Consideration of a marine oil contingency plan for China

Guo Mei Tang

Follow this and additional works at: https://commons.wmu.se/all_dissertations

Recommended Citation
https://commons.wmu.se/all_dissertations/829

This Dissertation is brought to you courtesy of Maritime Commons. Open Access items may be downloaded for non-commercial, fair use academic purposes. No items may be hosted on another server or web site without express written permission from the World Maritime University. For more information, please contact library@wmu.se.
WORLD MARITIME UNIVERSITY
Malmö, Sweden

CONSIDERATION OF A MARINE OIL CONTINGENCY PLAN FOR CHINA

by

TANG GUO MEI
PEOPLE'S REPUBLIC OF CHINA

A dissertation submitted to the World Maritime University in partial fulfillment of the requirements for the award of the

DEGREE OF MASTER OF SCIENCE

IN

GENERAL MARITIME ADMINISTRATION

Year of Graduation

1992
I certify that all material in this dissertation which is not my own work has been identified and that no material is included for which a degree has been previously conferred upon me.

The contents of this dissertation reflect my personal views and are not necessarily endorsed by the University.

(signature) [Signature]
(Date) 1 Nov. 1992

Supervised and assessed by:

Theodore Sampson
Course Professor
World Maritime University

Co-assessed by:

Commander Edmond P. Thompson
USCG
Head of Oil Pollution Co-ordination Center and Advisor on Marine Pollution Environmental Division
International Maritime Organization
London
DEDICATION

TO MY MOTHER-IN-LAW, XUE JIE MEI AND
MY SON, WEI ZHI YING.
Acknowledgements

I wish to express my profound gratitude to the following for helping me make this study a reality.

The Ministry of Communications of the People’s Republic of China for nominating me to study General Maritime Administration course at the World Maritime University.

The International Maritime Organization for sponsoring my scholarship at WMU.

Professor Ted Sampson for his enlightening guidance and encouragement.

Mr. Y. Boixel for his encouragement and help.

Mr. Lao Hui, Chief of Ship Pollution Prevention Division of the Harbor Superintendency Administration of P. R. China who kindly accepted my interview and provided me with valuable information.

Professor Pu Bao Kang of Dalian Maritime University of P. R. China for his constant concern for my study in WMU.

Commander Edmond P. Thompson for his evaluation of my dissertation.

U.S. Coast Guard Headquarters, Marine Environmental Protection Division and Canadian Coast Guard, Environmental Response and Emergency Planning Division for their kind arrangements for my on-the-job training.

Ms. Suganda Pannak for her help and encouragement.

Capt. Soe Win for his sincere help and friendship.

Last but not least, I would like to thank my parents both of them are over 80, my husband and my brothers for their constant love and encouragement.
List of Tables

1.1 China Oil Reserves, Production and Consumption ... 2

1.2 World Offshore Daily Average Oil Production by Country -- China ................................. 3

1.3 China Oil Refining Capacity ................................. 3

1.4 Statistical Report by the Port State to IMO of MARPOL 73/78 Effectiveness of Port State Control ........................................ 18

1.5 Waterborne Transportation of Oil in China .......... 20

1.6 Oil Pollution Accidents Happened in Chinese Water ........................................ 22

1.7 12 Accidents Happened along the Chinese Coast ........................................ 25

1.8 Off Shore Oil Spills in China ................................. 26

4.1 Oil Spills and the Compensation ............................... 135
# List of Figures

<p>| Fig. 1-1 | MOC HSA Pollution Prevention Organization | 16 |
| Fig. 2-1 | An Example of a Spill Response Decision Guide | 59 |
| Fig. 3-1 |  | 73 |
| Fig. 3-2 |  | 73 |
| Fig. 3-3 | USA Federal Agency Membership National Response Team | 75 |
| Fig. 3-4 | Incident Response Chart | 78 |
| Fig. 3-5 |  | 80 |
| Fig. 3-6 |  | 80 |
| Fig. 3-7 | National Response Mechanism | 84 |
| Fig. 4-1 | Status of the Funds | 123 |
| Fig. 4-2 | Compensation for Oil Pollution Damage in Respect of Any One Incident Involving a Laden Tanker | 124 |</p>
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADEC</td>
<td>Alaska Department of Environmental Conservation</td>
</tr>
<tr>
<td>ADSC</td>
<td>The Alyeska Oil Spill Coordinator</td>
</tr>
<tr>
<td>CERCLA</td>
<td>The Comprehensive Environmental Response, Compensation, and Liability Act</td>
</tr>
<tr>
<td>CLC</td>
<td>International Convention on Civil Liability for Oil Pollution Damage, 1969</td>
</tr>
<tr>
<td>COPT</td>
<td>Captain of the Port</td>
</tr>
<tr>
<td>CSA</td>
<td>Canada Shipping Act</td>
</tr>
<tr>
<td>DOD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>DOI</td>
<td>Department of Interior</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>ERT</td>
<td>Environmental Response Team</td>
</tr>
<tr>
<td>FOSC</td>
<td>Federal On-scene Commander</td>
</tr>
<tr>
<td>FWPCA</td>
<td>The Federal Water Pollution Act</td>
</tr>
<tr>
<td>HSA</td>
<td>Harbor Superintendency Administration</td>
</tr>
<tr>
<td>IHBA</td>
<td>Intervention on the High Seas Act/</td>
</tr>
<tr>
<td>IOPC</td>
<td>International Oil Pollution Compensation</td>
</tr>
<tr>
<td>LCP</td>
<td>Local Contingency Plan</td>
</tr>
<tr>
<td>MEP</td>
<td>Marine Environmental Protection Branch</td>
</tr>
<tr>
<td>MEPL</td>
<td>Marine Environmental Protection Law of PRC</td>
</tr>
<tr>
<td>MOC</td>
<td>Ministry of Communications</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of Energy</td>
</tr>
</tbody>
</table>
MPCF  The Maritime Pollution Claims Fund
MSO  Marine Safety Office
NCP  National Contingency Plan
NRC  National Response Center
NRT  National Response Team
NSF  National Strike Force
OERR  Office of Emergency and Remedial Responses
OPA  Oil Pollution Act
OSC  On-scene Commander
PIAT  Public Information Assist Team
PRC  People's Republic of China
RCP  Regional Contingency Plan
RRT  Regional Response Team
SAR  Search and Rescue
SARA  Superfund Amendments Reauthorization Act
SOPF  Ship-source Oil Pollution Fund
SSC  Scientific Support Coordinator
TAPS  Trans-Alaska Pipeline system
TDVA OP  Tanker Owners Voluntary Agreement Concerning Liability of Oil Pollution
USCG  US Coast Guard
# TABLE OF CONTENTS

Acknowledgments
List of Tables ........................................................................ i
List of Figures ........................................................................ ii
Abbreviations ......................................................................... iii

## CHAPTER ONE: THE NECESSITY FOR NATIONAL OIL CONTINGENCY PLAN

1-1 China’s Marine Environment Protection Policy .. 1

1-1-1 Basic Facts ................................................................. 1

1-2 Historical Development of Chinese Marine Pollution legislation ........................................... 4

1-1-2-1 The Early Period ..................................................... 4

1-1-2-2 The Formative Period ............................................. 5

1-1-2-3 The Period of Emergence ...................................... 6

1-1-2-4 The Marine Environmental Protection Law of PRC ......................................................... 6

1-1-2-5 The Regulations Concerning the Prevention of Pollution of Sea Areas by Vessels .......... 7

1-1-2-6 The Regulation for Dumping at Sea ....................... 9

1-1-2-7 The Regulation on Prevention of Environmental Pollution by Ship-breaking ................. 9

1-1-2-8 The Water Pollution Prevention Law ................. 9

1-1-2-9 The National Discharge Standards for Polluted Substances from Vessels GB32-83 .......... 10

1-2 The implementation of International Marine Pollution Prevention conventions in China ...... 10

1-2-1 CLC Convention 1969 .............................................. 10

1-2-2 1976 Protocol to CLC 1969 ................................. 11

1-2-3 MARPOL 73/78 ....................................................... 11
CHAPTER TWO: BASICS ABOUT A NATIONAL CONTINGENCY PLAN

2-1 Consideration Before Contingency
Plan Writing ........................................ 39
2-1-1 Designation of Authority Responsible for Development of a Plan ........................................ 39
2-1-2 Identification of Areas of High Spill Risk .. 41
2-1-3 Fate of Oil Spills in the Marine Environment. 42
2-1-4 Coastal Sensitivity Mapping ................................. 43
2-1-5 Oil Spill Response Policy ................................. 45
2-1-6 Organization for Response ................................. 47
2-2 National Oil Spill Contingency Plan ................. 50
2-2-1 Definition .................................................. 50
2-2-2 Purpose and Objectives .................................... 51
2-2-3 Scope and Content of the Plan ......................... 51
2-2-4 Reporting Systems ........................................ 54
2-2-5 Alerting System ........................................... 55
2-2-6 Spill Assessment ........................................... 56
2-2-7 Salvage and Cargo Removal Considerations ... 57
2-2-8 Response Decisions ........................................ 58
2-2-9 Clean-up Operations ....................................... 60
2-2-10 Communication ............................................ 63
2-2-11 Disposal of Recovered Oil and Oily Debris ... 65
2-2-12 Record Keeping and Preparation of Claims ... 65
2-2-12-1 Identification of the Polluter ...................... 66
2-2-13 Public Relations ........................................... 67
2-2-14 Training and Exercises ................................ 68
2-2-15 Plan Revision ............................................. 69√

CHAPTER THREE: USA NATIONAL RESPONSE SYSTEM ANALYSIS

3-1 Introduction of the National Response System . 70
3-1-1 Federal Response Statutes ............................... 71
3-1-2 Federal Regulatory Structure .......................... 74
3-1-2-1 National Response Team .............................. 74
3-1-2-2 Regional Response Team .............................. 74
3-1-2-3  Local Contingency Plan ........................................ 76
3-1-2-4  Federal On-scene Coordinator .................................. 76
3-1-2-5  National Response Centre ........................................ 77
3-1-3   USCG/EPA Response Structures ...................................... 79
3-1-4   Local Response Community ......................................... 81
3-1-4-1  The Coast Guard’s National Strike Force ..................... 82
3-1-4-2  Environmental Response Teams ................................... 82
3-1-4-3  Public Information Assist Team .................................. 82
3-1-4-4  Scientific Support Coordinator ................................. 83
3-1-5   Summary .............................................................. 83
3-2    Exxon Valdez Case Study .............................................. 85
3-2-1   Introduction of the Incident ....................................... 85
3-2-2   Contingency Plans and Preparedness .............................. 86
3-2-2-1  The Alyeska Plan .................................................. 86
3-2-2-2  Captain of the Port Prince William Sound
          Pollution Action Plan ............................................... 88
3-2-2-3  National and Regional Contingency Plans ................. 88
3-2-2-4  State of Alaska Contingency Plan and Response
          Program .............................................................. 89
3-2-2-5  The Exxon Plan .................................................. 90
3-2-3   Analysis of Contingency Plans .................................... 90
3-2-3-1  Contingency Plan Coordination ................................ 91
3-2-3-2  Implementation of Alyeska Plan ............................... 93
3-2-4   Response Organization ............................................. 95
3-2-5   Inexperience of Personnel ........................................ 99
3-2-6   Equipment ........................................................... 101
3-2-6-1  Availability of Equipment ....................................... 101
3-2-6-2  Boom Connection ................................................ 101
3-2-6-3  Insufficient Tankage for the Recovered Oil ............... 102
3-2-7   Public Information ................................................ 104
3-2-8   Summary .............................................................. 104
# Chapter Four: Canadian Experience on the Ship-source Oil Pollution Fund

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1</td>
<td>Origin of the SOFP</td>
<td>107</td>
</tr>
<tr>
<td>4-1-1</td>
<td>Arrow Incident</td>
<td>108</td>
</tr>
<tr>
<td>4-1-2</td>
<td>Irving Whale Incident</td>
<td>109</td>
</tr>
<tr>
<td>4-1-3</td>
<td>Principle Elements of the Part XX of the Act</td>
<td>109</td>
</tr>
<tr>
<td>4-1-4</td>
<td>Financing the MPCE</td>
<td>110</td>
</tr>
<tr>
<td>4-1-5</td>
<td>Kurdistan Incident - First Test of the Regime</td>
<td>111</td>
</tr>
<tr>
<td>4-1-5-1</td>
<td>The Incident</td>
<td>111</td>
</tr>
<tr>
<td>4-1-5-2</td>
<td>Extensive Litigation</td>
<td>112</td>
</tr>
<tr>
<td>4-1-5-3</td>
<td>The Cause of the Incident</td>
<td>113</td>
</tr>
<tr>
<td>4-1-5-4</td>
<td>Settlement of the Claims</td>
<td>114</td>
</tr>
<tr>
<td>4-2</td>
<td>Amendments to the Part XX of the Act</td>
<td>115</td>
</tr>
<tr>
<td>4-2-1</td>
<td>1969 CLC Convention</td>
<td>115</td>
</tr>
<tr>
<td>4-2-2</td>
<td>1971 Fund Convention</td>
<td>115</td>
</tr>
<tr>
<td>4-2-3</td>
<td>Main Content of Part XV and XVI</td>
<td>116</td>
</tr>
<tr>
<td>4-2-4</td>
<td>Scope of Application</td>
<td>117</td>
</tr>
<tr>
<td>4-2-5</td>
<td>Liability and Compensation</td>
<td>118</td>
</tr>
<tr>
<td>4-2-6</td>
<td>The Ship-source Oil Pollution Fund</td>
<td>119</td>
</tr>
<tr>
<td>4-2-7</td>
<td>Improvements through the New Amendments</td>
<td>120</td>
</tr>
<tr>
<td>4-3</td>
<td>How the New Compensation Regime Works</td>
<td>122</td>
</tr>
<tr>
<td>4-3-1</td>
<td>For Convention Ships</td>
<td>122</td>
</tr>
<tr>
<td>4-3-2</td>
<td>For Other Type of Ships</td>
<td>122</td>
</tr>
<tr>
<td>4-3-3</td>
<td>Claimants against the SOFP</td>
<td>122</td>
</tr>
<tr>
<td>4-4</td>
<td>Possible New Levy on the Industries</td>
<td>125</td>
</tr>
<tr>
<td>4-4-1</td>
<td>Background</td>
<td>125</td>
</tr>
<tr>
<td>4-4-2</td>
<td>Internal Review and Public Review</td>
<td>126</td>
</tr>
<tr>
<td>4-4-3</td>
<td>Major Findings</td>
<td>126</td>
</tr>
<tr>
<td>4-4-4</td>
<td>Major Recommendations</td>
<td>130</td>
</tr>
</tbody>
</table>
CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5-1 Present Structure for Marine Oil Spill Response in China .......................... 138
5-1-1 SAR Centre ..................................... 139
5-1-2 Environment Protection Agency .......................... 139
5-1-3 State Oceanic Bureau .................................. 139
5-1-4 Harbor Superintendency Administration .......... 140
5-1-5 Fishing Administration .................................. 140
5-1-6 Navy and Air Force ..................................... 140
5-1-7 Rescue and Salvage Bureau .......................... 141
5-1-8 Conclusion .................................................. 141
5-2 Oil Spill Contingency Plan .......................... 142
5-3 Possible Needed Structure for Oil Spill Response .................. 143
5-3-1 Three-tiered Structure .......................... 143
5-3-2 National Level .............................................. 144
5-3-2-1 Navy and Air Force ..................................... 144
5-3-2-2 Ministry of Foreign Affairs .......................... 144
5-3-2-3 Ministry of Public Security .......................... 145
5-3-2-4 Ministry of Petroleum .................................. 145
5-3-2-5 Ministry of Post and Telecommunications ....... 145
5-3-2-6 Ministry of Communications .......................... 146
5-3-2-7 Ministry of Foreign Trade .......................... 147
5-3-2-8 Ministry of Agriculture, Animal husbandry and Fishing .......................... 147
5-3-2-9 State Bureau of Meteorology .......................... 148
5-3-2-10 National Oceanic Bureau .......................... 148
5-3-2-11 National Environment Protection Agency .... 148
5-3-2-12 Ministry of Geology and Minerals .................. 149
5-3-2-13 Possible Main Task of the National
     Level Structure ........................................ 150
5-3-3  Provincial Level ...................................... 150
5-3-3-1 Possible Main Tasks of the Provincial Level .... 151
5-3-4  Local Level ........................................... 152
5-3-4-1 Harbor Superintendency Administration Branch 152
5-3-4-2 Environment Protection Agency Sub-branch ...... 152
5-3-4-3 Port Authority ....................................... 153
5-3-4-5 Fishing Administration and Fishing Harbor
     Superintendence ........................................ 153
5-3-4-6 Navy .................................................. 154
5-3-4-7 Rescue and Salvage Bureau Branch ............... 154
5-3-4-8 Fire Brigade ......................................... 154
5-3-4-9 Enterprises Which Have Response Capability .. 155
5-2-4 Possible Tasks for Local Level Structure ......... 155
5-4 Role of MOC within the Possible Structure ......... 156
5-4-1 SAR System ............................................. 156
5-4-2 HSA Structure and Experiences ...................... 156
5-4-3 Rescue and Salvage Capability ....................... 157
5-4-4 Equipment Capability in MOC ......................... 157
5-5 Response Force ........................................... 158
5-5-1 National Response Force ............................... 158
5-5-2 Local Response Force ................................ 159
5-5-2-1 Coastal Force ....................................... 159
5-5-2-2 Offshore Force ..................................... 159
5-6 Equipment ................................................ 159
5-6-1 Exxon Valdez Lesson ................................... 160
5-6-2 Rough Idea about China's Equipment ............... 160
5-6-3 Possible Places to be Assigned as the
     Inventory Places ...................................... 161
5-7 Marine Oil Spill Pollution Fund ....................... 161

xi
<table>
<thead>
<tr>
<th></th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-7-1</td>
<td>Establishment of a Fund in China</td>
<td>161</td>
</tr>
<tr>
<td>5-7-2</td>
<td>MOC Role in the Possible Fund Organization</td>
<td>163</td>
</tr>
<tr>
<td>5-8</td>
<td>Telecommunication System</td>
<td>163</td>
</tr>
<tr>
<td>5-9</td>
<td>Training</td>
<td>165</td>
</tr>
<tr>
<td>5-9-1</td>
<td>Establishment of a Training Centre</td>
<td>165</td>
</tr>
<tr>
<td>5-9-2</td>
<td>On Science Drills</td>
<td>165</td>
</tr>
</tbody>
</table>
Chapter One

The Necessity for National Oil Contingency Plan

1-1 China’s Marine Environment Protection Policy

1-1-1 Basic Facts

China is a country with a population of 1.1 billion, population of which one third are living along its 18,000 km coastline *1 (32000 km including island coastline) *3 with 60 large and medium sized ports. *1

At the same time, China is also a big oil producing and consuming country with oil reserves of up to 3288 million tons and with annual capability of oil production up to 139 million tons, oil consumption of 104 million tons and oil refinery capacity up to 110 million tons in 1990. (see Tables 1-1 and 1-3). *2

In addition to the active land oil field exploitation, China’s offshore oil production is developing rapidly, (see Table 1-2) *2

Source:

*2. Shipping statistics yearbook 1990, ISL
*3. Water Transport Research Institute Report 1989, China
With the long coastlines, large volume of oil production, consumption and oil refinery capacity, the oil movement in China is very intensive along the coastline. This poses a threat to the Chinese marine environment.

Table 1-1

CHINA OIL RESERVES, PRODUCTION AND CONSUMPTION

(1975-1990)

<table>
<thead>
<tr>
<th>Year</th>
<th>Reserves</th>
<th>Production</th>
<th>Consuming</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>2740</td>
<td>77.0</td>
<td>68.1</td>
</tr>
<tr>
<td>1980</td>
<td>2789</td>
<td>105.8</td>
<td>90.3</td>
</tr>
<tr>
<td>1985</td>
<td>2505</td>
<td>124.9</td>
<td>90.0</td>
</tr>
<tr>
<td>1986</td>
<td>2400</td>
<td>130.6</td>
<td>101.4</td>
</tr>
<tr>
<td>1987</td>
<td>2521</td>
<td>132.9</td>
<td>104.0</td>
</tr>
<tr>
<td>1988</td>
<td>3226</td>
<td>137.0</td>
<td>103.0</td>
</tr>
<tr>
<td>1989</td>
<td>3228</td>
<td>139.0</td>
<td>104.0</td>
</tr>
<tr>
<td>1990</td>
<td>3288</td>
<td>139.0</td>
<td></td>
</tr>
</tbody>
</table>

(in mill tons)

Source:
Table 1-2

World Offshore Daily Average Oil Production by Country
CHINA  (1985-1990)

(in 1000 b/d *)

<table>
<thead>
<tr>
<th>Year</th>
<th>production</th>
<th>% share of Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>2.5</td>
<td>0.0</td>
</tr>
<tr>
<td>1986</td>
<td>1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1987</td>
<td>1.3</td>
<td>0.0</td>
</tr>
<tr>
<td>1988</td>
<td>2.9</td>
<td>0.0</td>
</tr>
<tr>
<td>1989</td>
<td>16.7</td>
<td>0.1</td>
</tr>
<tr>
<td>1990</td>
<td>21.3</td>
<td>0.1</td>
</tr>
</tbody>
</table>

* b/d barrel per day

Source: Shipping Statistics Yearbook 1990  ISL

Table 1-3

CHINA OIL REFINING CAPACITY
(1975-1990)

(in mill tons)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>90.5</td>
<td>107</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Source: Shipping Statistics Yearbook 1990  ISL
1-1-2 Historical Development of Chinese Marine Pollution Legislation

According to Fan Zhijie, * three historical periods may be defined in the development of legislation concerned with the protection of coastal waters in China. These are the early period (to 1965), the formative period (1966-76), and the period of emergence (1977 to the present).

1-1-2-1 The Early Period

The years from the founding of the People’s Republic of China in 1949 up to 1965 were characterized by a general lack of public attention to problems relating to coastal pollution in China. Industrial development was not intense during this period, and few coastal pollution problems existed to require the introduction of legislation aimed specifically at reducing marine pollution. However, certain regulations were enacted during this period to deal with the exploitation of marine resources. As early as 1950, the State Council promulgated the DRAFT REGULATIONS FOR MINERAL EXPLOITATION, and in 1955, the REGULATIONS ON FORBIDDEN FISHING GROUNDS IN THE BOHAI, HUANGHAI AND DONGHAI SEAS were passed.

1-1-2-2 The Formative Period

The decade from 1966 to 1976 was a time of great change in coastal pollution in China. The Cultural revolution gave rise to massive expansion of coastal industries, with little or no regard for their effects upon the environment. Pre-existing regulations were largely ignored during this phase of industrial development, emphasis being placed upon productivity rather than on the impacts of such development on natural resources. As a result, the water quality in many coastal areas suffered serious deterioration.

In 1973, the First National environmental Protection Conference was held in Beijing. This conference is now considered to have marked the beginning of an emerging public awareness of marine environmental pollution in China, and was in many ways a turning point between the previous exploitation of coastal zones and the current efforts to protect these areas and their important resources. The conference passed a resolution to protect and improve environmental quality through the rational use of natural resources, and called for a strengthening of administrative agencies dealing with marine pollution and the enactment of further regulations designed to protect coastal zones.

