REPORT BY THE TASK TEAM ON VOS RECRUITMENT AND PROGRAMME PROMOTION

(Report submitted by Julie Fletcher, Chairperson of the SOT Task Team on VOS Recruitment and Programme Promotion)

1. Current Terms of Reference

Tasks:

Further, develop the generic pre-installation design standards that will eventually be available to ship builders and classification societies.

Review existing promotional aids (flyer, certificate) and recommend new promotional aids.

Promote the use of, and keep under review, the promotional presentation "The Partnership between the Maritime Industry, Marine Forecasting and Science".

Establish a store of newsworthy articles for use in a SOT or VOSClim Newsletter or in national newsletters.

Review the questionnaire used for the Marine Meteorological Services Monitoring Programme, and propose amendments, which should be reflected in the questionnaire survey to be conducted in 2008.

Review all relevant JCOMM Publications to ensure they are up to date and comply with Quality Management terminology.

TT Members:

Julie Fletcher (TT chairperson, New Zealand)
Graeme Ball (Australia)
Pierre Blouch (France)
Sarah North (United Kingdom)
Volker Weidner (Germany)
Gerie Lynn Lavigne (Canada)
Tom Rossby (URI, USA, advisor).

2. Status of Action Items from SOT-IV for TT-VRPP

I-4.1.4 - To approach the Maritime Safety Committee with a joint document from JCOMM (WMO-IOC) and the International Chamber of Shipping (ICS).

Status: Pending. There has been no high level WMO-IMO-ICS meeting since Feb 2007. Sarah North supplied a ‘Generic Design Standards’ document to WMO in Dec 2007.

I-4.1.5 - To consider producing a VOS training video

Status: After SOT-IV, WMO had some communication with JMA about updating a video that JMA had produced in the past but it appeared this was not feasible. Because VOS instrumentation and practices vary from country to country, the Task Team concluded that one video would not capture all of the regional and national differences, and it was therefore impractical to pursue the making of a video. Some NMS however, might still wish to investigate making a video to be used as a training aid at nautical colleges and training institutions. Such a video would need to be made by a professional company. The E-logbook software e.g. TurboWin provides ‘help’ to observers on observing practices and can be used for training purposes.

IV-4.5.6 - To consider the editing of training materials such as CD-ROMs as well as the organization of training workshops

Status: Pending. An International PMO Meeting for 2010 is mooted, although funding is still an issue. WMO is investigating establishing a joint Meeting with Marine Services and WMO Regional Programme, where PMO would be part of it. The WMO is proposing to have it in North America (RA-IV), or Central America (RA-III), but there may be merit in holding it in a location where ships frequently visit but where there is currently no PMO coverage, e.g. China (RA-II), or a Mediterranean port in Italy or Spain (RA-VI) to try to encourage PMO activities in these regions. In view of the importance of PMOs to the VOS programme, the holding of an International PMO meeting should be strongly encouraged to provide PMO training and to allow PMOs to meet to strengthen the global PMO network.

IV-4.6.3 - To investigate the conduction of an impact assessment study of the VOF in liaison with other appropriate bodies and to report at the next SOT Session.

Status: Ongoing.
The documents below provide impact assessments on the use of VOS data.

(1) AOPC-XIV Document 27a Item 8.4 The Case for Maintaining Surface Meteorological Data Collection from Voluntary Observing Ships by Elizabeth Kent (Geneva, 21-25 April 2008). Final report from the meeting itself, can be found at:
http://www.wmo.int/pages/prog/gcos/Publications/gcos-122.pdf

Note paragraph 72 in particular.

(2) Statements of Guidance (SoG) for WMO applications:
http://www.wmo.int/pages/prog/sat/Refdocuments.html#SOG

These SoGs identify the observational gaps with respect to the requirements for a number of applications serving WMO Programmes and Co-sponsored Programmes. In particular, the following SoGs provide rationale for making observations from VOS:

Statement of Guidance for Global Numerical Weather Prediction (June 2008)
Statement of Guidance for Regional Numerical Weather Prediction (May 2008)
Statement of Guidance for Synoptic Meteorology (June 2008)
Statement of Guidance for Seasonal to Inter-annual Forecasts (April 2006/April 2008) Statement of Guidance for Ocean Applications (June 2008)

3. Progress by TT on Tasks defined at SOT IV

Task 1

Work in progress – Sarah North's 'Generic Design Installation' document was submitted to WMO in November 2007. See *Annex 1*.

