



ENVIRONMENTAL REPORT 2005/2006



THE CHINA NAVIGATION CO. LTD.

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1. FOREWORD

Managing Director's Statement

It is my pleasure to introduce the CNCo Environmental Report 2005/06. The past year has seen CNCo introduce a number of policies that aim to reduce the adverse impact of its operations on the environment by increasing the efficiency of raw material consumption, conserving resources and reducing any detrimental outputs.

Whilst shipping is the most efficient way to transport goods around the world and has the least environmental impact, CNCo is constantly seeking to reduce the environmental impact of its operation. All CNCo vessels are constantly upgraded to ensure that they meet the standards of the International Convention for the Prevention of Pollution from Ships (MARPOL). Where possible, CNCo aims to introduce environmental policies well before enactment as legislation.

At the end of 2004 CNCo set up an Environmental Steering Committee, which meets quarterly with the purpose of raising awareness of environmental issues, to ensure policies are implemented systematically and to provide a forum for suggestions. Through this Committee CNCo has improved its environmental reporting systems to better understand the impact of its operations. The committee has been the driving force behind the policies set out in this report and will continue to strive for heightened environmental awareness and a measurable improvement upon its environmental impact performance.

CNCo is aware that its operations have an impact on the environment, and also recognises its duty to its customers, staff, and to the marine systems through which it sails, to continually strive to reduce that impact. I hope that we will be able to build on the initiatives set out in this Report to ensure that the impact of our operations continues to reduce.

Geoff Cundle

Managing Director

2. INTRODUCTION TO THE CHINA NAVIGATION COMPANY'S (CNCo) ACTIVITIES

The China Navigation Co. Ltd. is the Hong Kong based deep-sea shipping arm of John Swire & Sons Ltd. The company is UK-registered and managed from Hong Kong. CNCo has established Owner's Representative offices in Singapore, Indonesia, Papua New Guinea, India and the United States. Founded in 1872, China Navigation operates liner-shipping services to over 100 international ports and is actively involved in container and dry bulk chartering on a worldwide basis.

CNCo's managed services include:

- **Bank Line** (round the world);
- **Chief Container Service** (Australia to/from New Zealand, Papua New Guinea and the Pacific Islands);
- **Greater Bali Hai** (North Asia to/from the South Pacific Islands);
- **Indotrans** (Southeast Asia, India, Saudi Arabia to/from US Gulf, US East Coast and Canada);
- **Indotrans Asia** (Southeast Asia, Papua New Guinea, the Pacific Islands to/from the US/Canadian West Coast);
- **Indotrans Pacific** (Australia and New Zealand to/from the US/Canadian West Coast)
- **New Guinea Pacific Line** (Southeast Asia and the Far East to/from Papua New Guinea, the Pacific Islands and Australia);
- **Tasman Orient Line** (New Zealand to/from Southeast, East and North Asia).
- CNCo also has a long-standing interest in Polynesia Line, a liner trade connecting the west coast of the USA with Tahiti, Samoa and American Samoa.

CNCo's owned fleet comprises 15 multi-purpose vessels and one bulk carrier. In addition, up to 30 multi-purpose liners are chartered in for the company's liner services.

3. THE CHINA NAVIGATION COMPANY LIMITED: HEALTH SAFETY & ENVIRONMENTAL POLICY (HSE)

The China Navigation Co. is committed to ensuring that Health, Safety and Environmental considerations are an integral part of its decision-making management and culture.

Accordingly The China Navigation Co., in conducting its business, will endeavour to:

- Protect** the health of its employees and that of others who may enter its workplace.
- Preserve** the environment by promoting appropriate environmental awareness at all levels.
- Prevent** injuries and damage to property and the environment.

To achieve these objectives the Company will endeavour to adopt the following policies:

- ◆ Maintain HSE policies and standards that meet or exceed legal requirements and our customer's expectations.
- ◆ Continually develop HSE policies and standards through the Safety Management System (SMS) to benefit company staff, the environment and wider community.
- ◆ Communicate and encourage staff, contractors, suppliers and customers to accept responsibility for their actions and comply with our HSE policies and standards when dealing with us.
- ◆ Encourage all staff to maintain a high standard of health, safety and environmental consciousness. Management, in turn, will ensure that personnel have the required facilities, skills and support to achieve this.

