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OIL SPILL RESPONSE ARRANGEMENTS IN MALAYSIA

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ABSTRACT: The increasing incidence of oil spills in the Straits of Malacca and the South China sea, has resulted in growing concern about Malaysia's capability to respond to oil spills in its water. This concern is compounded by the ever growing number of oil tankers plying the Straits of Malacca and the South China Seas, as well as the activities in exploration and development of offshore petroleum resources.

Various measures were taken by the Government to deal with the problem including a review of its National Oil Spill Contingency Plan (NOSCP), incorporating a coordinated and a cost-effective response mechanism amongst the various government agencies. The incorporation of the Petroleum industry of Malaysia Mutual Aid Group (PIMMAG), which enables pooling of spill response resources among the oil industry reflects the industry's commitment to strengthen the NOSCP. Since mid-seventies, a number of regional efforts have been constituted such as the Traffic Separation Scheme for Straits of Malacca, the Straits of Malacca and Singapore Revolving Fund the Lombok-Macassar Oil Spill Contingency Plan, the Brunei Bay Oil Spill Contingency Plan, the ASEAN Oil Spill Response Plan and the proposed ASCOPE Oil Spill Contingency Plan.

The recent establishment of equipment stockpiles in Singapore by the East Asia Response Ltd. (EARL), in respective ASEAN countries by the Japanese Government aids on Oil Spill Response and Preparedness and in Singapore and Port Klang by the Petroleum Association of Japan, further strengthen the national capability in combating oil spill.

INTRODUCTION

Malaysia, a maritime nation with a population of about 19 million. It has relatively long coastline and maritime area of approximately 4500 km. and 592,630 sq. km. Geographically, Malaysia is located between the Indian and the Pacific Oceans, at the centre of the ASEAN (Association of South East Asian Nations) and shares her borders with all the group's member states (Figure 1.). By virtue of its geographical location, the seas bordering Malaysia namely the Straits of Malacca and the South China Seas serve as an important sea-lanes linking the west to the Far East.

The Straits of Malacca is a shallow funnel-shaped waterway. its width varies from 3 nautical miles at its narrowest passage near Singapore island to 300 miles, near the northwestern entrance with depths generally less than 23 meters. Similar to the Dover Straits the Straits of Malacca is also known to be one of the busiest sea-lanes in the world, with approximately 400 oil tankers and cargo ships plying the Straits each day (Hashim, 1994). The coastlines bordering the Straits also has terminal operations where crude oil and persistent oil products are moved or transferred. Owing to its hazardous nature of the narrow and shallow waterway, with congested entrance towards south, the Straits is exposed to threat of potential oil spills from the thousand of oil tankers plying the Straits and from the terminal operations. The most likely spill size ranges from 8000 barrels (bbls) from smaller tankers to some 80000 bbls from large crude oil carriers. (PIMMAG, 1992). To date, Malaysia has experienced three major incidents involving the grounding of two tankers, **Showa Maru (1975) and Diego Silang (1976) and the collision between Nagasaki Spirit and Ocean Blessing (1992).**

The South China Seas, bordering the East Coast Peninsular Malaysia, Sabah and Sarawak is no exception. The accelerated development and exploitation of Malaysia's offshore petroleum resources and those of its neighbours introduces similar risk as a result of the oil exploration and production operation and a consequential increase in tanker traffic in and out of the region (Figure 2). These potential spills arise from pipeline transport and transfer and shipment of crude oil as well as from blowouts. The most likely volume of spill from the tanker scenario is 70000 bbls (PIMMAG 1992).

The vast maritime area is rich in resources which contributes significantly to the country's economy. The hydrocarbon extraction in the South China Seas, with a daily production of about 630000 bbls of crude oil and 1957 million standard cubic feet accounts for about 29% of the country's revenue (Hashim Mohamad, 1994). Another invaluable resource is fish which contributes over 75% of animal protein supply to the local populace. Other than petroleum and gas, there are also other minerals such as tin, cobalt, magnesium, aluminium, nickel that may be of commercial volume with new extraction technology.

The coastal areas are covered with invaluable resources such as mangroves, coral reefs and sandy beaches. Mangroves and coral reefs serve as nursery grounds for fish and other marine organisms, thus supporting the fishing industry. The long stretch of beaches with all year warm tropical climate not only support foreign but also local tourism and recreation.

The ever increasing traffic in the Straits of Malacca and the intensifying activities in the exploration and development of offshore petroleum resources in the South China Seas has resulted in increasing incidence of oil spills and form a major threat to the rich and fragile ecosystem. Figure 3 shows a yearly trend of oil spill incidents in Malaysian waters from 1975 to 1992 (Department of Environment, 1992). Any occurrence of oil spills in these areas could result in significant environment impact and economic loss. With that extent of sensitivity, the

Government has, since 1975 taken various measures to mitigate and combat oil spills through the development of National Oil Spill Contingency, upgrading of the oil industry oil spill response capability and the enhancement of regional cooperation.

THE NATIONAL OIL SPILL CONTINGENCY PLAN

Background

In the early seventies, when the threats of oil spills from thousand of oil tankers plying the Straits of Malacca became real, the Department of Environment (DOE) formulated its first oil spill response plan in 1975, then known as The National Oil Spill Contingency Plan for the Straits of Malacca (SOMCP). In response to changing circumstances, DOE has revised and updated and improved the Plan incorporating amongst others the search and rescue elements and information on environmentally sensitive areas. With the intensified activities in the development of Malaysia's offshore petroleum resources and with increase in tanker traffic in the South China Seas, the Government formulated another Oil Spill Contingency Plan for South China Seas (SCSCP) in 1989. The SOMCP and the SCSCP were integrated and together they constitute a National Oil Spill Contingency Plan (NOSCP).

Scope and Objectives

The NOSCP was formulated to cater for oil spill in Malaysian waters including the 200 nautical-mile Exclusive Economic Zone (EEZ) to meet the following objectives

- To provide a mechanism for coordinating response systems for effective containment and recovery of oil;

- To enhance capability with the existing resources with respect to equipment and manpower as well as training in combating oil spill; and

- To alleviate or minimise potential adverse impacts to the environment arising from the spill.

