

CHALLENGES OF OIL SPILL RESPONSE IN EGYPTIAN COASTAL ZONE OVERLOOKING THE MEDITERRANEAN AND THE RED SEA*

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ABSTRACT

The rapid growth of economic development in Egypt over the last few decades has led to numerous offshore projects, expanding maritime facilities and a vast spread of coastal tourist developments. However, adequate capacity building of existing national oil spill response facilities did not complement such growth. This has resulted in an imbalance between the degree of environmental exposure and level of preparedness to respond to potential oil and chemical spills that may occur along these highly sensitive coastal areas and to the marine environment of Egypt. Both the Red Sea and Mediterranean coasts of Egypt support thriving ecosystems and a substantial tourist industry centered around golden beaches, crystalline waters, and a plethora of plant and animal species that exist nowhere else on earth. At the southern tip of the Sinai Peninsula Ras Mohammad National Park alone shelters over 130 species of coral and 116 species of fish. Only a few kilometers away, the Gulf of Suez is one of the world's busiest industrial shipping routes. More than 117 million tons of oil pass through Egyptian waters each year and cross Egypt's main land through the SUMED pipeline from Ain Sukhna terminal (at the head of the Gulf of Suez) to Sidi Krir terminal on the Mediterranean. Another 28 to 30 million tons of oil go through the Suez Canal directly and there is a 15000-ship movement every year in Egypt.

The Egyptian Environmental Affairs Agency (EEAA) has updated a National Oil Spill Contingency Plan (NOSCP), prepared in 1986 by the petroleum sector, in 1998. The NOSCP is the national framework for action in the event of an oil pollution incident. Updating, the NOSCP was just the beginning and not the end of the road. Challenges to take forward necessary action at all response levels to ensure efficiency of application of the NOSCP are enormous. Over the last few years concerned parties and stakeholders conducted several investigations and assessment to identify critical areas of concern and high exposure. Many assessment reports have identified gaps and addressed required measures needed to enhance bridging those gaps and restore the required balance between exposure and preparedness to recover from this situation.

This paper considers the present status of the imbalance between environmental exposure and oil spill response preparedness along Egyptian coastline, describes current status of the NOSCP and the recovery measures taken to improve the situation and ensure credible response to potential major spills.

INTRODUCTION

The National Oil Spill Contingency Plan of Egypt, (NOSCP), in place since 1986 and updated in 1998, is actually the national framework for action in the event of an oil pollution incident. It is structured and based on three levels of response called, tiers:

- **Tier One:** It is the responsibility of all offshore petroleum activities; oil handling facilities, (offshore installations; terminals, refineries; etc) in addition to individual port authorities and the Suez Canal Authority. Maximum response capabilities would be for spills up to 100 tons.
- **Tier Two:** It is essentially the responsibility of EEAA. There are 5 oil spill response centers with contingency plans for the various geographical sectors of the Egyptian coast each supposed to be capable of dealing with spills up to 1,000 tons.
- **Tier Three:** Handling spills larger than 1000 tons is the responsibility of EEAA to coordinate the response to such major oil spills and establish a minimum level of pre positioned oil spill combating equipment in accordance with the 1990 OPRC Convention, signed by Egypt.

Updating the NOSCP in 1998 was just the beginning and not the end of a long and difficult road. It was clear after this update that many necessary actions needed to be taken at all above three levels of response to ensure efficiency of application of the plan. However these actions faced numerous challenges and remained far from prompt implementation. On the other hand several offshore and inshore developments took place along the Egyptian Coastal Zone without parallel development of Oil Spill response facilities since that update in 1998. As a result, the situation has caused a severe imbalance between exposure and preparedness. This imbalance facing concerned authorities and industry challenges them to improve oil spill response capabilities in Egypt to ensure effectiveness of the NOSCP. Review of the situation and measures taken to recover are discussed hereinafter.

CURRENT STATUS OF THE NOSCP

Background

The first National Oil Spill Contingency Plan (NOSCP) was prepared by the Petroleum Sector in 1986 with some Canadian aid. At that time, the Ministry of Maritime Transport (MMT) was designated as the responsible lead Agency. This responsibility was then passed on to the Egyptian Environmental Affairs Agency (EEAA) in 1994 upon the promulgation of the new Law for the Environ-

ment (Law No. 4 of 1994) that assigned the Agency management of all environmental crises.

