MARINE SAFETY

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NOTICE TO SHIPMASTERS LOADING, TRANSPORTING AND UNLOADING COAL

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1	**November 2002**	**All**	**AMSEB**	**To accommodate requirements for great lakes self unloaders**

Important Notices and Disclaimers

Également disponible en français.

NOTICE TO SHIPMASTERS LOADING, TRANSPORTING AND UNLOADING COAL

SAFETY REQUIREMENTS AND OTHER PRECAUTIONS TO BE FOLLOWED DURING LOADING, CARRIAGE AND DISCHARGE OF COAL CARGOES

Introduction

In order to eliminate the risks of explosion or spontaneous combustion that are associated with some coal cargoes the International Maritime Organization (IMO) have developed recommended safety procedures for ships loading coal. The following instructions are taken from the coal Schedule in Appendix B of the IMO Code of Safe Practice for Solid Bulk Cargoes (BC Code). *These instructions meet the special operational needs of self-unloaders and apply to all ships, including any foreign vessel either loading or unloading coal in Canadian ports and to Canadian ships in all waters*.

The dangers associated with the carriage of coal are explosion due to a build up of methane gas or spontaneous combustion due to oxidization of the cargo. It should be pointed out that such risks are usually associated with coals of known specific origins. However, due to modern shipping trends such as mixing and blending of coals, these dangers may also occur with coals of other origins. There are basic precautions that must be followed with all coals cargoes (see section A for further details) and these are augmented when coals identified as having a known propensity to emit large quantities of methane or to readily self-heat (oxidize) are to be carried.

Methane is a gas, which is lighter than air and may therefore accumulate in the upper regions of cargo spaces. Methane explosions can be extremely violent and may cause considerable damage. A methane/air mixture containing between 5% and 16% constitutes an explosive atmosphere, which can readily be ignited by sparks or naked flame. The only sure safeguard is to ensure that the surface of the cargo receives ample and regular ventilation (see section B for further details). Similarly isolated pockets of gas inside a coal pile may be freed during handling and discharge of the cargo. In the case of self-unloaders this may introduce methane into the tunnels.

In the case of cargoes that spontaneously heat, (see section C for further details), this phenomenon is the result of coal particles oxidizing as it comes into contact with the air. This reaction causes heating and can eventually result in fire breaking out.

Some coals may be liable to react with water and produce acids, which may cause corrosion. Flammable and toxic gases, including hydrogen, may be produced. Hydrogen is an odourless gas, much lighter than air, and has flammable limits in air of 4% to 75% by volume.

The type of coal you are loading is described on the Cargo Declaration, which should be supplied to you by the shipper. In the absence of such declaration, the master shall assume that the coal is of unknown origin and handle the cargo as per the special precautions in section D.

Should you require any further information, please contact your local Transport Canada (Marine Safety) Office, or Port State Competent Authority.

REQUIREMENTS FOR ALL SHIPS LOADING COAL IN CANADIAN PORTS AND ALL CANADIAN SHIPS LOADING COAL ANYWHERE

A. ALL COALS

1. Segregation and Stowage Requirements

   a) Boundaries of cargo spaces where materials are carried shall be resistant to fire and liquids.

   b) Coals shall be "separated from" goods of classes 1 (except division 1.4), 2, 3, 4, and 5 in packaged form (see the International Maritime Dangerous Goods Code (IMDG Code) and "separated from" solid bulk materials of classes 4 and 5.1.

   c) Stowage of goods of class 5.1 in packaged form or solid bulk materials of class 5.1 above or below a coal cargo shall be prohibited.

   d) Coals shall be "separated longitudinally by an intervening complete compartment or hold from" goods of class 1 other than division 1.4.

2. **SOLAS CHAPTER VI REGULATION 2 REQUIREMENTS:** Prior to loading, the shipper or his appointed agent shall provide in writing the appropriate information on the cargo to the master, as per SOLAS Chapter VI, Regulation 2. The cargo information, which is also applicable to non-Convention ships, shall include information on the stowage factor of the cargo, the trimming procedures and, the moisture content of the cargo and its transportable moisture limit. It shall describe the characteristics of the cargo and the recommended safe handling procedures for loading and transport of the cargo and especially whether the cargo is **liable to emit methane or self-heat**.

