



ASSEMBLY
20th session
Agenda item 11

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RESOLUTION A.849(20)

adopted on 27 November 1997

CODE FOR THE INVESTIGATION OF MARINE CASUALTIES AND INCIDENTS

THE ASSEMBLY,

RECALLING article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety and the prevention and control of marine pollution from ships,

NOTING with concern that, despite the best endeavours of the Organization, casualties and incidents resulting in loss of life, loss of ships and pollution of the marine environment continue to occur,

NOTING ALSO that the safety of seafarers and passengers and the protection of the marine environment can be enhanced by timely and accurate reports identifying the circumstances and causes of marine casualties and incidents,

NOTING FURTHER the rights and obligations of coastal and flag States under the provisions of articles 2 and 94 of the United Nations Convention on the Law of the Sea (UNCLOS),

NOTING IN ADDITION the responsibilities of flag States under the provisions of the International Convention for the Safety of Life at Sea, 1974 (regulation I/21), the International Convention on Load Lines, 1966 (article 23) and the International Convention for the Prevention of Pollution from Ships, 1973 (article 12), to conduct casualty investigations and to supply the Organization with relevant findings,

CONSIDERING the need to ensure that flag States are required, under the aforementioned conventions, to investigate all cases of serious and very serious casualties,

ACKNOWLEDGING that the investigation and proper analysis of marine casualties and incidents can lead to greater awareness of casualty causation and result in remedial measures, including better training, for the purpose of enhancing safety of life at sea and protection of the marine environment,

RECOGNIZING the need for a code to provide, as far as national laws allow, a standard approach to marine casualty and incident investigation with the sole purpose of correctly identifying the causes and underlying causes of casualties and incidents,

RECOGNIZING ALSO the international nature of shipping and the need for co-operation between Governments having a substantial interest in a marine casualty or incident for the purpose of determining the circumstances and causes thereof,

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HAVING CONSIDERED the recommendations made by the Maritime Safety Committee at its sixty-eighth session and by the Marine Environment Protection Committee at its fortieth session:

1. ADOPTS the Code for the Investigation of Marine Casualties and Incidents set out in the Annex to the present resolution;
2. INVITES all Governments concerned to take appropriate measures to give effect to the Code as soon as possible;
3. REQUESTS flag States to conduct an investigation into all very serious and serious marine casualties and to supply the Organization with all relevant findings;
4. REVOKES resolutions A.173(ES.IV), A.440 (XI) and A.637(16).

ANNEX

CODE FOR THE INVESTIGATION OF MARINE CASUALTIES AND INCIDENTS

1 Introduction

1.1 This Code recognizes that under IMO conventions each flag State has a duty to conduct an investigation into any casualty occurring to any of its ships when it judges that such an investigation may assist in determining what changes in the present regulations may be desirable or if such a casualty has produced a major deleterious effect upon the environment. The Code also takes into account that under the provisions of UNCLOS article 94, a flag State shall cause an inquiry to be held, by or before a suitably qualified person or persons into certain casualties or incidents of navigation on the high seas. However, the Code also recognises that where a casualty occurs within the territorial sea or internal waters of a State, that State has a right, under UNCLOS article 2, to investigate the cause of any such casualty which might pose a risk to life or to the environment, involve the coastal State's search and rescue authorities, or otherwise affect the coastal State.

1.2 The aim of this Code is to promote a common approach to the safety investigation of marine casualties and incidents, and also to promote co-operation between States in identifying the contributing factors leading to marine casualties. The result of this common approach and co-operation will be to aid remedial action and to enhance the safety of seafarers and passengers and the protection of the marine environment. In achieving these aims, this Code recognizes the need for mutual respect for national rules and practices and puts particular emphasis upon co-operation.

1.3 By introducing a common approach to marine casualty investigations and the reporting on such casualties, the international maritime community may be better informed about the factors which lead up to and cause, or contribute to, marine casualties. This may be facilitated by:

- .1 Clearly defining the purpose of marine casualty investigation and the guiding principles for its conduct.
- .2 Defining a framework for consultation and co-operation between substantially interested States.
- .3 Recognizing that the free flow of information will be promoted if individuals who are attempting to assist the investigation may be offered a degree of immunity, both from self-incrimination and from any ensuing risk to their livelihood.
- .4 Establishing a common format for reports to facilitate publication and sharing of the lessons to be learned.

