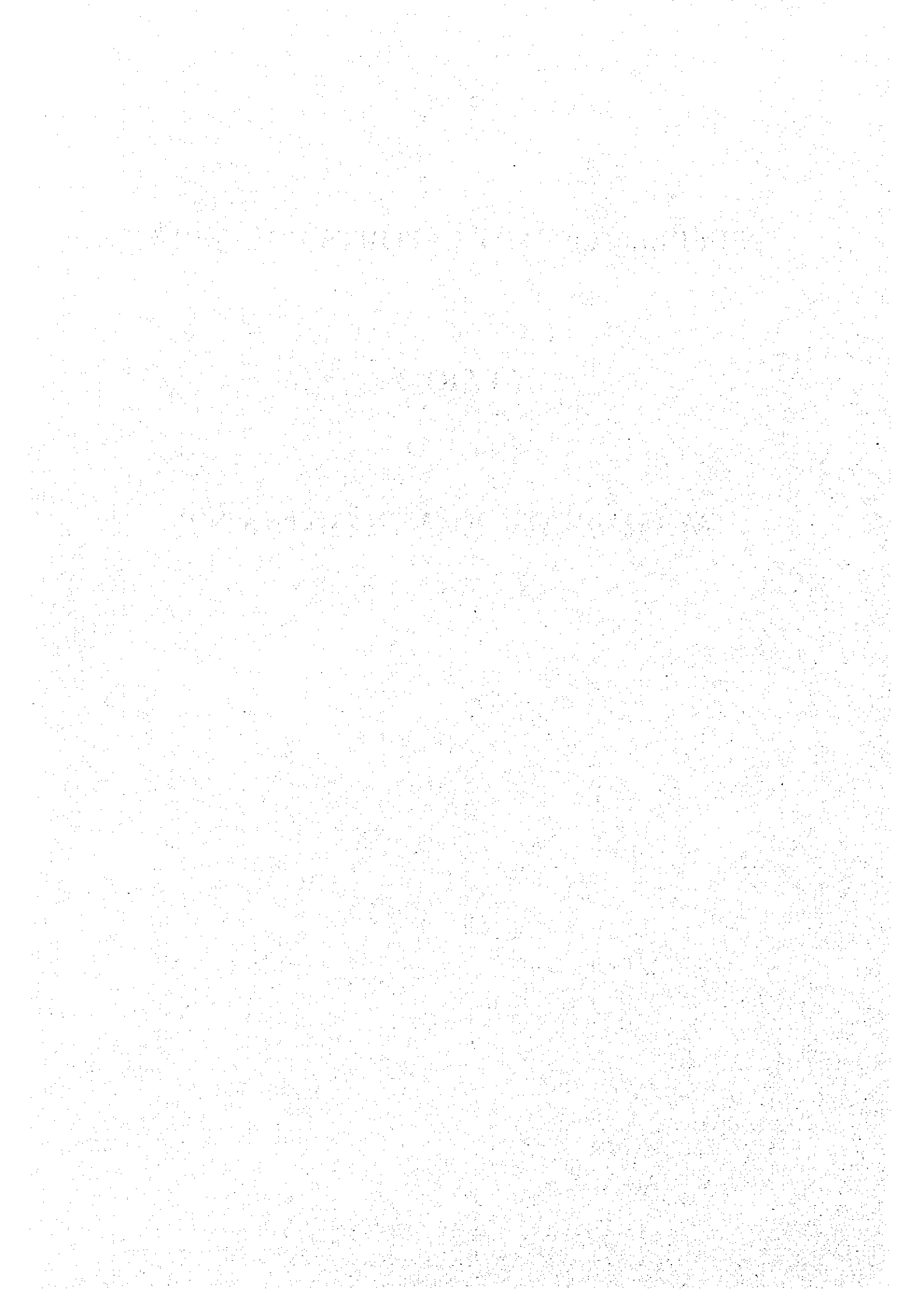


SUPPLEMENTARY REPORTS VOLUME 4

PART 3

MARITIME ENVIRONMENT



PART 3 MARITIME ENVIRONMENT

Chapter 1. Maritime Environment

1.1 Preface

Nowadays, environmental problems such as global warming, destruction of the ozone layer, acid precipitation and ocean pollution are regarded as some of the most important issues throughout the world.

The common features of these problems are as follows:

- 1) They exert their influence all over the world;
- 2) Their global effects extend over a long period of time;
- 3) They adversely affect human life;
- 4) They require solutions on a worldwide basis; and
- 5) They have to be investigated, monitored and audited by all countries in the world not only developed countries but also developing ones.

It follows that all countries in the world are responsible for preventing environmental disruption which could limit sustainability of human activity.

In June 1992, the United Nations Conference on Environment and Development Conference (UNCED) was held in Rio, Brazil, with the participation of more than 100 countries. The conference resolved to incorporate an environmental dimension into policies, procedures and development activities.

In this country, in 1985, the Council of Ministers of the Vietnam Government adopted Resolution No.246 under the title "Activities on Basic Investigation, National Utilization of National Resources and Environmental Protection". In the year 1991, the National Plan for Environment and Sustainable Development presented by a group headed by UNDP was approved by the Chairman of the Council of Ministers.

In October 1992, the government restructured the State Committee for Science (SCS) to form the Ministry of Science, Technology and Environment (MOSTE). In December 1993, the National Law on Environment Protection was enacted and the National Environment Agency was established with the responsibility of undertaking public administration of environmental protection on behalf of MOSTE. These measures provided the basis for Vietnam to participate with other countries on agreed actions aimed at environmental protection.

1.2 Current Situation

The extent of investigations and studies concerning the present environmental situation in Vietnam demonstrates that the country is deeply concerned with the importance of Environmental Impact Assessment. The institutional and legal framework of environmental management has been established and there are many specialists in this field.

However it is clear that appropriate actions and measures against environmental problems are not effective.

The present environmental situation in Vietnam, especially that of the maritime sector, is described below.

1.2.1 Law and Regulation

(a) Environmental Protection Law

The "Law on Environmental Protection" was constituted in December 27, 1993: This law stipulates activities aimed at preserving a healthy, clean and beautiful environment, ensuring ecological balance, preventing and overcoming adverse impacts of man and nature on the environment, ensuring ecological balance, preventing and overcoming adverse impacts of man and nature on the environment, promoting a rational and economical exploitation and utilization of natural resources.

On October 1994, Decree 175 / CP was enacted to guide the implementation of this law. Provincial regulations and standards were then enacted in accordance with the law and decree. The National Assembly mandates MOSTE to implement this law and decree.

(b) MARPOL 1973/1978

MARPOL 1973/1978 (International Convention for the Prevention of Pollution from ships, 1973 as modified by the Protocol of 1978) was ratified in May 29, 1991. On the other hand, a national rule, TCVN-4044-85 (Rules for Marine Pollution Prevention by Ship) was drafted in 1985 and is now in force. Though TCVN 5973-1997, 1st Edition (Rules for Survey and Construction of Marine Pollution Prevention Installations of Ship) is only now in draft form, it will be in full force in 1997.

(c) Vietnamese Maritime Code

Prior to the ratification of the above MARPOL, the "Vietnamese Maritime Code" was promulgated on July 12, 1990 by the National Assembly and published as the bilingual edition in Vietnamese and English by the Vietnam National Maritime Bureau

(Vinamarine). Section B of Chapter 2 of this Code stipulates Maritime Navigation Safety and Prevention of Environmental Pollution provisions.

Article 23 in this Section mentions the following:

- 1) When operating in the sovereign waters of Vietnam, Vietnamese and foreign sea-going vessels are bound to properly implement provisions related to environmental protection in Vietnam and international treaties signed, or at least recognized by Vietnam.
- 2) When operating in the waters of sea ports and other navigable waters of Vietnam, Vietnamese and foreign sea-going vessels which are employed exclusively for transporting oil products or other dangerous goods are to be covered by insurance policy as to civil liability of shipowner for environmental pollution.

The above Law and Code are presently the fundamentals of environmental legislation covering the Vietnamese maritime sector.

(d) Port Regulation

Each port in Vietnam defines its own port regulations and complied in accordance with the above fundamental law and code, though except for Haiphong Port these regulations are currently described only in Vietnamese.

The following are typical provisions which have been extracted from Haiphong, Da Nang and Saigon Port regulations.

1) Haiphong Sea-Port Regulation

Article 32; The organizations which have their own wharves for oil, petrol delivery/receiving those which have floating yards, docks for repair of sea-going ships must be equipped with the equipment and tools to prevent environmental pollution (such as the booms, chemicals, oil sludge tanks, etc.)

Article 33;

- a) To remove, discharge wastes and residues as provided from ships, the shipmaster must apply for a permit from Port Authority of Haiphong, and upon obtaining the permit, such activities may be carried out. The application letter is submitted to the Procedures Section of Port Authority of Haiphong. Garbage must be collected and put into containers, then removed by services organizations once every two days.
- b) In the Haiphong sea-port waters, the garbage collectors as well as facilities carrying out the services of waste collection and removal must correspondingly meet the requirements defined for the sanitary and environmental protection regulations.

2) Da Nang Port Regulation

When ships anchor in the water areas of the port, the following are prohibited:

- 1) Using whistle or loud speaker except when asking for rescue or greeting at Port Authority's request;
- 2) Cleaning chimneys or letting dirty smoke out;
- 3) Cleaning and washing ship's hold deck ;
- 4) Pumping out dirty water, dirty goods, oil or mixture containing oil and harmful mixture in port ;
- 5) Throwing out garbage from ship into the water and into the berth;
- 6) Putting equipment and ship property and crew onto berth without permission;
- 7) Scrapping and painting ship without permission;
- 8) Carrying out repair, testing ship's engine and whistle without permission;
- 9) Using equipment for salvage without appropriate purpose; and
- 10) Swimming and making noise in port area.

A maximum fine of US\$20,000 may be imposed for violations against the above prohibition.

3) Saigon Port Regulation

Presented in Table 1.1 are the contents of Saigon Port Regulation.

Table 1.1
SAIGON PORT REGULATION - ARTICLE 58 (PENALTIES)

No.	Type of Violation	For Vietnamese (VND)	For Foreigner (USD)
1	Sanitation order	30,000 - 200,000	50 - 200
2	Procedure on entering & leaving ports, maritime operations, anchoring, berthing alongside	200,000 - 500,000	200 - 3,000
3	Stipulation on pilotage, fire-explosion prevention, protecting environmental pollution caused by ships or re-violations	500,000 - 2,000,000	3,000 - 20,000

(e) Environmental Regulation for River and Coast

Regulation of environmental protection in the rivers and coast in Vietnam is covered by the above law and provincial and local regulations, but an effective environmental pollution control is not yet established.