Response arrangement

The NOSCP is activated on a three tiered response concept, based on the location of spill, quantity of spill and the response capability. The First Tier Response, is coordinated by local authorities or local oil industry on operational spill either within port limits, oil terminal and depots or oil exploration and production platforms. Usually, the magnitude of the spill is small and a local oil spill contingency plan is activated, utilising the existing manpower and equipment.

As the spilled oil spread beyond the local area response capability, both in terms of resources and mobilisation time, the second tiered response is coordinated, activating either the SOMCP or the Area Operation Committees under the SCSCP, depending on the location of the incident. As shown in Figure. 4, there are four Area Operation Committees under the SCSCP, two covering the East Coast of Peninsular Malaysia and one each for Sabah and Sarawak (DOE, 1994).

The third Tiered Response is coordinated to deal with major oil spills, where all the available government and industry resources are exhausted and where neighbouring countries' assistance is needed. This tiered response is also activated when the spilled oil spreads out to the neighbouring countries. A number of regional contingency plans and marine response procedures will be activated depending on the geographical location and magnitude of the spills.

Each of the response level is inter- related to one another, and can be activated simultaneously depending on the resources capability, mobilisation time, quantity and location of spills as mentioned above. Figure. 5 summarizes the sequence of Tiered Response of the NOSCP (DOE, 1994).

Plan organisation

The NOSCP is coordinated by the National Oil Spill Control Committee. the Committee, chaired by the Director-General of DOE, comprises related government agencies and oil industry namely : DOE the Marine Department, Fisheries Department, Meteorological Services Department, Custom and Excise Department, Immigration Department, Royal Malaysian Navy, Royal Malaysian Air Force, Marine and Air Wing Police, Foreign Affairs Ministry, the National Security Council, Maritime Enforcement and Coordination Centre, PETRONAS and the Petroleum industry of Malaysia Mutual Aid Group (PIMMAG).

The Committee has been given a mandate to advise the Area Coordinator and to coordinate the various agencies involved in clean-up operation, air surveillance, procurement and deployment of equipment, movement of personnel and communication. The Committee, through the Foreign Affairs Ministry, also coordinates with other neighbouring countries for assistance to expedite action with minimum red tape.

Other operational aspects of the NOSCP

The NOSCP also detailed various important operational procedures, amongst others includes: the notification and reporting, spill investigation, security against liability, communication, sample collection, safety, public relations, claim, environmental and property damages, use of dispersants salvage and transfer of cargo, temporary disposal of oily waste and training.

Recognising the need to make available financial support in an oil spill emergency, the Government established a National Trust Fund for Oil Spill Clean-Up. An allocation of 2 million Ringgit Malaysia has been set aside to be used for making available emergency clean-up fund against spill of identified or unidentified source.

THE PETROLEUM INDUSTRY OF MALAYSIA MUTUAL AID GROUP (PIMMAG)

Scope

The oil companies, led by PETRONAS in their effort to strengthen the national response capability established a joint service company called the Petroleum Industry of Malaysia Mutual Aid Group (PIMMAG). PIMMAG was incorporated as a non-profit service company limited by guarantee under the Companies Act 1965. The main purpose of PIMMAG is to establish an adequate, coordinated and cost effective joint petroleum industry Tier 2 response capability for potential oil spill emergencies arising from members' activities in Malaysian waters including the EEZ. PIMMAG is being empowered to cooperate with and to integrate its effort with prevailing governmental efforts concerned with the control and clean-up of oil spills.

Membership and Contribution

PIMMAG is somewhat unique in that it caters to members from the whole spectrum of petroleum industry activities, both upstream and downstream. The PIMMAG membership categories and financial contributions covers the diversity in size and nature of members' operations. Any entity undertaking upstream and or downstream petroleum industry activities including exploration, production, pipeline operation, terminal and storage operation, refining and bulk transportation is eligible for Ordinary Membership. There is also an Associate Membership category for companies undertaking such activities on a temporary basis (mainly to accommodate exploration activities). PIMMAG Members are expected to have appropriate Tier 1 Oil Spill Response (OSR) Capability in place in order to ensure effective mobilisation and deployment of PIMMAG resources if required.

Such a diversified group of members does pose problems on cost allocating requirements. Available formulae from similar organisations around the world were not able to satisfy these requirements. As a result, PIMMAG has derived its own unique cost sharing method which is transparent and equitable depending on members' oil spill exposure volume. the "oil spill exposure volume", which is the total yearly barrels of persistent oil produced and/or handled through marine terminals expressed in KB/D. For exploration wells (which include wildcats and appraisal drilling), the oil spill exposure volume is deemed to be equivalent to 1 KB/D for each exploration well spudded. Figure. 6 illustrates the oil spill exposure categories.

PIMMAG cost is classified under Administration Cost (cost of PIMMAG office), Capital Cost (cost of assets) and on-going Operating Cost for maintenance and deployment availability of the shared OSR capability. The Administrative Cost is shared equally by all members (up to a limit of ten percent of the total operating cost). The Capital Cost and the Operating Cost is paid by the Ordinary members on oil spill exposure volume basis. The Ordinary Members Capital contribution(less depreciation) is reflected in their "Membership Interest" account. Associate Members pay a fee consisting of Administration Cost element and Operating and Capital depreciation cost element according to their oil spill exposure volume percentage, but do not contribute to the capital requirements and consequently do not acquire "Membership Interest". Figure. 7 illustrates the breakdown of cost contributions by members.

The actual cost of call-out and deployment of shared PIMMAG resources in response to oil spills, or training of members will be paid for by the specific member requesting the service. PIMMAG shall also provide service to non-members upon request. Non-members however, shall pay higher call-out costs compared to members.

Structure and organisation

PIMMAG is governed by a Board of Directors comprising ordinary members with the overall responsibility for ensuring the objectives of PIMMAG are achieved in an effective and efficient manner. The day to day management of PIMMAG is undertaken by a small group of employees headed by a manager.