1.4 It is not the purpose of the Code to preclude any other form of investigation, whether for civil, criminal, administrative, or any other form of action, but to create a marine casualty investigation process the aim of which is to establish the circumstances relevant to the casualty, to establish the causal factors, to publicise the causes of the casualty and to make appropriate safety recommendations. Ideally, marine casualty investigation should be separate from, and independent of, any other form of investigation.

2 Objective

The objective of any marine casualty investigation is to prevent similar casualties in the future. Investigations identify the circumstances of the casualty under investigation and establish the causes and contributing factors, by gathering and analysing information and drawing conclusions. Ideally, it is not the purpose of such investigations to determine liability, or apportion blame. However, the investigating authority should not refrain from fully reporting the causes because fault or liability may be inferred from the findings.

3 Application

This Code applies, as far as national laws allow, to the investigation of marine casualties or incidents where either one or more interested States have a substantial interest in a marine casualty involving a ship under their jurisdiction.

4 Definitions

For the purpose of this Code:

4.1 *Marine casualty* means an event that has resulted in any of the following:

- .1 the death of, or serious injury to, a person that is caused by, or in connection with, the operations of a ship; or
- .2 the loss of a person from a ship that is caused by, or in connection with, the operations of a ship; or
- .3 the loss, presumed loss or abandonment of a ship; or
- .4 material damage to a ship; or
- .5 the stranding or disabling of a ship, or the involvement of a ship in a collision; or
- .6 material damage being caused by, or in connection with, the operation of a ship; or
- .7 damage to the environment brought about by the damage of a ship or ships being caused by, or in connection with, the operations of a ship or ships.

4.2 *Very serious casualty* means a casualty to a ship which involves the total loss of the ship, loss of life or severe pollution.

4.3 *Serious casualty* means a casualty which does not qualify as a very serious casualty and which involves:

- .1 a fire, explosion, grounding, contact, heavy weather damage, ice damage, hull cracking or suspected hull defect, etc., resulting in;
- .2 structural damage rendering the ship unseaworthy, such as penetration of the hull underwater, immobilization of main engines, extensive accommodation damage etc.; or
- .3 pollution (regardless of quantity); and/or

.4 a breakdown necessitating towage or shore assistance.

4.4 *Marine incident* means an occurrence or event being caused by, or in connection with, the operations of a ship by which the ship or any person is imperilled, or as a result of which serious damage to the ship or structure or the environment might be caused.

4.5 *Causes* means actions, omissions, events, existing or pre-existing conditions or a combination thereof, which led to the casualty or incident.

4.6 *Marine casualty or incident safety investigation* means a process held either in public or in camera conducted for the purpose of casualty prevention which includes the gathering and analysis of information, the drawing of conclusions, including the identification of the circumstances and the determination of causes and contributing factors and, when appropriate, the making of safety recommendations.

4.7 *Marine casualty investigator* means a person or persons qualified and appointed to investigate a casualty, or incident, under procedures laid down in national legislation for the furtherance of marine safety and protection of the marine environment.

4.8 *Serious injury* means an injury which is sustained by a person in a casualty resulting in incapacitation for more than 72 hours commencing within seven days from the date of injury.

4.9 *Ship* means any kind of vessel which is used in navigation by water.

4.10 *Lead investigating State* means the State that takes responsibility for the conduct of the investigation as mutually agreed between the substantially interested States.

4.11 *Substantially interested State* means a State:

- .1 which is the flag State of a ship that is the subject of an investigation; or
- .2 in whose internal waters or territorial sea a marine casualty has occurred; or
- .3 where a marine casualty caused, or threatened, serious harm to the environment of that State, or within those areas over which the State is entitled to exercise jurisdiction as recognised under international law; or
- .4 where the consequences of a marine casualty caused, or threatened, serious harm to that State or to artificial islands, installations, or structures over which it is entitled to exercise jurisdiction; or
- .5 where, as a result of a casualty, nationals of that State lost their lives or received serious injuries; or
- .6 that has at its disposal important information that may be of use to the investigation; or
- .7 that for some other reason establishes an interest that is considered significant by the lead investigating State.

