island. With respect to HIMI and Kerguelen, a Statement was made by the CCAMLR Conference Chairman at the adoption of the Convention to the effect that CCAMLR Area waters north of 60 degrees south that were subject to national jurisdiction would have the States concerned implement measures at least as strong as conservation measures adopted by CCAMLR.

One use of CCAMLR may be to act as an RFO under the Highly Migratory Fish Stocks and Straddling Fish Stocks Agreement, giving Australian Government vessels a limited right of inspection and enforcement of foreign flagged vessels whose flag States are CCAMLR members. CCAMLR itself has shown some reluctance in the past to being regarded as a regional fisheries organisation. Certainly, the utility of CCAMLR may be undermined by an aggression attitude to enforcement, due to the vulnerability inherent in its consensus decision-making system.

From an operational perspective, CCAMLR is unlikely to impact significantly upon efforts to police the HIMI. CCAMLR and Antarctic Treaty member States may express some concern in relation to enforcement efforts off the AAT, however these considerations have been noted above.

Legal Considerations affecting Operations

The AO extends over a vast area, and this in itself presents unique challenges to the operation of Australian law. These challenges may ultimately require a legislative solution to resolve, however, the following discussion is based on the existing legal regime. For surveillance and boarding operations, many of the issues present in the Southern Ocean are the same as in other areas subject to Australian jurisdiction. The use of force at sea to apprehend suspected illegal fishing vessels is problematic insofar as international law does not countenance the firing of solid shot into fishing vessels, nor taking action that might endanger life. International cases such as the *Red Crusader* and the *I'm Alone* place a heavy burden upon the arresting State to ensure that life is not endangered in attempting to stop a vessel for arrest. In the Southern Ocean, the scope of action might be even further restricted given the remoteness of the location and the appalling weather conditions. Even the disabling of a vessel's engine or rudder might represent a substantial danger to that vessel, when it may be necessary to face a tow of several weeks duration in severe sea States.

With this in mind, care needs to be taken that any proposed enforcement vessel can effectively stop a vessel without danger to its crew, and have the

capacity to take a vessel in tow, or take aboard its crew if lives were under threat. The duty to provide assistance to a vessel in distress is of tremendous importance, particularly when the vessel has been placed in distress as a result of action by the arresting vessel. Failure to adequately respond to a distress situation could lead to international action against Australia.

Another difficulty inherent in operations in the Southern Ocean relates to arrest. At common law, an individual under arrest should, after a period of time, either be charged or released. If charged, the individual is entitled to seek bail, and if refused, can reapply for bail after a period of eight days. Aside from statutory restrictions setting appropriate time scales, the common law permits individuals to seek a writ of *habeas corpus* demanding the release of individuals held beyond lawful authority. The litigation surrounding the incident involving *MV Tampa* has confirmed that a writ of *habeas corpus* is available to those detained at sea. The problem inherent in Southern Ocean operations is that they take place at great distance from courts, and therefore a vessel and her master may be in custody pending arrival in Fremantle or Hobart for a number of weeks. If the vessel is detained in the company of a support vessel, while another RAN vessel engages in interception and arrest operations this period would only lengthen. When one considers the offences likely faced by the master of an illegal fishing vessel are not custodial, the reaction of the courts to a lengthy detention at sea may not be sympathetic. In order to avoid legal action that may upset operations, it may be necessary to ask for amendments to the *Fisheries Management Act 1991 (Cth)* giving protection from ADF personnel, and legitimising the detention at sea of a vessel, pending its convenient return to Australia. Operations involving long delays in returning a vessel to Australia might require legislative confirmation, in line with the measures that were taken to confirm escort of an apprehended vessel across the high seas.

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Australian Defence Organisation Environment Policy

The Defence Environment Manager provides Environmental Policy through the Director Environmental Stewardship and manages Environmental Programs through the Director Environmental Programs. The Director of Environmental Stewardship is responsible for advice on environmental legislative requirements, the Defence Environmental Management System and training for environmental issues. The Director of Environmental Programs provides environmental program information including the Greenhouse Challenge, incorporating the Defence Energy Efficiency Program, National Environmental Protection Measures, and matters relating to sustainable environmental management and ecologically sustainable development.

The ADO employed the ISO 14000 family of International Standards for environmental management in the development of its policy, as these are widely accepted as the 'best practice' model. The Vision of the Environment Policy is for the Australian Defence Force (ADF) to be a leader in sustainable environmental management to support its capability to defend Australia and its national interests.