(f) Environmental Standards

Environmental Standards for air, water, soil and waste paper and so on are described in Table 1.2. The Standards are pursuant to Decree 22-CP dated May 22, 1993 on the submission of Director General of General Administration of Quality, Measurement and Standards in MOSTE.

1.2.2 Organization and Management

The Vietnam organization for environmental management has three (3) levels. Refer to Figure 1.1.

- 1) Central (national) level core agencies- National Assembly
- 2) Central level sectoral agencies- Mainly MOSTE
- 3) Provincial level agencies- Mainly Provincial People's Committees

The achievement of the management is made by the National Environment Agency (NEA) of the Ministry of Science, Technology and Environment (MOSTE). Refer to Figure 1.2.

NEA has six divisions which are as follows:

- 1) Administration, Personnel and Planning Division
- 2) Training and Information Division
- 3) Monitoring and SOE reporting Division (SOE; State Environment)
- 4) EIA Division
- 5) Pollution Control Division
- 6) Policy Division
- 7) Inspection Division

On the other hand, the Ministry of Transport (MOT) mandates VINAMARINE, (Vietnam National Maritime Bureau), VIRES (Vietnam Register of Shipping) and VIMARU (Vietnam Maritime University) to manage marine environmental protection matters for vessels in ports and waterborne areas in Vietnam. But the administrative management is recently not functioning effectively. Although the Vietnam Maritime Safety Agency (VMS) which is under the control of VINAMARINE intends to be responsible for maritime environmental protection according to the MOT Organization Chart. However, does not perform its function at present.

Figure 1.1
VIETNAM ORGANIZATION OF ENVIRONMENTAL MANAGEMENT

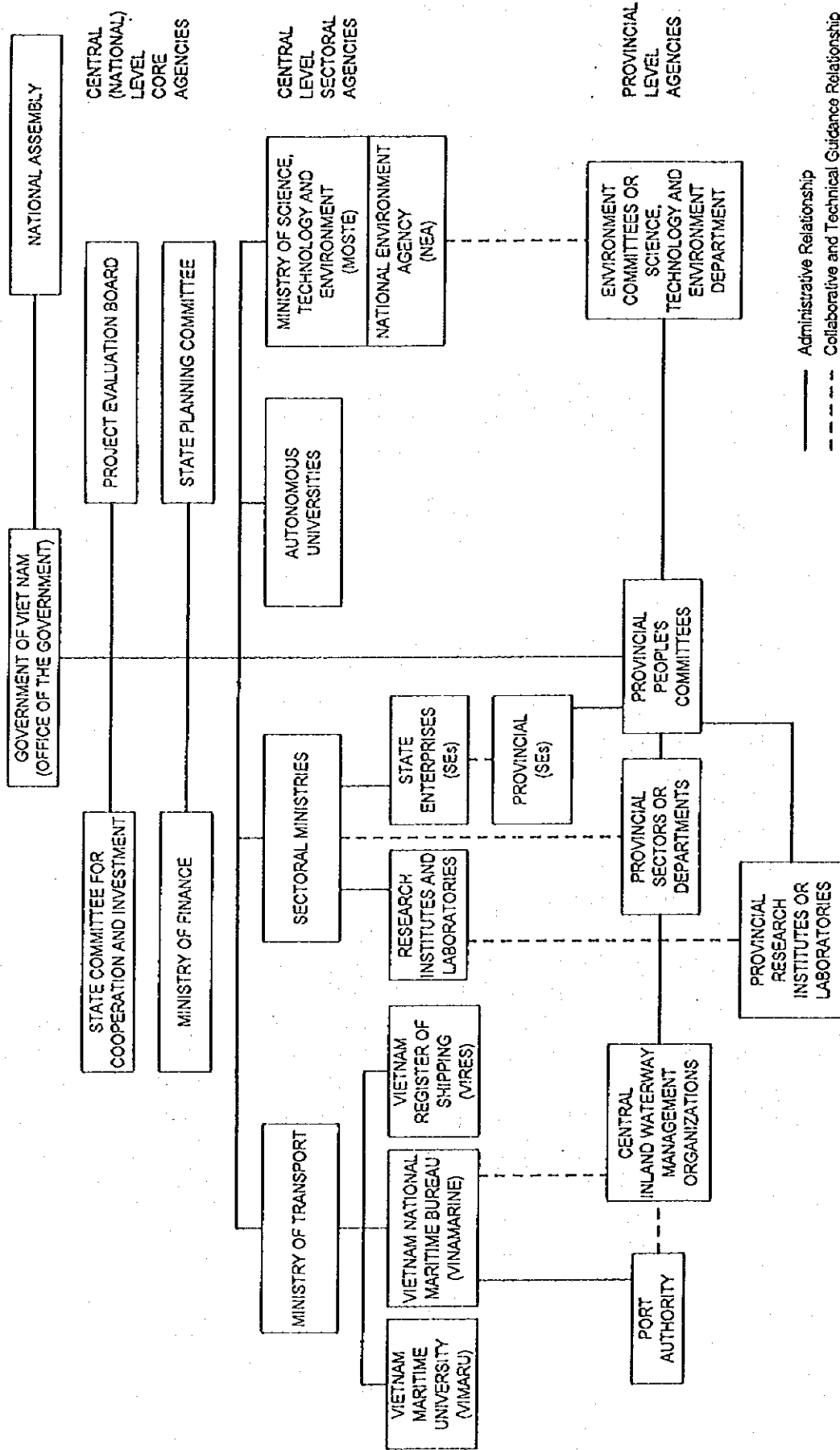
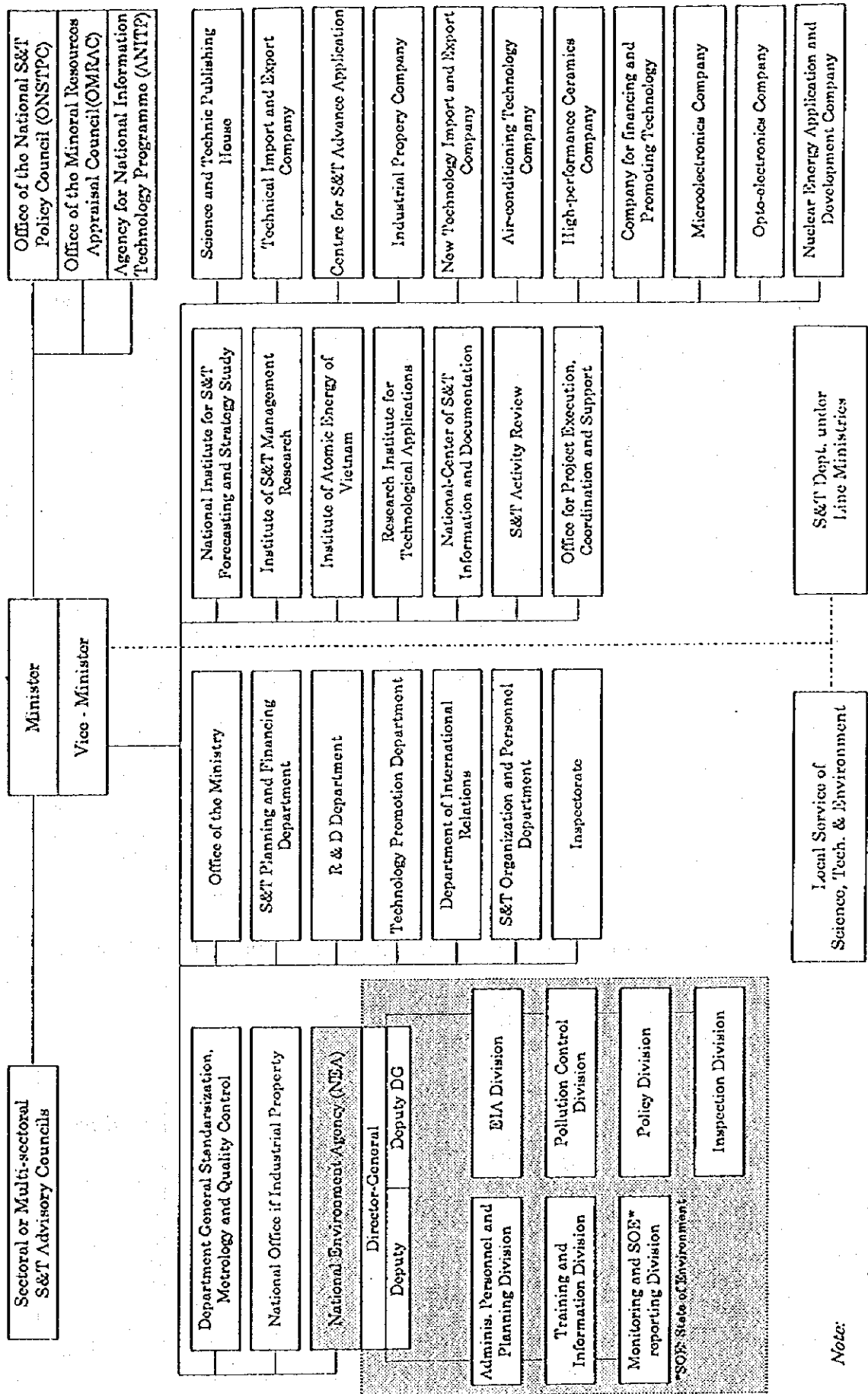


Figure 1.2
MOSTE ORGANIZATIONAL CHART



Note:

— Direct MOSTE administration

..... MOSTE technical/guidance/assistance in S&T management

1.2.3 Activities

(a) Port State Control

Port State Control (PSC) is the inspection system for ships at ports in accordance with port regulation, international conventions and agreements SOLAS, MARPOL LLC, STWC, COLREG, ILO147 and also Tokyo MOU). The Port Authority is usually responsible for this control.

In the case of Saigon Port, six inspectors are available for PSC and are implementing this system, mainly aimed at Vietnamese flag ships Haiphong Port has three officers (deck officer, engineer and radio operator). The vessel inspection system in other ports of Vietnam hardly functions at all.

(b) Garbage collection of vessels in port

Garbage (wastes) from vessels in the ports is collected by Port Authorities or private sector organizations which meet qualification standards set by local government (Health Department) per request of vessel captains at the port.