5 Conduct of marine casualty investigations

5.1 Where an investigation is to be conducted, the following should be taken into consideration:

- .1 Thorough and unbiased marine casualty investigations are the most effective way of establishing the circumstances and causes of a casualty.
- .2 Only through co-operation between States with a substantial interest can a full analysis be made of a marine casualty.
- .3 Marine casualty investigations should be given the same priority as criminal or other investigations held to determine responsibility or blame.
- .4 Marine casualty investigators should have ready access to relevant safety information including survey records held by the flag State, the owners, and classification societies. Access to information should not be barred by reason of competing investigations.
- .5 Effective use should be made of all recorded data, including voyage data recorders (VDR), if fitted, in the investigation of a marine casualty or marine incident wherever it occurred. The State conducting the investigation should arrange for the read-out of the VDR.
- .6 Marine casualty investigators should be afforded access to Government surveyors, coastguard officers, vessel traffic service operators, pilots or other marine personnel of the respective States.
- .7 The investigation should take into account any recommendations or instruments published by IMO or ILO, in particular those relating to the human factor, and any other recommendations or instruments adopted by other relevant international organizations.
- .8 Reports of investigations are most effective when released to the shipping industry and public.

5.2 In accordance with 9, other substantially interested States should be invited to be represented during any such investigation and should be admitted as a party in the proceedings and have equal standing, rights and access to evidence as the State conducting the investigation.

5.3 Recognizing that any vessel involved in a casualty may continue in service and that a ship should not be delayed more than is absolutely necessary, the State conducting the investigation should start the investigation as soon as practicable, without delaying the ship unreasonably. Other substantially interested States may, by mutual agreement, join the investigation either immediately or at a later stage.

6 Responsibility for investigating casualties and incidents

6.1 Flag States are encouraged to ensure that investigations are carried out into all casualties occurring to its ships. All cases of serious and very serious casualties should be investigated.

6.2 Where a marine casualty or incident occurs within the territorial sea of a State, the flag and coastal States recognizing the obligations of that State to its citizens and the legal status of the territorial sea under the provisions of UNCLOS and also recognising the duties placed on a flag State, the flag and coastal States should co-operate to the maximum extent possible, and mutually agree which State should take the role of lead investigating State.

6.3 Where a marine casualty or incident occurs on the high seas, a flag State should carry out an investigation into a casualty to, or on, any of its ships. If that casualty is a collision involving a ship of another flag State, then the States should consult with each other and agree which will be the lead investigating State

and determine the best means of co-operation under this Code. In line with 9.1, if another State is a substantially interested State by virtue of the nationality of the ship's crew, passengers or other persons, or the location of the casualty, that State or States should be invited to take part in the investigation.

6.4 By fully participating in an investigation conducted by another substantially interested State, the flag State shall be considered as fulfilling its obligations under UNCLOS article 94, section 7.

6.5 An investigation should be started as soon as practicable after the casualty occurs. Substantially interested States should, by mutual agreement, be allowed to join an investigation conducted by another substantially interested State at any stage of the investigation.

7 Responsibilities of the lead investigating State

The lead investigating State should be responsible for:

- .1 developing a common strategy for investigating the casualty in liaison with substantially interested States;
- .2 providing the investigator in charge and co-ordinating the investigation;
- .3 establishing the investigation parameters based on the laws of the investigating State and ensuring that the investigation respects those laws;
- .4 being the custodian of records of interviews and other evidence gathered by the investigation;
- .5 preparing the report of the investigation, and obtaining and reflecting the views of the substantially interested States;
- .6 co-ordinating, when applicable, with other agencies conducting other investigations;
- .7 providing reasonable logistical support; and for
- .8 liaison with agencies, organizations and individuals not part of the investigating team.

8 Consultation

8.1 Notwithstanding the obligation placed on the master or owners of a ship to inform its flag State authority of any casualty occurring to the ship, where a casualty or incident occurs in the internal waters or territorial sea of another State, the coastal State should notify, with a minimum of delay, the flag State or States of the circumstances and what, if any, action is proposed by the coastal State.

8.2 Following a casualty, the investigating State should inform the other substantially interested States, either through the Consular Office in that State or by contacting the relevant authorities listed in MSC/Circ.781/MEPC.6/Circ.2. That State and the other substantially interested States should consult, at the earliest opportunity, on the conduct of the investigation and to determine details of co-operation.