Task 2

The promotional aids are on the VOS website and are being used.
http://www.bom.gov.au/jcomm/vos/information.html

The Certificate of Appreciation was approved at SOT-III, but, unknowingly at the time, still required JCOMM approval, which was received late in 2008. As at February 2009, WMO was preparing a letter for PRs informing them of the certificate. The Certificate was temporarily withdrawn from the VOS web

site pending the issue of WMO's letter to PRs.

Task 3

Review of the PowerPoint presentation commenced in Nov 2007. The updated presentation entitled "Partnership between Marine Industry and Marine Meteorological and Oceanographic Communities V3 2008" was uploaded to the VOS website 10/6/2008 http://www.bom.gov.au/jcomm/vos/information.html

Task 4

Agreed to use the E-SURFAR Wiki website at SOT-IV

Task 5

Questionnaire was updated according to recommendations from SOT-IV (and ETSI) but was not issued in 2008. As at February 2009, the questionnaire is being translated into 6 languages by WMO for issue later in 2009.

Task 6

The SOT and VOSP Chairs reviewed the VOS Framework Document WMO/TD No 1009, in February 2008.

4. Summary of other work completed under the TT-VRPP

Initiatives

1. VOS Recruitment and metadata collection tools were developed in conjunction with the TT on Metadata for WMO No. 47, namely:
   VOSP002 – Metadata Collection Form
   VOSP002 Metadata Viewer
   Pub47 XML Generator

   These were placed on the VOS website May 2008
   http://www.bom.gov.au/jcomm/vos/resources.html

2. The MSC Circular 1017 was updated in Q3 2007. New MSC Circular MSC.1/Circ.1293 issued by IMO 10/12/2008.

3. The VOS website http://www.bom.gov.au/jcomm/vos/index.html
   is regularly updated and is a valuable resource for VOS Programme Managers and PMOs.

   In particular, attention is drawn to the VOS Quick Reference Guides for PMOs and National VOS Programme Managers. These guides are intended to standardize global VOS practices and to provide helpful guidelines for both existing and new PMOs and VOS Programme Managers. As well as providing information about ship recruitment and visiting, the Guides contain links to the VOS Quality Monitoring Tools and details the recommended international reporting requirements for WMO, SOT, and other bodies on the status of National VOS.

5. Recommendations

The Task Team recommends:

(i.) Removing reference to the year of issue from Task number 5 in the current Terms of Reference.

(ii.) That the WMO, in support of the PMO activities, commit to holding an International PMO Meeting (PMO-IV) in 2010.

6. Actions

1. Review and complete the 'Generic Design Installation' document, and with ICS/IMO decide how to progress this.

2. Review the Task Team membership and encourage new Task Team members

Annex 1: Proposed Generic Design [Standards] [Specifications] [Recommendations] for Voluntary Observing Ships and Ships of Opportunity
Annex 2: Generic Design [Standards] [Specifications] [Recommendations] for Voluntary Observing Ships (VOS) and Ships of Opportunity (SOOP) *(Draft)*

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ANNEX 1

Proposed Generic Design [Standards] [Specifications] [Recommendations] for Voluntary Observing Ships and Ships of Opportunity

Submitted by WMO & IOC Secretariats

1. Weather observations submitted by ships recruited to the World Meteorological Organisation's Voluntary Observing Ship (VOS) Scheme[1] are essential for the provision of quality marine weather forecasts and warnings, and also provide vital data for use in climate research and climate prediction studies

2. The importance of such observations for the safety of navigation is recognised in Regulation 5 of Chapter V of the SOLAS Convention which states that '*Contracting Governments undertake to encourage the collection of meteorological data by ships at sea and to arrange for their examination, dissemination and exchange in the manner most suitable for the purpose of aiding navigation'*

3. Unfortunately, the number of VOS being recruited worldwide has decreased in recent years and this has inevitably had a consequential effect on the number, and quality, of observations being received from observing ships. This is due, at least in part, to the changing dynamic of modern ship operations, with reduced manning levels, and sudden changes of vessel ownership, flag and trading patterns.

4. To some extent, this decline in observations can be overcome by the use of Automatic Weather Stations (AWS) installed on suitable host ships. However, whilst the number of such AWS ships has increased in recent years they only provide a limited number of measured and observed parameters, and should only be considered as supplementing the traditional manually reporting VOS (where ships' officers provide additional visual observations of clouds, weather conditions, and sea states).

