

OIL SPILL RESPONSE ORGANIZATION DEVELOPMENT— BOHAI SEA—CHINA

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ABSTRACT

Oil spill response along the coast of China has been recognized as an important issue by the Chinese government. The Bohai Sea in particular, is an area of high oil exploration and production activity, with offshore developments comprising platforms and FPSO's (floating, production, storage and off-loading) together with associated vessels and pipelines. Major shipping lanes from the East China Sea into China also pass through the offshore oil fields. For the oil companies operating in the area, the prospect of an accidental oil spill is a concern from both a domestic and international perspective.

In 2000, the companies involved in upstream activities in the Bohai Sea began discussions with the China National Offshore Oil Corporation (CNOOC) to develop an oil spill response capability. Led by ConocoPhillips, the international oil companies worked with CNOOC to build a framework for developing an oil spill response organization (OSRO) to provide appropriate services within the Bohai Sea. The key tenet for this OSRO, was to be able to perform to international standards.

In 2002, the CNOOC executive management, through its subsidiary, Bohai Corporation (COOBC) committed to establishing a commercial oil spill response organization, Bohai Environmental Services Ltd. (BES). The BES remit is focused on the Bohai Sea, but with the eventual goal of providing response services along the wider China coastal region and eventually fulfilling a longer term vision of expanding into the international market.

This Paper describes the standards required by the international oil companies and how BES was conceived and organized to meet them.

INTRODUCTION

There are several domestic Chinese laws that govern various aspects of offshore operations. These include *The Marine Environmental Protection Law of the People's Republic of China*, *Regulations of the People's Republic of China Concerning Environmental Protection in Offshore Oil Exploration and Exploitation* and *The Procedures of Drawing up and Approving the Oil Spill Emergency Plan Concerning the Offshore Oil Exploration and Exploitation*. All offshore operators are required to develop oil spill contingency plans for their operations which are to be approved by the State Oceanic Administration. Given that the international oil companies had been exploring for oil in the Bohai Sea since the late 1990's with some contingency plans still dating back that far, it was apparent that oil spill response arrangements were in need of some further development.

Thus in 2000, the establishment of a Tier 2 oil spill response organization to serve the upstream oil industry, became a focused objective for the companies involved in the Bohai Sea oil and gas industry. The international companies along with the China National Offshore Oil Corporation (CNOOC) began to discuss how best to develop oil spill response capabilities that met the needs of the industry and satisfied regulatory standards.

Numerous meetings were conducted with all parties potentially involved and international oil spill response organizations were invited to conduct presentations, submit proposals and generally engage in the development process. As a result, the following six key planning /service criteria were determined to be required for the oil spill response organization:

- Provide a resident oil spill response service organization to the upstream offshore industry that effectively meets Tier 1 and Tier 2 spill response needs in a cost efficient manner,
- Provide a stockpile of equipment and material that, along with trained operators, will achieve its intended level of oil recovery or control,
- Set out a practical response system that will work in the physical, political, commercial setting of the Bohai Sea,
- Provide a comprehensive and balanced Tier 2 approach for oil spill control/recovery under the various conditions expected in the Bohai Sea. Capabilities to be evaluated include the use of:
 - mechanical recovery
 - in-situ burning
 - dispersants
- Provide training and exercises in response management and equipment operation and maintenance, and
- Provide the logistical infrastructure to assist in the delivery and support of Tier 3 resources in the event of a worst case oil spill.

STRUCTURE OF THE RESPONSE ORGANIZATION

The initial proposal was to establish a joint venture company with the international oil spill response provider, the international oil companies and a local Chinese company, all as shareholding partners. The joint venture (JV) company would establish and run an oil spill response organization (OSRO).

All involved would share in the initial capitalization costs. The international oil spill response provider would manage equipment procurement, personnel recruitment, training, and exercise support for the JV company with appropriate compensation. After an agreed period, the international oil companies would have the option to sell their shares in the JV company to the international oil

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spill response provider and the Chinese shareholder for payment and/or service credit.

Once established, the original oil companies involved in establishing the OSRO would be termed 'charter members' and would pay annual retainer fees to support the OSRO. As other oil company operators joined the OSRO as members, a portion of the new members' annual retainer fees would be used to offer discount/rebate to the charter members' annual fees.