The Defence Environment Policy has the following six strategic environmental policy objectives:

- Establishing an innovative Environmental Management System (EMS) which supports ADF capability, promotes environmental sustainability and achieves the Government's broader environmental objectives.
- Creating a culture where sustainable environmental management is considered an integral element of capability development, equipment acquisition and through life support, including operational application.
- Establishing clear lines of accountability for environmental outcomes.
- Developing effective processes for education and training in support of the creation of an environmentally aware culture.
- Measuring and reporting environmental performance as a part of a process of continuous improvement.

- Creating a climate of transparency and strategic partnerships with key environmental stakeholders.

The ADO is obliged to comply with all Commonwealth environmental regulatory requirements including the EPBCA. The strategy identifies regulatory compliance as a basic requirement to be included in the awareness and training education framework.

RAN Environmental Policy

The RAN's policy has been built upon the Environmental Policy developed for the ADO as a whole. The ADO policy has been developed in response to Australia's international environmental obligations and domestic legislation, including amendments to MARPOL and the adoption of the *Environment Protection and Biodiversity Act 1999 (EPBCA)*.

The RAN Environmental Organisation is diverse. Policy development is divided between the Navy Basing and Environment Policy Directorate in Naval Headquarters, and the Directorate of Naval Platform Systems. The Navy Environment Policy section is responsible for strategic policy development and compliance with Commonwealth legislation. The Directorate of Naval Platform Systems (DNPS) is the technical regulatory authority and is responsible for policy and advice on equipment and engineering aspects.

Management and implementation of policy in the Fleet is the responsibility of the Fleet Environment and Occupational Health & Safety Coordination Officer. This includes management of offshore training areas.

New Acquisition Projects and major installations of new equipment in existing ships, incorporate the various environmental policies during the project definition phase, with approval of documentation through the technical regulatory authority being required.

The RAN policy has been developed to decrease the likelihood of damage to the environment. The policy acknowledges that the potential for environmental damage varies with both the scale and intensity of the activity, and the degree of risk. So, planning for different activities is such that there is layered protection for the environment, tailored for each activity. The layers of protection are:

- Environmental awareness training for all employees – both Service and civilian.
- Policy focussed on particular activities or requirements.

- Ships' Environmental Management Plans and activity Mitigation Procedures.
- Training Area/Establishment Environmental Management Plans.
- Independent external review through Environment Australia/Minister of the Environment.

Environmental Management of Establishments

Australian Defence Establishments are owned and managed by the Australian Defence Estate Organisation. Environmental compliance for these facilities is the responsibility of the Environmental Stewardship Infrastructure Division. Environmental Management Plans (EMPs) are a key element of the Department of Defence's overall management program and provide both tangible evidence of Departmental commitment to sustainable, environmental management and a prescriptive management guide for facility managers in meeting statutory environmental obligations.

The development of the EMPs has been ongoing across the ADO portfolio. This is a dynamic process with each site being assessed and its EMP upgraded as the circumstances for that particular site change. The EMPs are incorporated into the evolving Defence Environmental Management System and play a significant role in delivering the expected, credible, and accountable environmental management performance across Defence Training Areas and facilities.

Environmentally Sustainable Warship Bibliography | Annex D

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[165] IMO News, 'IMO environmental meeting approves new measures on ballast water management', Issue 2 2002, p. 17.

[166] Sub-Committee on Ship Design and Equipment, Summary of agenda discussed at 45th Session: 18–22 March 2002, URL: *www.imo.org*.

[167] Sub-Committee on Ship Design and Equipment, Summary of agenda discussed at 45th Session: 18–22 March 2002, URL: *www.imo.org*.

[168] IMO News, 'IMO environmental meeting approves new measures on ballast water management', Issue 2 2002, p. 20.

[169] IMO News, 'IMO environmental meeting approves new measures on ballast water management', Issue 2 2002, p. 20.

[170] A referral is to contain a set of information that includes contact details and brief descriptions of the proposal, its location and potential impacts on matters of national environmental significance. The referral may be submitted electronically or in paper form. The regulations set out what information must be included in the referral.

[171] Environment Australia, Guidelines on the Application of the Environment Protection and Biodiversity Conservation Act to Interactions Between Offshore Seismic Operations and Larger Cetaceans, URL: *http://www.ea.gov.au/epbc/assessmentsapprovals/guidelines/seismic/index.html*.