(c) Environmental Impact Assessment (EIA) Report

- 1) Article 18 of "Law on Environmental Protection" stipulates the following matters:

"Organizations, individuals when constructing, renovating production areas, population centers or economic, scientific, technical, health, cultural, social, security and defense facilities ; owners of foreign investment or joint venture projects, and owners of other socioeconomic development projects, must submit an E.I.A report to the state management agency for appraisal."

- 2) MOSTE issued the following guideline in Circular 715/M.Tg dated April 3, 1995.

The reports must cover the following terms:

- 1) Assessment of existing environment of the project;
- 2) Assessment of expected environmental impact for project operation; and
- 3) Measures for environmental mitigation.

About 3 copies of the following documents must be submitted:

- 1) Application form for appraisal
- 2) Environment impact evaluation report
- 3) Project and appendices (if necessary)

Application documents shall be forwarded to the relevant appraisal agency and the agency shall provide the appraisal results within two months.

- 1) The above system is functioning quite well in the case of the development of industrial factories.

(d) Environmental Standards

MOSTE Decision No. 229/QĐ - TCC dated March 25, 1995 on the issuance of environmental standards of Vietnam defines the following ten standards (describe in more detailed in Table 1.2):

- 1) Standards of Vietnam TCVN 5937- 1995; Air Quality- Ambient Air Quality Standards
- 2) Standards of Vietnam TCVN 5938- 1995; Air Quality- Maximum Allowable Concentration of Hazardous Substances in Ambient Air
- 3) Standards of Vietnam TCVN 5939- 1995; Air Quality- Industrial Emission Standards- Inorganic Substances and Dusts
- 4) Standards of Vietnam TCVN 5940- 1995; Air Quality- Organic Substances
- 5) Standards of Vietnam TCVN 5941- 1995; Solid Quality- Maximum Allowable Limits of Pesticide Residues in the Soil
- 6) Standards of Vietnam TCVN 5942- 1995; Water Quality- Surface Water Quality Standards
- 7) Standards of Vietnam TCVN 5943- 1995; Water Quality- Coastal (Shoreline) Water Quality Standards
- 8) Standards of Vietnam TCVN 5944- 1995; Water Quality- Ground Water Quality Standards
- 9) Standards of Vietnam TCVN 5945- 1995; Industrial Waste Water- Discharge Standards
- 10) Standards of Vietnam TCVN 5946- 1995; Waste Paper

(e) Oil Pollution Record in the Past

The following list summarizes all major oil spill accidents from 1989 to 1996 in Vietnam Waters as supplied by the National Environment Agency.

Table 1.2
MAJOR OIL SPILL ACCIDENTS (1989-1996)

No	Date	Place	Accident	Spilled Oil & Volume	Compensatory Demand
1	1989/9/10	Qui Nhon	Cargo vessel sunk in Qui Nhon Port	200 tons of FO	Yes
2	1990/5/-	Vung Tau	Uncertain, possibly rupture pipeline of VIETSOVPETRO	Probably crude oil	Not made
3	1992/11/26	Bach Ho off-shore	Flexible pipe from tanker to shore was broken	300/700 tons of crude oil	Not made
4	1993/9/20	Vung Tau off-shore	Two cargo vessels collided 20 km off Vung Tau Coastline. One sunk	200 tons of FO & DO	Estimated damage cost US\$ 640 thousand but unresolved
5	1994/5/8	Can Gio rivers	Container ship and small tanker collided and oil spread more than 40 km ²	130 tons of FO	US\$ 600 thousand paid by ship owner (of cont. ship)
6	1994/5/-	Do Son	Unknown. Possibly tank cleaning	Unknown, possibly crude oil	None
7	1994/10/3	Cai Lai Rivers	Tanker collided with terminal jetty	1,700 tons gas/oil	Yes US\$ 4.2 millions payment received
8	1994/10/21	Qui Nhon	Pipeline of on-shore terminal broken due to bad weather	27-37 KL of DO	None
9	1995/2/8	Dai Hung off-shore	Flexible pipe from tanker to off-shore loading buoy was broken	15 KL of DO	None
10	1995/2/15	Cai Be rivers	Oil leaks from tanker when high tide in the river	10 KL of gasoil	None
11	1996/1/10	Vung Tau off-shore	Oil leaks from fuel tank of service vessel	83 m ³ of gasoil	Started
12	1996/1/27	Cat Lai	Tanker collided with terminal jetty	72 tons of gasoil	Yes US\$ 400,000 payment agreed
13	1996/5/-	Vung Tau off-shore	Oil spillage was dispersed in Vung Tau off-shore, but spill source unknown	Unknown	None
14	1996/5/-	Red river delta	Oil sludge was dispersed in the coastal water, but source unknown	Unknown	None

(f) Oil Pollution Control Situation

An appropriate action system against oil spill accidents is not completely established in Vietnam, although there are some systems implemented on oil tanker berths such as B-12 (PETROLMEX) and Van Phong Bay. For instance, the joint venture "VIETSOVPETRO" (VSP) has an oil spill control base in Vung Tau and contracts with many oil and gas company operators for off-shore oil spill response. VSP stores the following oil spill control equipment at its base.

Table 1.3
LIST OF EQUIPMENT FOR OIL SPILL RESPONSE OF VSP

No.	Contents	Type	Quantity
1	Oil boom system on hydraulically driven reel	BRD-600	2 units: 1,200 m
2	Oil weirboom system on hydraulically driven reel	Weirboom	2 units: 600m
3	Oil skimmer - capacity 200 m ³ /h from FRAMO, Norway	TRANSREC-200	1 unit
4	Oil skimmer - capacity 30 m ³ /h from VIKOMA, England	Seawolf	1 unit
5	Hydraulic multipurpose power pack (diesel engine)	HL-6	4 units
6	Emergency/standby power pack (diesel oil)	HL-3	4 units
7	Hydraulic jib crane	EFFER-1500	1 unit
8	Container with transfer pump		2 sets
9	Trolley with loading capacity 5 tons		8 units
10	Stock tank with capacity 100 m ³	VIKOMA	2 sets
11	Heavy fuel oil skip with transfer pump capacity 90 m ³ /h	100 D	1 unit
12	Equipment for absorption	VISKOPRAY	1 unit
13	Cleaner with hot water and high pressure	VIKOMA	1 unit
14	Radio communication equipment	IKOM	4 units

(g) Pollution of Shipyards

There are more than fifty shipyards in Vietnam. These shipyards are controlled by the relevant provincial agencies including port authorities in charge of environmental management.

Currently, the environmental pollution such as noise and dust produced from shipyards donot seem to be strictly controlled. Oil sludge, garbage and other wastes from vessels in shipyards are collected on shore for disposal.

(h) The Reports appeared in the News Paper of Vietnam

See attached Appendices

1.3 Assessment of Current Situation

Vietnam has a 3,200 km long coastline which consists of agro-ecosystems, aquaculture systems, estuaries, lagoons, deltas, beaches, mangrove and nipa swamps, marine plant beds, coral reefs, up- weeling areas, islands and oceanic/ river waters.

To maintain the cleanliness of coastal waters through environmental protection of the above natural resources, following are the two issues considered to be important.

- 1) To control pollution from vessels in Vietnamese waters
- 2) To control pollution from coastal areas on shore

It can be said that Environmental protection as far as its laws and regulations is taken as crucial and this country is concerned about protecting its environment. But in the case of coastline water pollution, the present situation is worsening brought about by hasty commercial/ industrial development and increased number of vessels. According to the demand forecast of coastal shipping in the Master Plan, cargo volume would more than 5 times in year 2000 and 12 times in year 2010, compared with 1995 volume which means there will be a huge increase in the number of vessels in the near future. In order to improve this situation, it is indispensable to establish investigating, monitoring and auditing system against such pollution and also improve public education awareness system concerning environmental protection.

(a) Investigating/Monitoring/Auditing system

Environmental regulations (for instance, Ordinance No. 200/Ttg, Circular No. 1420/Mtg, Circular 715/ Mtg and Decision No. 229/QD- TCC) for the execution of Law on Environment of Protection cover nearly this system. Therefore it is possible to strengthen and improve this system by fostering qualified specialists in management. On the other hand, the strengthening of education and discipline for the relevant persons/ parties in the private sector is required.

(b) Education of Seafarers

International Conventions such as SOLAS, MARPOL and STCW ratified by this country as well as port and other regulations are deeply concerned about maritime environmental protection. It is completely effective for the control of maritime pollution from coastal going vessels to strengthen and improve the education system of such regulations and conventions to seafarers in maritime schools such as Maritime Universities, Maritime Technical and Training Schools, Riverway Technical School, Inland Navigation Training Centers, Technical Worker Waterway School and other

educational institutions concerned. Otherwise, it is natural to strengthen the audit system by the government including Port Authorities.

(c) Establishment of Oil Pollution Control System

Based on the present situation in relation to oil pollution the following issues will be study further:

- 1) Developing a national oil spill contingency plan
- 2) Training program of personnel for oil spill response organization
- 3) Developing equipment for oil spill response
- 4) Compensation and claim policy on environmental damage like oil spill
- 5) Application for International Convention

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (1)

Air quality - Ambient air quality standards				
1. Scope of using				
1.1. These standards regulate critical limit of basic parameters (including suspending dust, CO, NO ₂ , SO ₂ , O ₃ and lead) in ambient air.				
1.2. These standards are promulgated to assess ambient air quality and supervisor situation of air pollution.				
2. Critical Limits				
The critical limits of basic parameters in ambient air (mg/m ³)				
No	Parameters	Average in 1 hour	Average in 8 hours	Average in 24 hours
1	CO	40	10	5
2	NO ₂	0.4	-	0.1
3	SO ₂	0.5	-	0.3
4	Pb	-	-	0.005
5	O ₃	0.2	-	0.06
6	suspending dust	0.3	-	0.2
Note: Method of sampling, analysis, computation, determination of specified parameters will be regulated in adequate standards of Vietnam				

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (2)

