Spillage

Introduction to the emergency schedules for SPILLAGE

1 Be prepared

1.1 Incidents involving dangerous goods may result in spillages from such goods, and the magnitude of the effects of an incident depends upon the type and amount of product released, together with the type of any other product involved and whether the spillage is on deck or in enclosed spaces.

1.2 Spillages could create additional hazards to those indicated by classification and labelling of the dangerous goods (e.g. the spillage of a flammable liquid may create an explosive atmosphere). Of particular concern are leakages of reactive chemicals, which in contact with other materials or further spillages will produce additional or other chemicals (e.g. toxic gases).

1.3 When dealing with a spillage on board a ship, the value of crew training and of familiarity with the general contingency plan will become evident. Drills and exercises specific to the cargoes on board at the time should be a part of shipboard routine.

1.4 This Guide should be integrated into the ship's Safety Management System. Procedures contained within the shipboard emergency plan have to be tailored to the individual ship. Spillage response procedures within the EmS SPILLAGE SCHEDULES are differentiated for "on deck" and "under deck" stowage. For specific ship types (e.g. hatchless containerships) or cargo spaces (e.g. open vehicle decks of ferries) these two procedural categories have to be assigned specifically to the individual ship (e.g. run-off considerations concerning bilges and drains).

2 Personal protection

2.1 The safety of the emergency personnel is of paramount importance.

2.2 The likelihood of the development of an explosive, flammable or toxic atmosphere should be considered.

2.3 Full protective clothing resistant to the effects of the specific dangerous substance involved should be worn. The protective clothing should cover all skin so that no part of the body is unprotected. Wearing self-contained breathing apparatus is essential to protect against inhalation of toxic or corrosive dusts, vapours or gases.

2.4 Emergency teams should avoid direct contact with any dangerous goods regardless of the protective clothing being used. If direct contact takes place when dealing with a spillage, the contact time should be kept to a minimum.

2.5 It is a requirement of SOLAS that four sets of full protective clothing resistant to chemical attack should be provided in addition to firefighters' outfits.

2.6 Firefighters' outfits are not designed to protect against chemical hazards and chemical-resistant clothing is not designed to protect against fire. Masters are reminded that personnel should have regular training in the use of self-contained breathing apparatus, and that special attention should be paid to ensuring that face masks fit satisfactorily at all times.

2.7 Responders should also ensure that any chemical protective clothing is used with other suitable protection against the specific hazards involved.

3 General response

3.1 The safety of the emergency personnel is most important.

3.2 Working spaces and living quarters should be protected by water spray wherever possible. Ventilation systems for living quarters and working spaces should be shut off, closed and secured to reduce the possibility of smoke, dust, fumes and gases from entering these areas. Particular care should be given to ventilation inlets (e.g. machinery and accommodation spaces). It may be necessary to turn the ship to ensure that the accommodation spaces are upwind.

3.3 Before entering cargo holds or compartments, the emergency personnel should determine the oxygen content of the space's atmosphere and should test for the presence of dangerous vapours. If a confined space entry is attempted, the use of self-contained breathing apparatus is essential. Only trained personnel should use this equipment, which should be well maintained.

3.4 It is essential to ensure that there is always an escape route for emergency personnel despite the limited means of escape due to narrow exit paths and the danger of falling overboard.

3.5 Decontamination and medical first aid also need to be considered. Arrange for a decontamination station to be set up at a suitable safe location.

3.6 The general response to spillage involving dangerous goods can be subdivided into the following tactical objectives:

.1 identification;

.2 rescue;

.3 isolation; and

.4 response.

Experience from previous incidents has shown that these objectives can normally be achieved in this order.

4 Identification of the dangerous goods involved

4.1 It is essential to identify the dangerous good(s) involved in the spillage in order that the specific EmS SPILLAGE SCHEDULE(S) for the cargo(es) may be consulted and appropriate action taken. This is important because some dangerous goods are incompatible with some media available for dealing with a spillage.

4.2 An identification number with four digits preceded by the letters "UN" is assigned to each dangerous good. From the UN number, it is possible to find the appropriate EmS SPILLAGE SCHEDULE. The Dangerous Goods List in part 3 of chapter 3.2 of the IMDG Code contains the names and the UN numbers, as well as the EmS SCHEDULE numbers. The Dangerous Goods Manifest and the Stowage Plan required by SOLAS regulation VII/4.2 will also contain the proper shipping name and UN number of the dangerous good(s) concerned. Packages will usually be labelled as well.

4.3 Specific information as to properties of dangerous goods may also be found in the Dangerous Goods List in the IMDG Code. Dangerous goods are classified and labelled according to their hazards. Labels and marks on packages provide a warning of the general risks to be encountered. Personnel should understand the labelling system. It will also be beneficial to consult other sources of information. A safety data sheet provided by the manufacturer may be one such source of additional information. Seek expert advice from manufacturers, specialized agencies or professional responders.