In 1974, the State Council promulgated the DRAFT REGULATIONS FOR THE PROTECTION OF COASTAL MARINE ENVIRONMENT, including ten provisions for preventing the discharge of oil and other contaminants into coastal waters. These regulations were the first to deal specifically with pollution of the coastal zone in China, and were a forerunner of the present legislation.
1-1-2-3 The Period of Emergence

In the period from 1977 to the present, two historic events had great impacts upon environmental protection in China. The first of these occurred in 1978, when the CONSTITUTION OF THE PRC was passed by the Fifth National People's Congress. The Constitution stipulates that "... the State shall protect the environment and natural resources, preventing pollution and the adverse social effects caused by pollution... ". This was the first occasion on which environmental matters had been specifically included in the Constitution, and laid a foundation for the enactment of new legislation on environmental protection in both terrestrial and aquatic ecosystems in China. Thus, in 1979, THE ENVIRONMENTAL PROTECTION LAW OF THE PRC was passed, and this legislation formed both a general and specific framework for the future protection of the environment, including that of coastal waters.

1-1-2-4 The Marine Environmental Protection Law of PRC

The second historic event concerned with marine pollution in China was the passing of the MARINE ENVIRONMENTAL PROTECTION LAW OF PRC (MEPL). The purpose of the MEPL is to protect the marine environment and resources, prevent pollution damage, maintain ecologic balance, safeguard human health and promote the development of marine programs, the 5th Chinese National People's Congress, on 23 August 1982, at the 24th session of the Standing committee, adopted the MEPL. It was promulgated under the No.9 Decree of the President and came into force from 1 March 1983.
The adoption of this law was a big step in protecting the environment in China.

It covers the prevention of pollution damage to the marine environment by coastal construction projects, by offshore oil exploration and exploitation, by land based pollutants, by vessels and by dumping of wastes. In the 5th chapter, PREVENTION OF POLLUTION DAMAGE TO THE MARINE ENVIRONMENT BY VESSELS, it clearly states that no vessel shall discharge oils, oily mixtures, wastes and other harmful substances into the sea areas under the jurisdiction of the People’s Republic of China in violation of the provisions of this Law.

The law recognizes the need to coordinate with previous legislation and with international conventions, and attempts to marry the drive for the exploitation of marine resources in China with the need for appropriate protection of marine environment.

1-1-2-5 The Regulations Concerning the Prevention of Pollution of Sea Areas by Vessels

In order to enforce the Law of Marine Environmental Protection of the PRC, to prevent pollution of sea areas by vessels and to preserve the marine ecological environment, the State Council of the People’s Republic of China on December 29, 1983 promulgated THE REGULATIONS CONCERNING THE PREVENTION OF POLLUTION OF SEA AREAS BY VESSELS.

These rules are applicable to both Chinese ships and foreign flag ships within the sea areas and the sea ports under the jurisdiction of PRC, as well as to shipowners and
other individuals.

The authorities in charge of prevention of pollution of marine environment by vessels are the HARBOR SUPERINTENDENCY ADMINISTRATION OF PRC (HSA) which is one department of the Ministry of Communications (MOC).

These rules more or less follow the principles of MARPOL73/78. It covers the following contents.

Part 1. General provisions
Part 2. General rules
Part 3. Anti-pollution documents and equipment for vessels
Part 4. Oil operations and discharge of oily water from vessels
part 5. Dangerous cargoes shipped by vessels
Part 6. Other dirty water from vessels
Part 7. Garbage from vessels
Part 8. Hiring vessels to dump wastes
Part 9. Building, repairing, salvage and scrapping of vessels on or under water
Part 10. Compensation for pollution damage caused by vessels
Part 11. Punishment and reward
Part 12. Supplementary provisions

Article 6 of Part 2 General Rules, requires that when a vessel is involved in an accident of pollution of the sea by oils, oily mixtures, and any other poisonous or harmful substances, this vessel shall immediately take steps to control and eliminate the pollution, submit a written report to the nearest Harbor Superintendency Administration and such Administration will carry out investigations and
take necessary actions.

1-1-2-6 The Regulations for Dumping at Sea

Besides the laws and regulations mentioned above, the State Council, having the same objective, promulgated THE PRC REGULATIONS FOR DUMPING AT SEA on 6 March 1985. The competent authority under these regulations is PRC State Oceanic Administration.

1-1-2-7 The Regulations on Prevention of Environmental Pollution by Ship-breaking

On May 18, 1988, the State Council promulgated REGULATIONS ON PREVENTION OF ENVIRONMENTAL POLLUTION BY SHIP-BREAKING.

According to these regulations the PRC Harbor Superintendency Administration is in charge of the environmental protection of ship-breaking on the water and ship-breaking within the water areas of the comprehensive harbor, and in cooperation with the environmental protection department supervises the environmental protection of the ship-breaking on the coast beyond the harbor water areas.

1-1-2-8 The Water Pollution Prevention Law

In order to prevent water from being polluted, to protect and to improve environment, to safeguard human health and promote the development of socialist modernization construction, on 11 May 1984, the 6th People's Congress adopted WATER POLLUTION PREVENTION LAW at its 5th session. This Law only applies to pollution
prevention for the PRC land surface water column and underground water column such as rivers, lakes, canals, ditches and reservoirs. This Law does not apply to sea area pollution prevention.

This Law is applicable from 1 November 1984.

Following this the detailed code of conduct for this Law was adopted and is applicable from 1 September 1989.

1-1-2-9 The National Discharge Standards for Polluted Substances from Vessels GB32-83

This gives detailed regulations for the implementation of the Marine Environment Prevention Law.

This set of Standards is applicable to both Chinese flag and foreign flag ships and is regulating the discharge of oil-water mixture from tanker ballast, tank washing and bilge as well as sewage and garbage discharges.

1-2 The Implementation of International Marine Pollution Prevention Conventions in China

With the adoption of the Environmental Protection Law of PRC, the open-door policy at the end of 1970s, the rapid growth of its national fleet, its active participation in international shipping activity, with more emphasis on marine environment protection, China acceded to a series of international marine pollution prevention and compensation conventions.

1-2-1 CLC Convention 1969

1-2-2 1976 Protocol to CLC 1969


1-2-3 MARPOL 73/78

On 1 July 1983, China acceded to the International Convention for the prevention of Pollution from ships, 1973 and the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73/78) as well as Annex I—Regulations for the Prevention of Pollution by oil; Protocol I — Provisions concerning Reports on Incidents involving Harmful substances, and Protocol II — Arbitration. They are in force for China on the same day as they are in force themselves. The date is 2 October 1983.

China ratified Annex II — Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk, of MARPOL 73/78 on 1 July 1983. It came into force for China on 6 April 1987. For Annexes III — Regulations for the Prevention of Pollution by Harmful Substances carried by Sea in Packaged Forms, or in freight Container, Portable tanks or Road and Rail Tank Wagons and IV — Regulations for the Prevention of pollution by Sewage from Ships, they
are not yet in force for China.


The 1984 amendment to the Annex to the 1978 Protocol, the 1985 amendments to Protocol I and 1985 amendments to Annex II are also in force for China respectively in 1986 and 1987.

1-2-4 London Dumping Convention 1972


The 1978 Amendments on the prevention and control of pollution by incineration of wastes and other matter and the 1980 Amendments to the annexes to the Convention concerning the list of substances are also in force for China since 1985.

1-2-5 Implementation Mechanism

1-2-5-1 HSA

All the Conventions mentioned above are implemented through the mechanism of the HARBOR SUPERINTENDENCY ADMINISTRATION (HSA) under the Ministry of Communications except the London Dumping Convention which is implemented through the State Oceanic Administration and its branches all over the country.
The HSA of PRC serves as the coast guard in other countries. The HSA plays an active part in maintaining national sovereignty, ensuring water-borne traffic safety and promoting sea transport. Under the leadership of the Ministry of Communications, the HSA is the competent authority responsible for the supervision of the water-borne traffic safety and marine pollution by vessels.

The HSA has its more than 60 subordinate bodies on the coast and inland waters of the relevant provinces, autonomous regions and municipalities. It is responsible for exercising the leadership over the work of every local harbor superintendency administration, which supervises water-borne traffic safety and pollution in its area designated.

The functions of HSA are the following:

Developing the draft of laws and regulations for water-borne traffic safety and prevention of marine pollution in accordance with the national needs and international conventions, of which China is a contracting party;

Implementing and supervising the implementation of the international conventions, national laws and regulations;

Registering vessels and approving the ownership and the right of the vessel to fly the flag of the PRC;

Supervising the manning of vessels in accordance with safety standards, examining marine officers, pilots, crew members and issuing appropriate certificates;

Approving the application of foreign vessels for
entering the ports and organizing the joint safety, customs, immigration and health inspection of the foreign vessels;

Supervising the compulsory pilotage for foreign vessels;

Endorsing the documents of Chinese vessels to enter or leave ports;

Supervising, inspecting and checking the technical, navigational and loading conditions of vessels;

Maintaining water-borne traffic order, carrying out traffic control in important waters, administering the salvage of shipwrecks and sunken objects, ordering the mandatory removal of shipwrecks or objects, obstructing navigation;

Approving the construction of surface and underwater projects and the towage of large units;

Organizing search and rescue at sea;

Approving and eliminating the areas shut to navigation, promulgating navigation warnings;

Controlling the use of the shore lines of harbors, supervising the maintenance of the water depths of navigational channels and aids; and,

Investigating and dealing with the traffic and pollution accidents caused by ships and offshore installations and taking disciplinary actions against
ships, offshore installations or persons concerned.

In the HSA, PRC, there is a Pollution Prevention Division. It also has its branches in each coastal port and river port. (see Figure 1-1)

1-2-5-2 China Search and Rescue Centre

The Search and Rescue Center was a committee type of organization with members from different ministries and the Navy who would play a role in the major search and rescue operations. It was a coordinating and commanding organ for major SAR operation before 1990.

The HSA also plays an important role in major SAR operations. In fact the office for this Search and Rescue Centre is in HSA of PRC. For minor accidents, HSA takes charge; usually the local HSA acts as the local commander of the SAR operation.

But now the Search and Rescue Center is only under the Ministry of Communications. The MOC is responsible for the SAR operation. If additional sources are needed for the operation, the Center can ask the Navy or other ministries for assistance.

The Bureau of Maritime Rescue and Salvage is the main force with dedicated search and rescue resources for SAR operations.

1-2-5-3 Marine Rescue and Salvage Bureau

The Marine Rescue and Salvage Bureau is under the Ministry of Communications. The tasks of this bureau are:
HARBOR SUPERINTENDENCY
BUREAU OF MOC

POLLUTION PREVENTION DIVISION

SAR CENTER

HSA BRANCHES OVER 60

CHANGJIANG SUPERINTENDENCY ADM.

HELONGJIANG SUPERINTENDENCY ADM.

3 SAR BRANCHES

OVER 60 POLLUTION PREVENTION SECTIONS

16 COASTAL RESCUE STATIONS

FIGURE 1-1

MOC HSA POLLUTION PREVENTION ORGANIZATION
a. Searching and rescuing lives at sea;
b. searching and salvaging ships in distress;
c. salvaging shipwrecks;
d. fire-fighting at sea;
e. combating marine pollution; and,
f. helping the marine engineering, especially underwater engineering with divers.

The Bureau has three branches at Yantai, Shanghai and Guangzhou and 16 coastal rescue stations located along the coastline. Each station is provided with a stand-by rescue boat on duty round the clock. Currently the Bureau has 9,000 employees, including 600 divers and 5,000 seafarers.

Rescue and salvage is regarded as one of the major elements in the fight for improved safety and the prevention of marine pollution. The Bureau has about 150 ships of different types and sizes, including 36 multi-functional rescue tug boats and floating cranes.

Since China acceded to the IMO marine pollution prevention conventions and has adopted a series of national marine pollution prevention laws and regulations, China is paying more attention to the prevention of marine pollution from ships. (see Table 1-4) From the following information it is possible to see that China is effectively tightening its marine pollution control of ships calling at its ports.
Table 1-4
STATISTICAL REPORT BY THE PORT STATE TO IMD OF MARPOL 73/78 EFFECTIVENESS OF PORT STATE CONTROL with emphasis on Chinese port state control

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>U.S</td>
<td>Italy</td>
<td>China</td>
<td>China</td>
<td>China</td>
</tr>
<tr>
<td>1.</td>
<td>Total</td>
<td>9715</td>
<td>944</td>
<td>2234</td>
<td>3423</td>
</tr>
<tr>
<td>2.</td>
<td>Total</td>
<td>175</td>
<td>19</td>
<td>70</td>
<td>34</td>
</tr>
<tr>
<td>2.1</td>
<td>-</td>
<td>81</td>
<td>15</td>
<td>28</td>
<td>17</td>
</tr>
<tr>
<td>2.2</td>
<td>-</td>
<td>94</td>
<td>4</td>
<td>42</td>
<td>17</td>
</tr>
<tr>
<td>2.3</td>
<td>%</td>
<td>95.20</td>
<td>97.9</td>
<td>96.87</td>
<td>99.33</td>
</tr>
<tr>
<td>3.</td>
<td>Total</td>
<td>226</td>
<td>29</td>
<td>271</td>
<td>311</td>
</tr>
<tr>
<td>3.1</td>
<td>-</td>
<td>76</td>
<td>9</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>3.2</td>
<td>-</td>
<td>150</td>
<td>20</td>
<td>260</td>
<td>296</td>
</tr>
<tr>
<td>3.3</td>
<td>%</td>
<td>97.67</td>
<td>96.93</td>
<td>87.87</td>
<td>90.20</td>
</tr>
<tr>
<td>4.</td>
<td>Total</td>
<td>151</td>
<td>5</td>
<td>89</td>
<td>58</td>
</tr>
<tr>
<td>4.1</td>
<td>-</td>
<td>124</td>
<td>5</td>
<td>55</td>
<td>5</td>
</tr>
<tr>
<td>4.2</td>
<td>-</td>
<td>27</td>
<td>-</td>
<td>34</td>
<td>53</td>
</tr>
<tr>
<td>4.3</td>
<td>%</td>
<td>98.44</td>
<td>99.40</td>
<td>96.00</td>
<td>98.31</td>
</tr>
<tr>
<td>5.</td>
<td>Total</td>
<td>42</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Legend:

1. Number of ships boarded during report period
2. IOPP certification discrepancies
2.1 No certificate or equivalency
2.2 Certificate or Equivalency discrepancy
2.3 Compliance rate
3. Oil Record Book discrepancies
3.1 No Oil Record Book or equivalency
3.2 Oil Record Book or equivalency discrepancy
3.3 Compliance rate
4. MARPOL 73/78 equipment discrepancies
4.1 Required equipment not on board
4.2 Required equipment not functioning
4.3 Compliance rate
5. Number of ships detained in port or denied entry

Although various means of marine environment protection have been taken oil spill accidents do still happen and have happened in Chinese waters very frequently.

1-3 Ship Source Pollution History

1-3-1 Movement of Oil in China

China has a big oil reserve and is a big oil production country. There are 9 oil production centres. They are mainly located in the northeast and northwest part of China.

The oil refining facilities are scattered along the coastal cities such as Shanghai, Nanjing, Ningpo Zhenhai and Guangzhou.

Large volumes of oil produced are carried by ships or barges (see Table 1-5)

China has 1500 vessels of various types, aggregating over 19 million dead weight ton (dwt) *1, among which there are 198 oil tankers with 2.935 million dwt *2, 208 oil barges accounting for 0.42 million tons *3. (see source on page 1)
According to a Water Transport Research Institute Report in 1989, among the over 100 million tons of oil produced, 88 million tons were carried by Chinese coastal ships, oceangoing tankers and foreign flag tankers.

Table 1-5

**WATERBORNE TRANSPORTATION OF OIL IN CHINA**

(1979-1986)

(in millions of tons)

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Waterborne Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>1979</td>
<td>106.1</td>
<td>90.1</td>
</tr>
<tr>
<td>1980</td>
<td>106.0</td>
<td>93.9</td>
</tr>
<tr>
<td>1985</td>
<td>124.8</td>
<td>138.49</td>
</tr>
<tr>
<td>1986</td>
<td>130.7</td>
<td>144.89</td>
</tr>
</tbody>
</table>

Source: The table is composed by the author based on the information provided in Shipping Statistics Yearbook 1990, ISL and the Water Transport Research Institute Report 1989, China.

1-3-2 Accidents Do Happen
China is a country which suffers frequent oil pollution accidents. From 1976 to 1986, there were 386 oil pollution accidents making a average of 35 accidents per year and one accident per year with 100 tons or more oil spilled. The total volume of oil spilled in this period was 16362 tons. The average volume of oil spilled each year was 1487 tons.

These spills can be categorized as follows:

301 accidents happened in category A (oil spilled under 1 ton), the volume of oil spilled in this category is 39.4 tons.

64 accidents happened in Category B (oil spilled between 1-10 tons), the volume of spilled oil is 147.9 tons.

9 accidents happened in category C (oil spilled between 10-100 tons) the volume of spilled oil is 171 tons; and

12 accidents happened in Category D (oil spilled over 100 tons), the volume of spilled oil is 16004 tons. (see Table 1-6)

From Table 1-6, one can see that oil spilled by the 12 big accidents in Category D is more than 90% of the volume of oil spilled by the 386 accidents.

Here are some specifics on some of the 12 oil spill case histories.

a. On November 25, 1983 the Panama oil tanker Feoso Ambassador ran aground on Zhongsha reef at Qingdao, a coastal city in Shandong Province, spilling 3700 tons
Table 1-6

OIL POLLUTION ACCIDENTS HAPPENED IN CHINESE WATERS

(1976-1986)  (in tons)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>&lt;1</th>
<th>1-10'</th>
<th>10-100</th>
<th>&gt;100</th>
<th>spilled</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>16</td>
<td>16</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1977</td>
<td>25</td>
<td>25</td>
<td>18</td>
<td>6</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1978</td>
<td>24</td>
<td>24</td>
<td>16</td>
<td>6</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1979</td>
<td>23</td>
<td>23</td>
<td>20</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1980</td>
<td>35</td>
<td>35</td>
<td>24</td>
<td>10</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1981</td>
<td>41</td>
<td>41</td>
<td>32</td>
<td>8</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1982</td>
<td>43</td>
<td>43</td>
<td>37</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1983</td>
<td>45</td>
<td>45</td>
<td>41</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1984</td>
<td>35</td>
<td>35</td>
<td>26</td>
<td>5</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>1985</td>
<td>53</td>
<td>53</td>
<td>46</td>
<td>5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1986</td>
<td>46</td>
<td>46</td>
<td>39</td>
<td>6</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Grand
Total 306  301  64  9  12  16362.3

Source: Water Transport Research Institute Report
1989, China
of crude oil and resulting in a significant pollution problem for the city. *

b. On September 28, 1984 the Brazilian oil tanker Jacui ran aground at the same place that Feoso Ambassador did, with more than 750 tons of crude oil spilled.

c. On January 2, 1989 two oil barges being towed ran aground in the Yangtze River, about 80 km upstream of Wuhan. A fire and explosion took place, with 5,000 tons of crude oil lost. During fire fighting, one person died; seven were missing and eight were injured.

d. On August 12, 1989 the Huangdao Oil Depot, about 7.4 km west of Qingdao, was set on fire and an explosion took place due to lightning, with 40,000 tons of crude oil burned up and 830 tons flowing from the oil depot area. Of the crude oil spilled, 200 tons remained on the land, causing pollution along the coastline and 630 tons entered the sea. This incident left 19 dead and 77 injured, most of whom were fire fighters.

e. On June 8, 1990 the Panama vessel Maya 8 and the Liberia vessel Spring Falcon collided at the water course of Bohai Strait near Laotieshan, about 50 km southwest from Dalian, a coastal city in Liaoning Province. Maya 8 sank, and Spring Falcon, having rescued the crew of Maya 8, went to Japan. A 1,300 square km oil slick was formed.

* Source: Pu Bao Kang and Yu Chengguo, Oil Spill Contingency Planning in Shanghai, Oil Spill Conference Proceedings, USA. 1990
According to the Water Transport Research Institute Report 1989, China, the accidents with less than 10 tons of oil spilled were mainly caused by over-loading, piping breakage and wrong valve operation in the process of tanker handling. For accidents with over 10 tons of oil spilled, the causes were tanker damage from incidents such as collisions, groundings, tanker breakage and tanker sinking.

From the above information, one can see that all the figures given in the various tables are increasing every year even including the figure for marine pollution accidents.

With the Chinese "open door wider" policy, one can expect that the production of oil, the waterborne transportation of oil and the oil pollution accidents will continue to increase. There exists the potential for bigger oil pollution accidents in China.

1-3-3 The Places Prone to Oil Pollution Accidents

China is rich in its coastal fishery resources. Along its 32000 km coastline (including the coastline around the islands), there are a lot of shrimp, pearl oyster and other farming of sea plants. In offshore sea areas, the fishing ground is intense and fishing in these areas is very active. Tourism is booming along the coast. The cities with oil terminals, such as Dalian, Qinghuangdao, Qingdao, Shanghai, Ningpo, Guangzhou and Zhanjiang, are also famous for tourism, some of them are even world renowned tourist resorts.

From 1976 to 1984, the Chinese coast suffered 12 oil pollution accidents. Each of the 12 accidents had oil
Spilled of over 100 tons. (see Table 1-7).

<table>
<thead>
<tr>
<th>Date</th>
<th>Vessel</th>
<th>Flag</th>
<th>Place</th>
<th>Oil Spilled (ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>021676</td>
<td>Nanyang</td>
<td>Somalia</td>
<td>Santuo</td>
<td>8000.00</td>
</tr>
<tr>
<td>021776</td>
<td>Biyang Maru</td>
<td>Japan</td>
<td>Haifeng</td>
<td>200.00</td>
</tr>
<tr>
<td>062376</td>
<td>Honghu</td>
<td>China</td>
<td>Weihai</td>
<td>330.00</td>
</tr>
<tr>
<td>053277</td>
<td>Sea harvest</td>
<td>Liberia</td>
<td>Nanao Is.</td>
<td>350.00</td>
</tr>
<tr>
<td>042678</td>
<td>Daqing412</td>
<td>China</td>
<td>Shanghai</td>
<td>655.00</td>
</tr>
<tr>
<td>070878</td>
<td>Daqing401</td>
<td>China</td>
<td>Shanghai</td>
<td>179.00</td>
</tr>
<tr>
<td>061979</td>
<td>Trefindent Camtoss</td>
<td>Brazil</td>
<td>Qingdao</td>
<td>355.00</td>
</tr>
<tr>
<td>101183</td>
<td>Daqing236</td>
<td>China</td>
<td>Jieshi Bay</td>
<td>750.00</td>
</tr>
<tr>
<td>112583</td>
<td>Feoso</td>
<td>Panama</td>
<td>Qingdao</td>
<td>3343.00</td>
</tr>
<tr>
<td>040584</td>
<td>Raya Eclat</td>
<td>Panama</td>
<td>Henglan Is.</td>
<td>685.00</td>
</tr>
<tr>
<td>051184</td>
<td>Sea Carrier</td>
<td>Panama</td>
<td>Wenzhuo</td>
<td>400.00</td>
</tr>
<tr>
<td>092884</td>
<td>Jacui</td>
<td>Brazil</td>
<td>Qingdao</td>
<td>757.00</td>
</tr>
</tbody>
</table>

Grand total: 16004

Source: Water Transport Research Institute Report 1989, China
China started its offshore oil exploitation in the late 1970s. According to Lu Mo Zi in her paper presented to the Oil Spill Conference 1989, the offshore oil industry is also suffering from oil spill accidents. (see Table 1-8)

Table 1-8

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Pollution Source</th>
<th>Amount(T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>197805</td>
<td>Central Bohai</td>
<td>Drilling platform</td>
<td>113</td>
</tr>
<tr>
<td>19790509</td>
<td>Bohai</td>
<td>Production platform</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bohai No.4</td>
<td>6.6</td>
</tr>
<tr>
<td>197907</td>
<td>Bohai Port</td>
<td>Drilling platform</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bohai No.3</td>
<td>14</td>
</tr>
<tr>
<td>197908</td>
<td>Bohai</td>
<td>Production platform</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bohai No.4</td>
<td>38</td>
</tr>
<tr>
<td>19810214</td>
<td>Bohai Port</td>
<td>Supply ship</td>
<td>5.7</td>
</tr>
<tr>
<td>19860820</td>
<td>Bohai</td>
<td>Supply ship</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Source: Lu Mo Zi, Oil Spill Prevention and Treatment in Offshore Oil Industry of China, Oil Spill Conference 1989, USA.
Bohai was the main oil exploitation base in the 1980s. Now intensive offshore activity is going on in the South China Sea, but no statistics about oil spills in that region are available. Based on the Bohai's oil spill experience, the South China Sea is also threatened by the potential of oil spills due to the offshore activity.