Air quality - Maximum allowable concentration of hazardous substances in ambient air				
1. Scope of using				
1.1. These standards regulate maximum allowable concentration of hazardous substances in ambient air including organic, inorganic substances... generated from human economic activities.				
1.2. These standards are applicable to assess level of air quality and supervision of ambient air pollution conditions.				
1.3. These standards shall not be applicable with respect to air in space of industrial production facilities.				
2. Critical Limits				
Maximum allowable concentration of hazardous substances in ambient air (mg/m ³)				
No	Name of substances	Chemical formula	Average day and night	Maximum 1 time
1	Acrylonitril	CH ₂ =CHCN	0.2	-
2	Amoniac	NH ₃	0.2	0.2
3	Anlin	C ₆ H ₅ NH ₂	0.03	0.05
4	Anhydric vanadic	V ₂ O ₅	0.002	0.05
5	Asen	As	0.003	-
6	Asen hydrua (Asin)	AsH ₃	0.002	-
7	Acid axetic	CH ₃ COOH	0.06	0.2
8	Acid clohydric	HCl	0.06	-
9	Acid nitric	HNO ₃	0.15	0.4
10	Acid Sulfuric	H ₂ SO ₄	0.1	0.3
11	Benzen	C ₆ H ₆	0.1	1.5
12	Dust contains SiO ₂			
	- dianas 85-90% SiO ₂		0.05	0.15
	- brick 50% SiO ₂		0.1	0.3
	- cement 10% SiO ₂		0.1	0.3
	- dolomit 8% SiO ₂		0.15	0.5
13	Dust contains amiang		none	none
14	Cadmi (Smoke included acid and metal) upon Cd		0.001	0.003
15	Carbon Disulfua	CS ₂	0.005	0.03
16	Carbon Tetraclohua	CCl ₄	2	4
17	Cloroform	CHCl ₃	0.02	-
18	Tetraetyl lead	Pb(C ₂ H ₅) ₄	none	0.005
19	Clo	Cl ₂	0.03	0.1
20	Benzini	NH ₂ C ₆ H ₄ C ₆ H ₄ NH ₂	none	none
21	Crom Metal and compound	Cr	0.0015	0.0015
22	1,2 - Dicloetan	C ₂ H ₄ Cl ₂	1	3
23	DDT	C ₁₄ H ₉ Cl ₅	0.5	-
24	Hydroflorua	HF	0.005	0.02
25	Fomaldehyt	HCHO	0.012	0.012
26	Hydro Sulfua	H ₂ S	0.008	0.008
27	Hydrocyanua	HCN	0.01	0.01
28	Mangan and compound	Mn/MnO ₂	0.01	-
29	Niken (metal & compound)	Ni	0.001	-
30	Naphta		4	-
31	Phenol	C ₆ H ₅ OH	0.01	0.01
32	Styren	C ₆ H ₅ CH=CH ₂	0.003	0.003
33	Toluen	C ₆ H ₅ CH ₃	0.6	0.6
34	Tricloetylen	C ₂ HCl=CCl ₂	1	4
35	Quicksilver (metal & compound)	Hg	0.0003	-
36	Vinylclorua	C ₂ HCl=CH ₂	-	13
37	Petrol		1.5	5.0
38	Tetracloetylen	C ₂ Cl ₄	0.1	-

Note: Method of sampling, analysis, computation, determination of specified parameters will be regulated in adequate standards of Vietnam

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (3)

Air quality - Industrial emission standards - Inorganic substances and dusts

1. Scope of using

- 1.1. These standards regulate maximum concentration value of inorganic substances and dusts in industrial emission (calculating unit : mg/m^3 emission) in ambient air.
- 1.2. Industrial emission air mentioned in this standards shall be gas and dusty gas created from manufacturing, business, service process and other activities.
- 1.3. These standards shall be used to control concentration of inorganic substances and dusts in industrial emission proportion before discharge in ambient air.

2. Critical Limits

- 2.1. List and concentration critical limits of inorganic substances and dusts in industrial emission when discharging into atmosphere shall be complied with regulations in the table.
- 2.2. Critical limits at column A shall be used for working facilities. Critical limits at column B shall be used for all facilities from the date of issuance of regulations by environment supervision unit.
- 2.3. With respect to emission air of business, production activities, particular services, discharging into atmosphere shall be pursuant to regulations of proper standards.

Maximum allowable limits of inorganic substances and dusts in industrial emission air (mg/m^3)

No	Parameters	Critical limits	
		A	B
1	Smoke dusts		
	- melting metals	400	200
	- concrete asphalt	500	200
	- cement	400	100
	- other source	600	400
2	Dust		
	- contained silic	100	50
	- contained amiang	none	none
3	Antimone	40	25
4	Asenic	30	10
5	Cadmi	20	1
6	Lead	30	10
7	Copper	150	20
8	Zinc	150	30
9	Clorine	250	20
10	HCl	500	200
11	Fluor, acid HF (from various sources)	100	10
12	H ₂ S	6	2
13	CO	1500	500
14	SO ₂	-	-
15	NOx (from various sources)	2500	1000
16	NOx (acid facilities)	4000	1000
17	H ₂ SO ₄	3000	35
18	HNO ₃	2000	70
19	Ammonia	300	100

Note: Method of sampling, analysis, computation for determination of concentration value of specified inorganic and dust proportion in industrial emission shall be identified in standards of Vietnam accordingly

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (4)

Air quality - Industrial emission standards - Organic substances			
1. Scope of using			
1.1. These standards regulate maximum concentration value of organic substances in industrial emission (mg/m ³ emission) if discharging into ambient air.			
1.2. Industrial emission mentioned in these standards is gas occurring from service, business, manufacturing performance and other activities.			
1.3. These standards shall be used to control concentration of organic substances in industrial emission proportion before discharging into ambient air.			
2. Critical Limits			
2.1. Name, chemical formula and concentration limits of organic substances in industrial emission when discharging into atmosphere shall be pursuant to regulations in the table.			
2.2. As to emission of several particular service, business, production activities, when discharging into atmosphere shall be conformed to regulations in respective standards.			
Maximum allowable limits of organic substances in ambient air (mg/m ³)			
No	Name	Chemical formula	Maximum limit
1	Axeton	CH ₃ COCH ₃	2400
2	Axetylen tetrabromua	CHBr ₂ CHBr ₂	14
3	Axetaldehyd	CH ₃ CHO	270
4	Acrolein	CH ₂ =CHCHO	1.2
5	Amilaxetat	CH ₃ COOC ₅ H ₁₁	525
6	Anilin	C ₆ H ₅ NH ₂	19
7	Anhydrit axetic	(CH ₃ CO) ₂ O	360
8	Benzidin	NH ₂ C ₆ H ₄ C ₆ H ₄ NH ₂	none
9	Benzen	C ₆ H ₆	80
10	Benzil clorua	C ₆ H ₅ CH ₂ Cl	5
11	Butadien	C ₄ H ₆	2200
12	Butan	C ₄ H ₁₀	2350
13	Butyl axetat	CH ₃ COOC ₄ H ₉	950
14	n-Butanol	C ₄ H ₉ OH	300
15	Butylamin	CH ₃ (CH ₂) ₂ CH ₂ NH ₂	15
16	Creson (o.m.p)	CH ₃ C ₆ H ₄ OH	22
17	Clorbenzen	C ₆ H ₅ Cl	350
18	Clorofom	CHCl ₃	240
19	β-Clופן	CH ₂ =CClCH=CH ₂	90
20	Clopicrin	CCl ₃ NO ₂	0.7
21	Cyclohexan	C ₆ H ₁₂	1300
22	Cyclohexanol	C ₆ H ₁₁ OH	410
23	Cyclohexanon	C ₆ H ₁₀ O	400
24	Cyclohexen	C ₆ H ₁₀	1350
25	Dietylamin	(C ₂ H ₅) ₂ NH	75
26	Diiodobrommetan	CF ₂ Br ₂	860
27	o-Diclobenzen	C ₆ H ₄ Cl ₂	300
28	1,1-Dicloetan	CHCl ₂ CH ₃	400
29	1,2-Dicloetyfen	ClCH=CHCl	790
30	1,2-Diclodiflometan	CCl ₂ F ₂	4950
31	Dioxan	C ₄ H ₈ O ₂	360
32	Dimetylanilin	C ₆ H ₅ N(CH ₃) ₂	25
33	Dicloetylete	(ClCH ₂ CH ₂) ₂ O	90
34	Dimetylomamit	(CH ₃) ₂ HOCH	60
35	Dimetylsunfat	(CH ₃) ₂ SO ₄	0.5
36	Dimetythydrazin	(NH ₂) ₂ NNH ₂	1
37	Dinitrobenzen (o.m.p)	C ₆ H ₄ (NO ₂) ₂	1
38	Etylaxetat	CH ₃ COOC ₂ H ₅	1400
39	Etylamin	CH ₃ CH ₂ NH ₂	45
40	Etylbenzen	CH ₃ CH ₂ C ₆ H ₅	870
41	Etylbromua	C ₂ H ₅ Br	890
42	Etylendiamin	NH ₂ CH ₂ CH ₂ NH ₂	30
43	Etylendibromua	CHBr=CHBr	190
44	Etanol	C ₂ H ₅ OH	1900
45	Etylacriat	CH ₂ =CHCOOC ₂ H ₅	100