3. Loading shall not commence until the appropriate cargo declaration has been provided to the master. *For vessels regularly loading coal in Great Lakes ports no cargo declaration need be required provided the master at the time of loading has declared in writing the coal as unknown and put into place the precautions in section D.*

4. Where the shipper has advised that the cargo is liable to emit methane or self-heat, the master shall additionally refer to sections B or C of these instructions.

5. Where the shipper has advised that the cargo's behavioral pattern is unknown the master shall additionally refer to section D of these instructions.
Should it not be possible to obtain a cargo declaration from the shipper, then the cargo should also be treated as cargo with unknown behaviour (see section D). *Should the characteristics of any coal carried vary considerably from those given in any cargo declaration the* Transport Canada, Marine Safety Branch in Ottawa should be notified with details i.e. shipper, date, port, country, and terminal.

6. The shipper shall ensure that the master receives co-operation from the terminal with regard to loading procedures (trimming etc.).

7. **Information records** – The most comprehensive record of measurements will always be the log used to record daily results. The following minimum information is essential if an accurate assessment of the situation is to be achieved:

(a) identity of the holds involved; monitoring results covering carbon monoxide, methane and oxygen concentrations;

(b) if available, temperature of coal, location and method used to obtain results;

(c) time gas samples taken (monitoring routine);

(d) time ventilators opened/closed;

(e) quantity of coal in hold(s) involved;

(f) type of coal as per shipper's declaration, and any special precautions indicated on declaration;

(g) date loaded, and ETA at intended discharge port (which should be specified); and

(h) comments or observations from the ship's master.

8. **Before and during loading, and until the cargo is discharged, the master shall ensure that**:

a) all cargo spaces and bilge wells are clean and dry. Any residue of waste material or previous cargo shall be removed, including removable cargo battens;

b) all electrical cables and components situated in cargo spaces and in adjacent spaces are free of defects. Where possible due to the particular construction of the ship, any such cables and components should be safe for use in hazardous zones or means should be provided for positive isolations.

Ships that are self-unloader, and Canadian registered need not to comply with paragraph (b), however, electrical equipment installed in adjacent spaces, tunnels, etc should:

i) have a minimum of Class II, Group F, Division 2 rating, in accordance with the Canadian Electrical Code, or higher; and

ii) be suitably ventilated.

For these self unloader ships, forced ventilation system (mechanical) shall be installed and powered up in unloading tunnels and loopbelt tunnels (or any other transfer equipment). It is recommended that ventilation be achieved by means of forced air supply and natural exhaust. Where exhaust type fans are used, equipment shall be "certified safe". Procedures, relating to operation in hazardous environment, should be documented and in place.

c) the ship shall be suitably fitted and carry on board appropriate instruments for measuring the following, without requiring entry into the cargo space, where practicable:

i. concentration of methane in the atmosphere(*Explosimeter or Methanometer type);*

ii. concentration of oxygen in the atmosphere;

iii. concentration of carbon monoxide in the atmosphere;

iv. pH value of cargo hold bilge samples, as appropriate; and

v. temperature monitoring during the voyage is considered optional and is not required by Canada.

These instruments shall be regularly serviced and calibrated. Ship personnel shall be trained in the use of such instruments. **Details of gas measurement procedures are given in appendix A.**

d) the ship shall carry on board self-contained breathing apparatus required by SOLAS regulation II-2/17. The self-contained breathing apparatus shall be worn only by personnel trained in its use;

e) **smoking and the use of naked flames shall not be permitted in the cargo areas and adjacent spaces and appropriate warning notices shall be posted in conspicuous places.** Burning, cutting, chipping, welding or other sources of ignition shall not be permitted in the vicinity of cargo spaces or in other adjacent spaces, unless the space has been properly ventilated and the methane gas measurements indicate it is safe to do so;