From the above two tables, we can say that:

1. More tanker source oil spill accidents happened in southeast and mid-east of China, and more spills caused by offshore operations happened in Bohai Sea.

2. Some of the ports suffered repeated accidents, Shanghai and Qingdao.

3. More foreign flag ships caused oil pollution accidents and larger volumes of oil spilled from foreign flag ships.

4. The offshore oil industry is a source of oil spills.

So, the possibility of a big oil spill exists in China, based on historical information. Therefore, it is obvious that there is a necessity for China to be better prepared for future marine oil spills.

1-4. The Way China Responded to Oil Spill Accidents *

* This section is written by the author based on the interview of Jan. 1992 with Mr. Lao Hui who is the chief of Pollution Prevention Division of HSA of PRC.
1-4-1 The Notification

According to the Regulation on the Procedure for the Penalty of the Vessel Oil Pollution Accident issued by HSA of PRC, anyone who notices an oil spill must report it to the nearest HSA branch.

When a vessel accidentally discharges oil into the Chinese territorial water, the vessel captain must notify the HSA first and submit "VESSEL POLLUTION REPORT" to the HSA branch.

When the oil spill is discovered by a witness, this witness must report to the HSA officer and then the officer should fill in the form "POLLUTION WITNESS REPORT".

After the HSA branch is notified of the oil pollution, officers should be sent to the spot to evaluate the situation and establish the record, then fill in the form of "VESSEL POLLUTION ACCIDENT ON SPOT REPORT".

If the accident is very small, the relevant HSA will deal with it alone. If the accident is of greater significance and is beyond the response capability of the relevant HSA branch, then the HSA PRC will be notified and the HSA PRC will be in charge to coordinate among the ministerial level and pull in response resources from other ministries or the Navy to provide immediate support for the combating of the oil pollution incident.

1-4-2 Organization

When an oil spill accident happens, if the scale of the
spill is within the HSA branch’s response capability, the branch will take care of it. But if it is out of a particular HSA branch’s response capability, then the HSA Headquarters is notified and the Headquarters will be taking charge. And meanwhile, the local government will also be notified.

The organization for the bigger oil spill accidents at sea in China is an ad-hoc arrangement. It is set up only when it is necessary.

The members of the committee are usually the representatives of the departments who are directly involved with the accident and its response. All the response decisions are made through this ad hoc committee. The HSA Headquarters, (actually it is the SAR Center), coordinates the response and pulls in the necessary resources from different agencies and organizations such as the Navy, EPA, etc. But, the actual operation is carried out at the local level.

At the same time, the local level committee is formed and HSA is the leading organization for the sea pollution response operation while the local government is organizing people to do the shore cleanup.

1-4-3 Response Capability*

China has a certain degree of response capability but it is far from enough. The resources China has are mainly the following:

a. about 5 oil recovery vessels
b. about 7 boom deployment vessels

c. several thousand oil containment booms

d. some dispersent and sorbent materials

Only oil terminals such as Dalian port, Qinghuangdao port, Zhanjian port and Guangzhou port are equipped with oil recovery vessels. But oil booms and oil mops and other sorbent material are provided. The Rescue and Salvage Bureau and the Navy have tug boats and big floating lifting cranes.

Another rich resource for oil spill response in China is people. China has cheap labour which is essential to the shoreline cleanup operation.

Shore cleanup involves a lot of laborers and tractors, small bulldozers, trucks. These are all local resources. Shore cleanup needs good planning and coordination, the Chinese practice is that the local government coordinates the shoreline cleanup operation since it has the power to mobilize laborers and equipment. In addition, the EPA branches who are playing important roles in shoreline cleanup planning, evaluation and statistics collection are also under the authority of the local government. In the shoreline cleanup, the contaminated shoreline is divided

* Source: No official information is available. Figures used are only a reflection of the author's personal impression.
into sections and the people are also divided into groups to clean the different sections.

1-4-4 Disposal

In China, the recovered product is used as best as possible. All the oil and oiled debris recovered are sent to small oil refineries. The least refined oil is used as burning fuel for brick-making. The sediments are used to make road surface pavement.

1-4-5 Liability and Compensation

According to the Article 39 and 40 of Part 10 of THE REGULATIONS CONCERNING THE PREVENTION OF POLLUTION OF SEA AREAS BY VESSELS -- Compensation for Pollution Damage Caused by Vessels, the HSA may order vessels violating the Environmental Protection Law of PRC and these Regulations and causing marine environment pollution to pay the cost of eliminating pollution and compensation for the losses suffered by the state (Art. 39). Claims by firms or individuals demanding compensation under civil liability for damage suffered as a result of marine environmental pollution should be handled according to the procedures set forth in Article 42 of the MARINE ENVIRONMENTAL PROTECTION LAW OF THE PRC.

Disputes over liability for compensation and the amount of compensation can be settled through reconciliation of the HSA. In case any party should contest the decision thereof, an appeal can be made to People’s Court or a suit brought therein. Whereas disputes involving foreign vessels can be settled through arbitration (Art. 40).
1-5 Tanker "Feoso Ambassador" Oil Pollution Case *

1-5-1 How the Accident Happened

At 1847 hours 25 November 1983, the Panamanian tanker, fully loaded with 43934 tons of crude oil from Shengli Oil field, was leaving Huangdao Oil Terminal of Qingdao Port. Due to the careless lookout and improper operation of the tanker, it grounded upon the Zhongsha Reef. The position was at 36°03'58"N, 120°15'07"E. The hull was heavily damaged with an opening torn in the hull which was 14.5 meters in length and 0.5 meter at the largest point in width. It extended from tank No.4 starboard to mid-tank No.5.

1-5-2 How Much Oil Spilled

The oil kept leaking from the tanks on 26th and 27th. On the 28th the oil spilling stopped. According to the calculation, the oil spilled was 3343.6 tons. This is one of the biggest oil spills in China.

1-5-3 The Fate of the Oil

On the 25th and 26th, the prevailing wind from north was 6 on Beaufort Scale. On the 27th and 28th, the wind was mild, then on the 29th and 30th it was the 6-7 or sometimes 8 Scale out of the north. The entire amount of

* The case was rewritten by the author based on the article "Feoso Ambassador tanker oil pollution case" by Mr. Lao Hui in "Chinese Maritime Law Annual Report 1990"
oil spilled on the sea, with the exception of a small amount of oil recovered by oil recovery ship, was all carried to the shore by sea and wind driven currents. The oil on the shore polluted the whole area of Qingdao port and Jiaozhuo Bay and other shorelines up to 230 km including a seriously polluted section of 4.7 km where the thickness of oil was about 30-40 cm.

1-5-4 How Did China Respond to the Spill

As soon as the tanker hit the reef, the captain of the tanker notified the Qingdao HSA via VHF telephone and asked for rescue and assistance operations.

Four hours later, at 2300 hour, the booms were deployed surrounding the ship and the oil recovery ship HSA No.3 was recovering the oil from the sea. Due to the strong north wind, the tug operation for the tanker, and the boom itself, the containment was not very effective. The oil went over and under the boom and was driven ashore by the sea current and wind.

The SAR Centre in HSA Headquarters in Beijing was notified immediately and the Centre began coordination to bring resources to Qingdao.

The SAR Centre instructed Qingdao Port Authority, the Navy based in Qingdao, and the Yantai Rescue and Salvage Bureau and other units to carry out a series of rescue and tug operations such as transferring cargo oil to empty tankers, assemblage of oil booms, material and equipment to control the leakage of oil from the tanker. The Navy based in Qingdao also sent divers and working boats to the spot to assist in the operations. The Navy also sent
helicopters to observe the oil pollution in Jiaozhuo Bay.

Qingdao HSA and Qingdao Port Authority were the first to send the tug, oil recovery ship and speed boat to the spot for operation. The next day more than 140 tons of oil was recovered.

After a five-day operation, at 0020 hour on 30 November, the tanker was towed away from the reef.

The Qingdao Municipality paid great attention to this accident and held several meetings to make decisions and coordinated the shore cleanup operations.

People from four nearby counties were mobilized to clean the coast and beaches. Different organizations of Qingdao city were also mobilized. People were divided into groups and each group had its responsible area to clean up.

The Environment Protection Bureau of the city sent personnel on the spot to organize the shore cleanup and carry out statistics work.

By May 1984, the cleanup was finished. During the shore cleanup, 7391 truck/time (including tractors), 639 ship/time and 30411 units of other equipment, including small hand trolleys and baskets and poles were used. 225,482 person/day including employees from enterprises and factories and farmers. 2469.8 ton of crude oil (some of the oil containing sand, pebble and water, etc.) was recovered.

In the aquaculture field, cleanup was also carried out such as cleaning the sea weed farming shelves and glass
buoys. An investigation and evaluation of the damage to the fishery and sea farming was also done.

The sea response was quick but not very effective. The containment of the spilled oil was not effective and this resulted in the contamination of the shoreline. But the shoreline cleanup operation could be described as successful since so many people and equipment were effectively mobilized and well organized to clean up the beaches and the coast. The result of the cleanup was also satisfying.

1-5-5 Settlement of Compensation

1-5-5-1 Legal Considerations

According to Art. 40 AND Art. 13 of THE REGULATIONS CONCERNING THE PREVENTION OF POLLUTION OF SEA AREAS BY VESSELS, claims by firms or individuals demanding compensation under civil liability for damage suffered as a result of marine environmental pollution should be handled according to the procedures set forth in Art. 42 of the MARINE ENVIRONMENTAL PROTECTION LAW OF THE PRC; vessels engaged in international trade with a bulk oil carrying capacity of 2,000 tons shall, besides observing these regulations, be bound by the provisions of the International Convention on Civil Liability for Oil Pollution Damage 1969.

The owner of the tanker Feoso Ambassador was Feoso Oil Ltd. Hong Kong who is a party to the Tanker Owners Voluntary Agreement Concerning Liability of Oil Pollution (TOVALOP).
The owner of the cargo carried by this tanker on the voyage was Philippine National Oil Company who is a party to the Contract Regarding a Supplement to Tanker Liability for oil Pollution.

1-5-5-2 Claims

The total claim was 28 769 696.08 RMB (then about 14 million US dollars). Among which,

a. 17 269 607.5 RMB for aquaculture losses including sea cleanup expenses and losses suffered by fishery and sea farming,

b. 7 236 112.54 RMB for environment protection expenses including losses suffered by coastal factories and tourism.

1-5-5-3 The Payment

The claim was mediated to 17 750 000 RMB. The ship owner's liability under CLC 1969 was limited to 6 453 433.1 RMB. The rest of the claim 11 296 566.9 was paid by CRISTAL.

1-6 Pros and Cons of Chinese Way of Response

The Feoso Ambassador accident is considered as the Torrey Canyon in China. Based on the response to this accident the following points are summarized.

a. It is easier to coordinate among the different departments in the relatively high centralized
government taking into consideration the present political and administrative system.

b. China has rich cheap labour for the shore cleanup and they are well organized.

c. The response capability is far from adequate.

d. There is no preset response organization.

e. The initial response is slow due to the lack of preparedness.

f. No contingency plans are available.

g. No capability has been provided for the catastrophic oil spill accident.
Chapter Two

Basics about a National Contingency Plan

According to Dagmar Schmidt Etkin, three-quarters of a billion barrels of oil (31.5 billion gallons) are in transport at sea every day (O'Keefe 1989). Additionally, billions of gallons are transferred at petroleum refineries and fuel depots and terminals, as well as pumped from offshore oil fields. Over the course of the last decade, over one billion gallons of oil spilled worldwide.

Ideally, preventive measures, such as better tanker construction, expert navigation and pilotage on all tankers carrying petroleum products, and proper maintenance on tankers and pipelines, would minimize the chances of an oil spill ever occurring. Despite the best preventive measures, tanker transport of oil is always subject to the vagaries of weather and human error.

Oil spills, both large and small, are inevitable. Therefore all nations that are involved in the transport of oil, or that merely exist in a coastal location, must be prepared to deal with oil spills.

The most effective way to do this is with advance preparation -- through the development of well-designed contingency plans, the development of efficient, operable response structures, procurement and maintenance of effective response equipment, and the training of response personnel, particularly through drills and exercises.

The Marine environment Protection committee of the
International Maritime Organization prepared the Manual on Oil Pollution. Section II of the manual is about contingency planning which provides guidance to Governments, particularly those of developing countries, on ways and means of establishing a response organization and preparing contingency plans both at the port and national level. The guidelines are considered applicable to China and the following considerations are recommended:

2-1 Consideration Before Contingency Plan Writing

A country, before writing the oil spill contingency plan, must make some agency or agencies responsible for the task.

2-1-1 Designation of Authority Responsible for Development of a Plan

The principal options at Government level are:

- military (or naval) department
- maritime transport department
- environment protection department
- coast guard
- national committee.

Different agencies will be responsible for different aspects of the counter pollution plan at sea and on shore, but overall co-ordination by a designated authority or lead agency is essential for success. Similarly a wide range of expertise will have to made available. Necessary skills include:

- marine salvage
- ship operations
- meteorology and oceanography
- aircraft operations
- scientific expertise of various kinds
- fisheries
- environment protection
- civil engineering
- legal

This is considered applicable to China. In China, there are about 12 ministries or agencies whose functions are relevant to the marine oil spill response. In the past marine oil spill response operations, the following organizations were involved:

- SAR Center
- HSA branch
- Rescue and Salvage Bureau
- EPA Branch
- Local government
- Navy
- Air force
- State Oceanic Bureau branch
- Fishing Administration and Harbor Superintendence
- Fire brigade
- Volunteers.

Since there are so many organizations involved, before writing the plan, an organization should be made responsible to coordinate the task.

MOC is the main organization which actually responds to marine oil spill accidents, but according to MEPL, HSA of MOC is only responsible for "environmental protection
against pollution damage caused by vessels", and this plan under consideration is to cover both vessel sources and offshore industry oil spill pollution. In addition, MOC is only one of the many marine oil spill response relevant ministries. Oil spill response expertise is covered by many other ministries which have the same degree of authority and administrative power from the State Council. According to MEPL, they are only given specific responsibilities in their specific field, therefore it could be difficult for MOC to coordinate the task.

EPA is the agency responsible for the whole environment protection work. Among its main functions there is one function which is specific for this purpose, "organizing to make a national marine environment protection plan, regulations and standards". Based on this, EPA could be a suitable organization to coordinate the work.

2-1-2 Identification of Areas of High Spill Risk

In deciding on the provision of counter pollution response capability, it is clearly desirable to give special emphasis to those areas at highest risk. The perception of risk might be based upon the amount of passing tankers and other shipping traffic, navigational hazards, the location of oil refineries and oil terminals and the existence of offshore oil exploration and production operations and related undersea pipelines.

According to the statistics in Chapter one, in China, Bohai Bay suffered frequent oil spills from the offshore industry. Along the Bohai Bay coast there are several oil terminals. Bohai Bay is also a protected fishing ground, therefore it could be one of the high risk areas.
Jiaozhou Bay could be another high risk area, since Qingdao port which suffered from repeated big oil spill accidents is in the area. It is also a base for mariculture and tourism.

Shanghai area could be another high risk area. Shanghai is situated on the estuary of the Yangtze River, the longest river in China. The Huangpu River flows through Shanghai, and the river mouth meets the Yangtze at Wusongkou. On the banks on each side of the lower and middle reaches there are many wharfs, storage areas, shipyards, manufacturing factories, and oil tanks of nearly one million tons capacity. A number of water intakes and water works provide the clean water needed by the more than 10 million citizens of Shanghai and its industries.

Fujian and Guangdong could be another two areas of high risk, since these two areas have also suffered from the oil spill accidents. There is active mariculture activity in these areas; offshore oil exploration and exploitation in South China Sea is intensive and tourism is also booming in this area.

2-1-3 Fate of Oil Spills in the Marine Environment

There are wide variations in characteristics of oil and in the way they change with time once released into the marine environment. This affects the response options available and can make speed of response imperative. Therefore information about the characteristics of oil and sea and meteorological conditions are very important in this aspect.
Information about the physical characteristics of the oil, in particular, specific gravity, viscosity and volatility, the composition and chemical characteristics of the oil produced from different oil fields and offshore in China could be collected either through the oil exporting companies under the Ministry of Foreign Trade or through oil producing companies under the Ministry of Energy.

Information about meteorological conditions such as sea state, wind and air temperatures could be provided by the State Bureau of Meteorology. Characteristics of the seawater such as specific gravity, currents, temperature, presence of bacteria, nutrients and dissolved oxygen and suspended solids could be provided by the State Oceanic Bureau.

Knowing these processes and how they interact to alter the nature of oil is valuable when responding to spills.

The prediction of the fate of an oil spill is an exercise in team-work which needs different special expertise from different organizations in China. Their interactions are also valuable to effect a proper response.

2-1-4 Coastal Sensitivity Mapping

For a variety of reasons, some stretches of coastline and coastal waters are more sensitive than others to oil pollution. Some factors which might influence such considerations are:

- fisheries
- mariculture
- birds and other wildlife
- areas of particular environmental significance
- industrial use of seawater-desalination plants
- amenity beaches
- yachting and other recreational facilities.

In China, fisheries, mariculture and amenity beaches could be the three main sensitive fields.

The Chinese marine fishery resource areas consist of the Yellow Sea, Bohai Sea, the East China Sea and the South China Sea. The total area is approximately 4.83 million square kilometers and spans tropical and temperate zones. Most resources are found to be concentrated in shallow water less than 200 meters deep.

These resources are composed of more than 150 marine species of some economic value, with 30 species of economic importance.

Chinese marine waters are also considered to have moderate potential productivity due to weak ocean currents and inadequate up-welling in the China Seas.

The resources also congregate in certain areas to form more than 50 fishing grounds totalling approximately 2.8 million square kilometers. Of these 50 grounds, about 20 are the main producers, with the following distribution:

-----
10 fishing ground in the Yellow/Bohai Seas,
6 fishing ground in the East China Sea,
5 fishing ground in the South China Sea,

with Zhoushan fishing ground in the East China Sea as the leading ground.

For mariculture, China is encouraging the development of mariculture. As a result the mariculture is booming along the Chinese coast lines, which has owned earned considerable of hard currency for China.

Tourism is also a big industry in China. Almost all of the coastal cities are open to the foreign tourists. With economic development in China, more and more Chinese are travelling as tourists in the country. The hot places for tourists at home and abroad are mainly coastal cities.

Based on the sensitivity mapping, the priority for protection could be decided.

In planning response to oil spills, a knowledge of coastal sensitivities in the threatened area will enable the best use to be made of available clean-up resources. In order to assist the decision makers, the Chinese coastal sensitivity maps may be prepared by the State Oceanic Bureau with cooperation from other relevant governmental agencies.

2-1-5 Oil Spill Response Policy

Oil spill response is not an exact science and there are different opinions as to the best techniques. The planners should try to keep their options open to permit
the best combination of responses for any particular incident in the light of existing circumstances.

The response measures include:

- if possible prevent or reduce outflow of oil from the source
- if marine or coastal resources are not threatened, monitoring the oil slick
- attempting to recover the oil at sea
- application of dispersants at sea
- protection of key resources
- shoreline clean-up
- or any combination of the above.

Whatever the response, action at sea must be prompt if it is to be effective.

What is stated in the first paragraph is true and could be applicable to China. According to the case study in Chapter one, during the response to the Feoso Ambassador incident, the first consideration was to deploy the booms around the ship and then try to stop or reduce the outflow of oil from the ship. The second step was to try to recover the oil spilled on the sea surface. The third step was to do the shore cleanup.

The second paragraph, however, is not considered very true. It is true in the general sense that the quicker the
response the more effective it will be. But in the case of "Feoso Ambassador", the response could be considered prompt or at least not very slow, since the booms were deployed around the ship within four hours upon the notification. But the response was not very effective at the very beginning because the booms could not effectively contain the oil on the sea. Therefore not only the promptness of response is important for effectiveness, but proper application of the right equipment is equally important.

2-1-6 Organization for Response

The response organization should be large enough and sufficiently funded to deal with a pollution incident of a specified size and nature. It should be capable of enlargement and modification to cope with a more extensive operation.

It is considered that the enlargement of the response organization during the actual oil spill response in China is not feasible since the enlarged part may not be well prepared beforehand, so it is suggested that the response organization could include all the possible marine oil spill response related organizations but with the flexibility to contract according to the actual response demand to the accident. This type of organization could get all relevant organizations prepared for the oil spill and when it is necessary, each of them could be ready to play its role.

In China, the enlargement of the ad hoc response organization was not very difficult but it is considered better to have the maximum participation of all relevant organizations than to only get those which are involved in
a specific accident.

Arrangements should exist for prompt gathering and dissemination of information about actual or threatened pollution. The decision makers in the response organization must be available at all times to receive such information. Adequate communication facilities must therefore exist for transmission of instructions and information.

In MOC of China, there exist several telecommunication systems which could fulfill the above-mentioned purposes. These systems are: SAR telecommunication system, port telecommunication system, coast radio telecommunication system. In addition, there also exists an offshore oil company's satellite telecommunication system. They are potential telecommunication systems for the marine oil spill response purpose but they need to be coordinated.

The decision makers in the response organization must have sufficient authority to initiate action to deal promptly with a spill or with an incident which may lead to a spill. This is of particular importance if oil is to be dealt with whilst it is still on the sea.

The response organization should be capable of coordinating the activities of other agencies, including the control of substantial numbers of personnel and a variety of equipment.

In China, these authorities and capability could be granted through the making of a national marine oil spill contingency plan. After the plan is approved by the State Council, the decision makers in the response organization would have the authority to initiate actions and coordinate
the response.

Resources for combating the oil pollution should be readily available, whatever technique is to be used. Additional personnel, equipment and materials should be identified in advance to deal with large incidents and arrangements made in advance for obtaining the same.

As for response equipment, China is weak. Since there is little equipment, it is not difficult to make it available at any time and to identify it in advance.

Suitable centres should be identified for effective command and control of operations. It may be decided that different centers will be used for different aspects of counter pollution operations, but an overall command centre should be established.

This is important. According to the Chinese experience in marine oil spill response, the SAR Center in MOC which has commanded and controlled the past oil spill response operations in China played a vital role in coordinating the activities of different organizations working together. Taking into consideration the present SAR structure and its role played in the past oil spill response, it could be suitable to suggest that the SAR Center act as the command and coordinating center for the possible Chinese response organization.

Clear instructions should exist defining the responsibilities of different parts of the response organization.

These responsibilities should be agreed upon among
the different entities that would constitute the response organization and be approved by the State Council.

2-2 National Oil Spill Contingency Plan

Having considered the above items, we can now consider the actual contingency plan preparation.

2-2-1 Definitions

In order to clarify the terminology, the following definitions are used:

Response

Any actions undertaken to prevent, reduce, monitor or combat oil pollution.

