

Experts Meeting on Preparedness and Response to Pollution Incidents by Hazardous and Noxious Substances
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CHINA'S STRATEGY AND RESOURCES FOR EMERGENCY RESPONSE TO HNS ACCIDENTS

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This paper briefly introduces the status of HNS carriage at sea along the Chinese coast; and generally describes HNS accidents; China's laws and legislation; the measures taken by the Chinese Government. The purpose of this presentation at this meeting is to give participants a picture of China's strategy and resources for emergency response to HNS accidents.

I. Status of HNS Carriage at Sea along the Chinese Coast

According to statistical analysis conducted by the Study on Response to Accidents Involving HNS Carried by Ships along the Coast, which was organized under the auspice of the Maritime Safety Administration, China has 245 terminals handling bulk chemicals along the coast, scattering in Guangdong, Jiangsu, Zhejiang Provinces and Shanghai Municipality. Among the terminals, there are 53 falling into the class with a handling capacity of 10,000-30,000 tons, 52 falling into the class of 5,000-10,000 tons, 30 the class of 3,000-5,000 tons and the rest falling into the class of less than 3,000 tons, with a total warehousing capacity of 6.655 million cubic meters. More than 130 different types of cargoes are handled by the terminals, categorized by MARPOL 73/78 as categories A, B, C, and D as well as Category III. Cargoes of Categories D have the largest share amounting to 50% to the aggregate volume, Category C amounting to 27.6%, Category B 13.1% and Category A 0.7%.¹

During the one and half decades from 1989 to 2004, the total volume of HNS carried in China increased by 30 times and their types by 3 times. In 2004, the total national

¹ HNS Convention and Corresponding Measures of China – by Gen Hong, Scientific Academy of the Ministry of Communications (see Compendium of Essays of Shanghai Maritime Forum, 2005).

transport volume was about 47 million tons, among which 37 million tons were inbound cargoes. The main cargoes were vegetable oils, ethylene glycol, methyl alcohol, styrene, sulphuric acid, xylene, toluene and its mixture, sodium hydroxide, ethylene dichloride, etc.

In 1994, China had only a dozen or so bulk chemicals carriers. Today, she has 27 bulk chemical carriers engaged in international trade, with an average age of 14.6 years and average gross tonnage of 3,846 tons; 62 chemical carriers operating along the coast, with an average age of 16.9 years and average gross tonnage of 729 tons; and a statistically incomplete total of 148 operating along inland waterways, with an average age of 9.9 years and average gross tonnage of 212 tons.

Although the fleet of bulk chemical carriers has expanded fairly rapidly, its quantity and quality can not keep commensurate with the development of the chemical industry. Some sub-standard ships pose certain threat to maritime safety and pollution prevention.

II. General Description of HNS Accidents

Incomplete statistics indicates that there were 52 pollution accidents caused by ships carrying HNS from 1991 to 2004. 14 accidents caused more than 100 tons of spillage each.

The history of accidents shows that most pollution incidents have been operational, such as overfilling and mishandling. Human and mechanic elements are the main causes. Bulk chemical carrier Dae Myong registered in Republic of Korea collided violently with cargo ship Great Prestige registered in Hong Kong in waters adjacent to the Yangtse estuary, leading to serious pollution of the marine environment after a spillage of 638 tons of styrene carried by Dae Myong into the sea.

Ships lost in accidents are in small number but can have great hazard. Furthermore, one should not ignore the circumstances under which the accidents occurred. For example, Hua Yang (Chemical) No 3 sunk on 29 March 2001 and bulk chemical carrier Jin Da 266 sunk in the sea area southeast of Shi Dao Island.

As the transport volume of HNS is increasing, so are the risks. Therefore, safety and pollution prevention in relation to carriage of HNS at sea has become one of the great concerns of the Chinese Government.

III. Chinese Laws and Legislations

1. Laws

The Marine Environment Protection Law of the People's Republic of China provides a legal basis for preventing marine pollution by harmful substances carried onboard ships;

The Maritime Traffic Safety Law of the People's Republic of China stipulates the supervision of and control measures for transport of dangerous good (including HNS), in respect of safety;

The Port Law of the People's Republic of China provides for supervision measures for safe carriage of dangerous goods into and out of ports.

2. Legislations

Regulations Governing Safety Control of Dangerous Chemicals of the People's Republic of China – a set of generic administrative rules for the purpose as shown by the title, which specify requirements on production, sale, stockpiling, transport and use of dangerous chemicals and disposal of abandoned dangerous chemicals;

Regulations Governing Traffic Safety Administration for Inland Waterways of the People's Republic of China clearly set out the requirements for ships carrying HNS in inland waterways.