8.3 Nothing should prejudice the right of any State to conduct its own separate investigation into a marine casualty occurring within its jurisdiction according to its own legislation. Ideally, if more than one State desires to conduct an investigation of its own, the procedures recommended by this Code should be followed, and

those States should co-ordinate the timing of such investigations to avoid conflicting demands upon witnesses and access to evidence.

9 Co-operation

9.1 Where two or more States have agreed to co-operate and have agreed the procedures for a marine casualty investigation, the State conducting the investigation should invite representatives of other substantially interested States to take part in the investigation and, consistent with the purpose of this Code, allow such representatives to:

- .1 question witnesses;
- .2 view and examine evidence and take copies of documentation;
- .3 produce witnesses or other evidence;
- .4 make submissions in respect of the evidence, comment on and have their views properly reflected in the final report; and
- .5 be provided with transcripts, statements and the final report relating to the investigation.

9.2 States are encouraged to provide for maximum participation in the investigation by all States with a substantial interest in the marine casualty.

9.3 The flag State of a ship involved in a marine casualty should help to facilitate the availability of the crew to the investigation and encourage the crew to co-operate with the State conducting the investigation.

10 Disclosure of records

10.1 The State conducting the investigation of a casualty or incident, wherever it has occurred, should not make the following records, obtained during the conduct of the investigation, available for purposes other than casualty investigation, unless the appropriate authority for the administration of justice in that State determines that their disclosure outweighs any possible adverse domestic and international impact on that or any future investigation, and the State providing the information authorizes its release:

- .1 all statements taken from persons by the investigating authorities in the course of the investigation;
- .2 all communications between persons having been involved in the operation of the ship;
- .3 medical or private information regarding persons involved in the casualty or incident;
- .4 opinions expressed during the conduct of the investigation.

10.2 These records should be included in the final report, or its appendices, *only* when pertinent to the analysis of the casualty or incident. Parts of the record not pertinent, and not included in the final report, should not be disclosed.

11 Personnel and material resources

Governments should take all necessary steps to ensure that they have available sufficient means and suitably qualified personnel and material resources to enable them to undertake casualty investigations.

12 Issue of marine casualty reports and submission to IMO

12.1 The lead investigating State should send a copy of the draft of the final report to all substantially interested States, inviting their significant and substantiated comments on the report as soon as possible. If the lead investigating State receives comments within thirty days, or within some mutually agreed period, it should either amend the draft final report to include the substance of the comments, or append the comments to the final report. If the lead investigating State receives no comments after the mutually agreed period has expired, it should send the final report to the Organization in accordance with applicable requirements and cause the report to be published.

12.2 By fully participating in an investigation conducted by another substantially interested State that will be reporting to IMO, the flag State shall be considered as fulfilling its obligations under IMO conventions.

12.3 Reports, or relevant parts of reports, into the circumstances and causes of a marine casualty should be completed as quickly as practicable, and be made available to the public and the shipping industry in order to enhance safety of life at sea and protection of the marine environment through improved awareness of the factors which combine to cause marine casualties.

12.4 Where a substantially interested State disagrees with whole or part of the report referred to in 12.1 above, it may submit its own report to the Organization.

12.5 The investigating State, upon determining that urgent safety action is needed, may initiate interim recommendations to the appropriate authority.

13 Re-opening of investigations

When new evidence relating to any casualty is presented, it should be fully assessed and referred to other substantially interested States for appropriate input. In the case of new evidence which may materially alter the determination of the circumstances under which the marine casualty occurred, and may materially alter the findings in relation to its cause or any consequential recommendations, States should reconsider their findings.

14 Contents of reports

14.1 To facilitate the flow of information from casualty investigations, each report should conform to the basic format outlined in 14.2 below.