The China Navigation Co. affirms its commitment to its HSE policy and requires each employee to abide by the principles contained herein.

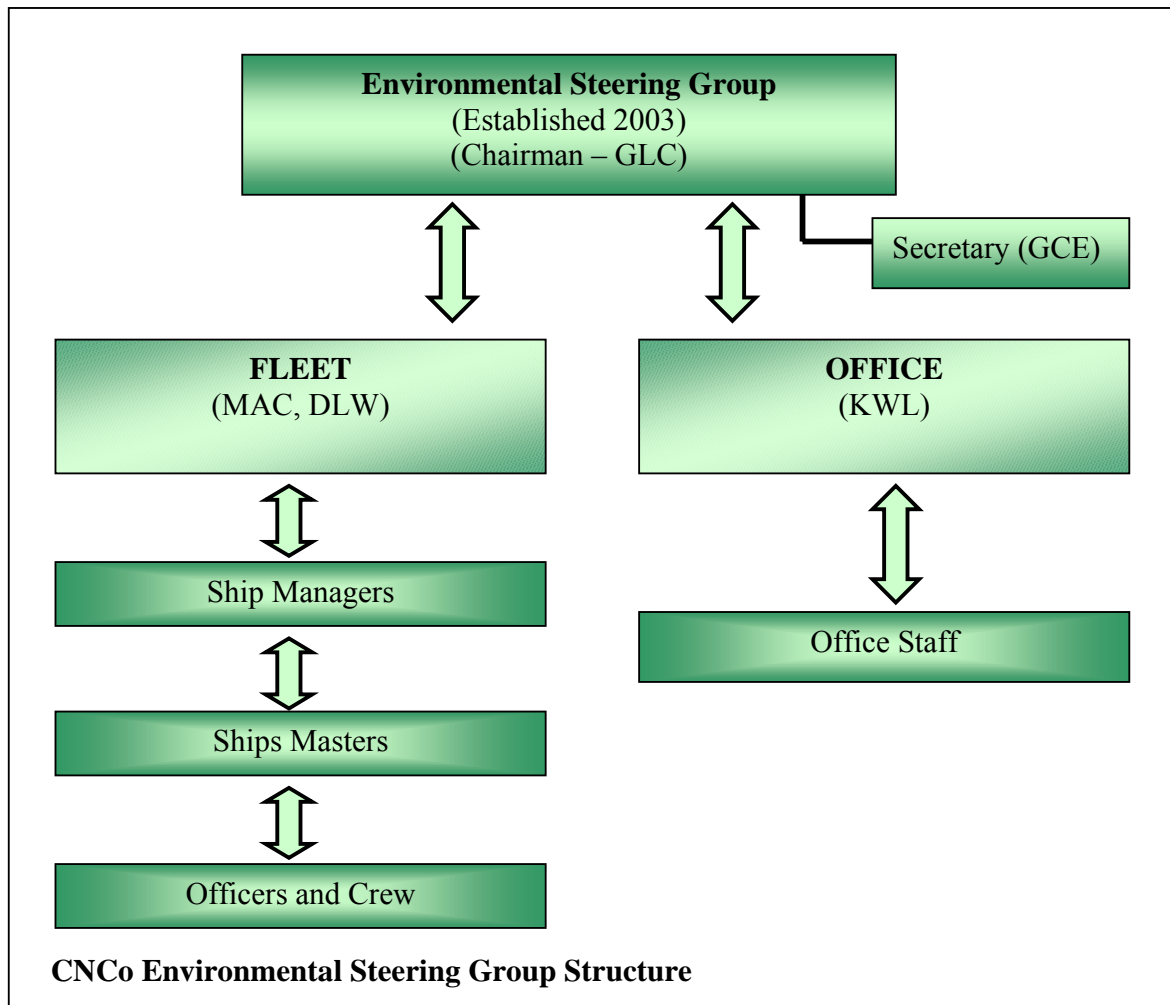
Geoff Cundle

Managing Director

4. CNCO ENVIRONMENTAL MANAGEMENT ORGANISATION

A CNCo Environmental Steering Group has been established, comprising of:

- Mr Geoff Cundle (GLC) -Managing Director (Chairman)
- Mr Martin Cresswell (MAC) -General Manager Fleet (Fleet Representative)
- Capt David Watkins (DLW) -Fleet Safety Manager (Fleet Representative)
- Mr Patrick Lee (KWL) -Senior Ship Manager (Office representative)
- Mr George Edmunds (GCE) -Assistant to Managing Director (Secretary).