The 1986 oil spill contingency plan was based on establishing a statewide oil spill combating system developed under government authority parallel to the existing capabilities within the petroleum sector and the Ports and Lighthouse Authority (PLA). After 10 years from the initiation of the NOSCP and the transfer of its ownership to the EEAA, it was decided to revise and update the NOSCP. This was done with Danish aid over 2 years and was completed in 1998. Since then the plan has not been fully integrated. Figure 1 shows the geographical distribution of present oil spill response facilities along the Egyptian Coastline. It clearly shows the coverage imbalance between the Mediterranean coast and the Red Sea coast including the Gulf of Suez and Gulf of Aqaba.

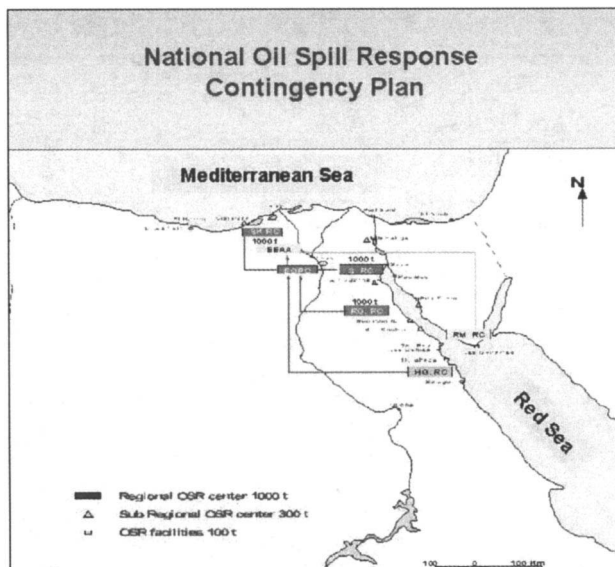


FIGURE 1 NATIONAL OIL SPILL CONTINGENCY PLAN OF EGYPT

Scope of the NOSCP

The NOSCP is a framework for action in the event of an oil pollution incident. It sets out:

- the respective roles and responsibilities of EEAA and all its partners in the national contingency plan;
- the procedures for notifying EEAA in the event of observed oil pollution or reporting discharges of oil from ships and offshore platforms;
- the tiered response concept and how this operates in Egypt including responsibility for taking initial response action to an oil spill;
- the incident command procedures which describe the ongoing management responsibilities in the case of Tier One, Tier Two and Tier Three spills;
- the national combat strategy and EEAA's policy on the use of dispersants.

The 1998 Update

The 2 years updating project has improved the NOSCP instrumentation where:

- a legal instrument was prepared to provide the legal basis for the NOSCP and to implement Egypt's obligations under the International Convention for Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC);

- a framework was prepared to enable the Government of Egypt to claim compensation for environmental damage from polluters;
- a mechanism was established to draw upon the financial resources of the Environmental Protection Fund to enable EEAA to reimburse combating and clean-up costs, including responding to pollution from unknown sources;
- a number of technical studies produced reports on:
 - marine currents;
 - meteorology and wind data;
 - predicting the fate of an oil spill in Egyptian waters;
 - national risk assessment;
 - national equipment review;
- implementation and enforcement of the MARPOL 73/78 Convention.
- the entire Egyptian coastline has been surveyed and its ecological and economic sensitivity analyzed. The results have been mapped in a Geographic Information System (GIS) which is available at EEAA;
- a 24-hour operational response center (the Central Operations Room) has been established at EEAA Headquarters and equipped with computers and communications equipment. It is continuously manned by personnel who have been trained and are qualified in communications procedures;
- the EEAA has entered into a 10 year Agreement with the Arab Academy for Science, Technology and Maritime Transport (AASTMT) under which the Academy is running NOSCP training courses under the auspices of EEAA;
- the EEAA has established a permanent National Contingency Planning Committee to oversee the development and implementation of the NOSCP. EEAA has also established liaison groups with the petroleum and the maritime sectors.

However, with all these achievements the NOSCP is not fully functioning or effectively operable to cope with the ever increasing offshore petroleum activities, maritime transportation and tourism development—specially that these activities are taking place in a very environmentally sensitive coastal zone (see Figures 2 and 3).

This situation has created a significant imbalance between exposure and preparedness.

