

*Papers in Australian Maritime Affairs*

No. 5



Royal Australian Navy  
Maritime Studies Program

# Issues in Regional Maritime Strategy

Papers by Foreign Visiting Military Fellows with the Royal  
Australian Navy Maritime Studies Program - 1998

**edited by David Wilson**



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*Papers in Australian Maritime Affairs Number Five*

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**General Editor** David Stevens

**Editor** David Wilson

The 'Papers in Australian Maritime Affairs' series is a vehicle for the distribution of substantial work by members of the Royal Australian Navy as well as members of the Australian and international community undertaking original research into regional maritime issues. Papers will be drawn generally from manuscripts not scheduled for publication elsewhere but that nonetheless merit extensive distribution. Candidates are considered by an editorial board under the auspices of the Director General Maritime Studies Program.

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## Foreword

Since its formation in 1990, the RAN Maritime Studies Program (MSP) has contributed significantly to the discussion and awareness of maritime strategy and more broadly to issues in maritime policy through lectures, seminars, conferences and study periods and a substantial publishing program. The MSP has established and maintained close links with many navies, academic and defence institutions around the world and has gained a respected international reputation for its contribution to maritime affairs.

In furthering its contribution to the understanding of regional maritime affairs and regional security the MSP has acted as host for visitors from regional navies who are undertaking research activities in Australia. While the nature of this research relates to contemporary domestic issues, any discussion of the sea attracts the interest of all actors in the region. The benefits of the MSP visiting fellows program to both the RAN and the regional countries concerned are enormous. The RAN gets first hand exposure to the issues affecting our regional neighbours and the visiting fellows share in the knowledge and experience of one of the more mature maritime nations in the region.

The two papers presented in this, the fifth publication in the MSP's 'Papers in Australian Maritime Affairs' series, represent maritime issues of significance not only to the countries concerned, but also to the world in general. I congratulate the authors on this work and recommend these papers as a valuable addition to the discussion of maritime affairs.



K.J. Scarce CSC  
Commodore, RAN  
Commander Training - Navy



*MV Iron Pacific*

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## Abbreviations

|            |   |
|------------|---|
| AFP        | Armed Forces of the Philippines                                     |
| ANCA       | Australian National Conservation Agency                             |
| APEC       | Asia-Pacific Economic Cooperation                                   |
| ASEAN      | Association of South East Asian Nations                             |
| BAKORKAMLA | Coordinating Board for Maritime Security                            |
| BFAR       | Bureau of Fisheries and Aquatic Resources                           |
| BUCUS      | Bureau of Customs   |
| CCMOA      | Cabinet Committee on Maritime and Ocean Affairs                     |
| CSCAP      | Council for Security Cooperation in the Asia-Pacific                |
| DA         | Department of Agriculture   |
| DENR       | Department of Environmental and Natural Resources                   |
| DILG       | Department of Interior and Local Government                         |
| DND        | Department of National Defence                                      |
| DOTC       | Department of Transport and Communications                          |
| EEZ        | exclusive economic zone   |
| GBR        | Great Barrier Reef  |
| GBRMP      | Great Barrier Reef Marine Park                                      |
| IAC        | Interdepartmental Advisory Committee                                |
| IMO        | International Maritime Organisation                                 |
| LEO        | low earth orbit   |
| LOSC       | Law of the Sea Convention   |
| LWR        | land-based microwave radar  |
| MARICOM    | Maritime Command  |
| MARPOL     | International Convention for the Prevention of Pollution from Ships |
| MECC       | Maritime Enforcement Coordination Committee                         |
| MEPC       | Marine Environment Protection Committee                             |
| MPA        | marine protected area   |
| MSC        | Maritime Safety Committee   |
| MTW        | Malaysian Territorial Waters  |
| NMSRCO     | National Maritime Surveillance and Response Coordination Office     |
| OHTR       | over-the-horizon radar  |
| OPAC       | Operations and Program Advisory Committee                           |
| OPAG       | Operations and Program Advisory Group                               |
| PAF        | Philippine Air Force  |
| PNG        | Papua New Guinea  |
| PNP        | Philippine National Police  |
| RAAF       | Royal Australian Air Force  |
| RAN        | Royal Australian Navy   |
| SLAR       | side-looking airborne radar   |
| STWC       | Standards of Training, Certification and Watchkeeping for Seafarers |
| SWR        | surface wave radar  |
| TSS        | traffic separation scheme   |
| TTEG       | Tripartite Technical Expert Group                                   |
| VTS        | vessel traffic services   |

## Introduction

*Lieutenant Commander David Wilson, RAN*

The two papers presented here discuss important maritime issues, which have relevance to not only the regions discussed, but to the world in general. In particular, protection of the marine environment is gaining widespread acceptance as a task that requires action sooner rather than later if the trends of the past century are to be halted and, if possible, reversed. That fact that developing countries are beginning to address these issues, albeit from a national perspective rather than a global one, is encouraging. It is incumbent upon the developed nations of the world to lead the way, not only by providing the support required by the developing nations, but by ensuring they are addressing the issues themselves. Far too often we have seen important global issues being sidetracked by the nationalistic concerns of some nations.

Both papers have particular relevance to Australia. The Malacca Strait is the second busiest waterway in the world<sup>1</sup> and an important trade route for Australia.<sup>2</sup> In addition, the Malacca Strait is exceedingly important, both economically and socially, to two of Australia's nearest neighbours, Indonesia and Malaysia. Therefore it is in Australia's interest to assist these countries to protect and regulate these waters. Indeed Australia's experience in protecting and regulating the marine environment is an example that can be of benefit to these countries. The significance of the Malacca Straits to the world economy dictates that there should be global interest in this issue.

Philippine efforts to develop a credible surveillance capability is a logical outcome of the increasing awareness of the importance of the marine environment to all facets of a nation's well-being. With the increased jurisdictions and the associated management and enforcement requirements resulting from the Law of the Sea Convention many nations around the world, and in the South East Asian region in particular, are now facing this issue. Australia has one of the largest maritime environments in the world, and although it has a significant surveillance capability, it is by no means ideal, and any efforts by other countries to develop a capability in an era dominated by the outcomes of the Law of the Sea Convention should be looked upon with interest.

1. J.H. Noer, *Chokepoints: Maritime Economic Concerns in Southeast Asia*, National Defence University Press Washington DC, 1996, p2

2. *ibid.*, p67





Chinese merchant vessel in the Malacca Strait  
*(Courtesy of 92 Wing Royal Australian Air Force)*

## THE MALACCA STRAITS : A SPECIAL AREA UNDER MARPOL 73/78?

*Sulistiyanto*

### Introduction

A century ago T. H. Huxley, one of the leading scientists of the British Empire denounced as absurd the notion that humans could have a significant, wide spread impact upon the marine environment.<sup>1</sup> In 1952 the United Nations in the one of its earliest actions established the Law of the Sea process, in part, to address the now recognised need to manage the sea, particularly its resources and environmental quality. There were several reasons for this, including: the recognition that the increasing range and efficiency of fishing fleets made it increasingly possible to over-exploit fish populations; identification of sea bed and sub-sea mineral and petroleum deposits and the technology development to exploit them commercially; and closer to land; awareness of estuarine damage and declining water quality resulting from of increasing use marine and estuarine environments and resources.

Development in the 20th century has banished the innocence of the late 19th century. Wide spread and increasing impact on the marine environment has followed the growth in human population and unsustainable uses of technology. A major global challenge *today is to develop and apply the means to halt then reverse these impacts. Failure to do so, will increase the pattern of collapsing marginal and wild stock fisheries, while increased pollution and degradation of the coastal margin will foreclose options for sea farming. The social and economic cost will be high, particularly in developing countries which rely on protein from sea to feed their populations. Maintaining, protecting and restoring the productivity of coastal and marine environments are critical to the long-term resource security of many nations.*

The decline in fishery production and environmental degradation is now a global trend, particularly among developing countries, with Indonesia being no exception. One specific area identified as highly susceptible to damage due to pollution is the Strait of Malacca. Aside from being one of the busiest sea routes for international traffic, this body of water is a primary source of livelihood for the local coastal communities. The risk of environmental damage is high and thus it requires special and careful consideration.

With respect to operational pollution by oil, noxious liquid substances in bulk, sewage and garbage, *uniform global discharge standards have been developed in the International Convention for the Prevention of Pollution from Ships (MARPOL) 1973, as modified by the Protocol of 1978 (MARPOL 73/78).* Regulations covering the various sources of ship-generated pollution are contained in the five annexes of the Convention. The *annexes relating to oil, noxious substances in bulk, harmful substances in packaged forms and garbage* have entered into force while the annex relating to sewage is waiting entry into force. Discussions are underway regarding alien marine organisms. The Guidelines for Preventing the Introduction of Unwanted Aquatic Organisms and Pathogens from Ships Ballast Water and Sediment Discharges were adopted by the Marine Environment Committee in July 1991. The object of this paper is to establish the urgency of instituting

measures to prevent an untoward incident from happening in the Malacca Straits. It also reviews the experience of Australia and attempts to draw lessons from that experience.

### **Indonesian Natural Resources Policy**

The guidelines of Indonesian Government Policy determine that the natural resources of the country, in the form of land, air, minerals, flora and fauna including genetic resources, whether on shore, in the sea or in the air, should be managed and utilised for the greatest possible benefit. At the same time, the environment should be preserved to produce the greatest possible advantage for development and public welfare for both present and future generations.

The policy on the management of natural resources and the environment is dealt with in four basic programs:

- The assessment and evaluation of natural resources and the environment.
- Measures to safe guard forest, land and water.
- The management of natural resources and the environment.
- The development of skills and knowledge in the field of meteorological and geophysical science.<sup>2</sup>

The marine zone is considered one of the important sectors of national development. The archipelagic state concept underlines national development in general, and includes the realisation of the Indonesian archipelago as one political, social, cultural and economic entity, as well as one entity for defence and security. Under this concept a basic pattern of national development was established, consisting of a general pattern that forms the basic foundation for medium term development covering a period of 25 divided into several Five-Year Development Plan (REPELITA) stages.<sup>3</sup>

Development of marine affairs has been directed towards the diversification, exploration and exploitation, and productivity of the marine resources and the preservation of its ecosystem with the appropriate application of science and technology. Exploration and exploitation require expansion of scientific knowledge of the resource potential of Indonesian maritime areas including the sea-bed and sub soil. The resource potential of the ocean is huge and to date this has been only partially tapped, especially in the case of oil, gas and some mineral products and to a lesser extent fisheries. The economic potential of the production of energy from the waters, current and winds is yet to be explored.

Indonesia's sea water of some 2.1 million km square represents a source of enormous fisheries potential, estimated at 6.7 million tons a year of which an annual 4.4 million tons is thought to be available from territorial waters and 2.3 million tons from the Exclusive Economic Zone (EEZ). Development of the fisheries sector is an important element in the Indonesian government's promotion of regional development and economic growth for the nation as a whole. Measured in current prices, the volume of total fisheries production has grown rapidly in recent years, exports of shrimp, tuna and other types of fish have also increased rapidly from US\$667.3 million in 1989 to US\$1.46 billion in 1995.<sup>4</sup>

To preserve the economic resources within Indonesia's sea and coastal areas, efforts were instituted to rehabilitate damaged areas and to prevent further damage to coastal

areas from sea water erosion. Some of the areas under rehabilitation include the 8,500 hectares<sup>5</sup> of mangrove forests in East Java, West Java, Central Java, North Sumatra, Lampung, South Sulawesi, Bali, and West Nusa Tenggara provinces. In addition sea gardens were preserved and developed in the Thousand Islands (Jakarta Bay), Pomo Island (Maluku), Karimunjawa (Central Java), Bunaken (North Sulawesi), Cendrawasih Bay (Irian Jaya) and Take Bonerate (South Sulawesi).<sup>6</sup>

### **The Malacca Straits**

Another major concern being seriously considered is the deteriorating state of the waters in the Malacca Straits, which have shown significant signs of degradation mainly due to oil pollution and unauthorised ballast discharges.

The Malacca Straits (Figure 1) is the main passage between the Indian Ocean, the South China Sea, and the Pacific Ocean. Maritime traffic through the strait is heavy with over 200 ships<sup>7</sup> per day, or more than 60,000 ships annually passing through, and this is anticipated to grow to approximately 100,000 transits annually by the year of 2000.<sup>8</sup> It is also a significant route for warships. The issue of submerged submarine passage does not arise owing to the relatively shallow depth of water. The length of the combined Malacca and Singapore Straits is approximately 600 nautical miles.

At its narrowest point the Strait is 3.2 nautical miles wide, and territorial waters are found throughout the straits. Three littoral states namely Indonesia, Malaysia and Singapore have drawn three boundary lines in their overlapping territorial seas within the Straits. Voluntary pilotage is encouraged in certain sections of the Strait.<sup>9</sup> During the Third Law of the Sea Conference, Malaysia and Indonesia tried very hard to promote the view that the Strait of Malacca was not an international strait. This was in order to counter the growing consensus that the international straits should be governed by the more liberal regime of transit passage rather than innocent passage through territorial seas. Their concerns were with pollution and a desire to regulate passage by warships.

In keeping with the increasing economies of the littoral states of Southeast and East Asia, the intensity of traffic through the straits has increased. Indonesia, Malaysia and Singapore have identified the need for appropriate arrangements regarding the prevention of accidents and the safety of navigation through the Straits. In the early 1980's, through the common efforts of these three states and with approval of the International Maritime Organisation (IMO), a Traffic Separation Scheme (TSS) was instituted at the southern end of the Malacca Straits, the most crucial area of navigation.

These congested, shallow, and narrow straits are a concern for maritime safety. Over 1,100 fully laden supertankers<sup>10</sup> pass towards the east through the straits every year, many with only a couple of meters of clearance between their keels and the sea bottom. About 26 tankers<sup>11</sup> per day are estimated to pass through the Malacca Straits. In terms of volume, crude oil accounted for about 58 percent of interregional cargo tonnage passing through the Malacca Straits in 1993.<sup>12</sup> The physical condition of the Malacca Straits



Figure 1. The Strait of Malacca

including the Strait of Singapore, are such that an accident, especially one involving a tanker, would have serious ecological impact on coasts on both sides of the Strait. The disposal of waste by passing ships, which is contrary to existing regulations, also has major cumulative ecological impact

### ***Ecological Conditions of the Strait***

Due to the convergence of warm and cold currents some areas of the Malacca Straits are rich in fisheries, and other sea living species such as: molluscs, sponges, turtles and sea birds. On the Indonesian side, coastal cities like Tanjung Balai Karimun, Dumai, Tanjung Balai Asahan, and Belawan are important fisheries ports. The commercial and traditional fishing fleets in these areas are generally engaged in fish and shrimp trawling, as well as trawling for scallops, reef linefishing, trolling for squid, inshore netting, and crab fishing.

Tanjung Balai Asahan in particular, over the past two decades has had the richest fish production for the western part of Indonesia. A number of new fishing ports have been constructed in recent years to help boost fisheries activities. These include those at Sibolga, and Belawan in North Sumatra, Pelabuhan Ratu in West Java, and at Ambon in Maluku. The islands of Aruah, approximately 25 nautical miles north-west of One Fathom Bank Lighthouse, is a breeding place of some turtle species and sea birds.

Similarly, on the Malaysian side of the Strait, where coastal cities including Lumut, Penang, Port Swettenhem and Port Dickson are located, there is also considerable involvement in the fishing industry. At Penang and Langkawi island, the tourist industry has grown rapidly in recent years. The above facts highlight the significance of the Malacca Straits for the people living in the littoral and those who are dependent on the coastal area for their livelihood. To preserve such a valuable source of livelihood, measures to protect the Malacca Straits from marine pollution are required.

### ***Oceanographic Conditions of the Strait***

Density, mobility and the capacity to dissolve a wide range of materials are three fundamental properties of sea water which make the scale of the management of marine environments very complex when compared with that of terrestrial areas. The density of sea water enables it to support sediment, other small particles and plant and animal cells. Larger animals and plants can remain in the water column for a long period or all of their life through buoyancy, while using a manageably small amount of energy. Large bodies of water are constantly mobile, driven by winds, current derived from the rotation of the earth and by tides generated by the gravitational effects of the moon and planets.

While there are prevailing currents, they vary and even reverse. Water masses mix and merge and the food nutrients, larvae and pollutants which they carry, may have wide spread effect far from their point of origin.<sup>13</sup> In principle, given good physical conditions and environment, sea water has great capacity to dissolve pollutants. To support the claim that the Malacca Straits is at high risk of damage, the oceanographic conditions of the strait

relative to factors<sup>14</sup> such as salinity, sea current, photosynthesis and the nature and density of pollutants must be considered together to establish how these factors affect the strait's capacity to absorb the impact of pollution.