3. Rules and Regulations

Regulations Governing Supervision and Control of Ships Carrying Dangerous Goods are regulations promulgated by the Ministry of Communication of the People's Republic of China specifically for ships carrying dangerous goods.

Rules Governing Water-Borne Transportation of Dangerous Goods (also known as national dangerous goods code) are technical rules for domestic transportation of dangerous goods.

4. Guides

The framework guides for programmes of public emergency response are formulated and revised by relevant organs and agencies under the State Council, and by various provinces, municipalities and autonomous regions. In 2002, the Guide for Drawing up Emergency Plans against Marine Pollution Emergencies Caused by Ships was developed under the auspice of the Maritime Safety Administration of China.

IV. Policy of the Chinese Government

(i) Policy for Prevention and Control of HNS Accidents

In light of their characteristics and causes, HNS accidents can be prevented by improving the quality of professional personnel, supervision and control of ships carrying bulk HNS, good management of ports and terminals, and prevention of traffic accidents etc.

- *Improvement of the quality of professional personnel* includes raising the awareness of professional personnel for safety and environment protection as well as implementation of the pre-job training scheme. Seafarers have to undergo special training in safety awareness and safe operation in accordance with STCW Convention, and will be offered jobs only after they have passed relevant examinations. Personnel engaged in loading and unloading operation and in administration will receive training on safety awareness.

- *Control of ships.* Safety administration and pollution prevention are achieved through ship inspection, PSC/FSC, and implementation of a declaration and approval scheme for ships carrying HNS, besides enforcement of MARPOL73/78 Convention, IBC/BCH Codes, ISM Code. A licensing system is established for operation in ports and terminals involved in handling HNS. Safety inspection onboard ships/on shore is carried out and an emergency plan is required. Compulsory pilotage is provided for major ships carrying HNS in key water areas. VTS is used as a tool for targeting ships in a supervision and control system. According to ISM Code, shipping companies must establish and strengthen their management in safety and pollution prevention.

(ii) Strategy for Emergency Response to HNS Accidents (Strategy)

1. Emergency Response System

On 31 March 2000, the Ministry of Communications and the State Environment Protection Administration jointly promulgated Emergency Plan of China against Oil Spills from Ships at Sea and oil spill emergency plans for the north sea area, the east sea area, the south sea areas and the Taiwan Strait waters. These plans became effective on 1 April 2000. In order to keep abreast with development and meet the needs in delivering the plans, the Maritime Safety Administration of China revised in 2004 the Emergency Plan of China against Oil Spills from Ships at Sea and will issue it as the State Emergency Plan of China against Marine Pollution from Ships (not promulgated yet), according to the Decision of the State Council on Implementation of the General Emergency Plan for Response to Public Incidents and the Framework Guide of the State Council for Establishing and Strengthening Emergency Response Mechanism and Developing Emergency Response Plans. The new State Emergency Plan covers HNS accidents. The original plans for different sea areas are modified and used as provincial emergency plans. Today, four tiers of HNS emergency plans have basically taken shape at national, provincial, municipal and port (terminal) levels.

2. Resources for Response to HNS Accidents

Emergency response to ships carrying HNS is an important part of maritime emergency response and is closely linked with maritime search and rescue. The emergency response system for maritime rescue is one of the 25 specialized emergency response systems built up in China. The Maritime Search and Rescue Centre of China is in charge of organization and coordination for maritime search and rescue. Search and rescue centres at provincial level are established in the provinces, municipalities and autonomous regions. There are sub-centres under the provincial centres. There is also a search and rescue centre for the Yangtse River. Each prefecture and city along the coast is building up its own maritime search and rescue centre. Three rescue bureaux have been established in the north sea, east sea and south sea areas respectively, with full financial support from the Chinese Government. They are the specialized forces responsible for maritime rescue. The

three rescue bureaux have their bases and will be ready around the clock and in all-weather conditions. The areas under their responsibilities are the north sea area and Heilongjiang River, the east sea area and the Yangtse River, and the south sea areas and the Pearl River estuary respectively.

For the study of technical problems with ships carrying HNS and follow-up of technical codes such as IMDG Code, the Ministry of Communications has set up a centre in Dalian to study HNS transportation, perform technical assessment of conditions for HNS transportation and provide services like technical training and consultancy for HNS transportation. At the same time, the Maritime Safety Administration of China and its subsidiary bodies have set up an expert system to deal with emergencies, which is composed of experts from the fields of navigation, maritime affairs, petrochemical industry, fire-fighting, health, environment protection, oceanography, meteorology, and safety administration. Its main role is to analyse the damage and its development following accidents, to provide basis and options for timely and feasible decisions to perform rescue operations, as well as participate in studies related to rescue and to the development and review of rescue plans.