No	Name	Chemical formula	Maximum limit
46	Etylen clohydrin	CH ₂ ClCH ₂ OH	16
47	Etylen oxyt	CH ₂ OCH ₂	20
48	Etylete	C ₂ H ₅ OC ₂ H ₅	1200
49	Etyl clorua	CH ₃ CH ₂ Cl	2600
50	Etylsilicat	(C ₂ H ₅) ₄ SiO ₄	850
51	Etanolamin	NH ₂ CH ₂ CH ₂ OH	45
52	Fufural	C ₄ H ₃ OCHO	20
53	Fomadehyt	HCHO	6
54	Fufuryl	C ₄ H ₃ OCH ₂ OH	120
55	Flotriclometan	CCl ₃ F	5600
56	n-Heptan	C ₇ H ₁₆	2000
57	n-Hexan	C ₆ H ₁₄	450
58	Isopropylamin	(CH ₃) ₂ CHNH ₂	12
59	Isobutanol	(CH ₃) ₂ CHCH ₂ OH	360
60	Metylaxetat	CH ₃ COOCH ₃	210
61	Mtylacrylat	CH ₂ =CHCOOCH ₃	35
62	Metanol	CH ₃ OH	260
63	Metylaxetylen	CH ₃ C=CH	1650
64	Metylbromua	CH ₃ Br	80
65	Metylcyclohexca	CH ₃ C ₆ H ₁₁	2000
66	Metylcyclohexanol	CH ₃ C ₆ H ₁₀ OH	470
67	Metylcyclohexanon	CH ₃ C ₆ H ₉ O	460
68	Metylclorua	CH ₃ Cl	210
69	Metylenclorua	CH ₂ Cl ₂	1750
70	Metylcloform	CH ₃ CCl ₃	2700
71	Monometylanilin	C ₆ H ₅ NHCH ₃	9
72	Metanolamin	HOCH ₂ NH ₂	31
73	Naphtalen	C ₁₀ H ₈	150
74	Nitrobenzen	C ₆ H ₅ NO ₂	5
75	Nitroetan	CH ₃ CH ₂ NO ₂	310
76	Nitroglycerin	C ₃ H ₅ (NO ₂) ₃	5
77	Nitrometan	CH ₃ NO ₂	250
78	2-Nitropropan	CH ₃ CH(NO ₂)CH ₃	1800
79	Nitrotoluen	NO ₂ C ₆ H ₄ CH ₃	30
80	Octan	C ₈ H ₁₈	2850
81	Bentan	C ₅ H ₁₂	2950
82	Bentanon	CH ₃ CO(CH ₂) ₂ CH ₃	700
83	Phenol	C ₆ H ₅ OH	19
84	Phenylhydrazin	C ₆ H ₅ NHNH ₂	22
85	Tetraclotylen	CCl ₂ =CCl ₂	670
86	Propanol	CH ₃ CH ₂ CH ₂ OH	980
87	Propylaxetat	CH ₃ -COO-C ₃ H ₇	840
88	Propylendiclorua	CH ₃ -CHCl-CH ₂ Cl	350
89	Propylenoxit	C ₃ H ₆ O	240
90	Propylenete	C ₃ H ₅ OC ₃ H ₅	2100
91	Pyridin	C ₅ H ₅ N	30
92	Pyren	C ₁₆ H ₁₀	15
93	Quinon	C ₆ H ₄ O ₂	0.4
94	Styren	C ₆ H ₅ CH=CH ₂	420
95	Tetrahydrofural	C ₄ H ₈ O	590
96	1.1, 2.2-Tetraclöetan	Cl ₂ HCCHCl ₂	35
97	Tetraclometan	CCl ₄	65
98	Toluen	C ₆ H ₅ CH ₃	750
99	Tetranitrometan	C(NO ₂) ₄	8
100	Toluidin	CH ₃ C ₆ H ₄ NH ₂	22
101	Toluen-2, 4-diisocyanat	CH ₃ C ₆ H ₃ (NCO) ₂	0.7
102	Trietylamin	(C ₂ H ₅) ₃ N	100
103	1.1.2-Tricloetan	CHCl ₂ CH ₂ Cl	1060
104	Tricloetylen	ClCH=CCl ₂	110
105	Triflo Brommetan	CBrF ₃	6100
106	Xylen (o.m.p)	C ₆ H ₄ (CH ₃) ₂	870
107	Xilidin	(CH ₃) ₂ C ₆ H ₃ NH ₂	50
108	Vinyclorua	CH ₂ CH=CHCl	150
109	Vinytoluen	CH ₂ =CHC ₆ H ₄ CH ₃	480

Note: Method of sampling, analysis, computation for determination of concrete organic concentration value in industrial emission shall be identified in standards of Vietnam accordingly

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (5)

Soil quality - Maximum allowable limits of pesticide residues in the soil				
1. Scope of using				
1.1. These standards regulate maximum allowable level of pesticide residues in the soil.				
1.2. These standards shall be used to control and apprise pollution level of pesticide chemicals in the soil.				
2. Critical Limits				
Maximum allowable limits of pesticide residues in the soil (mg/m ³ soil)				
No	Chemicals	Chemical formula	Effect	Allowable content
1	Atrazine	C ₈ H ₁₄ ClN ₅	burbicide	0.2
2	2.4-D	C ₈ H ₆ Cl ₂ O ₃	ditto	0.2
3	Dalapon	C ₃ H ₁₄ Cl ₂ O ₂	•	0.2
4	MPCA	C ₉ H ₉ ClO ₃	•	0.2
5	Sofit	C ₁₇ H ₂₅ ClNO ₂	•	0.5
6	Fenoxaprop	C ₁₆ H ₁₂ ClNO ₅	•	0.5
7	Simazine	C ₇ H ₁₂ ClN ₅	•	0.2
8	Cypemethrin	C ₂₂ H ₁₉ Cl ₂ NO ₃	•	0.5
9	Satum (Bethiocarb)	C ₁₂ H ₁₆ ClNO ₅	•	0.5
10	Dual (metorlactor)	C ₁₅ H ₂₂ ClNO ₂	•	0.5
11	fuji - One	C ₁₂ H ₁₈ O ₄ S ₂	Mushroom	0.1
12	Fenvalerato - ethyl (whips)	C ₂₅ H ₂₂ ClNO ₃	exterminating insects killing	0.1
13	Lindan	C ₆ H ₆ Cl ₆	ditto	0.1
14	Monitor (Methamidophos)	C ₂ H ₈ NO ₂ PS	•	0.1
15	Monocrotophos	C ₇ H ₁₄ NO ₅ P	•	0.1
16	Dimethoate	C ₅ H ₁₂ NO ₃ PS ₂	•	0.1
17	Metyl Parathion	C ₈ H ₁₀ NO ₅ PS	•	0.1
18	Triclofon 9chlorophos	C ₄ H ₆ Cl ₃ O ₄ P	•	0.1
19	Padan	C ₇ H ₁₆ N ₃ O ₃ PS	•	0.1
20	Diazinon	C ₁₂ H ₂₁ N ₂ O ₃ PS	•	0.1
21	Fenobucarb (Bassa)	C ₁₂ H ₁₇ NO ₂	•	0.1
22	DDT		•	0.1

Note: As to cultivated land, the sampling focused to determined pesticide residues shall be carried out upon harvest

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (6)

Water quality - Surface water quality standards				
1. Scope of using				
1.1. These standards regulate limits of allowable concentration and parameters of contaminated (polluted) substances in surface water.				
1.2. These standards shall be used to apprise pollution level of a spring of surface water.				
2. Critical Limits				
2.1. List of parameters, polluted substances and allowable limits in surface water are shown in the table.				
2.2. Method of sampling, analysis, computation for determination of every concrete concentration and parameters shall be identified standards of Vietnam accordingly.				
Allowable parameters and polluted substances concentration in surface water				
No	Parameters	Unit	Critical limits	
			A	B
1	pH	mg/l	6 to 8.5	5.5 to 9
2	BOD5 (200C)	mg/l	< 4	< 25
3	COD	mg/l	> 10	> 35
4	Dissolved Oxygen	mg/l	≥ 6	≥ 2
5	Suspending solids	mg/l	20	80
6	Asen	mg/l	0.05	0.1
7	Bari	mg/l	1	4
8	Cadimi	mg/l	0.01	0.02
9	Lead	mg/l	0.05	0.1
10	Crom (VI)	mg/l	0.05	0.05
11	Crom (VII)	mg/l	0.1	1
12	Copper	mg/l	0.1	1
13	Zinc	mg/l	1	2
14	Mangan	mg/l	0.1	0.8
15	Niken	mg/l	0.1	1
16	Iron	mg/l	1	2
17	Mercury	mg/l	0.001	0.002
18	Thiec	mg/l	1	2
19	Amoniac (as of N)	mg/l	0.05	1
20	Florua	mg/l	1	1.5
21	Nitrat (as of N)	mg/l	10	15
22	Nitrit (as of N)	mg/l	0.01	0.05
23	Xianua	mg/l	0.01	0.05
24	Total phenol	mg/l	0.001	0.02
25	Oil	mg/l	none	0.3
26	Cleaning substances	mg/l	0.5	0.5
27	Coliform	MPN/100ml	5000	10000
28	Total chemicals (other than DDT)	mg/l	0.15	0.15
29	DDT	mg/l	0.01	0.01
30	Tong hoat do phng xa α	Bq/l	0.1	0.1
31	----- β	Bq/l	1.0	1.0

Note: - Column A is used for surface water which can be used as source edible water supply (after treatment requested by regulations)
- Column B is used with regard to surface water which can be used for other purposes. There will be properly respective regulations for water used in agriculture and aquaculture.

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (7)

Water quality - Coastal (shoreline) water quality standard					
1. Scope of using					
1.1. These standards specify limits of allowable concentrations and parameters contaminated substances in shoreline water.					
1.2. These standards shall be used to apprise quality of shoreline water area.					
2. Critical Limits					
2.1. List of parameters, contaminated substances and allowable limits in coastal water shall be shown in the table.					
2.2. Method of sampling, analysis, computation for determination of every concrete concentration and parameter shall be identified standards of Vietnam accordingly.					
Allowable limits of concentration and parameter of contaminated substances in shoreline water					
No	Parameters	Unit	Critical limits		
			Beach	Aquaculture	Other place
1	Temperature	°C	30		
2	Smell		none		
3	pH		6.5 - 8.5	6.5 - 8.5	6.5 - 8.5
4	Dissolved oxygen	mg/l	≥ 4	≥ 5	≥ 4
5	BOD5 (200C)	mg/l	< 20	< 10	< 20
6	Suspending solids	mg/l	25	50	200
7	Asen	mg/l	0.05	0.01	0.05
8	Amoniac (as of N)	mg/l	0.1	0.5	0.5
9	Cadmi	mg/l	0.005	0.005	0.01
10	Lead	mg/l	0.1	0.05	0.1
11	Crom (VI)	mg/l	0.05	0.05	0.05
12	Crom (VII)	mg/l	0.1	0.1	0.2
13	Clo	mg/l	-	0.1	-
14	Copper	mg/l	0.02	0.01	0.02
15	Florua	mg/l	1.5	1.5	1.5
16	Zinc	mg/l	0.1	0.01	0.1
17	Mangan	mg/l	0.1	0.1	0.1
18	Iron	mg/l	0.1	0.1	0.3
19	Mercury	mg/l	0.005	0.005	0.01
20	Sulfua	mg/l	0.01	0.005	0.01
21	Xianua	mg/l	0.01	0.01	0.02
22	Total phenol	mg/l	0.001	0.001	0.002
23	Oil film	mg/l	none	none	0.3
24	Oil emulsion	mg/l	2	1	5
25	Total chemical	mg/l	0.05	0.01	0.05
26	Coliform	MPN/100ml	1000	1000	1000

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (8)