[172] Attorney General's Department, 1996, *Submission by the Office of International Law, Cth Attorney General's Department to the Marine Pollution Inquiry* (conducted by the Senate on the Environment, Recreation, Communications and the Arts Reference Committee), URL: *http://www.aph.gov.au/senate/committee/erca_ctte/marine/append3.htm*

[173] IMO, International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) – Annex IV, URL: *www.imo.org*, Accessed: March 2002.

[174] IMO, 'Information on the Ratification of Pollution Conventions', URL: *http://imo.org/convent/pollute.htm*, Accessed: February 2001.

[175] See *Coastal Waters (State Title) Act*, *Coastal Waters (State Powers) Act*, *Coastal Waters (Northern Territory Title) Act*; *Coastal Waters (Northern Territory Powers) Act*.

[176] In effect, *the Protection of the Sea (Prevention of Pollution from Ships) Act 1983* is the main piece of legislation implementing the provisions of MARPOL 73/78. However, since MARPOL 73/78 was introduced, several amendments to the Convention were made thus prompting the need to make modifications to domestic legislation so as to comply with international standards. Such modifications to domestic legislation have been made through the following amendments:

Navigation (Protection of the Sea) Amendment Act 1983.
Statute Law (Miscellaneous Provisions) Act (No.1) 1984.
Statute Law (Miscellaneous Provisions) Act (No.1) 1985.
Protection of the Sea (Prevention of Pollution from Ships) Amendment Act 1986.
Statute Law (Miscellaneous Provisions) Act (No.1) 1987.
Transport Legislation Amendment Act 1988.
Statutory Instruments (Tabling and Disallowance) Legislation Amendment Act 1988.
Transport Legislation Amendment Act (No.1) 1989.
Transport Legislation Amendment Act (No.1) 1990.
Transport and Communications Legislation Amendment Act 1990.
Transport Legislation Amendment Act 1991.
Transport and Communications Legislation Amendment Act (No.2) 1992.
Transport and Communications Legislation Amendment Act 1994.
Statute Law Revision Act 1996.

Marine Orders, Part 91 (Marine Pollution Prevention – Oil).
Marine Orders, Part 93 (Marine Pollution Prevention – Noxious Liquid Substances).
Marine Orders Part 94 (Marine Pollution Prevention – Harmful Substances in Packaged Forms).

AMSA, URL: *http://www.amsa.gov.au/me/pn324.htm#back%2027*, Accessed: February 2002.

It is important to note that MARPOL 73/78 is a dynamic instrument and consequently, from time to time, the MEPC adopts resolutions that amend the Convention or its Annexes. By virtue of delays in processing legislative amendments through the Commonwealth Parliament, domestic law has failed to reflect MARPOL 73/78 amendments for periods of up to three years. For example, MEPC Resolution 57(33) designating the Antarctic as a special area entered into force on 1 July 1994, but a proposal to amend the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* was yet to be effected as of September 1997. To overcome such delays, the Australian Maritime Safety Authority has on occasion used Marine Orders to provide a legislative basis for Australia to satisfy its MARPOL 73/78 obligations. One such use of a Marine Order with regard to MARPOL 73/78 occurred in mid-1997 and related to amendments to MARPOL 73/78 Annex V (garbage disposal at sea). This is a technique which is employed commonly with regard to other complex, evolving instruments such as the International Convention for Safety of Life at Sea (SOLAS) 1974. A limitation of the use of Marine Orders is that provision for sanctions is restricted and might not enable penalties to reflect the seriousness of the violation or to be consistent with other penalties stipulated in the Act.

[177] Attorney General's Department, 1996, *Submission by the Office of International Law, Attorney General's Department to the Marine Pollution Inquiry* (conducted by the Senate on the Environment, Recreation, Communications and the Arts Reference Committee), URL: *http://www.aph.gov.au/senate/committee/erca_ctte/marine/append3.htm* Accessed: January 2001.

[178] Above 9.

[179] Above 2.

[180] AMSA, 2000, *Directory of Australian Ports*, URL: *http://www.amsa.gov.au/ME/AUS.pdf* Accessed: February 2001.

[181] The information related in this section was adapted from AMSA'S website, URL: *www.amsa.gov.au*, Accessed: February 2002.

[182] AMSA, 1998, The National Plan to Combat Pollution of the Sea by Oil and other Noxious and Hazardous Substances, URL: *www.amsa.gov.au/me/natplan/SEC/objectiv.htm*, Accessed: November 2000.

