

**Co-Chairs' Summary Report of the ARF Workshop of Marine Oil Spill
Emergency Response Management and Disposal Cooperation
Kunming, China, 17-18 December 2015**

Introduction

1. Pursuant to the decision of the 22nd ASEAN Regional Forum (ARF) Ministerial Meeting held in Kuala Lumpur, Malaysia August 2015, the ARF Workshop of Marine Oil Spill Emergency Response Management and Disposal Cooperation was convened in Kunming, China on 17-18 December 2015. The Seminar was co-chaired by Mr. Xu Heyun, Director of Department of International Cooperation of State Oceanic Administration of China, Ms. Phasporn Sangasubana, Deputy Director General of Department of ASEAN Affairs of Ministry of Foreign Affairs of Thailand, and Ms. Rona Rathod, Advisor for International Scientific Cooperation in the Office of Ocean and Polar Affairs, Bureau of Oceans and International Environmental and Scientific Affairs of U.S. Department of State.

2. The Seminar was attended by more than 50 officials and experts from government authorities and industry of the ARF participants including Australia, Bangladesh, Brunei, Cambodia, Canada, China, Indonesia, Laos, Malaysia, Myanmar, Pakistan, Papua New Guinea, Korea, Singapore, Thailand, and the United States, as well as representatives from ASEAN Secretariat and International Petroleum Industry Environmental Conservation Association (IPIECA). The List of Participants is attached as ANNEX A.

Opening Ceremony – Welcome and Opening Remarks

3. Mr. Zheng Xuefang, Counselor from Department of Asian Affairs of China's Ministry of Foreign Affairs, delivered the keynote address. He first expressed his gratitude to the attendee's participation. Mr. Zheng indicated that increased marine pollution has far exceeded the purifying capability of the ocean itself, severely polluting many sea areas, and oil spills are one of the most damaging pollutants. Mr. Zheng emphasized that the Chinese Government has always attached great importance to the protection of marine ecosystem and environment. In recent years, China and ASEAN countries have conducted quite a few cooperation projects in this area. Mr. Zheng suggested that all sides should enhance policy dialogues and cooperation on the development of a blue economy and marine strategy, encourage technological cooperation and exchanges of visits and cooperation among marine research institutes, and strengthen the cooperation in and between international and regional regimes.

4. Ms. Xu Heyun, director of Department of International Cooperation of State Oceanic Administration of China delivered the opening remarks. She expressed her gratitude to all the participants for attending this workshop. Ms. Xu hoped that the workshop would be helpful to enhance mutual understanding, to exchange information and experiences, and good practices in promoting regional cooperation in the field of marine oil spill response and disposal.

5. Ms. Phasporn Sangasubana, Deputy Director-General of Department of ASEAN Affairs of Ministry of Foreign Affairs of Thailand, indicated in her opening remarks

that marine oil spill is one of the biggest challenges that threatens the marine ecosystem, ecological system, and the community's well-being. By illustrating two major oil spill cases that occurred in the Gulf of Thailand, she pointed out the necessity of regional cooperation on oil spill response. Ms. Sangasubana viewed that by bringing together experts on the field, a regional expert network could facilitate communication and cooperation in case of oil spill incidents.

6. Ms. Rona Rathod, Advisor for International Scientific Cooperation in the Office of Ocean and Polar Affairs, Bureau of Oceans and International Environmental and Scientific Affairs of U.S. Department of State, indicated in her remarks that oil spills have severely threatened the marine ecological security in recent years. She stated that the U.S. Government paid high attention to the regional cooperation, and together with China, Singapore, and Vietnam, sponsored the ASEAN Regional Forum Ministerial Statement on Strengthened Cooperation on Marine Environmental Protection and Conservation in August at the 22nd ARF Ministerial Meeting. Ms. Rathod expressed her hope for the positive results that could be achieved by further cooperation.