Water quality - Ground water quality standard			
1. Scope of using			
1.1. These standards regulate limit of allowable concentrations and parameters of contaminated (polluted) substances in ground water.			
1.2. These standards shall be used to appraise quality of a ground water source to supervisor ground water pollution in one specified area.			
2. Critical Limits			
2.1. List of parameters, polluted substances and its allowable limits in ground water shall be set forth in the table.			
2.2. Method of sampling, analysis, computation for determination of every concrete concentration and parameter shall be identified in standards of Vietnam accordingly.			
Allowable limits of parameters and polluted substances concentration in ground water			
No	Parameters	Unit	Critical limits
1	pH		6.5 to 8.5
2	Colour	Pt-Co	5 to 50
3	Firmness (as of CaCO ₃)	mg/l	300 to 500
4	Total solids	mg/l	750 to 1500
5	Asen	mg/l	0.05
6	Cadimi	mg/l	0.01
7	Clorua	mg/l	200 to 600
8	Lead	mg/l	0.05
9	Crom (VI)	mg/l	0.05
10	Xianua	mg/l	0.01
11	Copper	mg/l	1.0
12	Florua	mg/l	1.0
13	Zinc	mg/l	5.0
14	Mangan	mg/l	0.1 to 0.5
15	Nitrat	mg/l	45
16	Phenola	mg/l	0.001
17	Iron	mg/l	1 to 5
18	Sulfat	mg/l	200 to 400
19	Mercury	mg/l	0.001
20	Selen	mg/l	0.01
21	Fecalcoli	MPN/100ml	none
22	Coliform	MPN/100ml	3

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (9)

Industrial waste water - Discharge standards					
1. Scope of using					
1.1. These standards regulate concentration and parameter critical limits of proportion substances in waste water from service, business, processing, production facilities... (generally called is industrial waste water).					
1.2. This standard shall be used to supervise industrial waste water quality prior to drain into water basin.					
2. Critical Limits					
2.1. Critical limits of parameters and concentrations of substances in industrial waste water drained into water basin shall be conformed to regulations in the table.					
2.2. With respect to waste water of certain special industries, value of parameters and concentrations of substances shall be regulated accordingly in proper standards.					
2.3. Industrial waste water of parameters and concentrations of component substances equal or less than regulated values in column A may be drained into water basin that was used as source of living water supply.					
2.4. Industrial waste water of parameters and concentrations of component substances equal or less than regulated values in column B shall just be allowed to drain into water stream used as waterway, irrigation swimming, aquaculture and cropping.					
2.5. Industrial waste water of parameters and concentrations of component substances more than regulated values in column B, but not exceeded regulated values in column C shall be allowed only to drain into specified areas.					
2.6. Industrial waste water of parameters and concentrations of component substances more than regulated values in column C shall not be allowed to discharge into environment.					
2.7. Method of sampling collection, analysis, copulation, determination of every concrete shall be regulated in standards of Vietnam accordingly.					
Critical limits of parameter and concentrations of polluted substances					
No	Parameters	Unit	Critical limits		
			A	B	C
1	Temperature	°C	40	40	45
2	pH		6 - 9	5.5 - 9	5 - 9
3	BOD5 (200C)	mg/l	20	50	100
4	COD	mg/l	50	100	400
5	Suspending solids	mg/l	50	100	200
6	Asen	mg/l	0.05	0.1	0.5
7	Cadimi	mg/l	0.01	0.002	0.5
8	Lead	mg/l	0.1	0.5	1
9	Chlorine (surplus)	mg/l	1	2	2
10	Crom (VI)	mg/l	0.05	0.1	0.5
11	Crom (VII)	mg/l	0.2	1	2
12	Mineral oil	mg/l	KPHD	1	5
13	edible oil	mg/l	5	10	30
14	Copper	mg/l	0.2	1	5
15	Zinic	mg/l	1	2	5
16	Mangan	mg/l	0.2	1	5
17	Niken	mg/l	0.2	1	2
18	Organic photpho	mg/l	0.2	0.5	1
19	Total photpho	mg/l	4	6	8
20	Iron	mg/l	1	5	10
21	Tetratoetylen	mg/l	0.02	0.1	0.1
22	Tin	mg/l	0.2	1	5
23	Mercury	mg/l	0.005	0.005	0.01
24	Total Nitro	mg/l	30	60	60
25	Tricloetylen	mg/l	0.05	0.3	0.3
26	Amoniac (as of N)	mg/l	0.1	1	10
27	Florua	mg/l	1	2	5
28	Phenola	mg/l	0.001	0.05	1
29	Sulfua	mg/l	0.2	0.5	1
30	Xianua	mg/l	0.05	0.1	0.2
31	Total α radioactivity	mg/l	0.1	0.1	-
32	Total radium β radioactivity	mg/l	1.0	1.0	-
33	Coliform	MPN/100ml	5000	10000	-

Note: KPHD not Identified

Table 1.4
STANDARDS OF VIETNAM TCVN 5937-1995 (10)

Waste Paper	
1. Scope of using	These standards shall be used for import waste paper which be used as paper production materials.
2. General regulations	<p>2.1. Waste paper included paper and carton of all kinds which discharged during recycling, processing, printing, business production activities, sorting, packing to meet this standard's request.</p> <p>2.2. Waste paper may be mixed trace substances. The mixed trace substances which contained in waste paper including : prohibited substances and substances are advisable not existing.</p> <p>2.2.1. Prohibited substances are those influence to people's health, environmental pollution such as : radioactive, poisonous, chemicals, ineffective microbes...</p> <p>2.2.2. Advisable-not-existing substances are ones which are able to spoil machinery and equipment or useless for production process such as mails, pins, metal tape, sticking plaster, polymeric bag,</p>
3. Classification	<p>3.1. Based on raw material quality, waste paper shall be classified into 2 categories:</p> <ul style="list-style-type: none"> - From all kinds of carton paper. - From Kraft paper. <p>3.2. Based on quality level, each category shall be classified into groups as follows:</p> <ul style="list-style-type: none"> - Waste paper from carton of all kinds shall be classified into 3 groups: Group A,B,C. <ul style="list-style-type: none"> • Group A: group of low quality. • Group B: group of medium quality • Group C: group of high quality - Waste paper from Kraft including only one group: Group D <p>3.3. Each group including following quality levels:</p> <ul style="list-style-type: none"> - Group A: 6 levels, of notation from A1 to A6 - Group B: 8 levels, of notation from B1 to B8 - Group C: 18 levels, of notation from C1 to C18 - Group D: 6 levels, of notation from D1 to D6
4. Technological requirements	<p>4.1. Requirements on hygiene, safety and environment protection (shall be conformed to regulations in Table *1).</p> <p>4.2. Requirement on quality (shall be conformed to regulations in Table *2).</p>
5. Method of testing	<p>5.1. Determination of poisonous chemicals, radioactive substances. Method of sampling, analysis, determination shall be regulated in Standards of Vietnam properly.</p> <p>5.2. Determination of ineffective microbes. Apply regulations of Ministry of Health.</p> <p>5.3. Determination of mouldy mushrooms, insects, spoiled and nasty smells: by observation and sensation.</p> <p>5.4. Determination of humidity. Apply TCVN 1867-76</p> <p>5.5. Determination of substances advisable not existing.</p> <ul style="list-style-type: none"> - Sampling: Testing sample shall be collected from some packages with quality not less than 10 kg. - Testing instruments: Laboratory scale with exactness up to 0.01 kg - Testing: Detachment, elimination of substances advisable not existing by hand. - Calculation of result: <p>Substance advisable not existing (%), are ratio of quality of substances existing and total quality testing sample. The final result shall be averaged of three testings.</p>
6. Packing, transport and preservation	<ul style="list-style-type: none"> - Waste paper shall be packed and tightly bagged. - Quality of packages, means of transport shall be subject to agreement between buyer and seller. - During transporting, waste paper shall be tightly covered to keep from affects of outside environment.

Table *1: Requirement of hygiene, safety and environment protection of waste paper

Groups quality level	Targets	Rate
1	Poisonous chemicals	not allowed
2	Radio active	.
3	Ineffective microbe	.
4	Mouldy mushroom	.
5	Insect	.
6	Spoiled/Nasty smell	.
7	Humidity, (%), not more than	15
8	Percentage of substances unallowable, not more than	1

Table *2: The quality target of group of waste paper

Groups quality level	Targets	Rate
<u>Group A</u>	<u>Low quality group</u>	
A1	Mixed paper, carton which not classified – Percentage of short fiber cartons, papers (%)	not limited
A2	Mixed paper, carton classified – Percentage of newspaper, magazine paper (%), not more than	40
A3	Carton margin – From straw powder and	not allowed
A4	Waste paper from supermarket – Percentage of corrugated carton (%), not more than	50
A5	Used box made from used corrugated carton	
A6	Mixed newspaper, magazine and books without cover	
<u>Group B</u>	<u>Medium quality group</u>	
B1	Newspaper read one time only – Percentage of the color printed advertisement enclosed (%), not more than	5
B2	Daily newspapers not smelling over, printed on white paper, without advertisements and color pictures enclosed	
B3	Carton margin has a lot of layers with, at least one white cover printed or not printed	
B4	Margin paper of mixed color, percentage of white paper, mechanic powder	
B5	Book margin paper, color printed, with or without hard cover, main constituent of paper is mechanic powder	
B6	Book margin paper without hard cover	
B7	Postal envelop with printed color, without carbon paper, hard cover	
B8	Old book with white paper, without mechanic powder and hard cover – Percentage of white paper (%), not less than	10

Groups quality level	Targets	Rate
<u>Group C</u>	<u>High quality group</u>	
C1	Margin paper with few color printed including mainly printed paper, writing paper – Percentage of paper not included mechanic powder (%), not less than	50
C2	Margin paper with few color including mainly printed paper, writing paper – Percentage of paper not contained mechanic powder (%), not less than	90
C3	Different cards from papers selected into colors, not contained mechanic powder	
C4	Different cards with selected into colors, not contained mechanic powder	
C5	Leather imitated, not contained mechanic powder. Percentage of color printed (%), not more than	5
C6	Mixed postal envelope from selected white paper – Percentage of paper without mechanic powder (%), not less than – Percentage of book, carbon paper and undissolved gum – Percentage of copying color paper, but not carbon paper (%), not more than	60 not allowed 3
C7	White paper postal envelope without selected mechanic powder – Percentage of book, carbon paper and gum undissolved in water – Percentage of copying paper, with color, (other than carbon paper) (%), not more than	not allowed 3
C8	Office waste paper, white, not contained mechanic powder – Percentage of copying paper, with color (other than carbon paper) (%), not more than	3
C9	Official waste paper, white, not contained mechanic powder, with color copying paper, other than carbon paper	
C10	Carbon margin of various layers, white, contained a few printing ink	
C11	Carbon margin of various layers, white, not contained printing ink	
C12	Newspaper margin, white, not printed, without margin paper	
C13	Magazine paper, white, not printed, without newspaper	
C14	White paper margin, not printed, made from mechanic powder, galvanized by chalks.	
C15	White paper margin, not printed, not contained mechanic powder, galvanized by chalks	
C16	White paper margin, made from mechanic powder without newspaper and magazine – Percentage of paper galvanized by chalk (%), not more than	20
<u>C17</u>	Mixed white paper margin, not printed, without newspaper and magazine – Percentage of paper made from mechanic powder (%), not more than – Percentage of paper galvanized by chalk (%), not more than	60 10
C18	White paper margin, not printed, not contained mechanic powder – Percentage of paper galvanized by chalk (%), not more than	
<u>Group D</u>	<u>Waste Kraft paper group</u>	
D1	Waste Kraft paper II (including: box, slap, carton margin with Kraft flat layer and corrugated layer)	
D2	Waste Kraft paper I (including: box, piece, carton margin with one Kraft flat layer only made from chemical powder or haft-chemical powder)	
D3	Used Kraft bags (including: bags, contained construction materials, fertilizers, color powder...)	
D4	Used Kraft bags cleaned	
D5	Used Kraft carton and paper, one color only or white	
D6	Kraft carton and paper margin not used, one color only	