Lead agency

The authority within the national government designated under the plan as having overall responsibility for response to marine emergencies.

Support agency

Any organization assigned specific tasks under the plan in support of the response.

On-scene commander

The person responsible for deployment of the required resources on-scene.

Marine emergency

Any casualty, incident, occurrence or situation, however caused, resulting in substantial pollution, or imminent threat of substantial pollution, to the marine environment by oil and includes, collisions, strandings and other
incidents involving ships, blowouts arising from petroleum drilling and production activities, and the presence of oil arising from the failure of industrial installations.

These definitions could be accepted in the possible Chinese contingency plan. Since they are widely used and they are familiar to the Chinese marine oil spill responders.

2-2-2 Purpose and Objectives

A national oil spill contingency plan is intended to delineate responsibilities for the operational response to marine emergencies which could result in the spillage of oil into the marine environment.

The objectives of such a plan are to ensure a timely and effective response to spillages or the threat of spillages of oil.

The purpose and objectives could be acceptable in the possible Chinese national marine oil spill contingency plan since they are also reflected in the Chinese MEPL.

2-2-3 Scope and Content of the Plan

Most oil spills are small and can be dealt with at the local level, in the event of a major spill mechanisms must be available to escalate the response to the national and international level. In general, contingency plans should follow a similar format at each level.
For China, the three-tiered structure could be suitable since the Chinese administrative structure is also three-tiered: central (national), provincial and local. The national plan could cover the entirety of marine oil spills resulting from both ships and offshore industry activities.

The provincial and local level plan could cover their own geographic area since these governmental organizations are responsible for almost everything within their geographic areas. And the implementation of the plan needs their financial support. If specific oil contingency plan area is designated without considering the geographic jurisdiction of provinces and local government, for example, one plan covers more than one provinces, this could need more coordination which might not be beneficial to the maintenance and implementation of the plan.

It is ideal if the contingency plans at all levels can have a uniform layout, irrespective of whether they are local, national or regional in scope, though length and content will vary. Similarity in layout will enable plans to be easily understood, will assist compatibility and ensure smooth transition from one level to the next.

The plan should define policy and responsibilities, and identify the authority or lead agency responsible for the preparation and implementation of the plan, together with the supporting legislation. The geographical area covered by the plan should be clearly indicated, with reference made to supporting legislation and agreements.

This could be the most important part of the NCP. In any NCP, this should be made crystal clear that there is only one lead agency. It is the same for China. If it is
not, then the whole system could have difficulty to function properly. In China, it is considered better to designate only one lead agency at national level which could be responsible for all major marine oil spill response, be it is ship-sourced or offshore-sourced.

Since MOC is more experienced in response to ship source oil spill while the Ministry of Energy is more experienced in response to offshore source oil spill. It would be logic that MOC and MOE could shift its position as OSC in the NCP according to different sources of oil spill. But, it is considered not feasible to have this kind of arrangement because it would be difficult for the MOE OSC, when there is an oil spill, to move quickly to the MOC SAR Center and coordinate the response. But this point could be taken care of in the local plan. For ship source oil spills, MOC could play the main role whereas for offshore source oil spills the MOE could play the main role.

As for the only one lead Agency responsible for implementation of the NCP, it is considered that MOC could be the possible candidate for this responsibility because:

1. It has the fundamental responsibility for preventing and combating the ship-source oil pollution by the national law.

2. It has a ready-made SAR system which coordinated the marine oil spill responses of the past.

3. It has Rescue and Salvage forces whose expertise is vital for the marine oil spill response operation.

4. It owns the most part of China’s marine oil spill
response equipment.

5. It is in charge of IMO matters for China. An oil spill contingency plan is well within the scope of IMO matters. With MOC as the lead agency, it is easier to keep contact with its counterparts around the world.

2-2-4 Reporting Systems

Information regarding a marine emergency which could result or has resulted in oil spillage can come from a number of sources. The plan should identify an agency which will receive and disseminate such reports, which should contain as much of the following information as possible:

- name of person reporting incident
- telephone number (work/home) or other means of contact
- date and time of observation
- details of observation
- location (e.g. name and type of vessel, collision or grounding)
- type and estimated quantity of oil spilled (and possibility of further pollution)
- weather and sea conditions
- action taken or intended for response to the incident.

It should be made clear that the initial report should
not be delayed as long as the information about date and time of observation, location and source and cause of pollution can be satisfied. The remaining information can be transmitted as soon as available.

In China, there already exists the similar reporting system. HSA branches are responsible organizations to receive the report. If it is a big oil spill, the report will be sent immediately to HSA headquarters where SAR Center is located.

This system is not specifically designed for the oil spill response but for the purpose of penalizing the oil spillers.

It is considered that this channel of reporting oil spill accidents could be used for oil spill response reporting purposes but with some different reporting content.

2-2-5 Alerting System

An alert procedure should be included in the plan. The initial and subsequent reports should be disseminated to the lead and support agencies by the fastest means.

The existing oil spill reporting system in HSA could also be used for this purpose. According to the law, in China everyone is encouraged to report to the nearest HSA branches any oil spill observed. If it is a big oil spill the report will be immediately sent to the HSA headquarters. For oil spill response purposes, with the presumption that MOC could be the lead agency and the SAR Center could be the operational office for this lead
agency, this type of report could be easily referred to SAR Center since it is located just in the Headquarters of HSA.

There is another reason why it is suggested to use the HSA reporting system. Many foreign ships navigating in Chinese waters could have the possibility to observe the oil spills. In this case, HSA branches are the suitable organizations for the ship captain to report since ship captains might be more familiar with HSA than with other agencies and can easily communicate with HSA either through radio or VHF equipment on board ship.

2-2-6 Spill Assessment

A rapid assessment of the threat presented by a marine emergency is essential. If an actual oil spill occurred, then the on-scene commander should arrange for surveillance of the oil slick and, by use of météorological and hydrographic data, predict its probable movement. The spill assessment might include the following actions:

- Identify the type of oil in terms of specific gravity, viscosity, pour point, wax content and distillation characteristics;

- determine the expected track of the oil slick at regular intervals from data on currents, tides and winds;

- consider arranging on-site surveillance using aircraft to verify predictions and obtain further details; and

- identify threatened resources.
In China, these actions could be taken by different organizations such as HSA, State Oceanic Bureau, State Meteorological Bureau, etc. For this, the plan should clearly delineate the responsibilities of each relevant organization so that they can support the OSC in the best way.

2-2-7 Salvage and Cargo Removal Considerations

In the case of ship casualty there may not be any immediate oil spill but a threat may exist due to the condition of the vessel and the possibility of leakage from oil cargo or bunker tanks.

Salvage operations are complex and usually require the services of a professional salvor. The plan should facilitate communications between the Administration, the salvor, the vessel’s master and owner and the cargo owner. While the Administration’s concern is to mitigate damage from oil pollution in the event of a casualty, this may be best achieved by the prompt and efficient salvage of the ship and cargo. In the case of an oil tanker casualty, this will frequently entail cargo removal by lightering into another tanker using portable pumping equipment.

It is true that in past oil spill accident response in China, the Salvage operation was a part of the whole oil spill response. The Rescue and Salvage Bureau of MOC and the Navy Rescue Brigade are special salvage force which could be suitable for marine oil spill response operations. Since they are specialized for rescue and salvage and they are run by the government, it could be possible for them to become the main national marine oil spill response force for China.
2-2-8 Response Decisions

The plan should make provision for the various response options to be considered:

- if possible prevent or reduce outflow of oil from the source;

- if no marine or coastal resources are threatened or likely to be threatened, continue monitoring the movement and behavior of the oil slick;

- if marine or coastal resources are threatened, decide whether to begin response operations at sea and/or to protect sensitive shoreline areas by use of booms;

- if, due to weather conditions, response at sea and shoreline protection are not feasible or shoreline resources have already been affected, decide on clean-up priorities; and

- begin mobilization of the required personnel, equipment and materials.

According to ITOPF (1987), there is an example of a spill response decision guide. The schematic representation of the factors to be considered can be of assistance, but there is a danger of over-simplification. In reality additional factors may have to be taken into account and each case is best judged against the specific conditions and their relative importance at the time.

In the possible China NCP, as for the response
An example of a spill response decision guide

* ITOPF 1987 Response to Marine Oil Spills p.18
decision, the provisions should be made with flexibility so that the OSC could make response decisions according to the specific situation. Since the oil spill accident is different from one situation to another, making the proper response decision-making is similar to commanders making decisions in war time. In both cases there is a need to adapt tactics to fit the situation at hand; therefore, rapid, proper decision making by the OSC is dependent on the pre-authorization of actions and the flexibility provided in the plan.

2-2-9 Clean-up Operations

The plan should state which clean-up techniques should be used and in what circumstances. Generally containment and recovery of spilled oil is to be preferred but in some instances it may be necessary to use chemical dispersants. The plan should state the policy with regard to whether, where and when dispersants may be used and the approved types.

In this regard, China has no specific regulations as to which clean-up techniques should be used and in what circumstances. For the past oil spill accidents, the mechanical clean-up techniques were used to contain and recover oil on the sea.

For chemical dispersants, China only produces one type of chemical dispersant. The brand is Shuang-Xiang. For dispersant use in China, there is a provision in the "Regulations Concerning the Prevention of Pollution of Sea Areas by Vessels" which was promulgated by the state Council of PRC in Dec. 1983, stipulating "after an occurrence of an oil pollution damage or an illegal
discharge of oil, no oil dispersant shall be used unless authorized and, if it is necessary to apply such dispersant, approval must be obtained beforehand through telephone or written application to the authority in charge, stating the type and quantity of the intended dispersant and the place of application."

In order to implement this regulation, the Research Institute of Water Transport under MOC, which successfully researched and developed the Chinese dispersant, was given the task to research and draft the standards of dispersant application. The Institute’s effort in this aspect could contribute to the preparedness levels provided by the NCP and provide assistance to the decision makers as to the application of dispersants. As far as to the author’s knowledge, this work, which could be valuable for China’s possible NCP, is still going on.

According to the present regulations on dispersant application in China, getting approval from the authority could take some time, and that time could be crucial for the effective dispersant application since dispersant should be applied at the early stage of an oil spill. Therefore the possible NCP could result in consideration of possible amendment to the regulation.

According to Dagmar Schmidt Etkin, mechanical containment and recovery remains a popular choice among many contingency planners and response organizations. It is important to keep in mind, however, that, even under the best of circumstances, most spill experts agree that mechanical containment and recovery operations can never successfully recover more than 15% of the oil in a large spill. Containment is also often less than completely
effective, so that, unless dispersants or in-situ burning are successfully employed, shoreline clean-up operations will most likely be included in the response to a major near-shore spill.

Since China's NCP is to be prepared for the oil spill of national significance, in-situ burning might be another possible way to respond. When Mr. Lao Hui has unofficially indicated that China in general is not in favor of burning. According to the author's own perspective the following reasons may support this attitude:

- In-situ burning is a controversial method in the world. China has not started to study this method so they are not in a ready position to decide that they are in favor of the method.

- Most of the big oil spill accidents that have happened in China were near the coast where the in-situ burning was definitely not a suitable method to consider. The oil finally came to the shore.

- The accidents did not show that there was a necessity to burn the oil.

According to the talks with Professor Ted Sampson from World Maritime University (WMU) concerning the response to the Exxon Valdez incident, in-situ burning was tried in the response to the incident and its limited application was effective. Therefore, it is considered that for China's NCP, this technique be studied further before the final conclusion is reached.

In many cases oil will reach the coastal areas and it
will be necessary to remove oil and oily debris from shorelines and the water surfaces within bays, etc. For shoreline clean-up a large work force and civil engineering construction equipment are frequently required and the plan should identify their availability.

For shore line clean-up, since it is often labor-intensive, and of long duration and generally does not require specialized equipment, China has advantages in this aspect. Since it has a large cheap labor force and non-specialized equipment which could be effectively organized through the local governments.

The progress of the clean-up operation should be monitored using inputs from aerial surveillance and site supervisors to reassess response decisions. Each area will require different standards of clean-up. The decision to terminate clean-up operations must be made by the OSC in consultation with all other parties concerned. In general this is done when further operations would be ineffective or the desired level of clean-up has been achieved.

In this regard, China has practical and relatively successful experience because coordination among the organization is not difficult since the governmental structure is centralized.

2-2-10 Communication

The plan should establish systems and procedures for effective communication between the on-scene commander, field sites, vessels and aircraft equipped at least with telephone, telex and radio communication systems. Consideration should be given to allocating an operating
frequency or frequencies for radio communication.

R. B. Pearce in the Article "What Constitutes Good Telecommunication Systems for an Oil Spill Cleanup" points out that for an oil spill cleanup, good telecommunications can provide the key to minimize, control and even prevent additional outgrowths of oil spills. The key to minimizing costs of a cleanup operation is related to the speed in bringing the situation under control at the early stage. Therefore, telecommunications systems must be carefully configured to enhance the cleanup team's needs and in a state of instant readiness if they are to effectively support the overall plan of responsible cleanup participants.

Team members need two specific telecommunications systems to enhance the efficiency of this reactivity. "operations" systems are needed to keep the on-scene cleanup team synchronized, while "logistics" systems are needed to call up and maintain an orderly flow of support materials, supplies, and equipment.

In past marine oil spill accidents, China encountered no problems in this field because:

- The accidents happened near the coast which is the most developed area in China. They have better communication capability than other areas in China.

- For past big oil spills, the response operations were controlled by the SAR Center which has very good telecommunication connections with all the relevant ministries, local governments and HSA branches.
- The SAR communication system is well connected with other communication systems in MOC such as the Rescue and Salvage system, coastal radio communication system.

As regards the possible NCP for China, there is a necessity to better coordinate the present communication systems since the plan could cover offshore oil spills. This could be done with the help from the Ministry of Post and Telecommunications.

2-2-11 Disposal of Recovered Oil and Oily Debris

The plan should identify available equipment and temporary storage sites, which can be used for collection and reception of recovered oil and oily debris. Final disposal of the recovered oil will depend on its nature and degree of contamination.

Disposal of oily debris and oiled sand presents particular problems in handling due to the large quantities involved. It is recommended that suitable final disposal sites are identified in the plan in consultation with the relevant Government agencies.

This could be easily done in the possible NCP. As explained in Chapter one, oil recovered was best used up by the Chinese. This might be another reason why China is not in favor of burning oil.

2-2-12 Record Keeping and Preparation of Claims

In order that claims may be processed with minimal delay, it is essential that accurate records are maintained for each cleanup location of all the actions taken,
personnel and equipment deployed and consumable material used. It is recommended that sample work sheets should be provided as an annex to the plan.

In China, for record keeping, it could be divided into two parts, one for sea clean-up the other for shore line clean-up. In the case of the Feoso Ambassador incident, the recording work was well done. For sampling, HSA has effective regulations and procedure to follow for this purpose. It is suggested that the NCP could incorporate this procedure without change.

When a spill occurs, claims for cleanup costs and damage can be brought against the owner of the ship which caused the oil spill and, if the limit of the owner’s liability is exceeded, against the IOPC Fund (if the country where the pollution damage is caused is a member of the IOPC Fund) or CRISTAL (if the cargo owner is a CRISTAL member). In China HSA coordinates the submission of the various claims and makes sure that accurate detailed records such as invoices, daily work sheets and explanatory notes are kept to support the claims.

2-2-12-1 Identification of the Polluter

In the case of major oil spills there is usually little difficulty in identifying the source. However, the possibility of legal proceedings being taken under national law against the offending vessel should be borne in mind in all cases of pollution. Samples of spilled oil should be taken immediately, properly labelled and witnessed, and then submitted for analysis, ensuring that a custodial chain can be proved in court. Samples should also be taken from oil cargo tanks, bunker tanks and machinery spaces of
suspected offenders for comparative analysis with the spilled oil.

For this, as explained in Chapter one, there is a well established practice in China. It also could be incorporated in the NCP.

2-2-13 Public Relations

Effective public relations is an integral part of the entire operation and it is recommended that an experienced public relations officer be designated in the plan for liaison with the media. It should be remembered that failure to provide pertinent information to the public and the media as quickly as possible may create unnecessary difficulties in dealing with an oil spill incident.

Public relations only found its place in China about six years ago. Before 1986, there was not any form of public relation organization in China. Even in the universities, there was no such course called public relations. It is only the economic development in China which has brought the concept of public relations to China. Therefore, for the oil spill response operations in the past there was no need to consider public relations and the big oil spill accident happened almost ten years ago. At that time, the Chinese people were not as environmentally sensitive as today.

But with the rapid economic development, the increasing awareness of the environment and the extensive offshore mariculture development, people are taking different attitudes to oil spill accidents. Therefore, it is suggested that in the possible NCP, a public relation
officer be designated.

2-2-14 Training and Exercises

The requirements for training and exercises should be clearly defined in the plan. Training programmes should be developed at all levels.

A recent study by the US congress' office of Technology Assessment (1990) showed that the strong commitment to response training in Norway has led to a higher level of preparedness by personnel at all levels. The State Pollution Control Authority's Oil Spill Control Center in Horten, Norway, offers a series of courses and exercises in which virtually all municipal, state, and private employees involved in decision-making and/or cleanup operations participate. The training courses include elaborate "tactical exercises" and "yearly sea-going exercises." A major consequence of the emphasis on training is that those with oil spill cleanup responsibilities at all levels of government and industry -- an estimated 3,000 people -- are well-informed about how to respond and are aware of the types of things that can go wrong. Uncertainty about how to respond appears to have been reduced to a minimum, "the US Congress/OTA report concluded.

In China, there is no specific oil spill response training. Taking into consideration the possible NCP, the key to successful implementation of the plan is training and exercises. Therefore it is considered quite necessary for China to establish the mechanism for training and exercises.
2-2-15 Plan Revision

The plan should be reviewed periodically to incorporate experience gained from regular exercises and actual incidents. Regular updates of alerting lists and equipment inventories should also be made.
Chapter Three


3-1 Introduction of the National Response System *

On March 18, 1967, the oil tanker Torrey Canyon ran aground off the southwestern coast of England, spilling over 100,000 tons of oil that eventually washed ashore on English and French beaches, causing massive environmental and economic damage. In the wake of the disaster, the then U.S.A. president Johnson ordered the departments of the Interior and Transportation to study the nation's capabilities to handle such disasters.

On June 7, 1968, the president directed the Secretaries of the Interior (DOI), defense (DOD), and Transportation (DOT) and the Director of the Office of Science and Technology to assume the responsibility to strengthen the nation's ability to act in the event of an oil spill emergency along the coasts or waterways. The Secretary of the interior was directed to take the lead in completing a multi-agency contingency plan for responding to such emergencies.

The first National Contingency Plan (NCP) was adopted in 1968 known as National Multiagency Oil and Hazardous

* Source:
2. National Response Mechanism by Harry E. Schultz, USCG
3. National Response Centre 1991 printed by NRC
Materials Contingency Plan (later known as the National oil and Hazardous substances Pollution Contingency Plan) to bring federal agency expertise to bear during response to oil spills and releases of hazardous substances and to provide for a federal spill response mechanism to help meet the challenge of responding to oil spills into US waters and the adjacent shorelines.

The NCP was promulgated as a federal regulation in 1973. The NCP establishes three organizational levels: the National response Team, Regional Response Teams, and Federal On-Scene Coordinators; and four special force components: The National Strike Force, The Environmental Response Team, the Public Information Assist Team, and the Scientific Support Coordinators.

3-1-1 Federal Response Statutes

There are three federal statutes that provide the basis for U.S. Coast Guard authority to respond (Figure 3-1). Each statute has specific intent and equally specific limitations.

1. The Federal Water Pollution Act (FWPCA, 1972; as amended) created the $35 million Fund. This fund, administered by the USCG, but equally available to the Environmental Protection Agency (EPA), may be used to finance the response to and removal of a pollutant if:

   (1) The spilled material is either oil or one of 297 specified chemicals,

   (2) the spill has entered navigable/tributary waters or threatens same, and
(3) the spiller is unwilling to undertake cleanup or the identity is unknown.

The pollution fund is an appropriated resource requiring periodic Congressional action for continuation. Monies collected through the reimbursement processes are returned to the fund.

2. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 1980 established the original Superfund. The Superfund Amendments Reauthorization Act (SARA) of 1986 reauthorized the original superfund at $9.0 billion. This fund, administered by the EPA, but also available to the USCG, may be used to finance an immediate and/or remedial response to either an actual or potential chemical release which threatens the environment. Superfund monies are accumulated from tax revenues related to chemical production.

3. A third statute which is related to both the FWPCA and CERCLA is the Intervention on the High Seas Act (IHSA, 1974). The IHSA authorizes the Commandant of USCG to assume physical control of any (non-military) vessel on the high seas, regardless of flag, which poses a substantial environmental threat to specific US resources. Both the FWPCA Pollution fund and the CERCLA Superfund may be used in conjunction with high seas intervention activities.

4. After Exxon Valdez Accident which happened on March 24, 1989, the US Congress adopted Oil Pollution Act of 1990 (OPA 1990). It establishes a billion dollar federal trust fund to supplement the liability of responsible parties.*
3-1-2 Federal Regulatory Structure

Both the FWPCA and SARA require the development of a National Contingency Plan to establish the federal framework for oil and hazardous material spill (Figure 3-2).

3-1-2-1 National Response Team

NCP establishes the National Response Team (NRT). The NRT’s membership consists of 15 federal agencies with interest and expertise in various aspects of emergency (Figure 3-3). The EPA serves as chairman and the CG serves as vice-chairman of the NRT. During activation for specific incidents, the agency providing the On-Scene coordinator (OSC) serves as chairman of the NRT. The NRT is primarily a national planning, policy and coordinating body and does not respond directly to incidents. The NRT provides policy guidance prior to an incident and assistance as requested by Federal OSC (FOSC) via an Regional Response Team (RRT) during an incident. NRT assistance usually takes the form of technical advice, access to additional resources/equipment or coordination with other RRTs.

3-1-2-2 Regional Response Team

The NCP created a second organizational level through the establishment of Regional Response Teams (RRTs). There are 13 RRTs, one for each of ten federal regions, plus one

<table>
<thead>
<tr>
<th>USA FEDERAL AGENCY MEMBERSHIP</th>
<th>NATIONAL RESPONSE TEAM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENVIRONMENTAL PROTECTION AGENCY, CHAIR</strong>&lt;br&gt;(Environmental Effects and Pollution Control Techniques)&lt;br&gt;(Planning and Response for Inland Areas)</td>
<td><strong>U.S. COAST GUARD, VICE-CHAIR</strong>&lt;br&gt;(Planning and Response for Coastal Areas)</td>
</tr>
<tr>
<td><strong>FEDERAL EMERGENCY MANAGEMENT AGENCY</strong>&lt;br&gt;(Emergency Planning, Training and Relocation)</td>
<td><strong>DEPARTMENT OF DEFENSE</strong>&lt;br&gt;(Specialized Response Equipment and Personnel)&lt;br&gt;(Response to Certain Incidents)</td>
</tr>
<tr>
<td><strong>DEPARTMENT OF ENERGY</strong>&lt;br&gt;(Response to Radiological Hazards)</td>
<td><strong>DEPARTMENT OF AGRICULTURE</strong>&lt;br&gt;(Evaluation of Impact on Natural Resources)</td>
</tr>
<tr>
<td><strong>DEPARTMENT OF COMMERCE</strong>&lt;br&gt;National Oceanic and Atmospheric Adm.&lt;br&gt;(Scientific Support for Coastal Response)</td>
<td><strong>DEPARTMENT OF HEALTH AND HUMAN SERVICES</strong>&lt;br&gt;Agency for Toxic Substances and Disease Registry&lt;br&gt;(Health Hazards to Responders and Public)</td>
</tr>
<tr>
<td><strong>DEPARTMENT OF THE INTERIOR</strong>&lt;br&gt;(Protection of Natural Resources)</td>
<td><strong>DEPARTMENT OF JUSTICE</strong>&lt;br&gt;(Legal Expertise)</td>
</tr>
<tr>
<td><strong>DEPARTMENT OF LABOR</strong>&lt;br&gt;Occupational Safety and Health Adm.&lt;br&gt;(Worker Safety)</td>
<td><strong>DEPARTMENT OF TRANSPORTATION</strong>&lt;br&gt;Research and Special Programs Adm.&lt;br&gt;(Transportation of Hazardous Materials)</td>
</tr>
<tr>
<td><strong>NUCLEAR REGULATORY COMMISSION</strong>&lt;br&gt;(Radioactive Materials)</td>
<td><strong>DEPARTMENT OF STATE</strong>&lt;br&gt;(International Agreements)</td>
</tr>
</tbody>
</table>

**GENERAL SERVICE ADMINISTRATION**

**FIGURE 3-3**
for Alaska, one for the Caribbean, and one for the Pacific Basin. Each RRT maintains a Regional Contingency Plan (RCP) and has state, as well as federal government representation. EPA and the CG co-chair the RRTs. Like the NRT, RRTs are planning, policy and coordinating bodies, and do not respond directly to the scene. The RRT provides assistance as requested by the FOSC during an incident.