Salinity. The lower the salinity of sea water, the lower its capacity to dissolve pollutants, therefore salinity is regarded as the most important characteristic of sea water. The level of salinity decreases in places where rivers empty into the sea. There are many estuaries on both sides of the Malacca Straits which account for the low level of salinity found there. Because of its narrow width and extensive length, the water column is not as great as the volume of fresh water discharging from the rivers. Additionally, the lower salinity can also be attributed to the high concentration of industry and human settlement areas on the nearby rivers that empty into the Malacca Straits.

Sea Current. Another factor affecting the capacity of sea water to dissolve pollutants is sea current. Horizontal currents are caused mainly by differences in air pressure and the rise and fall on the tides. Horizontal sea currents lead to the spread of pollution over wider areas. This in turn reduces the existing levels of pollution, by mixing it with larger masses of water. Therefore reduction of pollution levels and subsequent dissolution occurs faster in the open seas than in enclosed sea environments. In an enclosed sea such as in the Malacca Straits, horizontal sea currents are not very strong, and the water column is much smaller than in the open sea. In addition to the impact of horizontal currents, diffusion currents are also substantial. Diffusion currents are brought about by temperature gradients in the vertical plane, and the higher the temperature gradient, the stronger the diffusion current. In the Malacca Straits, diffusion currents are not as strong as sea currents because of the shallow nature of the Strait.

Photosynthesis. The capacity of sea water to dissolve pollutants is also affected by the amount of available oxygen and sun light as dissolution of pollutants also takes place through the process of photosynthesis. In tropical climates, sun light is generally sufficiently available, but the amount of sun light penetrating water columns is determined by the clarity of sea water, which is in turn determined by the amount of oxygen available. In an enclosed sea environment, such as the Malacca Straits, the level of clarity of the sea water is influenced by sediment coming from the numerous rivers emptying into the Straits. This affects the capacity of the sea water to dissolve pollutants. The sea water in the Malacca Straits can clear faster should there be strong currents, either horizontal or vertical but the physical conditions of the strait often make this impossible.

Nature and Density of Pollutants. In principle, a distinction may be made between soluble and insoluble pollutants. Hydrocarbon and heavy metal substances are the most important insoluble pollutants and metal pollutants disturb the ecological balance more than hydrocarbons. Hydrocarbon pollutants are mostly sea-borne either coming from ships or from resource exploitation offshore and mainly take the form of oil spills. Heavy metal pollutant content in the water is determined by the intensity of industrial activity in coastal and hinterland areas. Given the existence of many industries on both sides of the Malacca Straits, oil pollutants have very damaging effects. They impede the process of photosynthesis so that the capacity of sea water to dissolve pollutants decreases. They reduce the available content of oxygen which adversely affects the marine biotic. When they reach the coastal zone they disturb coastal ecosystems as well as coral reef systems.



## **The Need to Ensure Safety and Prevent Pollution**

As economic growth continues in the Asia-Pacific region, the carriage of hazardous and dangerous cargoes has increased significantly. Consequently, there is now, more than ever, a higher risk of damage or pollution as a result of collision, explosion, fire, grounding or other accident involving the ships carrying these dangerous cargoes. In the same way as national and regional contingency plans are required to clean up oil spills, national and regional chemical spill response plans may also become necessary.

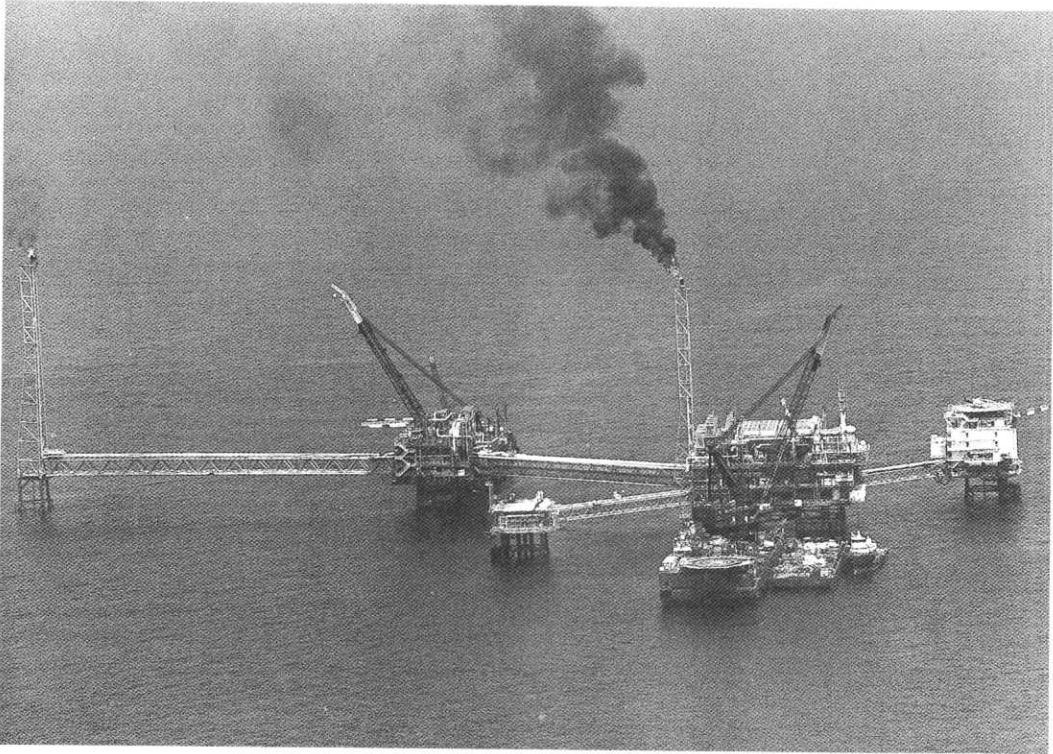
Any accident involving ships in the Malacca Straits would not only disrupt movement of sea trade, but also threaten lives, property and the environment. Examples of such accidents occurring in the Malacca and Singapore Straits include: the grounding of Showa Maru supertanker near Pulau Bukom in Singapore in 1975 which spilt 2,300 tons of crude oil; the collision between two supertankers, Asian Energy and Century Dawn, in 1988; and the collision of two supertankers, Orapin Global and Evoikos, that resulted in the biggest ever oil spill in the straits of 25,000 tons in 1997.<sup>15</sup>

## **National and Regional Efforts on Pollution Prevention and Control**

*In view of the limited capabilities of the littoral states to respond in the event of a serious accident, and since pollution in the Strait of Malacca or the Strait of Singapore would have an impact across nations, international cooperation is necessary. The issue of trans-boundary pollution was raised in the Kuala Lumpur Accord on Environment and Development of 1992 which then became the concern of ASEAN at the Singapore Summit of 1992. Finally, in 1994 ASEAN adopted the Resolution on Environment and Development which was followed by the ASEAN Cooperation and Trans-boundary Pollution Plan adopted in Kuala Lumpur in 1995.*

*In the last meeting of the CSCAP (Council for Security Cooperation in Asia-Pacific) Maritime Cooperation Working Group on 19 November 1997 in Tokyo, the Indonesian delegation raised the issue of the Malacca Straits, including the Strait of Singapore, being designated as a Special Area under coastal management in an enclosed sea environment, and that all the three littoral states of those straits should be attached in all regional and international marine environment forums.*

The process toward that goal would certainly need international cooperation considering that the prevention of ship-borne pollution in the Malacca Straits can no longer be separated from the safety of navigation. Along the strait, Indonesia has established 35 navigational aids of various kinds. Each year, the Indonesian government has to repair or replace around ten percent of these because of collision with passing ships.<sup>16</sup> This number is significant as an indicator of the level of proficiency on the part of some seafarers using the Malacca Straits. It thus raises the question of supervision of compliance with IMO, MSC (Maritime Safety Committee) and STWC (Standards of Training, Certification and Watchkeeping for Seafarers) regulations. Perhaps this needs to be addressed more closely by the three littoral states of the Malacca Straits.



Oil rig in the South China Sea  
*(Courtesy of 92 Wing Royal Australian Air Force)*

In keeping with the commitment of the three littoral states to the safety of navigation in the Malacca Straits, serious efforts towards pollution prevention and control in the Straits are being undertaken. This is clearly embodied in Annex D to the agreement of 1997. A Tripartite Technical Expert Group (TTEG) was formed to formulate joint policy to deal specifically with marine pollution by coordinating resources, man power and technology. In addition, the TTEG will consider the possibility of creating a revolving fund for marine anti-pollution activities. Those two tasks clearly demonstrate the desire to foster regional and international cooperation.

At the TTEG forum, cooperation in the installation of VTS (Vessel Traffic Services) for the entire Strait of Malacca in anticipation of an agreement on TSS along the straits, was discussed by the IMO. VTS is a vehicle for the exchange of information of great importance to overall maritime safety and can be integrated, with the VTS owned by Singapore so that it may result in tripartite cooperation. The benefit of VTS along the Malacca Straits will be felt by all users. On the other hand, in order to detect oil pollution, satellite sensing and aircraft equipped with SLARs (Side-looking Airborne Radars) are needed.<sup>17</sup> Data collected from air detection may be communicated to a pollution centre by the state operating the aircraft and distributed to other national centres.

States littoral to the Malacca Straits have raised concerns regarding the possibility of hazardous cargoes having to pass through the Straits where there have been frequent shipping accidents and incidents of piracy. The issue of restricting the passage of vessels carrying nuclear or other hazardous cargoes has been raised. Among the suggestions being made are the provision of advance notice of the impending passage, and the diversion of these vessels to avoid the Straits altogether. It has been observed that such measures could conceivably be implemented under the auspices of the IMO in the form of regulations.<sup>18</sup>

Regional and international joint cooperation is also necessary to protecting the Straits from the influence of dangerous cargoes by making use of International Sea Power Symposium, ASEAN Regional Forum and Western Pacific Naval Symposium activities for consideration of key issues. Today, awareness of environment preservation is a global consideration as attested by the Second Conference on Habitat. Preservation of the environment in the Malacca Straits should form part of that global awareness, in view of the strategic importance of the Straits, in terms of geo-strategic and sub-regional, regional and international economic interests.

### **The Issue on Bosphorus and Dardanelles Straits**

The latest issue being considered by the IMO is the Bosphorus and Dardanelles Straits (Figure 2). This is a relatively similar case to the Malacca and Singapore Straits. Turkey's two Straits currently provide the only outlet for Russian oil exports but are *becoming too busy to handle the main oil production from big Caspian development projects to western markets*. The sea traffic record indicates that over 51,000 vessels transited these Straits in 1997, including about 2,500 oil tankers.<sup>19</sup> Turkey's government has appointed a council to prepare new legislation for the Straits, to improve local passenger and cargo ships, international transit traffic, and to lessen ship accidents. The legislation will amend several articles of previous legislation on this issue dating from 1994, and will

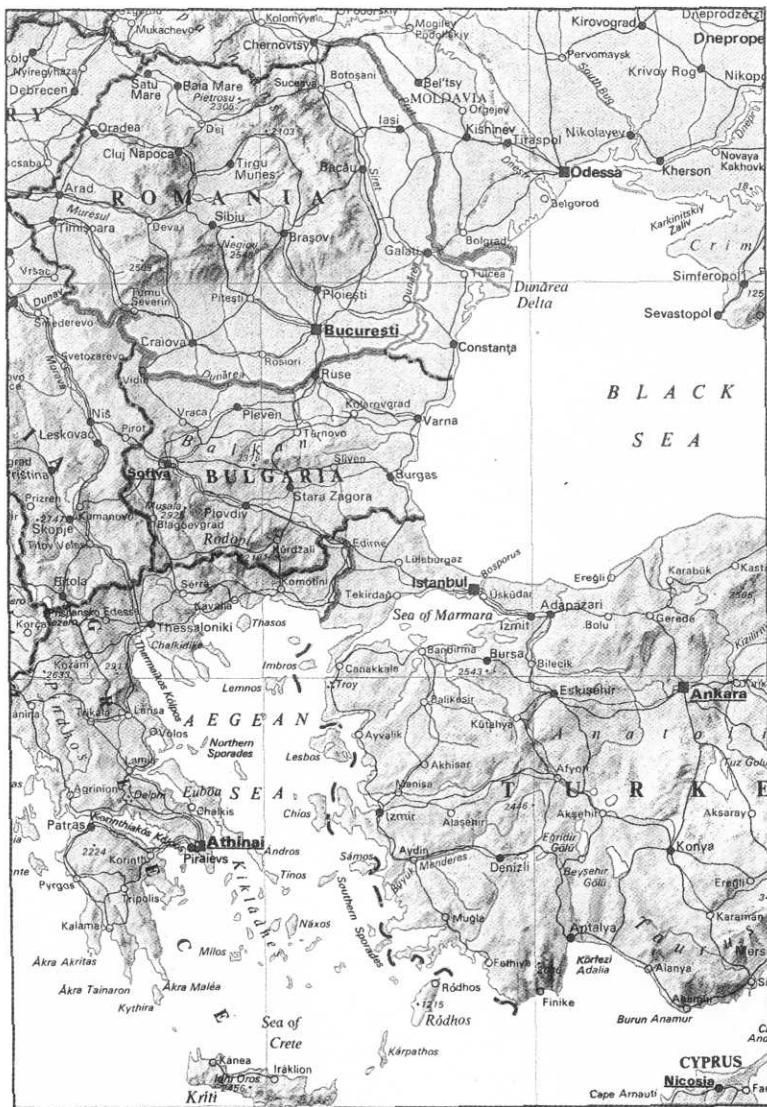


Figure 2. The Bosphorus and Dardanelles Straits

increase the pre-notification period in which a vessel must inform authorities of its intended transit. The legislation will also make provision for penalties.

Turkey was scheduled to inform the IMO of its new legislation at a meeting scheduled for May 1998 in London. The new legislation stipulates that vessels of 150 to 200 metres in length must notify the authorities 24 hours prior to their passage. The period will be 48 hours for those of 200 to 300 metres or vessels with nuclear waste or other hazardous cargo. In the medium term some of that oil can go through the Straits, but in the long term all nations, including the United States, see the only feasible solution being the Baku-Ceyhan oil pipe line, that will cost about US\$2.5 billion, and run from Baku to its Ceyhan port through Georgia and eastern Turkey. The aim is to carry the Caspian's main oil output to western markets by avoiding further tanker passage through the Straits.

### **Marine Environmental Management: The Australian Experience**

Australia has always been concerned about its coast, common lands and common coastal environment. Since its federation, there have been many inquiries relating to the *management of coastal environments*. This is manifested in the several policies pertinent to the management and protection of the marine environment formulated in recent years.<sup>20</sup> Australia has tended to follow policies that support the concept of multiple use.

Multiple use management involves the allocation of resources on geographical scales and across sufficient time periods so that the integrity of ecosystems can be maintained and the evolutionary potential of biological diversity can be accommodated. It includes consideration, before resource allocation decisions are made, of possibilities for uses which can occur in much the same area at the same time, and those which require separation in space or in time, with the objective of retention of the greatest number of possible options for the future. Management must also be adaptive, able to respond to indications of adverse change in the environment, changes in social, cultural, and economic values, and changes in understanding and technology.

Before decisions are made about allocation of ocean resources, a number of factors need to be taken into account:

- Objective assessment of the resources and values of an area, and potential impacts from proposed uses.
- The value and impacts of alternative uses.
- The level of compatibility amongst potential uses of the resources of an area, and the potential for maximising the benefits, or the value to the community by encouraging multiple and sequential use of the resource.
- The positive identification of means of detecting undesirable environmental outcomes, and actions to be taken to mitigate adverse impacts.<sup>21</sup>

Management for multiple uses should ensure that decisions about access to and/or use of resources are objective and transparent and include explicit assessment of impacts, in particular on other recognised uses and ecosystem integrity. Integrated management of multiple uses should provide a capacity to manage conflicts between uses which maximise the flow of benefits to the community in term of environment, social, cultural and economic

outcomes. Annex A discusses the characteristics of ecosystem based oceans planning and management.

### **Marine Protected Area**

The generalised definition of protected area is intended to apply equally to marine and terrestrial areas. As adopted in the context of the Australian National Reserves System, a Marine Protected Area (MPA) is an area of land or sea specifically dedicated to the protection and maintenance of biological diversity, and natural and associated resources, managed through legal or other effective means. Australia's success in convincing the international community of the need to institute serious measures to preserve the marine habitat is evident from the numerous sites in Australia declared as MPAs. In fact, as of 1992, there are 303 MPAs in Australia totalling an area of 463,200 square kilometres. This represents about 5.2 percent of Australia's marine environment.<sup>22</sup> However a very large proportion of this (74 percent) is within a single MPA, the Great Barrier Reef Marine Park.

