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**RESOLUTION A.854(20)
adopted on 27 November 1997**

**GUIDELINES FOR DEVELOPING SHIPBOARD EMERGENCY
PLANS FOR SHIPS CARRYING MATERIALS
SUBJECT TO THE INF CODE**

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention of the International Maritime Organization concerning the function of this Assembly in relation to regulations and guidelines concerning maritime safety, the prevention and control of marine pollution from ships, and other matters concerning the effect of shipping on the marine environment,

HAVING ADOPTED by resolution A.853(20), amendments to the INF Code on shipboard emergency plans and notification in the event of an incident involving materials subject to the Code,

RECOGNIZING the need to have a consistent approach to the development of shipboard emergency plans,

HAVING CONSIDERED the recommendations made by the MSC at its sixty-eighth session and by the MEPC at its thirty-ninth session and fortieth session:

1. ADOPTS the Guidelines for Developing Shipboard Emergency Plans for Ships Carrying Materials subject to the INF Code set out at Annex to this resolution; and
2. URGES Governments, in implementing the provisions referring to this subject in the INF Code, to use the Guidelines set out at Annex to this resolution.

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ANNEX

**GUIDELINES FOR DEVELOPING SHIPBOARD EMERGENCY PLANS FOR
SHIPS CARRYING MATERIALS SUBJECT TO THE INF CODE****FOREWORD**

These Guidelines, prepared by the Marine Environment Protection Committee of the International Maritime Organization (IMO) contain information for the preparation of Shipboard Emergency Plans for Ships Carrying Materials Subject to the IMO Code for the Safe Carriage of Irradiated Nuclear Fuel, Plutonium, and High-Level Radioactive Wastes in Flasks on board Ships (INF Code). These Guidelines were developed as part of the work assigned by the Assembly to the Committees regarding the review and amendment of the INF Code.

The main objectives of these Guidelines are:

- to assist shipowners in preparing comprehensive shipboard emergency plans for ships carrying INF Code materials; and
- to assist in responding to shipboard emergencies involving INF Code materials and in providing information in accordance with international law to authorities involved in assisting or handling incidents at sea involving INF Code materials.

In the interest of uniformity, Governments are requested to refer to these Guidelines when preparing appropriate national regulations. While in port or an offshore terminal, the carriage of a shipboard emergency plan for ships carrying materials subject to the INF Code should be subject to inspection by duly authorized officers.

The type of emergency planning and preparedness that is needed for responding to transport incidents involving INF Code materials is, to some extent, similar to that required for responding to transport accidents involving non-radioactive hazardous or noxious substances. Accordingly, emergency response organizations and personnel may apply the concepts used to respond to incidents involving other types of hazardous or noxious substances, employing special knowledge, skills and equipment to deal effectively with the wide range of possible consequences of incidents involving INF Code materials.

In the case where a ship is required to have a shipboard emergency plan by other international instruments, the plan provided for in these Guidelines may be combined with such other plans. In this case, the title of such a combined plan should be "Shipboard Marine Emergency Plan".

1 INTRODUCTION

1.1 These Guidelines have been developed to assist in the preparation of Shipboard Emergency Plans for Ships carrying materials subject to the INF Code ("Plan(s)"). These Guidelines were developed as part of the work assigned by the Assembly regarding the review and amendment of the INF Code, particularly in view of paragraph 27 of the Code. The Plan(s) should be approved in accordance with the Code.

Definitions for the purpose of these Guidelines

1.2 *Incident* means any occurrence or series of occurrences, including loss of container integrity, having the same origin which results or may result in a release, or probable cargo release of INF Code materials.

1.3 *Shipboard Emergency Plan* or *Plan* means a document that is tailored to a particular ship carrying INF Code materials and contains the procedures to be followed to ensure shipboard preparedness for responding to emergencies.

1.4 *Release* means the escape of INF Code materials from its containment system or the loss of an INF Code package.

1.5 The Guidelines are comprised of three sections:

- .1 Introduction: This section provides a general overview of the subject matter and introduces the reader to the basic concept of the Guidelines and the Plans that are expected to be developed from them.
- .2 Essential provisions: This section provides those elements that should, at a minimum, be included in a Plan.
- .3 Additional provisions: This section provides guidance concerning the inclusion of other information in the Plan. Such information may be required by local authorities in ports visited by the ship, or it may be added to provide additional assistance to the ship's master when responding to an emergency situation. The section also provides guidance on updating and training and exercises to test the plan.

Concept of the Guidelines

1.6 The Guidelines are intended to provide a starting point for the preparation of specific Shipboard Emergency Plans for each ship engaged in transporting INF Code materials. Plan writers are cautioned that they should consider in their Plans the many variables that apply to their ships. Some of these variables include: type and size of ship, category of INF Code materials and their physical properties, route, and shore-based management structure. The Guidelines are not intended to be a compilation of menu items from which the Plan writer can select certain sections and produce a workable Plan, but rather a process to ensure preparedness for responding to emergencies. For a Plan to be effective, it should be carefully tailored to the particular ship for which it is intended. Properly used, the Guidelines will ensure that all appropriate issues are considered in developing the Plan.