ASSESSMENT OF OIL SPILL RESPONSE CAPABILITY

The oil spill response capability can be measured by simple index relating magnitude of exposure to level of preparedness where several relevant parameters contribute to the index. Each parameter is assessed through a certain evaluation process to determine its impact on the magnitude of exposure and level of preparedness. Following are some of the factors assessed in this measurement and the result of its application to the prevailing situation in Egypt is given in Figure 4.

Exposure

Factors considered for exposure included:

- Length of sensitive coastal zone;
- Number and significance of identified areas;
- Accessibility of sensitive areas;
- Probability of impact;
- Magnitude and quality of risk assessment;
- Role of stakeholders;
- Competency and skills of players;
- Media anticipated reaction;
- Community and NGO's anticipated reaction;
- Number of terminals;
- Number of tankers' movement per year;

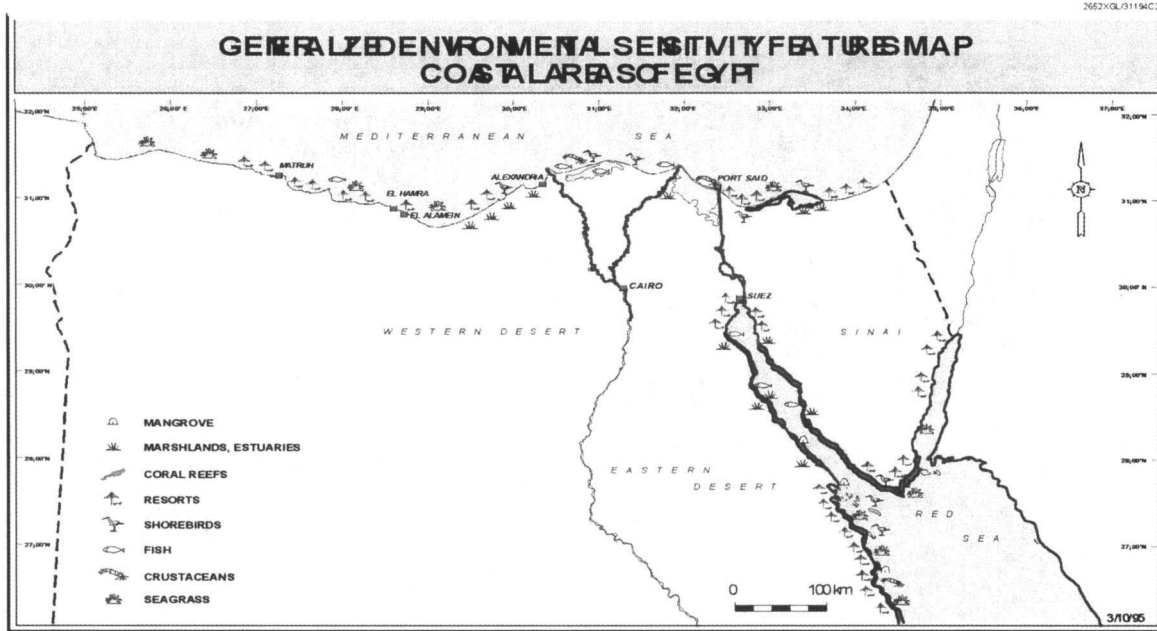


FIGURE 2 ENVIRONMENTAL SENSITIVITIES



FIGURE 3 COASTAL AND OFFSHORE ACTIVITIES

- Total length of marine pipelines;
- Total quantity and types of oils handled per year;
- Number of offshore drilling rigs;
- Number and location of production platforms.

Preparedness

Factors considered for preparedness included:

- Adequacy of assessment of potential threats;
- Mapped sensitivities of surrounding areas;
- Tier response risk analysis;
- Integrated contingency plans;
- Roles and responsibilities defined and agreed;
- Well informed and educated media;
- Adequacy of response equipment;
- Adequate geographical coverage of response centres;
- Response management exercised;
- Equipment deployment regularly exercised;
- Regular audits performed and audit findings addressed;
- Regional assistance integrated.