Keynote Speeches

7. Dr. Kenneth Lee, from commonwealth scientific and industry organization of Australia shared on the behavior and environmental impacts of crude oil released into aqueous environments. Based on the introduction of oil spill risks, relationship of oil composition to oil type and properties, biodegradation of hydrocarbons, fate and behavior of oil spilled in the aquatic environment, fate and behavior of oil interacting with ice in marine and freshwater environments, he brought research concepts needed to better understand the environmental impact of spilled crude oil in high-risk and poorly understood areas, to increase the understanding of effect of oil spills on aquatic organisms, communities and ecosystems, to develop an understanding of the ecological characteristics of area that may be affected by oil spills in the future. Besides, controlled field research is needed to better understand spill behavior and effects across a spectrum of crude oil types in different ecosystems and conditions. For the oil spill response options, there are four main sections: natural processes, physical response methods, biological and chemical methods, factors affecting spill response and cleanup effectiveness. In the end, he presented that modeling relies on small-scale information to predict large-scale behavior, and mentioned that more researches and work are needed to update, refine, and focus risk assessments of oil spills in Canada.

8. Ms. Dong Xin, Senior Consultant commissioned by International Petroleum Industry Environmental Conservation Association (IPIECA) introduced one of IPIECA's Global Industry Response Group projects - Joint Industry Project (JIP) aimed towards enhancing oil spill preparedness and response. She first gave a brief introduction of the IPIECA and International Association of Oil & Gas Producers (IOGP), and then presented the origination and progress of the JIP. Ms. Dong specifically elaborated the approaches they used to present the outputs of JIP to different audience, and illustrated several topics of the JIP, such as the oil spill preparedness and response framework, stakeholder engagement, selecting response tools, and capabilities of tiered preparedness and response.

9. Ms. Zhou Qing, Professor from North China Sea Environment Monitoring Center (NCSEMC) of the State Oceanic Administration, China, delivered a presentation on laboratory simulation study on marine spill oil behavior and ecological effect. She pointed out that although NCSEMC had participated in the disposal of a number of threatening oil spills, there were still many questions to be answered. In order to further understand the behavior and fate of spilled oil and its ecological effect, NCSEMC built Marine Oil Spill and Ecological Effects Simulation Laboratory. She briefly introduced the experimental facilities in this lab, including wave tank, tower, weathering simulation pool, microalgae aquaculture system, fish aquaculture and test system, multiple species aquaculture system, Biological exposure system, and expressed the welcome of the delegates to visit this laboratory. She also introduced collaborative wave tank experiments between SOA and BIO from which they found out that wax content of spill oil had great effect on the dispersion possibility.

Session 1 Technology on Prevention, Preparedness, Response and Restoration of Marine Oil Spill

10. Mr. ZHANG Zhaoxuan, from Oil Spill Response Limited of Singapore, briefed workshop participants on the scope of Tiered Preparedness and Response. He introduced that Oil Spill Response Limited was owned by major oil and gas production and transportation companies, and was the largest international commercially funded corporation. He provided an overview of the global response capability and a globally recognized framework. He focused on tiered preparedness and response, including the evolution of TPR, the complete model, tiered approach, common barriers, and targets for success. To that end, he touched on the case study on 2013 Rayong Spill.

11. Dr. Haibo Niu from Department of Engineering of Dalhousie University in Canada introduced the development and applications of numerical models for Oil Spill response off the East Coast of Canada. The oil spill trajectory forecast model is driven by high resolution coupled atmosphere–ocean forcing. Focusing on the oil particles, the model can simulate the oil volume on the surface, inside the water, and on the land respectively. It also has the capability of analyzing the range and risk of spilled oil in different phases to technically support emergency response. Besides, Dr. Niu also briefed the development of oil spill modeling, to include the effects of chemical dispersion and sea ice.

12. Mr. Li Jianwei from China Offshore Environmental Service Ltd. introduced the research and development of underwater oil spill numerical simulation and the 3-D visualization system in deep-water areas. Utilizing laboratory experiment results, their research optimized the parameterization of spilled oil in deep waters. They also developed high resolution numerical model system to provide fine hydrological forcing for oil spill simulations. To better visualize the model results, CNOOC developed the first visualization system for deep-water oil spill simulation in China, which could show effectively the underwater topography and oil spill distribution. Based on these achievements, CNOOC has 4 software copyrights, 1 utility model and 5 papers in this field.