f) the coal cargo shall not be stowed adjacent to hot areas;

g) prior to departure the surface of the cargo shall be trimmed reasonably level to the boundaries of the cargo space to avoid the formation of gas pockets and to prevent air

from permeating the body of the coal. All access openings leading into the cargo space shall be adequately sealed;

h) the atmosphere in the space above the cargo in each cargo space should be regularly monitored as appropriate for the presence of methane, oxygen and carbon monoxide. Details of gas monitoring procedures are given in **Appendix A**. Records of these readings should be maintained. The frequency of the testing should depend upon the information provided by the shipper and the information obtained through the analysis of the atmosphere in the cargo space.

i) **for bulk carriers** unless expressly directed otherwise, all holds should be surface ventilated for the first 24 hours after departure from the loading port. During this period, one measurement should be taken from one sample point per hold.

If after 24 hours the methane concentrations are at an acceptably low level, the ventilators should be closed. If not, they should remain open until acceptably low levels are obtained. In either event measurements should be continued on a daily basis.

If significant concentrations of methane subsequently occur in unventilated holds the appropriate special precautions as described in section C.2.a. should apply.

F**or Canadian self-unloaders** the above is not applicable but alternative appropriate methods should be used.

j) As far as possible any gases which may be emitted from the materials do not accumulate in adjacent spaces.

k) Adjacent working spaces, e.g. storerooms, carpenter's shop, passage ways, tunnels, etc., are regularly monitored for the presence of methane, oxygen and carbon monoxide. Such spaces should be adequately ventilated.

l) Regular hold bilge testing should be systematically carried out, if applicable. If the pH monitoring indicates that a corrosion risk exists, the master should ensure that all bilges are kept dry during the voyage in order to avoid possible accumulation of acids on tank tops and in the bilge system.

m) the atmosphere in the space above the cargo shall be monitored for the presence of adequate oxygen before permitting anyone to enter into such space*; and

n) if the behaviour of the cargo during the voyage differs from that described in the Cargo Declaration, such differences shall be reported to the shipper and to Marine Safety, Transport Canada Ottawa.

* refer to appendix F of the IMO BC Code for entry into enclosed spaces

B. COALS THAT EMIT METHANE

In addition to the requirements of section A, the following procedures must also be followed:

1. The master of a ship loading coal of this type, prior to loading, shall ensure:

   a) there exists a natural ventilation system, capable of providing adequate surface ventilation;
   OR
   there exists a mechanical ventilation system capable of providing ventilation appropriate to the type of the ship. Exhaust systems shall be safe for use in an explosive atmosphere;

   b) the ship is equipped with at least-two suitable portable apparatus capable of measuring:

      0-100% of the L.E.L. of methane gas (Explosimeter type)
      OR
      0-5% of methane concentration in air (Methanometer type such as MSA-D6)

      and at least two officers have been instructed in the use and maintenance of such equipment;

   c) the ship is generally acceptable for the carriage of the cargo in question.

All ships shall be inspected for the above requirements by a Transport Canada, Marine Safety inspectors prior to their first loading of this type of coal and at least once a year. Canadian registered ships may elect to have this done during the annual inspection.

2. If the shipper has advised that the cargo is liable to emit methane or analysis of the atmosphere in the cargo space, or unloading space if applicable, indicates the presence of methane in excess of 20% of the lower explosive limit (LEL), the master shall ensure:

   a) that procedures are in place to establish whether any methane is in fact emitted at top of cargo holds. This shall be done as a minimum the first few days of any voyage until ascertaining that no gas is present. Any gas reading with vents open should indicate potential of gas build-up with vents closed;

   b) adequate surface ventilation should be maintained. On no account should air be directed into the body of the coal as air could promote self-heating;

c) care should be taken to vent any accumulated gases prior to removal of the hatch covers or other openings for any reason, including unloading. Cargo hatches and other openings should be opened carefully to avoid creating sparks. Smoking and the use of naked flame should be prohibited. On self unloader type ships, adjacent spaces, tunnels, etc. must be adequately ventilated before electrical power sources etc. are activated;