By IMO definition, a MPA is any area of inter-tidal or sub-tidal terrain, together with overlying water and associated flora, fauna, historical, and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment. MPAs are a very important tool for marine conservation and management, particularly in protecting biodiversity and achieving sustainable use of marine resources. Establishing a national network of MPAs around Australia is the primary objective of the 'Ocean Rescue 2000 Program'.

MPAs may serve many functions including conserving nature, protecting human heritage and providing tourism, recreation, education and research opportunities. Australia is a world leader in using MPAs for marine conservation and management and has 24 percent of the total number of MPAs in the world. Most MPAs in the southern and eastern half of continent are small, yet this is where human activity is greatest and the demand for conservation action is highest. The largest MPAs tend to be away from the areas of highest human activity. However MPAs are established to maintain biodiversity and should be sufficiently large to maintain ecosystem functions, to protect all life cycle stages and to achieve adequate buffering or dilution of impact from human activity. MPAs might also be placed adjacent to land protected areas, and managed in a complementary manner. The major multiple use MPAs around Australia are described in Annex B.<sup>23</sup>

### **The Great Barrier Reef Marine Park**

The Great Barrier Reef Marine Park (GBRMP) is the world's largest reef complex, the largest multiple-use MPA and a World Heritage Site. It is approximately 2,300 km long and comprises 2,800 separate reefs, including 760 fringing reefs and 940 islands. The Great Barrier Reef (GBR) is not a continuous barrier but a broken maze of coral reefs. These reefs range in size from less than one hectare to more than 100 square kilometres and in shape from flat platform reefs to elongated ribbon reefs. It was established under the GBRMP Act 1975 and is managed by the Commonwealth GBRMP Authority, with the Queensland Department of Environment and Heritage responsible for day to day management. Major uses include tourism (there are approximately 2 million visitors to the GBR and its coast

each year), commercial and recreational fisheries, and shipping. Economic value of the GBRMP is over AUD\$1 billion per Annum.<sup>24</sup> Major environmental issues include: water quality, especially elevated nutrients in shore areas; outbreaks of crown-of thorns starfish; large-scale perturbations such as cyclones and coral bleaching events; effects of trawling on sea floor biota; effects of fishing on reefs; threat of oil spills from shipping; and effects of tourism and recreation.<sup>25</sup>

## **Lessons from The Great Barrier Reef**

The GBRMP Authority has established conservation and management regimes for the GBR region. The GBRMP Act was the first Act in Australia based on concepts which are now known as ecologically sustainable development. The Act requires the Authority to provide for conservation and reasonable use of the GBR.

The provisions of the Act make it clear that it is expected that some parts of the reef will be preserved but that the majority will be available for use which is not incompatible with maintenance of the GBR as a natural productive ecosystem. The GBRMP has been seen as a national and international model for some aspects of marine and coastal zone management. Conceptually the management system is that of an overarching authority which is responsible for formulating policies and to oversee management arrangements to ensure that they are consistent with conservation.

The reef represents the world's largest system of corals and associated life forms. It is the greatest known marine repository of biodiversity, and a unique area requiring the highest level of environmental protection. In some places the reefs are separated by channels no more than 200 metres wide, while elsewhere the reefs may be as much as 20 kilometres apart. Most reefs are submerged, with some being exposed at low tide. For shipping, the GBR can be a formidable obstacle to navigation. In most places, the reef is many kilometres from the coast, but the waters within the outer barrier are also studded with submerged shoals and reefs. Added to these hazards are strong trade winds and occasional cyclones which are characteristic of the region.

The inner route through the Reef (Figure 3) is a significant sea route, with approximately 2000 transits<sup>26</sup> per year by large vessels or vessels carrying hazardous cargoes. This represents only 3.3% of the annual transits of the Malacca Straits. The route offers relatively calm water, but it is intricate and shallow. Within the route there are also areas of intense fishing activity which reach a peak in the trawling season between April and October. Between October and April the area is subject to heavy rain which reduces visibility and the effectiveness of some navigation aids. Having surveyed various options for reducing the risk of maritime accidents in the reef region, Australia is proceeding to implement a scheme of compulsory pilotage for ships which constitute a potential threat to the GBR. The implementation of this scheme has been preceded by an international campaign consisting of three phases.

During the first phase, international representations were made to seek compliance with the existing system of voluntary pilotage for the region. This system covers all ships of 100 metres in length and over, and all loaded oil tankers, chemical carriers or liquefied gas carriers irrespective of size, navigating the Torres Strait, the inner route of the GBR, the



Great North-East channel and Hydrographer Passage. In 1987 Australia sought and gained endorsement from the IMO for this scheme in the GBR and Torres Strait region. It is embodied in IMO resolution A. 619 (15) of 19 November 1987 which was adopted by consensus. In seeking to promote compliance with the IMO resolution, Australia monitored ships defined by the resolution transiting the inner route of the GBR without a pilot.

In each case the flag state was contacted and its assistance sought in urging compliance by the shipping company involved. Many vessels have, however, ignored this resolution and have continued to transit the defined area without a pilot. This amounts to approximately 200 unpiloted transits per year. In February 1990 Australia intensively lobbied the governments of those countries whose ships were not availing themselves of the voluntary system. Despite these efforts there was not a noticeable increase in compliance and as a consequence, the risk of accident remained unacceptably high.

In the second phase, Australia participated in the development, within the IMO, of the new concept of Particularly Sensitive Areas. A seminar on Sensitive Sea Areas was held under the auspices of the IMO in September 1990 in Sweden, attended by experts from approximately fifty countries. The seminar endorsed the guidelines for Particularly Sensitive Areas. It also called on the IMO to identify the GBR as Particularly Sensitive Area and to recognise compulsory pilotage as an appropriate measure in such an area under certain circumstances. At the same time Australia embarked on the major diplomatic effort to gain support from the IMO for identification of the GBR as a Particularly Sensitive Area and endorsement of Australia's pilotage scheme in the Reef region.

The third phase involved a global lobbying campaign to achieve formal identification of the GBR as a Particularly Sensitive Area and international endorsement of a compulsory pilotage scheme through the IMO. These goals were achieved in November 1990 at the thirtieth session of the Marine Environment Protection Committee (MEPC) in London. Thus resolution MEPC.44 (30) of 16 November 1990 identified the GBR as the world's first Particularly Sensitive Area. Resolution MEPC.45 (30) adopted on the same day, recommended compulsory pilotage for merchant ships of 70 metres in length and over and oil tankers, chemical tankers and gas carriers, irrespective of size, navigating the inner route of the GBR between the northern extreme of Cape York Peninsula (10 degrees 41 minutes South) and 16 degrees 40 minutes South and in Hydrographer Passage.

The culmination of this effort has been the introduction of amendments to the GBRMP Act 1975 implementing the compulsory pilotage scheme. The new scheme came into effect in the latter part of 1991. The rate of compliance with the scheme should be virtually 100 percent, significantly reducing the risk of collisions or grounding of vessels representing a potential hazard to the region. The compulsory pilotage scheme and the identification of the GBR as a Particularly Sensitive Area represents a major step in securing greater environmental protection for this unique and irreplaceable ecosystem.<sup>27</sup>

### **Designation of the Malacca Straits as a 'Special Area'**

MARPOL 73/78 provides that in cases where a special area is within the jurisdiction of more than one State, agreement should be reached between the States involved before a proposal is submitted to MEPC. With regard to the Malacca Straits it is important for the

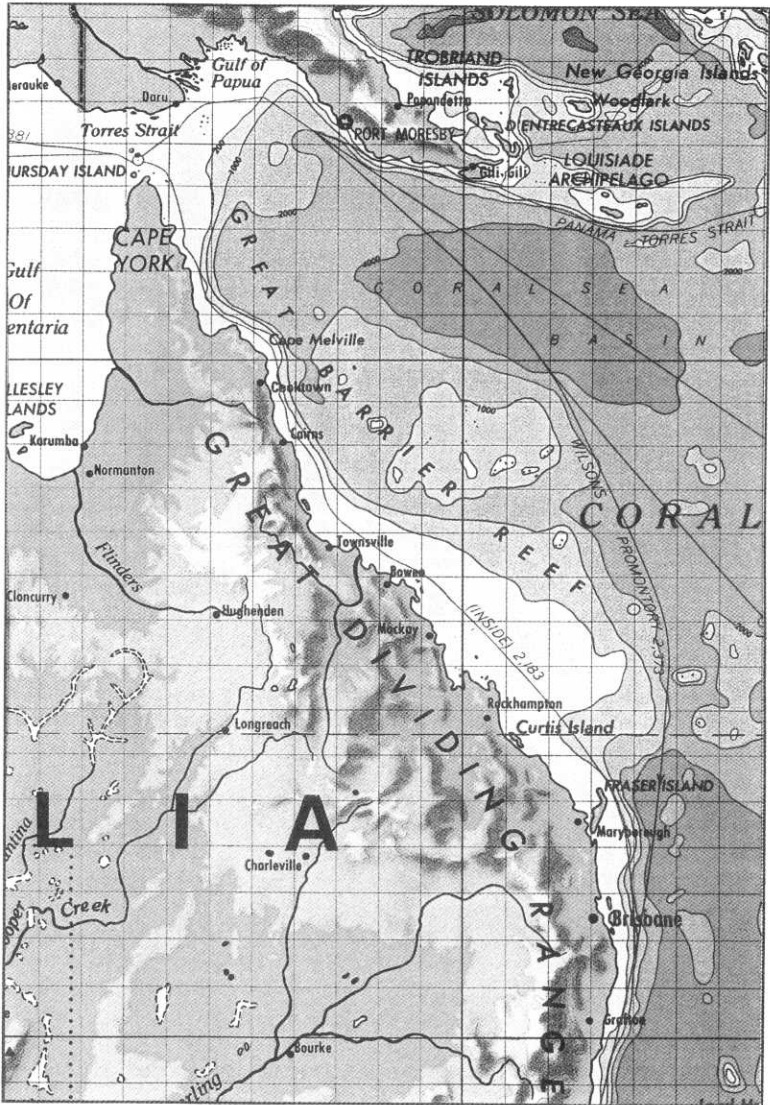


Figure 3. The inner route through the Great Barrier Reef

three littoral states to have a common perception and then intensively lobby the governments of other countries, particularly the users of Straits if they are to gain support for designation of the Malacca Straits as a Special Area under Annexes I, II and V of MARPOL 73/78.

Using the lessons learnt from the experience of others such as Australia, this can be done through coordination and cooperation of the coastal states, the IMO and Regional and Multilateral joint cooperative programs. Users of the Straits of Malacca and Singapore will have to implement all provisions therein. As pollution from hydrocarbon and heavy metal substances have the worst impact, regulation to control these two kinds of pollution should be strengthened, particularly in respect to pollution from lead substances.

To foster better joint coordination and cooperation, the coastal states require resources such as hardware, software and manpower for pollution prevention programs. The early detection of pollution from passing ships would require a satellite remote sensing capability in addition to aircraft fitted with the SLAR. Full implementation of all provisions of MARPOL 73/78 would need regional coordination in the fields of education, training, research and development, joint operations and joint funding. The most important factor will be the exchange of operational information relating to pollution and the safety of navigation.

Based on the provisions for Special Areas in MARPOL 73/78, the government of each Party to the convention having a coastline which borders on any given special area, undertakes to ensure that all oil loading terminals and repair ports within the special area have facilities adequate for reception and treatment of all dirty ballast, residues and mixtures containing noxious liquid substances, and garbage. The special area regulation should be applied for each area on the basis of notification by the states bordering the special area where reception facilities are available.<sup>28</sup> In this regard, the littoral states should be provided with facilities adequate for reception and treatment of all marine pollution from ships. The three littoral states should undertake a lobbying campaign in regional and international forums in order to try and achieve this goal.

MARPOL 73/78 in annexes I, II, and V define certain sea areas as 'Special Areas' in relation to the type of pollution covered by each annex. A 'Special Area' is defined as a sea area where, for recognised technical reasons in relation to its oceanographic and ecological condition and to the particular character of its traffic, the adoption of special mandatory methods for prevention of sea pollution by oil, noxious liquid substances or garbage, as applicable, is required.<sup>29</sup> Under the Convention, the special areas are provided with higher levels of protection than other areas of the sea. Additional protection is given to special areas with respect to operational discharges of oil (Annex I), noxious liquid substances (Annex II), and garbage (Annex V).

Most of the existing special areas were declared at the time when MARPOL 1973 was conceived and adopted. The Gulf of Aden (Annex I), the North Sea (Annex V), the Antarctic (Annexes I & V), and the Wider Caribbean (Annex V) special areas were designated after 1973 as amendments to MARPOL 73/78. Table 1 lists the sea areas that have been designated as special areas under MARPOL.<sup>30</sup>

| <b>Annex I</b>   | <b>Annex II</b>   | <b>Annex V</b>  |
|--|---|---|
| <b>The Mediterranean Sea area</b><br><b>The Baltic Sea area</b><br><b>The Black Sea area</b><br><b>The Red Sea area</b><br><b>The Gulfs area</b><br><b>The Gulf of Aden</b><br><b>The Antarctic area</b> | <b>The Baltic Sea area</b><br><b>The Black Sea area</b> | <b>The Mediterranean Sea area</b><br><b>The Baltic Sea area</b><br><b>The Black Sea area</b><br><b>The Red Sea area</b><br><b>The Gulfs area</b><br><b>The North Sea area</b><br><b>The Antarctic area</b><br><b>The Wider Caribbean area</b> |

**Table 1.** Special areas designated under MARPOL 73/78

### **Procedures for the Designation of a Special Area**

A proposal to designate the Malacca Straits as a special area should be submitted to the IMO for consideration by its MEPC. The submission date for the proposal should be at least three months before a session of the MEPC. The proposal should contain a draft amendment to MARPOL 73/78 providing the formal basis for the designation of an area as a special area, together with a background document addressing:

- The definition of the area which is proposed as a special area, including an indication of its precise geographical location. It is essential also to include a reference chart.
- An indication of the type of special area proposed. Proposals can be made with respect to Annexes I, II, and V of MARPOL 73/78, but proposals for designation of a given area as a special area should be evaluated and submitted separately for each annex.
- A general description of the area including such issues as its oceanography, ecological characteristics, social economic value, scientific and cultural significance, environmental pressures and measures already taken to protect the environment of the proposed area. The general description may be supported by annexes containing additional information on the area, or references to documentation.
- A review of the criteria for the designation of a special area showing that the area in question satisfies those criteria. The criteria which must be satisfied in order for an area to be given special area status are oceanographic conditions, ecological conditions and vessel traffic characteristics.<sup>31</sup>

Given the oceanographic and ecological conditions of the Malacca Straits coupled with an already high and continuously increasing density of traffic the probability of ship-borne pollution will continue to increase unless strict control and management is exercised in the Straits in accordance with the International Convention for the Prevention of Pollution from ships (MARPOL 73/78). To preserve the marine environment and the valuable source of livelihood for the people who are living on the coast, the Malacca Straits should be designated by the IMO as a 'Special Area' under Annexes I, II and V of MARPOL 73/78.



*MV BP Achiever*

## Conclusion

The ASEAN plan, particularly in relation to ship borne pollution, indicates a potential for sub-regional action to implement MARPOL 73/78. With the task assigned to the TTEG, a joint policy should be formulated to deal with marine pollution at the sub-regional level based on the strategic location, economic and environmental aspects with a priority on the safety of the coastal states and passing vessels. The littoral states should control and manage marine pollution and these should be designated by development of an IMO Convention providing for the Malacca Straits to be designated as a 'Special Area' under Annexes I, II and V of MARPOL 73/78 for the protection of marine environment from ship pollution and the dumping of waste.

In view of the complexity of the problems relating to the two straits, one channel of cooperation would not suffice. Rather, beginning with bilateral arrangements between littoral states, there should be various forms of cooperation that are mutually complementary and interlocking with scope for expansion. A comprehensive vision is necessary, not only on the part of government officials and the private sector but the whole of society to ensure that a national approach will provide government sectors and agencies with common objectives for marine management thus minimising duplication and conflict. It would also ensure more effective use of human and financial resources, by pooling experience, resources and knowledge. It would also provide a framework for national leadership, financial support and community and industry involvement throughout the coastal zone.

Australia has achieved the formal identification of the Great Barrier Reef as a Particularly Sensitive Area and has achieved international endorsement of the compulsory pilotage scheme through the IMO after a long struggle. It took Australia more than 15 years, from the introduction of amendment to the GBRMP Act 1975, through the proceedings of the IMO to implement a scheme of compulsory pilotage, which involved a regional and international lobbying campaign. The culmination of this effort was put into effect in the latter part of 1991. The rate of compliance with the scheme should be virtually 100 percent thereby significantly reducing the risk of collision or grounding of vessels representing a potential hazard to the region. The three littoral states of the Malacca Straits should learn from the Australian experience which succeeded in identifying the GBR as the world's first Particularly Sensitive Area.