Concept of the Plan

1.7 The Plan is intended to assist personnel in avoiding the further escalation of an incident and in dealing with an actual or potential release of INF Code materials. Its primary purpose is to set in motion the necessary actions to avoid or minimize a release and to mitigate its effects. Regardless of the magnitude of an incident, effective planning ensures that the necessary actions are taken in a structured, logical, safe, and timely manner.

1.8 The Plan should provide for small or routine emergencies. However, it should also include guidance to assist the master in meeting the demands of a large scale incident, should the ship become involved in one.

1.9 The need for a predetermined and properly structured Plan is clear when one considers the pressures and multiple tasks facing personnel confronted with an emergency situation. In the heat of the moment, lack of proper planning will often result in confusion, mistakes, and failure to advise key people. Delays will be incurred and time will be wasted, time during which the situation may well worsen. As a consequence, the ship, its personnel, and the public may be exposed to increasing hazards, and greater environmental damage may result.

1.10 Shipboard emergency plans should be realistic, practical, and easy to use. They should be understood by ship management personnel, both onboard and ashore, and be evaluated, reviewed, and updated regularly.

1.11 The Plan is envisioned as a simple document. Use of summarizing flow charts or checklists to guide the master through the various actions and decisions required during an incident response is highly encouraged. These can provide a quickly visible and logically sequenced form of information which can reduce error and oversight during emergency situations. Inclusion of extensive background information on the ship or cargo should be avoided, as this is generally available elsewhere. If such information is relevant, it should be kept in annexes where it will not make it more difficult for ship personnel to locate operative parts of the Plan.

1.12 An example of a summarizing flow chart referred to in 1.11 is included in appendix I.

1.13 Also, since the Plan is intended to be a document used on board by master and officers of the ship, it is imperative that one copy in the language understood by crew members with responsibilities under the Plan, as well as an English copy, is carried on board. A change in the master and officers which brings about an attendant change in their working languages would require the issuance of the Plan in the new language.

Responsibilities for action

1.14 Responsibilities for preparing and dealing with a marine transport incident involving INF Code materials are generally divided among several entities: Governments, organizations, and persons. The severity, or potential severity, of the incident in terms of its consequences typically would determine the level of response and involvement of these entities.

1.15 The consignor or shipper is responsible for ensuring that before the transport of INF Code material, carriers are made fully aware of the procedures to be followed, both on board the ship and by shore-based organizations, in the event of an incident involving such materials. It is the responsibility of the consignor or shipper to know and comply with all applicable international, national, state, or local regulations or guidelines pertaining to the shipment of INF Code materials, and how to deal with all the potential difficulties anticipated when shipping by sea. In addition, the consignor should make available to the carrier the appropriate technical information, emergency instructions, and notification information. Generally, the consignor should be prepared to assist in an emergency response to an incident involving any INF Code materials by providing timely and detailed information about shipments and to send immediately emergency response/support assets to an incident site, if required. The planning for such assistance should be complementary to the Plan.

1.16 The carrier also has responsibilities both for safety during transport and in the event of an incident. In general, both the carrier and the consignor should be prepared to respond immediately to an incident involving INF Code materials. The carrier also has the responsibility to know and comply with all applicable regulations pertaining to the carriage of INF Code materials. This may include being informed of the different response procedures in all areas along the route; ensuring that if an incident occurs, it is

properly and rapidly assessed by people knowledgeable in responding to incidents involving INF Code material; ensuring that proper emergency instructions are carried on board the ship; facilitating a prompt response by the consignor/shipper and crew in the event of an incident; and ensuring that all required notifications are accomplished in an expeditious manner. Specifically, carrier personnel should ensure that they immediately inform the nearest coastal State, the consignor, and other appropriate authorities and act according to the Plan.

1.17 Distribution of the Plan should be as follows:

- the shipowner and operator should both keep a copy of the Plan and ensure that at least one copy is carried on board.

1.18 The Plan should clearly emphasize the following:

- Without interfering with shipowners' liability, some coastal States consider that it is their responsibility to define techniques and means to be taken against a marine pollution incident and approve such operations which might cause further pollution. States are in general entitled to do so under the International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 and the Protocol relating to Intervention on the High Seas in Cases of Pollution by Substances other than Oil, 1973.

1.19 Planning for incidents involving INF Code materials should be approached as part of a process which also includes the emergency response plans of local authorities and organizations. As noted in 1.15 above, the carriers are to be made fully aware of the international, national, state and local regulations pertaining to the shipment of INF Code materials and potential difficulties anticipated when shipping by sea by the consignor or shipper.

1.20 The content of each Plan should be determined by a consideration of the type of ship used for transporting INF Code materials, the packages used for transport, and the potential consequences of related transport incidents. Appendix II provides additional sources of information that may be useful in developing a Plan.