13. Dr. Xu Jiangling, from North China Sea Marine Forecasting Center of State Oceanic Administration of China, presented the latest work on operational monitoring

and forecasting of offshore oil spills for emergency response. After more than 50 years development, NMFC has built a real-time marine environment observation network. Based on such observations, an operational marine environmental forecasting system has been established. Consequently, the environmental forecast driven by the 3-D forecasting model of oil spills can predict the trajectory, area, swept area, and residual amount of oil spilled in the future or track back one oil spill case to find the source location. For the operational monitoring of oil spills- using SAR image data instead of traditional tools, SAR monitoring has the advantages of lower cost, larger area covering, and no weather implications. In the end, Dr. Xu introduced the China-ASEAN cooperation project and called for the joint development of marine disaster early warning and emergency response procedures.

14. Ms. Linda Zhang, chairman of Sino-Gas & Oil Technology Co., Ltd, introduced the SGOT sinking type swirling flow recovery Technology. She shared the areas of technological development process, the main technical problems of oil spill emergency disposal, technical comparisons, SGOT technology principles, technology appraisals, honors, and equipment profile.

Session 2 Oil Spill Case Studies and Best Practice

15. Ms. Jungwon Kim, from Korea Marine Environment Management Corporation (KOEM), introduced an automatic gravel cleaning machine, and its composition and structure. The improvements of KOEM in wheels and noise control capabilities were emphasized. Additionally, the usage and performance of the cleaning machine were also introduced. In terms of cost, the comprehensive expense of the machine is reduced more than 50% when compared to traditional means of cleaning..

16. Mr. Mark Dix, from the National Oceanic and Atmospheric Administration of the United States, discussed spill response with one case study that happened in 2014 in the United States. Mr. Dix, from Washington state, represents an oil spill cleanup agency, which has 45 staff aiming to improve oil spill cleanup. They respond all over the world, but are mainly concentrated in the United States. The treatment methods and some detailed processes in the case study were discussed. After listing some practical difficulties at the time of the incident, like equipment transportation challenges near the affected islands, the success factors contributing to the process of oil spill cleanup were listed, including the forecast work of the oil spill. The government and industry cooperation was built based in part on people that knew the other players ahead of time and built towards cooperation in advance. In retrospect, cooperation has helped recognition of other states' talents and shortcomings without incident. .

17. Ms. Soontharee Pirom, Environmental Officer from Marine Department, Thailand, provided an overview of oil spill cases and best practices in Thailand. She elaborated on National Oil Spill Contingency Plan which was established on April 24, 1995 (B.D. 2538). In order to better deal with spilled oil, Thailand joined a number of international conventions and carried out cooperation with Philippines, Vietnam and other countries. She gave a detailed introduction on the oil spill cases from 1900 to 2014 and focused on major oil spillages, their drifting paths, clean-up operations, and recovery reclamations.

18. Mr. Lv Shili, Senior Staff Member from China's Maritime Search and Rescue Center brought the participants an overview of China's Maritime Oil Spill Emergency Response System, which consisted of an all-in organizational structure, a program system, and an emergency -system. In order to improve oil spill emergency response capabilities, China has done a lot on capacity building, including drafting capacity plans, improving technologies, and conducting joint exercises. The emergency system achieved positive application during the Dalian 7.16 Pipeline Fire & Explosion Accident, Penglai 19-3 Oil Field Spill Accident, and Huangwei Pipelines Explosion Accident.

Session 3 Regional Oil Spill Cooperative Management Mechanism and International Cooperation

19. Ms. Yan Yan, from National Institute for South China Sea Studies, presented the cooperation on marine oil pollution preparedness and response in the Arctic. She introduced the background of the Arctic Council, the task force, and the development of the agreement. One group is EPPR, which is the emergency prevention, preparedness and response working group, and it addresses the prevention, preparedness, and response to environmental emergencies in the Arctic resulting from human activities. In the end, the experiences and implications in the South China Sea were described. She emphasized that prevention is the highest priority and that future cooperation on binding agreements is needed. .

20. Mr. Wu Liang, from China Offshore Environmental Services of CNOOC, gave a brief introduction of their work on national emergency cooperation and resources sharing under 'oil winter', as well as the United Drill between CNPC, SINOPEC, and CNOOC. The top three oil companies in China organized a united drill on June 17, 2015 to further promote cooperation and establish emergency linkage mechanisms to provide effective communication and cooperation on related issues. He described the cooperation plan on co-delivering an OSR training plan, a joint TTX or practical exercise, personnel exchanges and responses.