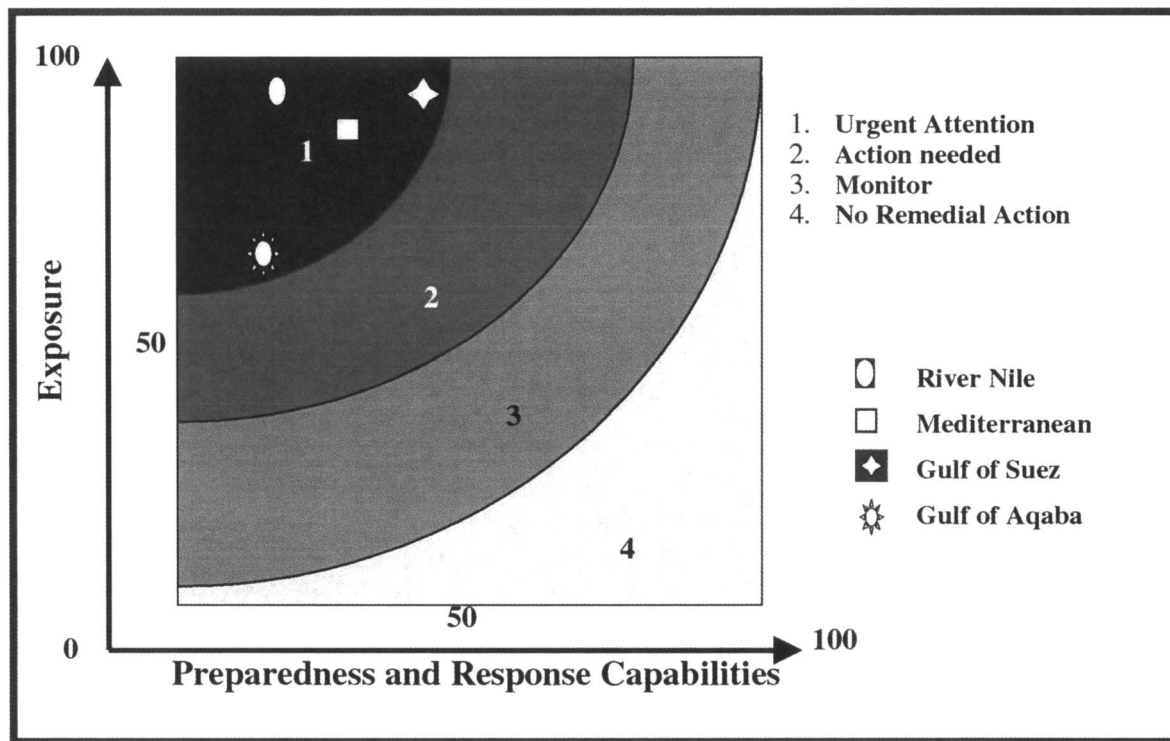


FIGURE 4 - RESPONSE INDEX

Response Index

Assessment of exposure magnitude and level of preparedness for different coastal areas of Egypt including the River Nile (Figure 4) indicates a disturbing situation that needs to be rectified.

THE CHALLENGES

The 1998 update has identified several actions to be promptly taken at all levels to ensure effectiveness of the NOSCP and provide for its efficient implementation. The following sections discuss these required actions of each tier and the challenges facing their implementation.

Tier One

Considering Tier One oil spill response plans are the foundation pillars of the NOSCP. It was obvious from the update that without good Tier One plans in the Petroleum Sector, the Suez Canal Authority and the Ports, backed up by adequate and appropriate expertise and equipment, the NOSCP will not function effectively. However, this requirement was far from complete and needed to be implemented immediately. In addition, these requirements fall under the State obligation of the OPRC, to which Egypt is committed.

Action Needed by Tier One Players

The Tier One players; such as Ports Authority (under the supervision of MMT), the Suez Canal Authority and the Petroleum Sector, need to:

1. Prepare or revise local (Tier One) oil pollution emergency plans that are consistent with the policies and procedures laid down in the NOSCP.

2. Submit such plans to EEAA for approval. The plans should:
 - evaluate the risks arising from operations and plan for most likely and worst case scenarios;
 - assess the use of dispersants as part of the response strategy in the light of EEAA's policy on the use of dispersants and the application guidelines set out in the NOSCP; and
 - evaluate equipment stockpiles and ensure that they are adequate to deal with the most likely risk scenario without recourse to external assistance.
3. Ensure that their operational staff receive regular training and participate in exercises, including national exercises organized by EEAA in accordance with the NOSCP.