1.21 A shipowner or operator with multiple ships may prepare one plan with a separate ship-specific annex for each ship covered by the Plan and a separate geographic-specific appendix for each coastal State in which the ship(s) operate.

2 ESSENTIAL PROVISIONS OF SHIPBOARD EMERGENCY PLAN FOR SHIPS CARRYING MATERIALS SUBJECT TO THE INF CODE

2.1 In accordance with paragraph 27 of the Code, the Plan at a minimum should contain:

- .1 the procedure to be followed by the master or other persons having charge of the ship in reporting an incident involving INF Code materials, as required by paragraph 29;
- .2 the list of authorities or persons to be contacted in the event of an incident involving INF Code materials;
- .3 a detailed description of the action to be taken immediately by persons on board to prevent, reduce or control the release, and mitigate the consequences of the loss, of INF Code materials following the incident; and

- .4 the procedures and point of contact on the ship for coordinating shipboard action with national and local authorities.

2.2 The Plan should provide specific information regarding the ship, including:

- .1 the ship name, country of registry, call sign, and IMO identification number, if applicable;
- .2 the name, address, and procedures for contacting the consignor, consignee, shipper, shipowner or operator on a 24-hour basis; and
- .3 identification of communication equipment on board.

The coastal State report

2.3 Paragraphs 29 and 30 of the INF Code provide that the nearest coastal State should be notified of an actual or probable release. The intent of this provision is to ensure that coastal States are informed without delay of any incident giving rise to pollution, or threat of pollution, of the marine environment, or in the event of damage, failure or breakdown of a ship carrying INF Code materials, so that appropriate action may be taken.

2.4 **When required.** The Plan should provide clear, concise guidance to enable the master to determine when a report to the coastal State is required.

2.5 **Actual release.** A report to the nearest coastal State is required whenever there is any release of INF Code materials. A report should also be made in the event of damage, failure, or breakdown of a ship carrying INF Code materials which affects the safety of the ship, including allision, collision, grounding, fire, explosion, structural failure, flooding, and cargo shifting; and results in the impairment of the safety of navigation, including the failure or breakdown of steering gear, propulsion system, electrical generating system and essential shipborne navigational aids.

2.6 **Probable release.** The Plan should give the master guidance in evaluating a situation which, though not involving an actual release, would present a risk of a release and thus require a report. In judging whether there is such a risk and whether a report should be made, the following factors, as a minimum, should be taken into account:

- .1 the nature of the damage, failure or breakdown of the ship, machinery, equipment or the loss of cargo container integrity;
- .2 ship location and proximity to land or other navigational hazards;
- .3 weather, tide, current, and sea state; and
- .4 traffic density.

2.7 It is impracticable to lay down precise definitions of all types of situations involving risks which would warrant an obligation to report. As a general guideline, the master should make a report in cases of:

- .1 damage, failure, or breakdown which affects the safety of the ship such as allision, collision, grounding, fire, explosion, structural failure, flooding, or cargo shifting;

- .2 failure or breakdown of machinery or equipment which results in impairment of safety of navigation such as failure or breakdown of steering gear, propulsion, electrical generating system, and essential shipboard navigational aids; and
- .3 loss of cargo container integrity that may involve a release or probable release of INF Code materials.

2.8 **Information required.** The Plan shall specify, in appropriate detail, the procedure for making the initial report to the coastal State. The Organization's Guidelines on Reporting in resolution A.648(16) provide necessary detail for the Plan writer. The Plan should include a prepared message form, an example of which is included in appendix III to these Guidelines. Coastal States are encouraged to take note of the information in this appendix and accept it as sufficient information. Supplementary or follow-up reports should as far as possible use the same format.

2.9 The initial reporting by on-board personnel should include answers to the following questions:

- .1 Are there any injuries on board;
- .2 Is there (or was there) a fire near the INF Code materials;
- .3 What kind of radiological or chemical hazards exist; and
- .4 What are the meteorological conditions, including wind direction?

List of persons, agencies and organizations to be contacted

2.10 The ship involved in an incident involving INF Code material will have to communicate with both coastal State or port contacts and ship interest contacts. The Plan should include descriptions of the primary and secondary communications methods by which notifications will be made.

2.11 When compiling such contact lists, due account should be taken of the need to provide 24-hour contact information and to provide alternatives to the designated contact. These details should be routinely updated to take account of personnel changes and changes to telephone, fax, e-mail and telex numbers. Clear guidance should also be provided regarding the preferred means of communication (telephone, fax, e-mail, telex, etc.).

Coastal State contacts

2.12 In order to expedite response and minimize damage from an incident involving INF Code material, it is essential that the nearest coastal States be notified without delay.