5. When recruiting existing ships to the VOS Scheme, problems are often experienced by meteorological and oceanographic services when trying to install, and locate instruments to ensure that they have the correct exposure, or when trying to install cables and meteorological/ oceanographic sensors for automatic systems.

6. Such problems could be, largely avoided if meteorological and oceanographic observing considerations could be taken into account at the ships initial commissioning and new-build design stage. In the overwhelming majority of cases only minor design adjustments are likely to be needed, and should therefore have no appreciable impact on overall ship costs.

7. With a view to reducing, the impact of such downstream problems the JCOMM[2] Ship Observations Team has prepared initial draft generic [specifications] [standards] [recommendations] that are considered appropriate for new ships intending to perform meteorological or oceanographic observations. A copy of these draft specifications is annexed to this paper (*Annex 2*). These specifications have been categorised according to the type of meteorological or oceanographic observations that the host ship is recruited by the meteorological services to perform. They range from simply making provision for suitable space in the wheelhouse for positioning meteorological instruments, to providing extra cabling capacity for remotely sensed sea temperatures, or gyro output connections to provide compass data to our anemometers. [It is recognised that these draft specifications will require further development in concert with shipowners, and wider the marine community]

8. Because the observing scheme is entirely voluntary there should be no necessity to mandate the requirement for new ships to be designed for meteorological/oceanographic observing by

introducing amendments to the SOLAS Convention. Clearly the meteorological services rely on the continued support of shipping companies and their officers and masters for the success of the VOS Scheme – and it is pleasing to note that many shipowners now pro-actively request their newly delivered ships to be recruited, as they recognise the merits of the VOS scheme

9. However, it would be helpful if, at the initial design stage, shipowners could, if they so wish, request that their vessels be designed and constructed to allow their future recruitment to perform meteorological/oceanographic observations. [One way in which this could perhaps be achieved could be through the development of optional 'weather ship' classification specifications or notations that could be requested by shipowners at the new build stage]. This would help to provide a future "pool" of potential VOS, which could be available, for future recruitment into the VOS Scheme].

10. Most ships that agree to participate in the VOS scheme are, provided with calibrated instruments by the national meteorological service that has recruited them, and transmit a full range of observed parameters. These are referred to as 'Selected' observing ships. However, in some cases, ships may be recruited by the national meteorological service to use their own ships instruments and to transmit a limited number of observed parameters. These ships are referred to as 'Auxiliary' observing ships and are often recruited because they operate in areas where data is in sparse supply

11. Many new ships are already being equipped by the shipowners themselves with modern weather observing equipment such as sonic anemometers, and in some cases automatic weather stations. Subject to the suitability of the instruments, being provided, such ships would lend themselves to recruitment as 'Auxiliary' observing ships. Development of specifications based on those annexed herewith, could therefore also be of assistance to shipowners and shipbuilders when determining the suitability of the ships meteorological arrangements. For instance, it is essential that ships anemometers be correctly exposed, ideally on the foremast, so that windage effects caused by the ship superstructure or other adjacent structures do not adversely affect them. Similarly, the quality of measurement using wet/dry bulb thermometers in a marine screen will diminish if the screen is not properly exposed e.g. if it is positioned under a ships overhang or adjacent to ship's vents

12. In addition to their value to the meteorological and oceanographic community, observations from ships at sea clearly have an important role to play in ensuring the ongoing safety of ships, their crews and their cargoes. The data provided by observing ships is needed for a variety of marine activities including having to deal with incidents such as search and rescue, marine pollution and safe weather routing of ships. The VOS Scheme therefore needs active support from the marine community, and particularly, support and assistance from shipowners, if we are going to reverse the current decline in ships weather data.

13. The Maritime Safety Committee is invited to consider the issues raised in this paper and to advise on the most appropriate way to proceed [refer this subject to the work programme of the Ship Design and Equipment Sub Committee with a view to developing appropriate [standards][recommendations][specifications] and that could then be issued as guidance to shipowners or be used as the basis of optional classification requirements].

1 http://www.bom.gov.au/jcomm/vos/
2 Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (http://www.jcomm.info/)

ANNEX 2

Generic Design [Standards] [Specifications] [Recommendations]
For
Voluntary Observing Ships (VOS) and Ships of Opportunity (SOOP)
(Draft)

The following [Standards] [Specifications] [Recommendations] provide a basic guidance to shipowners, shipbuilders and classification societies concerning the design and construction arrangements that should be taken into account for new ships that will be engaged in undertaking meteorological or oceanographic observations.

Shipowners are encouraged to liaise with the national meteorological services concerning the level of observational activity they wish their vessels to become involved in, so these can be taken into account in the initial ship build specifications and design.