The Board of Directors appoints one or more service contractor(s) who act in a service capacity only. The service contractor(s) provides maintenance and a small core of trained manpower as well as specified logistical support to ensure ready deployability of PIMMAG equipment where and when required. The service contractor(s) also provides training of PIMMAG members.

Each member of PIMMAG has equal access to PIMMAG equipment in the event of an oil spill and for training. In the event of an oil spill, the spiller shall request PIMMAG OSR assistance directly from the contractor, under the call out procedures. PIMMAG equipment stockpiles will be located and managed at three areas, two in Peninsular Malaysia and one in Sabah and Sarawak.

Liability and indemnity

A spiller is responsible for the management and control of the oil spill response required to combat such a spill. All costs incurred by PIMMAG for such activities over and above the cost necessary to ensure availability of the resources shall be borne by the spiller inclusive of all costs incurred through other parties which provided assistance for the spill response when such assistance is given at the spiller's request. PIMMAG rules include comprehensive liability and indemnity clauses protecting PIMMAG and its members against any and all liabilities that may arise from the actual provision of OSR services.

Planned OSR Capability

In order to effectively respond to a Tier 2 oil spill at any location throughout Malaysia, PIMMAG will have a total OSR Capability of about 200,000 bbls (Hussein Rahmat, 1994). The planned OSR capability is acquired through pooling of existing OSR resources of members as well as procuring additional resources where necessary. These OSR resources will be mobilised at three stockpile areas as mentioned above. Each stockpile area will enable PIMMAG to mobilise the area resources within 12 to 24 hours. For larger spills which are beyond the designated geographical area's capability, mobilisation of OSR resources of up to 50% from each of the other two locations will be made possible within 24 to 48 hours. PIMMAG will also liaise with other oil spill response organisations.

Integration with NOSCP and Regional Contingency Plans

PIMMAG augments the national oil spill response capability and represent its members in the National Oil Spill Control Committee (NOSCC). PIMMAG, without liability to its members, give assistance to the NOSCC by providing necessary OSR resources in NOSCC's effort to combat any oil spill.

PIMMAG also complements and provides assistance to other oil spill response plans within the region such as the proposed ASEAN Oil Spill Response Action Plan (ASEAN-OSRAP), Lombok-Maccasar Oil Spill Contingency Plan and the proposed ASCOPE Oil Spill Response Plan through the NOSCP.

REGIONAL ARRANGEMENTS IN OIL SPILL RESPONSE

As environmental problems arising from oil spill rarely affect one nation alone, particularly in coastal areas and the marine environment. In this respect, the needs for regional cooperation to hold down hazards to the marine environment have been recognised by the Government since the early seventies. Amongst the important arrangements are the Traffic Separation Scheme for the Straits of Malacca and the Straits of Malacca and Singapore Revolving Fund and Regional Oil Spill Contingency Plans

Traffic Separation Scheme for the Straits of Malacca

The Scheme, endorsed by the International Maritime Organisation in 1977 adopted by three littoral states namely Indonesia, Malaysia and Singapore is geared for the orderly flow of vessels with an under keel clearance of at least 3.5 meters at all time during the passage through the Straits of Malacca to reduce the risk of collision in congested and converging areas (Tan, 1987). The Scheme which came into force in 1987, also provides for one-way routes for opposing east-bound and west-bound traffic, at a constant speed of twelve knots to prevent in-line collision.

The Straits of Malacca and Singapore Oil Spill Revolving Fund

The Memorandum of Understanding was signed in 1981 between the Governments of Indonesia, Malaysia and Singapore on the one part and the Malacca Straits Council for the Japanese Non-Governmental Associations on the other part to established a revolving fund of four hundred million yen. The Fund enables the three littoral coastal states to take immediate action either independently or jointly against any spill caused by ships whether accidental or intentional.

Regional Contingency Plans

In mid eighties, Indonesia, Malaysia and the Philippines formulated the Lombok-Macassar Oil Spill plan to mitigate and combat oil spill arising from vessel plying the straits. In early 1994, Malaysia and Brunei Darulsallam also formulated the Bay of Brunei Oil Spill Contingency Plan. The Plan complements the NOSCP and caters for oil spill in both the Malaysian and Brunei waters.

In our continuing efforts to strengthened the regional capability in mitigating and combating oil spill, in 1993, the six ASEAN countries including Malaysia has agreed to establish the ASEAN Oil Spill Response Action Plan or in short ASEAN-OSRAP. The objective of the Plan is to provide a mutual assistance from Member states in the event of a major spill incident which exceeds the national response capability.

The ASEAN Council on Petroleum (ASCOPE) comprising national petroleum corporations of ASEAN countries is looking into the possibility of forming the ASCOPE Oil Spill Contingency Plan to provide support in terms of equipment stockpiles and manpower to member countries. The proposed Plan shall complement the ASEAN-OSRAP. Figure. 8 shows the linkages of Malaysia's National Oil Spill contingency Plan with other regional plans (DOE, 1994).

OTHER OIL SPILL RESPONSE ASSISTANCE

Oil Spill Response Preparedness and Response (OSPAR)

Japan, in her efforts to positively to meet the expectation of the OPRC 1990, promoted a cooperative project on oil spill preparedness and response with the acronym OSPAR. The aim of OSPAR is to promoted international cooperation and improve regional response capabilities for combating major oil spill incidents. the OSPAR project for ASEAN waters paved the way for the development of an ASEAN Oil Spill information Network System and enhancement of equipment stockpile bases at MUARA in Brunei Darussalam, Balikpapan in Indonesia, Port Kelang, Penang, Johore Bahru and Labuan in Malaysia, Manila, Cebu and Davao in the Philippines, in the southern part of Thailand and Singapore. While the implementation of the OSPAR project is not conditional upon the establishment of the ASEAN-OSRAP, it has been instrumental in expediting the endorsement by member governments of the Memorandum of Understanding on ASEAN-OSRAP.

Petroleum Association of Japan (PAJ)

The Japan Ministry of international Trade and Industry through PAJ has also established equipment stockpiles in Singapore and Pork Kelang. It is understood that similar stockpiles are being planned in other locations of the ASEAN regions. In terms of size and deployability, the stockpiles are considered as part of the national oil spill resource, together with the equipment available from local oil companies.