14.2 Reports should include, wherever possible:

- .1 a summary outlining the basic facts of the casualty and stating whether any deaths, injuries or pollution occurred as a result;
- .2 the identity of the flag State, owners, managers, company and classification society;
- .3 details of the dimensions and engines of any ship involved, together with a description of the

crew, work routine and other relevant matters, such as time served on the ship;

- .4 a narrative detailing the circumstances of the casualty;
- .5 analysis and comment which should enable the report to reach logical conclusions, or findings, establishing all the factors that contributed to the casualty;
- .6 a section, or sections, analysing and commenting on the causal elements, including both mechanical and human factors, meeting the requirements of the IMO casualty data base; and
- .7 where appropriate, recommendations with a view to preventing similar casualties.

15 Contact between Administrations

To facilitate implementation of this Code, States should inform the Organization of the responsible authorities within their Governments that may be contacted regarding cooperation in casualty investigations.

Appendix

Guidelines to assist investigators in the implementation of the Code

Introduction

The contents of this section should be treated as guidelines to assist investigators co-operating in an investigation. Investigators should bear in mind the information required under the IMO marine casualties and incidents reporting system.

In following this Code, participating investigators must be guided by the requirements of the legal system of the State in which the investigation is being conducted. In particular, co-operating investigators must be guided by the requirements of national law over issues such as:

- providing formal notification of an investigation to interested parties;
- boarding ships and securing documents;
- arranging interviews with witnesses;
- the presence of legal advisers or other third parties during an interview.

1. Information generally required in all cases

1.1 Particulars of the ship

Name, IMO number, nationality, port of registry, call sign

Name and address of owners and operators, if applicable, also, if an overseas ship, of agents

Type of ship

Name and address of charterer, and type of charter

Deadweight, net and gross tonnages, and principal dimensions

Means of propulsion; particulars of engines

When, where and by whom built

Any relevant structural peculiarities

Amount of fuel carried, and position of fuel tanks

Radio (type, make)

Radar (number, type, make)

Gyro compass (make, model)

Automatic pilot (make, model)

Electronic positioning equipment (make, model) (GPS, Decca, etc.)

Life saving equipment (dates of survey/expiry)

1.2 Documents to be produced

(Note: Any documents that may have relevance to the investigation should be produced. Where possible original documents should be retained, otherwise authenticated and dated photocopies should be taken in accordance with 9.1.2 of the Code. A number of these documents will contain details sought under 1.1 of these Guidelines.)

Ship's register
Current statutory certificates
ISM Code certification
Classification society or survey authority certificates
Official log book
Crew list
Crew qualifications (see also 1.4 of these Guidelines)
Deck log book
Port log, log abstract and cargo log book
Engine movement book
Engine-room log book
Data logger print-out
Course recorder chart
Echo sounder chart
Oil record book
Soundings book
Night order book
Master's/Chief Engineer's Standing Orders
Company Standing Orders/Operations Manual
Company Safety Manual
Compass error book or records
Radar log book
Planned maintenance schedules
Repair requisition records
Articles of Agreement
Bar records - daily purchases - voyage receipts, etc.
Records of drug and alcohol tests
Passenger list
Radio log
Ship Reporting records
Voyage Plan
Charts and record of chart corrections
Equipment/machinery manufacturer's operational/maintenance manuals
Any other documentation relevant to the inquiry

1.3 Particulars of voyage

Port at which voyage commenced and port at which it was to have ended, with dates

Details of cargo

Last port and date of departure

Draughts (forward, aft and midships) and any list

Port bound for at time of occurrence

Any incident during the voyage that may have a material bearing on the incident, or unusual occurrence, whether or not it appears to be relevant to the incident

Plan view of ship's layout including cargo spaces, slop tanks, bunker/fuel lube oil tanks (diagrams from IOPP Certificate)

Details of cargo, bunkers, fresh water and ballast and consumption

1.4 Particulars of personnel involved in incident

Full name

Age

Details of injury

Description of accident

Person supervising activity

First aid or other action on board

Capacity on board

Certificate of Competency/Licence:

grade;

date of issue;

issuing country/authority;

other Certificates of Competency held

Time spent on vessel concerned

Experience on similar vessels

Experience on other types of vessels

Experience in current capacity

Experience in other ranks

Number of hours spent on duty on that day and the previous days

Number of hours sleep in the 96 hours prior to the incident

Any other factors, on board or personal, that may have affected sleep

Whether smoker, and if so, quantity

Normal alcohol habit

Alcohol consumption immediately prior to incident or in the previous 24 hours

Whether under prescribed medication

Any ingested non-prescribed drugs

Records of drug and alcohol tests

1.5 **Particulars of sea state, weather and tide**

Direction and force of wind
Direction and state of sea and swell
Atmospheric conditions and visibility
State and height of tide
Direction and strength of tidal and other currents, bearing in mind local conditions