d) personnel should not be permitted to enter the cargo space or enclosed adjacent spaces unless the space has been ventilated and the atmosphere tested and found to be gas-free and to have sufficient oxygen to support life. If this is not possible, emergency entry into the space should be undertaken only by trained personnel wearing self-contained breathing apparatus, under the supervision of a responsible officer. In addition, special precautions to ensure that no source of ignition is carried into the space should be observed (see also section 3 and appendix F of the BC Code);

e) adjacent working spaces, e.g. storerooms, carpenter's shops, passage ways, tunnels, etc., are regularly monitored for the presence of methane. Such spaces should be adequately ventilated and, in the case of mechanical ventilation, only equipment safe for use in an explosive atmosphere should be used. On self unloader type ships, supply ventilation equipment for tunnels does not need to be explosion proof. Testing is especially important prior to permitting personnel to enter such spaces or energizing equipment within those spaces. Monitoring of the cargo surface, as well as the unloading space, if applicable, is integral to the determination of the characteristics during transportation; and

f) the No Smoking provision and posting of signs are strictly adhered to.

C. SELF HEATING COALS

Some coals may be liable to self-heating that could lead to spontaneous combustion in the cargo space. Flammable and toxic gases, including carbon monoxide, may be produced. Carbon monoxide is an *odorless* gas, slightly lighter than air, and has flammable limits in air of 12% to 75% by volume. It is toxic by inhalation, with an affinity for blood hemoglobin over 200 times that of oxygen. In addition to the requirements of section A, the following procedures must also be followed:

1. The master of a ship loading coal of this type, prior to loading, shall ensure:

a) the ship carries on board the following instruments for measuring the following without requiring entry into the cargo holds:

i) the concentration of carbon monoxide in the atmosphere and optionally;

ii) the temperature of the cargo in the range between 0ºC-100ºC (see 2(d)); and

b) the ship is generally acceptable for the carriage of the cargo in question.

All ships shall be inspected for the above requirements by a Transport Canada, Marine Safety inspector prior to their first loading of this type of coal and at least once a year. Canadian registered ships may elect to have this done during their annual inspection.

2. The master should seek confirmation that the precautions intended to be taken and the procedures intended for monitoring the cargo during the voyage are adequate. If the cargo is liable to self-heat or analysis of the atmosphere in the cargo space indicates an increasing concentration of carbon monoxide, then the following additional precautions should be taken:

a) the hatches should be closed immediately after completion of loading in each cargo space. The hatch covers can also be additionally sealed with a suitable sealing tape. Surface ventilation should be limited to the absolute minimum time necessary to remove methane which may have accumulated. Forced ventilation should not be used. On no account should air be directed into the body of the coal as air could promote self-heating. Similarly, oxidization could occur through self-unloading gates if positive pressure ventilation is in effect;

b) personnel shall not be permitted to enter any cargo space, unloading spaces and or self unloader's tunnels, unless they are wearing self-contained breathing apparatus and access is critical to the safety of the ship or safety of life. The self-contained breathing apparatus should be worn only by personnel trained in its use. Where the operations of the ship requires entry into cargo space, unloading spaces and or self unloader's tunnels, entry shall not be permitted unless the atmosphere is at a safe level not exceeding 50 ppm*;

* refer to appendix F of the IMO BC Code for entry into enclosed spaces

c) carbon monoxide and optionally temperature levels shall be monitored at regular intervals and logged;

d) if at the time of loading, when the hatches are open, the temperature of the coal exceeds 55ºC, expert advice should be obtained; and

e) if the carbon monoxide level is increasing steadily, a potential self-heating may be developing. The cargo space should be completely closed down and all ventilation ceased. The master should seek expert advice immediately. Water should not be used for cooling the material or fighting coal cargo fires at sea, but may be used for cooling the boundaries of the cargo space and if, at sea in Canadian waters, the master should also advise the nearest Transport Canada Marine Safety office. *For Canadian self-unloaders the above is not applicable but alternative appropriate methods should be used as outlined in A2.7* .