East Asia Response Limited (EARL)

East Asia Response limited (EARL) is considered as the primary regional oil spill equipment resource, on the basis of its size and deployability. EARL was established in Singapore in 1992 to provide prompt and efficient Tier 3 response to oil spill incidents in the Straits of Malacca and the areas in the Pacific Region.

CONCLUSION

In line with the growing concerns over the ever increasing traffic in the Straits of Malacca and the rapid development in the exploration and exploitation of petroleum resources in the South China Seas, the Government and the oil industry is constantly reviewing and updating its national oil spill response capability. The joint effort in sharing stock-piled equipment by PIMMAG not only greatly enhance the National Oil Spill Contingency Plan, but also providing a more coordinated response action and ensuring a more cost effective mobilisation and deployment of resources.

The IMO global programme for the protection of the marine environment and UNEP regional seas programme contributed significantly to the development of contingency plans and cooperative measures which have enhanced oil spill response preparedness and capabilities in Malaysia and other ASEAN nations. Assistance by Japan through the OSPAR and PAJ programmes have promoted the establishment of new OSR centres and improved the existing national capabilities. The key factor now is the availability of skill personnel. In this respect training and exercises to improve deployment capability, communication and coordination are areas that need priority attention.

BIOGRAPHY

Hussein Rahmat graduated as a mining engineer in 1962 from Camborne School of metalliferous mining, UK. He also has a M.S. in Petroleum Engineering and a MBA from Stanford University. He is currently the General Manager, Engineering & Safety Unit, PETRONAS, who is responsible for providing groupwide stewardship of Technical management

System in areas of Health, Safety and Environment.

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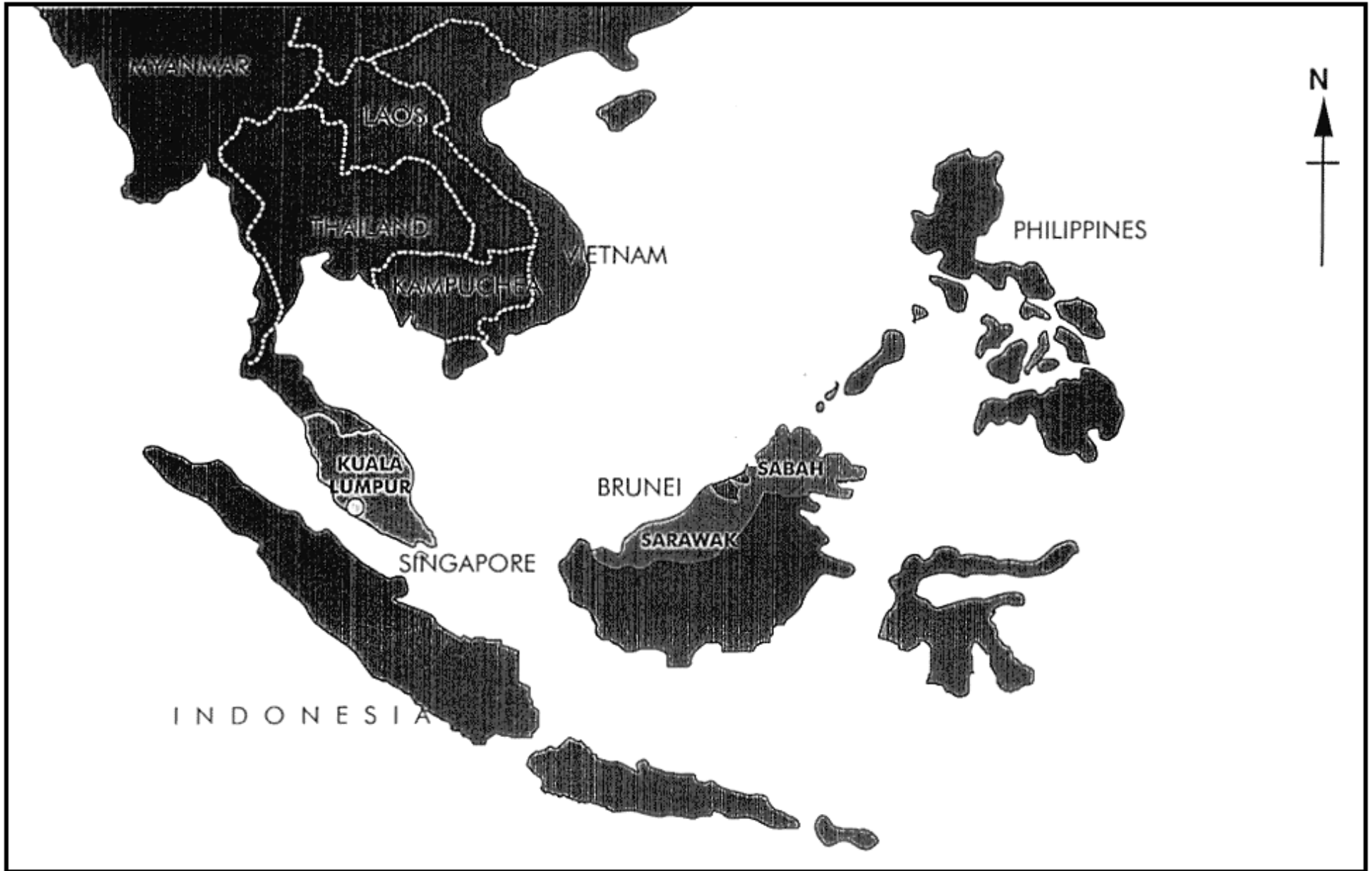