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## ANNEX A

### CHARACTERISTICS OF ECOSYSTEM-BASED OCEANS PLANNING AND MANAGEMENT

- Ecological connections are recognised.  
Connections between and across all ecological dimensions (species, populations, habitat and regions) are taken into account in resolving problems, a focus on one level is inadequate.
- Planning and management boundaries recognise ecosystems .  
Management recognises the extent and distribution of ecological entities, requiring integration across other administrative, sectoral and jurisdictional boundaries.
- Ecosystem integrity is maintained.  
The maintenance of ecological integrity is a fundamental management objective. This involves ensuring the maintenance of Australia's total marine biological diversity (genes, species, communities and habitats) and the ecological processes that underpin that diversity.
- Data is collected for ecosystem-based management.  
The understanding of ecosystem implications of decisions will often require information beyond that needed to manage individual resource sectors. Inventory of biological diversity assets, baseline assessments of ecosystem functions and the interactions between sectors will contribute to understanding of ecological processes and impacts of particular activities.
- Management is monitored for ecosystem maintenance.  
Measurable ecosystem-based performance indicators are used to assess the success or failure of management. Monitoring provides feedback that is critical to evaluating and refining management approaches, supporting adaptive and precautionary management.
- Management decisions are planned and precautionary.  
Management decisions are planned, based on anticipation of the consequences of use, rather than being solely reactive. When consequences are uncertain or potentially irreversible on the time scale of human generation the precautionary principle should be applied.
- Human activity is recognised as a fundamental influence.  
*Management should generally aim to influence the human activity or use, rather than the marine resources directly.* Human activities have a fundamental influence on many marine ecological patterns and processes and are in turn affected by them.
- Natural and human values should be integrated.  
Biological diversity values are recognised and incorporated in all resource-allocation processes that could affect ocean ecosystems, even where scientific and technical knowledge may be insufficient for a full definition of values. It is recognised that human values will play a dominant role in decisions about ocean uses.<sup>1</sup>

#### Note:

1. The draft of Australia's Oceans Policy 1998 , p 29

## **ANNEX B**

### **OTHER MAJOR MULTIPLE USE MARINE PROTECTED AREAS (MPA) AROUND AUSTRALIA**

#### **Torres Strait Protected Area**

The Torres Strait is a 150 km wide, shallow passage between Cape York and Papua New Guinea (PNG). It contains many reefs, over 100 islands and cays, and a population of 6,300 Torres Strait Islanders. It has major populations of dugong and turtles. The Torres Strait Treaty with Papua New Guinea protects the marine environment, provides access for vessels and allocates fisheries and mineral resources. Major uses include shipping and prawn and rock lobster fishing. Major environmental issues include possible contamination by heavy metals from PNG mines, treatment of oil spills from shipping, PNG off-shore oil activities, and the effects of prawn trawling.

#### **The Ningaloo Marine Park**

The Ningaloo Marine Park is Australia's the third longest MPA enclosing Australia's longest fringing reef and was established in 1987. It extends 260 km along the coast of Western Australia (WA) and has an area of 4,572 square km. Ningaloo is an ecologically unique mainland fringing coral reef and contains significant populations of dugongs, humpback whales, shore birds, turtles and whale sharks. Ningaloo Marine Park is managed by the WA Department of Conservation and Land Management. Major uses include tourism and recreational fishing. Major environmental issues include outbreaks of coral-eating *Drupella* snail, increasing tourism, risk of pollution from oil production outside the marine park and shipping.

#### **Shark Bay Marine Park and Hamelin Pool Marine Nature Reserve**

Shark Bay Marine Park, covering an area of approximately 7,487 square km, and the adjacent Hamelin Pool Marine Nature Reserve, approximately 1,320 square km in area, were gazetted in 1990. The sea grass meadows and the calcareous sand bank of Shark Bay are amongst the worlds most extensive. Shark Bay Marine Park contains the most southerly resident populations of dugongs and green turtles, the internationally famous bottle nose dolphins of Monkey Mia, and important nursery areas for several valuable recreational and commercial fisheries. The Hamelin Pool Marine Nature Reserve includes unique stromatolites and Holocene coquina deposits together with equally significant terrestrial features. The area is included in the World Heritage List. Major uses include commercial and recreational fishing and tourism. Major environment issues include tourism and the management of fisheries including aqua culture. The major long term issue is the protection of the unique stromatolites and sea grass.

### **Solitary Islands Marine Reserve**

The Solitary Islands Marine Reserve is a unique area of tropical or temperate overlapping coral communities, mangroves, rock platforms and rocky reefs. The reserve extends along 70 km of coast north of Coffs Harbour and has an area of 950 square km. It includes State and Commonwealth waters and is managed by New South Wales Department of Fisheries and the Australian Nature Conservation Agency (ANCA). Major uses include tourism (diving and water sport) and commercial and recreational fishing. Major environment issues include alteration of catchment and eutrophication of estuaries, recreational fisheries and tourism development.

### **Jervis Bay National Park**

Jervis Bay is a relatively pristine bay with diverse estuaries, dune, sea grass beds, sand flats, rock platforms and reefs. The land area in the park is 6,312 hectares and the marine area is 840 hectares. It is part of Commonwealth Jervis Bay Territory and it is managed by the ANCA. The New South Wales Department of Fisheries is currently preparing a management plan for the remaining 93 percent of the bay. Major uses include commercial and recreational fishing, recreation and tourism, naval activities, scientific research and educational activities. Major environmental issues include aboriginal fishing rights, the effects of shipping, nutrients from discharges and run-off, tourism and recreational use.

### **Coringa-Herald and Lihou National Reserves**

The Coringa-Herald and Lihou National Reserves are rich and diverse containing coral sea reefs, cays and important sea bird nesting sites. These national nature reserves cover an area of approximately 8,856 square km and are part of the Commonwealth Coral Sea Islands External Territory which is managed by the ANCA. Major environmental issues include foreign fishing (fish and clams) and sea borne pollution.

### **Ashmore Reef National Nature Reserve**

The Ashmore Reef National Nature Reserve in the Timor Sea is rich and diverse with a large number of coral reefs and sand cays, significant populations of sea snakes and important sea bird breeding and migratory shore bird roosting sites. This reserve area is approximately 583 square km and is part of the Commonwealth External Territory of Ashmore and Cartier Islands which is managed by the ANCA. Major environmental issues include removal of sea birds and turtles, over fishing, and risk of oil spills.



Russian merchant vessel in the Malacca Strait  
*(Courtesy of 92 Wing Royal Australian Air Force)*



Philippine corvette *BRP Artemio Ricarte*  
(Courtesy of Mr J. Mortimer)

# **DEVELOPMENT OF A PHILIPPINE MARITIME SURVEILLANCE CAPABILITY**

*Edgar L. Abogado and Reynaldo L. Yoma*

## **Introduction**

This paper assesses the current maritime surveillance arrangements and procedures in the Philippines and identifies their strengths and weaknesses. Based on the resultant evaluation, it identifies possible measures to enhance maritime surveillance arrangements in the Philippines.

To better appreciate the importance of this undertaking, the paper discusses emerging maritime concerns and relates these issues to the evolving geo-strategic, security and economic developments over the maritime areas in the Asia-Pacific region.

During the study, various surveillance models currently in place in other countries were examined with emphasis on the organisational, management and command structure, coordinating arrangements and other related operational aspects. The paper therefore, presents a generic surveillance structure that may be adopted to a local scenario. Additionally, it identifies the type of command arrangements, management, equipment, facilities and infrastructure necessary to establish the system, and how these should be employed as part of the overall surveillance regime.

## **Philippines' Maritime Issues And Concerns**

### *Overview*

The Philippines is an archipelagic nation composed of more than 7,100 islands situated between the South China Sea and the Pacific Ocean and is inhabited by over 70 million people which form part of a deep-rooted geographical, social, political and economic being. The Philippines has an aggregate land mass of 297,000 square kilometers and a total coastline length of about 17,460 kilometers which is longer than that of mainland USA. Approximately, 60 percent of the population resides in about 10,000 coastal towns and cities. Prominent features of Philippine marine waters include: its natural beauty, a distinct variety of fish, exquisite coral reefs, a potentially oil-rich seabed, and possibly substantial deposits of minerals, including manganese, nickel and copper.<sup>1</sup> The vast expanse of Philippine waters, which cover an area roughly six times its aggregate land area, serve as an essential mode of transportation, a primary source of livelihood for coastal communities and a major breeding area and habitat for local wildlife.<sup>2</sup>

The Philippines are strategically located at the crossroads of the Asia Pacific Region and share the major sea corridor for international maritime traffic in the South China Sea which provides the most direct link between the Indian Ocean and East Asia through the Strait of Malacca and the Indonesian Straits (Figure 1). Currently 40 percent of the world's maritime trade, which includes energy and raw materials essential to the booming

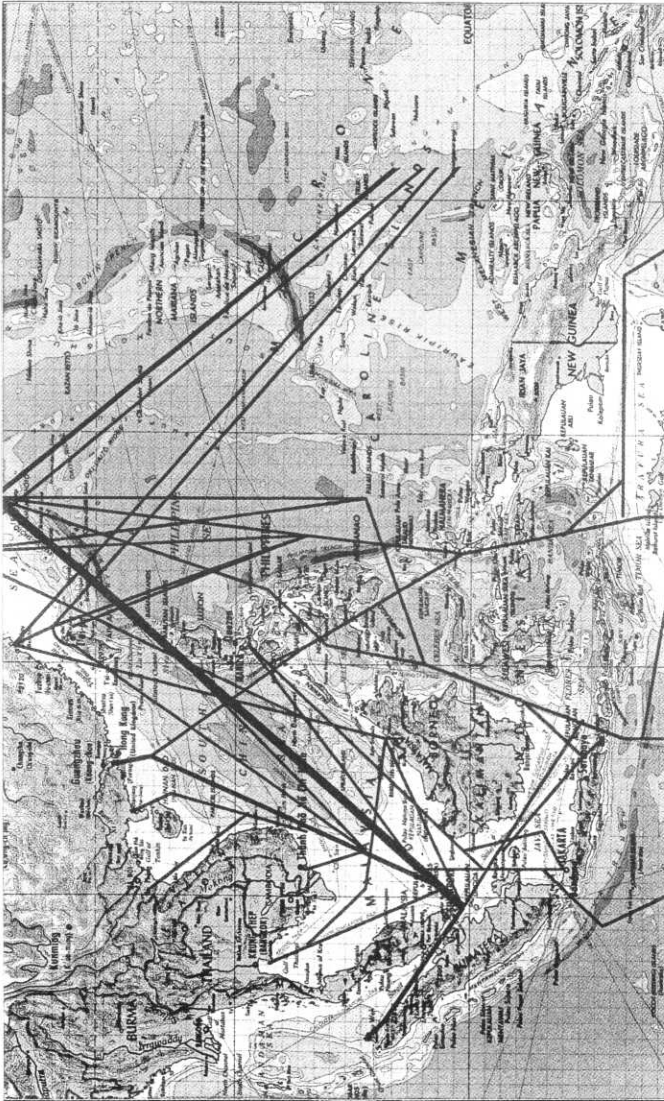


Figure 1. Traffic Densities for Strategic Routes Through the South China Sea



economies of Southeast and North Asia, passes through the South China Sea. On the Eastern front is the vast reaches of the Pacific Ocean with great reserves of fish which are eagerly sought by the large and economically powerful Distant Water Fishing Nations of East Asia, in particularly Korea, Japan, and Taiwan.

Modern technology has made it possible to exploit the bounties of the sea that only decades ago were beyond reach. With land based resources depleting and becoming increasingly insufficient to provide the needs of growing populations in many countries, people now turn to the sea as a primary source of food, medicines, hydrocarbon fuels, hard minerals, animal feeds and construction materials. As a result of the Law of the Sea Convention (LOSC) which established a comprehensive framework on the limits of national jurisdiction and use of all ocean spaces and its resources for economic sustenance, most countries in the region have responded by establishing or strengthening their respective ocean management regimes. Underlying these regimes are the inherent functions to manage, protect and preserve the rich marine resources in the coastal and offshore zones for the benefit of present and future generations. One of the specific tasks of Exclusive Economic Zone (EEZ) administration is surveillance, which is resource intensive in terms of people, equipment, time and money. Australia, Malaysia and Indonesia, along with many other countries in the region, have increased and enhanced their own surveillance capabilities in response to an increasing awareness of their maritime status and of their national responsibility to detect, monitor and control activities within their territorial and offshore zones in order to be able to effectively exercise their sovereign rights and jurisdiction over these vital maritime areas.

The Philippines on the other hand, although considered a maritime nation in the strict meaning of the term, has yet to evolve from being a primarily agrarian and land-based economy to that of a major maritime trading nation. While there have been calls for a shift in development policy that would emphasise the country's status as an archipelagic state, as stipulated in the recently published National Maritime and Oceans Policy, parallel efforts to establish a more cohesive and integrated approach towards the management, protection and sustainable use of resources within sovereign waters are far from adequate. While it is also true that there have been a number of resource and environmental conservation measures in the maritime sector including rehabilitation of mangrove areas, establishment and maintenance of fish sanctuaries and artificial reef planting, these efforts fall short of what is considered necessary to arrest the rapid rate of marine environmental degradation and depletion of aquatic resources. Compared to the current efforts devoted to management and protection of land-based resources, programs directed towards the maritime sector are perceived to be less than significant relative to the magnitude of the problem confronting the maritime environment.

The apparent conservative attitude of the government and its citizens toward the management and development of a maritime regime can be attributed to a number of factors. One factor is the government's past pre-occupation with land-based programs aimed at restoring internal security and political stability. Efforts toward this end have dissipated much of the already scant resources to the detriment and neglect of other equally important developmental and environmental concerns, including those related to the maritime environment. The prevailing attitude is exacerbated by the fact that extracting the resources (except for fish in inshore areas) from the sea is a lot more complex, and in most

cases, more expensive than those sourced from the land. Such ventures are made even more difficult because of the lack of requisite technological knowledge and equipment which are only available to developed and wealthy nations.

With the advent of a new geopolitical milieu and the course of economic developments of other countries in the region, the emerging defence and security concerns are not only confined to the traditional military threats but now include economic and environmental issues as well. Security means much more than just the protection of sovereign territory from armed attack, but now also implies the ability to preclude external intimidation of national institutions and the community at large, freedom of movement for people and commerce and the extension of national values into the broader community.<sup>3</sup> Non-military challenges to maritime security in the region are posed by illegal activities at sea (eg. piracy, drug smuggling, unlicensed fishing and illegal immigration) and degradation of the marine environment through pollution, destruction of habitats and over fishing, among others.

### *Maritime Security and Economic Concerns*

The Philippines' security environment is essentially maritime and its geography provides a substantial natural defence through the lack of shared land boundaries with any country and the large number of islands suitable for basing strategic defence forces. In addition, the waters throughout the archipelago can serve as a venue for cooperation with neighbouring countries, thereby facilitating mutual benefits in terms of economic and cultural development. Ironically, while these large bodies of water separating the islands offer numerous benefits, they also present potential vulnerabilities that could be exploited by an adversary. One major security concern is the continuing problem of maritime jurisdiction, especially in the marginal seas, due to the lack of agreed maritime boundaries, conflicting claims to offshore islands and overlapping EEZs. As an example, the Philippines has maritime claims overlapping the EEZ of neighbouring states such as Indonesia, Malaysia, Vietnam, China and Taiwan.<sup>4</sup> Related to this, on 15 May 1996 China ratified the United Nations Convention on the Law of the Sea (UNCLOS) becoming the 87th country to adopt the almost international maritime convention which took effect in 1994. Almost simultaneously however, on 16 May 1996 China released the coordinates of 78 base points which form the baselines of part of its territorial sea. The detailed baselines included the Paracel Islands, and in effect, expanded their territorial sea by about 2.6 million square kilometers from 370,000 square kilometers.