D. COALS WHOSE BEHAVIOURAL PATTERN IS UNKNOWN

In addition to the requirements of Section A, the following procedures must also be followed:

1. The master of a ship loading coal of this type, prior to loading shall ensure:

a) the ship carries on board appropriate instruments for measuring without requiring entry into the cargo space:

i) concentration of methane in the atmosphere(*Explosimeter or Methanometer type);*

ii) concentration of oxygen in the atmosphere; and

iii) (1) concentration of carbon monoxide in the atmosphere and

(2) optionally temperature of the cargo in the range between 0°C-100°C.

b) crew members are proficient in operating the equipment in (a);

c) i) there exists a natural ventilation system, capable of providing adequate surface ventilation OR

ii) there exists a mechanical ventilation system capable of providing adequate surface ventilation. Exhaust systems shall be safe for use in an explosive atmosphere.

d) The ship is generally acceptable for the carriage of the cargo in question.

All ships shall be inspected for the above requirements by a Transport Canada, Marine Safety inspector prior to their first loading of this type of coal and at least once a year. Canadian registered ships may elect to have this done during their annual inspection.

2. The master shall ensure that all provisions of sections B.2 or C.2 of these instructions are complied with, as required by monitoring.

* RECORD OF METHANE READINGS (SAMPLE)

M.V.: _____ PORT OF REGISTRY: _____

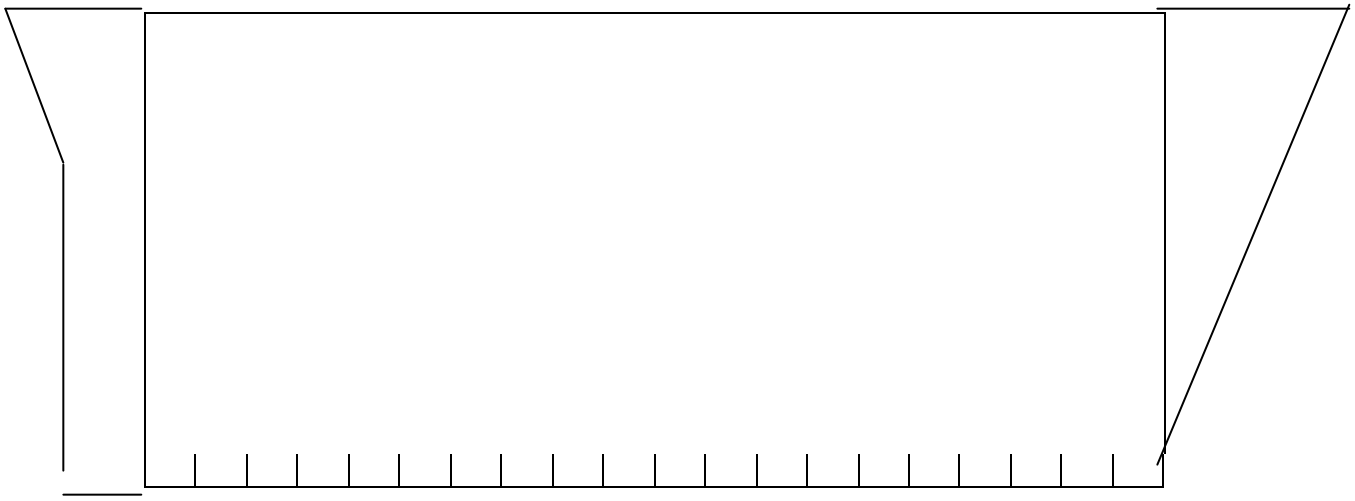
LOADPORT: _____ DATE ARRIVAL LOADPORT: _____

DATE COMMENCED LOADING: _____

TOTAL CARGO LOADED: _____ DATE SAILED: _____

DESTINATION: _____ DATE OF ARRIVAL: _____

INDICATE BELOW COMPARTMENTS LOADED AND AMOUNTS OF CARGO



DISCHARGE PORT	ARRIVAL DATE	COMMENCED DISCHARGE	COMPLETED DISCHARGE
1.			
2.			
3.			