Currently the group meets four times a year, with the purpose of raising awareness of environmental issues, to ensure policies are implemented systematically and to provide a forum for suggestions.

CNCo's environmental procedures are embedded through various levels of the company. Ultimate responsibility for environmental policy lies with Senior Management.

5. ENVIRONMENTAL ACCOUNTING

Environmental accounting helps CNCo to grasp the costs of environmental protection activities and their economic and environmental benefits.

Table charting investment and expenses for environmental protection measures to date

Measure	Benefit	Investment (USD '000)	Expense (USD '000)
Repainting Ship with TBT-free paint (pg 9)	Marine Environment		3,550
Landing waste products	Marine Environment		20
Office related initiatives	Conserving electricity, reducing paper use	29 ¹	

1 Cost of implementing LCD screens and new photocopiers

Environmental accounting covers CNCo head office and its owned fleet.

6. MARINE ENVIRONMENTAL PROTECTION

Introduction

Pollution of the marine environment from ships may originate from a variety of sources, including accidental and operational pollution. Accidental pollution may result from the loss of cargo or fuel after a grounding or collision and from minor accidents on board such as a hose breaking or a tank overflowing. Operational pollution results from the discharge of shipboard generated wastes such as garbage, sewage, dirty bilge water and tank washings as well as from engine exhaust and tank venting emissions.

Measures to prevent marine pollution and to improve maritime safety are addressed by the International Maritime Organization (IMO), a United Nations specialised agency dealing with maritime affairs. The control of pollution of the seas by ships is addressed in the International Convention for the Prevention of Pollution from Ships (MARPOL).

The MARPOL convention lays down requirements for construction (i.e., double hulls on oil and chemical tankers), inspection (including enhanced surveys on existing tankers), equipment (i.e., oily/water separators), record keeping (i.e., Oil Record Books, Cargo Record Books) and in-port procedures (i.e., receipts for the discharge of wastes to shore reception facilities, tank cleaning in port). It further includes six technical annexes, which deal with pollution from oil, chemicals, packaged goods, garbage, sewage and air emissions.

Anti-Fouling paints

The fouling of ships' hulls, whether by barnacles and seaweed or by slime-creating bacteria, is a major problem for shipping worldwide. It has been estimated, for example, that fouling of hulls can create such turbulence as a ship moves through the water that fuel consumption is increased by as much as 30 percent.

TBT Paint Replacement Schedule and Costs

Class of Vessel	Cost per Vessel (USD)	Percentage of total Dry Docking cost
Miho	100,000	12.5%
Challenger	250,000	31.3%
Indotrans	350,000	21.9%
Erradale	250,000	26.3%
Erawan	300,000	30.0%

2004 Expenditure	USD	Percentage of fleet TBT free
4 x Indotrans	1,400,000	
1 x Erradale	250,000	
Total	1,650,000	26.3%
2005 Expenditure		
4 x Miho	400,000	
6 x Challenger	1,500,000	
Total	1,900,000	77.8%
2006 Expenditure		
1 x Miho	100,000	
2 x Challenger	500,000	
1 x Erawan	300,000	
Total	900,000	100%

Fleet Size
19

Fleet size
18

Anti-fouling paints are used to coat the bottoms of ships to prevent sea life such as algae and molluscs attaching themselves to the hull. The International Maritime Organisation (IMO) Convention defines "anti-fouling systems" as "a coating, paint, surface treatment, surface or device that is used on a ship to control or prevent attachment of unwanted organisms".