Emergency rescue forces consist of specialized teams and volunteers, responsible for on-site engineering rescue, fire-fighting, warding-off, evacuation, monitoring, search and rescue, and medical aid etc. When dealing with cases of HNS accidents, China's maritime emergency rescue forces are mainly composed of professional personnel, because accidents involving dangerous chemicals can produce great hazard, require complicated rescue and assistance technology, and necessitate strong protective measures and rescue personnel of high quality, particularly in engineering rescue, fighting fires involving chemicals, monitoring the environment of accident sites, and medical aid etc, which call for professional personnel and specialized equipment and apparatus.

As determined by the state of work arrangement and capabilities of China's rescue and assistance forces in this field, emergency rescue in accidents involving chemicals is mainly undertaken by the State Emergency Rescue and Assistance Centre for Accidents Involving Chemicals (the State Registry Centre for Chemicals), the specialized fire-fighting brigades of the public security authorities and the antichemical armed forces, as well as professional emergency rescue teams within chemical companies. When accidents occur, agencies in charge of environment protection are responsible for checks and

measurements, while the oceanic administration and maritime administration will take care of some monitoring at sea.

Compared to oil spills, accidents caused by ships carrying HNS will impose greater need for evacuation of population ashore. Such evacuation will rely upon the local governments.

In addition, chemical industry including warehousing entities is one of the important forces in rescue and assistance in case of accident involving HNS carried by ships. Pursuant to relevant laws and legislations, ports and terminals engaged in handling operation for HNS cargoes shall have necessary equipment and apparatus besides their work on emergency plans.

3. Principles of and Procedures for HNS Emergency Response (Tactics)

Principles of HNS Emergency Response:

- The first priority is to save, evacuate and/or aid people;
- The first suspect material is HNS in monitoring and responding to an accident, if the real material involved is not known;
- Control of source of hazard comes before prevention of spreading of accidents;
- Damage to environment should be prevented or alleviated as far as possible, especially to resources with environmental sensitivity.

Emergency response includes four stages, i.e. preparation, initial response, further response and rehabilitation. The emergency response mechanism is composed of four basic elements of coordinated command, step-by-step response, reliance on local forces and mobilization of the public. The main steps are as follows:

- Reception and processing of information on accidents, which are undertaken by local maritime search and rescue centres;
- Analysis of accidents, which includes the following elements:
 - a. persons and ships within the area in danger, as well as protection of personnel engaged in emergency response and residents in areas nearby;

- b. materials involved in accidents, nature and causes of accidents, time and location of accidents, time length of fire and/or spills;
 - c. scope and damage severity of accidents;
 - d. type, structure and size of ships and terminals in accidents, and distribution of ships and buildings in adjacent areas;
 - e. meteorology, sea conditions and their forecasts in the accident area;
 - f. disaster consequence that might follow an accident and the possible maximum damage of an accident;
 - g. persons, ships, buildings, areas and environment to be protected after an accident;
 - h. need for emergency rescue and available human and material resources;
- Decisions to respond. Based on analysis mentioned above, decisions have to be made to:
 - a. determine areas in danger, buffer zones, safety areas and work area on site;
 - b. prioritize targets for emergency rescue;
 - c. determine areas and targets for priority protection;
 - d. emergency resources to be mobilized;
 - e. strategy and action plan for search and rescue, emergency evacuation of persons and ships, and establishment of places of refuge;
 - f. social support and international assistance in respect of emergency rescue.
- Warning and public notice. Issuance of public notice of emergencies is to spread the important information on accidents, their impact and scope, potential hazard to public health and environment. It is also to publicize measures for self-protection, and route of evacuation and place of refuge in case of evacuation being the option.
- Dealing with emergency. It is necessary to work out detailed and practicable programmes, particularly in respect of fire-fighting and engineering rescue, search and aid for lives, medical care and treatment, control and clean-up of pollution etc., define terms of reference for different levels of the command system to deploy rescue forces, adopt suitable measures, optimize the utilization

of human resources, follow applicable procedures to dispatch equipment, apparatus, materials and medicine, and coordinate the work of all rescue teams.

- Safe protection of rescue personnel. Safe measures must be adopted to protect all rescue personnel.
- Safe protection of the mass. Accidents involving ships carrying HNS in areas near shore or ports would threaten the safety of life and health of people in the port or on the ship. Evacuation of people is mainly undertaken by local governments, specifically their departments responsible for public security, welfare, and community affairs. Sometime volunteers would participate in assistance. Besides evacuation of people ashore, it might also be necessary to evacuate people from ships nearby under the coordination of maritime search and rescue centres.
- Monitoring and assessment of accidents. Relevant departments are responsible for monitoring and assessing the scale and impact of accidents, meteorological conditions, pollution to food, potable water, health and body of water, coastline, sea food, agricultural produce, possible hazardous materials and explosion risks resulting from second reaction, and hold-up areas of pollutants.
- News conference.
- End of emergency response.
- Post-emergency settlement. Medical departments are responsible for saving and treating the injured and the welfare department of local government concerned for placement of personnel and settlement of death claims. Legislations are very clear for disposal of pollutants. Generally speaking, environment protection agency will be in charge of disposing pollutants ashore.
- Insurance and settlement of claims. There are no specialized laws applicable to compensation for damage from dangerous chemicals and cases are settled by reference to the principles of oil pollution compensation.
- Casualty investigation and experience gained from emergency response. The maritime safety administration is responsible for casualty investigation and experience accumulation, to revise emergency plans accordingly.