2.13 The Plan should include as an appendix the list of agencies or officials of administrations responsible for receiving and processing reports of incidents involving INF Code materials. In the absence of a listed focal point, or should any undue delay be experienced in contacting the responsible authority by direct means, the master should be advised to contact the nearest rescue coordination centre, coastal radio station, or designated ship movement reporting station by the quickest available means to accomplish the report. See IMO list of National Operational Contact Points.

Port contacts

2.14 For ships in port, notification of local agencies will speed response. Information on regularly visited ports should be included as an appendix to the Plan. Where this is not feasible, the Plan should require the master to obtain details concerning local reporting procedures upon arriving in port.

Ship interest contacts

2.15 The Plan should provide details of all parties with an interest in the ship to be advised in the event of an incident. This information should be compiled in the form of a contact list. When compiling such lists, it should be remembered that in the event of a serious incident, ship's personnel may be fully engaged in saving life and taking steps to control and minimize the effects of the incident. They should therefore not be hampered by having onerous communications requirements imposed on them.

2.16 Procedures will vary between companies but it is important that the Plan clearly specifies who will be responsible for informing the various interested parties such as cargo owners, insurers and salvage interests. It is also essential that both the ship's Plan and its company's shore side Plan are coordinated to guarantee that all parties having an interest are advised and that duplication of reports is avoided.

2.17 In addition to any radiological expertise of the crew, radiological monitoring and assessment may be delivered by specialized monitoring teams. The Plan should identify points of contact for such teams on a 24-hour basis so that they can be notified expeditiously when their assistance is required.

Shipboard emergency procedures

2.18 Ship personnel will almost always be in the best position to take quick action to prevent, reduce, or control the release of INF Code material from their ship. The Plan should provide the master with clear guidance on how to accomplish such action for a variety of situations. The Plan should identify situations where standard operating procedures or detailed guidance will ensure that the emergency response is prompt, co-ordinated and efficient. The Plan should not only outline action to be taken, but should also identify who on board is responsible as well as the tasks of various crew members, so that confusion during the emergency can be avoided.

2.19 This section of the Plan will vary widely from ship to ship. Differences in ship size, construction, equipment, manning, and even route may result in shifting emphasis being placed on various aspects of this section. As a minimum, the Plan should provide the master with guidance to address emergencies affecting the safe operation of the ship and procedures to counter actual or potential emergencies involving INF Code materials, including:

- .1 Procedures for safe removal from the ship of INF Code materials or packages that may have been damaged during loading or unloading.
- .2 Various checklists or other means which will ensure that the master considers all appropriate factors when addressing the specific incident. The following are examples of casualties which should be considered:
 - .2.1 grounding or stranding;
 - .2.2 fire/explosion;
 - .2.3 collision;

- .2.4 hull failure, serious structural failure, flooding, and/or heavy weather damage, or icing;
- .2.5 excessive list;
- .2.6 equipment failure (e.g., main propulsion, steering gear, etc.);
- .2.7 containment system failure (e.g., release of INF Code, cargo contamination yielding a hazardous condition, or loss of cargo)
- .2.8 security threats;
- .2.9 submerged or foundered; and
- .2.10 wrecked.

Procedures for the crew to prevent, reduce, or control a release of INF Code material

2.20 Loss or damage to the ship may result in the loss of cargo packages. However, for cargo incidents not resulting from a ship incident, a suspected cargo leak which is detected in time and handled properly will not necessarily constitute an imminent threat to the crew or the safe operation of the vessel. However, procedures for dealing with the following incidents should be developed and practised:

- .1 abnormal radiation levels detected by remote monitoring instruments;
- .2 discovery of abnormal loose contamination on clothing, shoes or in spaces outside of the cargo hold;
- .3 flask coolant loss or leak;
- .4 movement or shifting of a flask from its transport position;
- .5 unexpected temperature rise at the flask surface; and
- .6 dropping a flask during loading or unloading.

2.21 In addition to the checklists and personnel duty assignments, the Plan should provide the master with guidance concerning priority actions, stability and stress considerations, and cargo transfer.

Priority actions

2.22 This section outlines some general considerations that apply to a wide range of casualties. The Plan should provide ship-specific guidance to the master concerning these considerations.

- .1 In responding to an incident, the master's priority will be to ensure the safety of personnel and the ship and to take action to prevent escalation of the incident. In casualties involving a release of INF Code materials, immediate consideration should be given to measures aimed at preventing contamination of personnel, such as altering course so that the ship is upwind of the released or lost cargo, shutting down nonessential air intakes, using protective clothing, etc. When it is possible to manoeuvre, the master, in conjunction with

the appropriate shore authorities, may consider moving the ship to a more suitable location to facilitate emergency repair work, cargo transfer operations, or to reduce the threat posed to any particularly sensitive ocean or shoreline areas. Such manoeuvring should be coordinated with the coastal State.