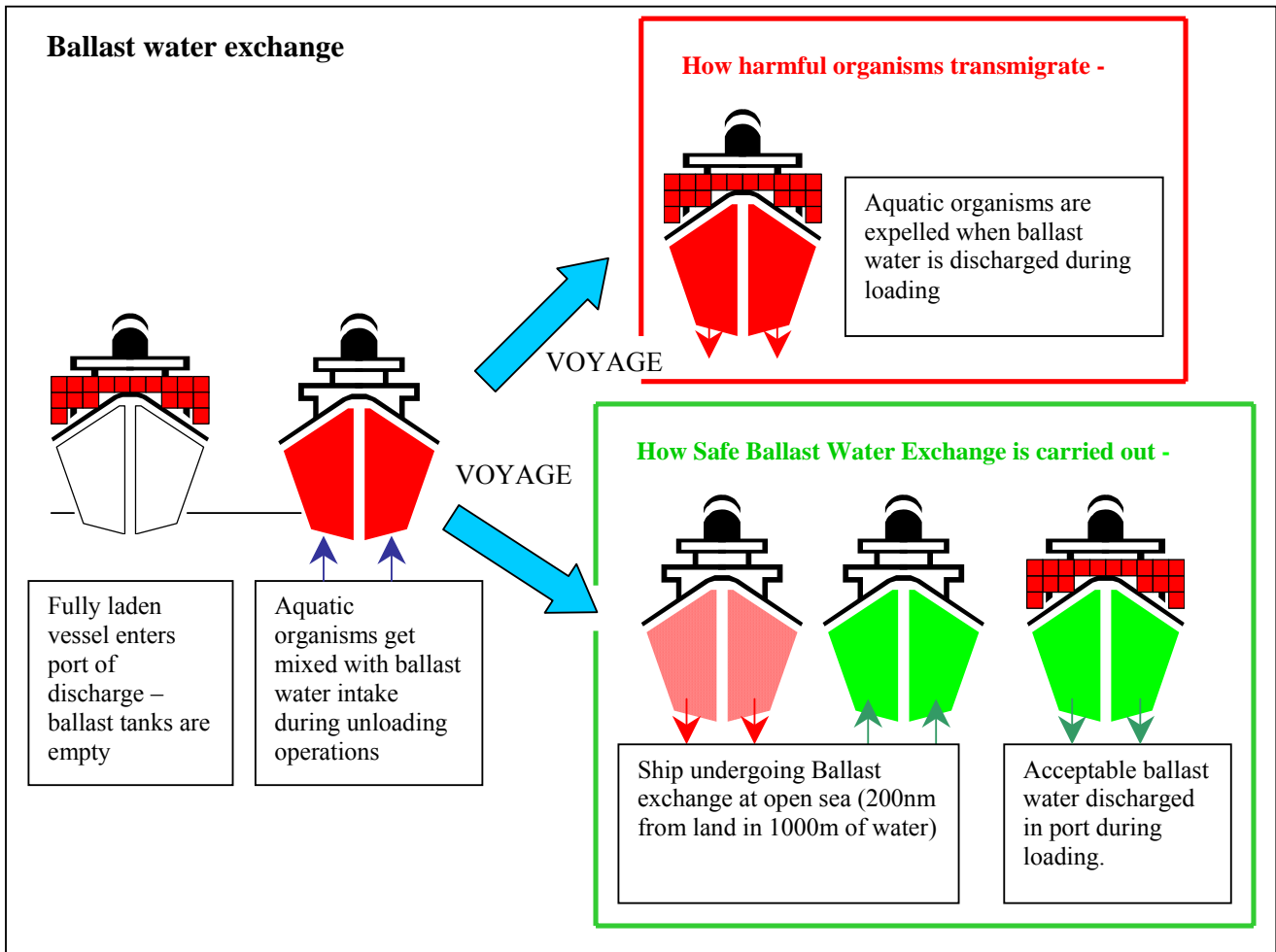
One of the most effective anti-fouling paints, developed in the 1960s, contains tributyltin (TBT). Tributyltin (TBT) is a tin-based organic compound, which has been proven harmful to marine organisms. The General Assembly of the IMO decided in 1998 that the environment committee (MEPC) should work on a global legal instrument to ban TBT. IMO has banned the application of TBT as an anti-fouling agent on ships since January 1, 2003 and prohibits the presence of TBT as an antifouling agent after January 1, 2008.