If the assistance requested by an FOSC exceeds an RRTs capability, the RRT may request assistance from the NRT. During an incident, the RRT may either be alerted by telephone or convened as a group.

RRTs may also provide assistance to state and local government in preparedness, planning and training for emergency response.

3-1-2-3 Local Contingency Plan

The third organizational level created by the NCP is at the local level. The Local Contingency Plan (LCP) is a specific document which identifies environmentally sensitive areas and resources at risk, contains a response equipment guide and response procedures, and identifies operational contacts throughout the local response network. The LCP is developed as an "immediate response" document. As with most operational planning documents, a significant benefit is derived during the development and annual updating of the LCP.

3-1-2-4 Federal On-Scene Coordinator

The most important element in regulatory structure is the role defined for the OSC. The OSC is the predesignated
federal official responsible for ensuring proper pollution response and enforcement. The OSC coordinates all federal containment, removal and disposal efforts and resources during an incident; authorized to control and finance pollution cleanup operations; serves as point of contact for the coordination of federal efforts with those of the local response community; and is a source of valuable support and information to the local response community.

The USCG provides OSCs for the coastal zone and the EPA provides OSCs for the inland zone. The boundary between the coastal zone and inland zone is determined by an agreement between the USCG and the EPA for each of the 13 regions and is found in the respective RCPs.

The OSCs are responsible for managing Federal response actions. Using procedures established for the area in the RCP, the OSC can draw on the expertise and resources of the RRT. The OSC may take a number of steps as warranted by the incidents, as can be seen from Figure 3-4.

3-1-2-5 National Response Centre

NCP also established the National Response Centre (NRC). The NRC is the primary federal point of contact for reporting all oil, chemical, biological, and etiological discharges into the environment anywhere in the US and its territories.

This Centre, supported by the members of the NRT and staffed by USCG personnel, maintains a 365 day a year, 24-hour telephone watch. NRC watchstanders enter telephonic reports of pollution incidents into a computer database and immediately relay each report to the predesignated FOSC.
Pollution reports may also entail notification of other Federal agencies depending upon the transportation mode involved and the severity of the incident. During major pollution incidents, the NRC is responsible for briefing senior CB, Department of Transportation, and White House officials.

Additionally, the NRC is the contact point for activation of the NRT and provides facilities for the NRT to use in coordinating a national response action when required.

The NRC also provides emergency response support to the OSCs, including extensive reference materials, state of the art telecommunication conferencing, and operation of automated chemical identification and chemical dispersion information systems.

3-1-3 USCG/EPA Response Structures

Figure 3-5 illustrates that the national structure allows for the designation of essentially parallel agencies (USCG and EPA) to resolve inland and coastal zone spill situations using the same planning, logistics, and funding strategies.

The USCG, an agency in the Department of Transportation, is headed by the Commandant (G-C), to whom the Secretary of Transportation has redelegated the various authorities for the FWPCA, CERCLA, and IHSA. The Commandant’s representative serves as vice-chair of the NRT. The USCG is divided into ten districts which don’t coincide with the ten federal regions. Each district is headed by a District Commander (d), to whom most of the
statutory authorities have been transferred (except IHSA). Assisting the District Commander in a staff capacity is the Chief, Marine Safety Division (m) and the Chief, Marine Environmental Protection Branch (mep). The Chief, Marine Safety Division serves as co-chair of the RRT. The Chief, Marine Environmental Protection Branch generally manages each district’s allocation from the pollution Fund. Close coordination among USCG districts and associated staffs is required since district boundaries and federal regions don’t align.

Next in the actual line of authority after the District Commander is the Captain of the Port (COTP) (Figure 3-6). The COTP is normally the Commanding Officer of the local Marine Safety Office (MSO). This individual serves as the USCG OSC when an incident occurs. There are currently 48 MSOs in the CG.

The EPA organization parallels that of the USCG to a large degree. The EPA has an Administrator’s representative serves as chair of the NRT. There are ten Regional Administrators (RA) (instead of d), and each region has an Office of Emergency and Remedial Responses (OERR), or equivalent (instead of m). The regional Chief, OERR generally serves as co-chair of the RRT. This similarity ends with Emergency Response Branch (ER) (equivalent to mep). Unlike the USCG which has a three-level organization (national, district, and local), EPA has a two-level organization (national and regional). Since there is no local-level EPA structure, the predesignated OSCs come from a group in the regional offices.

3-1-4 Local Response Community
The focal point of activity for all major response episodes involving the use of federal funds is the OSC (figure 3-2). Most cleanup activities are accomplished through prenegotiated agreements with private sector contractors. In addition to the cooperative assistance of various federal, state, and local agencies, and contracted services, the OSC (either USCG or EPA) has Special Forces to call upon. The Special Forces are Four unique resources:

3-1-4-1 The Coast Guard’s National Strike Force (NSF)

NSF is composed of 3 strategically located strike teams which are extensively trained and equipped to respond to major oil spills and chemical releases. Their capabilities are especially suited to incidents in a marine environment but also include site assessment, safety, action plan development and documentation for both inland and coastal zone incidents.

3-1-4-2 Environmental Response Teams (ERT)

ERT is a group of highly-trained scientists and engineers funded by EPA. The capabilities of the ERT include multimedia sampling and analysis, hazard evaluation, contamination monitoring, cleanup techniques and overall technical support to the OSCs.

3-1-4-3 Public Information Assist Team (PIAT)

PIAT is a highly skilled unit of Public Affairs Specialists funded by the USCG. At the request of an OSC, PIAT is prepared to either complement the existing or provide additional public information capability for an OSC to properly address the role of the media during an
Immediate response. PIAT maintains and coordinates the flow of timely and factual information from the OSC to the public through frequent and direct contact with the news media.

3-1-4-4 Scientific Support Coordinator (SSC)

SSC is a scientific and technical advisor funded by the National Oceanic and Atmospheric Administration (NOAA) and assigned one to each USCG district. The SSC assists OSCs in the evaluation of available technical data and serves as the principal point of contact for members of the scientific community. The SSC network involves detailed and frequent exchanges of information to support one another. Their capabilities include: surface/subsurface trajectory forecasting/hindcasting, resources at risk analysis, technical hazard data, contingency planning, and general communications.

3-1-5 Summary

According to Samuel K. Skinner and William K. Reilly Report to the President 1990, the Nation's oil spill response system routinely and effectively responds to a wide range of minor, medium, and major oil spills, but the country's response capabilities can be overwhelmed by catastrophic events such as Exxon Valdez incident.

Although the system is basically sound, there are shortcomings that undercut the Nation's ability to respond to catastrophic oil spills. These shortcomings include shortfalls in equipment, trained personnel, and other resources; inadequate coordination among the Federal, state, local, and industry participants; sometimes
THE NATIONAL RESPONSE MECHANISM

OIL SPILL

CERCLA

INS

CHEMICAL SPILL

FWSRA / OPA 1990

US COAST GUARD

EPA

NATIONAL RESPONSE CENTER

NCP

RCP

RRT

LCP

USCG
d
m
mop

EPA
Ra
OERR
ER

OSC

EXT
PIAT

SSC

NSF

THE PRE-DESIGNATED FEDERAL ON-SCENE COORDINATORS HAVE RESOURCES TO SUPPORT THE LCP

FEDERAL, STATE AND LOCAL AGENCIES

CLEANUP CONTRACTOR(S)

DISPOSAL

FIG. 3-7
differing missions at the Federal and State levels; and a fragmented approach to training and exercises.

In next section, the Exxon Valdez Case will be studied.

3-2 Exxon Valdez Case Study*

3-2-1 Introduction of the Incident

At 0004 on March 24, 1989, the 987-foot tank vessel Exxon Valdez struck Bligh Reef in Prince William Sound, Alaska. What followed was the largest oil spill in U.S. history: over ten million gallons of crude oil flooded one of the nation’s most sensitive ecosystems in less than five hours. The oil slick spread over 3,000 square miles and onto over 350 miles of shoreline in Prince William Sound alone.

At the time of grounding, the Exxon Valdez was loaded to a draft of 56 feet. The charted depth where the vessel grounded was 30 feet at low tide. The severity of the grounding is attributed to the sound’s rocky bottom, coupled with the vessel’s momentum. Subsequent damage surveys showed that eight of the 11 cargo tanks, extending the full length of the vessel, were torn open. Three salt-water ballast tanks also were pierced. A total of 11 tanks

* source: All the contents are drawn from the following unless otherwise stated.
1. The Exxon Valdez Oil Spill. A report to the President May 1989 by Skinner and Reilly.
2. Oil Spill Contingency planning: A Global Perspective by Dagmar Schmidt Etkin.
on the center and starboard side of the vessel were damaged.

About 80 percent of the ship’s cargo remained on board, however, and the vessel came to rest in a very unstable position. The Exxon Valdez was in danger of capsizing if it floated off the reef. Both oil spill response and removal of the remaining oil from the ship became top priorities.

3-2-2 Contingency Plans and Preparedness

According to the Report to the President, May 1989, when the tanker Exxon Valdez ran aground on Bligh reef, six contingency plans were in place, ranging from the NCP to site-specific plans for Prince William Sound. They were designed to bring about an effective and coordinated national, regional, state, local, and industry oil spill response effort. The NCP and the Alaska Regional Contingency Plan (RCP) established federal responsibilities for response and identified the Coast Guard (CG) as OSC. The Alaska State Oil and Hazardous Substances Pollution Contingency Plan outlined the state role.

Initial responses were identified in both local Coast Guard Marine Safety Offices (CGMSO) plan for the Port of Valdez and industry’s Alyeska Contingency Plan for Prince William Sound. The Alyeska plan guided the Exxon Valdez spill response before the Exxon Company took responsibility on March 25 for the incident and put its own plans into effect.

3-2-2-1 The Alyeska Plan

The Alyeska Pipeline Service Company operates the
"Alaska Pipeline," which carries oil from Prudhoe Bay to the terminal at Valdez. Tankers that load at Valdez terminal and travel through Prince William Sound are covered by the Alyeska Pipeline Service Company's oil spill contingency plan for the pipeline, terminal and Prince William Sound. It is a industry plan required under state law.

The plan states that Alyeska will "direct cleanup operations of spills" from tankers carrying Trans-Alaska Pipeline System (TAPS) oil through Prince William Sound in such a way as to make federal or state intervention or takeovers unnecessary. The plan also states that Alyeska would, "maintain full responsibility and control in the event of an oil spill unless relieved of its duties by a 'government agency'." It does not mention the takeover of the cleanup operation by the tanker owners or their hired contractors according to their own contingency plan. *

The plan describes equipment and lays out procedures for oil spill detection and assessment, emergency notification and coordination, and control actions covering cleanup, disposal, and restoration.

The Alyeska plan gives priority to containment and cleanup of oil spills to prevent or minimize the amount of oil reaching sensitive areas.

The plan covers scenarios for three spill sizes, including an 8.4 million gallon spill in Prince William

* Source: Oil Spill Contingency Planning: A Global Perspective by Dagmar Schmidt Etkin.
Sound which, according to Woodward-Clyde, the oil spill contingency-planning consultants that assisted in the preparation of the Alyeska contingency plan, might be expected to occur once in 241 years, a remarkably similar quantity to what actually was spilled on March 24, 1989.

Chain of command responsibilities in the Alyeska plan generally parallel the NCP. The Alyeska Oil Spill Coordinator (AOSC) heads the Oil Spill Task Force responsible for providing response and follow-up activities for all oil spills.

The plan emphasizes the use of dispersants as an option for spill management.

**3-2-2-2 Captain of the Port Prince William Sound Pollution Action Plan (OSC Plan)**

The Captain of the port (CDTP) for the USCG, who would technically be the on-scene coordinator in the event of negligence on the part of the spiller, is under the jurisdiction of the Prince William Sound Pollution Action Plan (OSC Plan), which implements provisions of the NCP and Alaska RCP. It takes into account the Alyeska plan for Prince William Sound and the Port of Valdez. The plan includes procedures for notifying federal, state, and local agencies -- including Alaska Department of Environmental Conservation (ADEC) and other Regional Response Team (RRT) members. It also recommended response actions for five areas of the port, and procedures for gaining access to response resources.

**3-2-2-3 National and Regional Contingency Plans**
The NCP provides guidance for more site-specific regional contingency plans and OSC plans. Both the Alyeska and COTP Prince William Sound plans operate in the context of national and regional response policies established through the NCP and RCP. The principal task of the NRT is to coordinate all federal oil spill response actions and policies.

The RCP is the region-specific plan that establishes a RRT. It predesignates federal OSCs and outlines all regional mechanisms for coordinated response activities involving federal and state personnel. The OSC monitors the spiller’s (the responsible party’s) activities to terminate, contain, and remove an oil discharge. The OSC manages a response action when the spiller is unknown or unable to provide a response.

The RCP establishes a RRT for the area that includes Prince William Sound. The plan outlines the regional response system that establishes mechanical oil removal as a primary spill response strategy. The plan provides a mechanism for coordination of state and federal assistance after a spill in support of the federal OSC’s basic responsibility to either monitor the cleanup or conduct a response. The RRT also furnishes equipment and other resources.

3-2-2-4 State of Alaska Contingency Plan and Response Program

The Alaska oil spill response program is administered by the ADEC. The ADEC does not maintain full-time oil spill response teams or large clean-up equipment inventories. This plan lists the USCG as having "the base investigative
and enforcement responsibilities for oil spills that occur on coastal waters bordering Alaska." It adds that the USCG Captain of the Port of Valdez is the federal OSC for the coastal waters of Prince William Sound from Cape Fugut to Castle Island near Cordova.

Under the plan, responses to moderate (1,000 to 100,000 gallons in coastal waters) or large (over 100,000 gallons) oil spills fall under the province of the USCG or Environmental Protection Agency (EPA) OSC. In these cases, the state OSC will act as an advisor to the federal OSC regarding such state issues as availability of state and local resources, assignment of priority areas, threats to humans and wildlife habitats, adequacy of cleanup, activation of the RRT, and activation of a state-funded response.

3-2-2-5 The Exxon Plan

The Exxon Shipping Company Headquarters Casualty Plan is a voluntary document, not required by federal or state law. The plan merely defines the organization and responsibilities of each response team, but, since it is not specific to any location, does not provide any details on how a response should be carried out. It includes no explanation of any interaction with the NCP, RCP, Ayleska, state or CG plans. The Exxon plan contains no information specific to the Prince William Sound or Valdez Terminal and no equipment list other than mention of a van and sampling equipment. The plan also does not prescribe uses of booms, skimmers, and dispersants. The Exxon Plan required no approval by federal or state government.

3-2-3 Analysis of Contingency Plans
3-2-3-1 Contingency Plan Coordination

Government and industry plans, except the Alyeska plan, did not assume a spill of the magnitude of the Exxon Valdez spill and the Alyeska plan did not provide sufficient detail to guide the response. The Alyeska plan was the primary plan for purpose of directing spill cleanup involving oil from the Trans-Alaska Pipeline in the Valdez Terminal and Prince William Sound area. The Exxon plan states that Exxon Shipping Company is responsible for containment, cleanup, and claims settlements related to spills in the waters of the U.S. from Exxon vessels. The Exxon plan does not refer to other plans or establish a response command hierarchy that would take precedence over the Alyeska plan in the event of a spill either at the Valdez Terminal or in Prince William Sound.

According to Vice Admiral Clyde Robbins, federal OSC of the Exxon Valdez from 9 April - 1 October 1989, "the lack of coordination between all these contingency plans was at the root of the difficulties experienced in the response to the Exxon Valdez". (Schimid Etkin) All of the plans assumed that the spiller would take responsibility and respond initially, with the OSC, state, and RRT providing evaluation of the response actions. There seems to have been insufficient planning to assure that either the responsible party would be able to respond effectively, or, if necessary, government parties could respond to a spill of this magnitude. In particular, lack of coordination between the Alyeska plan and the Exxon plan appears to have caused confusion in structuring the response to the Exxon Valdez incident.
Because of lack of planning coordination, when Alyeska turned over its responsibility to Exxon on the second day after the spill, the State of Alaska was not informed in a timely manner.

The above findings are very important to China when the Chinese contingency plan is considered. Lack of coordination of plans at different levels render activated plans partially paralyzed and hence paralyze the whole response.

If the U. S. A. plans at different levels had been better coordinated the response to the incident could have been better.

China could incorporate this lesson in its contingency planing. In China, the oil spill incident of national significance will rely on the national force to respond rather than the spiller since there is little probability that a spiller could fund the response operation as Exxon did in the U.S.A. Therefore in the possible China NCP it could be made clear that oil spill of national significance should be dealt with by a national response force. By doing so, it would eliminate the possibility of spending precious time at the crucial initial stage of response to discuss who is going to response to the spill and whether the national response force should observe the response or immediately take over the response.

In China, it might be feasible to have three-tiered contingency plans, namely national, provincial and local since the Chinese administrative structure is three tiered. The provincial plan could coordinate the local plans.
Considering U.S.A. lessons learned in contingency plan coordination from the Exxon Valdez incident, when China is considering its plan, it should be stressed that all the contingency plans should refer to each other, be consistent and well coordinated.

The well coordinated contingency plan is only the first step to ensure the successful response to an oil spill but more important, is the actual implementation of the plan.

3-2-3-2 Implementation of Alyeska Plan

Although the Alyeska plan assumed a spill of the magnitude similar to the Exxon Valdez incident, yet it did not ensure preparation for response to this spill. In the opinion of many experts, it was not the inadequacies of the Alyeska contingency plan that were at the root of the problems in the Exxon Valdez situation, but rather the actual implementation of the plan as it stood. The July 1989 State of Alaska Report to the US National Transportation Safety Board said "Alyeska did not perform its duties consistent with the plan on the morning of the grounding."

A critical part of Alyeska’s response plan was the use of its contingency barge, which was only be loaded in the early part of the mobilization, after the USCG received a report of an oil spill. The contingency plan assumed that the contingency barge would arrive at the scene of a spill within five hours of being notified.

On the morning of the Exxon Valdez spill, Alyeska was "unprepared", since its contingency barge was completely
unloaded and in the process of undergoing repairs. According to Alyeska, the barge had been damaged during its use in the previous incident in late January - early February (State of Alaska 1989). The state of Alaska had not been informed of this "state of unreadiness," as required by State regulations.

It took Alyeska response crews ten hours to load the contingency barge with its response equipment. The barge arrived 14 hours after the initial spill notification.

Besides the delay in response, the manner in which booms and skimmers were used to contain and clean up the spill during the first day was unsatisfying. The boom deployment was not well directed, the large skimmer was not operational.

The Alaska oil spill commission (1989) noted that the oil recovery rate that was achieved by Alyeska's response team in the first three days after the spill was only just over 1% of that intended in the Alyeska contingency plan, even though the conditions assumed in the 8.4 million gallon scenario in the Alyeska contingency plan closely matched the actual conditions on March 24, 1989.

The Skinner and Reilly report of May 1989 noted that although the basic response strategy is outlined clearly in the Alyeska plan, guidance to help responders implement this strategy was inadequate in the Exxon Valdez spill. For example, the plan identifies sensitive habitats in detail and ranks them in order of response priority. It even calculates the amount of diversion booming needed to protect these habitats. The Alyeska plan does not provide clear guidelines, however, on the manpower or equipment

94
needed to deploy this booming or the time it would take. In addition, the adequacy of the amount of equipment actually stockpiled at the Valdez Terminal and elsewhere in the state was not known before the response was undertaken.

Although the Alyeska plan assumed the 8.4 million gallon scenario which was close in magnitude to the actual Exxon Valdez incident, the implementation of the plan, bungled the chance of winning the battle (an ancient Chinese military expression). This is another lesson that China should note.

Contingency plans are only pieces of paper if they can not be implemented effectively during the spill response. In Chinese contingency planning, emphasis should be put on the effective implementation of plans through training of personnel, testing of plans, preparedness and equipment and scenario exercises.

3-2-4 Response Organization

Under the NCP, the OSC is responsible for ensuring a proper response by continuously assessing and monitoring all response actions, and by "federalizing" a spill if the response activities are unsatisfactory.

The OSC is the focal point in effectively coordinating the response to an oil spill. The OSC pulls together the various threads of expertise and provides oversight direction for the use of manpower, equipment, and resources. In this case, the predesignated OSC was the Commanding Officer of the CGMSO in Valdez. That office is responsible for marine inspections, casualty investigations, port safety, environmental response, and
the Vessel Traffic System (VTS) for the MSO Valdez area.

With Alyeska accepting responsibility for the cleanup immediately after the spill occurred, the OSC established a response organization in conformance with the NCP. The lack of preparedness on the part of Alyeska to have the requisite equipment pre-staged, however, effectively delayed any meaningful response.

The spill's size and the complexity of the required response taxed the initial OSC organization. Additionally, public and media concerns over the spill's potential environmental and economic effects demanded the OSC's attention to a far greater degree than that previously experienced during any spill in U.S. history. It was quickly evident that this spill would require additional assistance for the OSC.

To alleviate pressure on the OSC, the Seventeenth CG District Commander was despatched to the scene on the second day after the spill. No transfer of authority took place, the OSC retained his role under the Clean Water Act.

As the response increased in intensity, the response organization grew to accommodate the increased demands placed on it. By the fourth day of the spill, a high level management steering committee, consisting of the Seventeenth CG District Commander, the President of Exxon Shipping, and the Commissioner of ADEC, evolved to coordinate the response.

On April 6, President Bush expanded the DOD involvement in the response effort. At the request of the President, the Secretary of the Army, as executive agent for military
assistance to civil authorities, was given responsibility for planning, coordinating, and managing all DOD activities in support of the FOSC.*

On April 7 President Bush announced that Adm. Paul Yost, Commandant of the USCG, would assume personal oversight of the cleanup effort, working with Exxon and the Government of Alaska.*

In general, most spills are managed using a "team" concept. This approach involves the spiller, the OSC, other federal agencies, and the state. In this incident the team concept appeared to break down into adversary relationships that may have caused a lack of communication and ineffectiveness in the cleanup.