- .2 Prior to considering remedial action, the master will need to obtain detailed information on the damage sustained by the ship and INF Code material containers. A visual inspection should be carried out when it is safe to do so. An adequate number of trained crew members should be on board to assess the situation by means of standard equipment and radiological assessment procedures which will enable proper decisions to be made as to what further action is necessary. In certain cases, radiological monitoring and assessment teams may be required to assess properly any consequences of an incident involving the release of INF Code materials. The initial assessment should include consideration of three basic issues:
 - .2.1 confirming the quantity and type of INF Code materials involved;
 - .2.2 ascertaining whether the integrity of shipping containers or packages has been breached; and
 - .2.3 assessing, by monitoring with appropriate instrumentation, the radiological hazards that exist, if any.
- .3 On the basis of the results of the initial measurements, the master should assess the need for radiological experts to provide advice. The measurement information should be recorded on a map or sketch of the area of the incident to document the measurement results.
- .4 Having assessed the damage sustained, the master will be in a position to decide what action should be taken to prevent or minimize a further or more serious release, and a sufficient number of adequately trained crew members should be on board to assist in such action. Where appropriate, the Plan should provide a list of information required for making damage stability and damaged longitudinal strength assessments.
- .5 Ships' crew as well as fire fighting and radiological monitoring teams may require protective clothing and respiratory protection equipment. Equipment should be pre-selected to protect against radioactive contamination and inhalation of airborne radioactive material.

Cargo transfer

2.23 For those INF Code materials where cargo transfer is practicable, the Plan should provide guidance on the procedures to be followed for ship-to-ship transfer of cargo. Reference may be made in the Plan to existing company guides. A copy of such company procedures for ship-to-ship transfer operations should be kept with the Plan. The Plan should address the need for coordinating this activity with the coastal State, as such operation may be subject to its jurisdiction.

Mitigation activities

2.24 When the safety of both the ship and personnel has been addressed, the master can initiate mitigating activities according to the guidance given by the Plan. The Plan should address such as aspects as:

- .1 physical, chemical and radiological properties of the INF Code materials involved;
- .2 containment and other response techniques;
- .3 isolation procedures;
- .4 decontamination of personnel; and
- .5 safe storage of any contaminated materials.

2.25 In order to have the necessary information available to respond to the situations referred to in 2.19 and 2.20, certain plans, drawings, and ship-specific details, such as a layout of a general arrangement plan, should be available on board. The Plan should show where current cargo, bunker, and ballast information - including quantities and specifications - are available.

Security

2.26 Ships may be subject to bomb threats, sabotage, and unauthorized visitors. If not handled properly, these incidents can pose a hazard to the safe operation of the ship. Standard procedures will also prevent overreaction on the part of the crew which could lead to personnel injury. Procedures should be developed for:

- .1 bomb threats and resulting search;
- .2 search of visitors, luggage, vehicles, and freight during times of heightened threats; and
- .3 gangway procedures, including action in the event of unauthorized boarders.

National and local coordination

2.27 Quick, efficient coordination between the ship and coastal State or other involved parties becomes vital in mitigating the effects of an incident involving INF Code materials. The Plan should address the need, where appropriate, to contact the coastal State for consultation and/or authorization regarding mitigating actions. See also 1.15 above.

2.28 The identities and roles of various national and local authorities involved vary widely from State to State and from port to port. Approaches to responsibility for release response also vary. Some coastal States have agencies that take charge of response immediately and subsequently bill the owner for the cost. In other coastal States, responsibility for initiating response is placed on the shipowner.

3 ADDITIONAL PROVISIONS

3.1 In addition to the provisions identified as core provisions, additional guidance may be provided in the Plan. The topics of such guidance include provision of diagrams and drawings; ship-carried response equipment, including radiological monitoring equipment; public affairs; record-keeping; product response information; and reference materials.

Plans and diagrams

3.2 In addition to the plans required by 2.25 above, other details concerning the ship's design and construction may be appended to the Plan or their location identified.

Response equipment

3.3 Ships may carry on board equipment to assist in response. The type and quantity of this equipment may vary depending on the type of INF Code materials carried. The Plan should indicate an inventory of such equipment. It should also provide directions for safe use and guidelines to assist the master in determining when such use is warranted. Care should be exercised to ensure that the use of such equipment by the crew is practical and consistent with safety considerations. The Plan should establish personnel responsibilities for the deployment of the equipment, its oversight, and maintenance. In order to ensure its safe and effective use, the Plan should also provide for crew training in the use of it.

Shore side response co-ordinator or qualified individual

3.4 The Plan should provide guidance, if applicable, for the master for requesting and co-ordinating initial response actions with the person responsible for mobilizing shore side response personnel and equipment.

Planning standards

3.5 To facilitate consideration of the amount of response resources which should be requested, possible scenarios should be analysed and accordingly planned for.

Public information

3.6 The shipowners may want to include in the Plan guidance for the master in dealing with the distribution of information to the news media. Such guidance should be fashioned to reduce the burden on ship's personnel already busy with the emergency at hand.