CNCo has adopted a policy to replace all TBT anti-fouling paints at dry-docking with tin-free (TF) copper-based paints in readiness for 2008 IMO compliance. At the end of 2005, three quarters of CNCo vessels had been coated with Tin-free paint, with 100% expected to be completed by the end of 2006, well in advance of the 2008

deadline.

Ballast Water Management

To ensure safe operation of a vessel, it is necessary to stabilise the vessel and enhance the efficiency of the propeller by allowing seawater into the ballast tanks. This ballast seawater is taken on or discharged in amounts corresponding to the mass of cargo loaded or unloaded in port, and is adjusted for the vessel's trim and draft. However, ballast water discharged in port may contain alien marine organisms, transported from another marine environment, which can have adverse effects on the local ecosystem.

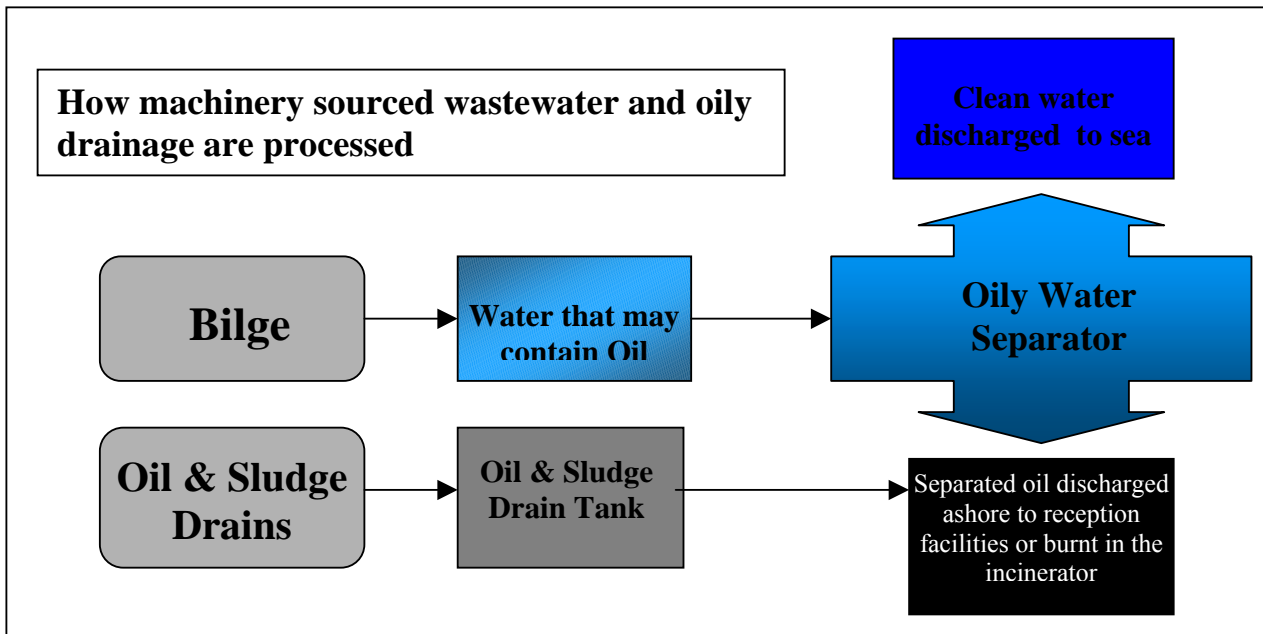


The International Maritime Organisation (IMO) adopted guidelines to prevent the invasion of foreign aquatic organism at unloading destinations in 1997. More recently the International Convention for the Control and Management of Ships' Ballast water and Sediments was adopted at a diplomatic conference held at IMO's headquarters in London in February 2004. This treaty obligates vessels to treat ballast water to be released with a device meeting a specified standard from 2016 onwards.

CNCo has adopted a policy where ballast water is only exchanged at deep-sea to prevent transmigration of species, this is in accordance with the guidelines mentioned above. In addition, all CNCo vessels are provided with a ballast plan, a measure that is aimed at ensuring that CNCo is ahead of expected mandatory regulations.