1. Selected Voluntary Observing Ship (VOS) - Basic

'Selected' ships recruited to participate in the VOS scheme are provided with range-calibrated instruments by the national meteorological services and transmit a full range of observed meteorological parameters. The following basic design requirements are therefore recommended to facilitate the installation of such instruments and to allow ships' officers to prepare their observations in a suitable environment that does not hamper other activities performed within the ships wheelhouse:

- A dedicated locker within the wheelhouse for storing spare meteorological equipment spares and stationery [dimensions approx 0.6m x 0.6m x 0.6m]
- A non-slip work surface for locating meteorological instruments supplied by the Meteorological Services (e.g. barograph, barometer, electronic logbooks) [dimensions approx 0.6m x 0.6m] with free area above for fixing instruments to bulkhead.
- A dedicated adjacent power socket to ships power supply (for use in connection with electronic logbooks or other digital observing instruments that require a power supply)
- Ability to pre-load electronic logbook software on to one of the ships bridge computers that is connected to the ships email system for transmitting observations to the national meteorological service, or which provides easy access for transferring the observations to the ships Inmarsat C equipment

2. Selected Voluntary Observing Ship (VOS) – Advanced

In addition to the basic provisions listed in para 1, 'Selected' ships recruited to participate in the VOS scheme may need additional arrangements to be taken into account, subject to the level of instrumentation being provided by the national meteorological service involved. These may include some or all of the following recommendations, which will need to be agreed with the national meteorological service involved:

- For ships provided by meteorological services with marine screens, containing wet/dry bulb thermometry of sensors - Two slotted vertical stanchions [approx 1m length] on the aft port and starboard bridge wings. To be located in a suitably exposed location and positioned so that screens can be fixed at a height above ships rails of [approx 1.6 m], but such that their position will not impair the taking of azimuth compass readings by navigating officers, or interfere with any other of the ships normal functions or requirements. For ships without bridge wings provision should be made for securing screens in alternative locations that are easily accessible from the ships bridge, but which are not, in so far as is reasonable and practicable, located under superstructure overhangs or adjacent to heat sources such as searchlights or ships vents.

- For ships provided by the meteorological service with a precision aneroid barometer located within a pressurised wheelhouse - a dedicated bulkhead penetration from the wheelhouse to the exterior atmosphere for leading a pressure static head tube [Dimensions approx 15mm].
- For ships provided by the meteorological service with electrical resistance thermometers or electrical humidity sensors - a bulkhead penetration to permit cables to be run from a digital indicator at the meteorological work surface in the wheelhouse (para 1 refers) to the marine screens located on either bridge wing [Dimensions approx 15mm]
- For ships provided by the meteorological service with hull contact sensors for measuring sea surface temperatures – a cable run from the digital indicator at the meteorological work surface in the wheelhouse (para 1 refers) to the hull contact sensor located in the engine room, or suitable void space, at a distance of [approx 1 metre] below the light waterline. Existing cable runs from the bridge to the engine control room, bus connector may be utilised if spare capacity is available
- For ships provided by the meteorological service with a dedicated anemometer for measuring wind speed and direction – a cable run and associated deck/hull penetrations from the meteorological work surface in the wheelhouse (para 1 refers) to the anemometer location on the foremast, mainmast or a dedicated meteorological mast, (as agreed with the meteorological services). To provide optimum exposure, free from obstructions, the preferred location for the anemometer will usually be on the foremast (i.e. for ships with aft accommodation superstructures).

3. Selected Voluntary Observing Ship (VOS) – Simple Automatic Weather Station (AWS)

The Ships recruited to participate in the VOS scheme, which are provided by the meteorological service with simple AWS systems, measuring a limited number of observed parameters e.g. pressure, temperature and humidity. Depending on the system provided the following arrangements be recommended for new build ships:

- For systems that rely on connection to the ships power supply – a dedicated power socket providing access to the ships power supply.
- For systems that incorporate a digital or visual readout unit on the bridge – a suitable installation location, or housing, on the ships bridge console or other suitable location within the wheelhouse or chartroom
- bulkhead or deck penetrations in the vicinity of the location chosen for the AWS installation for leading cabling, as necessary, to the wheelhouse power socket and/or digital readout
- A suitable location for securing the AWS to an adjacent handrail or bulwark together with a suitable securing bracket. As AWS systems will incorporate their own transmission systems, the position chosen should comply with specified electrical clearance distances to avoid interference from other ships antennae or electrical sources [4m from HF and 2m from VHF aerials ??]