The growing industrialisation alongside the rapid growth in population in most parts of Northeast and Southeast Asia has markedly increased the demand for raw materials, fossil fuels and foodstuffs. The energy demand, particularly oil, is projected to rise and will progressively broaden to include a wide range of even more rapidly growing nearby economies. Recent Asia-Pacific Economic Cooperation (APEC) forecasts (Table 1) suggest that within 15 years, there will be four or five major competitors for existing Asian oil supplies in regional markets traditionally dominated by Japan.<sup>5</sup>

With the world supply of these goods gradually becoming scarce, the emerging economic powers in the region have become more nationalistic and aggressive in the exploration and exploitation of their domestic resources. They are also becoming more

assertive in claiming offshore territories with resource potential thereby provoking regional conflict and tension. The bloody conflict between Chinese and Vietnamese forces in the Chigua Reef area of the Spratlys in the South China Sea in March 1988<sup>6</sup> and the recent Chinese maritime activities in Mischief Reef<sup>7</sup> and Scarborough Shoal are examples of the strategic interplay in the region that may give way to further confrontation.<sup>8</sup>

| IMPORTING NATION | Share of Total Asian Oil Import ( % ) |      |      |
|------------------|---------------------------------------|------|------|
|                  | 1992                                  | 2000 | 2010 |
| Japan            | 77.4                                  | 53.2 | 36.5 |
| China            | --                                    | 10.9 | 19.4 |
| Taiwan/Hong Kong | 10.0                                  | 9.7  | 9.0  |
| Korea            | 21.0                                  | 20.3 | 16.9 |
| ASEAN            | --                                    | 5.9  | 16.9 |

**Table 1.** Emerging Asian Oil Import Rivalry

*Source:* APEC International Advisory Committee for Energy Intermediate Report, June 1, 1995.

Notwithstanding the unresolved issue of jurisdiction over the islands in the South China Sea, the region has been experiencing an era of relative peace and political stability. This development contributed immensely to the unprecedented growth of Philippine gross domestic product (6.9% in 1996 and 5.7% in 1997<sup>9</sup>) despite Asia's currency turbulence. Approximately 76 percent of annual inter-island export trade and 95 percent of the volume of imported goods are transported through sea.<sup>10</sup> Ensuring the safety of commercial vessels transiting national sea corridors is therefore of profound importance if the present economic gains are to be sustained in the longer term.

With the promulgation of the 200-mile EEZ and continental shelf in accordance with the provisions of the LOSC, the Philippines shall have sovereign economic rights over an EEZ area of 2.3 million square kilometers<sup>11</sup> and the resources therein. However, the desire to reap the immense economic benefits of the EEZ will bring with it an obligation to improve its capability and management to control and safeguard these resource-rich areas. Therefore, security concerns, now more than ever, involve the sustainable use, development and protection of the living and non-living marine resources for the maximum benefit of its citizens.<sup>12</sup> This aspiration is aptly enshrined in Article 12 of the Philippine Constitution which among other things states that "The State shall protect the nation's marine wealth in its archipelagic waters, territorial sea, and EEZ, and reserves its use and enjoyment exclusively for Filipino citizens".

Philippine coastal waters have some of the world's richest ecosystems, characterised by extensive coral reefs and dense mangrove forests. Blessed with a warm tropical climate and high rainfall, these waters are further enriched with nutrients from the land which enable them to support a wide diversity of marine life.<sup>13</sup> The fishery industry contributes about 4.5 per cent to gross national product and provides employment to about 5 per cent the total labor force. Total fish production for 1993 was 2.647 million metric tons valued then at P70.269B of which a total of P14.0B (A\$517.67M) was exported to 82 countries.<sup>14</sup>



Philippine coastal patrol craft *BRP Jose Loo Sr*  
(*Courtesy of Mr J. Mortimer*)

The Philippines however, is now facing a decline in its fisheries production and wanton destruction of its resource base in offshore and coastal areas. This phenomenon is mainly attributed to land and marine-based pollution, over fishing, rampant use of destructive fishing methods (eg. dynamite, cyanide, 'muro-ami', etc.), mining operations, habitat destruction and conversion of mangrove forest to aquaculture ponds in the municipal sector.<sup>15</sup> Total economic loss from illegal activities at sea has been estimated at P40B annually, including 600,000 metric ton of fish worth P15B<sup>16</sup>, with the remainder made up of coral destruction, income foregone for local fishermen, illegal trade and unrealised tourism potential. It is estimated that of the original 27,000 square kilometers of coral reef area, about 70 percent has been seriously damaged<sup>17</sup> (Table 2). Similarly, the original 450,000 hectares of mangrove forests has been reduced to less than 140,000 hectares.<sup>18</sup>

|          | SITES | EXCELLENT  | GOOD        | FAIR         | POOR         |
|----------|-------|------------|-------------|--------------|--------------|
| Luzon    | 336   | 12 (3.6 %) | 86 (25.6 %) | 146 (43.4 %) | 92 (27.4 %)  |
| Visayas  | 363   | 24 (6.6 %) | 95 (26.2 %) | 131 (36.1 %) | 113 (31.1 %) |
| Mindanao | 43    | 3 (7.0 %)  | 6 (14.0 %)  | 13 (30.2 %)  | 21 (48.8 %)  |
| Total    | 742   | 3 (5.3 %)  | 18 (25.2 %) | 290 (39.0 %) | 226 (30.5 %) |

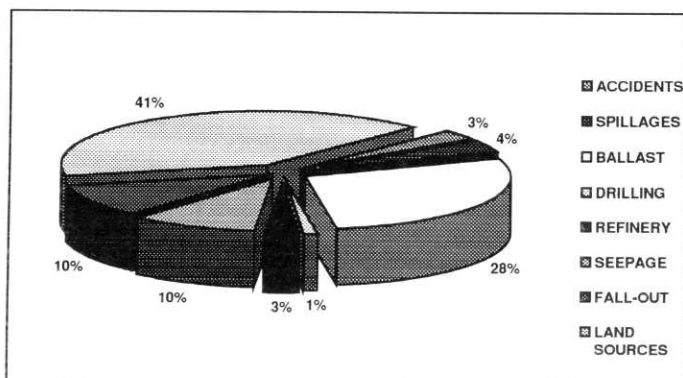
**Table 2.** Status of Philippine Coral Reefs

*Source:* Gomez et al., Status Report on Coral Reefs of the Philippines 1994 , Proceeding Third ASEAN-Australia Symposium on Living Coastal Resources, Vol.1: Status Reviews (AIMS, Townsville, 1994)

### *Environmental Concerns*

Environmental concerns include the maintenance of the ecosystem, natural life support systems, and the social and cultural conditions that impact on individual and community well-being.<sup>19</sup> Because of the unbridled exploitation of natural resources for immediate economic gains, the critical balance of the ecosystem that sustains marine life from which people subsist is now in great peril. This is a trend mostly felt in the coastal and offshore zones of developing states like the Philippines and unless immediate measures are implemented to arrest the rate of environmental degradation, the damage may become irreversible.

Environmental issues such as oil spills, ship's ballast discharges, introduction of exotic species and other sources of marine pollution are among the major concerns that merit serious attention. The increasing density of maritime traffic, especially that of large tankers carrying dangerous or hazardous cargoes in Philippine waters, has increased the risk of environmental damage or pollution as a result of collision, explosion, fire, grounding or other accidents. The threat is further aggravated by the possibility of accidental oil spills and oil well blow-outs from the offshore oil exploration and recovery operations off Palawan waters. Oil, in all its forms, from both ship and land sources, accounts for only 20 percent of maritime pollution, and ship discharges only 7 percent (Figure 2).<sup>20</sup>



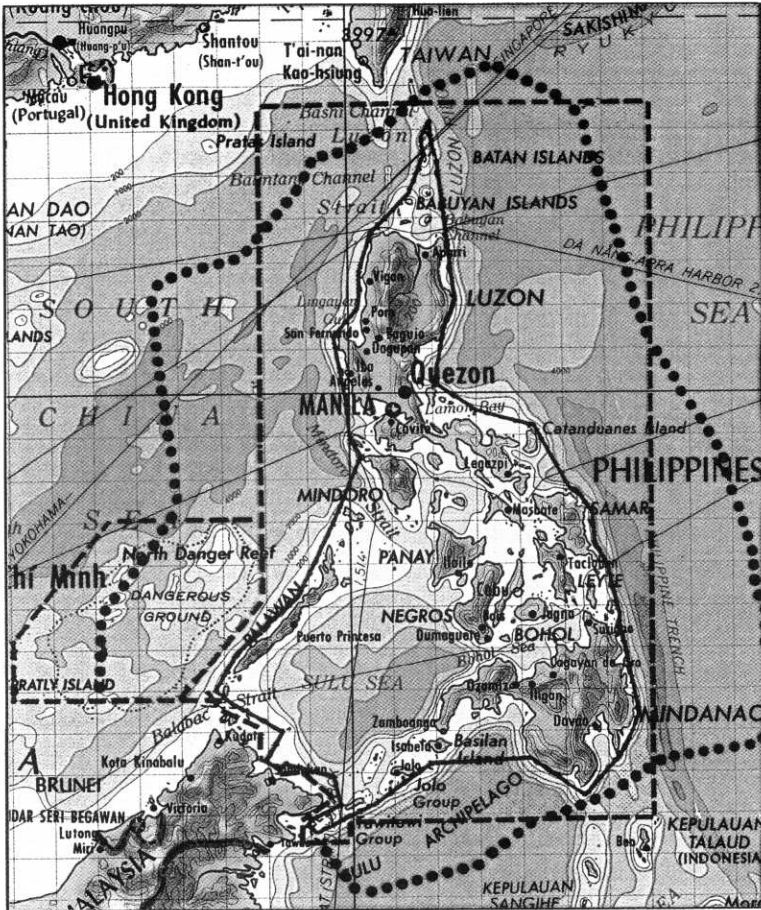
**Figure 2.** Sources of Marine Oil Pollution

The deterioration of marine water quality, particularly in coastal areas, bays and inland waterways, due to pressures of urban development and increased human settlement poses a more serious threat. The impact of declining water quality threatens the use of coastal and marine areas for recreation and commercial activities. Current pressures include untreated sewage discharges, direct sea dumping of garbage, agricultural wastes and toxic substances such as pesticides and non-organic fertilizers, industrial discharges, factory effluents and increasing beach and litter pollution. It is interesting to note that based on data gathered over time, combined land sources account for more than 90 percent of maritime pollution.<sup>21</sup>

### *Implications of LOSC*

While there has been determined efforts by the Philippine Legislature to ratify the adoption of the provisions of the 1992 LOSC which affirms the twelve nautical mile limit of the territorial sea and accords sovereign economic rights over the 200-mile EEZ, there is still lingering debate that, as a result of ratification, the Philippines will have to surrender its claim over a larger expanse of territorial waters (about 230,000 square miles) as stipulated under the 1898 Treaty of Paris when Spain ceded the Philippines to the United States (Figure 3).<sup>22</sup>

However, because of the promise of immense economic benefits from the exploitation of offshore resources and the growing global acceptance of the LOSC, it is inevitable that Philippine maritime boundaries will be clearly demarcated in accordance with the provisions set forth in the Convention (with reference to the baseline, territorial limits and EEZ as defined in Republic Act Nr. 5446 and Presidential Decrees Nr. 1596 and 1599<sup>23</sup>). To do otherwise will result in isolation from neighbouring countries.



- Baseline (Republic Act 3046 as amended by RA 5446,S-61)
- - - Treaty of Paris 1898/ Kalayan Claim (Presidential Decree 1596, S-78)
- 200 NM EEZ (Presidential decree 1599, S-78)/Line of Equidistance

Figure 3. Philippine Maritime Areas

Another related issue arising out of the promulgation of the LOSC is the designation of archipelagic sea lane passage. While the Convention confirmed the archipelagic state's sovereignty over waters within archipelagic baselines enclosing all the islands, this exercise of sovereignty is perceived to have been diminished with the inclusion of provisions of transit passage of foreign vessels through designated sea lanes. While at least two possible sea lanes are being considered, namely the maritime routes from Surigao Strait to Balabac Strait and East of Sibutu to West Mindoro, the Philippines has yet to officially designate these sea lanes. A third route, from San Bernardino Strait through the Verde Island Passage, has been suggested by the Americans; this being a route suitable for nuclear submarines. The Philippines object to this proposal as it is considered too close to Manila<sup>24</sup>, the country's seat of government and center of population. It should be noted that the Convention stipulates that if no archipelagic sea lane passage is designated, sea lane passage by foreign vessels may be exercised through all the routes normally used for navigation. Consequently, this translates to a wider area to monitor, this requiring more resources for the conduct of surveillance operations.

The declaration of an EEZ and continental shelf by the Philippines, however, implies that it is prepared to invest in the infrastructure, equipment and operation of offshore surveillance facilities and platforms to exploit the benefits and meet the attendant international obligations. One of the most important principles of the LOSC is that the rights and obligations for which it provides must be accepted by participating states as an integral package. When declaring their jurisdiction, coastal states cannot claim rights without incurring the obligations involved.<sup>25</sup> This means that a state which accepts the rights conferred by the LOSC is obliged to conduct marine research, enforce conservation measures and manage the resources within its zone. To derive the maximum economic benefits from its EEZ and at the same time fulfil its international obligations, the Philippines must therefore possess a capability to effectively manage and police its coastal and offshore estate. Table 3 illustrates, in summary, the varied tasks and potential benefits that could be derived from the exercise of sovereignty over the EEZ.

## **The Need For A Maritime Surveillance Capability**

### ***Background on Maritime Surveillance***

Professor Anthony Bergin, a noted Australian expert on the Law of the Sea, has identified five areas in which government must establish control. These areas are: the management of marine resources, the maintenance of territorial integrity, the protection and preservation of the marine environment, the prevention of illegal activity, and the safety of life at sea. He has further noted that in order to achieve this control, the coastal state must be capable of three basic tasks: surveillance, monitoring and enforcement.<sup>26</sup>

Maritime surveillance, monitoring and enforcement refers to the systematic observation and monitoring of an area in order to detect violations of specific rules and to deter violations of those rules. In order to demonstrate a nation's resolve and capability to exercise control over its sovereign territory, there must be a real expectation that the breaking of the rules within the nation's maritime domain will be discovered and punished.



To create such an expectation requires a surveillance system that is perceived as being capable of both detecting and apprehending offenders on a regular basis.<sup>27</sup>

| Task   | Potential income from                             | Potential benefit from  | Costs   |
|--|---|---|---|
| Fisheries  | License fees<br>Fines<br>Processing<br>Employment | Stock conservation<br>Food supply<br>Exports<br>Health benefits | Surveillance vessels<br>aircraft & radio links<br>HQ admin & mgmt costs   |
| Anti-smuggling   | Customs dues<br>Fines                             | Drug enforcement<br>Law enforcement<br>Health benefits          | Same as for fisheries   |
| Anti-piracy  | Fines   | Law enforcement<br>Accident prevention                          | Same as for fisheries   |
| Navigation Aids  | Light dues  | Trade<br>Safety of navigation<br>Accident prevention            | Traffic control<br>Radars<br>Lighthouses<br>Beacons<br>Buoys<br>Survey vessels<br>Admin & communications          |
| Hydrography  | Harbour dues<br>Chart sales                       | Safety of navigation<br>Accident prevention                     | Survey systems<br>Chart production & administration   |
| Search and rescue  | None by international convention                  | Life saving<br>Marine sports<br>Leisure                         | Same as for fisheries   |
| Marine pollution, prevention, monitoring, control and clean-up | Fines<br>Compliance fees                          | Fisheries<br>Fish farming<br>Marine tourism & leisure           | Monitor vessels<br>Aircraft<br>Remote sensing<br>Communications<br>Emergency and clean-up equipment and materials |

**Table 3.** The EEZ Balance Sheet<sup>28</sup>

\* If these tasks are not carried out effectively, the potential benefits may become a loss, with serious effects on trade, fisheries, loss of life, etc. The cost penalty is difficult to quantify.

Surveillance may be categorised into two broad categories, military and civil. The aim of military surveillance operations is to provide information for intelligence purposes and to provide combat information to a commander to assist in the decision making process.<sup>29</sup> The areas of interest for military surveillance are often more general and less defined than those for civil surveillance and are not limited to the offshore zone and the EEZ but extend to strategic areas outside these boundaries. The aims of civil surveillance on the other hand, are similar to those of military surveillance as far as maintaining an awareness of activity in the area of interest is concerned, however, it is generally more

focussed in area and target, and is subject to more precise customer requirements than the military is in peace-time. Areas of interest are clearly defined, but may also change with seasonal and customer requirements.<sup>30</sup>

It may be worthy to note however, that in the case of the Philippines, because of the limited number of assets available and budgetary constraints, both military and a great extent of civil surveillance are concurrently undertaken by the Armed Forces in support of civil agencies.

An effective maritime surveillance system is deemed essential for the defence of the littoral and the efficient exercise of sovereignty in internal waters, the territorial sea, and the EEZ. It requires the coordination of civil and defence assets (See Annex A: Modern Surveillance Equipment and Technology) to provide systematic observation of the country's maritime areas of interest. Such a system is necessary to maintain a high degree of awareness on what is happening in the maritime territories and ocean approaches. It is a vital tool to assess a particular situation, to collate and fuse data from a wide range of sources, to disseminate the information by timely and secure means to the decision makers or cognisant agencies, and to be able to appropriately respond to any contingency.