Oily Wastewater

Wastewater that contains oil accumulates on board a vessel as a result of open maintenance, leaks in pipes, machinery etc. IMO regulations require that in the processing of wastewater, water containing oil must first be separated into oil and water, and then only the water may be discharged from the vessel (in designated waste water disposal areas).



CNCo has adopted a policy where all vessels are fitted with oily water separators including spare monitor alarms to ensure no oil is discharged over the side. Furthermore, it is company policy to dismiss any crewmember found to be disobeying IMO regulations regarding the processing of wastewater.

Shipboard Waste

Vessels are not only means of cargo transportation, but are the constant living areas for crew. Consequently, apart from waste resulting from dunnage used in day-to-day cargo operations, a wide range of garbage including paper, food, bottles, cans and other household waste is produced.

CNCo vessels separate garbage into various categories for recycling and disposal. A waste management (or general EHS) officer is appointed for each vessel. Food scraps and other non-harmful waste is ground up and disposed of in designated areas. Plastics are held on board the vessel until arrival in port for discharge and disposal/recycling. All disposals are recorded in a “Garbage Record Book” and input into the AMOS monthly data report (see Data Reporting from Vessels section).

Emissions

Regulations for the Prevention of Air Pollution from Ships were adopted in the 1997 Protocol to MARPOL 73/78 and are included in Annex VI of the Convention; they came into effect on 19th May 2005.

MARPOL Annex VI sets limits on Sulphur oxide (SO_x) and Nitrogen oxide (NO_x) emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances. The annex includes a global cap of 4.5% m/m on the sulphur content of fuel oil and calls on IMO to monitor the worldwide average sulphur content of fuel after the Protocol came into force.


Annex VI contains provisions allowing for special SO_x Emission Control Areas (SECAS) to be established with more stringent controls on sulphur emissions. In these areas, the sulphur content of fuel oil used onboard ships must not exceed 1.5% m/m. Alternatively, ships must fit an exhaust gas cleaning system or use any other technological method to limit SO_x emissions. The Baltic Sea Area is designated as a SO_x Emission Control area in the Protocol.

CNCo ensures that Sulphur content on all fuel oil used is below 4.5% m/m. In 2005 the average sulphur content of fuel used by CNCo vessels was 2.93%. In addition CNCo utilises fuel saving measures to help reduce emissions. Measures include:

- The reduction of cruising speed where appropriate
- Weather routing
- Regular maintenance of the main engine, generators and boilers
- Hull and propeller cleaning
- Gritblasting ship bottoms in dry dock
- Use of antifouling paints

7. DATA REPORTING FROM VESSELS

Since January 2005, CNCo has been producing a monthly report detailing the various environmental items in layout format and maintained in vessel's AMOS maintenance system. A screen shot of the system can be seen below.

THE CHINA NAVIGATION COMPANY


MONTHLY SHIPS ENVIRONMENTAL REPORT

Vessels Details		Report for					
Name	<input type="text"/>	Call Sign	<input type="text"/>	Month	<input type="text"/>	Approximate Trading Area ⁽¹⁾	<input type="text"/>
Type	<input type="text"/>	IMO No	<input type="text"/>	Year	<input type="text"/>		

Item	Amount Discharged (m ³)		Incinerated (m ³)	Type	Used	kg	Fuel, Cargo & Ballast		
	To Sea in accordance with MARPOL	To Shore					Onboard	Ballast Water exchanged	m ³
Category 2	<input type="text"/>	<input type="text"/>	<input type="text"/>	1	<input type="text"/>	x <input type="text"/>	Cargo loaded	<input type="text"/>	tonnes
Category 3	<input type="text"/>	<input type="text"/>	<input type="text"/>	2	<input type="text"/>	x <input type="text"/>	Diesel Oil consumption	<input type="text"/>	tonnes
Category 4	<input type="text"/>	<input type="text"/>	<input type="text"/>	3	<input type="text"/>	x <input type="text"/>	Fuel Oil consumption	<input type="text"/>	tonnes
Category 5	<input type="text"/>	<input type="text"/>	<input type="text"/>	Cylinders returned ashore			Sulphur content	<input type="text"/>	% ⁽²⁾
Category 6	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/> x Exchange Cylinders <input type="checkbox"/> x Disposable Cylinders					
Bilge Water	<input type="text"/>	<input type="text"/>	<input type="text"/>						
	Category 1		<input type="text"/>						
	Waste Oil		<input type="text"/>						
	Lead Acid Batteries		<input type="text"/>						
	Drums		<input type="text"/>						
		Total Cost of landing Waste Products (USD)		<input type="text"/>					

Comments
 Purchase Order Numbers, Special Areas, availability of reception facilities etc.