* Form to be completed only by ships required to monitor cargo holds presence of methane (see "Instructions to Masters").

METHANE READINGS TO BE MONITORED AT REGULAR INTERVALS THROUGHOUT VOYAGE AND RECORDED BELOW

DATE	TIME	COMPARTMENT	METHANE CONTENT		DATE	TIME	COMPARTMENT	METHANE CONTENT

Indicate type of instrument used:

Explosimeter type: 0-100% L.E.L.

or

Methanometer type: 0-5%
(Methane concentration in air)

PLEASE RETURN COMPLETED REPORT TO:

Transport Canada
Marine Safety
Tower C, Place de Ville
11th Floor, 330 Sparks Street
Ottawa, Ontario

K1A 0N8

APPENDIX A
Procedures for gas monitoring of coal cargoes

A.1 Observations

Carbon monoxide monitoring, when conducted in accordance with the following recommendations, will provide a reliable early indication of self-heating within a coal cargo. This allows preventive action to be considered without delay. A steady rise in the level of carbon monoxide detected is a conclusive indication that self-heating is taking place.

All ships engaged in the carriage of coal should carry on board an instrument for measuring methane, oxygen and carbon monoxide gas concentrations (requirements for all coals, section A.7.c), so that the atmosphere within the appropriate spaces may be monitored. This instrument should be regularly serviced and calibrated in accordance with the manufacturer's instructions. When properly maintained and operated, this instrument will provide reliable data about the atmosphere being tested. Care needs to be exercised in interpreting methane measurements carried out in the low oxygen concentrations often found in unventilated cargo holds. The catalytic sensors normally used for the detection of methane rely on the presence of sufficient oxygen for accurate measurement. This phenomenon does not affect the measurement of carbon monoxide, or measurement of methane by infrared sensor. Further guidance may be obtained from the instrument manufacturer.

A.2 Sampling and measurement procedure

A.2.1 Equipment

An instrument is required which is capable of measuring methane, oxygen and carbon monoxide concentrations. The instrument should be fitted with an aspirator, flexible connection and a length of tubing to enable a representative sample to be obtained. Stainless steel tubing approximately 0.5 m in length and 6 mm nominal internal diameter with an integral stainless steel threaded collar is preferred. The collar is necessary to provide an adequate seal at the sampling point.

A suitable filter should be used to protect the instrument against the ingress of moisture as recommended by the manufacturer. The presence of even small amount of moisture will compromise the accuracy of the measurement.

A.2.2 Siting of sampling points

In order to obtain meaningful information about the behaviour of coal in a hold, gas measurements should be made via one sample point per hold. To ensure flexibility of measurement in adverse weather, however, two sample points should be provided per hold, one on the port side and one on the starboard side of the hatch cover (refer to figure A.2.7). Measurement from either of these locations is satisfactory.

Each sample point should comprise a hole of diameter approximately 12 mm positioned as near to the top of the hatch coaming as possible. It should be sealed with a screw cap to prevent ingress of water and air. It is essential that this cap is securely replaced after each measurement to maintain a tight seal.

Due to the particular configurations of Great-Lakes self-unloaders, sampling points could be chosen in other locations provided a reasonable, logical and meaningful gas reading of the atmosphere in the hold can be obtained.

The provision of any sample point should not compromise the seaworthiness of the ship.

A.2.3 Measurement from fixed sampling point

Ensure that the instrument is calibrated and working properly in accordance with the manufacturer's instructions. Remove the sealing cap, insert the stainless steel tube into sampling point and tighten the integral cap to ensure an adequate seal. Connect the instrument to the sampling tube. Draw a sample of the hold atmosphere through the tube using the aspirator until steady readings are obtained. Log the results on a form, which records cargo hold, date and time for each measurement.