Record-keeping

3.7 As with any other incident that may eventually involve liability, compensation, and reimbursement issues, the owner may want to include in the Plan guidance for the keeping of appropriate records of the INF Code material incident. Apart from detailing all actions taken on board, records might include communications with outside authorities, owners, and other parties, and decisions and information passed and received. Details on the radiological monitoring undertaken should also be recorded.

Plan review

3.8 Regular review of the Plan by the owner, operator, or master is recommended to ensure that the specific information contained therein is current. A feedback system should be employed which will allow quick capture of changing information and incorporation of it into the Plan. This feedback system should incorporate the following two means:

- .1 Periodic review: the Plan should be reviewed by the owner or operator at least yearly to capture changes in local law or policy, contact names and numbers, ship characteristics, or company policy; and
- .2 Event review: after any use of the Plan in response to an incident, its effectiveness should be evaluated by the owner or operator and modifications made accordingly.

Plan exercises

3.9 The Plan will be of little value if it is not made familiar to the personnel who use it. Training and regular exercises will ensure that the Plan functions as expected and that the contacts and communications specified are accurate. Such training and exercises may be held in conjunction with other shipboard training and exercises and appropriately logged. Where ships carry response equipment, hands-on experience with it by crew members will greatly enhance safety and effectiveness in an emergency situation. After the performance of such exercises, the Plan may need to be modified.

Training procedures

3.10 The Plan may address the training procedures and programs of the shipowner or operator to assure an acceptable level of knowledge and professionalism in the crew. The consignors and carriers involved in the transport of INF Code materials should provide training related to their emergency instructions and the potential hazards of the types of materials involved. Training programs should be geared to the roles that personnel should play in responding to an incident. Provisions should be made for periodic brief refresher training in order to maintain the proficiency of all personnel in the emergency response organization and to review incident experience and practical problems. Guidance on the use of radiological monitoring equipment carried on board should also be provided.

3.11 The purpose of training is to provide basic information to the ships' crew. The training should cover in brief the subjects clearly applicable to such incidents. The information should include the fundamentals of first aid, radiological hazards, protective measures, and transport regulations (especially those aspects concerning transport documents, markings, labels and placards and fire control). Basic principles to protect people from radiation exposure and radioactive contamination and to control the spread of contamination should be included in the training. The preparation of standard training material is recommended to facilitate the success of such a training project.

Technical Training

3.12 A more extensive training programme is necessary to maintain the skills of the master and ships' officers. Training for these persons should include, at a minimum, incident assessment techniques using radiological monitoring instruments, implementation of protective measures, use of protective clothing and equipment, basic meteorology, and further detailed instructions on the transport regulations and on the packaging of radioactive materials.

Exercise and drill procedures

3.13 The Plan may also address the exercise and drill program to be carried out by the vessel owner or operator to maintain an appropriate level of preparedness. Exercise scenarios could be developed and used to test the response capabilities and skills of the master and the crew. Exercises could be based upon realistic accident exercise scenarios designed to test all major aspects of the plans. Exercises should aim at testing the effectiveness of communication links, the mobilization of emergency resources, and specialized teams and of the co-operation between agencies and services involved. Another objective of the exercises is to strengthen the confidence of the personnel that they can adequately handle an incident. Equipment and instruments specified in the emergency plans could be used in exercises. Exercises should be clearly identified as such in communications or messages related thereto.

3.14 Drills, which are more limited in scope than exercises, are designed to develop, test and maintain special skills of individuals. For example, a communications and notification drill might test the proficiency of personnel in giving notification of an incident, alerting various organizations, and in operating communications equipment. A fire-fighting drill could be limited to the operation of fire-fighting equipment. Thus, drills can be considered as subsets of exercises, i.e., many drills conducted at the same time, in a co-ordinated fashion, constitute an exercise.

3.15 Provision may be made for the critique of drills and exercises by qualified observers. The results of drills and exercises should be used as a basis for improving the emergency plans, as appropriate. Recording of communications and videotaping the exercises are valuable aids for learning by the participants. Reports and critiques of actual emergencies should also be used as training aids.

3.16 Provision should be made for testing radiological instruments, communications and other equipment. The condition of equipment should be checked periodically, in conjunction with drills or exercises, and at other times, as warranted. A record of all drills and exercises should be maintained on board the ship showing date and results of the event. Additionally, any faults or deficiencies identified should be documented and corrected quickly.