A different fee was proposed to be charged to operators, depending on whether they were in a pre-production or production mode with the production mode determined to present a greater risk of an oil spill and thus attract a higher fee. Annual retainer fees within the first three years of operation were intended to pay for the initial cost of equipment capitalization and to cover operating expenses including administrative, personnel, routine training, routine maintenance, and repair costs in the long term. Individual client fees were proposed to vary by the type and amount of drilling and production operations.

Oil spill response would be recognized as a revenue-generating event for the JV company. Equipment and services would be billed according to published rates and a separate tariff would be established for training/exercise events taking place between oil spill incidents.

The actual level of the retainer once in operation, would in any case, be based on the return generated from spill response and other commercial activities such as training; set against capital investment, annual operating and maintenance costs, insurance, reinvestment in replacement equipment and materials, and reasonable profit sharing.

A JV Board of Directors was proposed to manage the OSRO with oversight from a Client Advisory Body. The Board of Directors would be comprised of a representative of the international oil spill response provider, the Chinese JV partner and ConocoPhillips. The three entities were to be the founding members providing initial capitalization of the OSRO. The Advisory Board would consist of one member from each of the JV partners plus at least one member from each operator client. The JV company Directors would have authority for a range of management issues including capital expenditure, policy and operating procedures. The JV would consult with a Client Advisory Board for matters such as client needs, expectations and training/exercise scheduling. The full implementation of the OSRO, including base siting, spill equipment training on all equipment, and transition to local management, would take place over a span of approximately three years.

OSRO PLANNING GUIDELINES / CRITERIA

The following sub-sections provide a brief outline of the key planning criteria used for the OSRO.

Spill Management Arrangements

Upstream operator members would remain in charge of spills originating from their facilities/operations, drawing on their contingency plans and using their own spill management teams, supplemented as appropriate with OSRO personnel. The OSRO management team would not act as spill managers but would be versed in the spill management system as well as all aspects technical of oil spill response and would thus be able to provide member company spill management teams with technical advice and assistance. The JV management team would have sufficient management, technical, and support personnel to manage equipment activation and deployment, and conduct the necessary administrative, maintenance and training functions.

At the outset of an oil pollution incident, the offshore operator's employees and contract personnel working at the site—facility personnel, FPSO personnel, or boat crews—would be the first re-

sponders. As soon as the OSRO was notified of a spill, the OSRO would mobilise, activating its own staff and networked contractors and personnel. The OSRO management team would locate to wherever the operators deemed most logical. In the initial phase this would be in Tanggu. The OSRO management would commute between the operations base and the clients' offices, drilling rigs, production facilities and FPSO's as required.

A compact operations base would provide the administrative space for the management team and for responder training. It would also provide adequate storage area for shore-based equipment and maintenance. Various staging sites were also envisioned to be able to provide rapid response around the Bohai Sea.

The Chinese JV partner would arrange for additional laborers and service providers as required. Training would be provided by as required by the international oil spill provider and JV partner prior to deploying personnel to assume spill response activities

OSRO / Member Training

All of the Bohai Sea offshore operator members would have firmly committed their spill management teams and initial response personnel to participate in training activities and exercises. Management staff would be crossed trained in deployment and spill advisory duties. All of the OSRO management team would participate in these training activities.

A simplified Incident Command System (ICS) system would be utilized by the OSRO with a curriculum for instruction in Mandarin. The ICS system would retain the basic elements of Unified Command, Command Staff and general staff for Operations, Planning, Finance, and Logistics.

The initial Management/Training Team, was to be comprised of the following personnel:

- General Manager (1)
- Administrative Assistant/Translator (1) *
- Technical Manager/Engineer (2)
- Technical Manager/Engineer/trainee (2) *
- Training Manager (3)
- Training Manager/trainee (3)*
- Assistant G.M./G.M. trainee (3)*

Note: * bilingual

The initial management/training team would consist of employees from the international oil spill response provider who would serve as General Manager and Technical Manager/Engineer-Mechanic. They would be properly trained in the deployment and operation of the pre-positioned oil spill response equipment

The Technical Manager/Engineer-Mechanic would be familiar with the oil spill equipment and spill management system. Duties would be primarily related to mechanical equipment and maintenance.

The Training Manager trainee would be hired based on technical competence, spoken and written linguistic abilities, as well as training skills.