Figure 1 :Geographical location of Malaysia

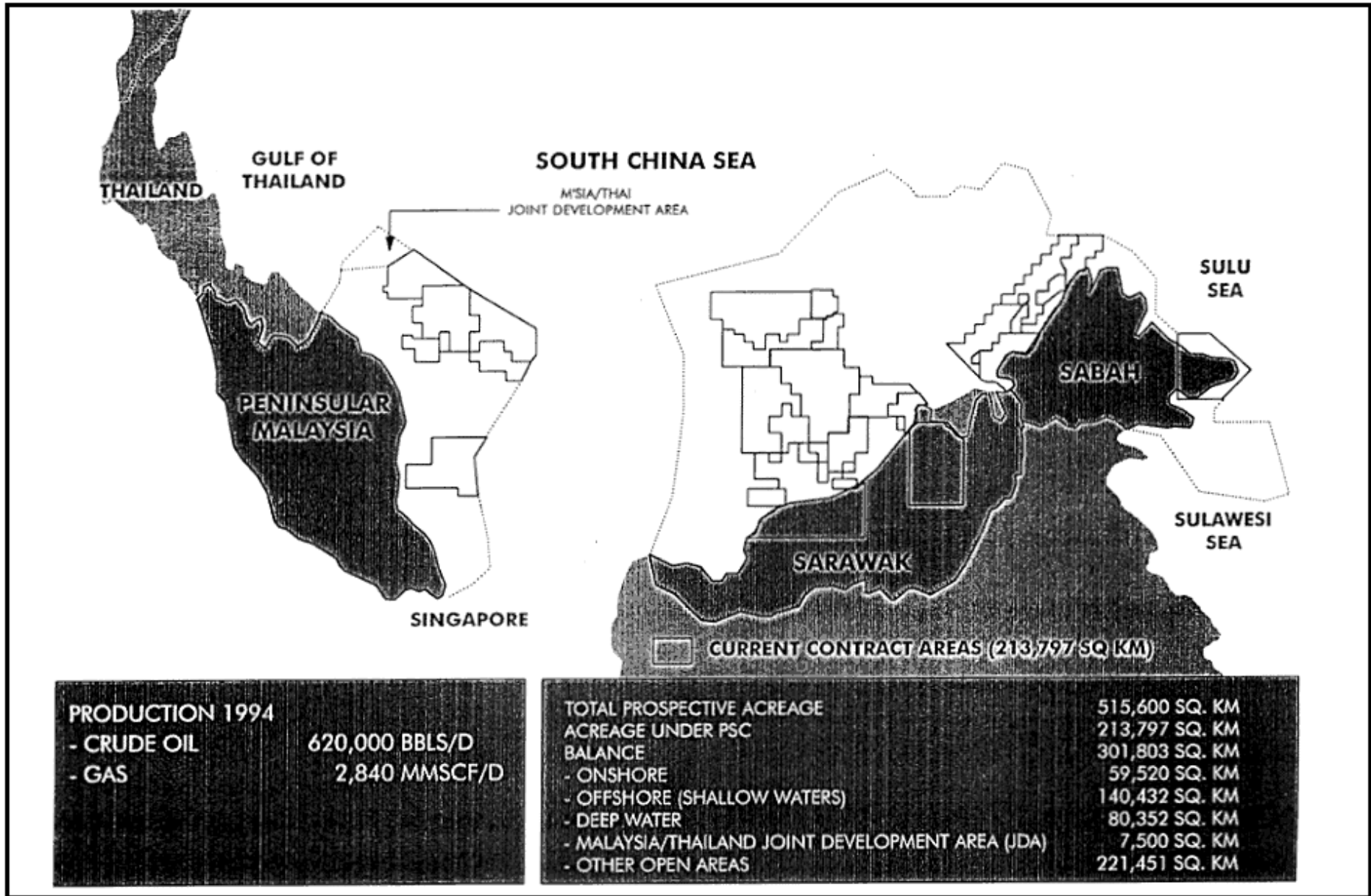


Figure 2 :Oil & Gas Exploration and Production Areas of Malaysia

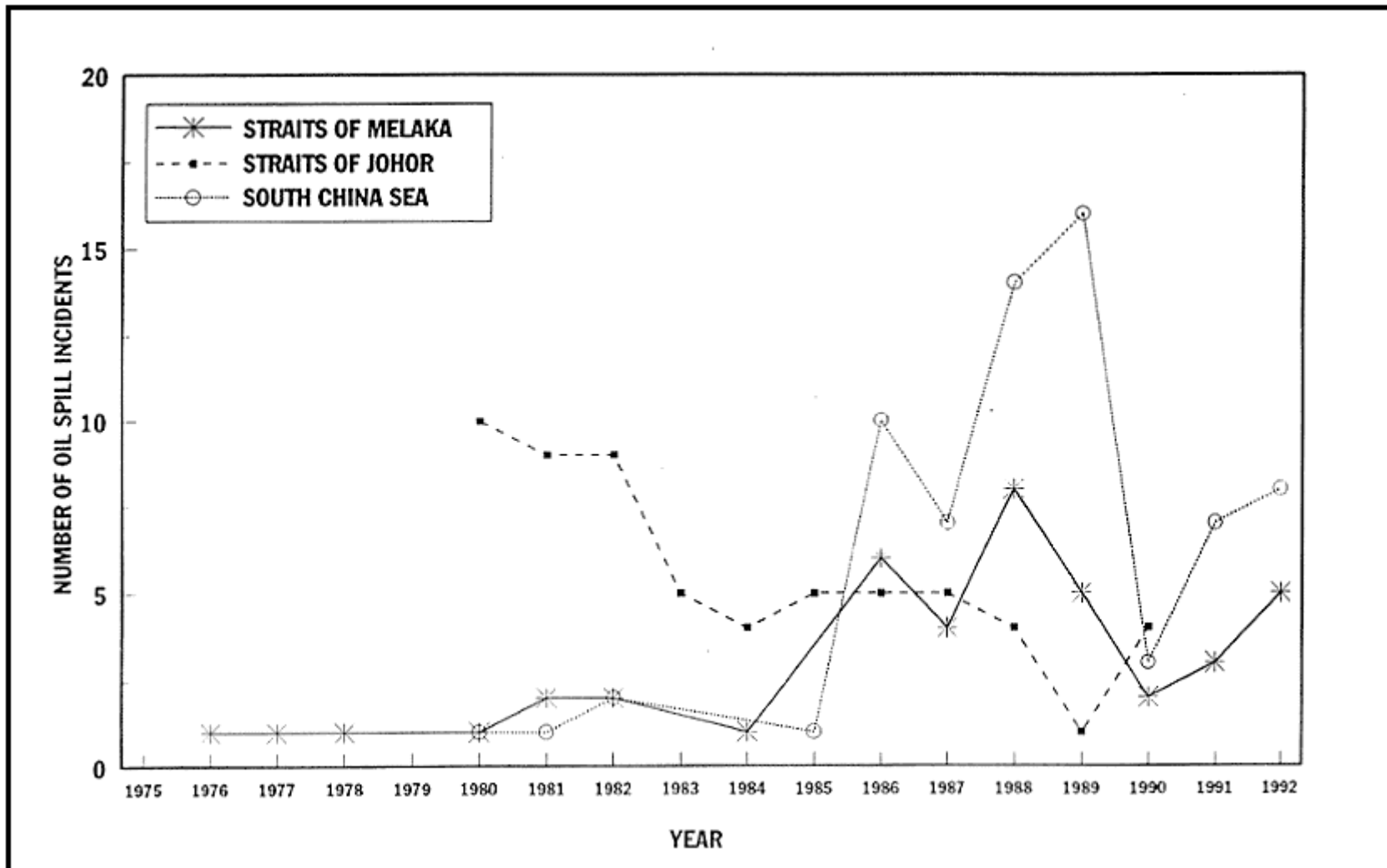