Action Needed by the Regulators

The Regulators are needed to:

1. consider applications for "standing approvals" for the use of dispersants and ensure that such approvals are given only in conformity with EEAA's policy and guidelines on the use of dispersants.
2. evaluate individual equipment stock of the Port Authorities, Suez Canal Authority and Petroleum Sector, in light of the authorities' own risk assessments, and advise on adequacy.
3. organize regular NOSCP training programs.

Tier Two

The NOSCP envisaged that most oil spills would be dealt with in the context of the Tier One oil pollution emergency plans—where the responsible authority will manage the response to the spill and notify EEAA using the OILPOL format.

The Tier Two contingency plans will be activated whenever:

- the oil pollution incident escalates beyond the capabilities of the Tier 1 plan to deal with; or
- the EEAA is called upon to deal with an unknown source of oil pollution.

It is the responsibility of EEAA to develop Tier Two contingency plans for geographical sectors of the Egyptian coast (see below). In parallel, EGPC should develop its own Tier Two contingency plan arrangements for organizing response up to the 1,000 tone level within the oil sector.

Action Needed by Regulators

According to the NOSCP, the strategy of the Regulators at Tier Two level should focus on preparing Tier Two contingency plans for the following geographic regions:

- Mediterranean coastline
- Gulf of Suez
- Gulf of Aqaba
- Red Sea proper
- Nile River

For each of these Tier Two contingency plans, it is necessary to:

1. improve the knowledge of surface currents and local wind conditions in order to better predict the likely movement of oil spills;
2. identify “sacrificial beaches”—where, circumstances permitting;
3. determine appropriate clean-up strategies for the different beach types in the region in accordance with the policies of the NOSCP;
4. identify, in advance, local resources for beach clean-up operations; and
5. develop disposal options for recovered oil and oily wastes in close cooperation with EGPC and the local coastal Government.

Tier Three

It is the responsibility of EEAA to coordinate the response to a major (Tier Three) oil pollution incident—where local resources exist in ports or the petroleum sector—these will be called upon to assist in the response action. Where the oil pollution incident involves a tanker owned by or carrying the oil of one of the petroleum companies operating in Egypt, the representative of that company will be a member of the Emergency Response Committee established by EEAA and he may be asked to activate a response from the petroleum industry’s stockpile of equipment in Southampton, UK. Where appropriate and relevant, Egypt’s partners in sub-regional contingency plans may be asked for their assistance.

In addition, according to article 6(2)(a) of the OPRC Convention, Egypt is obliged to establish: “... a minimum level of pre-positioned oil spill combating equipment, commensurate with the risk involved...” The Convention recognizes that this obligation may be affected by each State Party “either individually or through bilateral or multilateral co-operation and, as appropriate, in cooperation with the oil and shipping industries, port authorities and other relevant entities.”

In the Gulf of Aqaba, this obligation to provide a minimum level of equipment is being met through the establishment of the two combating centers at Sharm El-Sheikh and Nuweiba. These centers are being established by EEAA, with oil spill combating equipment being provided through the delegation of the European Community. However, tremendous effort is needed to upgrade these centers to sub regional level.

There are two regions where local resources do not exist or are inadequate to deal with the perceived risk of oil pollution: the Red Sea proper and the Mediterranean.

Challenges of the Red Sea

There are two reasons for Egypt to develop its response capability in the Red Sea: one is national and the other is regional. Much has been written about the unique ecosystem of the Red Sea and the need for Egypt to protect its share of this environment from threats such as uncontrolled coastal development and oil pollution. There are three indices that justify the establishment of a combat center in the Red Sea for national reasons:

1. The increasing tourism development in the Red Sea, south of Hurgada, and the need to protect these resources as well as the ecological resources on which they are based;
2. The increasing exploration for oil which is going on in the region as companies exercise their concessions and the increased risk of oil pollution incidents which will accompany such activity; and
3. The expansion of protected areas along the Red Sea coastline.

On the other hand, there is a regional need for a Red Sea Marine Emergency Mutual Aid Center in Egypt, as Egypt is a Contracting Party to the Jeddah Convention for the Conservation of the Red Sea and Gulf of Aden Environment. As part of the arrangements for implementing this regional convention, the Governments of the region have agreed upon the necessity to establish a Marine Emergency Mutual Aid Center (MEMAC). It has been agreed in principle that the Government of Egypt should act as host for MEMAC. The Center will have primarily a coordinating role in the exchange of information, training programs and monitoring.