4.4 Emergency preparedness should form part of the ship's Safety Management System as required by the ISM Code. Prepared information can reduce errors during a spillage emergency. Therefore, it is recommended that the EmS SCHEDULE(S) be identified and included within the Dangerous Goods Manifest and Stowage Plan, so directly connected to the stowage position of the cargo. This will enable key members of the crew to know in advance which emergency procedures would be necessary. In the event of a spillage, the allocation of a specific EmS SPILLAGE SCHEDULE via identification of the cargo via the UN number takes time and is open to error, especially in mixed cargoes in one container. Furthermore, some spillage response procedures may require specific use of material which could be hampered by an inaccessible stowage location. After locating the spillage area, the advice given in the EmS SPILLAGE SCHEDULE should be directly available from the Dangerous Goods Manifest and Stowage Plan.

5 Rescue

5.1 The safety of personnel should be the highest priority. One of the first concerns after evaluating the situation of the incident is finding and rescuing victims. This includes searching for and evacuating persons who may be exposed or who are disoriented or disabled by the release. It might be necessary to rescue persons from elevated places or confined spaces or those who are pinned under wreckage.

5.2 Appropriate equipment will need to be available, and prior training is essential for such circumstances.

6 Isolation

6.1 The objective of isolation is to limit the number of personnel exposed to the spilled material. This may be achieved by simply roping or taping off dangerous areas. Consider sealing off ventilation, air conditioning and other openings to living and working spaces.

6.2 At sea, the master has the capability and discretion to alter course and speed to ensure that dangerous gases or vapours are kept away from personnel, living quarters or ventilation inlets.

6.3 Consider the evacuation of passengers and members of the crew.

7 Response

7.1 At sea, human and other resources are limited. So in most cases involving spillage of dangerous goods, the most effective response will probably be to wash the substance overboard or jettison it. Attempts to repack dangerous goods may expose personnel to unreasonable risks.

7.2 The response to the spillage should be in accordance with the appropriate EmS SPILLAGE SCHEDULE(S) for the dangerous good(s) involved in the incident. The emergency team should take all reasonable precautions when dealing with the spillage and remember that the safety of personnel is most important.

8 Seek advice

8.1 Always seek expert ADVICE when dealing with dangerous goods spills. Such ADVICE could be given by:

.1 ship operating companies (e.g. designated persons);

.2 emergency information centres (such as CHEMTREC in the USA);

.3 specialized agencies;

.4 professional responders;

.5 port State authorities;

.6 coastguard;

.7 fire brigades; and

.8 manufacturers of the products.

9 Materials to be used

9.1 Water is the obvious medium to be used when dealing with a spillage on board a ship. It is recommended in the majority of cases to be used in copious quantities to wash the spillage overboard. However, certain dangerous goods react violently with water, producing flammable and toxic vapours. Others, for example marine pollutants, will produce pollution if washed overboard.

9.2 The term “copious quantities of water” used within the EmS SPILLAGE SCHEDULE(S) refers to the minimum total quantities of water provided for optimal firefighting with four jets as defined by SOLAS regulation II-2/10, Construction requirements. Master and crew should consider practical limitations at specific stowage locations in this respect.

9.3 Inert material should be used for spillages where it would be dangerous to use water. The inert material should be dry.

9.4 Sawdust should not be used as it is liable to be ignited by ignition sources or in contact with a number of substances. Cement may be used as an inert material for barricading.

9.5 An electric discharge may ignite some materials (e.g. explosives). Therefore, the use of non-certified safe type equipment within spillage areas may be dangerous. For some materials, “non-sparking footwear” is recommended (e.g. rubber boots without metal parts).

10 Action after spillage has been dealt with

10.1 Decontamination of personnel, clothing and ship’s structures

10.1.1 After the spillage has been dealt with, the emergency team personnel should ensure that all contamination of equipment and protective clothing is removed and washed immediately. All equipment should be restored and re-stowed for further use.

10.1.2 Areas not affected initially may have been contaminated during response procedures. Crew members coming in contact with improperly decontaminated areas may become contaminated. Clean the site thoroughly before any unprotected personnel are allowed to enter.

10.1.3 Contaminated material should be properly disposed of or be cleaned.

11 First aid

11.1 Information on medical first aid is provided in the IMO/WHO/ILO *Medical First Aid Guide for Use in Accidents Involving Dangerous Goods* (MFAG). **Be prepared to use the MFAG!**

11.2 Any contamination of the skin with a dangerous substance should be immediately removed and then washed, for example with water. Radio for expert advice if personnel have been exposed to dangerous goods.