Figure 3 :Yearly trend of Oil Spill Incidents in Malaysian Waters from 1975-1992 (Courtesy : DOE, 1994)

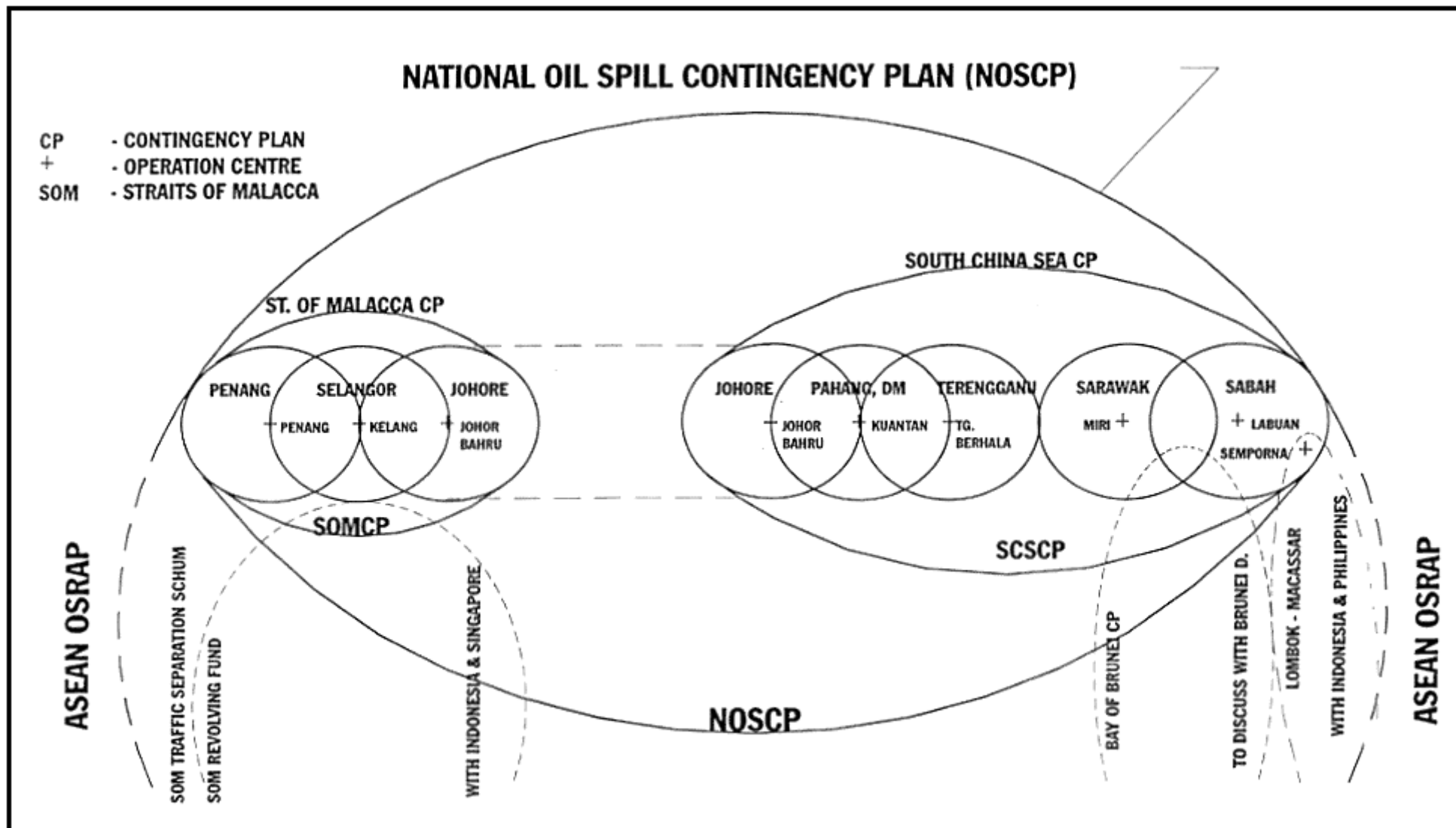


Figure 4 :Elements of Oil Spill Contingency Plan (Courtesy : DOE, 1994)