4. Selected Voluntary Observing Ship (VOS) – Complex Automatic Weather Station (AWS)

The Ships recruited to participate in the VOS scheme which are provided, by the meteorological service with complex AWS systems, measuring a variety of meteorological parameters, including pressure, sea temperature, air temperature, humidity, wind speed and wind direction. Depending on the system provided by the meteorological service, the following additional arrangements may be needed for new build ships:

- When AWS sensors, transmission systems, and associated units are located on a dedicated small mast, the deck plating should be suitably strengthened. Deck securing points may also need to be provided to facilitate guy wires.

- When the meteorological sensors are distributed on the ships structure the following installation considerations should be taken into account
    - The position of transmission antennae should comply with specified electrical clearance distances avoid interference from other ships antennae or electrical sources [4m from HF and 2m from VHF aerials??] and should ideally be located on the mast in a position that will allow unobstructed line of sight to geostationary satellites.
    - The position of the anemometer should provide good exposure, free from any obstructions that may interfere with the airflow. The optimum location for the anemometer will usually be on the foremast (i.e. for ships with aft accommodation superstructures)
    - The position of the temperature/ humidity screen should provide good exposure to allow unobstructed airflow and to avoid radiation heat sources. They are usually located on the ships monkey island fixed by brackets to an adjacent handrail or bulwark.
    - The hull contact sensor for measuring sea surface temperatures should normally be located on the ships hull plating in the ships engine room or a suitable void space, and positioned [approx 1 metre] below the waterline at the ships lightest operating draft, free from any adjacent heat sources in so far as is possible
- bulkhead or deck penetrations should be provided to allow cables to be led from the AWS unit or sensors to the central bridge computer, display and electronic junction boxes (when applicable) which would normally be located at the meteorological work surface in the wheelhouse (para 1 refers), and will need a dedicated electrical socket to provide access to the ships power. Typical cable requirements include for example;
    - Wind Sensor - [8 core multi-strand shielded cable from wheelhouse to sensor location on the mast]
    - Gyro Compass - [2 core multi-strand shielded cable from wheelhouse to gyro room]
    - Sea temperature sensor - [4 core braid-shielded cable from wheelhouse to sensor location in engine room or void space]. Existing ships spare cable capacity to engine room may be useable
    - Transmission system - [dedicated cable dependant upon system used – Inmarsat, iridium etc – from wheelhouse to antennae location]
    - Pressure sensor (Barometer) - [4 core multi-strand shielded cable from sensor to wheelhouse (depending on location)]
    - [Data transfer logging cables – multi- strand shielded cable as required]
- Access to the ships gyrocompass or gyro-repeaters may be needed to provide directional values to the ships anemometer readings, although some AWS systems may incorporate built in magnetic or fluxgate compasses. Where connection to the gyro is needed it may be considered necessary to provide an optical isolator to ensure that there is no interference with navigational safety

5. Automated Shipboard Aerological Programme (ASAP) Ships

A small number of observing ships are recruited to provide upper air data from radiosonde balloons, and are provided by the meteorological services with equipment. These ships contribute to the ASAP programme. ASAP ships designs can be based upon a 'modular' configuration with all the ASAP systems housed within standard 10 or 20 foot shipping containers, or may use a 'distributed' configuration, where the ground station and associated transmission system can be located in the host ship's wheelhouse. Depending on the arrangements provided by the meteorological Service, the following considerations should be taken into account in the ships initial design:

- Sufficient free deck space should be allocated for the [10 or 20 foot] shipping container, or any manual deck launching devices that may be provided by the meteorological

services. The locations chosen for these launching systems should not interfere with the ship's emergency embarkation arrangements, fire protection or safety arrangements, or with safe navigation of the ship.

- Where manual deck launchers are used there should be sufficient free space available to enable the launcher to be transferred to either side of the ship (to facilitate launching in lee wind conditions)

- The launching area should permit, as far as is possible, the radiosonde balloon to be launched such that it will not snag the funnel or ships superstructure during its ascent

- Where containerised systems are used suitable deck securing points should be provided and the deck plating strengthened where needed

- Access to the ships power supply should be available to the container

- When they are not located in a dedicated container, a suitable locker or other suitable storage location should be provided for spare radiosondes and balloons [Dimensions??]

