



Stockholm 2005

ATCM XXVIII

XXVIII ANTARCTIC TREATY
CONSULTATIVE MEETING
XXVIII TRAITÉ SUR L'ANTARCTIQUE
REUNION CONSULTATIVE
XXVIII TRATADO ANTÁRTICO
REUNION CONSULTIVA
XXVIII ДОГОВОР ОБ АНТАРКТИКЕ
КОНСУЛЬТАТИВНОЕ СОВЕЩАНИЕ

IP 67

Rev1

Agenda Item: ATCM 9, CEP 4 f

Presented by: COMNAP, IAATO

Original English
Language:

The Use of Heavy Fuel Oil in Antarctic Waters

Information Paper on The Use of Heavy Fuel Oil in Antarctic Waters

Submitted by:

The Council of Managers of National Antarctic Programs (COMNAP) and
The International Association of Antarctica Tour Operators (IAATO)

BACKGROUND

1. At ATCM XXVII (2004), Norway referred to the discussions on shipping guidelines, noting that there were two issues which merited further consideration at the next ATCM. The first concerned the use of heavy fuel oil in ships operating in the Treaty Area. In such cold waters a spill of heavy fuel would have a much more significant environmental impact than lighter ship fuels such as gas oil. Norway therefore proposed that the Treaty Parties should consider a prohibition on the use of heavy oils south of 60 degrees South.
2. ATCM XXVII agreed that this issue warranted further consideration and COMNAP, in consultation with IAATO, was asked to report to ATCM on the present and planned use of heavy fuel in ships operating in Antarctic waters by national operators and by the tourism industry.

USE OF HEAVY FUEL OILS IN SHIPS OPERATING IN ANTARCTIC WATERS

3. The Council of Managers of National Antarctic Programs (COMNAP) and the International Association of Antarctica Tour Operators (IAATO) conducted a survey on the fuel carried in the Antarctic Treaty area on ships currently operated or chartered by their members. This represents the bulk of the fleet operating in Antarctic waters with a total of 72 ships. Only 5 other ships are known to operate in the area, excluding private yachts which in any case are not expected to carry heavy fuels.
4. The survey captured fuel information for 50 of the 72 ships, that is 70% of the combined COMNAP-IAATO fleet and the information collected is deemed representative of the current state of practices for that fleet. No plans to change these practices were reported.
5. Although there can often be confusion in the way a range of intermediate fuels can be loosely described as “heavy”, MARPOL Regulation 13H which came into force on 5 April 2005 provides a clear definition of “Heavy Grade Oil” (HGO). Under that definition, all fuels heavier than Intermediate Fuel Oil 180 (IFO-180) are Heavy Grade Oils.

6. None of the 50 ships surveyed carries Heavy Grade Oil in the Antarctic Treaty Area. Of the 50 ships:

- 6 ships (12%) carry Intermediate Fuel Oil IFO-180
- 2 ships (4%) carry lighter Intermediate Fuel Oil IFO-040
- the remaining 42 ships (84%) carry a range of lighter fuels such as Diesel, Marine Gas Oil (MGO) or Marine Diesel Oil (MDO).

7. The sole ship carrying Heavy Grade Oil in the Treaty area carries IFO-380 fuel. This is a large (around 44 500 tons) vessel with a cruise only operation. It sails under UK flag and is class +100 A1 +LMC. It operates in Antarctic waters later in the season for a very short time period, and stays entirely out of ice.

8. It can be noted than two large cruise ship that usually use IFO-380 for their operation voluntarily restrict themselves to carrying and running on lighter fuels when in the Antarctic Treaty area.

9. Of the 5 ships known to operate in the Treaty area outside of the combined COMNAP-IAATO fleet we understand that:

- 1 ship uses Heavy Grade Oil (HGO) in the form of IFO-380;
- 1 ship uses IFO-180;
- 1 ship uses Marine Diesel Oil (MDO) and
- We have no fuel information for the last two ships.

The ship using Heavy Grade Oil is a large (around 30,000 tons) vessel registered in Majuro (Marshall Islands).