EQUIPMENT PROVISIONS

OSR Equipment

The actual definition of a Tier 2 response capability can vary considerably, depending on the circumstances, including locale, oil type, behaviour/fate and resources potentially affected. It also depends on whether proper Tier 1 capabilities are in place and the level to which co-operative working arrangements are supported by all concerned. The determination of Tier 1 and Tier 2 preparedness and response arrangements needs to be done at the same time. The establishment of a Tier 2 preparedness and response system

for the Bohai Sea area offers a positive opportunity to confirm these arrangements work at both Tier 1 and Tier 2 levels.

The primary aim for the proposed Tier 2 arrangement is that it should be capable of handling all but the largest of spills. If the combined local and area assets are insufficient for responding to a large spill, then Tier 3 assets from sources outside the region may be required. Even in the event of catastrophic spills, a Tier 2 response capability is still needed to provide effective and credible response until such time as Tier 3 resources can be mobilized to the site. The same Tier 2 resources are also extremely important in supporting any such Tier 3 services brought in.

The overall aim for the Tier 2 OSRO arrangement is to have an immediate response system package at or near the offshore facilities that are covered under contract by the OSRO. Given the wide range of Bohai crude oil characteristics and prevailing weather and sea state conditions, the response system would be set up to offer a range of response options, including mechanical recovery, in-situ burning and dispersant spraying. Most of the proposed equipment is intended for offshore use. A small amount of the equipment is scaled for use on harbor spills that may occur in the supply harbor area.

The intent would be to spread/allocate Tier 2 equipment throughout the Bohai Sea to facilitate a rapid Tier 2 response. Operators would still look to a recognized Tier 3 Center for additional resources for major or catastrophic spills. Where operator production fields are immediately adjacent, equipment will be shared to the greatest extent practicable. Oil spill response equipment that is spread throughout the Bohai Sea could be quickly activated and deployed in a cascading manner, to effectively respond to any client having a spill in any area within the Bohai Sea.

It is envisaged that equipment would be stored on an individual facility on a standby boat or on the offshore facility in storage containers. A stockpile of similar oil recovery equipment would be stored at the operations shore base. In this way, there would be facility for equipment rotation during maintenance or training without taking on-site response equipment off-line. In the event of a large offshore spill, the shore-based equipment could be deployed aboard one or more vessels of opportunity. An additional skimmer and training boom would be appropriately scaled for response to small spills occurring at or near the operations shore base.

As OSRO members bring production fields on-line throughout the Bohai Sea, the geographic spread of facilities may dictate the need for additional response packages in order to assure timely response and to provide shoreline protection. A single response equipment package may support two or more production sites in close proximity to each other.

Auxiliary Equipment/Material

The OSRO would look to local sources of supply for logistics support, to supplement an appropriate, but most likely modest range of in-house resources. Wherever local services were adequate and cost effective, they would supplant planned in-house capabilities.

Broadly, examples of auxiliary equipment, materials and services might include PPE, sorbents, shop maintenance and decontamination services, and a more extensive view might include the following:

- PPE for crews at protection levels commensurate with regulatory and member company requirements; estimated initially at 50 men,
- Sorbent stockpile (20' van by volume); mix of viscous and sheet forms,
- Handling equipment at an equipment base; forklift, pallet jack, crane or truck crane, slings and cargo nets, lashing gear,
- Diesel trash pumps w/ reducers and fire hose/nozzles,

- Air double diaphragm transfer pumps w/ hose,
- Decontamination system: diesel fired hot water pressure washer, visqueen to build decontamination pools, slops pump, cleaning solutions, brushes, boom cleaning rack, and
- Shop maintenance equipment sufficient to service equipment and conduct minor repairs.

It is envisaged that communications equipment and support would rely on existing members' arrangements/resources as much as possible. However, clear and non-interrupted communications must exist between the spill command post (shore or offshore facility) and the major floating assets.

PROJECT PLANNING AND IMPLEMENTATION

Project Development

Bohai Environmental Services (BES) a subsidiary of COOBC was officially established in January 2003. The stated purpose of BES is "to provide oil spill response services at the highest international standard to the oil and gas exploration and production operators in the Bohai Sea" through the provision of Tier 2 capabilities. BES is a for profit company.

In February 2003, ConocoPhillips co-ordinated a fact-finding tour for CNOOC and BES to the USA, UK and Finland; to meet with a range of different oil spill response organisations and interest-related groups.