Surveillance in areas of disputed ownership serves to demonstrate an ongoing commitment and political will of the State to protect its interests in that area, and to gather information concerning the activities of other parties with competing claims. If it fails to observe even a small unusual movement in its maritime areas and promptly act on it as needed, then sovereignty and security are unduly imperilled and prestige adversely diminished. This was proven by the incident in the South China Sea in early 1995 when Philippine authorities failed to detect that Chinese nationals had occupied and erected structures in the Mischief Reef<sup>31</sup> off the coast of Palawan, virtually declaring their ownership of this Philippine-claimed territory.

### ***Current Effort in Maritime Surveillance***

The Philippines, being a maritime nation, has a number of distinct agencies with mandated regulatory responsibilities that are either devoted to or related to the effective management and protection of sovereign ocean and waters, mostly in support of maritime constabulary functions. Among the major stakeholders are:

- Armed Forces of the Philippines (AFP), Department of National Defence (DND)
- Philippine National Police (PNP), Department of Interior & Local Government (DILG)
- Bureau of Fisheries & Aquatic Resources (BFAR), Department of Agriculture (DA)
- Department of Environment and Natural Resources (DENR)
- Department of Transportation & Communications (DOTC)
- Bureau of Customs (BUCUS), Department of Finance (DOF)
- Bureau of Immigration and Deportation (BID), Department of Justice (DOJ)

Under the current system, most of these each agencies carry out their own monitoring and surveillance over the maritime areas relative to their specific interests. However, the largest part of the surveillance and response operation is being undertaken by

the Armed Forces of the Philippines with its Navy and Air Force, under the aegis of the DND (which is the major provider of surveillance resources for both routine and response surveillance activities), at the forefront.

The Philippine Air Force (PAF), primarily through its 221<sup>st</sup> Airlift Squadron, provides maritime air surveillance support to the AFP and other government agencies. It uses two types of aircraft, the Aero Commander and the Fokker RF-27M which are equipped specifically for the conduct of surveillance operations, however, the full capability of these assets has not been utilised due to some logistical support problems.<sup>32</sup> In addition, other types of aircraft are occasionally employed for surveillance missions as deemed necessary. For a five-year period from 1992 to the first quarter of 1997, the Air Force conducted a total of 673 surveillance sorties mostly in the Kalayaan Island Group area logging a total of 1,109.7 hours flying time<sup>33</sup>; roughly an average of 220 hours annually. This figure, however, compares dismally with that of other countries, for example Australia, which, with an EEZ about five times larger than that of the Philippines, conducts about 14,000 hours of civil aerial surveillance (excluding military surveillance flights) annually.<sup>34</sup> Therefore, over the same expanse of maritime area, Australia undertakes about 2,800 hours of aerial surveillance annually compared to the Philippines' 220 hours.

While aircraft can patrol larger areas and respond more quickly over greater distances, a *surface platform or vessel is required to make contact with the target vessel* in order to investigate, board and effect an apprehension, if necessary. A balance between aircraft, surface ships and land-based sensors is therefore needed to provide operational flexibility. Thus, the Navy through its fleet and coast guard units conduct regular barrier patrols of the territorial waters and some portions of the EEZ as part of its Constitutional mandate to safeguard territorial integrity and sovereignty. The Navy currently employs a number of fast patrol craft and patrol gun boats for policing the internal and territorial waters while a handful of larger platforms, such as offshore patrol vessels, are tasked to operate in the outer fringes of the EEZ.

Between 1992 and June 1997, the Navy's assistance to other government law enforcement agencies resulted in the apprehension of 755 people for smuggling, 5,536 people engaged in illegal fishing, 120 people for illegal possession of firearms and explosives used in destructive fishing methods, 12 people for illegal drug trafficking, 826 people for illegal logging and 905 foreign nationals for illegal entry. Additionally, about 1,998 sea craft were apprehended and 1,294 firearms and 47,356 rounds of ammunition amounting to P629.54M confiscated.<sup>35</sup>

To augment its mobile surveillance assets, the Navy also operate and maintain a maritime surveillance network or coastwatch system consisting of land-based monitoring stations in various strategic locations, particularly along choke points and sea border zones, to monitor the movement of vessels transiting these sensitive areas. Four Coastwatch Stations have been established and these are located at: Cape Melville in Balabac, Palawan, in the West; Lower Calarian, Zamboanga, in the South; Capul Island, Northern Samar, in the East; and San Miguel, Zambales, in the Northwest (Figure 4). These facilities are equipped with micro-wave surface surveillance radars, radio direction finders and various types of communication equipment. The Navy intends to establish at least another four CWS within the next five years as part of its capability development program (See Annex B: Prospects in Surveillance Hardware Acquisition).

Another major participant in the government's surveillance effort is the Maritime Command (MARICOM) of the PNP. Its primary function is to prevent and suppress violators of maritime laws, rules and regulations within municipal waters (the area up to 15 kilometers from the shore<sup>36</sup>) and assist in search and rescue operations in times of disasters. MARICOM currently employ several catamarans and other small sea craft in the conduct of its maritime patrol sorties within its area of jurisdiction.

Another government agency with major maritime interest is BFAR under the DA. BFAR exercises responsibility for the administration of fisheries legislation concerned with the management and exploitation of fisheries and other aquatic resources within Philippine waters including the 200-mile EEZ. It is principally responsible for the management and protection of about 26.5 million hectares of coral reefs in the coastal areas and some 2,145 fish species in 32 major fishing grounds.<sup>37</sup> It employs a number of indigenous watercraft for limited monitoring of fishing activities in coastal areas and research purposes. BFAR's objectives in relation to maritime surveillance are: that fishing activities are carried out in accordance with legislative provisions, agreements and administrative arrangements; and that the highest possible detection and apprehension rate of unlicensed and illegal or destructive fishing operations is achieved.

The DENR is responsible for developing and coordinating policies and administering national programs (eg. Coastal Environmental Program, Bantay Dagat, Conservation of Priority Protected Areas Project, etc.) including scientific research projects relating to the conservation, management and protection of the environment and exploitation of natural resources. To fulfil this wide range of functions, DENR employs specially-built marine vessels, light helicopters and a number of indigenous watercraft. Due to the lack of personnel and relevant expertise within DNER, actual operation of some of these assets is currently undertaken by uniformed personnel from the AFP through special interagency arrangements.<sup>38</sup>

The BUCUS is another major stakeholder in the maritime surveillance effort. Its primary concerns involve revenue evaluations, prohibited imports and exports, including narcotic drugs and fauna, and other forms of smuggling perpetrated through Philippine water approaches. BUCUS does not, however, operate air and surface surveillance platforms and relies on intelligence inputs from its operatives deployed around the archipelago in addition to cooperative exchange of information with other government and non-government agencies and international and foreign organisations (eg. Interpol, Diplomatic and Trade Attaches, etc.) through overseas liaison arrangements. BUCUS generally makes arrangements for response and enforcement operations ashore using their own resources but has to rely on the assets of the AFP and the PNP for special maritime customs operations.

Other stakeholders have no or very limited surveillance assets and facilities and depend on the services provided by the AFP and the PNP.

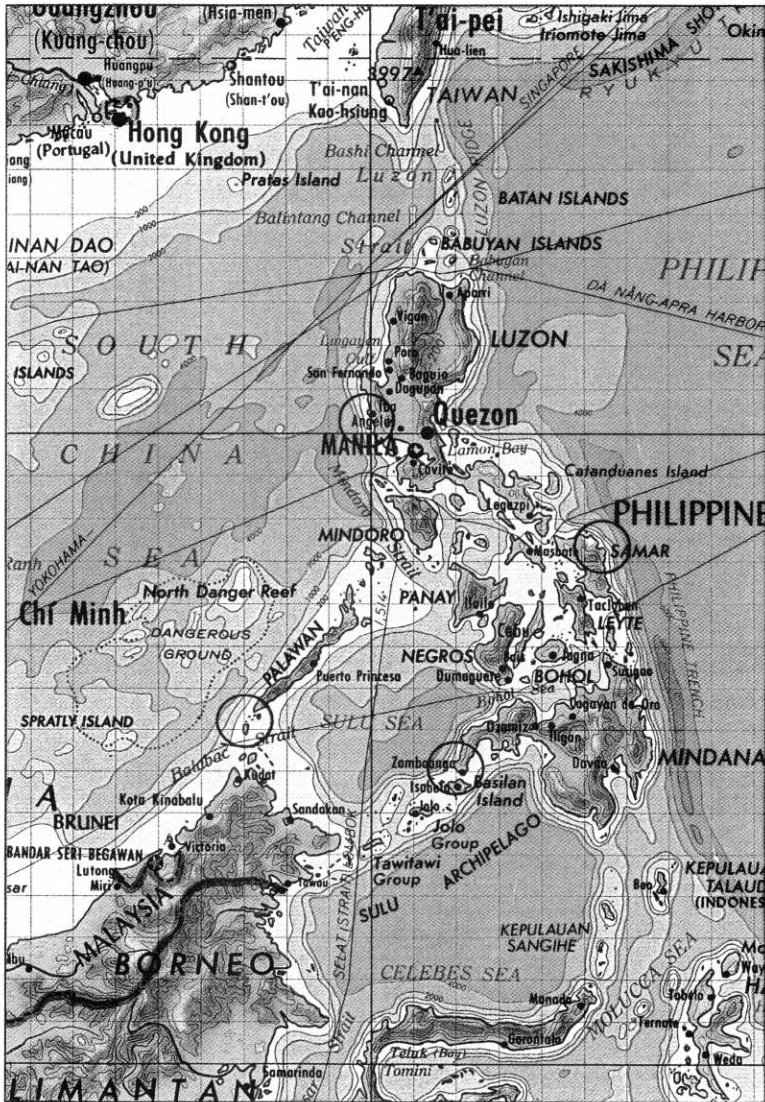


Figure 4. Existing Coastwatch Stations

## *Other Maritime Surveillance Models*

### The Australian Model<sup>39</sup>

The civil surveillance program in Australia is managed and coordinated by Coastwatch using a combination of contracted civilian aircraft, Defence patrol boats and aircraft and sea-going vessels of the Australian Customs Service for, and on behalf of, at least eight client agencies (Fisheries, Customs, Quarantine, Environment, Police, Immigration, Foreign Affairs/Trade and Primary Industry).

Coastwatch is a semi-autonomous operational branch of the Australian Customs Service and commenced operations in 1988. It has a head office in Canberra and regional offices in Darwin, Broome, Cairns and a sub-center on Thursday Island in the Torres Strait. The Minister for Science, Customs and Small Business within the portfolio of the Minister for Industry, Science and Technology is responsible for its operation, however, the National Manager in Canberra is responsible for its day-to-day administration. The National Manager determines the national direction and focus of surveillance efforts based on the priorities identified by its client agencies. The Regional Managers on the other hand are responsible for the direct coordination and control of the surveillance assets to address client priorities. It must be noted however, that Coastwatch is a service provider and does not determine threat areas or determine client's surveillance interests. The client agencies remain responsible for the development of threat assessments and surveillance requirements in relation to their respective program objectives. These client generated assessments form the basis of operational planning and the subsequent conduct of surveillance operations by Coastwatch.

Surveillance requirements are submitted by the client agencies through a formal committee system - the Operations and Program Advisory Committee (OPAC) composed of representatives from the major client agencies. OPAC convenes in Canberra every month to plan the Commonwealth's offshore civil surveillance program. Client organisations submit bids for the use of resources and the Committee representatives finalise and determine overall priorities for all taskings submitted. A network of Regional committees assist the OPAC in the formulation of the national surveillance program based on the requirements of the various regions.

Coastwatch's operational area covers the Australian coastline, its offshore islands and the Australian Fishing Zone (AFZ) and EEZ surrounding these areas which amounts to approximately 37,000 kilometers of coastline and an offshore maritime area larger than the Australian mainland. To maintain an acceptable probability of detection against an unknown threat, surveillance efforts are concentrated on identified priority areas with high a incidence of activities of interest to the client agencies. The Coastwatch program is focussed on a wide range of client concerns which include:

- drug importation;
- illegal immigration;
- foreign fishing activity;
- quarantine breaches;
- flora/fauna smuggling;
- national and marine park/wildlife monitoring and protection;



Australian patrol boat *HMAS Warrnambool*

- environmental protection in coastal/offshore areas;
- monitoring of historic shipwrecks; and
- any other breaches of Commonwealth or related offences in coastal and offshore areas falling within the capacity of Coastwatch to provide.

The principal components of Australia's current surveillance effort are:

- visual and electronic aerial surveillance provided by civilian contracted fixed-wing and rotary aircraft;
- 250 hours of dedicated RAAF P3C Orion offshore patrol of the Exclusive Economic Zone inaccessible to Coastwatch aircraft;
- 1800 days provided by Naval patrol boats (Fremantle Class) for civil-related, offshore surveillance purposes;
- complementary effort by Customs sea going vessels, particularly to provide an operational response capacity for inshore sightings or incursions detected by Coastwatch assets; and
- capacity to charter or hire additional air or surface resources, if required.

The majority of aerial surveillance is undertaken by general aviation contractors. The contracts can be described as 'turn key' operations whereby the contractor provides aircraft and aircrew together with the administrative and engineering support to meet Coastwatch requirements. The training of observers however is undertaken by Coastwatch. The annual cost of these contracts in 1994 was A\$27.23M consisting of A\$26.4M for fixed wing surveillance and A\$0.83M for helicopter surveillance. All operational funds for civil surveillance are directly budgeted for, allocated to and managed by Coastwatch. In broad terms, these funds (A\$35.2M for FY1997) cover:

- the costs associated with the contracted aircraft;
- the costs associated with chartering additional general aviation and marine assets; and
- the administrative costs and salaries of Coastwatch staff.

The cost however of operating the RAN Fremantle Class patrol boats and the RAAF P3C Orion aircraft (about A\$34M per annum) for civil surveillance are presently borne by the Australian Defence Force (ADF) through Cabinet direction.

#### The Malaysian Model<sup>40</sup>

After Malaysia's declaration of the 200-mile EEZ on 25 April 1980, the Malaysian government issued a directive (Prime Minister's Directive dated 6 October 1982) delineating the responsibilities of providing security in Malaysian waters as follows:

- Malaysian Territorial Waters (MTW) - Police (Marine and Air Wing)
- Exclusive Economic Zone (EEZ) - Navy assisted by the Air Force

Although these two agencies play a major role in the surveillance and enforcement of law and order in the MTW and EEZ, the other enforcement agencies/departments (Fisheries, Environment, Marine Department, Royal Customs and Excise, and Immigration)



continue to be fully responsible for carrying out their respective roles and functions pertaining to the enforcement of their relevant laws. Surveillance assets and manpower however were provided and operated by the Navy, Air Force, Police and Fisheries so that there was a need for a coordinated and effective scheme to optimise the utilisation of the limited resources available.

To address the problem of limited assets, the Maritime Enforcement Coordinating Center (MECC) under the Prime Minister's Department was created in 1985 through National Security Council Directive No.14. Its objective was to coordinate the activities of the various maritime law enforcement agencies and to ensure that the national assets involved in maritime operations are utilised competently, swiftly and efficiently.

As a coordinating agency, MECC is responsible for the formulation of standard operating procedures to enable the various maritime enforcement agencies to operate jointly when the need arises. To fulfil this requirement, MECC conducts various courses, dialogues and joint operations on a regular basis.

The MECC is headed by a senior naval officer and is comprised of 10 officers and 23 supporting staff from the Royal Malaysian Navy, Royal Malaysian Air Force, Royal Malaysian Police, Fisheries and Civil Service. The MECC is organised into five sections as follows:

- MTW Section (headed by a Police Officer);
- Coordination and Operations Section (headed by a Fisheries Officer);
- EEZ Section (headed by a Naval Officer);
- Air Surveillance Section (headed by an Air Force Officer); and
- Administration and Finance Section (headed by a civilian officer).

For effective operation, MECC is equipped with a range of communication facilities which include landline telephones, radios, facsimile and computers inter-connected with the other maritime enforcement agencies. The Operations Room is manned 24 hours, thereby ensuring an ability to respond quickly to any urgent matter.

MECC however, has no maritime assets under its command or control. It depends on the decisions made at the various committee meetings for the implementation of the maritime law enforcement requirement. It is not vested with legislative or executive authority to actively enforce maritime laws. The responsibility for enforcement is presently distributed to the various ministries and departments. As such, there are too many controlling agencies and some agencies possess assets that could do much more but are restricted by law.