1.6 **Particulars of the incident**

Type of incident
Date, time and place of incident
Details of incident and of the events leading up to it and following it
Details of the performance of relevant equipment with special regard to any malfunction
Persons on bridge
Persons in engine-room
Whereabouts of the master and chief engineer
Mode of steering (auto or manual)
Extracts from all relevant ship and, if applicable, shore documents including details of entries in official, bridge, scrap/rough and engine-room log books, data log printout, computer printouts, course and engine speed recorder, radar log, etc.
Details of communications made between vessel and radio stations, SAR centres and control centres, etc., with transcript of tape recordings where available
Details of any injuries/fatalities
Voyage data recorder information (if fitted) for analysis

1.7 **Assistance after the incident**

If assistance was summoned, what form and by what means
If assistance was offered or given, by whom and of what nature, and whether it was effective and competent
If assistance was offered and refused, the reason for refusal

1.8 **Authentication of documents**

The master should be asked to authenticate all documents and to sign all copies taken of documents as being true copies, also to authenticate relevant dates and times

1.9 **Engine-room orders**

In all cases where a collision or a stranding is the subject of an investigation, and the movements of the engine are involved, the master or officer on watch and other persons in a position to speak with knowledge are to be asked whether the orders to the engine-room were promptly carried out. If there is any doubt on the matter, the investigator shall refer to it in his report.

1.10 **External sources of information**

Investigators should consider independent corroborating information from external sources such as radar or voice recordings from vessel traffic systems, shore radar and radio surveillance systems, marine rescue co-ordination centres, coroners and medical records.

2. Additional information required in specific cases

2.1 Fire/Explosion

(Investigators should bear in mind the IMO Fire Casualty Record.)

How was the ship alerted to the fire?

How was the individual alerted to the fire?

Where did it start?

How did it start (if known)?

What was the immediate action taken?

Condition of fire-fighting equipment, supported by dates of survey/examination

Extinguishers available:

 Type available in the vicinity;

 Types available on the ship;

 Types used

Hoses available/used

Pumps available/used

Was water immediately available?

Were air vents closed off to the space?

What was the nature of the material on fire and surrounding the fire?

Fire retardant specification of bulkheads surrounding the fire

Restrictions caused by (a) smoke, (b) heat, (c) fumes

Freedom of access

Access availability for fire fighting equipment

Preparedness of crew - Frequency, duration, content and locations of fire musters and drills

Response by land-based fire-fighting brigades

2.2 Collision

(Investigators should bear in mind the IMO Damage cards and intact stability reporting format.)

General

Local or other special rules for navigation

Obstructions, if any, to manoeuvring, e.g. by a third vessel, shallow or narrow waters, beacon, buoy, etc.

Circumstances affecting visibility and audibility, e.g. state of the sun, dazzle of shore lights, strength of wind, ship-board noise and whether any door or window could obstruct look-out and/or audibility

Geographical plot

Possibilities of interaction

Name, IMO number, nationality and other details of other vessel

For each ship:

Time, position, course and speed (and method by which established), when presence of other ship first became known
 Details of all subsequent alterations of course and speed up to collision by own ship
 Bearing, distance and heading of other ship, if sighted visually, time of sighting, and subsequent alterations
 Bearing and distance of other ship, if observed by radar, timing of observations and subsequent alterations of bearing
 If other ship was plotted and by what method (auto-plot, reflection plotter, etc.), and copy of plot, if available
 Check performance of equipment
 Course recorder
 Lights/day signals carried and operated in ship, and those seen in other ship
 Sound signals, including fog signals, made by ship and when, and those heard from other ship and when
 If a listening watch was kept on VHF radio channel 16, or other frequency, and any messages sent, received or overheard
 Number of radars carried on ship, number operational at time of casualty, together with ranges used on each radar
 Whether steering by hand or automatic
 Check that steering was operating correctly
 Details of look-out
 The parts of each ship which first came into contact and the angle between ships at that time
 Nature and extent of damage
 Compliance with statutory requirement to give name and nationality to other ship and to stand by after collision