(d) The reports regarding the environment appeared in the News Paper of Vietnam

1) Pollution threat on the 3,200 km coastline

- 1) Environmental deterioration, namely industrial pollution, reduction of bio-diversity, over-fishing, destruction of coastal swamps and diminishing corals are the most serious problems facing Vietnam.
- 2) Virtually none of the enterprises located along Vietnamese coastline are equipped with pollution-control devices.
- 3) Sea water quality is deteriorating in seas located near to major urban centers due to industrial wastes and discharge of untreated sewage.
- 4) Dynamite fishing is common in the Central Region of Vietnam and Ha Long Bay and is extremely dangerous to the environment. In addition, people using explosives to destroy coral reefs in order to produce lime and souvenirs for tourists permanently damage the eco-system.
- 5) Between 60 to 70% of wastes dumped into the sea originates from residential houses. Industrial wastes despite a smaller portion is extremely dangerous because of the toxic nature of the wastes.
- 6) Coastal regions are plagued by excessive amounts of metal in the soil which exceed the State's accepted standards.
- 7) In October 1994, a Singaporean oil tanker spilled 1,700 tons of diesel oil in Cat Lai Port along the Saigon River which is the worst case in Vietnamese coast.
- 8) The Ministry of Science, Technology and Environment is developing a National Program in response to oil spills and submit the plan to the Government for approval in the near future.

(Vietnam Investment Review 22-28 Jan. 1996)

2) Measures needed to protect environment

In order to prevent environmental damage and to encourage the protection and regeneration of natural resources, the government should apply the following financial measures:

- 1) Establish an environmental protection and regeneration fund;
- 2) Use taxation to promote environmental protection;
- 3) Collection of toxic and waste deposits;
- 4) Investing in family planning programs and poverty alleviation schemes;
- 5) Streamline funds for reforestation and forest preservation programs;
- 6) Investment in urban and rural environment improvement ;
- 7) Make oil and gas enterprises buy insurance and avoid accidents ;
- 8) Set proper fines and bonuses ; and
- 9) Attract foreign aid thru international organizations News.

(Vietnam News February 26, 1996)

3) Chairman's Statement of Asia-Europe Meeting (ASEM)- Bangkok , March 2, 1996

- 1) The Meeting acknowledged the importance of addressing environmental issues such a global warning, protection of water resources, deforestation, bio-diversity of species and marine environment protection, and agreed that mutually beneficial cooperation should be undertaken in this field including the transfer of environmentally sound technology to promote sustainable development.

(Vietnam News March 7, 1996)

4) An Giang Avoids Use of Insecticides

An Giang province, the major rice producer of the country, is implementing a program avoiding the use of chemical insecticides for the rice crop during the first 40 days of the 95-96 spring-winter crop. The program aims at limiting adverse environmental effects and reducing cultivation costs.

(Vietnam News March 6, 1996)

5) Women for Cleaner Streets

- 1) A movement with the slogan "Women and people of the capital, for the sake of a clean environment, don't throw garbage in the streets" is being mobilized by the Hanoi Women's Association on the occasion of International Women's Day (March 8).

(Vietnam News March 8, 1996)

6) Technology for Clean Air, Water Introduced

- 1) Ways and means to protect the city's environment and provide its inhabitants with clean air and water were discussed at a seminar held in HCMC.
- 2) The seminar was organized by the Science and Technology and Environment in coordination the Coterie International, a Singapore-based engineering design and consultant company.

- a) A greater part of the sewage of all cities is dumped into the rivers and canals that finally to the sea- as a matter of fact, a report by the World Health Organization said Southeast Asian countries dump about 70 % of their wastes into the sea directly or indirectly.
- b) The exhaust fumes from factories is a major pollution agent in Vietnam, especially in big cities like HCM City and Haiphong, causing serious health problems.
- c) Clean, not pure, water has been a big problem for Vietnam. Up to now about 60 % of the Vietnamese, mainly in rural areas, do not have clean water. And pure water is even more scarce.

(Vietnam News March 9, 1996)

7) Pollution Fight Gets Boost

- 1) The northern province of Vinh Phu is getting help in its fight against industrial pollution worth over US\$900,000 from the United Nations Development Program (UNDP). Vinh Phu is facing serious difficulties in boosting its industry without destroying natural resources and endangering the health of local people. Wastes from Viet Tri industrial zone has affected Hanoi's water supply as well as water for agriculture in Red River Delta provinces. The project to manage industrial waste and reduce water pollution aims to arrest the large amount of untreated or partially treated or partially treated liquid waste that is being discharged into surrounding rivers. The project will conduct an area-wide environmental assessment and develop regional guidelines for water quality bases on desired beneficial uses of the Red River downstream.
- 2) "Water is the lifeblood of the environment and Vietnam's most precious natural resource. Its high quality must be ensured to protect the environment and the health of Vietnamese people" said UNDP Deputy Resident Representative.
(Vietnam News March 22, 1996)

8) Van Phong bay failing test as petroleum center

- 1) The use of the port at Van Phong bay in Khanh Hoa provinces as an oil transportation center for six-month trial period is meeting with less than positive reviews.
 - a) Deputy Prime Minister has sent a letter to the Ministry of Transport (MOT), the Ministry of Science, Technology and Environment (MOSTE), the Khanh Hoa People's Committee and the Bureau of Navigation (BON), in which he called for the BON to find a more advantageous location for the transportation of petroleum, that would have fewer negative effects on the environment.
 - b) This usage has negatively affected fishing, tourism and offshore agricultural development in the area, many local officials say.
 - c) A specialist at the MOSTE said that profits from oil transportation services are not enough to cover the losses as a result of this fallout. Van Phong bay is rich in natural resources - considerable weather, for example, than Quang Ninh, Hai Phong and Binh Ca bays. The operations of oil transportation ships and oil storage warehouses have badly polluted Van Phong's environment. "Obviously, the oil transportation project here is not good for sea environment, and there will be risks of oil spillage" he said.
 - d) There have been 12 oil spills in Vietnam since 1989, according to the MOSTE. The most serious was at Cat Lai port in Ho Chi Minh City in September, 1994, when a spillage of 1,700 tons of oil caused US \$ 4.2 Million in damages. On January 27 of this year, another accident at Cat Lai caused 70 tons of oil to be spilled into the sea.
(Vietnam Shipping Times March 11-24, 1996)

9) More Support to Protest Vietnam's Natural Wealth

1) The World Conservation Union (IUCN) has pledged further help in terms of technical assistance and training to Vietnam towards promoting sustainable development and protecting its natural resources. The pledge was made by IUCN President to Vice Prime Minister of Vietnam in Hanoi.

- a) Vietnam's great wealth of biological resources - forests, wetland, aquatic and marine areas - vital for the well-being of the population as well as for economic growth, is under serious threat.
- b) If the development process unleashed by doi moi continues unchecked and steps to make it sustainable are not taken, it will result in the loss of biodiversity; loss of natural resources; degradation of natural habitats; heavy pollution; and a decline in health and living standards.
- c) IUCN's in-country technical support to Vietnam began in 1984, and set up its office here in 1992. Vietnam joined the IUCN in 1993 as a state member following which a permanent country office was established here.
- d) The IUCN, along the other international organizations, has helped Vietnam formulate its National Conservation Strategy (NCS), and prepare the National Plan for the Environment and Sustainable Development (NPESD).
- e) It has also assisted Vietnam in specific projects such as the Xuan Thuy Reserve Project (watershed management), provided technical assistance to the United Nations Educational, Scientific and Cultural Organization (UNESCO), in the analysis and subsequent declaration of Halong Bay as an international heritage site.

(Vietnam News March 23, 1996)

Chapter 2. Formulation of Maritime Pollution Control System

2.1 Identified Problems

(a) Present Problem

There are a number of activities that contribute to maritime environmental degradation which are as follows.

- 1) Pollution of water due to uncontrolled dumping of toxic liquid substances, harmful substances, sewage, and garbage from ships;
- 2) Pollution of water, air and solid, due to industrial wastes, untreated sewage, pesticides, chemicals, and fertilizers;
- 3) Unsustainable and inefficient use of natural resources, especially water, biological resources and mineral resources;
- 4) Pollution of oil spill from vessels and oil terminals in rivers, ports and coast, and off shore oil production fields;
- 5) Pollution by handling cement and other dusty cargoes in ports; and
- 6) Coral destruction through the use of dynamite and through coral mining for lime and concrete.

(b) Future Problem

According to the future coastal shipping traffic demand in the Master Plan, cargo volume is anticipated to be 14.4 million tons in the year 2000 and 34.4 million tons in year 2010. These will become more than 5 times in year 2000 and 12 times in year 2010 respectively, compared with 2.7 million tons in 1995. Therefore the number of coastal ships will increase in proportion to the cargo volume annually.

On the other hand, the growth in economic development will result to an increase in the average per capita GDP from USD 290 in year 1994 to about USD 450 in year 2000 and about USD 1,000 in year 2010.

Considering the above future circumstances, marine environmental degradation will become more serious unless a comprehensive action plan against marine environmental pollution is established as soon as possible.

2.2 Proposed Maritime Pollution Control System

(a) Marine Pollution Control Legislation

Vietnamese Government (National Assembly) is required to stipulate rules and regulations on Marine Pollution Control covering whole Vietnamese waters. The rules and regulations must apply for basically both Vietnamese Law on Environmental Protection and International Convention, MARPOL 1973/1978.