10. More, technical and regulatory information on the issue of heavy fuel use in Antarctic waters can be found in the technical note prepared by COMNAP's Working Group on Ship Operations (SHIPOPS) in collaboration with IAATO and provided as Annex 1.

CONCLUSIONS

11. The combined COMNAP-IAATO fleet of 72 ships makes the bulk of the ships operating in the Antarctic Treaty area, with only 5 other ships known to operate in the area, excluding private yachts which in any case are not expected to carry heavy fuels.

12. Information was collected on 50 of the 72 ships, or 70% of the combined COMNAP-IAATO fleet, and is deemed representative of both the current and planned state of practices for that fleet. None of the 50 ships carries Heavy Grade Oil in the Antarctic Treaty Area.

13. Fuel information was available for 3 of the 5 other ships known to operate in the Antarctic Treaty area outside of the combined COMNAP-IAATO fleet. One of those 3 ships, registered in the Marshall Islands, is understood to carry Heavy Grade Oil in the Antarctic Treaty Area.

Annexes

Annex 1: Technical note on fuel oil used by ships in the Antarctic Treaty area - operational and regulatory aspects (Revised 07 June 2005)

Annex 1

Technical note on
FUEL OIL USED BY SHIPS IN THE ANTARCTIC TREATY AREA
OPERATIONAL AND REGULATORY ASPECTS

Prepared by the Working Group on Ship Operations (SHIPOPS)
of the Council of Managers of National Antarctic Programs (COMNAP)
in collaboration with
the International Association of Antarctica Tour Operators (IAATO).

Revised 07 June 2005

INTRODUCTION

The increasing number of ships carrying fuel oil in the world oceans does increase the risk of marine pollution accidents. This does raise questions about the measures that need to be taken to reduce the risks of an oil spill occurring. Much of this is addressed in various international agreements such as SOLAS and MARPOL. This is also addressed in the *Guidelines for Ships Operating in Arctic and Antarctic Ice Covered Waters* adopted in 2004 by XXVII ATCM and forwarded to IMO for consideration.

These agreements are dealing with the limitation of intentional operational pollution (eg through practices such as degassing) as well as with the prevention of accidental oil spills, essentially through measures intended to improve safety and integrity of ships so as to reduce the likelihood of a spill actually occurring as well as limit the quantity of any oil spilled.

A separate issue is that of the nature of the oil that could be spilled. To understand the risks of pollution from an accidental oil spill and the associated ecological impacts, consideration must be given to the type of fuel carried on board the ship suffering the accident.

Special consideration is given to accidents that could affect protected areas with outstanding natural environmental values and rich fauna such as the Antarctic. At ATCM XXVII, Norway noted that in the cold Antarctic waters *a spill of heavy fuel would have a much more significant environmental impact than lighter ship fuels such as gas oil and proposed that the Treaty Parties should consider a prohibition on the use of heavy oils south of 60 degrees South.*

ATCM XXVII agreed that this issue warranted further consideration and COMNAP, in consultation with IAATO, was asked to report to ATCM on the present and planned use of heavy fuel in ships operating in Antarctic waters by national operators and by the tourism industry.

In response to that request, COMNAP's Working Group on Ship Operations (SHIPOPS) collaborated with IAATO to conduct a survey on the fuel types carried on ships in the Antarctic Treaty area and also a preliminary review of a number of technical and regulatory issues related to the use of heavy fuel oil in ships. The present note provides an outline report of this work, including the results of the survey.

GENERAL CONSIDERATIONS – CRUDE OIL AND SHIP FUELS

Petroleum (crude oil) is a thick, flammable, black-to-yellow mixture of solid, liquid and gaseous hydrocarbons the remains of biomass matter accumulated over millions or billions of years below the Earth's surface.

Crude oils vary widely in appearance and viscosity between extraction fields. While all crude oils are essentially hydrocarbons their differences in properties, especially the variations in molecular structure, dictate how easy they are to extract, transport and refine. This also influences their suitability for certain applications and the quality of derived products.

Crude oils are roughly classified into three groups, according to the nature of hydrocarbons they contain.