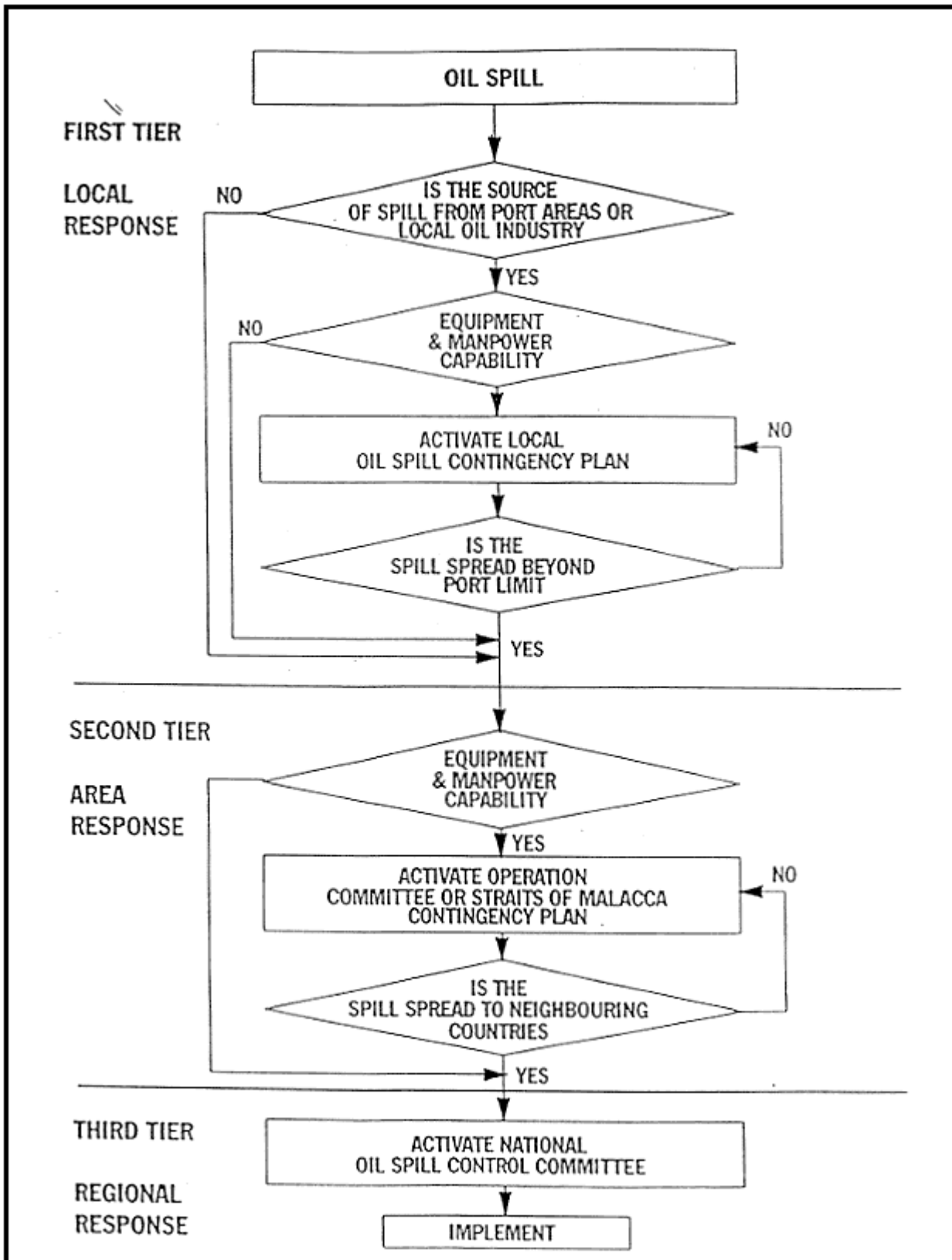


Figure 5 :Flow Diagram for the activation of Tiered Response Team

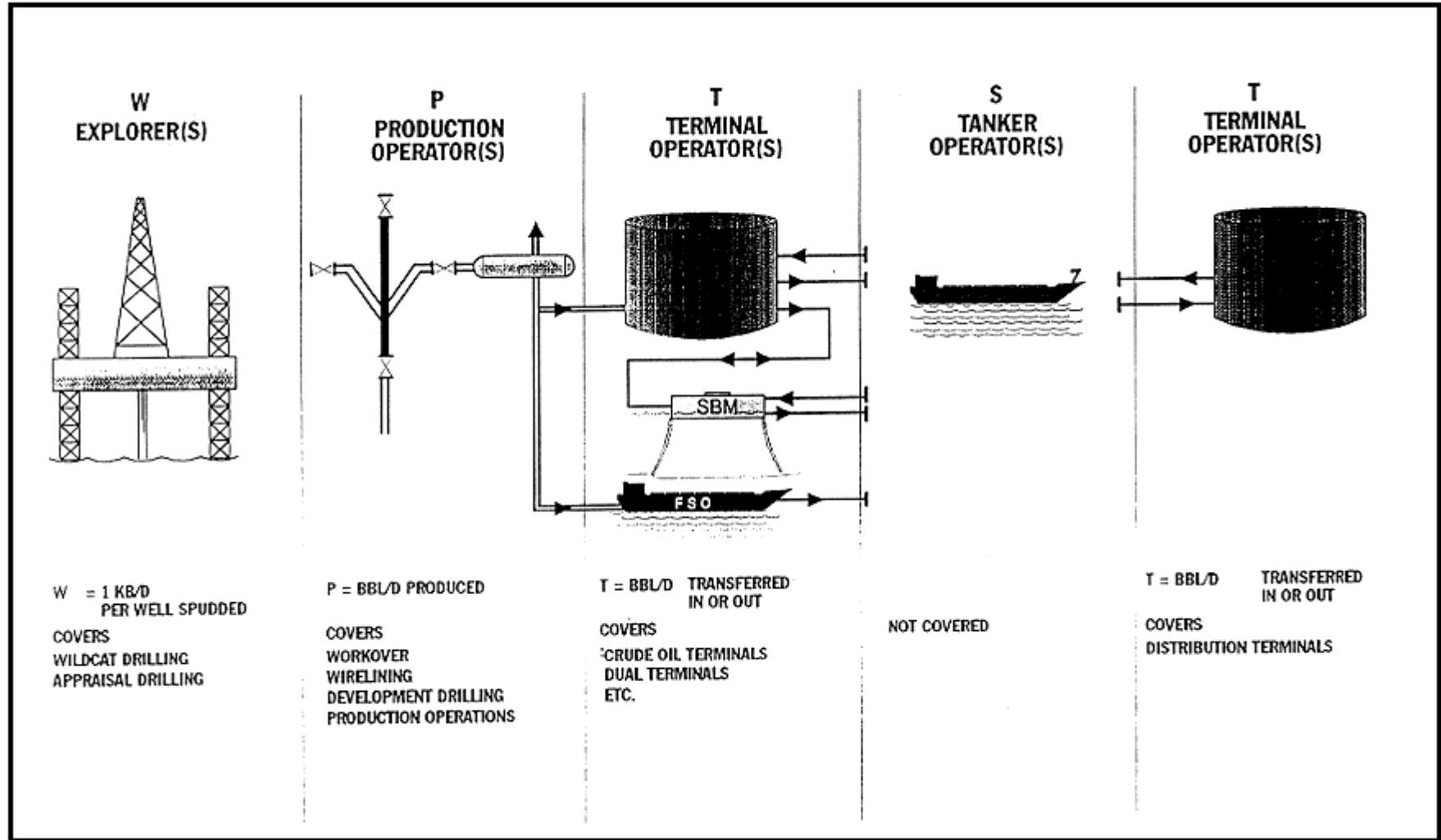


Figure 6 :PIMMAG : Oil Spill Exposure Categories

CAPEX (ORDINARY MEMBERS) : $\frac{X}{\Sigma X}$ x TOTAL COST OF EQUIPMENT

ASSOCIATE MEMBERS : $\frac{X}{\Sigma X}$ x YEAR'S DEPRECIATION (AGREED YEARLY DEPRECIATION CAPEX IS 10%)

OPEX : $\frac{X}{\Sigma X}$ x TOTAL OPERATING COST