Whole ministries must be responsible for the implementation of the rules and regulations, such as Ministry of Science Technology & Environment (MOSTE), Ministry of Transport (MOT), Ministry of Defense, Ministry of Foreign Affairs, Ministry of Health, General Department of Standardization, Measurement & Quality, General Department of Petroleum and Gas. MOSTE should become the administrative center of Marine Environment as the chairman of the whole ministries. National Environment Agency (NEA) of MOSTE should perform the actual management of the rules and regulations.

(b) Organization of Marine Pollution Control

1) Main Framework (Center)

MOSTE (NEA) and MOT (VINAMARINE, VIRES, VIMARU)

2) Administrative Skeleton (4 levels)

Local - Provincial - Regional - Central

(c) Monitoring, Auditing, Investigating and Reporting System

1) Monitoring, Investigating and Reporting System

NEA should perform monitoring, investigating and reporting system by controlling Sectoral Ministries (for instance, Department of Science, Technology & Environment)

2) Auditing and Reporting System

The Ministry of Transport should perform auditing system such as Port State Control by supervising VINAMARINE, VIRES and Port Authorities and then report the results of their audits to MOSTE, Ministry of Defense and Ministry of Interior can decide environmental issues according to the Environmental Protection Law and the Decision No. 175 of the Government.

(d) Applying for International Conventions, Associations and Projects

The Vietnam government should positively join other countries under international treaties, Conventions, associations and projects concerning marine environment and enact national laws, regulations, rules and guidelines, and then manage them.

1) To constitute national laws/ regulations according to MARPOL 1973/1978

2) To apply for Oil Pollution Preparedness, Response and Cooperation (OPRC) which requires each party must establish a national system for responding to oil pollution incidents and of which agreement became international law on 13 May 1995, ratified by fifteen countries.

- 3) To participate in LDC treaty concerning restriction against throwing out any wastes from ships and airplane.
- 4) To participate in ASEAN Oil Spill Response Action Plan Agreement (OSRAP) which the six ASEAN countries (Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand) have agreed to share information on oil pollution incidents, to conduct mutual visits, to undertake joint training exercise, to promote research and development in combating oil pollution and to facilitate prompt trans-boundary mobility of personnel, materials, and equipment in case of emergency.
- 5) To apply for the IMO International Safety Management Code (ISM Code) adopted in November 1993 which is an international standard for the safe management and operation to safety and pollution prevention and for the implementation of a safety management system (SMS).
- 6) To strengthen Port State Control System in each port according to Tokyo MOU (Memorandum of Understanding) which was adopted on Dec. 1993 between 18 Asian/ Pacific regional countries which took effect on April 1, 1994.
- 7) To apply for ISO (International Standard Organization) 9000 and 14000 series
- 8) To participate in NGO (Non Governmental Organizations) such as International Petroleum Industry Environmental Conversation (IPIECA) following the establishment of UNEP, the UN Conference on the Human Environment.

(e) Public Education and Awareness

It is one of the most important factors for marine environmental management that only persons involved in maritime activities including seafarers but also the public should understand and appreciate the importance of marine environmental protection by means of education, publications and so on.

(f) Liability/ insurance for marine pollution

The persons and other parties that cause marine pollution should be liable for any damage to properties or for other economic losses. Therefore the insurance system against marine pollution must be duly established. For instance,:

- 1) Ship owners' Mutual Protection & Indemnity Association (P&I)
- 2) Convention on Limitation of Liability for Maritime Claims, 1976 (LLMC)
- 3) International Convention on Civil Liability for Oil Pollution Damage (CLC)
- 4) International Convention on the establishment for an International Fund for oil Pollution (FUND)

(g) More Investment for Environmental Preservation

The government should provide more capital to strengthen marine environmental activities and also to further consider the utilization of ODA funds from developed countries in this field, such as:

- 1) Installation of oil spill preparedness equipment in critical areas
- 2) Provision of residence on shore for fishermen societies who make a living in fishing boats

2.3 Establishment of National Oil Spill Protection System in the Short Term

More than fourteen oil spill major accidents occurred in Vietnamese rivers, ports and coast, and huge damages were reported involving the marine environment during the past seven years. According to the demand forecast of coastal shipping traffic by commodity, the liquid bulk cargo volume (oil and oil products) will be 27 times in the year 2000 and 54 times in year 2010, compared with volumes in year 1995 after the implementation of big oil refinery projects such as in Dung Quat. Therefore, an urgent action plan against oil pollution will be required from the Vietnamese Government.

Marine oil pollution in Vietnamese coast, ports and inland waters should be collectively controlled by one governmental organization in order to manage it systematically in accordance with the National Environmental Protection Law and MARPOL 1973/1978 treaty ratified in 1991.

Vietnamese Government already started to study about oil spill preparedness response plan through the European Consulting Company (Sweden) and Government Consultant.

The following action plans should be considered in response to marine oil pollution preparedness.

(a) Establishment of Organization to Control Marine Oil Pollution

Though marine oil pollution accidents had been treated by local parties such as regions, provinces, ports, and private sectors in Vietnam, it must be basically controlled by the central government. It is recommended that National Assembly organizes MOSTE as marine oil control and management center because MOSTE almost established a marine pollution network all over the country and is fostering experts and technical staff in this field. The following four level organization system is recommended.

1) Local Level

Each local district and private sectors including off-shore oil production fields

2) Provincial Level (including major cities)

Each province and city located in coast, ports and rivers

3) Regional Level

- Northern Region (Head office; Hai Phong)
- Central Region (Head office; Danang)

- Southern Region (Head office; Ho Chi Mine City)

4) Central Level

National Assembly - MOSTE (NEA) and MOT (VINAMARINE/VIRES/ VIMARU), followed by other state organization concerned such as Ministry of Defense, Central Inland Waterway Management Organization and so on. Their functions are as follows:

- MOSTE (NEA): to control comprehensive environmental protection on marine pollution from shore and waters
- MOT:
 - a) VINAMARINE: to control marine pollution from ships including seafarers. VINAMARINE is currently not implementing this system including Port State Control. VINAMARINE should take the initiative in performing marine pollution prevention system to ships.
 - b) VIRES: to inspect the condition of environmental installation on board ships including oil filtering equipment, sewage treatment tank and the like, and issue International Oil Pollution Prevention Certificate (IOPC) required by MARPOL.
 - c) VIMARU: to supply education and training courses to students and seafarers concerning marine pollution prevention compiled for the requirement of MARPOL, Port State Control according to Tokyo (MOU), IMO ISM Code and so on.

(b) Development of Oil Spill Contingency Plan

The most important factor of Oil Spill Contingency Plan is to establish communication (order and reporting) system to minimize the spread of oil spill and/ or the prevention of major oil spill accidents.

1) Oil Spill Contingency Plan

Oil spill contingency plan should be formulated consisting of four level organizations (Local, Provincial, Regional and Central) and the order/ reporting flow plan must be described in one sheet to determine the responsible persons among the four level organizations. The plan consists of competent authorities and private sector forms like oil terminals, oil tanker shipping companies and crude oil production companies. An exclusive special communication network must be prepared to cope with emergency measures in any oil spill accident case.

2) Preparedness for Oil Spill Contingency Plan

The Central Level should identify matters in emergency cases in advance.

- The likely sources of oil spill, vulnerable resources at risk and priorities for protection ;

- Available logistic support facilities including equipment for recovered oil/ disposal ; and
- Available troops including Vietnamese Navy to be mobilized in emergency cases.

(c) Training Practice for Personnel of Oil Spill Organization and Education of Seafarers

- 1) Central Level (Government) should prepare guidelines for practical training courses to personnel belonging to the above four level organizations.

As this system in Vietnam is not established yet, it is proposed that the government should send trainees to developed countries for the purpose of training potential leaders in this field.

For instance, the Japanese government has opened 'the Project on Maritime Disaster Prevention and Cooperation' (M'PAC Project) as ODA project from October 1996, for five years in Tokyo in which, on the first course for a week, seven Asian country trainees including Vietnamese participated and were trained in oil spill response training significantly. It is said that participation cost per person is about 10 thousand USD including travel and accommodation charges.

In order to prevent marine oil pollution, it is indispensable to improve the education system according to international conventions such as SOLAS, MARPOL and STCW as well as local regulations/rules such as port regulations to Vietnamese seafarers by Vietnamese maritime institutions. For instance;

- Training and qualifications of masters, officers and ratings on tankers (STCW);
- Establishment of oil tanker training program (STCW);
- Establishment of oil pollution emergency plan on tankers(MARPOL) ;and
- Preparation of the procedures manual on tankers (MARPOL).

(d) Improvement of monitoring, auditing and reporting system against marine pollution

- 1) For Shore

Though various environmental regulations for the execution of "Law on Environment Protection" and related decrees have covered this system, it is necessary to strengthen and improve it by increasing the number of qualified specialists in the organization.

- 2) To Ships

VINAMARINE AND VIRES must establish auditing and reporting system for ships in Vietnamese waters. Port State Control (PSC) is currently functioning only in Haiphong and Saigon Ports. For the improvement of port state control system it is indispensable to foster and train the officers of PSC according to relevant laws,

regulations, rules and international conventions by sending trainees to developed countries.

(e) Preparedness for Oil Spill Response Equipment and Facilities

Preparedness for oil spill response equipment and facilities such as oil booms, oil skimmer, oil absorbent, chemicals, working boats, storage tanks and so on should be the responsibility of individual oil operators. Major operators such as VIETSOVPETRO and PETROLIMEX have undertaken these measures but these are not adequate enough, since the number of such equipment and facilities are not adequate to cover the whole Vietnam waters.

The following proposal is recommended to improve this issue.

- Central Level establishes working team for the preparedness;
- Working team investigates necessary number of equipment and facilities including ones for off-shore production areas by involving special experts from developed countries; and
- As a result of the investigation, Central Level provides necessary equipment and facilities to Local Level. (Their procurement may be assisted by ODA funds from developed countries).

(f) Participation in International Conventions and Associations on Oil Pollution

After the above issues are prepared, Vietnamese government should participate in OPRC and OSPAP for international cooperation with countries aiming at initial preparedness for marine oil spill incidents.

(g) Establishment of Liability/ Insurance System for Marine Oil Spill Incidents

Persons and Parties who are liable for any damages to property or for other economic losses caused by the oil spill should cover the cost. Therefore, the Vietnamese government should participate in CLC Treaty 1969 (International Treaty for Civil Liability of oil spill damages) and FUND Treaty for Compensation of Oil Spill Damages 1971. On the other hand, ship owners in Vietnamese coastal service may participate in P&I insurance.

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