- **Paraffin-Base Crude Oils:** These contain higher molecular weight paraffin, which are solid at room temperatures, but with little or no asphalt (bituminous) matter. They can produce high-grade lubricating oil.
- **Asphalt-Base Crude Oils:** Contain large proportions of asphalted matter, and little or no paraffin. Some are predominantly naphthenes yielding lubricating oils that are more sensitive to temperature changes than the paraffin-base crude products.
- **Mixed-base Crude Oils:** Between the two types above. Naphtenes and paraffins are present, as well as aromatic hydrocarbons. Most crudes fit into this category.

Heavy crude oil is very viscous and does not flow easily. The common characteristic properties are high specific density, low hydrogen to carbon ratios, high carbon residues, and high content of asphaltenes, heavy metals, sulphur and nitrogen. Heavy crude has a high boiling point and a high molecular weight containing over 60 carbon atoms in a molecule.

Another characteristic of heavy crude oils is their containing impurities that usually make them toxic. The impurities are usually free radicals attached to the large hydrocarbon molecules. The most common impurity is sulphur that is very corrosive and makes refining difficult. Sulphur is a danger in the drilling, transporting and refining processes being, in one of its gaseous forms, hydrogen sulphide - a deadly gas. The Carcinogenetic International Research Agency (IARC, Lyon) classified the heavy oils as elements with a potential cancer danger of 2B, as showing experimental evidence in laboratory animals, but not in humans.

Refining of crude oils is required to produce through distillation more useable derived products. It produces the more volatile gasoline and kerosene (aviation fuel) and the heavier gas oil and fuel oil.

One barrel of crude oil contains 42 gallons. The typical barrel produces through refining a total of 44.6 gallons of derived products as detailed in the following table (note the 2.6 gallon “processing gain”):

Product	Gallons
Gasoline	19.4

Distillate Fuel Oil (home heating oil and diesel fuel)	9.7
Kerosene – Jet fuel	4.3
Coke	2
Residual, Heavy Fuel Oil (also commonly known as Fuel Oil No. 6 or Bunker C). What is left at the end of the refinery process.	1.9
Liquefied Refinery Gases	1.9
Still Gas	1.8
Asphalt and Road Oil	1.4
Petrochemical Feedstocks	1.1
Lubricants	0.5
Kerosene	0.2
Other	0.4
Total :	44.6

Residual, heavy fuel oil is the heavy residual fraction obtained in the refining process over the temperature of 330°C. It is also commonly known as “Bunker C” or “Fuel Oil No6” although, as a residual product, its characteristics will actually vary depending on which crude oil it is the residue of.

Most industrial fuels used in ships or power plants are essentially blends of residual fuel oil and lighter oil. Lighter blends will be obtained with higher proportions of lighter oil. To obtain each ‘standard’ grade of industrial fuel, the exact proportion of lighter oil will be adjusted depending on the exact nature of the residual oil used so as to conform to the exact specifications of that fuel grade.

The **International Standard Organization (ISO)**, in cooperation with marine and petroleum industry, prepared specifications to meet the requirements for marine fuels supplied world wide for use onboard ships. 19 well defined ISO categories or grades are available internationally with only a few of those frequently used by ships.

Heavy metals such as vanadium, sodium, silicon, aluminum, sulfur, and ash content are allowed in varying proportions. In general, the more heavy metals you have, the greater the

ash content is. Vanadium content is critical factor in diesel engines as it causes severe corrosion within the engine exhaust valve area. Too high a vanadium content can cause engine failure in a short period of time. Vanadium is found naturally in heavy fuels.

Sulfur content depends on how much distillate fuel the blend contains and on the nature of the originating crude oil. Sulfur content varies from an average of 2.5 to 4.3 percent by volume and is a major factor contributing to high Nitrogen oxides (NO_x) and Sulfur Dioxide in the exhaust stream.

But the major difference between the different grades of industrial fuels remains their “heaviness”, which is generally measured through either their gravity or their viscosity. A range of scales are used, such as (a) the American Petroleum Institute (API) Gravity index, (b) the density at 15°C or (c) the kinematics viscosity at 50°C expressed in square millimeters per second [mm²/s] or centistokes [cSt].