Salvage

3.17 The Plan should contain information on the crew's responsibilities in an incident where a ship is partially or fully disabled, and what constitutes dangerous conditions. A decision process should be outlined in the Plan that will aid the master in determining when salvage assistance should be obtained. The decision process should include, but not be limited, to the following:

- .1 Nearest land or hazard to navigation;
- .2 Ship's set and drift;
- .3 Location and time of impact with hazard based on ship's set and drift;
- .4 Estimated time of incident repair; and

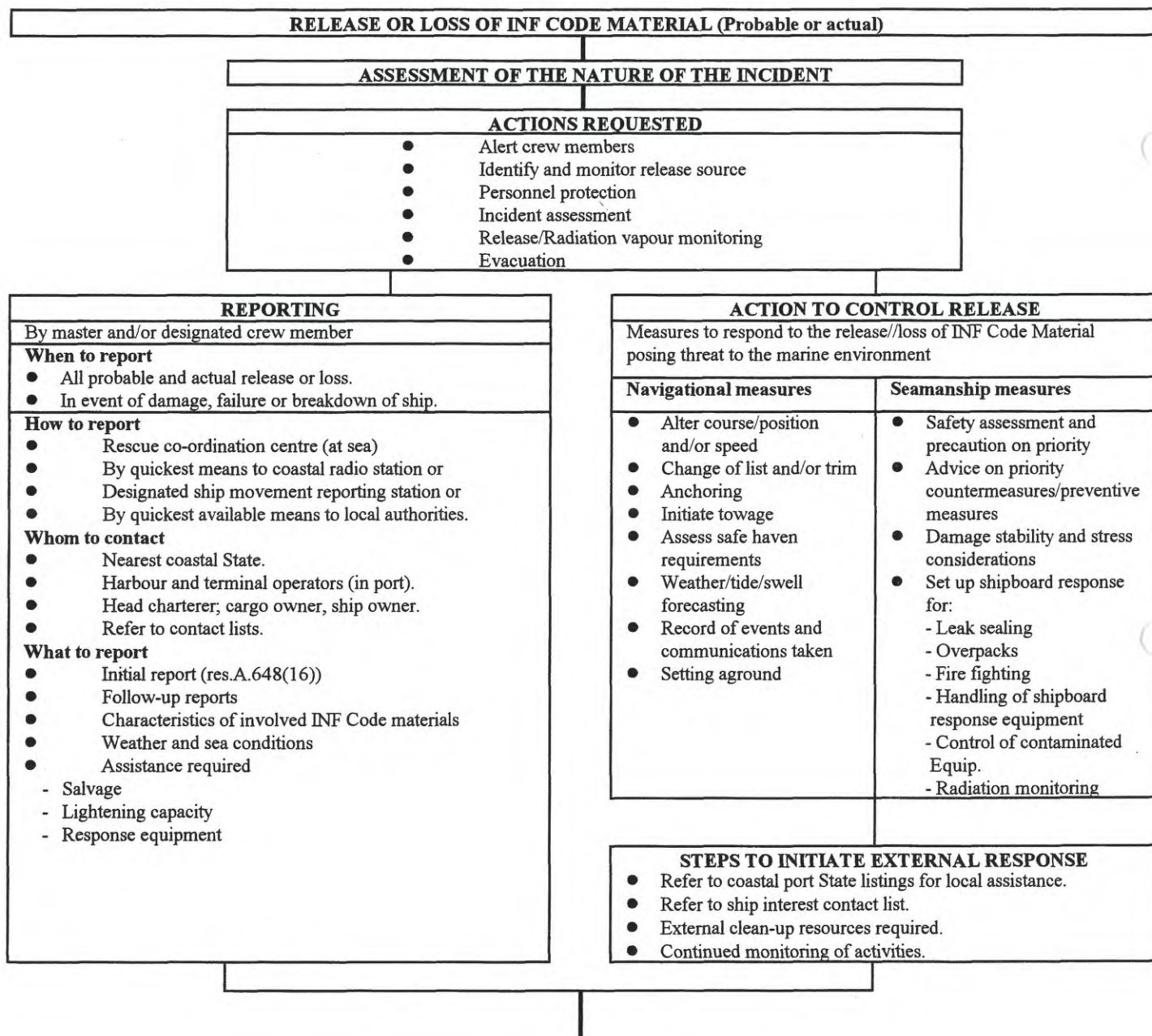
- .5 Determination of nearest capable assistance and response time (i.e., for tug assistance, the time it will take to get on scene and secure the tow). When an incident occurs to a ship underway that reduces its manoeuvrability, the master needs to determine the window of opportunity considering the response time of assistance, regardless of estimated time of repair. It would not be prudent to hesitate in calling for assistance when the time needed to repair something goes beyond the window of opportunity.
- 3.18 Plans should contain lists and means of contacting and securing salvage assistance.

APPENDIX I

SHIPBOARD MARINE POLLUTION EMERGENCY PLAN FOR INF CODE MATERIALS

Example summary flow chart

This flow diagram is an outline of the course of action that shipboard personnel should follow in responding to an incident involving INF Code materials based on the Guidelines published by the Organization. This diagram is not exhaustive and should not be used as a sole reference in response. Consideration should be given for inclusion of specific references to the Plan. The steps are designed to assist ship personnel in actions to prevent or control the release or loss of INF Code materials. These steps fall into two main categories - reporting and action.



APPENDIX II

Additional references for the development of emergency plans for ships transporting material subject to the INF Code

American National Standard (ANSI) for Highway Route Controlled Quantities of Radioactive Materials - Domestic Barge Transport, ANSI N14.24 (1985) (available in English, French, Russian and Spanish).