The Exxon Valdez response could be characterized as confused over the issue of responsibility, and the system currently established by Federal law encourages this situation. The law is not clear about who is to do what. The spiller need do only enough to keep the spill from being federalized to carry out its legal responsibilities. This leads to a situation in which confusion, debate, and discussion take the place of needed quick and decisive actions. Every discussion delays the response, and every delay impairs the response, especially in the crucial

early hours and days of the spill (p.218). *

The OSC spill-response organization outlined in the NCP was not followed in this case. Public and media interest required a disproportionate amount of the OSC’s time. Three different organizations eventually evolved to deal with this spill: the NCP-specified organization, the steering committee, and Presidentially-directed oversight by the Commandant of the CG.

According to Prof. Ted Sampson, the normal functioning of the Regional Response Team during this incident was disrupted by the personal interest of varied, high-level program managers, including agency heads, cabinet Officers, and the President himself. Much of the time of RRT members was spent involved with their own agencies, keeping them apprised of the development of the spill. This immediate need for information at higher agency levels, and the frequent communications which it stimulated, at times caused operational decisions, normally made at the RRT level, to be deferred to higher authority. At times some RRT members functioned more in a capacity to promote individual agency agendas than to provide ready assistance to the OSC.

Because of the frequent delays in obtaining answers to critical questions caused by deferring decisions to higher authority, the FOSC at times found the benefit of the RRT to be somewhat limited.

In my view, the root of the problem of organization and responsibility that caused confusion in the response to the incident, is that there was more democracy and less centralism in the organization principles in the US. In China, there is an organizational principle for the country, namely, centralism on the basis of democracy and democracy under centralized guidance. If this incident happened in China, the Chinese way of organizing could be less confusing and more efficient even without a contingency plan since the Chinese Governmental structure is a relatively highly centralized one.

According to Prof. Ted Sampson, the most vexing intergovernmental coordination problem which the FOSC faced was the inability to establish an effective working relationship with the State of Alaska. In China, this could not happen since the Central Government has the power over the provinces (equivalent to state in US). But it does not mean that the Central Government is so autocratic that it is always overriding the provinces. The normal procedure is that the Central Government will discuss the matter with the province and generally speaking the Central Government respects the view of the province. But when coordination is necessary, especially during the emergency situation the Central Government has the right to centralize and make decisions. From the point of view of marine oil spill contingency planning, centralism is a strong point for the organization.

3-2-5 Inexperience of Personnel

Because planners could not anticipate the manpower needed to response to a very large, very widespread spill, there was a lack of personnel skilled in oil spill response
techniques. Valuable time was used to train inexperienced workers. In a spill of national or region-wide significance, persons at organizations not normally involved in oil spill response may be required to function in key roles. Some response personnel and government representatives did not fully understand the NRT/RRT structure and how it works, reducing the effectiveness of available on-scene organization and resources through unrelated or overlapping efforts and management chains.

According to Prof. Ted Sampson, considering the magnitude of Exxon Valdez spill, and the numbers of diverse interest groups affected by the spill, that intergovernmental coordination presented significant problems. Most of the people involved in organizing the spill response had little, if any, previous experience in dealing with the problems associated with a major pollution incident. Many key individuals, representing interests of agencies that would be subjected to the severe impacts of the spill, were not even aware that mechanisms like the NCP and the RRT existed. The relationship prescribed by the NCP between the FOSC and a spiller accepting responsibility for the spill response was understood by few within the varied affected organizations and by virtually no one in the general public.

This is another lesson for China. It is not difficult to imaging that the above-mentioned situation could happen in China. In this case, training is crucial for solving this problem. In China there is no training center for the purpose of marine oil spill response. In my opinion there is a necessity for such an establishment in China. The training courses should not only cover the oil spill response operation but also cover the oil spill response
3-2-6 Equipment *

3-2-6-1 Availability of Equipment

According to Prof. Ted Sampson, the assessment of the availability of equipment to provide a response for a spill of this size in this area is largely a function of how fast equipment could be mobilized and effectively deployed on scene.

Since the discharge was never surrounded with containment boom and only a limited amount (less than 5 percent) of the spilled oil recovered before it washed ashore or left Prince William Sound, it appears that too little equipment was immediately available for a spill of this size, in this location.

3-2-6-2 Boom Connection

The boom on scene was of three different types, which could not be readily joined together because of incompatible construction methods, and came in increments which would require multiple joints. This slowed down the response process.

Due to a variety of weather conditions and locations in * Source: All the information about the incident used in this section is based on the talks with Prof. Ted Sampson.
which a response may be required, the stocking of various types and lengths of containment boom are needed. However, great benefit might be realized by planning equipment inventories with the intent of maximizing the utility of the equipment in worst case scenarios. If boom is stockpiled which is compatible for joining with the other types of boom in the inventory, the utility of this equipment would be enhanced. Beyond this, there is a need to be able to collectively apply, in simple and efficient manner, the many varied types of containment boom produced by the multitude of response equipment manufacturers. This is of particular importance when a spill of national significance results in the deployment of a large percentage of the world’s supply of containment boom.

Since China is relatively young in oil spill response equipment stockpiling, the experience mentioned above could serve as an example for the Chinese oil spill contingency planners. If the Chinese NCP is adopted, the present equipment inventories will be enhanced with limited budget. In order to make best use of the equipment and taking into account the U.S. experience in this regard, it is suggested that China adopt uniform requirements to ensure that the equipment purchased by or produced in China is compatible.

3-2-6-3 Insufficient Tankage for the Recovered Oil

As time passed the number and types of skimming devices available for use increased. By 15 May there was assembled in the response zones a total of 50 separate skimming devices, more than ever before deployed in the response to a single oil spill. Generally speaking, those skimming devices that were equipped with debris cutters, along with Archimedean screw types pumps to handle the
recovered product, functioned best for the greatest duration of the response.

The greatest inefficiency which all of the skimming systems faced was the failure to keep the system employed in the recovery mode. While most systems employed were mechanically reliable, the remote locations of operations, often without nearby support of other larger vessels or repair facilities, extended down times for repair as well as for routine or preventive maintenance. Repair and maintenance problems were exacerbated by the shortage of experienced or trained operators who were needed to sustain the operations over the months of the response.

Some recovery systems were equipped with their own on-board storage capacity for recovered product. This provided some advantage over many other systems because they could be employed immediately without the need to locate a storage barge or other storage device of opportunity. This advantage was in all cases (with the exception of the two U.S. Army Corps of Engineers dredges and the then Soviet Skimmer/dredge) very short-lived. Some of the best skimmers had only a 32 barrel, storage capacity which was topped off in roughly 30 minutes of skimming operation. Oil recovery operations were then delayed for a minimum of approximately 2 hours while the vessels transited to and from an off-loading point and disposed of recovered product.

All of the above problems contributed to the inefficiency of the free-floating oil recovery operations. However, the single biggest factor affecting the efficiency of the operation was insufficient tankage for the recovered oil. In addition to the number of oil skimming devices deployed in this response, thousands of feet of boom were
towed between pairs of vessels to concentrate and surround oil threatening the shorelines or floating free in open water. This method of collecting the oil, while reasonably efficient, was severely limited because storage barges or vessels equipped with off-loading pumps were not readily available. Collecting booms and recovery devices routinely spent hours and sometimes days out of service waiting for the recovered oil to be picked up. This storage problem persisted throughout the free-floating oil recovery effort.

The two U.S. Corps of Engineers dredges and the Soviet skimmer/dredge demonstrated a capability for dealing with this problem.

The above information could be very valuable for the Chinese oil spill responders and contingency planners while considering purchasing equipment or planning the inventory.

3-2-7 Public Information

CG did not initially foresee the magnitude of the public and media interest in this incident. Consequently, the small number of public affairs personnel assigned were overwhelmed. This adversely affected the OSC organization and its ability to carry out operational responsibilities.

3-2-8 Summary

Two months after the incident, the NRT prepared the May 1989 Report summarizing the early stage (24 March to 26 April) of response to the incident. In its executive summary section, there are several emphasized points which, in the author's view, would serve as a reminder to her country in the process of oil spill contingency
planning.

1. Prevention is the first line of defense. Avoidance of accidents remains the best way to assure the quality and health of our environment.

2. Preparedness must be strengthened. Exxon was not prepared for a spill of this magnitude -- nor were Alyeska, the State of Alaska or the federal government. It is clear that the planning for and response to the Exxon Valdez incident was unequal to the task. Contingency planning in the future needs to incorporate realistic worst-case scenarios and to include adequate equipment and personnel to handle major spills. Adequate training in the techniques and limitations of oil spill removal is critical to success of contingency planning. Organizational responsibilities must be clear, and personnel must be knowledgeable about their roles. Realistic exercises that fully test the response system must be undertaken regularly.

3. Response capabilities must be enhanced to reduce environmental risk. Oil spills -- even small ones -- are difficult to clean up. Oil recovery rates are low. Research is needed to improve cleanup technology. Research should focus on mechanical, chemical, and biological means of combating oil spills. Decision-making processes for determining what technology to use should be streamlined, and strategies for the protection of natural resources need to be rethought.

4. Federal planning for oil spills must be improved. The NCP has helped to minimize environmental harm and health impacts from accidents. The NCP should, however, continue to be reviewed and improved in order to ensure that it
activates the most effective response structure for releases or spills, particularly of great magnitude. Moreover, to assure expeditious and well-coordinated response actions, it is critical that top officials -- local, state, and federal -- fully understand and be prepared to implement the contingency plans that are in place.
Chapter Four

Canadian Experience on the Ship-source Oil Pollution Fund *

For the establishment of a NCP and the effective implementation of the NCP, the key problem is funding. Without funds, it is impossible to consider the NCP in a rational way. Funding is also a key element for the possible Chinese NCP. During my on-the-job training in March 1992 in the Canadian Coast Guard Marine Emergency Response Center, I found the Canadian Ship-source Oil Pollution Fund (SOPF) is a very effective way to solve the funding problem and at the same time it provides better protection and compensation to the claimants. This funding system plays a very flexible and sensitive role in adjusting the relationships between the industry and the environmental concerns. In my own view this system could be very useful to China if applied in china and adapted to the Chinese situation. In this Chapter, the Canadian SOPF system is analyzed, various concepts are explained and the possible ways of application in China is discussed.

4-1 Origin of the SOPF

In the early 1970s in Canada, two incidents drove the Canadian government to propose a new bill to fill the vacuum in Canadian law by imposing legal liability on tanker owners to pay for the costs of cleanup and to pay

* All the financial figures in this chapter are expressed in Canadian dollars, except where indicated otherwise.
amages caused by oil pollution. These two incidents polarized remedial legislative action, which culminated in the oil spill legislation proposed becoming Part XX of the Canada Shipping Act and became part of Canadian Law on June 30, 1971.

4-1-1 Arrow Incident *

On February 4, 1970, the Liberian oil tanker Arrow struck Cerberus rock in Chedabucto bay, Nova Scotia. The tanker, owned by Sunstone Marine S. A. of Panama, was carrying 16,000 metric tons of bunker C fuel oil for Imperial Oil Limited from Venezuela to a plant in the Strait of Canso. During attempts at salvage, the ship broke in two on February 12, with the bow fast on the rock and the stern section on the ocean floor at a depth of 95 feet, approximately 700 yards to the north. Some 82,500 barrels (11550 tons) of bunker C were discharged into the surrounding waters.

At the time of the Arrow incident the circumstances in the chedabucto Bay area were among the worst that were likely to be encountered. Water temperatures were extremely cold, with land-fast ice in the bays and inlets, and the oil involved was very thick bunker C.

A multidisciplinary task force, "Operation Oil," was organized to deal with the oil recovery and cleanup. Many


108
lessons were learned, scientific data collected, and experience gained. Cleanup costs were over $4,000,000, but, with no specific Canadian legal regime in place at that time, the only practical recovery route available was the Tanker Owners Voluntary Agreement concerning liability for oil pollution which had just come into operation on October 6, 1969. A substantial claim was submitted, which, despite vigorous negotiations, was settled in an amount much less than the actual costs.

4-1-2 Irving Whale Incident

On February 20, 1970 an oil barge named the Irving Whale had caused an oil spill off the south coast of Newfoundland and was later called upon by the Operation Oil Task force to act as the receiving vessel for oil pumped from the sunken stern section of the Arrow. Following upon such service, she was released to her owners and underwent refit/maintenance at St. John, N. B. In July 1970, on her first subsequent voyage, while carrying a cargo of bunker C oil to Bathurst, N. B., she sank off the north coast of Prince Edward Island and thus became the second largest oil pollution incident to affect the Maritime Provinces in less than one year, and while cleanup operations were still continuing for the Arrow incident.

4-1-3 Principle Elements of the Part XX of the Act

Predating the entry into force of the International Convention on Civil Liability for Oil Pollution Damage 1969 (CLC) by more than four years, and of the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage 1971 (Fund Convention) by more than seven years, the
new Part XX was one of the first national comprehensive regimes for oil spill liability in the western world. The new Part XX adopted many of the same principles as in the CLC 1969. These included:

- Establishing the liability of shipowners to be responsible for costs and damages for a discharge of oil;

- Allowing the shipowner, in certain circumstances, to limit his liability;

- Creating a new fund, the Maritime Pollution Claims Fund (MPCF), to be available for claims in excess of the shipowner’s limit of liability;

- Giving the Minister of Transport the power to move or to dispose of any ship and cargo discharging or likely to discharge oil.

4-1-4 Financing the MPCF

To finance the MPCF, a levy of 15 cents per metric ton on all oil shipments by sea entering Canada as well as movements of oil by water within Canada were paid into the fund and became payable for the first time on February 15, 1972. By the end of March 1975, there was $27,000,000 * in the fund and by the end of March 1976, over $36,000,000. * The collection of the levy was suspended on September 1, 1976, when it was decided that there was sufficient money

in the fund to meet any foreseeable claims. The MPCF was a special account in the Consolidated Revenue Fund of Canada and the Canadian Minister of Finance credits interest to the fund at a rate fixed by the Governor-in-Council.

The later new Ship Source Pollution Fund receives similar treatment. The interest is presently credited monthly by the Minister of Finance (about 10.75% per annum during the 1990-91 fiscal year) (see Figure 4-1).

The Minister of Transport has the statutory power to impose a levy on "contributing oil" imported into or shipped from a place in Canada in bulk as cargo of a ship. The levy is indexed annually to the consumer price index.

4-1-5 Kurdistan Incident – First Test of the Regime *

4-1-5-1 The Incident

The first major challenge of the Canadian Part XX came on March 15, 1979, when the British owned and registered motor tanker Kurdistan broke in two in a position south of Cabot Strait in a very cold sea. She was fully laden with 26,000 metric tons of heated bunker C fuel oil on a voyage from Point Tupper, Nova Scotia, through the Cabot Strait to Baie des Sept-Îles, Quebec.

After the initial hull plate fracture failure, the tanker remained intact for some time, and then the bow and

stern sections of the tanker separated, spilling an estimated 4,000 tons of her cargo of oil. After the casualty, the bow and stern sections of the Kurdistan, each still containing and discharging oil, drifted within waters to which Part XX of the Act applied.

The stern section of the tanker was removed by contract to a place of safety under Lloyds Open Form, where the oil remaining was recovered. The bow section, containing some 7,000 tons was towed to an environmentally safe deep water location some 200 n. miles off Nova Scotia and sunk under the guns of HMCS Margaree on April 1, 1979, without further oil release.

4-1-5-2 Extensive Litigation

As one would expect, extensive litigation ensued:

- The shipowners commenced proceedings in the Federal Court of Canada to limit their liability under the Canada Shipping Act to $3,559,962.40.

- The Government of Canada sued the ship Kurdistan and her owners to recover the costs and expenses incurred by the Minister of Transport for the very successful actions taken to repair and remedy the conditions resulting from the discharge of oil from the Kurdistan, amounting to $6,946,109.

- On the basis that the bow section could have been salvaged, the Kurdistan owners and cargo owners commenced proceedings against the Government of Canada for damages in excess of $20,000,000 for the unlawful destruction of the bow section and its contents.
- The shipowners sued the U.K. repair yard in the English courts for damages for the negligent repair of the Kurdistan.

4-1-5-3 The Cause of the Incident

The common thread throughout the litigation was the cause of the breaking in two of the tanker. It was not disputed that the tanker sustained a brittle fracture of such magnitude that it was almost inevitable that she would break in two.

The debate among the parties involved two contentions:

- The fact that Kurdistan was navigated into an ice field at full speed ahead which initiated the primary fracture;
  or,

- The fracture was initiated after she had emerged from the ice and was pitching into head seas.

This very technical debate was resolved by a formal investigation under the Merchant Shipping Act (1894), in London before R. F. Stone, Q. C., as judge with three assessors. After 51 days of hearing in 1981, the court, on November 12, 1981, concluded that the breaking in two of the tanker was caused by a brittle fracture which initiated in a weld defect in the port bilge keel flat bar butt weld under stress from still and wave bending moments, thermal loads, and wave impact on the bow at low temperatures.

The bilge keels had been repaired, and parts renewed in 1977 at a yard in North Shields, U. K. It turned out that there had been no inspection at any stage by the
classification surveyor. In fact, the welding showed a very poor standard of workmanship in its fabrication. The court found that the set up and buckling to both flat bars was sufficiently serious to constitute a threat to the structural integrity of the tanker.

4-1-5-4 Settlement of the Claims

As stipulated by the Canada Shipping Act, the administrator of the Maritime Pollution Claims Fund was a party to the proceedings against the Kurdistan and her owners for recovery of the Crown's costs and expenses totalling $6,946,109, plus interest. As a result of lengthy examinations of the Crown's claim, obtaining the advice of persons with professional or technical skills in such matters, and after extensive negotiations, the Crown's claim was agreed at $8,500,000 including accrued interest.

The companies involved with Kurdistan sued to limit their liability to a sum of 2,000 gold francs for each metric ton of her limitation tonnage, i.e., 35,033,780 gold francs or $3,559,962, based on a plea that the incident had occurred without actual fault and privity on their part.

Subsequent to a series of meetings in Halifax, Nova Scotia, of all the parties involved, an agreement was reached to settle the balance of the Crown's claim of $4,271,571.00 above the monies in Court by the administrator paying 55 percent of the balance ($2,349,364.05), and the shipowner paying 45 percent of the outstanding balance ($1,922,206.95).

The action against the Crown for the alleged unlawful sinking of the bow section was abandoned at an early stage.
4-2 Amendments to the Part XX of the Act

The Kurdistan incident and the experiences of other pollution incidents over the years since the proclamation of Part XX led to further revisions and amendments to the Canada Shipping Act.

Canada Acceded to the 1969 CLC Convention and the 1971 Fund Convention and incorporated their provisions into the Canada Shipping Act.

The new ship source pollution regimes of the Act which also came into force on April 24, 1989, are found in Parts XV and XVI.

4-2-1 1969 CLC Convention

The 1969 CLC convention governs the liability of shipowners for oil pollution damage, establishes the principle of strict liability (i.e., with certain prescribed defences), and creates a system of compulsory liability insurance. It is restricted to laden tankers carrying persistent oil and establishes a limitation of liability of about $200 * per ton (usually expressed in terms of SDR), with an upper limit of about $21 * million. This limitation only applies if shipowners can prove that the events giving rise to the claim occurred without their "actual fault or privity". If they cannot, their liability is unlimited. CLC Convention only applies to the territorial sea of the contracting Party.

4-2-2 1971 Fund Convention

The 1971 Fund convention led to the creation of an
international fund to supplement the compensation payable under the CLC. This fund, financed in most states by companies that annually receive more than 150,000 * tons of "contributing" oil in bulk by sea, is used to compensate victims of oil pollution damage up to a maximum of about $90 * million in respect of any one incident. This amount includes any compensation available under the CLC.

If shipowners are not liable, or where they are liable but cannot meet their liabilities, the International Fund pays the full compensation due, up to the prescribed maximum.

4-2-3 Main Content of Part XV and XVI

Part XV is entitled "Pollution Prevention and Control." Accordingly, the provisions of that part set out the pollution prevention and control regime for ship source pollution in Canada. In this part are found provisions relating to the Governor-in-Council's regulation-making power, the powers of Pollution Prevention Officers, provisions relating to offenses for contravening the part as well as regulations made under the part, and provisions relating to the detention of ships.

Part XVI, entitled "Civil Liability and Compensation for Pollution," sets out the general rules relating to

civil liability and compensation for pollution from ships generally and special rules with respect to ships covered by the 1969 CLC Convention. In this part are also set out the provisions touching on the International Oil Pollution Compensation (IOPC) fund and the Ship-source Oil Pollution Fund.

Canada's contributions to the IOPC Fund are paid directly by the SOPF.

4-2-4 Scope of Application

Part XV and its regulations have force and effect in all Canadian waters and the fishing zones of Canada, and apply to all ships found in these waters.

Part XVI, in-so-far as it applies to ships not covered by the 1969 CLC Convention, has application with respect to actual or anticipated pollution damage caused by such ships

- in any place in Canada,
- in Canadian waters, and
- in the fishing zones of Canada.

This regime which is applicable to non-Civil Liability Convention ships has no application in waters covered by the Arctic Waters Pollution Prevention Act.

With respect to ships covered by the Civil Liability Convention, the part applies

- in any place in Canada and
- in Canadian waters.
There are two important features respecting the scope of application of the part in respect of Convention ships, namely that the liability and compensation regime set out in the part applies irrespective of the location of the actual or expected discharge of the oil, and the regime applies in waters covered by the Arctic Waters Pollution Prevention Act.

4-2-5 Liability and Compensation

Part XVI retains the principle of strict liability (with certain prescribed defences) of the shipowner for oil pollution damage, cleanup costs and expenses of public authority, in relation to any pollutant and the costs and expenses of the Minister of Transport for preventive measures, including removal or destruction of the ship and its contents: the shipowner is liable without the need to prove fault or negligence on his part. Three defenses remain, that can negate this liability. The shipowner can escape liability if he establishes that the occurrence:

- resulted from an act of God or war;
- was wholly caused by an act or omission of a third party; or
- by negligence of government authorities responsible for navigational aids.

Part XVI adds new provisions outlining "Special Rules for Ships Covered by Civil Liability Convention." These provisions prevent a convention shipowner from limiting his liability for an oil pollution occurrence unless he sets up a "convention Shipowner's Fund" in an appropriate court. The purpose of this fund is to establish a source of money against which compensation claimants in respect of an oil
pollution occurrence may be paid as determined by the court. These Special Rules are followed by measures providing that judgments of a court of another state that is a party to the Civil Liability Convention may be registered in Canada, in effect as a basis to pursue assets of the shipowner in this country. The reciprocity in respect of the foregoing measures among parties to the Civil Liability Convention enhances the capacity of Canadian claimants to obtain restitution from foreign shipowners liable for oil pollution in Canadian waters. The only drawback in this regard arises from the fact that not all states are party to the Convention.

4-2-6 The Ship-source Oil Pollution Fund

Over the years, the main issue with respect to the MPCF related to its adequacy and availability as a source of ultimate compensation. By "ultimate compensation" it was meant that MPCF constituted a means of last resort. A claimant could not obtain compensation from the MPCF until he had exhausted all other legal remedies against the shipowner. There was the perception that the high cost of exhausting all other legal remedies in effect discouraged relatively small claimants from seeking compensation because such costs could easily exceed their claim long before it reached the MPCF.

In enacting the recent amendments to the Canada Shipping Act, Canada decided to adopt a new compensation regime incorporating the international conventions, but retaining the domestic fund, suitably modified in the light of experiences gained and renamed the Ship-source Oil Pollution Fund (SOPF). In addition to the previous availability of the MPCF to cover lost income of fishermen
and clean-up costs, the SOPF is available for:

- use as an "excess fund" to cover any portion of claims exceeding the funds available under the 1969 CLC and the 1971 Fund convention, to a maximum of $100 million (indexed to $105.5 million in 1990) per incident;

- meeting claims that might not be covered by the International fund, which applies only to laden tankers. The Canadian fund covers spills from any ship. In the case of "mystery spills", the onus is on the fund's administrator to show that the spill did not come from a ship;

- meeting claims against a shipowner who is financially incapable of paying the limited liability portion of the damages;

- meeting claims resulting from oil pollution damage suffered outside the territorial sea, but within Canada's fishing zones;

- paying Canada's contribution to the International Fund.