The industrial names and corresponding ISO denominations for the four grades most commonly used on ships are, from the lighter to the heavier (and in general in decreasing order of price):

(Distillate marine fuels)

- MGO (Marine Gas Oil) or ISO grade DMA,
- MDO (Marine Diesel Oil - a blend of gas oil and heavy oil) or ISO grade DMB,

(“Intermediate Fuel Oil” bunker fuels)

- IFO-180 (Intermediate Fuel Oil 180) or ISO grade RME25 and
- IFO-380 (Intermediate Fuel Oil 380) or ISO grade RMG35.

In “IFO-XXX” the number XXX corresponds to the fuel’s kinematic viscosity at 50°C in centistokes while the ISO grade numbers 25 and 35 in RME25 and RMG35 correspond to the viscosity at 100°C.

WHAT IS A HEAVY FUEL OIL?

There is some confusion in the way fuels can be commonly described as “light” or “heavy”. For example the entire range of Intermediate Fuel Oils (IFOs) can often be described as “heavy”. However MARPOL Regulation 13H which came into force on 5 April 2005 provides a clear definition of “Heavy Grade Oils” (HGOs) under which any of the following is a Heavy Grade Oil:

- a) crude oils having a density at 15°C higher than 900 kg/m³;
- b) fuel oils having either a density at 15°C higher than 900 kg/ m³ or a kinematic viscosity at 50°C higher than 180 mm²/s;

- c) bitumen, tar and their emulsions.

Under this definition, all IFOs with a number above 180 are Heavy Grade Oils and in the four grades of fuels commonly used on ships, IFO-380 (RMG35) must be considered a Heavy Grade Oil (HGO).

It is also in line with the European Union's deliberations regarding the accelerated phasing in of double hulled tankers to minimize pollution to the marine environment, which resulted in the proposal that

Heavy grades of oil (should) mean:

- a) *crude oils with a density at 15° C of over 900 kg/m³ (corresponding to an API grade of less than 25.7);*
- b) *fuel oils with a density at 15° C of over 900 kg/m³ or a kinematic viscosity at 50°C of over 180 mm²/s (corresponding to a kinematic viscosity of over 180cSt);*
- c) *bitumen and tar and emulsions thereof.*

(Amendment 10; ARTICLE 1, POINT 3; article 3, point 14 (regulation (EC) No 417/2002))

RISKS AND PREVENTION OF OIL POLLUTION FROM SHIPS.

In 1967 tanker 'Torrey Canyon' ran aground while entering the English Channel and spilled her entire cargo of 120 000 Tons of crude oil into the sea. This resulted in the biggest oil pollution incident ever recorded up to that time. The incident raised questions about measures then in place to prevent oil pollutions from ships and also exposed deficiencies in the existing system for providing compensation following accidents at sea.

Other similar disasters followed, mainly in coastal areas bordering heavily used maritime corridors. This included oil spills from the accidents of 'Urquiola' (1976): 100 000 Tons in La Coruña, Spain; 'Amoco Cadiz' (1978): 223 000 Tons in Bretagne, France; 'Exxon Valdez' (1989): 40 000 Tons in Prince William Sound, Alaska; 'Aegean Sea' (1992): 15 000 Tons in La Coruña, Spain and 'Erika' (1999): 10 000 Tons in Bretagne, France. More recently, in November 2002, the oil tanker 'Prestige', laden with 77 000 tonnes of heavy fuel oil, broke in two off the coast of Galicia (Spain) spilling an unknown but substantial quantity of its cargo. The oil from the Prestige affected the Atlantic coast from Vigo in Spain to Brest in France, as well as causing intermittent and light contamination on the French and English coasts of the English Channel as far as the Dover Strait. Approximately 1 900 km of shoreline was affected in Spain and France. All these accidents affected areas of outstanding environmental value and rich fauna.

Just after the 'Torrey Canyon' ran aground, The International Maritime Organization (IMO) called for an extraordinary conference of its Council, which drew up a plan of action in the technical and legal aspects of the "Torrey Canyon" incident. It decided in 1969 to convene an

international conference in 1973 in order to prepare a suitable international agreement for placing restraints on the contamination of the sea, land and air by ships.