[183] Marine Division of Transport Department SA, Protecting Our Waters, *http://www.marine.transport.sa.gov.au/pdfs/oil_pollution.pdf*, Accessed: February 2001.

[184] Above n 9.

[185] Australian and New Zealand Environment and Conservation Council (ANZECC), 1997, *Guide to Environmental Legislation in Australia and New Zealand*, 5th Edition, Report No. 31, p. 43.

[186] Above n 9.

[187] Table is adapted from AMSA, Directory of Australian Ports, URL: *http://www.amsa.gov.au/ME/AUS.pdf*, Accessed: February 2001. Note that garbage may only be received from Australian vessels (non-quarantine).

[188] The information reported in this section was derived from the Environment Protection Agency (NSW), 'State of the Environment 2000 Report, URL: *http://www.epa.nsw.gov.au/soe/soe2000/cw/cw_5.11.htm#cw_5.11_h103*, Accessed: February 2002.

[189] Section 26 of the Act provides that the meaning attributed to 'harmful substance' is that given by the International Maritime Dangerous Goods Code.

[190] Above n 9, paras 103-106

[191] Source: Table is adapted from AMSA, Directory of Australian Ports, URL: *http://www.amsa.gov.au/ME/AUS.pdf*, Accessed: February 2001. Note that garbage may only be received from Australian vessels (non-quarantine).

[192] Information in this section is derived from Department of Infrastructure, Planning and Environment, URL: *http://www.nt.gov.au/dtw/aboutus/branches/transport/marine/pollution.shtml#marinepollution*, Accessed: March 2002.

[193] According to section 67(1) of the Act a reportable incident is a discharge of oil, a noxious liquid substance, or a harmful substance in packaged form from a ship in coastal waters.

[194] The chief executive may appoint officers of the public service, employees of the port authority or any other person prescribed in the regulations to be an authorised officer within the meaning of the Act. *Transport Operations (Marine Pollution) Act 1995*, section 72.

[195] *Environmental Protection Act 1994*, section 24(2).

[196] *Environmental Protection Act 1994*, section 124.

[197] *Environmental Protection Act 1994*, section 30(1).

[198] *Environmental Protection Act 1994*, section 34.

[199] *Environmental Protection (Water) Policy 1997*, section 5.

[200] *Environmental Protection (Water) Policy 1997*, section 6.

[201] R. Milne, op. cit. at 27.

[202] *Environmental Protection (Water) Policy 1997*, section 7(2).

[203] *Environmental Protection (Water) Policy 1997*, section 13.

[204] *Environmental Protection (Water) Policy 1997*, sections 8 and 9.

[205] Source: Table is adapted from AMSA, Directory of Australian Ports, URL: *http://www.amsa.gov.au/ME/AUS.pdf*, Accessed: February 2001. Note that garbage may only be received from Australian vessels (non-quarantine).

[206] Moreover, the act does not apply in relation to certain activities undertaken or wastes produced in the course of certain activities under the following legislation: *Petroleum Act, 1940, Petroleum (Submerged Lands) Act, 1982, Mining Act 1971, Roxby Downs (Indenture Ratification) Act 1982*.

[207] Source: Table is adapted from AMSA, Directory of Australian Ports, URL: *http://www.amsa.gov.au/ME/AUS.pdf*, Accessed: February 2001. Note that garbage may only be received from Australian vessels (non-quarantine).

[208] Source: Table is adapted from AMSA, Directory of Australian Ports, URL: *http://www.amsa.gov.au/ME/AUS.pdf*, Accessed: February 2001. Note that garbage may only be received from Australian vessels (non-quarantine).

[209] Environment Protection Agency, URL: *http://www.epa.vic.gov.au/Publications/Legislation/acts.asp#pollution*, Accessed: March 2002.

[210] Being dunnage, lining or packing materials which will float and are not plastics

[211] Source: Table is adapted from AMSA, Directory of Australian Ports, URL: *http://www.amsa.gov.au/ME/AUS.pdf*, Accessed: February 2001. Note that garbage may only be received from Australian vessels (non-quarantine).

[212] Turnbull, J.S., 'Review of Port Reform in Victoria, Submission Discussion Paper No.5', URL: *http://www.doi.vic.gov.au/doi/doielect.nsf/2a6bd98dee287482ca256915001cff0c/e03caf581ab7a2894a256aed000c1e40/$FILE/Sub_Turnbull%20John%20(5).pdf*, Accessed: March 2002.