Code for the Safe Carriage of Irradiated Nuclear Fuel, Plutonium and High Level Radioactive Wastes in Flasks on Board ships, International Maritime Organization (IMO), (Res. A.748(18) (available in English, French and Spanish).

Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, International Atomic energy Agency (IAEA) (1986).

Convention on Early Notification of a Nuclear Accident, IAED, INFCIRC 1335 (1986).

Convention of the Physical Protection of Nuclear Material, IAEA, INFCIRC.274/Rev.1 (1979).

Emergency Response Planning and Preparedness for Transport Accidents Involving Radioactive Material, IAEA, Safety Series No. 87 (1988) (ISBN 92-0-123088-5) (available in English).

International Basic Safety Standards for Protection against Ionizing Radiation and the Safety of Radiation Sources, IAEA, Safety Series Number 115 (1996).

International Convention on Oil Pollution Preparedness, Response and Co-operation, IMO (1990) (ISBN 92-801-1267-8) (available in English, French and Spanish).

International Maritime Dangerous Goods (IMDG) Code, IMO (available in English, French and Spanish).

Manual on Oil Pollution, Section II, Contingency Planning, IMO (year) (ISBN 92-801-1233-3) (available in English, French and Spanish).

Regulations for the Safe Transport of Radioactive Material 1985, IAEA, Safety Series No. ST-1 (as amended, 1990) (ISBN 92-0-1-4996-X) (available in English, French, Russian and Spanish).

APPENDIX III

SHIPBOARD EMERGENCY PLAN FOR VESSELS CARRYING INF CODE MATERIALS SAMPLE FORMAT FOR INITIAL NOTIFICATION	
AA (SHIP NAME, CALL SIGN, FLAG)	
BB (DATE AND TIME OF EVENT, UTC) <div style="text-align: center; margin-top: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="text-align: center; margin-top: 5px;"> D D H H M M </div>	
CC (POSITION, LAT, LONG) <div style="text-align: center; margin-top: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="text-align: center; margin-top: 5px;"> d d m m </div> <div style="text-align: center; margin-top: 5px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="text-align: center; margin-top: 5px;"> d d d m m </div> <div style="text-align: center; margin-top: 5px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="text-align: center; margin-top: 5px;"> E W </div>	OR DD (BEARING, DISTANCE FROM LANDMARK) <div style="text-align: center; margin-top: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="text-align: center; margin-top: 5px;"> d d d </div> <div style="text-align: center; margin-top: 5px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="text-align: center; margin-top: 5px;"> N miles </div>
EE (COURSE) <div style="text-align: center; margin-top: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="text-align: center; margin-top: 5px;"> d d d </div>	FF (SPEED, KNOTS) <div style="text-align: center; margin-top: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="text-align: center; margin-top: 5px;"> kn kn 1/10 </div>
LL (INTENDED TRACK)	
MM (RADIO STATION(S) GUARDED)	
NN (DATE AND TIME OF NEXT REPORT, UTC) <div style="text-align: center; margin-top: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="text-align: center; margin-top: 5px;"> D D H H M M </div>	
PP (TYPE AND QUANTITY OF CARGO ON BOARD)	
QQ (BRIEF DETAILS OF DEFECTS/DEFICIENCIES/DAMAGE)	
RR (BRIEF DETAILS OF POLLUTION, RADIOLOGICAL OR CHEMICAL HAZARDS THAT EXIST)	
SS (BRIEF DETAILS OF WEATHER AND SEA CONDITIONS) <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <div style="margin-bottom: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="margin-left: 10px;">direction</div> </div> <div style="width: 45%;"> <div style="margin-bottom: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="margin-left: 10px;">direction</div> </div> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <div style="margin-bottom: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="margin-left: 10px;">speed</div> </div> <div style="width: 45%;"> <div style="margin-bottom: 10px;"> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin: 2px;"></div> </div> <div style="margin-left: 10px;">height</div> </div> </div> <div style="text-align: center; margin-top: 5px;"> (Beaufort) (m) </div>	
TT (CONTACT DETAILS OF SHIP'S OWNER/OPERATOR/AGENT)	
UU (SHIP SIZE AND TYPE) LENGTH: (m) BREADTH: (m) DRAUGHT: (m) TYPE:	
XX (ADDITIONAL INFORMATION)	

Footnote: The alphabetical reference letters in the above format are from "general principles for ship reporting systems and ship reporting requirements, including Guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants" adopted by the International Maritime Organization by resolution A.851(20). The letters do not follow the complete alphabetical sequence as certain letters are used to designate information required for other standard reporting formats, e.g., those used to transmit route information.

RESOLUTION A.854(20) adopted on 27 November 1997
GUIDELINES FOR DEVELOPING SHIPBOARD EMERGENCY
PLANS FOR SHIPS CARRYING MATERIALS SUBJECT TO THE INF CODE