Meanwhile IMO adopted further amendments to the 1954 International Convention for the Prevention of Pollution of the Sea by Oil (**OILPOL 1954**) to give additional protection to the Great Barrier Reef of Australia and to limit the size of tanks on oil tankers as a means of minimizing the quantity of oil that could spill out in the event of collision or stranding.

MARPOL 73/78 ANNEX I.

An international conference, in 1973, adopted the '*International Convention for the Prevention of Pollution from Ships*' (MARPOL) and, considering that operational pollution was the bigger threat of ships at sea, decided to incorporate most of OILPOL 1954 and its amendments into MARPOL's Annex I (*The risks and prevention measurements of ships oil International Convention pollutions*). Other annexes covered the prevention measurements for chemicals, harmful substances, sewage, garbage and air pollution and two protocols dealt with reports on incidents involving harmful substances and arbitration.

A special feature of the 1973 MARPOL Convention was the concept of special areas considered so vulnerable to pollution by oil that discharges within them was completely prohibited. These areas were identified as the Mediterranean, Black, Baltic, Red seas and the Gulf area.

In response to tanker accidents in 1976-77 IMO held in February 1978 a conference on tanker safety and pollution prevention. The conference adopted measures affecting tanker design and operations which were incorporated into both the Protocol of 1978 relating to the 1974 '*Convention on the Safety of Life at Sea*' (SOLAS), and the Protocol of 1978 relating to the 1973 *International Convention for the Prevention of Pollution for Ships* (MARPOL).

As the 1973 MARPOL Convention had not yet entered into force, the 1978 MARPOL Protocol absorbed the parent convention in a combined instrument '*The International Convention for the Prevention of Marine Pollution from Ships 1973, as modified by the Protocol of 1978*' (MARPOL73/78) that entered into force in October 1983.

This Convention includes regulations aimed at preventing and minimising pollution from ships – both accidental pollution and that from routine operations – and currently includes six technical annexes. Annex I is "Regulations for the Prevention of Pollution by Oil".

NEW REQUIREMENTS UNDER MARPOL

A number of amendments to MARPOL have progressively introduced more stringent requirements, especially for tankers. It must be noted that the 1997 Amendment added the Antarctic area to the list of “special areas” defined in MARPOL.

The **1992 (Annex 1) amendments to MARPOL 73/78** that entered into force on 6 July 1993 dealt with pollution by oil and brought in the double hull requirements for tankers, applicable to ships ordered after July 1993 and delivered after July 1996.

Regulation 13 F requires all new tankers of 5 000 dwt and above to be fitted with double hulls separated by a space of up to 2 metres. As an alternative, tankers may incorporate the mid-deck concept under which the pressure within the cargo tank does not exceed the external hydrostatic water pressure.

The amendments also considerably reduced the amount of oil which can be discharged into the sea. Originally tankers were permitted to discharge oil or oily mixtures at the rate of 60 litres per nautical mile. The amendment reduced this to 30 litres per mile. For non-tankers the permitted content of the effluent is cut from 100 parts per million to 15 parts per million.

Regulation 13 G applies to existing crude oil tankers of 20 000 dwt and above, that are 25 years old and were not constructed according the 1978 Protocol to MARPOL 1973/78, have to be fitted with double sides and double bottom. Tankers built according to protocol are exempt until they reach the age of 30 years.

The **1997 amendment**, in force from February 1999, extend the special area to North Sea and its approaches and part of North East Atlantic immediately to the West of Ireland. Other special areas already designated under Annex I includes: Mediterranean, Black and Red Sea areas, the Gulf of Aden area and the **Antarctic** area.

Annex VI Regulation for the prevention of air pollution from ships was adopted in the Conference held in September 1997 that enters into force on 19 May 2005. The annex set up the limits of sulphur oxide and nitrogen oxide (**produced** by Diesel engines) from ships and prohibited deliberate emissions of ozone depleting substances, which include Halons and ChloroFluoroCarbons (CFCs) and prohibited new installations containing ozone depleting substances.