A.2.4 Measurement strategy

The identification of incipient self-heating from measurement of gas concentrations is more readily achieved under unventilated conditions. This is not always desirable because of the possibility of the accumulation of methane to dangerous concentrations. This is primarily, but not exclusively, a problem in the early stages of a voyage. Therefore it is recommended that holds are initially ventilated until measured methane concentrations are at an acceptably low level. *For Great Lakes self-unloaders operating on inland voyages only procedures as outlined in 2.7 may be followed.*

A.2.5 Measurement in unventilated holds

Under normal conditions one measurement per day is sufficient as a precautionary measure. However, if carbon monoxide levels are higher than 30 ppm then the frequency should be increased to at least twice a day at suitably spaced intervals. Any additional results should be logged.

If carbon monoxide level in any hold reaches 50 ppm a self-heating condition may be developing and the owners of the ship should be notified or *For Great Lakes self-unloaders operating on inland voyages only procedures as outlined in 2.7 may be followed.*

A.2.6 Measurement in ventilated holds

If the presence of methane is such that the ventilators are required to remain open, then a different procedure should be applied to enable the onset of any incipient self-heating to be detected.

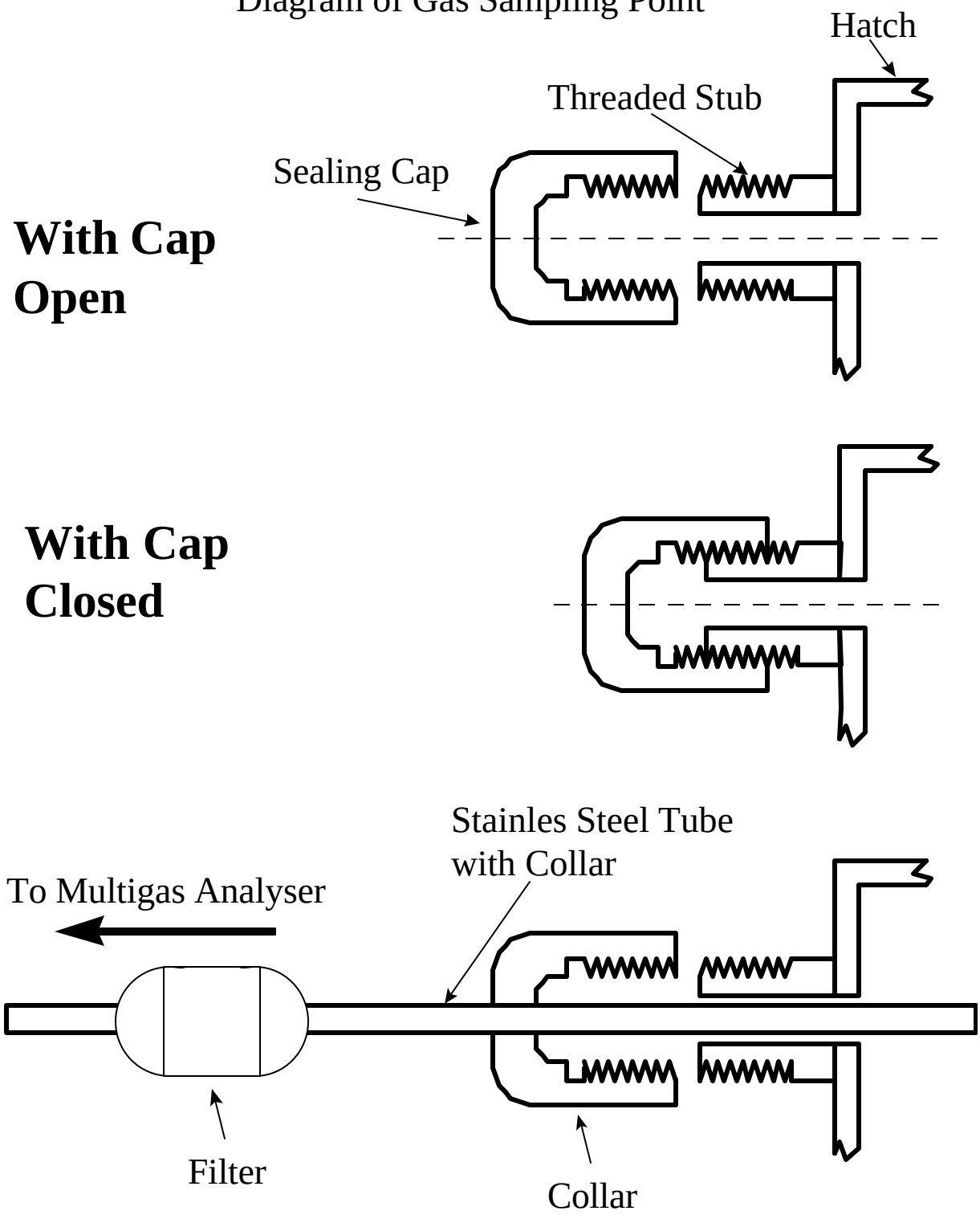
To obtain meaningful data the ventilators should be closed for a period before the measurements are taken. This period may be chosen to suit the operational requirements of the ship, but it is recommended that it is not less than four hours. It is vital in the interests of data interpretation that the shutdown time is constant whichever time period is selected. These measurements should be taken on a daily basis. If the carbon monoxide results exhibit a steady rise over three consecutive days, or exceed 50 ppm on any day, the owners of the ship should be notified.