21. Mr. Teerapol Phaparkhorn, from Oil Industry Environmental Safety Group Association (IESG) of Thailand, presented Thailand's regional oil spill response cooperation plan and background of IESG. The IESG is a non-profit organization and is a petroleum industry cooperative organization for safety and environment excellence. The IESG's responsibilities include providing support of information for the verification of oil spills, participating in oil spill response efforts with government agencies, and assisting in the member coordination of oil spill equipment support requests. The speaker also described cooperation between IESG and regional oil spill response organizations, such as with RITAG in 2010 and MOU with OSCT Indonesia in 2014. .

22. Mr. Baesoon PARK, from Ministry of Oceans and Fisheries of the Republic of Korea, shared the regional cooperation on maritime oil spill response in the Northwest Pacific Action Plan (NOWPAP). The action plan is for the protection, management, and development of the marine and coastal environment of the Northwest Pacific Region. The member states are the Republic of Korea, Japan, China and Russia. He described the oil and HNS spill incidents from 1990 to 2013, as well as the NOWPAP regional oil and HNS contingency plans. Besides the actions to be taken to achieve its

objectives and components of the contingency plan, geographical coverage, risks, response elements and planning, and financial procedures were elaborated. In the end, Mr. PARK introduced many exercises.

Establishment of Regional Expert Network of Marine Oil Spill Emergency Response

23. The seminar welcomed Dr. Sun Peiyan to elaborate on the proposal of establishing a regional network of marine oil spill emergency response experts, which was first proposed at an ARF seminar on the regional cooperation of offshore oil spills in 2014. In the Statement of Cooperation in Prevention, Preparedness Response and Restoration from Marine Oil Spill Incidents approved by the 21st ARF Ministerial Meeting on August 6, 2014, it proposed establishing a network of oil spill response experts to foster technical information exchange. Dr. Sun stated that the objective of the network is to enhance mutual understanding, to provide a platform for communication among experts, share information, experience and good practices, and to promote international cooperation in the region. She proposed establishing an Expert Directory as the first step, and offered two options for composition of the directory. Option 1 is to include diplomatic officials, technical officials, academic, and operational experts, while Option 2 is to include technical officials, academic, and operational experts. Then, the following discussion ensued on the topic.

24. Ms. Xu Heyun, the Chair of this session, suggested choosing Option 2.

25. Experts from Brunei showed the support of the idea of the expert directory, but required more time to nominate the experts to the list, so that they could obtain approval from their government. They suggested it be informal and not official.

26. Experts from Thailand also suggested the process of nominating members to the directory. They think the directory might be done in one of these three steps. First, start with a few experts present at this seminar. Second, fill in the form with feedback. Lastly, supplement the form with more experts nominated in the future.

27. Ms. Xu Heyun summarized the discussions, concluding that Option 2 should be adopted, and it be a technical and voluntary network, not an official directory of experts. She suggested that all experts fill in the expert directory form after a week. Dr. Sun Peiyan was assigned as the contact person for this task.

Closing Remarks

28. Ms. Xu Heyun, on behalf of the Co-Chairs summarized the outcome of the workshop as follows:

- a. First, the participants agreed on the urgency and seriousness of marine oil spill accidents and the need of greater in-depth research on them.
- b. Second, the participants frankly exchanged information and experiences on dynamic concepts, principles, frameworks, and technology to prepare for monitoring, forecasting, disposal, and recovery events in the future.

- c. Third, the participants recognized that even if national responsibilities on dealing with such accidents have been fulfilled, this threat could not be addressed by countries in isolation. So participants shall commit themselves to a sustained, effective process of international cooperation in dealing with oil spill accidents.

29. In the closing remarks, the Co-Chairs expressed their thanks to all speakers for sharing their experiences in preventing and response to oil spill incidents, and to all participants for the cooperative spirit that they brought to the discussions. The Chinese and U.S. Co-Chairs also mentioned their hope for a more formal multilateral, regional arrangement on oil spill cooperation. They were confident that the valuable discussions at the workshop, especially on the establishment of an informal regional expert network agreed upon by all participants, would help enhance response efforts during future oil spill incidents.

30. The seminar expressed gratitude to Brunei Darussalam, China, Thailand, and the United States for their effective co-chairmanship. The participants also thanked the North China Sea Branch of State Oceanic Administration of China for its warm hospitality and excellent arrangements in hosting the workshop.