ADMIN COST : $\frac{\text{TOTAL ADMIN COST}^*}{\Sigma \text{ MEMBER}}$

**NOTE : X = OIL SPILL EXPOSURE VOLUME IN KB/D FOR MEMBER
X = 1 KB/D FOR ASSOCIATE MEMBER**

*** ADMIN. COST TO BE SHARED EQUALLY BY ALL MEMBERS IS LIMITED TO 10% OF OPEX. ADDITIONAL ADMIN. COST (IF ANY) IS ADDED TO OPEX**

Figure 7 :PIMMAG : Cost Contribution by Member

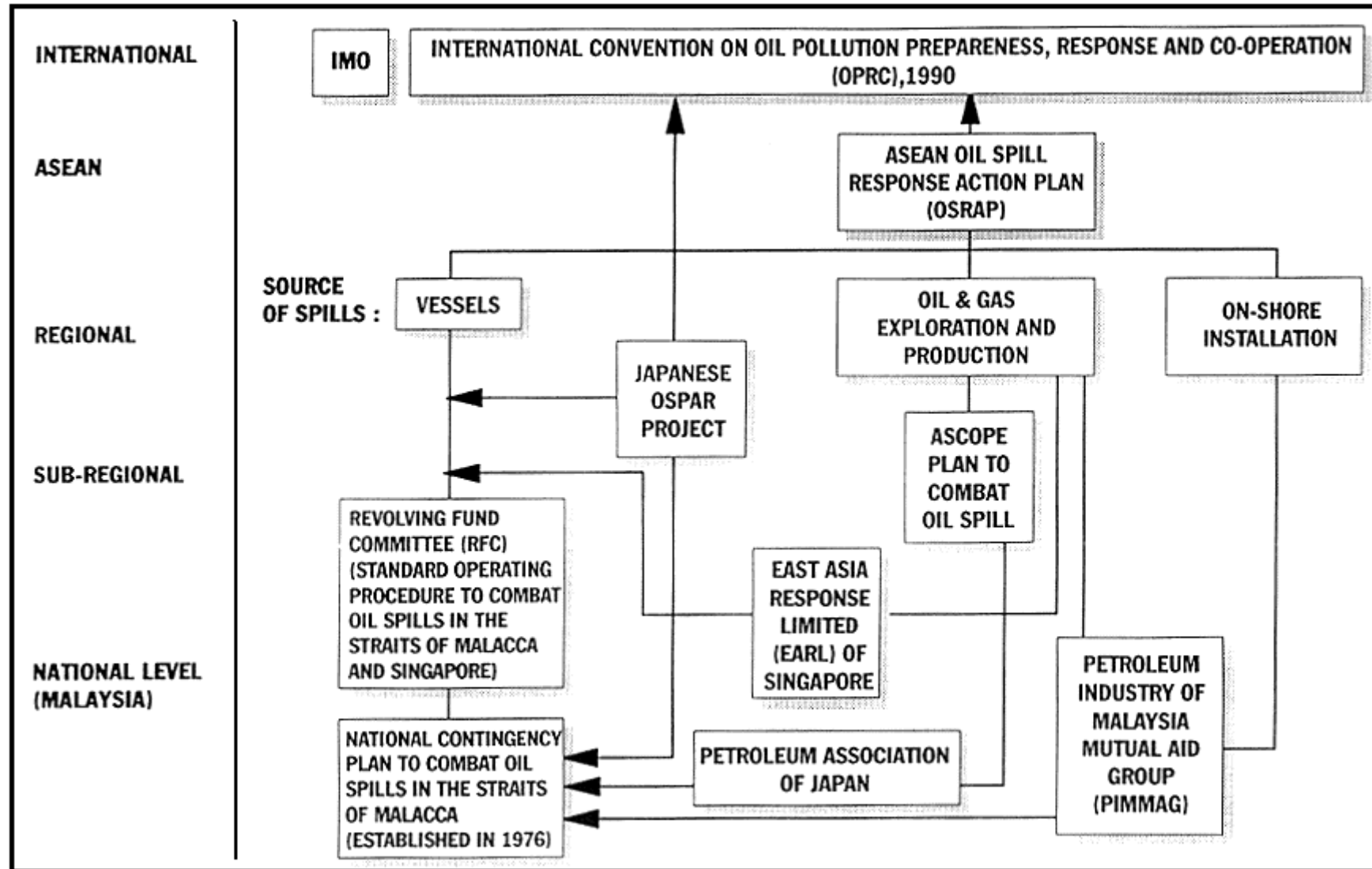


Figure 8 :Arrangement in Oil Spill Preparedness & Response at various levels of organisations