Challenges of the Mediterranean

The Mediterranean already has some equipment at strategic locations: the EGPC stockpile at the French Harbor; small quantities of equipment at the Ports of Alexandria and Damietta to deal with pollution incidents in the ports and the Suez Canal Authority stockpile at Port Said. However, there is no local center for coordinating a Tier Two response in the 1000 km Mediterranean coastal region and no equipment west of Sidi Krir or east of Port Said.

The highest risk area for an oil pollution incident is in the vicinity of tankers calling at SUMED’s Sidi Krir terminal. The risk of collisions involving ships entering or leaving Alexandria port is also relatively high. It is essential that the major equipment stockpiles should focus on these areas.

However, there is also a need to have a shoreline protection and shoreline cleanup capacity in the areas west of Sidi Krir and east of Port Said. In particular, the coastline east of Port Said suffers from a heavy incidence of tar balls, which pollute the beaches. It is likely that this is the result of tankers reducing their ballast before entering the Suez Canal.

The strategy for improving the situation of the Mediterranean should focus on:

1. establishing a local response center for the Mediterranean;
2. enhancement of the response capability of SUMED at Sidi Krir and EGPC at the French Harbor;
3. establishing an oil pollution combating center at El Arish—preferably, within El Arish port;
4. establishing a small shoreline clean-up center at Marsa Matruh; and
5. a dedicated combat ship for the long and busy 1000 km. Mediterranean coast.

RECOVERY MEASURES AND CORRECTIVE ACTIONS TAKEN

With all-pervading influence of the oil industry in Egypt, it goes without saying that oil-spill response is a crucial issue and that the quality of responders has to be second to none. Particularly when we consider the significance of the tourism industry in Egypt where millions of visitors each year swarm to the country to visit not only the traditional pharonic sites of the interior but also its beaches and for activities like diving in the Red Sea. An oil spill in these sensitive areas could, therefore, mean a serious impact not only on the local environment, but also on tourism and the revenue it provides. Therefore, in 2001 concerned parties motivated by government support have taken strategic measures to adopt a public/private partnership policy to deal with all these challenges. A Ministerial Decree assigned the Egyptian Environmental Affairs Agency (EEAA), the Egyptian General Petroleum Corporation (EGPC) and the Multinational Oil Companies Forum in Egypt (PIEPC) to put up the basis and structure of a sustainable joint venture with a specialized British corporation in oil spill response businesses, Briggs Marine Environment Services (BMES) to deal with those challenges facing the appropriate implementation of the NOSCP.

Public/Private Partnership

Consequently a public/private joint venture with majority to private sector was formed, in January 2003, under the name of Petro Environmental Services Company, PESCO. The company is committed to:

1. Man and train the required manpower for all the Oil Spill Response Centers in Egypt;
2. Upgrade combat equipment of existing OSR Centers;
3. Provide dedicated combat vessels for the Red Sea and Mediterranean;
4. Professionally manage all OSR Centers in Egypt;
5. Perform, at least, two annual national oil spill exercises; one in the Red Sea and one in the Mediterranean;
6. Provide required assistance to Tier One players including ports and tourist facilities;
7. Ensure credible response to Tier Two spills and incidents.

Currently this joint venture manages five Tier 2 oil spill response centres at Alexandria, Suez, Ras Ghareb, Hurghada and Sharm El Sheikh. The latter is multimillion dollars facility donated by the European Union to the Egyptian Environmental Affairs Agency (EEAA). These centres are backed up by a strong nucleus of internationally trained personnel, modern equipment and dedicated offshore response and support vessels. In spite of the short time since the formation of this JV, PESCO currently has 190 internationally trained Egyptian responders placed throughout its centres and operational sites supported from its main hub in Cairo, which boasts a fully dedicated 'Pollution Incident Centre.'