The tour began in Seattle, USA with a meeting with Foss Environmental, an oil spill response contractor and equipment supplier, which presented their capabilities, demonstrated equipment and reviewed the role of the oil spill response contractor. The structure of the Washington Maritime Association, Clean Sound Cooperative, and oil spill response capabilities as provided by SERVS (Alyeska Pipeline System—Ship Escort Response Vessel System) were also presented and discussed within the group's meeting. The group then went to Houston to meet with the ConocoPhillips emergency response management, to review corporate protocol and plans and to tour the company's emergency operations center. A subsequent tour of the Marine Spill Response Corporation (MSRC) Galveston Base covered a range of issues. These included the roles and responsibilities of contractors in oil spills, MSRC's relationship with MMS/USCG (Minerals Management Service/U.S. Coast Guard) and how MSRC works with the company responsible for the spill, incorporation of the contractor and company's command system and review of facilities and equipment. The International Response Corporation (IRC) had the opportunity to discuss with the group the roles and responsibilities of a U.S.-based response organization (OSRO), the differences between the various types of OSRO's and supported a tour of the oil spill response vessel "NRC Admiral" in Galveston.

In the UK, the group travelled to Aberdeen and met with ConocoPhillips to review the Company's North Sea emergency response plans, capabilities, oil spill response organization membership and emergency operations center. Briggs Marine Environmental Services, also located in Aberdeen, presented their philosophy and procedures for establishment of an oil spill response organization, relationship between an oil spill response service provider, government agencies and oil companies, and reviewed available oil spill response equipment. The group then visited Southampton with OSRL who provided an overview of the organization, the relationship between an oil spill response service provider, government agencies and oil company and reviewed available oil spill response equipment. The oil spill equipment manufacturer Vikoma also presented its equipment during this meeting.

CNOOC and BES personnel completed the international tour with a visit to Finland to visit equipment manufacturer, Lamor.

The breadth, depth and detailed nature of this international fact-finding mission illustrates the commitment by CNOOC and BES to learning as much as possible from commercial and non-profit oil spill responders and others in order to find the very best of international practice in establishing BES as a credible oil spill response contractor.

Current Status

By mid 2004 Bohai Environmental Services (BES) has made significant progress in establishing a commercial oil spill response organization for Tier 2 services in the Bohai Sea area, including:

- *Equipment*—Ordered and received international standard oil spill equipment including boom systems that allow for single vessel deployment of boom.
- *Equipment training*—Conducted training on equipment usage with the appropriate vendor and developed preliminary operations procedures.
- *Exercises*—Upon completion of the training BES conducted three large scale oil spill drills including deployment.
- *Response arrangements*—Established an oil spill response agreement with oil spill organizations in Yantai and Sheng Li oilfield.
- *Personnel / staffing*—The BES organization has 20 full time personnel that will be focused primarily on oil spill response technical issues. The personnel have certificates of OPRC level 2 training. English training is being provided for these personnel. Additionally, 80 people on standby and on payroll for oil spill response. These personnel are offshore personnel who are trained and provided a minimal wage while they were on their off-time.
- *Response planning*—Developed emergency response plans and an action plan for implementation of the organization to provide oil spill response service.
- *Technical development*—International oil spill response providers are being solicited to work with BES to improve its level of expertise.

- *Vessel arrangements*—Contacted the Fishing Bureau and Navy to provide boats and services in the event of a spill.
- *Workshop facilities*—A 2000 sq meter workshop, 6000 sq meter yard space and an oily water treating system in Tanggu
- *Workshop facilities*—Reserved space in Longkou and Sui-zhong for storage of oil spill equipment and maintenance facilities.
- *Equipment*—Purchased oil spill tracking software developed in China.
- *Contingency planning*—BES is working diligently to develop databases of relevant information including weather, environmentally sensitive areas, regulatory requirements, human resources, etc.
- *External Communication*—Established a Chinese language website at www.cleanupoil.org.cn
- *Membership*—BES has signed the contracts with several operators in the Bohai Sea.

In addition, BES has also responded to two marine industry oil spills in the Bohai Sea, the “Tasman Sea” during November 2002 and the “Shan Da 2” during October 2003.

CONCLUDING REMARKS

Much has been done in the last four years to develop oil spill response capabilities in the Bohai Sea. The oil company operators have improved their contingency plans and continue to train their personnel and generally enhance their emergency response procedures and capabilities. Bohai Environmental Services is working to solidify a relationship with an international oil spill response organization to elevate its oil spill response capabilities. Bohai Environmental Services has the aim of being internationally recognised as a professional oil spill response provider within five years.