2.3 Grounding

Details of voyage plan, or evidence of voyage planning
 Last accurate position and how obtained
 Subsequent opportunities for fixing position or position lines, by celestial or terrestrial observations, GPS, radio, radar or otherwise, or by lines of soundings and, if not taken, why not
 Chart datum comparison to WGS datum
 Subsequent weather and tidal or other currents experienced
 Effect on compass of any magnetic cargo, electrical disturbance or local attraction
 Radar/s in use, respective ranges used, and evidence of radar performance monitoring and logging
 Charts, sailing directions and relevant notices to mariners held, if corrected to date, and if any warnings they contain had been observed
 Depth soundings taken, when and by what means
 Tank soundings taken, when and by what means
 Draught of ship before grounding and how determined
 Position of grounding and how determined
 Cause and nature of any engine or steering failure before the grounding
 Readiness of anchors, their use and effectiveness
 Nature and extent of damage
 Action taken, and movements of ship, after grounding
 (Note: information as in cases of foundering may also be required)

2.4 **Foundering**

(Investigators should bear in mind the IMO damage cards and intact stability reporting format.)

Draught and freeboard on leaving last port and changes consequent upon consumption of stores and fuel

Freeboard appropriate to zone and date

Loading procedures, hull stresses

Particulars of any alterations to hull or equipment, since survey, and by whom such alterations sanctioned

Condition of ship, possible effects on seaworthiness

Stability data and when determined

Factors affecting stability, e.g. structural alterations, nature, weight, distribution and shift of any cargo and ballast, free surface in tanks or of loose water in ship

Subdivision by watertight bulkheads

Position of, and watertight integrity of, hatches, scuttles, ports and other openings

Number and capacity of pumps and their effectiveness; the position of suction

Cause and nature of water first entering ship

Other circumstances leading up to foundering

Measures taken to prevent foundering

Position where ship foundered and how established

Life-saving appliances provided and used, and any difficulties experienced in their use

2.5 **Pollution resulting from an incident**

(Investigators should bear in mind IMO reporting of incidental spillages of liquids, 50 tonnes or more, and reporting of information from investigation of incidents involving dangerous goods or marine pollutants in packaged form.)

Type of pollutant.

UN number/IMO hazard class (if applicable).

Type of packaging (if applicable).

Quantity on board.

Quantity lost.

Method of stowage and securing.

Where stowed and quantities in each compartment/container.

Tanks/spaces breached.

Tanks/spaces liable to be breached.

Action taken to prevent further loss.

Action taken to mitigate pollution.

Dispersant/neutraliser used, if any.

Restricting boom used, if any.

3. Securing of physical evidence

3.1 Occasions may arise where physical evidence may be available and which will require scientific examination. Some examples are oil, paint/scale, pieces of equipment and machinery, pieces of structure.

3.2 Before removal, such evidence should first be photographed *in situ*. The sample should then be photographed on a clear background before being placed in an appropriate clean container(s), glass bottle, plastic bag, tin container, etc. The container should be sealed and clearly labelled, showing contents, name of vessel, location from which the evidence was taken, the date and the name of the investigator. For items of equipment and machinery, copies of the relevant certificates should be obtained.

3.3 Where paint samples are being taken for identification purposes in collision cases, a sample of paint from the ship's paint drum should also be obtained if possible.

3.4 Advice should be sought on the correct container to use. For example, plastic bags are suitable for paint samples, but are not suitable in investigations of fires where materials may need to be tested for accelerant, in which case sealable tin cans are preferred.

4. Voyage data recorders

Where information from a voyage data recorder (VDR) is available, in the event that the State conducting the investigation into a casualty or serious incident does not have appropriate facilities for readout of the VDR, it should seek and use the facilities of another State, giving consideration to the following:

- .1 the capabilities of the readout facility;
- .2 the timeliness of the availability of the facility; and
- .3 the location of the readout facility.

5. Other sources of information

Investigators should bear in mind that other Government agencies, such as customs, quarantine and State Authorities, may have useful information relating to crew lists, the general condition of the ship, stores lists (including alcohol on board), ship certificates, etc. Port authorities and independent surveyors may also hold information of use to an investigation.