#### The Indonesian Model<sup>41</sup>

Maritime safety and surveillance in Indonesia is managed by BAKORKAMLA (Coordinating Board for Maritime Security) which is an inter-agency body established in 1972 by a Joint Ministerial Decree of Defence, Justice and Communication. It is responsible for security issues such as piracy, fishing intrusions by foreign vessels, trans-boundary marine pollution and smuggling in offshore maritime areas. This organisation comes under

the Chief of Armed Forces who is assisted by the Chief of Naval Staff who has oversight of day to day operation. BAKORKAMLA is based in the Armed Forces Headquarters in Jakarta and employs a combination of patrol ships and aircraft from the Navy, Air Force and the Police. Other government agencies with maritime-related concerns however assist the Armed Forces in the national surveillance effort employing mainly patrol ships and boats.

For efficient surveillance coverage of the entire maritime area of operations, BAKORKAMLA is divided into two Sub-Area Coordinating Centers (GUSKAMLA). The Western Sub-Area Coordinating Center (GUSKAMLABAR) is based in Tanjung Pinang, Bintan Island and the Eastern Sub-Area Coordinating Center (GUSKAMLATIM) is based in Ujung Pandang in the South of Celebes Island. Each Sub-Area Coordinating Center is headed by a senior naval officer with a rank of First Admiral (Commodore).

The Sub-Area Coordinating Centers exercise direct control over the naval assets based in their area of operations and coordinate with the nearest Air Force base for air support as required. The Western Fleet based in Jakarta and the Eastern Fleet based in Surabaya provide ships and maritime patrol aircraft to both Sub-Area Coordinating Centers for continuous year-round operations. Both Fleets also maintain several forward bases for various strategic areas to support the logistic requirements of surveillance assets.

The maritime patrol aircraft provided by the Air Force are managed by BAKORKAMLA. It also decides on the scheduling of flights based on surveillance requirements from various military units. Surveillance assets however are readily attached to the Sub-Area Coordinating Centers when there is an urgent need for these assets.

Contribution to the surveillance effort from other government agencies is coordinated through the conduct of regular committee meetings with the Armed Forces and other concerned groups, however the responsibility for the enforcement of respective laws is presently distributed to the various government departments/agencies. Joint patrol operations are regularly conducted by the various government departments and the Armed Forces and these activities are managed by the Sub-Area Coordinating Centers.

There are also joint patrol operations with the naval and police forces from friendly neighbours like Malaysia and Singapore in the Malacca and Singapore Straits in the West and with the Philippines in the Celebes Sea in the East.

### **Rationale For The Development Of A National Surveillance Structure**

As evident from the foregoing discussions, the ability to protect and manage the Philippines' extensive marine resources in the coastal and offshore areas is deemed vital to the national economy. It requires the capability to monitor activities within those areas and to respond to incursions. This capability is also necessary to protect the interests of national enterprises and at the same time ensure that a just return is derived from others operating in those areas. Equally important, it provides a clear demonstration of sovereignty where maritime boundaries are still to be resolved. It is unfortunate however, that the Philippines has yet to develop what could be referred to as a "credible surveillance capability" to support national efforts towards economic prosperity.

In spite of its inadequacies, it can be said the Philippines has a modest history in maritime surveillance. The DND, through the AFP, is the dominant agency in the conduct of maritime surveillance and enforcement operations (by virtue of its Constitutional mandate to uphold Philippine sovereignty and integrity and at the same time preserve the national patrimony particularly for defence and security purposes). Various government agencies and other stakeholders in maritime affairs, are being assisted by the DND-AFP for their surveillance requirements particularly in the collection of information and the enforcement of relevant laws. This is understandable inasmuch as the DND-AFP is, at the moment, the only government entity that is relatively well equipped with the relevant skills and experience to conduct maritime surveillance.

Maritime surveillance is an expensive undertaking and hence, a developing country like the Philippines must look at the most cost-effective means to carry it out. Sharing or joint use of assets among government agencies is a recognised measure which is expected to be cost-effective. However, with the amorphous surveillance structure and the apparent lack of coordination among the stakeholders, national surveillance and enforcement tasks on various maritime interests and regimes have been proven to be costly, inefficient and ineffective. There have been attempts to integrate the surveillance requirements of various civilian government agencies into the defence surveillance program, however, most of these efforts were limited only to lateral arrangements between DND-AFP and one other agency (e.g., DND-DENR), rather than pursuing a collective or multilateral approach. Other agencies, with their own interests in mind, sought to develop and maintain exclusive surveillance arrangements. This perpetuated the tendency among these agencies to compete with each other, particularly with the DND-AFP, for a substantial share of the limited national budget to sustain their respective surveillance activities.

The AFP, through the navy and the air force, annually allocates patrol ships steaming time and aircraft flying hours for surveillance and response operations, however, surveillance deployments do not actually follow any preconceived program or pattern. The time allocated for surveillance is determined by simply adding incremental increases to the previous year's effort and is not based on validated patterns of activity or developed knowledge of variations on the normal sea traffic (over the long term) that may be crucial to security and economic well being. These allocations are done arbitrarily because there is no comprehensive data-bank on which sound decisions can be based. This results in a number of unnecessary visits to locations where the surveillance activity has relatively little or no impact or provides no deterrent to any prospective adversary or intruder. Essentially, surveillance and enforcement needs to be seen as credible and effective in the eyes of those at whom it is targeted. These flaws give rise to an inefficient and very costly endeavour. Deliberate effort to concentrate surveillance assets to critical areas when and where they are needed most is therefore necessary and this requires good intelligence collection and exchange, inter-agency coordination and interoperability; all of which appear absent from the current arrangements.

Maritime surveillance and enforcement operations have been conducted on an ad-hoc and sectoral basis in which sectorally based policies and strategies are generally applied without coordination, and often without adequate consultation, resulting in economic inefficiencies, conflict, duplication of effort, late responses and confusion about resource use issues. No single agency has total responsibility for any area. Many agencies and many different user groups share responsibilities for most areas. It is apparent that a strategic and

integrated approach is needed to allow the stakeholders to design a shared vision rather than competing with each other and duplicating activities.

Notwithstanding the foregoing, a number of agencies were able to collect years of invaluable data for their own purposes. Exchange of data between agencies has been encouraged, but too much effort is required to collect, collate and translate the data for it to be widely useable. Data independently gathered by one agency and assessed as less valuable may be stored away without being shared, when it could be of significance to another agency. This highlights the notion that surveillance systems are not merely concerned with the actual observation over a target area and collection of data, but equally, if not more importantly, the validation, analysis and communication of this data to aid formulation of medium and long-term maritime strategy.

In summary, the Philippines' current surveillance and enforcement regime for the marine environment is characterised by: lack of an overall coordination mechanism or single administering agency; fragmentation and overlapping of functions by a wide range of government agencies; a sectoral approach to surveillance and enforcement; unclear demarcation of areas of responsibility; and a primary response capability dependent upon the priorities of the Armed Forces of the Philippines.

The foregoing frailties in the Philippine maritime surveillance effort clearly suggests that there would be certain advantages if it were managed and administered in a holistic or integrated manner. On the other hand, the special interests of different government departments in sectors related to the maritime sphere normally militate against having one national authority for running the surveillance effort. As a sensible compromise, the establishment of a coordinating mechanism (See Annex C: Proposed National Maritime Surveillance Organisation) whereby officials from departments with major maritime interests meet regularly to develop ways and means of working closely together is a viable alternative. Where practicable, cooperation can involve the sharing of assets, agreed common purchasing standards leading to interoperability of equipment (particularly in the field of communications), the use of common training facilities and joint exercises to prepare to meet disasters and other emergencies.

## **Conclusion**

The Philippines by its very nature, an archipelago composed of thousands of islands and islets surrounded by large bodies of water teeming with life and mineral resources and a population mostly settled in coastal areas, is essentially a maritime state. However, despite this, the people, government policy, the economy and many aspects of social attitudes and traditions tend to be insular and inward looking. The prevailing conservative attitude towards the management and protection of the maritime environment and the resources therein is manifested in the present predominance of an agrarian-based economy and the poor state of the maritime environment caused by years of abuse and neglect. However, with the promulgation of the LOSC and the recent calls for a shift in development policy that would emphasise the Philippines as an archipelagic state augurs well for a brighter prospect in maritime-related programs. These circumstances make it all the more important

to preserve and manage what is left of the resources at sea and one inherent task to achieve this end is to have what could be referred to as a credible maritime surveillance capability.

While there are two broad categories of surveillance, military and civil, ultimately the objectives of both are the same; to maintain awareness and information dominance, as well as provide a credible deterrence. The main difference however lies in their definition and the extent of their respective areas of interest. The military's maritime interests are more general in scope and extend to areas far beyond the EEZ boundaries, while civil requirements are more focused on a definite area and target. Both civil and military surveillance however, is undertaken primarily by the Philippine armed forces under the Department of Defence and to a lesser extent the police force and other government agencies.

Compared to other surveillance models in place in many countries in the region, the present surveillance effort is far from being cost-effective, efficient and responsive to the prevailing needs of the present times. Aside from the apparent lack of funding and inadequacy of appropriate equipment, facilities, infrastructure and technology, it is characterised by a lack of coordination leading to economic inefficiencies, duplication of effort among a myriad of government agencies, gaps in surveillance coverage and inadequate or late response.

What has been suggested in this paper is the establishment of an optimal means of conducting surveillance over vast maritime areas of interest which must include an appropriate level of coordination and control. Basically, the objective is to satisfy the civil surveillance requirements of the participating agencies and at the same time to optimise the use of the limited resources available. The proposed solution is for the establishment of a generic surveillance structure with the National Maritime Surveillance and Response Coordinating Office (NMSRCO) at its core. NMSRCO shall be tasked to coordinate, plan and integrate all surveillance operations at a national level. The essence of the system would be an organisation that has the responsibility to develop and promulgate the national surveillance plan based on the surveillance priorities of all concerned agencies while at the same time being vested with sufficient authority to coordinate its implementation. To provide the strategic level oversight and guidance, a strategic level committee which shall be referred to as the Interdepartmental Advisory Committee (IAC) composed of senior representatives from the participating departments, shall be constituted for the purpose.

As to its financial requirements, the national surveillance program shall be treated as a distinct and separate budget entity. This funding scheme is intended to maintain the autonomy of the organisation such that it is not perceived as belonging to a specific department but, rather, is considered an agency that caters to the surveillance requirements of all participating agencies. Its funding should not lead to reduced funding for the other agencies' activities not directly related to surveillance. It is important to emphasise that NMSRCO shall undertake the administration, coordination and other managerial aspects of the national surveillance program, while the participant agencies shall provide whatever operational resources are available within their inventories.

Finally, there exists a number of possible surveillance methods using several types of platforms and sensors of varying costs and complexity. The choice of the most appropriate solution however, would be dependent on a cost-benefit analysis, striking a balance between

performance, cost and other factors such as value of assets being protected and the consequence of inaction. The Philippines has a modest capability for surveillance and enforcement using limited equipment of less sophistication but there are plans to enhance current efforts through acquisition of new equipment and sensors. The strategy of procurement however should be an integrated one to optimise the limited resources available.

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## ANNEX A

### MODERN SURVEILLANCE EQUIPMENT AND TECHNOLOGY

The resources and assets generally applied to maritime surveillance by the vast majority of nations have not changed significantly in the past two or three decades. However, new systems (eg. satellite-based, unmanned aerial vehicles and over-the-horizon radars) which offer longer detection range have been, or are being, developed and some are now in operation in countries like Canada, the USA and Australia, to name a few. These new systems however, are very expensive to acquire and require substantial capital investment for through life operation and support.

Nonetheless, effective monitoring of the offshore estate can still be achieved by a judicious mix of fixed and mobile surveillance systems. The particular choice of surveillance methods and equipment would result from a trade-off analysis of factors such as performance, cost, value of the assets to be protected and the perceived damage to national interests of a failure to protect. The selection of the most appropriate combination of surveillance systems is therefore a major issue in the establishment of a national maritime surveillance system. There are numerous solutions available and each has its advantages and disadvantages depending on the nature of the task. Some of the platforms and sensors (both new and old) currently employed for maritime surveillance are briefly described below.

#### Fixed Arrays

##### *Over-the Horizon Radar (OTHR)*

OTHR operates in the HF radio band at frequencies between 5 and 32 MHz, and relies on reflection of the radio waves from the earth's ionosphere on their path to and from the target. OTHR is used for broad or wide area surveillance since it is capable of ranges 1,000 to 3,000 kilometers. It illuminates the target from above so that it is not possible for an aircraft to fly under the radar, as is the case with line-of-sight radar systems. It is therefore suitable for detecting aircraft and ships. However, it is unreliable against submarines and occasionally against small surface vessels, particularly those with wooden hulls. Australia currently has an OTHR network in place which cost about A\$970M.

##### *Surface Wave Radar (SWR)*

SWR also operates in the HF radio band at frequencies between 5 and 12 MHz. Unlike OTHR which relies on reflection from the ionosphere, SWR relies on a technique where electromagnetic energy or high frequency waves<sup>1</sup> are propagated over the ocean surface following the earth's curvature to detect and track targets beyond the horizon to about 500 kilometers. It can cover an area of up to 260,000 square kilometers. Like OTHR, SWR has the advantage that it is not possible for an aircraft to escape detection by flying under the beam. The cost of an operational system is anticipated to lie in the range of A\$10-100M.

### ***Land-based Microwave Radar (LMR)***

LMR is a line-of-sight radar used for focal area surveillance. LMR is capable of providing accurate information on surface and airborne targets. Its greater classification capability is a result of its short wavelength (~3 cm) compared with the size of the objects being detected, and is based on Doppler modulation of the return beam due to the motion of parts of the contact (eg. propellers). Basic target information obtainable from LMR includes size, range, bearing, speed, track, and in the case of aircraft, altitude. Classification of surface targets may indicate target length, and whether the target is merchant or military. Airborne targets may be categorised as fixed or rotary wing and fixed wing aircraft may be classified as propeller or jet. Jet driven aircraft may be further classified by the number of engines, and differentiation, between an FA/18 and a Boeing 747 for example, is possible. The classification can be carried out at a range sufficient to enable a weapons system time to react effectively. The radar range however is limited by the height of the antenna above sea level and its performance is downgraded by environmental factors such as sea clutter, rain, hail, sleet and snow. The cost per installation is estimated at A\$1M.

### ***Laser Radar***

Laser Radar is basically a line-of-sight radar that operates by scanning a laser beam across a field of view in a point-by-point fashion. Using signal processing techniques, depth and range resolution suitable for target definition are obtained. Since it operates on line-of-sight principles, it thus suffer from the same inherent disadvantage that affects microwave radar systems, that is an incoming aircraft can fly at low altitude to escape detection. Detection ranges of 100 kilometers are possible for aircraft, but adverse atmospheric conditions can seriously degrade its performance. The cost of the system is anticipated to lie in the range from \$200,000 to several million dollars.

### **Bottom Mounted Sonar Arrays**

Bottom Mounted Sonar Arrays are arrays of hydrophones mounted on the sea bottom which are increasingly used for oil exploration but may also be employed for surveillance. Unlike the surveillance systems described above, the sonar array offers a potential for detecting and classifying sub-surface targets and this can be carried out at substantial distances. Fixed sonar arrays are estimated to cost from A\$10-100M, depending on the capability desired.

### **Aerial Platforms**

#### ***Fixed Wing Aircraft***

Fixed Wing Aircraft range from light aircraft with one pilot and maybe an observer through to military long-range maritime patrol aircraft with crews of about ten. Because of the slow flight and good manoeuvrability characteristics of light aircraft they are normally used to search visually for signs of a landing along the coastline. The larger, more capable and longer range aircraft are employed to search a large open ocean area. Australia, for example, utilises Britten Norman Islanders for visual surveillance of its northern coastline

while the P3C Orion aircraft of the Royal Australian Air Force are deployed to monitor the vast expanse of their Southern waters including the Australian Antarctic Territory.

### ***Helicopters***

Helicopters offer the distinct advantages of being capable of conducting boarding operations, hovering and landing at isolated locations. However, they are generally more expensive to purchase and operate than equivalent fixed wing aircraft and have reduced range, speed, operating altitude, endurance and payload.

### ***Satellite Mounted Surveillance Sensor***

Satellite Mounted Surveillance Sensors have the advantage of high operating altitudes and consequently wide area coverage. They would have to be in low earth orbit (LEO) however, either in an equatorial or polar orbit, in order to be effective for surveillance purposes. The cost of a LEO system would be in the order of A\$250M for the first satellite and ground facilities and A\$50M for each additional satellite.