Although the annual drill program for Egypt allows for two Major Exercises per year, the Company has organized and conducted five national exercises over the last two years compared to three drills conducted over the previous twelve years. These real-time exercises did reflect a realistic response to an oil pollution incident and have engaged a wide range of stakeholders such as relevant Egyptian Government Agencies, Private Sector Organisations, the Oil Sector and the Egyptian Navy. In all these drills, an Exercise Committee including representatives from all players and concerned parties was formed to oversee the development of the Exercise starting from the design, the scenario, mobilization of equipment and personnel, communications and execution to the assessment, evaluation and lessons learned. This practice has tremendously enhanced the required "Working Together" approach and speeded up bridging the gap.

The National Pollution Response Club of Egypt

In addition to the above-mentioned reforming measures, the joint venture has launched a pollution response club: "The National Pollution Response Club of Egypt" (NPRC). The Club is designed to support existing mechanism for prevention, preparedness and response whilst continually improving interaction between those mechanisms. The Club provides members with increased efficiency for the provision of urgent assistance. The National Pollution Response Club of Egypt provides a joint mechanism through an alliance of members.

The NPRC overall objectives are:

- **Firstly**, to promote integration of pollution prevention, preparedness and response measures in the businesses;
- **Secondly**, to assist companies in developing their own capabilities to deal with pollution emergencies, to facilitate information exchange, training and technological co-operation;
- **Thirdly**, to improve dialogue between government authorities and the private sector in general on issues of pollution prevention, preparedness and response.

The Club was recently launched and members are increasingly joining.

Regional Cooperation

Egypt already has signed almost all the IMO Conventions including MARPOL 73/78 and the OPRC 90. In compliance with the latter, Egypt has signed two sub regional Agreements:

- Mediterranean Trilateral Agreement and sub regional Contingency Plan with Israel and Cyprus.
 - Upper Aqaba Trilateral Agreement and sub regional Contingency Plan with Israel and Jordan.
- In addition to this, Egypt has signed two regional conventions namely:
- Jeddah Convention with the States of the Red Sea and Gulf of Eden.
 - Barcelona Convention with the States bordering Mediterranean.

Over the last two decades, progress on these regional and sub regional agreements was slow and below expectations. Perhaps this is due to the governmental nature of these agreements and prevailing sensitivities among some member states.

To improve this situation and enhance the private/government cooperation and strengthen preparedness measures, the industry forum known as "Petroleum Industry Environmental Protection Committee" (PIEPC), formed in 1990 from a number of major multinational oil and gas companies working in Egypt, has taken many initiatives ranging from organizing full scale Tier Three OSR Exercises to providing special response equipment to National Parks and protected areas to active contribution in updating the NOSCP and upgrading of the oil spill response centers.

On the regional level PIEPC joined the Mediterranean Oil Industry Group (MOIG), formed under the IPIECA umbrella of OSR experts representing oil and gas companies working in the Mediterranean. The aim of the group is to enhance regional cooperation at industry level leading to improved regional government/industry cooperation. The group holds two meetings per year hosted by a different member company where an OSR exercise is organized. The MOIG, although formed in 1995, was formally launched only in January 2004 with its headquarters in Tunis and is currently chaired by PIEPC/Shell Egypt. Joining MOIG and chairing its Board has provided great opportunities to improve preparedness in the Mediterranean coast of Egypt.

Conclusion

Oil is, and will continue to be for decades to come, the main source of energy for both the developed and developing countries

all over the world. Offshore areas and coastal zones will be the main hosting environment to an ever-increasing exploration, field development and production activities. Sea transport will continue to be the main transportation mean to move oil and oil products from producing countries to consumers all over the world. In spite of continuous improvement in safety of maritime transportation, tankers industry and ports facilities, oil spills incidents and vessels accidents will continue to occur. Therefore, countries should have in place effective and integrated National Oil Spill Contingency Plans that can promptly respond to these incidents and deal with preventable consequences. Plans should be based on appropriate balance between exposure and preparedness.

Egypt, with its long and sensitive coastline situated in the centre of the marine transportation lanes of oil from east to west had a National Oil Spill Contingency Plan in place since 1986 and has signed all relevant international and regional conventions. However, having a NOSCP in place is not the end of the road. Experience showed that without appropriate integration and regular testing of the plan its effectiveness would not be assured. Equally important, is to maintain the required exposure/preparedness balance. Considering there is little to be done with its environmentally sensitive coastline, focus will be on preparedness through continued cooperation between government and industry to provide for appropriate prevention and protection measures. Private / public partnership proved to be effective when managed through professionalism with economic objectives.

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