The 1999 amendment to **regulation 13 G of Annex I** makes existing oil tankers between 20 000 and 30 000 dwt, carrying persistent product oil, **including heavy diesel and fuel oil** to be subject to the same construction requirements as crude oil tankers. The aim of the amendment is to address concerns that **oil pollution incidents involving persistent oil are as severe as those involving crude oil.**

The **2001 amendments** that entered into force in September 2002 brought a **new time table for accelerating the phase out of single hull oil tankers**. The time table will see most of single-hulls oil tankers eliminated by **2015 or earlier**.

Although the phase-out timetable sets 2015 as the principal cut-off date for all single hull tankers, the flag state administration may allow for some newer single hull ships registered in its country that conform to certain technical specifications to continue trading until the 25th anniversary of their delivery. However **any port state can deny entry of those single hull tankers which are allowed to operate until the 25th anniversary** to ports and offshore terminals, communicating their intention to IMO.

A new MARPOL **Regulation 13H** bans the carriage of **Heavy Grade Oil (HGO) in single-hull tankers** of 5 000 dwt and above after the date of entry into force of the regulation (April 2005) and in single-hull tankers of 600 dwt and above but less than 5 000 dwt, not later than the anniversary of their delivery date in 2008.

THE PROTOCOL ON ENVIRONMENTAL PROTECTION TO THE ANTARCTIC TREATY.

The *Madrid Protocol* recalls the designation of Antarctica as a Special Conservation Area defining a series of measures adopted, under the Antarctic Treaty System, and aimed to the comprehensive protection of the Antarctic environment and its dependent and associated ecosystems.

Consequently the activities in the Antarctic Treaty Area shall be planned and conducted so as to limit adverse impacts on the Antarctic environment and dependent and associated ecosystem, avoiding significant adverse effects on air and water quality and significant changes in the marine environment (*article 3*).

In the same sense article 10 indicates that Antarctic Treaty Consultative Meetings will define the general policy for the comprehensive protection of the Antarctic environment and dependent and associated ecosystems.

Annex IV of the Protocol on Environmental Protection to the Antarctic Treaty develops matters related to the Prevention of Marine Pollution including, among others, the following definitions:

- d) “noxious liquid substance” means any noxious liquid substance as defined in Annex II of MARPOL 73/78;

(e) “oil” means petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined oil products (other than petrochemicals which are subject to the provisions of Article 4);

(f) “oily mixture” means a mixture with any oil content;

Article 3, of this annex indicates that any discharge into the sea of oil or oily mixture shall be prohibited, except in cases permitted under Annex I of MARPOL 73/78. Ships shall discharge residues only outside the Antarctic Treaty Area, at reception facilities or as otherwise permitted under Annex I of MARPOL 73/78.

Article 10 indicates that in the design, construction, manning and equipment of ships engaged in or supporting Antarctic operations, each Party shall take into account the objectives of this Annex. As a preventive measure and in order to respond more effectively to marine pollution emergencies in the Antarctic Treaty area, the Parties, shall develop contingency plans for marine pollution response particularly ships carrying oil as cargo, and for oil spills (*article 12*).

The Parties also shall keep under continuous review the provisions of this Annex and other measures to prevent, reduce and respond to pollution of the Antarctic marine environment, including any amendments and new regulations adopted under MARPOL 73/78, with a view to achieving the objectives of this *Annex IV of the Protocol (Article 13)*.

GUIDELINES FOR SHIPS OPERATING IN ARCTIC AND ANTARCTIC ICE-COVERED WATERS.

IMO adopted in 2002 Guidelines for Ships Operating in Arctic Ice-Covered Waters (MSC/Circular 1056; MEPC Circular 399, 23 December 2002). It contains recommendatory provisions applicable to ships operating in Arctic ice-covered waters, additional to the mandatory and recommendatory provisions contained in existing IMO instruments such as SOLAS or MARPOL. These additional provisions were deemed necessary in order to take into account the climatic conditions of Arctic ice-covered waters and to meet appropriate standards of maritime safety and pollution prevention. As such, they aim to promote the safety of navigation and to prevent pollution for ship operations in these waters.