4. Human resources for emergency response after HNS accidents

Human resources cover special teams, volunteers and other persons concerned. Like other emergency assistance, emergency response to ships carrying HNS requires commanders, on-site rescuing personnel, teams of experts, and logistic support etc. Due to the potentially serious hazard and complex nature of HNS accidents, emergency response most probably needs specialized equipment and rescue teams who have undergone special training, especially on-site rescue teams capable of dealing with chemicals, fire-fighting brigades, monitoring personnel and medical care staff etc. Specialized teams include full-time teams and part-time teams who have received proper training. Such teams are mainly special fire-fighting brigades in different regions, full-time or part-time rescue teams of ports, terminals, warehousing enterprises and the chemical manufacturing industry, full-time maritime rescue teams, personnel working in chemical emergency centres set up by the state and located in various parts of the country, full-time monitoring personnel in environment protection agencies, medical care staff who are trained for this purpose, specialized clean-up teams for marine pollution etc.. The local maritime safety administrations have established contacts with other institutions and departments through emergency plans and actual response. Meanwhile, the liaison methods used by manufacturers and transport companies are made known in the process of declaration and approval for transportation of HNS by ships.

The above-mentioned special forces are mainly deployed in on-site rescue and follow-up rehabilitation. Chemical emergency response needs advice and guidance from professional forces on rapid decisions and emergency rescues. The expert teams should include experts on chemistry, naval architecture, oceanography and meteorology, environment protection, medical care, fire-fighting, maritime navigation, law, salvage etc. logistic support teams will be similar to those for other emergencies. Today, the Maritime Safety Administration of China and its subsidiary bodies have built up an expert system to deal with accidents.

The main task in assuring human resources is to train the professionals, volunteers and other emergency personnel. At present, China has set up training institutions of related disciplinaries and is conducting training on emergency response for ships carrying HNS in the whole system and at different levels. The Maritime Safety Administration of China is considering knowledge training for existing professional clean-up teams and maritime search and rescue forces on tackling accidents involving dangerous chemicals, so that they

can undertake more response tasks. This is also one of the approaches and tasks in building up an emergency response system for ships carrying HNS.

5. Compensation in connection with HNS

China has consistently attached great importance to compensation in connection with HNS, followed closely the development of relevant international conventions, and done some follow-up study on HNS Convention. The Ministry of Communications has thrice studied the issue of establishing a compensation scheme for damage caused by pollution from sources other than oil tankers. Now, China is considering the necessity and feasibility to ratify HNS Convention or to establish a national HNS fund.

V. Conclusion

1. The volume of HNS carried by ships is ever-increasing along the coast of China, thus posing a grave threat from HNS accidents. Therefore, maritime safety and pollution prevention in connection with water-borne carriage of HNS has become one of the great concerns of the Chinese Government.

2. China has built up a relatively healthy legal system for prevention of and response to HNS accidents.

3. After effective enforcement of relevant international conventions and national laws, the Chinese Government has adopted measures to enhance the quality of the professionals, strengthen the control of ships carrying bulk HNS, improve the management of cargo handling operation in ports and terminals etc, in order to prevent accidents involving ships carrying HNS.

4. While an emergency response system for spillage of oil from ships is being built up, the emergency response system at four levels for HNS accidents is taking shape.

5. The main resources for response to HNS accidents include: professional maritime

search and rescue forces, the State Emergency Rescue and Assistance Centre for Accidents Involving Chemicals, the specialized fire-fighting brigades of the public security authorities and the antichemical armed forces, as well as professional emergency rescue teams within chemical companies. Institutions and expert teams in the field of environment monitoring and study provide strong support to emergency response to HNS accidents.

6. The principles and procedures of China's emergency response system for ships carrying HNS is relatively healthy and this has been illustrated in the cases mentioned.

7. China has set up training institutions for the related disciplinaries, which are carrying out training at different levels of the whole system on emergency response to ships carrying HNS. It is hoped that international cooperation could be strengthened in this field.

8. China has always paid great attention to the issue of compensation for damage from pollution by HNS, and is considering ratification of the HNS Convention or establishment of a national HNS fund.