4-2-7 Improvements through the New Amendments

The MPCF did not have any limit on the amount that it might have to pay out for any one pollution incident. This exposed the MPCF to the possibility of becoming completely depleted in case of a large and costly pollution incident, leaving insufficient money in the MPCF to pay claims for subsequent pollution incidents. The new amendments limits the liability of the SOPF to $100 million (indexed to
dollars ($105.5 million in 1990) for each occurrence.

The new amendments has broadened its coverage to cover loss of income not only for fishermen, but also for fish processors, workers in certain types of fish processing plants, sport fishing boat operators, etc.

It was not clear previously whether the MPCF intended to be available in cases of "mystery spills", i.e. spills of unknown origin. To obtain compensation from the MPCF, claimants had to overcome two major problems. First, they had to establish that the spill was caused by a ship, and second, they had to exhaust all their remedies against the shipowner. The provisions relating to compensation for "mystery spills" have been clarified in the new amendments. In contrast to the previous legislation, the SOPF now is liable for such spills unless the administrator can prove that they were not caused by ship. The burden was shifted to the administrator of the SOPF.

Perceived shortcoming of the MPCF with respect to its nature as a source of "ultimate" compensation was remedied by the new amendments permitting claimants, other than a public authority, to claim directly against the SOPF in the first place, thus obliging the SOPF administrator to settle legitimate claims quickly and then, in turn, claim against the shipowner or the International Fund as appropriate.

Another especially important modification was to make the SOPF available to compensate claims for oil pollution in Arctic waters in respect of Convention ships (tankers loaded with persistent oil). Since the MPCF did not apply to the Arctic at all.
4-3 How the New Compensation Regime Works

4-3-1 For Convention Ships *1

In the case of oil pollution from a convention ship, compensation claimants would first have access to a maximum of about $93.22 (1991) million in compensation via the two international conventions. In addition to that, another $142 (1991) million would also be available from the SOPF, for a total compensation coverage of $203.36 (1991) million. (see Figure 4-2)

4-3-2 For Other Type of Ships

In the case of oil pollution from any other type of ship, the international conventions would not be available, and the compensation coverage would be 110 (1991) million from the SOPF. (see Figure 4-2)

4-3-3 Claimants against the SOPF *2

There are three potential types of claimants against the SOPF. The first consists of a public authority, claiming in respect of costs and expenses for preventive measures, repair, and cleanup, and the Minister, claiming in respect of his costs and expenses due to an oil pollution incident. This first type of claimant is expected to seek compensation first from the shipowner and


122
Status of the Funds
Monetary Value of the M.P.C.F. / S.O.P.F.

$ Millions

200
180
160
140
120
100
80
60
40
20
0

Balance in the M.P.C.F. / S.O.P.F. as of March 31st, by year


Figure 4-1
Canada Shipping Act Part XVI — Compensation for Oil Pollution Damage in respect of any one incident involving a laden tanker

(Based on the value of the SDR at April 1, 1991)

\[ \text{CLC & IOPC Fund & S. O. P. F. up to approx. $203.36 million} \]

\[ \text{CLC & IOPC Fund up to approx. $93.22 million} \]

\[ \text{CLC approx. $206.83 per liability ton up to a maximum of approx. $21.75 million} \]

vessel size - thousands of tons

1. 1969 Civil Liability Convention (CLC) provides compensation of up to approx. $21.75 million.
2. International Oil Pollution Compensation Fund (IOPC Fund) and CLC provide aggregate compensation of up to approx. $93.22 million.
3. Ship-source Oil Pollution Fund (S. O. P. F.), IOPC Fund and CLC provide a combined amount of up to approx. $203.36 million for any one incident involving a laden tanker.

Note: The S. O. P. F. provides up to $110.142 million (during fiscal year commencing April 1, 1991) over and above the funds available under the IOPC Fund and CLC in respect of spills from laden tankers. The S. O. P. F. is also available for compensation for oil spills from ships other than laden tankers, certain claims for loss of fishing income and mystery spills.

* As defined in Article V of the Civil Liability Convention


Figure 4-2
the International Fund as the case may be, before resorting to the SOPF.

The second group of potential claimants consists of persons other than public authorities, who suffer loss or damage or incur expenses due to oil pollution.

The third group of potential claimants consists generally of persons who derive a living from the fishery and who suffer an actual or prospective loss of their living not otherwise recoverable.

Claimants in these latter two groups may file their claims directly with the SOPF, and the administrator must then investigate and assess each claim. He then takes an offer to the claimant who may at that time either accept the offer or make an appeal to the Federal Court of Canada for reassessment of that claim under the process outlined within the Act. When the fund pays such a claim, the administrator is subrogated to the rights of claims, and thus must pursue the shipowner, the insurers, and the International Fund to recover the amount paid. In this aspect, the SOPF is a fund of first resort.

4-4 Possible New Levy on the Industries

4-4-1 Background

In December 1988, the tug Ocean Service struck the tank barge Nestucca off the coast of Washington, resulting in an 875 ton oil spill that affected Canada’s west coast. A few months later, in March 1989, Exxon Valdez grounded on Bligh Reef in Alaska. Both of these spills caused highly visible environmental damage and were followed by public outrage
because clean-up efforts were slow or unsuccessful.

4-4-2 Internal Review and Public Review *

The growing concern for the marine environment and safety led the Government of Canada to quickly launch two initiatives. The first, a federal internal review of marine spill prevention and response capabilities, began in April 1989. On June 9, 1989 an independent public review that would parallel, and build upon, the results of the internal review was conducted. The mandate was to review and evaluate:

- the measures currently in place to ensure the safe movement of oil and chemicals by tanker and tank barge through Canadian waters;
- Canada’s ability to respond to marine spills of these products;
- provisions for compensation for damages resulting from spills of oil and chemicals;
- Canadian legislation and international conventions which regulate the movement of vessels transporting oil and chemicals.

4-4-3 Major Findings *

In fulfilling its mandate, the Public Review Panel on Tanker Safety and Marine Spill Response Capability held 31 days of public hearings across the country. The following are its major findings.

1. The capability to respond effectively to a spill of any significant magnitude does not presently exist anywhere in Canada.

2. Each year, based on current levels of tanker traffic, Canada can expect over 100 small oil spills, about 10 moderate spills and at least one major spill. A catastrophic spill (10,000 tons), for which Canada is wholly unprepared, can be expected once every 15 years.

3. The risk of spills is highest in eastern Canada, particularly in Newfoundland. Placentia Bay is considered by many to be the most likely place in Canada for a major spill.

4. A much greater volume of oil enters the marine environment as a result of routine tanker operations than of accidents. Almost all of these operational spills can be avoided.

5. The overwhelming majority of tanker accidents are caused by human error. Despite this, competitive pressures have reduced manning of vessels to dangerously low levels and made quick port turnarounds a growing priority.

6. Only 8% of the oil tankers operating worldwide have double hulls or bottoms, despite overwhelming evidence that this type of construction offers a substantially
higher margin of operational safety. Of Canada’s 31 tankers, only one is double-hulled and ice-reinforced.

7. Canada’s tanker fleet is old and in need of replacement. The estimated life span of a tanker is 20 years, but Canadian tankers are on average older than that.

8. Overall, foreign tankers pose a greater threat to Canadian shores than domestic tankers; almost one quarter of the foreign tankers inspected by the Canadian Coast Guard in the Atlantic region over an 18-month period ending December 31, 1989 were found to be defective.

9. Over 340 chemical spills occur in Canadian waters every year. The environmental and health hazards they pose are largely unknown and (in the very rare circumstances where clean-up is possible) they often cost 10 times as much, and take 5 times as long, to clean up as oil spills.

10. There is also a glaring need to standardize and upgrade dockside chemical loading and unloading requirements, as well as the design, construction and inspection of chemical tankers and barges.

11. A major research and development effort is urgently needed to develop more effective spill clean-up equipment and technology because what is now available is essentially primitive and largely ineffectual.

12. The Coast Guard is seriously under-resourced and cannot provide the level of monitoring, inspection and
surveillance required to adequately protect our waters. Despite the fact that it commits most of its inspection resources to compulsory inspection (up to 90% in some regions), and that Canada is a signatory to an international agreement requiring inspection of 25% of all foreign tankers entering its ports, only 8% of foreign tankers are inspected.

13. The Coast Guard's investigative and prosecution efforts are seriously inadequate and do little to deter polluters. Indeed, the chances of polluters being caught are small; of being caught and prosecuted even smaller. If polluters are prosecuted, the chances of being found guilty are minuscule and, if found guilty, fines are paltry. In the few instances where prosecutions are attempted and prove successful, fines are unacceptably meagre: between 1979 and 1988, the average fine under the Canada Shipping Act was $4,700.

14. Industry relies inordinately upon the Coast Guard for spill response. To date, the amount it has invested in spill-related R & D and in response equipment has not been commensurate with the risks inherent in the loading, discharging and transportation of its products.

15. While contingency plans to deal with just about every possible marine spill scenario exist in all regions, they are for the most part poorly designed, uncoordinated and untested. Too often, the are based on the mistaken belief that if things go badly the response will escalate and additional resources will simply be called in. The necessary linkages, roles and responsibilities are largely assumed and the needed
equipment non-existent.

16. Numerous spill reporting systems exist between and within regions, leading to uncertainty and poor coordination. It is essential that these systems be integrated and that a public education program be undertaken to encourage Canadians to get involved.

17. The current international and domestic statutory frameworks relevant to prevention, preparedness, liability and compensation need to be overhauled. No less than eight separate statutes govern spill response in Canada and each has widely different limitations of liability, duty to remedy and penalty provisions (maximum fines range from $500 under the Canada Ports Corporation Act to $1 million under the Canadian Environmental Protection Act). To enforce compliance, these statutes must be streamlined, strengthened and more vigorously enforced.

4-4-4 Major Recommendations *

In response to the situation outlined above, the Panel made 107 recommendations, of which 51 focus on specific local or regional concerns raised during the public hearings. The Panel estimates that the cost of implementing these recommendations will be approximately $1.5 billion over a 10-year period, of which $800 million to $1 billion

is to be raised through a $2 per ton levy on all oil and oil products transported in Canadian waters.

Canadian recent experience demonstrates clearly that the $163 million (1990) now in the SOPF is not adequate to deal with a major spill. Given the demands which the fund may be called upon to meet, and those which the Panel proposes to add and the Minister of Transport has the authority to impose the levy at any time, the Panel makes the following recommendation:

"The Minister of Transport should immediately impose a levy of $2 per ton on all oil and oil products transported in Canadian waters. The levy should be paid into the Ship-source Oil Pollution Fund, whose purpose should be expanded to expedite replacement of the Canadian-flag fleet with double-hulled vessels and to fund spill response research and equipment purchases."

The Panel also recommends that this should be done at once and the purpose of the fund should be expanded to include both prevention and response measures. Specifically, the SOPF levy should be used to:

- encourage the replacement of Canadian-flag fleet of tankers and tank barges with safer double-hulled ships;

- provide an incentive for companies that charter foreign tankers to use double-hulled or double-bottomed tankers in Canadian waters by discounting the levy for safer ships;

- launch and sustain a major Canadian research initiative aimed at learning more about the effects of oil and
chemical spills and developing effective spill clean-up technologies;

- fund the acquisition of clean-up equipment to a level five times that of existing inventories;

- increase the amount in the fund for its original purpose -- oil spill clean-up;

- provide a source of funding to facilitate immediate response to spills.

4-4-5 Implications of the New Levy

According to the Panel’s view this proposal has several implications.

First, it is known that ultimately the levy may be passed on to consumers, all Canadians could be bearing part of the price for safer ships and improved response capability. Therefore the Panel suggests that the new double-hulled tankers and tank barges be built in Canadian shipyards, thus providing economic benefits to Canada.

Second, as single-hulled tankers and tank barges are replaced by double-hulled vessels and spill response equipment requirements are satisfied, the levy will be eliminated. The Panel’s expectation is that there will be reasonable coincidence between the complete funding of the SOPF objective of clean waters and the disappearance of the levy.

Third, since the chemical industry stands to benefit from the ameliorations in regional and national response
capacity that will result once the SDPF levy is imposed, the chemical industry must contribute to the maintenance of this improved capacity.

Finally, the Panel concludes that while $800 million to $1 billion may appear to be a substantial amount, the Panel believes it is justifiable and reasonable, given the potential pay-off in terms of preserving the Canadian marine environment. It is half the cost of one unsuccessful clean-up operation. (It is estimated that, as of September 1990, Exxon has spent $2 billion to clean up less than 10% of the oil from the Valdez spill.)

4-5 Conclusions and Suggestions

The SDPF is not only a mechanism to fulfil Canada's international obligations (1969 CLC and 1971 Fund Conventions) but also it fills some of the gaps in the present international regime and in particular for oil spills from other ships not carrying oil as cargo. It also provides a substantial additional layer of compensation for oil spills from laden tankers covered by the international conventions. It can also play an important role in the effort to enhance the Canadian oil spill prevention and response capability.

China has gone through a similar process in the compensation and liability field for oil pollution. China is a party to the 1969 CLC convention and its strict liability principle is incorporated in Chinese MEPL. But this protection is far from enough. On 11 Oct. 1983, the Chinese flag tanker "Daqing 236" was struck and sunk by an Indonesian tanker along the Guangdong coast. After the
collision, the Indonesian tanker fled to Hong Kong. Then the sunken tanker was again struck by another English flag vessel. Because of the complexity of the case and lack of the necessary mechanism in China the damaged party could not get compensated after more than 5 years. After this incident, on 25 Nov. of the same year, the tanker "Feoso Ambassador" polluted Qingdao coast causing very serious damage to fishing, tourism etc.

According to the MOC Water Transport Research Institute Report 1989, between the year 1976 to 1986, 386 oil spills occurred along the Chinese coast of which 12 had spilled oil of more than 100 ton. Among the 386 oil spills only 88 were compensated. (see table 4-1)

These incidents and the slowness and inadequacy of compensation made the Chinese Government consider seriously acceding to the 1971 Fund convention. At present, China is an observer to the IOPC Fund.

If China accedes to IOPC Fund then it is necessary to establish an organization which can keep a working relationship with IOPC Fund and assist IOPC Fund people in case of oil pollution in China.

To establish an oil pollution fund in China, the Canadian experience could serve as an example for China to follow. Canadian SOPF not only provides additional protection for claimants who have suffered from pollution by convention ships but also provides protection for claimants who have suffered from pollution by non-

---


134
convention ships. It also coordinates the Canadian contribution to the IOPC Fund.

Table 4-1

Oil Spills and the Compensation
(1976-1986)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of</th>
<th>Oil Spilled</th>
<th>Number of</th>
<th>Sum paid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>spills</td>
<td>(ton)</td>
<td>oil spill</td>
<td>(RMB)</td>
</tr>
<tr>
<td>1976</td>
<td>16</td>
<td>8611.6</td>
<td>7</td>
<td>8728250</td>
</tr>
<tr>
<td>1977</td>
<td>25</td>
<td>375.5</td>
<td>1</td>
<td>2000000</td>
</tr>
<tr>
<td>1978</td>
<td>24</td>
<td>861.4</td>
<td>4</td>
<td>3133</td>
</tr>
<tr>
<td>1979</td>
<td>23</td>
<td>358.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1980</td>
<td>35</td>
<td>55.9</td>
<td>8</td>
<td>3469</td>
</tr>
<tr>
<td>1981</td>
<td>41</td>
<td>38.9</td>
<td>14</td>
<td>98604</td>
</tr>
<tr>
<td>1982</td>
<td>43</td>
<td>17.4</td>
<td>9</td>
<td>10513</td>
</tr>
<tr>
<td>1983</td>
<td>45</td>
<td>4101.3</td>
<td>12</td>
<td>20251578</td>
</tr>
<tr>
<td>1984</td>
<td>35</td>
<td>1971.3</td>
<td>11</td>
<td>6292223</td>
</tr>
<tr>
<td>1985</td>
<td>53</td>
<td>32.8</td>
<td>11</td>
<td>110675</td>
</tr>
<tr>
<td>1986</td>
<td>46</td>
<td>37.7</td>
<td>11</td>
<td>6392</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>386</td>
<td>88</td>
<td>37504837</td>
</tr>
</tbody>
</table>

Meanwhile if China adopts its NCP, then the biggest problem is the funding for oil spill pollution combating equipment. The Canadian experience of funding in this aspect is also worth learning. In China, because of other higher priority items on the national agenda, it is difficult to obtain a budget from the Central Government to purchase marine oil pollution combating equipment. Without equipment how can the NCP be implemented effectively? In this case, the Canadian way of imposing a levy on the oil industry is another feasible way for China to raise funds to build up its national oil spill response capability.

The fund raised through a levy in China could also be used to provide additional compensation to the claimants seeking compensation from the two international conventions.

Since MOC is responsible for the implementation of 1969 CLC and 1971 Fund conventions, and MOC also has employers who know oil spill pollution liability and compensation, and since it has working relationships with other oil spill pollution liability and compensation related agencies and organizations such as MOE, Ministry of Agriculture, Animal Husbandry and Fishing, EPA, State Oceanic Bureau, China People's Insurance Company, Supreme Court, Maritime courts and Marine Arbitration Committee, the China SOPF secretariat could be established within the MOC with the following possible functions:

- doing daily work

- keeping a working relation with IOPC Fund

- paying contribution to IOPC Fund on behalf of the Chinese
oil industry

- administering the levy imposed

- serving as the first resort of compensation

- participating in and coordinating the on-scene oil pollution incident investigation.

China is opening its door wider to the outside world and is attracting more foreign investors to China, this fund could serve as a safety belt to protect the potential foreign investor in the field of tourism, aquaculture etc., therefore, this suggestion to establish China SOPF is in compliance with the Chinese national policy.
Chapter Five

Conclusions and Recommendations

Taking into account of the present Chinese resources and capability in oil spill response, the principles generally accepted by the world, the actual experiences gained by other countries, specifically by U.S.A. and Canada, with lessons learned in the Exxon Valdez incident, the following conclusions and recommendations are made. It is hoped that these conclusions and recommendations could be useful to the planners of a possible marine oil spill contingency plan in China.

The principles of making the recommendations are:

- Contingency planning should consider not only the present Chinese needs but also should take into account the possible future development.

- The main internationally accepted principles should not merely be adopted, but rather adapted to the Chinese situation.

- The establishment of new, independent organizations as a result of contingency planning should be avoided by trying to use what already exists, finding arrangements whereby they might be organized to work together efficiently.
5-1 Present Structure for Marine Oil Spill Response in China

Through "the Feoso Ambassador" tanker oil pollution case explained in Chapter One, one can see that the main departments involved in oil spill response are the following:

5-1-1 SAR Center

SAR Center was established in 1973 with members such as Navy, Air force, Ministry of Foreign Affairs, Ministry of Public Security, Ministry of Post and Telecommunications, Ministry of Foreign Trade, Ministry of Agriculture, Animal Husbandry and Fishing, State Bureau of Meteorology, National Oceanic Bureau etc. It is based in the Ministry of Communications. It is responsible for coordinating and commanding the work of protecting ships from typhoons and ice, ice breaking, prevention of pollution from ships on the sea (large scale oil spill) and marine search and rescue.

Large scale marine oil spill incidents were alerted and reported to SAR Center in the past and the SAR Center has coordinated the response to large scale oil spill incidents.

5-1-2 Environment Protection Agency

The Environment Protection Agency and its branches are essential elements in response operations especially for the shore clean-up. In practice, it is the EPA branches which organize, monitor work and gather statistics during shore clean-up.
5-1-3 State Oceanic Bureau

The State Oceanic Bureau branch is also a key element in the oil spill response operation. It has the basic surveillance means to evaluate the size and possible movement of the oil spill. Its patrol boats and remote sensing air planes are important to the response operation. It has played a similar role to NOAA in U.S.A.

5-1-4 Harbor Suprintendency Administration

The HSA and its branches are the corner stone of the marine oil spill operation. In practice most of the past oil spill response operations were organized and directed by HSA and its branches.

5-1-5 Fishing Administration

The Fishing Administration and its branches have monitoring stations along the coast. During the oil spill response operations, they not only have provided advice to the ad hoc commanding organization about the priority of fishing resource to be protected but have also collected information about the damage to the fishermen, fishing ground, etc. In addition they have estimated the damages to the fishing industry.

5-1-6 Navy and Air Force

The Navy and Air force are strong resource elements in marine oil pollution response operations. The Navy has ships and professional skills and equipment for rescue which could also be used for oil spill response. The Air
Force's plane did a good job during the response operation to the "Feoso Ambassador" incident.

5-1-7 Rescue and Salvage Bureau

The Rescue and Salvage Bureau and its branches are the backbone of the response operation. Like the Navy it also has the professional skills and equipment for rescue and salvage. They are experienced in sea operations. They were indispensable in the past for oil spill response operation in China.

5-1-8 Conclusion

The response structure is not well established and it is only an ad hoc type. Each of the departments which may have a role to play during the spill response operation is not prepared in advance for the incident. People are not trained for response actions. According to the Marine Environment Protection Law, each of these departments has certain responsibilities for the protection of the marine environment but they are not specifically assigned for the oil spill response situation. Therefore no specific legislation or authorizations have been made for the oil spill response. The response to the past oil spill incidents have clearly shown that China needs contingency planning for oil spill response purposes.

With this plan, a purpose built structure for oil spill response could be formed. The response force could be established and clear delineation of the responsibilities and authorization specified among all relevant departments so each department knows clearly who must do what and how for marine oil spill response. After the plan is approved
by the Central Government it would be an established regulation and each department would follow the plan. To improve the present response structure and response capability making a national plan is a necessary step.

5-2 Oil Spill Contingency Plan

China has 9 coastal provinces namely Liaoning, Hebei, Shandong, Jiangsu, Fujian, Guangdong, Hainan provinces and Guangxi Chuang Autonomous Region and 2 municipalities directly under the Central Government (province equivalent) Tianjin and Shanghai. They are all independent administrative regions with independent budgets; most of the ports are now owned by the provincial government as the result of the decentralization in the 1980s. Considering the present administrative structure of these provinces and municipalities, it is suitable to have a three level contingency plan structure, national level, provincial level and local level parallel to the present administrative layout.

Since China has a relatively high centralized administrative system, in China, all the regulations if adopted by the Central Government are uniformly implemented in the whole country. Comparing with the U.S.A., its states have their own laws and regulations which could be different from the Federal ones. In this case, sometimes it is difficult to coordinate while in China it could be a bit easier to do so.

Since no contingency plan could cover exactly the actual situation of a possible oil spill incident, and since China has an advantage of easier coordination among governmental organs, this possible contingency plan could
be made more flexible, i.e., the plan could cover only the response strategy and principles so that in the actual response situation, response people could adapt to the demands of the situation without worrying about the detailed requirements of the plans. This should lead to making the right decisions, better tailored to the emergency at hand.

5-3 Possible Needed Structure for Oil Spill Response

Taking into account the ad hoc type of oil spill response structure that China currently has for oil spill response, and the basic American structure which has proven to be effective in many cases, the following structure is attempted.