COMNAP’s Working Group on Ship Operations presented at XXVII ATCM a proposed amendment to these guidelines to make them applicable to both the Arctic and the Antarctic. These “Guidelines for Ships Operating in Arctic and Antarctic Ice-Covered Waters” were welcomed and endorsed by XXVII ATCM and also forwarded to IMO for its consideration.

SURVEY ON THE USE OF HEAVY FUEL IN THE ANTARCTIC TREATY AREA

COMNAP and IAATO conducted a survey on the fuel carried in the Antarctic Treaty area on ships currently operated or chartered by their members. This represents the bulk of the fleet operating in Antarctic waters with a total of 72 ships. Only 5 other ships are known to operate in the area, excluding private yachts which in any case are not expected to carry heavy fuels.

The survey captured fuel information for 50 of the 72 ships, that is 70% of the combined COMNAP-IAATO fleet and the information collected is deemed representative of the current state of practices for that fleet. No plans to change these practices were reported.

Although there can often be confusion in the way a range of intermediate fuels can be loosely described as “heavy”, MARPOL Regulation 13H which came into force on 5 April 2005 provides a clear definition of “Heavy Grade Oil” (HGO). Under that definition, all fuels heavier than Intermediate Fuel Oil 180 (IFO-180) are Heavy Grade Oils.

None of the 50 ships surveyed carries Heavy Grade Oil in the Antarctic Treaty Area. Of the 50 ships:

- 6 ships (12%) carry Intermediate Fuel Oil IFO-180;
- 2 ships (4%) carry lighter Intermediate Fuel Oil IFO-040 and
- the remaining 42 ships (84%) carry a range of lighter fuels such as Diesel, Marine Gas Oil (MGO) or Marine Diesel Oil (MDO).

It can be noted that two large cruise ships that usually use IFO-380 for their operation voluntarily restrict themselves to carrying and running on lighter fuels when in the Antarctic Treaty area.

Of the 5 ships known to operate in the Treaty area outside of the combined COMNAP-IAATO fleet we understand that:

- 1 ship uses Heavy Grade Oil (HGO) in the form of IFO-380;
- 1 ship uses IFO-180;
- 1 ship uses Marine Diesel Oil (MDO) and
- We have no fuel information for the last two ships.

The ship using Heavy Grade Oil is a large (around 30,000 tons) vessel registered in Majuro (Marshall Islands).

CONCLUSIONS

Operational pollution by heavy fuels is recognized as the biggest threat of ships at seas, addressing concern that oil pollution incidents involving persistent oil, are as severe as those involving crude oil.

- 1- MARPOL 73/78 and its amendments deals with new regulations to prevent pollution by oil including, between others, double hull requirements for tankers delivered after 1996, limits of sulphur oxide and nitrogen oxide (produced by Diesel engines) from ships, prohibited emissions of ozone depleting substances and the possibility that any port state can deny entry of single hull tankers.
- 2- The Protocol on Environmental Protection to the Antarctic Treaty, the Madrid Protocol, recalls that the activities in the Antarctic Treaty Area shall be planned and conducted so as to avoid significant adverse effects on air and water quality and significant changes in the marine environment. The Parties also shall keep under continuous review the provisions about pollution of the Antarctic marine environment, including any amendments and new regulations adopted under MARPOL 73/78.
- 3- The *Guidelines for Ships Operating in Arctic and Antarctic Ice-Covered Waters* endorsed by XXVII ATCM and forwarded to IMO for consideration provide additional tools to reduce the risks of accidental oil pollution in Antarctic ice-covered waters.
- 4- Information was collected on 50 of the 72 ships of the combined COMNAP-IAATO fleet and is deemed representative of both the current and planned state of practices for that fleet. None of the 50 ships carries Heavy Grade Oil in the Antarctic Treaty Area. Fuel information was available for 3 of the 5 other ships known to operate in the Antarctic Treaty area outside of the combined COMNAP-IAATO fleet. One of those 3 ships, registered in the Marshall Islands, is understood to carry Heavy Grade Oil in the Antarctic Treaty Area.