A.2.7 Measurement and Reporting Procedures for Self Unloaders operating on Inland Voyages only.

For coal loaded in Great Lakes ports it is not uncommon to have CO levels reach as high as 1000 ppm in enclosed areas. Normally the concentrations will peak within approximate 12 hours of loading and gradually decrease over the next few days. Due to the short duration of these voyages reporting procedures are only required if both CO and LEL readings are simultaneously increasing, as this may indicate self heating is occurring. To establish whether such a trend is taking place readings should be taken at least every 4 hours in the first 24 hours of sailing. Otherwise CO readings should, as a minimum, be taken once per day if CO levels are under 50 ppm, at least twice per day if CO levels range from 50 to 500 ppm, and for CO levels in excess of 500ppm readings should be taken once per watch or every 4 hours.

Figure A.2.7

Diagram of Gas Sampling Point



APPENDIX B
FORM FOR CARGO INFORMATION
(Recommended layout)

Note: This form is not applicable if the cargo to be loaded requires a declaration under the requirements of SOLAS 1974, chapter VII, regulation 5; MARPOL 73/78, Annex III, regulation 4; and the IMDG Code, General Introduction section 9.

<table>
<tr><td colspan="2">Shipper</td><td>Reference number(s)</td></tr>
<tr><td colspan="2">Consignee</td><td>Carrier</td></tr>
<tr><td>Name/means
of transport</td><td>Port/place
of departure</td><td>Instructions or other matters</td></tr>
<tr><td colspan="3">Port/place of destination</td></tr>
<tr><td colspan="2">General description of the cargo
(Type of material/particle size)*

*For solid bulk cargo</td><td>Gross mass (kg/tonnes)

• General cargo
• Cargo unit(s)
• Bulk cargo</td></tr>
<tr><td colspan="3">Specification of bulk cargo*
Stowage factor
Angle of repose
Trimming procedures
Chemical properties**if potential hazard

* If applicable
**e.g., IMO class, UN No. or BC No. and EmS No.</td></tr>
<tr><td colspan="2">Relevant special properties of the cargo</td><td>Additional certificate(s)*
• Certificate of moisture content and transportable moisture limit
• Weathering certificate
• Exemption certificate
• Other (specify)

* if required</td></tr>
<tr><td colspan="2">DECLARATION

I hereby declare that the consignment is fully and accurately described and that the given test results and other specifications are correct to the best of my knowledge and belief and can be considered as representative for the cargo to be loaded.</td><td>Name/status, company/organization of signatory

Place and date

Signature on behalf of shipper</td></tr>
</table>

As an aid to paper documentation, Electronic Data Processing (EDP) or Electronic Data Interchange (EDI) techniques may be used.

This form meets the requirements of SOLAS 1974, chapter VI, regulation 2; and the BC Code, section 4, subsection 4.1