5-3-1 Three-Tiered Structure

As China's administrative pattern is basically three-leveled: Central Governmental level, provincial level and local level, the possible oil spill contingency plan is recommended on the three-level basis. Therefore it is logical that the oil spill response structure could also be three leveled. As the U.S. experience and past Chinese practice show that a committee type of response organization and coordinating system is a feasible way to efficiently pull all relevant oil spill response departments in the country together, such an arrangement could allow coordinated response decisions that are best for the national interest. A three tiered structure could be right for China.

It is best, and also feasible, to keep the possible three-leveled structure parallel to the existing Chinese
administration structure so that it is easier to coordinate.

5-3-2 National Level

According to the China Marine Environment Protection Law and the present functions of the relevant ministries, a national level structure could consist of the following government agencies with the possible role indicated in the marine oil spill response.

5-3-2-1 Navy and Air Force

According to Article 5 of the Marine Environment Protection Law, "the environmental Protection department of the armed forces is responsible for supervising the discharge of pollutants by naval vessels and keeping under surveillance the waters of the naval ports." Besides the responsibility assigned by this law the Navy, specifically the Navy Rescue Brigade, has certain responsibilities for civilian vessels in search and rescue. It's rescue capability in terms of both skills and equipment, could serve well in the oil spill response operation. The Air Force has airplanes which could be deployed during the oil spill response to survey the scale of the oil spill and collect information which could be vital for the effectiveness of the whole response.

5-3-2-2 Ministry of Foreign Affairs

Although nothing is mentioned about the Ministry of Foreign Affairs in the MEPL in the marine oil spill response field, the Ministry might play an important role if there is a catastrophic oil spill which requires
international assistance, in the future there may be a need to conclude bilateral oil spill response cooperation treaties. All these matters need the involvement of this Ministry.

5-3-2-3 Ministry of Public Security

All the fire brigades in China are under the Ministry of Public Security. They are well equipped and well trained. They could be an important element in oil spill response operations.

5-3-2-4 Ministry of Petroleum

The Ministry of Petroleum has a number of oil tankers transporting its own oil. It's tankers have had oil spill records along the coast. These tankers could be the potential polluters and at the same time could be used in the oil spill response operation. Besides, the Ministry has it's own oil refineries along the coast. These refineries are also potential oil polluters. Their capability to deal with their own spills could be a useful element to employ in possible local responses to other small scale oil spills.

5-3-2-5 Ministry of Post and Telecommunications

Telecommunication in oil spill response operation is vital. On scene communication is important for the actual response but the communication covering the whole response activity is also important. Most of the oil spill response operation requires a joint effort and teamwork. Without efficient communication nothing can be done.
The Ministry has the authority to approve any possibly purpose-built communication system and has the capability to connect different existing independent communication systems to meet the specific needs.

5-3-2-6 Ministry of Communications

Under the Ministry of Communication, there exists the main structure and main force for oil spill response.

The SAR Center and its branches have played vital roles in coordinating and commanding a number of successful search and rescue operations. For marine oil spill response it has also functioned well.

The Harbor Superintendency Administration is the national administration in charge of shipping safety administration and exercises the uniform navigation administrative rights on behalf of the PR of China. According to the MEPL, "The Harbor Superintendency Administration of the PR of China is responsible for overseeing, investigating and dealing with the discharge of pollutants from vessels and for keeping under surveillance the waters of the port areas, and it is in charge of environmental protection against pollution damage caused by vessels." And, "In case any vessel is involved in a marine accident which has caused, or is likely to cause, a serious pollution damage to the marine environment, the HSA has the power to take mandatory measures to avoid or minimize such a pollution damage." With the power conferred by the law, it has the basic condition, structure and capability to direct and coordinate the spill response operation. Each port has HSA branches. Probably HSA staff are the people who are most experienced in coordinating and
directing oil spill response operations in China. HSA has various type of vessels which could be very useful for response purpose.

What the Rescue and Salvage Bureau and its branches working under the HSA, have done so far in the marine oil spill response operation clearly demonstrates that they are and will still be the main force in China to respond to the oil spill incidents.

5-3-2-7 Ministry of Foreign Trade

The Ministry of Foreign Trade has its own fleet to carry China's foreign trade cargo. According to the MEPL "All vessels have the obligation to watch out for pollution of the sea. Upon discovering acts in violation of law or occurrence of pollution, they shall immediately report to the nearest HSA." Its ships could also be used in the oil spill response operation.

5-3-2-8 Ministry of Agriculture, Animal Husbandry and Fishing

According to the MEPL "The state agency in charge of fishery administration and fishing harbor superintendence is responsible for supervising the discharge of wastes by vessels in the fishing harbor and for keeping under surveillance the waters thereof." The MEPL also requires the fishing boats who discover the occurrence of pollution shall immediately report to the nearest agency in charge of fishery administration and fishing harbor superintendence.

The Fishing Administration exercises rights over the national fishing resources and administers the fishing
fleet. Fishing industry and fishing ports are the most vulnerable places to be damaged by the oil spill. They are potential claimants. It also has the ability to identify areas of critical importance and assess the damage to the fishing industry.

5-3-2-9 State Bureau of Meteorology

Meteorological and hydrographic data is essential for predicting the oil spill movement. The Bureau could provide the advice and expertise in this regard.

5-3-2-10 National Oceanic Bureau

According to MEPL, "The National Oceanic Bureau is responsible for organizing investigations, monitoring and surveillance of the marine environment and for conducting scientific research therein, and it is in charge of environmental protection against marine pollution damage caused by offshore oil exploration and exploitation and by the dumping of wastes into the sea." The National Oceanic Bureau is directly under the State Council. It is in charge of organizing and coordinating the work relating to the ocean, organizing and carrying out tasks such as oceanic investigations, oceanic scientific research, ocean administration, etc. It has about 50 marine environment supervision and investigation vessels and it carries out regular surveillance of the sea area.

This Bureau could play the role for sensitivity mapping for the purpose of contingency planning and could provide scientific assistance to the marine oil spill response operation.
5-3-2-11 National Environment Protection Agency

The national EPA is the agency responsible for all environment protection work including marine environment protection. In the marine environment protection field, it is responsible for organizing and supervising the implementation of the national marine environment protection policy, laws and regulations; organizing to make a national marine environment protection plan, regulations and standards; investigating the national status of the marine environment and the trend of development; organizing to evaluate the quality of the marine environment; approving the new building, conversion or expansion of major coastal engineering projects of national significance; approving the environmental impact report on offshore exploration and exploitation, and giving advice to the relevant departments under the State Council and to the work of the environmental protection departments of the coastal provinces and municipalities.

According to the functions that EPA assumes, it could be an coordinating body for the contingency planning.

5-3-2-12 Ministry of Geology and Minerals

The Ministry of Geology and Minerals is in charge of offshore exploration. Offshore activity is closely related to the marine environment. According to Article 19 of the MEPL, in exploring and exploiting offshore oil resources, there shall be available appropriate anti-pollution facilities and equipment, and effective technical measures be taken to prevent blow-outs or oil spill accidents. This Ministry has some anti-pollution equipment specifically suitable for offshore oil pollution accidents which could
be used in the marine oil spill response. Some of the offshore companies might become part of the local response force.

5-3-2-13 Possible Main Task of the National Level Structure

Based on the above information, the possible main task of the national level response structure might be the following:

- Coordinating and commanding response operations of national significance;

- Giving advice to the local response operation;

- Concluding regional response cooperation treaties and keeping in touch with relevant countries and international organizations;

- Approving provincial and local level contingency plans;

- Making rules to make sure that all oil response equipment purchased or manufactured is compatible;

- Administering the budget for improving national response capability;

- Approving the purchase of equipment for national response forces;

- Organizing the training for response personnel;

- Planning revision.
5-3-3 Provincial Level

According to Article 5 of the MEPL, "The environment protection departments of the coastal provinces, autonomous regions, and municipalities directly under the Central Government are responsible for organizing, coordinating, overseeing and checking marine environmental protection in their respective administrative areas, and are in charge of environmental protection against pollution damage caused by coastal construction projects and land-based pollutants." Based on this law, it is feasible to establish a provincial level response structure. In order to provide a better coordinating and commanding structure for response, the provincial level structure should also be the committee type. Since the branches of relevant Ministries could play similar roles at provincial level as the Ministries at the national level; the committee could consist of the branches of the above mentioned ministries and agencies.

5-3-3-1 Possible Main Tasks of the Provincial Level

The main tasks of the provincial level could be the following:

- coordinating and commanding the response operation at provincial level;

- Coordinating the work of the different departments within the committee in the field of oil spill preparedness and response;

- Organizing the joint drills;
- Coordinating the settlement of the oil spill claims;

- Provincial plan revision.

5-3-4 Local Level

Under the guidance and coordination of the national and provincial level, the local level organization could be established in the main coastal ports and at the sea area where the offshore oil exploration and exploitation activities are intensive so that in case of an oil spill, this organization can directly organize and command the response operations.

The members of the organization could be the following.

5-3-4-1 Harbor Superintendency Administration Branch

As explained in previous sections the HSA is the first organization who will get the oil spill report and it is also the first responder to oil spill incidents on the sea. Since local HSA serves in practice the OSC in the response operation and it has a good working relationship with other oil spill response related organizations it could play a very important role in the possible local response structure such as to be in charge of technical groups dealing with the emergency, insurance and compensation, supervising the response operation, etc. Since there is no SAR sub-branch at the local level, HSA branches serve as the SAR sub-branches. HSA branches could also take the responsibility to report to the national level structure.
5-3-4-2 Environment Protection Agency Sub-branch

In each city there is an EPA sub-branch, along the Chinese coast behind each port there is a city. The EPA sub-branch has the units carrying out specific functions such as water intakes, hygienic and disease spreading preventive stations, and environment monitoring centers. Under the environment monitoring centers, there are harbor environment protective centers. These centers could be an important assistance in the response operation. Besides the EPA sub-branch is in charge of organizing the shore clean up and other response related functions. Therefore the EPA sub-branch is an important member in the possible local response structure.

5-3-4-3 Port Authority

The Port Authority could be another member of the structure since HSA, and EPA sub-branches work daily with the port authority; sometimes their offices could be in the same building. In the oil spill response operation the Port Authority could mobilize equipment and more importantly if the oil reaches the shore, the port could be polluted; therefore, the port authority should be in the structure.

5-3-4-4 State Oceanic Bureau Sub-branch

At the local level the State Oceanic Bureau has monitoring stations, patrol boats and patrol airplanes. These are important elements in response operation. In addition, the local level branch could provide scientific support to the structure.
5-3-4-5 Fishing Administration and Fishing Harbor Superintendence

There are a number of monitoring stations along the coast. The Fishing Harbor Superintendence could have the similar role that the HSA has in its fields. There are over 40 Fishing Harbor Superintendence offices, about 600 inspectors and about 20 fishing patrol boats in the country. It could take care of every thing relating to the fishing industry. So, being a member of the possible local structure the Fishing Administration and Fishing Harbor Superintendence could assist the structure to make the right decisions for the response operations protecting the fishing industry.

5-3-4-6 Navy

The Navy has bases along the coast. It is an important force in discovering the oil spill, alerting, safeguarding, stopping the leakage, towing and salvage. It has a responsibility to serve the military vessels but also to help the civilian vessels. The local response structure needs the Navy participation.

5-3-4-7 Rescue and Salvage Bureau Branch

Like the Navy, these branches have the same role to play in the response operation. These branches cooperated well with the Navy and HSA in actual oil spill responses. Since they have hands-on experience in the response and this experience and expertise is invaluable for the local response structure to reach the right response decisions, the branch should be a member in the local structure.
5-3-4-8 Fire Brigade

Every city and port has fire brigades. They could be an important force in the fire-fighting on board ship or at the oil terminals. They are well trained and well equipped.

5-3-4-9 Enterprises Which Have Response Capability.

Some of the enterprises such as the coastal cargo owner’s oil terminals, coastal oil refineries have some oil response capability to deal with small scale spills. Their equipment could be fully used if they could be integrated in the local response structure. Therefore it is necessary to invite these enterprises to participate in the possible structure. Besides these enterprises are big potential polluters. If an accident happens in their jurisdiction the damage to the environment could be greater than that from an oil tanker. In this aspect, their involvement in the structure could be even more important.

5-2-4 Possible Tasks for Local Level Structure

The possible main tasks for local level structure could be the following:

- Directing and coordinating the on scene oil spill response operation;

- Coordinating the work of relevant departments;

- Organizing the local response force’s drills;

- Evaluating the response operation;
- plan revision;
- Settlement of the oil claims.

5-4 Role of MOC within the Possible Structure

Based on the present practice and the functions of MOC in marine environment protection aspects, MOC might have the potential to become the lead agency in the response structure because it has the following specific strength.

5-4-1 SAR System

As it is already explained in this chapter, the SAR system is a well-established system for search and rescue. The structure has stood the test for a long time as very effective. If the contingency plan could accept the SAR system as the basis to build up China's response plan, it could be a cost-effective way. In China, there is a widely observed principle "use less money and get better result". With the existing SAR system, there is no need to establish a specific new marine oil spill response structure. The head of the SAR Centre is the deputy Minister of the Communications and the head of the SAR branch is the leader from the province or municipality. During response operation, the head has enough power and authority to coordinate the operation. The SAR staff are very experienced in dealing with emergencies. Since SAR work concentrates mainly on search and rescue, it has less expertise in dealing with marine pollution. However, there are a lot of similarities in rescue and oil spill response, still, the SAR staff would need specific training in oil spill response operations.
5-4-2 HSA Structure and Experiences

The HSA (SAR Center) is one office of it which functions like a coast guard in some countries has more than 60 branches at various ports and harbors. It's network is well established and very efficient. In the marine environmental protection field, it is responsible for both pollution prevention and response. The pollution prevention officers are well trained. In fact, most of the oil spill response operations were commanded by HSA people. They have the potential to assume the deputy OSC role and provide a technical advisory role in the response.

5-4-3 Rescue and Salvage Capability

The MOC has the number one rescue and salvage capability in China. The Rescue and Salvage Bureau has 3 sub-branches and 14 salvage stations. It has its purpose-built vessels, a world class floating crane and some oil spill response equipment. Since oil spills often result from damage to ships, during the marine casualties, the first considerations are to save life, then to render assistance to the ship, stopping the leakage, salvage and fire-fighting. The oil spill response is carried out at the same time or afterwards. Since the oil spill is closely related to the marine casualties and the Rescue and Salvage Bureau is a professional team for marine casualties, it is rational to think that this Bureau is an important force in the oil spill response operation. It could form the main part of the possible national response force.

5-4-4 Equipment Capability in MOC *

China's marine oil spill response capability was
initiated in 1976 but there has not been much improvement since then. The equipment is used largely for dealing with small scale oil spills resulting from ship casualties and from oil terminal operations. Most of the equipment belongs to the ports' administrative department of MOC. This equipment includes several thousand meters of booms, about 5 oil recovery ships, 7 boom deployment vessels, some sorbent materials and oil dispersants. This equipment is small in number but represents almost 70-80% of the whole nation’s equipment stockpile.

5-5 Response Force

The response force could be established at two levels: the national level and the local level.

5-5-1 National Response Force

The Rescue and Salvage Bureau under the MOC could be appointed as the main part of the National Response Force, taking into account its present organizational structure, the professional characteristics, experiences in salvage operations, the equipment and facilities and its manpower. The National Response Force should have the capability to carry out large and medium scale oil spill response operations. But at present, the response capability is far from necessary since this Bureau is mainly equipped with rescue and salvage facilities rather than oil response equipment. Therefore, the Rescue and Salvage Bureau’s oil spill response capability needs to be enhanced.

* This section is written by the author without any accurate official information. It only reflects the author’s own impression on this subject.
The Navy Rescue Brigade, which is responsible to provide rescue and salvage to military vessels as well as some civilian vessels, could be appointed as the other part of the National Response Force. Like the Rescue and Salvage Bureau, it could be responsible to carry out oil spill response operations in military harbors as well as in other sea areas.

5-5-2 Local Response Force

The Local response force could consist of two possible forces, the coastal force and the offshore force. For coastal forces, it might include manpower from the ports, coastal refineries, coastal oil storage facilities, etc., while the offshore force might include personnel from the oil exploration and exploitation organizations.

5-5-2-1 Coastal Force

The ports, oil terminals, coastal oil storage facilities, coastal oil refineries could either jointly or individually establish their own oil spill response forces consisting of trained personnel and necessary response equipment to carry out small scale spill responses within their jurisdictions.

5-5-2-2 Offshore Force

The offshore oil companies could establish their professional response forces equipped with facilities to carry out small scale response operations.
5-6 Equipment

Oil spill response equipment is the key element in the whole response operation.

5-6-1 Exxon Valdez Lesson

From Exxon Valdez incident, one important lesson learned is that the response equipment should be compatible.

Since China is just starting to build up its marine oil spill response capability, it is vital to remember that all the response equipment which will be bought overseas or manufactured at home should be compatible. The national response organization could delegate the function to China Register of Shipping to formulate the uniform standards for the equipment so that the equipment can be best utilized and also to some extent help to make the response operation more effective.

5-6-2 Rough Idea about China’s Equipment

Besides the equipment in MOC described in section 5-4-4, the Navy has a certain amount of equipment. In recent years, with offshore oil exploration and exploitation, in order to be prepared for marine oil pollution, some additional equipment was purchased by offshore oil companies. In addition, ship scrap yards have purchased some booms.

Taking into account the long coastline, the frequency of oil spills and the actual result of oil recovery from the sea in previous oil spill response operations, it is
viewed that China's marine oil spill response capability cannot meet the actual demand.

5-6-3 Possible Places to be Assigned as the Inventory Stocking Points

Inventory should be put in the places where the oil spills are most frequent. According to the Chinese oil spill case history, the main oil ports have suffered frequent oil spills. Therefore the following oil ports are suggested to be the possible inventory places.

Dalian Port, Qinghuangdao Port, Qingdao Port, Shanghai Port, Lingpo Port, Huangpu Port and Zhangjiang Port.

For offshore oil companies, the bases in Tianjian, Shanghai, Guangzhou and Zhangjiang could be appointed as the inventory places.

5-7 Marine Oil Spill Pollution Fund

Funding is another important part one has to take into account when considering the oil contingency plan.

5-7-1 Establishment of a Fund in China

An independent marine oil spill pollution fund could be established in China.

China has ratified the 1969 CLC convention and is going to ratify the 1971 Fund convention. Taking Canadian funding experiences and the Chinese present situation into account the author strongly recommend the Canadian way of funding to the Chinese Government for the following reasons:
- The fund is a flexible mechanism to adjust the relation between the oil industries and the environment protection concerns. The oil industry contributes more when marine environment is not well protected. As the marine environment improves, the oil industry could contribute less. This mechanism could be a positive factor for the protection of the marine environment.

- With the possible levy collected through the fund, the national response capability can be improved without asking money from the national budget and in the mean time levy contributors will be reminded to exercise more diligence to protect the environment.

From the previous sections, one can see that China needs to improve its oil spill response capability. But how? Where is the money to come from? It is the key problem of the whole contingency planning process.

Hoping to get the necessary money from the national pocket is not very promising. And even if some is available, it would likely not be enough. Every country's budget is tight. On the national agenda, sometimes it is difficult to find a place for the marine environment protection. Therefore it may be better to find other ways -- connecting the oil industry interest with the protection of the marine environment.

- The fund can serve as the first resort for the claimants. By doing so it is not only facilitating the claimants to be quickly compensated but also makes best use of the professional skill of the fund personnel to claim, in subrogation, damage against 1971 Fund,
insurers, shipowners, cargo owners etc. This will make the whole process smoother and more effective.

5-7-2 MOC Role in the Possible Fund Organization

The 1969 CLC and 1971 Fund conventions are administered by MOC. China is going to ratify the 1971 Fund Convention and now is an observer to the 1971 Fund. When China ratifies the 1971 Fund convention, according to the Chinese way of doing things, probably China would establish small organization specifically for the 1971 Fund functions, collecting money contributed from the oil industry in China and paying contributions to the 1971 Fund on behalf of the industry, dealing with claims under the 1971 Fund, etc. If China could establish an oil pollution fund which would take care of the 1971 Fund contribution, claim settlement matters and at the same time take care of levies (if law permits), it could not only fulfill China’s international obligations but also its domestic needs.

Since the 1971 Fund Convention is already within the scope of work of MOC, and MOC has the competent personnel who know maritime claims and oil spill response, it is suggested that a possible independent fund organization be established in MOC.

5-8 Telecommunication System

For marine oil spill response telecommunication purpose, it is not necessary to establish another system. The present SAR system, with some modification, could be used for this purpose.

At present, there are several telecommunication systems
which could be involved in oil spill operational communications, such as the SAR telecommunication system, offshore oil company's satellite communication system, the port telecommunication system and the coast radio communication system in China.

All the above-mentioned systems, except the offshore ones are under the administration of the China Transport and Telecommunication Center which is a governmental organ under MOC with responsibilities such as:

- Administering transport telecommunication work;

- Planning and implementing transport telecommunication networks;

- Transferring marine distress calls to HSA; and

- Providing the communication links between the relevant SAR units, including vessels engaged in SAR operations. etc..

This telecommunication center has built an INMARSAT standard A/C coast earth station in Beijing. With this station, the Center is planning to implement GMDSS in China. In the plan, it is indicated that actions will be taken to provide dedicated connections for the SAR Center, the SAR sub-branches, the HSA and its local branches, the Rescue and Salvage Bureau, its branches and salvage stations, and the shipping companies through the Beijing INMARSAT coast earth station.

With this plan, the SAR communication system is going to be improved and it is going to be more suitable to the
possible oil spill response needs discussed in this dissertation.

In addition, with the assistance from the Ministry of Post and Telecommunications, this SAR system could be connected with other oil spill response communication systems such as those of the offshore satellite system, the Navy or, if necessary, with the relevant systems outside of China.

5-9 Training

Training is the key for the successful implementation of the contingency plan.

5-9-1 Establishment of a Training Center

A training center for oil spill response to train people, ranging from vessel crew, equipment operators, response officers to OSCs, could be established to provide the basic training.

Dalian and Shanghai Marine Colleges have the basic conditions for such an establishment.

Canada and U. S. A. are experienced in this regard. Canada has a well-recognized training course for OSCs.

For China, it is not cost-effective to start everything on her own. It is suggested that China learn from Canadian and U.S. experiences, perhaps obtaining their course manuals and adapting them to the Chinese needs.
5-9-2 On Scene Drills

Besides the basic training in the Center, regular drills should be carried out to ensure that the reporting, alerting, and communication network function well and relevant response personnel with specific responsibilities under the plan become fully familiar with them. Such drills sometimes should require mobilization and deployment of personnel, equipment and material to ensure their availability and performance.

The evaluation of the drill is equally important to correct deficiencies and revise the plan.

Which organization is suitable to organize and supervise the drills? Since HSA is experienced in commanding the response and its daily work is also closely linked with oil pollution prevention and response, and the SAR center is located in HSA headquarters. It may be the logical choice. In fact, the SAR sub-branches are HSA local branches. Therefore the HSA is well suited for this purpose.

From the previous chapters, it is clear that there is significant potential for marine oil spill disasters in China’s future. In the past, the oil spill incidents were dealt with as well as possible, but on a provisional basis. This was not as efficient nor as timely as the response needed to be. China’s capability is far from what is really needed. It is foreseen that the establishment of a NCDP for China could be most beneficial.

With the internationally accepted general principles
Bibliography

5. Pu Bao Kang and Yue Chengguo, Oil Spill Contingency Planning in Shanghai, Oil Spill Conference Proceedings, USA. 1990
10. National Response Mechanism by Harry E. Schultz, USCG
11. National Response Center, 1991 printed by NRC
14. Dagmar Schmidt Etkin, Oil Spill Contingency Planning: a Global Perspective


18. Canada Shipping Act