<p>Garbage categories</p> <p>Cat.1 Plastic</p> <p>Cat.2 Floating dunnage, lining, or packing materials</p> <p>Cat.3 Ground paper products, rags, glass, metal, bottles, crockery, etc</p> <p>Cat.4 Paper products, rags, glass, metal, bottles, crockery etc</p> <p>Cat.5 Food waste</p> <p>Cat.6 Incinerator ash except from plastic products which may contain toxic or heavy metal residues</p>	<p>Notes:</p> <p>(1) Brief summary - PNG to New Zealand, US East Coast, Australis Pacific Islands</p> <p>(2) Sulphur content - If more than one bunker supply, then average %</p> <p>(3) Bilge water via Oil Water Separator</p> <p>(4) Includes paint, chemical and oil drums</p>
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Monthly Environmental report – completed by each vessel

The responsibility for maintaining the report has been assigned to the 2nd Officer on each ship. Figures for the report are to be taken directly from the relevant logbooks on board to ensure accuracy and consistency of reporting throughout the fleet.

At the end of the year, figures and data are collated from all CNCo ships via the office AMOS system and compiled in this report. This forms the basis of CNCo's environmental reporting system and thereby establishes a database to track the company's environmental performance.

Breakdown of Waste Products consumption:

Classification	Items	Total Amount Discharged (m ³)		Incinerated (m ³)
		To Sea (in accordance to MARPOL)	To Shore	
Garbage	Plastic		447.3	
	Biodegradable paper and timber packing materials	56.4	199.1	55.9
	Ground biodegradable paper goods, rags, glass, metal, etc.	56	103.85	38.3
	Paper products, rags, glass, metal, bottles etc.	172.3	226.2	359.15
	Food Waste	312.1	71.6	90.3
	Incinerator Ash (excl. plastic which may containing toxic/heavy metal residues)	19.05	22.9	
Wastewater	Bilge Water	6659.2	88.6	
	Waste Oil & Water		1725.6	1190.4
Others	Lead Acid Batteries		61 Pieces	
	Drums (Oil/paint/chemical)		100 Pieces	
COST	Cost of landing waste products		US\$ 19,765.2	

Refrigerant Use

Type	Total Amount
R22	897.3kg
R12	20kg
R134a	102kg

Fuel, Cargo and Ballast consumption

Type	Total Amount	Amount /cargo dwt*
Ballast Water exchanged	1,116,731m ³	0.24 m ³
Cargo Loaded	4,656,632 tonnes	
Fuel Oil consumption	132,508 tonnes	0.22 tonnes
Fleet Diesel Oil consumption	2552 tonnes	0.0006 tonnes
Erawan Diesel Oil consumption	822 tonnes	0.0013 tonnes
Sulphur content (averaged)	2.93%	

Fuel Consumption

Month	Total HFO Consumption (mt)	Total DO Consumption (mt)
January	9891.40	206.10
February	9873.10	173.60
March	10994.10	258.30
April	11693.70	143.80
May	11293.80	250.30
June	11757.70	137.60
July	11944.10	159.10
August	11031.40	103.40
September	12235.40	461.50
October	11216.40	144.40
November	12471.70	133.20
December	9204.10	103.50
Total	133606.9	2274.8

8. OFFICE ENVIRONMENTAL INITIATIVES

A number of initiatives have been introduced at head office to mitigate the environmental impact of office activities.

Paper Consumption and Recycling

The following measures have been adopted to reduce paper use:

- (i) Restrict copying to an absolute minimum
- (ii) Encouraging double sided copying/printing
- (iii) Utilising Email and attachments as alternatives to paper documentation
- (iv) Reusing envelopes

Every desk has a dedicated paper-recycling bin next to it.