12 Special notes on specific dangerous goods classes

12.1 Based on the specific properties of the individual dangerous goods listed under one UN number, experts have allocated the substances, articles and materials to EmS SPILLAGE SCHEDULES. The allocation has not been based on the classification and labelling of the substances only. However, to help the mariner who is used to the handling and labelling of packaged dangerous goods to understand the advice given in the EmS SPILLAGE SCHEDULES, this introduction based on classification properties of substances is given.

12.2 Explosives – class 1

12.2.1 Properly packaged explosives are unlikely to detonate unless exposed to a fire or source of ignition. Within the divisions of this class, there are differences in explosive power. From a mariner's standpoint, the volumes of explosives concerned are of primary importance for the safety of the ship. However, even small volumes of spilled material may ignite and injure individual crew members. In general, spilled explosive substances are less hazardous when kept wet (see SPILLAGE SCHEDULE S-X).

12.2.2 Some explosive mixtures are stabilized in such a way that water will separate explosives from the stabilizer, thus creating a higher risk. The explosive component becomes very sensitive to shock and heat. The explosive should be kept mixed under water and washed overboard. Wetted articles should be jettisoned (see SPILLAGE SCHEDULE S-Y).

12.2.3 Some ammunition types contain a toxic material or a tear-gas substance. In addition to the explosive hazard, the toxicity hazard has to be realized. Use of self-contained breathing apparatus is essential (see SPILLAGE SCHEDULE S-Z).

12.3 Gases – class 2

12.3.1 A release of a flammable gas (class 2.1) is the preliminary step leading to a potential *vapour cloud explosion* (VCE). For a blast to take place, the substance has to mix with air in a quantity that will allow the mixture to form a cloud. As soon as a friction (electrostatic potential) lies within the explosive range and encounters an ignition source, a flash fire, a deflagration or, sometimes, even a detonation may occur, with devastating consequences. In dealing with gas leakages, let the gas evaporate and drift away. Keep away all sources of ignition. Water spray could reduce the ignition potential of the cloud (see SPILLAGE SCHEDULE S-U).

12.3.2 Non-toxic, non-flammable gases (class 2.2) may displace oxygen, creating a suffocation hazard. Ventilation of all areas concerned is important (see SPILLAGE SCHEDULE S-V).

12.3.3 Toxic gases (class 2.3) when released may fill an area of the ship or a compartment with a toxic atmosphere. Therefore, it is important to shut off, close and secure all ventilation supplying the accommodation, machinery spaces and bridge to protect against such gases. Self-contained breathing apparatus is essential for the emergency team (see SPILLAGE SCHEDULE S-U).

12.3.4 Liquefied gases can cause the additional hazard of very low temperatures around the point of leakage. Such a leakage will be particularly dangerous when the leakage is in the liquid phase from a container where very low temperatures will be experienced. The emergency team should avoid contact with liquefied gases if at all possible.

12.3.5 Oxidizing gases can react violently with a number of organic materials. These reactions can generate heat, produce flammable gases and are liable to ignite combustible materials.

12.4 Flammable liquids – class 3

12.4.1 The release of a vaporized flammable liquid is the preliminary step leading to a potential *vapour cloud explosion* (VCE). For a blast to take place, the vapour has to mix with air in a quantity that will allow the mixture to form a cloud. As soon as a friction (electrostatic potential) lies within the explosive range and encounters an ignition source, a flash fire, a deflagration or, sometimes, even a detonation may occur, with devastating consequences. Water spray will reduce the vaporization and the ignition potential of the cloud. Keep away all sources of ignition (see SPILLAGE SCHEDULE S-D).

12.4.2 At high concentrations, many flammable liquids exhibit a narcotic effect (which is not labelled accordingly), a short-term potentially lethal effect (which is identified by a class 6.1 label) or a long-term toxic effect (not labelled). In all cases, the use of self-contained breathing apparatus is therefore recommended (see SPILLAGE SCHEDULE S-D).

12.4.3 Some flammable liquids are corrosive to human skin, the ship's hull or normal personal protection equipment. Their vapours are toxic by inhalation. Therefore, washing of spillages and forcing vapours overboard with water spray is the method of choice. It is important to close all ventilation to protect the accommodation and machinery spaces and the bridge from the vapours. Crew members should stay away from any effluent (see SPILLAGE SCHEDULE S-C).

12.4.4 Many flammable liquids are not soluble in water and will float on the water (e.g. mineral oil, gas oil, petroleum). In general, high concentrations of these substances are not lethal but exhibit a narcotic effect. The crew should be aware of that and stay away from highly concentrated vapours. Mineral oil is considered to be a marine pollutant although not classified nor labelled as such. Depending on the quantities, oil spilt into the sea may cause problems and is usually given a high profile by the media. In case of spillage on board, the dominating hazard is flammability. Keep away all sources of ignition (see SPILLAGE SCHEDULE S-E).