### ***Tethered Balloons or Lighter-than-Air Platforms***

Tethered Balloons or Lighter-than-Air Platforms are basically a platform for microwave surveillance radars and other line-of-sight sensors (eg. IR/Daylight camera, COMINT systems, etc.). It offers the advantage of longer range because of the altitude attained. For instance, a land-based microwave radar, because of altitude limitations, would only have a radar range of up to 17 nautical miles. Mounting the same radar to a tethered balloon operated at an altitude of 3,000 feet would increase surface coverage out to 70 nautical miles giving track area of more than 14,000 square miles.

## **Surface and Sub-surface Platforms**

### ***Surface Vessels***

Surface Vessels range from small patrol craft with shallow draft and suitable speed up to the large offshore patrol vessels with superior sea keeping and endurance abilities. The small patrol craft are usually employed for near shore surveillance and response usually in benign and shallow waters. The larger and more capable offshore patrol vessels of up to 1300 tonnes and capable of helicopter operations are deployed to patrol the rough portions of the economic zone not accessible to smaller vessels.

### ***Submarines***

While not generally classified as surveillance platforms, the utility of submarines for such purposes can not be overemphasised. Their ability to stay in an area over long periods and remain undetected offer a considerable degree of deterrence to would be intruders especially if the latter is aware of the likelihood of detection and neutralisation by unseen forces.

## **Command, Control and Communications Systems**

Maritime surveillance may be undertaken by a combination of the means described above. It involves numerous interdependent activities which have to be planned, directed, coordinated and adapted to suit the circumstances at the time. In its simplest form, this is achieved practically by a commander applying his authority and exercising command and control through a communications system that collates the information from different sources and produce a coordinated surveillance picture. The hardware needed to link and integrate all surveillance systems would include but not necessarily be limited to:

- satellite communications;
- radio communications (HF, VHF, UHF transceivers, etc.);
- computers with modems;
- tactical data link integration systems (e.g. Link 11); and
- multi-sensor fusion processors.

### **Note:**

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## ANNEX B

### PROSPECTS IN SURVEILLANCE HARDWARE ACQUISITION

The Philippines has in its current inventory some of the surveillance equipment discussed in Annex A, but these are limited in both quantity and quality. Except for the 21 new 26-meter patrol craft made available through Foreign Military Sales (FMS) and the three 62-meter Peacock Class Patrol Vessels recently acquired from the United Kingdom, most of the surface platforms primarily employed for maritime policing and resource protection by the AFP are obsolete and have are very expensive to operate and maintain. To enhance its present capability, the AFP, under its approved 15-year Modernisation Program, is pursuing the following maritime surveillance-related projects:

- acquisition of offshore patrol vessels, patrol boats and patrol craft;
- acquisition of long range maritime patrol aircraft;
- acquisition of multi-purpose helicopters;
- establishment of more Coastwatch Stations;
- acquisition of air defence radars;
- acquisition of command, control and communications equipment; and
- acquisition of a mine warfare vessel

Other government agencies also have plans to procure equipment for the performance of their respective maritime surveillance functions. These plans are summarised in Table B1.

| Agency   | Equipment for Acquisition  |
|----------|--|
| PNP/DILG | Small craft<br>Light Fixed wing Aircraft<br>Light Helicopter               |
| DOTC     | Search and Rescue Vessels<br>Buoy Tenders                                  |
| BFAR/DA  | Small craft (20-25 ft)<br>Patrol Craft (60 ft)<br>Communications Equipment |

**Table B1.** Government Agency Equipment Acquisitions

With independent plans to acquire equipment, it is necessary to consider each agency's program with reference to the total surveillance requirement in order to formulate an integrated acquisition program to optimise the limited funds available and to ensure that there is a justified need for all the equipment being considered.



Philippine corvette *BRP Pangasinan*  
(Courtesy of Mr J. Mortimer)

## ANNEX C

### **THE PROPOSED 'NATIONAL MARITIME SURVEILLANCE ORGANISATION'**

#### Purpose and Objectives

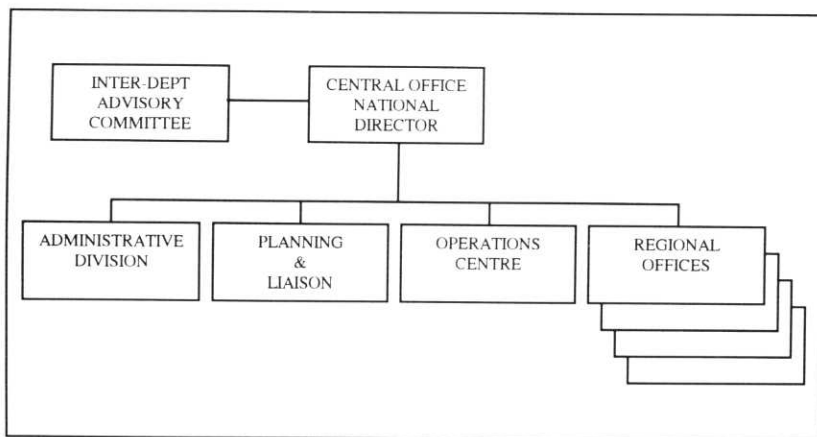
The formation of the national maritime surveillance and response coordinating organisation will be a conscious decision to integrate the responsibility for surveillance of Philippine waters under the auspices of a single entity. For the purpose of this paper, the proposed organisation shall be called the National Maritime Surveillance and Response Coordination Office (NMSRCO). The general purpose of the proposed NMSRCO is to orchestrate all national surveillance requirements and to establish effective liaison with interested government agencies to assist them to achieve their corporate goals by coordinating an effective surveillance program and response service in high risk, coastal and offshore areas. NMSRCO's operational area shall cover the Philippine archipelago's internal waters (within the baseline boundary), coastline, offshore territories (e.g., Kalayaan Island Group) and the EEZ.

The Organisation will have the following specific objectives:

- To develop and maintain effective coordination and direction of national surveillance and response activities:
  - to detect the presence of targets of interest within coastal areas and the 200 mile EEZ;
  - to respond to breaches or potential breaches of Philippine laws by raising alerts and coordinating response operations to meet the concerns of participating agencies;
  - to provide special assistance to search and rescue units; and,
  - to deter potential violations of Philippine laws.
- With client input, to plan, coordinate and manage the effective use of resources for surveillance and response activities (in meeting this aim the NMSRCO shall coordinate surveillance requirements and resources from the AFP, PNP, BFAR and other agencies as appropriate, in a program of air, sea and land patrols, including the resources necessary to undertake response action, including law-enforcement action).
- To ensure, within agreed standards, an efficient and effective level of program performance is maintained.
- To maintain a timely operational information service.
- To foster an informed, skilled and productive work force and provide a safe and satisfying work environment.

#### **Organisational Structure**

The NMSCRO will be organised as shown in Figure C1.



**Figure C1.** NMSCRO Organisation

The NMSCRO's day to day administrative control and direction of the surveillance program will be exercised by a designated National Director within the DND-AFP. An operations center which will provide a twenty-four hour centralised communications and coordination point for all surveillance operations may be established and co-located with the Joint Operations Center of the AFP. Although the office will be within the DND-AFP, it will have a semi-autonomous authority and structure.

The National Director at the Central Office will be responsible for:

- determining national surveillance planning priorities;
- monitoring the operational effectiveness of the surveillance program; and
- administering the overall financial aspects of the national surveillance program.

While the National Director must be given executive responsibility, it would be sensible to establish an advisory committee of major participants (Defence, Fisheries, Customs, Police, Immigrations, Environment and Transportation) to create a regular forum for joint surveillance requirements and advice to the NMSCRO on matters such as: flight patterns, flight frequency, adequacy of response, joint intelligence and equipment development. With many Government maritime concerns, there is considerable need to coordinate the efforts of the participants to obtain the best output.

If the organisation is to work effectively as a single agency supplying a joint service designed to satisfy the needs of the various government agencies with maritime interests, it is vital that it be perceived as autonomous and not "belonging" to any specific participant or



client. This can only be achieved if the organisation is not administered or controlled by one of the major users or participants. There will be oversight and advisory committees that will be formed to promote cooperation among participating departments. In this regard, a multi-tiered approach consisting of the following components will be adopted:

- Cabinet Committee on Maritime and Ocean Affairs (CCMOA) - this is an existing committee created under Executive Order No. 186 which is tasked to formulate practical and viable policies for the implementation of the UNCLOS and other marine related matters.
- NMSRCO Interdepartmental Advisory Committee (IAC) - this is a multi-agency body, consisting of the senior representatives from the participating departments, which provides a forum for discussion on surveillance cooperation and development and makes appropriate recommendations. One essential role of this committee is to keep interdepartmental arrangements under review, oversee the effectiveness of the surveillance program, approve the yearly surveillance program as well as strategic plans and provide advice to the National Director. This committee may convene biannually or as required.
- NMSRCO Operations and Program Advisory Group (OPAG) - consisting of cognisant representatives from participating departments/agencies. This working group provides input to the monthly surveillance program, reviews activities, prepares the yearly surveillance program, formulates and updates strategic plans for consideration by the IAC, and provides advice to the National Director on operational and administrative matters. This group meets monthly.
- NMSRCO Regional Coordination Meetings - to be chaired by the National Director with membership consisting of Area Directors and regional representatives of different departments. The purpose of the meeting is to provide regional input into the surveillance program and to request special operations of value to the regional representatives. Issues considered are relayed to the OPAG for discussion and inclusion in the national surveillance program.

To aid effective liaison with their major clients, the NMSRCO shall establish its operational headquarters in Camp Aguinaldo, Quezon City. Three Division Chiefs shall report to the National Director. Their responsibilities will be divided between operational matters and administrative matters.

The key organisational elements in Central Office are:

- an Administrative Division, which provides financial and general support to NMSRCO;
- the Planning and Liaison Division, which oversees the development and compilation of the national surveillance plan; and
- the Operations Coordination Center which provides a twenty-four hour centralised communications and coordination point for all surveillance and response operations.

## **Operational Concepts and Principles**

Fundamental to the national surveillance program is the NMSCRO concept and principles of operations. The concept of operations provides a statement of the desirable operational parameters for surveillance activities taking into account priority surveillance needs and anticipated surveillance needs. The overriding considerations in formulating the surveillance concept center on a cost-effective solution to the significant geographical difficulties and the specific types of targets envisaged in the area of operations.

The NMSRCO's surveillance program is a national program under the direction of the National Director. He controls and coordinates the surveillance program through a structure of Central and Regional Offices. Under this structure all operating procedures apply nationally.

NMSCRO is a service provider. It controls and coordinates the country's surveillance program on behalf of a range of client agencies. It must be pointed out that the philosophy of the NMSRCO is to assist, wherever possible, the achievement of the objectives of each client agency, and through the liaison process and joint intelligence effort become a contributor to the efficiency and effectiveness with which these objectives are attained. As this process develops, it is expected that users will develop a proprietary approach to the NMSRCO and in a real sense, perceive it as their own agency and not someone else's.

This service will be delivered through coordination of strategic and tactical surveillance and response missions, utilising the resources of DND-AFP, PNP-DILG, BFAR and other maritime agencies. On the other hand, the various clients departments will effectively contract the NMSRCO to meet their surveillance requirements.

For efficient coordination, provision must be made for liaison with the key departments. Contact officers should be made available at all times to ensure rapid processing of information and initiating of any necessary responses. Likewise, the establishment of a Joint Working Group comprised of representatives from the key departments is deemed necessary to facilitate exchange of vital information.

In broad terms, the Central Office determines the national direction and focus for surveillance activities in accordance with priorities identified by client agencies, including that of the DND-AFP. Regional Offices are then responsible for the direct coordination and control of the surveillance assets to address client priorities.

The surveillance activities should be based on previously agreed priorities and a deliberately planned pattern based on quality intelligence. However, in order to ensure program effectiveness, the pattern and frequency of surveillance operations must be flexible and should be readily adaptable to prevailing circumstances and available intelligence. Modifications in the program whenever proposed by any agency should be adequately justified and subsequently concurred by the members of the advisory committee.

The NMSRCO does not determine threat areas or clients' surveillance interests. Each client or participant is responsible for the development of threat assessments and surveillance requirements in relation to its program objectives. These client-generated

assessments form the basis of the operational planning for, and subsequent conduct of, surveillance operations by NMSRCO.

The surveillance effort shall be concentrated in the 'right place at the right time'. This does not mean that surveillance assets are only launched when a specific or known threat exists. Instead, NMSRCO will use client-generated threat assessments and surveillance requests to plan surveillance through areas that have the best chance to achieve satisfactory operational results. These areas change over time and are continually reassessed, in consultation with client agencies, so that all new or emerging threats can be adequately addressed.

NMSRCO will maintain a viable, level of system readiness in order to respond to urgent client requirements. The system readiness is maintained through a flexible roster system for surveillance assets and crew, careful assessment and planning of program changes and nationally relocating resources.

### **Funding Scheme**

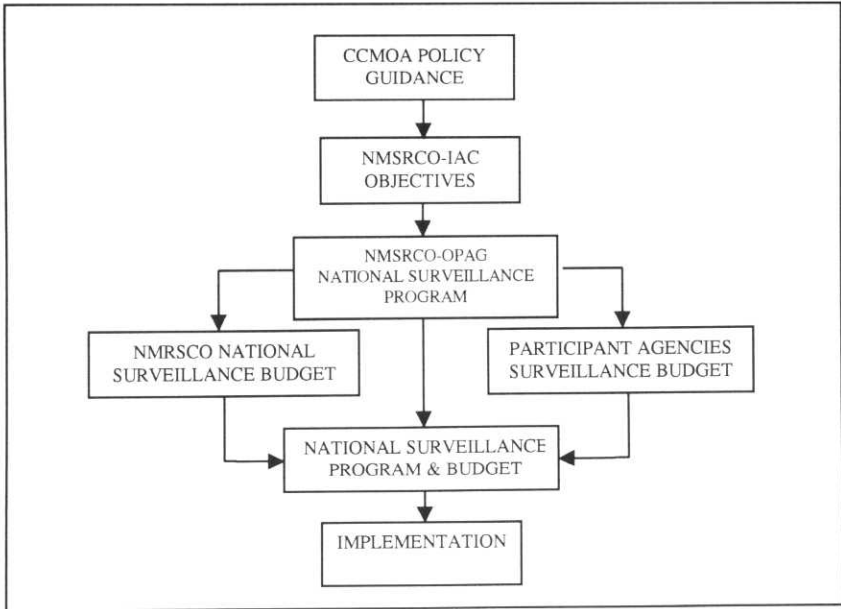
Maritime surveillance and response should not be viewed as an activity intended solely for defence but also as a requirement to provide protection for the maritime resource base, and to enforce applicable laws. Among the foremost consideration in establishing the NMSRCO is the economy of effort and resources. Given that the ideal surveillance 'force to sea area' ratio is not achievable in the short term, 'focus' and 'impact' shall be the important elements in the conduct of surveillance operations. Equipment and cost sharing shall characterise national surveillance and response activities (although most of the equipment and facilities can only be provided adequately by the AFP, PNP, DOTC and BFAR). These considerations can be best effected by having a distinct and separate organisation that would orchestrate and facilitate surveillance activities.

For the NMSRCO to be considered as an officially designated organisation and thus qualify as a budget entity, an Executive Order is necessary for its establishment. The NMSRCO funding requirements must be treated as a distinct and separate program to preserve its autonomy (as is the case with the National Disaster Coordination Center and the Mount Pinatubo Commission).

Maritime surveillance should be regarded as a program in its own right, and not as an input to other programs. However, the NMSRCO does not intend to gather all surveillance funds from the participant agencies and lump it together into one fund. The NMSRCO shall only require funding to sustain the administrative and management requirements of the Central Office and its Regional branches, including an establishment fund for the acquisition of command, control and communication equipment. NMSRCO shall not maintain big-ticket surveillance equipment but will have access to the facilities and equipment of the participant agencies. Capital outlay and pertinent operational requirements shall remain the responsibility of the participant agencies and thus remain part of their regular budget.

In the process of programming for the annual budget (see Figure C2), the CCMOA shall issue policy guidance pertaining to the national surveillance program as it relates to the

national maritime objectives/interests for a specified calendar year. The NMSRCO-IAC translates the policy guidance into specific objectives which the OPAG uses to generate the annual surveillance program and budget which are passed to higher authority for consideration.



**Figure C2.** National Surveillance Program & Budget Process

Consequently, the participant agencies (especially the operators of surveillance assets: AFP, PNP, BFAR, DOTC, etc.), in accordance with the CCMOA policy guidance and following the NMSRCO annual objectives and national surveillance program prepare their respective surveillance programs and budgets as items in their respective programs. It is important to emphasise that NMSRCO shall support the administration, coordination and managerial aspects of national surveillance, while the participant agencies shall support the operational aspects of the assets in their inventory.



Merchant ship in the South China Sea  
*(Courtesy of 92 Wing Royal Australian Air Force)*





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