- A suitable free deck space [dimensions ?] for securing the helium gas bottle racks , ideally located close to the launching area, but positioned so that replacement gas bottles/pallets can be easily loaded and positioned using the ships lifting appliances

- Plastic or copper piping from the helium bottles to the launching container and/or deck launcher. The piping should not interfere with the ships working or safety arrangements

- A suitable location high up in the ship (usually the monkey island) may be needed to install the dedicated aerial for receiving the raw data from the radiosonde. (This could be a directional mushroom aerial or a multi-directional dipole aerial). Lugs may need to be welded to the deck and a stand plate may be needed to secure the aerial pedestal. Anti vibration, mountings may be needed.

- A suitable location may also be needed for installing a dedicated Inmarsat Sat C aerial or other transmission system aerial for transmitting the upper air observations back to the meteorological services i.e. if the ships transmission system is not used

- A suitable location for an independent GPS aerial for determining the relative position of the ship and radiosonde

- bulkhead or deck penetrations should be provided to allow cables to be lead from the ASAP ground station computer when located in the wheelhouse to the required antennae

- The position of ASAP transmission antennae should be located to avoid interference from other ships antennae or electrical sources [4m from HF and 2m from VHF aerials ??] and free of obstructions that could prevent them receiving or transmitting signals e.g. masts, large funnels containers etc

6. Auxiliary Voluntary Observing Ship (VOS)

Auxiliary ships recruited by the meteorological service to the Voluntary Observing Ship (VOS) Scheme use their own ships' instruments to prepare and submit weather observations. To ensure that new ships can be considered suitable for future recruitment to the VOS Scheme it is recommended that

shipowners request that the instruments or automatic systems supplied, comply with the following design and construction standards

- [WMO Publication No 8]
- [ISO standards]
- [add resolution and accuracy requirements]

[Requires further consideration/development]

7. Ships Of Opportunity (SOOP)

[Someone else to add some basic requirements that will not scare the shipowners???]

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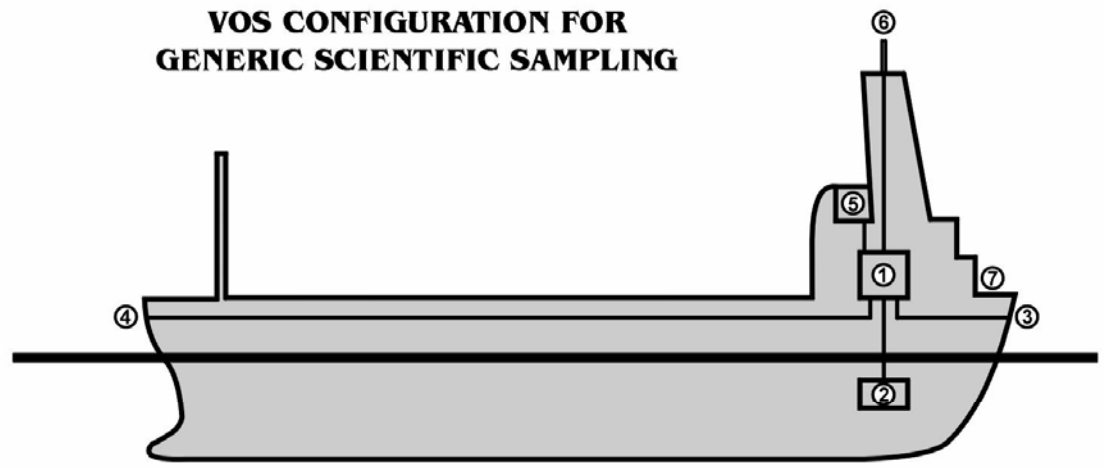
In accommodating all the above [Standards] [Specifications] [Recommendations] shipowners, shipbuilders and naval architects shall ensure that the arrangements are in accordance with, and do not conflict with, SOLAS requirements applicable to new vessels. In particular, it should be ensured that SOLAS fire class division requirements are observed and that the arrangements do not interfere with any navigational or life-saving requirements that may be applicable



① Dedicated scientific space for electronics & ship rider.
② Source & exit of sea & fresh water in engine room.
Power, LAN & antenna cable runs to scientific space.
③ Power, LAN & antenna cable runs to stern through scientific space.
④ Power, LAN & antenna cable & air tube runs to bow through scientific space.
⑤ Power, LAN & antenna cable & air tube runs to bridge through scientific space
Bridge displays of appropriate sensors for ships use.
⑥ Antenna, GPS & power cable runs to bridge railing or stack area, for position & real-time data transmission.
⑦ Deck or interior storage space for XBTs / Drifter / Floats.

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