Copy paper in the office

CNCo is currently using 80 gsm A4 copy paper, which meets International ISO 9001 standards, with no over bleaching, and is planning on implementing 100% Chlorine free paper. The current paper is within the environmental standards – with no over bleaching and with ISO 9001 certification

Current paper usage is roughly 800 reams a year, approximating to HKD 14,240 expenditure.

Using current paper:	HKD 14,240	
Using 100% Chlorine free paper:	HKD 16,960	+2,720

In 2005 CNCo photocopiers were replaced and the use of environmentally friendly toner is being investigated.

Electricity Consumption

The following measures have been adopted to reduce power consumption:

- (i) Encouraging employees to switch off lights after using meeting rooms, on lunch breaks etc.
- (ii) Shifting to LCD monitors for computers as these use less power than conventional monitors.
- (iii) Adjusting computer settings so screens switch to economy mode after a period of non-use.
- (iv) Encouraging employees to be sure to shut down electrical equipment before they leave the office.

Ink Consumption

Recycled printer cartridges have had two unsuccessful trial periods. Print quality together with technical problems occurred too frequently for a successful implementation.

9. CNCo's ENVIRONMENTAL INITIATIVES 2006

CNCo plans to build on the advances made in 2005 by exploring a number of environmental initiatives over the coming year. Below is a description of the major initiatives for 2006.

Swire Group – Carbon in the Ocean Partnership and Experiment

The Swire Group Charitable Trust has agreed to donate £100,000 to sponsor a research project being carried out by the UK's National Oceanographic Centre, which is based at Southampton University. The research aims to establish the role that the ocean plays in reducing the rate of global warming by absorbing Carbon Dioxide (CO₂). Data is needed to determine how rapidly surface water is replaced from the depths with water that has not been exposed to current CO₂ levels, and how effective the life and death cycle of plankton is at removing CO₂ by photosynthesis into materials which sink into the depths taking carbon with it. In June, instruments will be installed on one of CNCo's Indotrans ships to monitor the exchange of CO₂ between the atmosphere and the ocean. In addition to housing the equipment CNCo staff will be responsible for the day-to-day maintenance and upkeep of the equipment. It is hoped that the data gathered will provide an insight into the levels of Carbon absorption in the Indian Ocean.

Studies into the reduction of fuel and lube oil consumption

CNCo is currently carrying out a number of studies to reduce the consumption of fuel and lube oil on its owned fleet. Fuel oil savings are being made by improvements in vessel route planning using WNI Ocean Routes. Improving the routing of ships will reduce fuel consumed and will thereby reduce lube oil consumption, as well as engines burn lubs.

CNCo is also looking at methods to better control the purification of and filtering of lube oil, which will ensure it lasts longer.

Furthermore, the company is initiating a study into the use of wake ducts and rudder bulbs on the Indotrans and Challenger ships to see if they can be used to improve the propeller efficiency and save fuel.

Study into reducing Sulphur Dioxide (SO_x) emissions

The average SO_x levels in fuel used by CNCo vessels in 2005 was 2.93%, well below the 4.5% legislated in MARPOL Annex VI. The CNCo Environmental Steering Committee has initiated a study to limit SO_x levels in bunker fuel bought for the fleet to be completed in 2006.

Data Reporting by Vessels

2006 will see a major improvement in the quality of information available from ship's monthly environmental reports. In response to a proposition recently put forward by Intertanko, the lead technical spokegroup of the tanker industry, CNCo ship management has changed the functionality of the AMOS maintenance system to index ships' air emissions. By using a simple calculation pre-input into the AMOS system, operational indications will be provided to assist CNCo with decision-making in order to achieve more environmentally friendly transportation of goods.

Replacement of Machinery

CNCo is currently addressing the feasibility of replacing the oily water separators across the fleet. Advances have been made in the manufacture of oily water separators making them more reliable and thereby reducing the chances of environmental damage being caused by oily discharges. In addition, CNCo is currently examining the use of boil-off tanks on all vessels.

Office Lighting

CNCo is in the process of changing all office lights from T4 type to T5 type. T5 lights are 30% more efficient than T4 lights. The conversion cost will be HK\$37,000.