12.5 Flammable solids, self-reactive substances, solid desensitized explosives and polymerizing substances – class 4

12.5.1 This class contains many different substances and varying hazards within its three sub-classes. Many are not solids. Some of these materials require special agents to be used for cleaning/absorbing as they react unfavourably with water, sand or other inert material. The procedures and materials to be used in case of a spillage are identified in ten different schedules.

12.5.2 Spilled flammable solids may create an explosive atmosphere that could be ignited easily. Whereas some solids (e.g. articles) can be repacked (see SPILLAGE SCHEDULE S-I), others will contaminate ships' surfaces, which have to be cleaned thoroughly by washing the substances overboard (see SPILLAGE SCHEDULE S-G).

12.5.3 A few flammable substances are transported in a molten state. To clean contaminated areas, the use of inert materials is possible to enable the emergency team to shovel up the spillage and dispose of it overboard (see SPILLAGE SCHEDULE S-H).

12.5.4 Flammable solids that exhibit explosive properties when spilt from a package should be kept wet and disposed of overboard. Drying material being ignited (e.g. by heat or friction) would lead to a detonation (see SPILLAGE SCHEDULE S-J).

12.5.5 Temperature-controlled self-reactive substances are also classified as flammable solids under class 4.1. Spillage is often connected to a failure of temperature control, leading to chemical reaction and creating a fire hazard. If not disposed of overboard, the relevant FIRE SCHEDULE should be consulted (see SPILLAGE SCHEDULE S-K).

12.5.6 Some spontaneously combustible substances could react with water (see SPILLAGE SCHEDULE S-L). Smothering with dry inert material and the immediate disposal overboard could limit the ignition hazard. Others will ignite within minutes (see SPILLAGE SCHEDULE S-M) and firefighting will be necessary (see FIRE SCHEDULE F-G).

12.5.7 Depending on the chemical properties, substances which are dangerous when wet (class 4.3) could be collected and disposed of overboard (see SPILLAGE SCHEDULE S-P), or could be kept dry and disposed of overboard or could be washed overboard with copious quantities of water even though a reaction with water will occur (see SPILLAGE SCHEDULES S-N and S-O). The use of water spray is recommended in case of the development of flammable gases (see SPILLAGE SCHEDULE S-O).

12.5.8 Many flammable solids, substances liable to spontaneous combustion and most substances that are dangerous when wet are hazardous to health by skin contact or by inhalation of dust. The use of self-contained breathing apparatus and appropriate chemical protection (e.g. chemical suit) is therefore recommended in all cases.

12.6 Oxidizing substances and organic peroxides – class 5

12.6.1 Dangerous goods of class 5 contain oxygen, and some will ignite combustible material on contact. In general, contact with substances of class 5 will be harmful to the skin, eyes and mucous membranes. The use of self-contained breathing apparatus and appropriate chemical protection (e.g. chemical suit) is therefore recommended.

12.6.2 Spilled oxidizing substances (class 5.1) could ignite combustible material or destroy materials (e.g. personal protection) by their chemical reactivity. Such spillages should be washed overboard. All crew members should stay away from effluent (see SPILLAGE SCHEDULE S-Q).

12.6.3 Organic peroxides (class 5.2) are highly reactive and some may explode when ignited. Class 5.2 liquids are flammable liquids which should be kept away from all sources of ignition. These substances will instantly destroy eyes. Some substances are transported under temperature control which is necessary to prevent reaction (mostly noticed as smoke evolution) and development of heat which may lead to fire (see SPILLAGE SCHEDULE S-R).

12.7 Toxic and infectious substances – class 6

12.7.1 The effects of toxic substances (class 6.1) may appear at once during exposure to them or may be delayed until after exposure. Inhalation is the major route for vapours, gases, mists and dusts. Skin and eye contact is of concern for the emergency team. The use of self-contained breathing apparatus and appropriate chemical protection (e.g. chemical suit) is recommended in all cases. Vapours of toxic liquids may fill an area of the ship or a space with a toxic atmosphere. Therefore, in case of vapour development, it is important to shut off, close and seal off all ventilation leading to accommodation and machinery spaces and the bridge (see SPILLAGE SCHEDULE S-A).

12.7.2 Some toxic substances are also flammable. In this case, the safety advice for both flammable and toxic liquids should be followed (see SPILLAGE SCHEDULE S-D).

12.7.3 In case of spillage of toxic substances, be prepared to use the MFAG.

12.7.4 The substances of class 6.2 are infectious, biological products, diagnostic specimens, clinical waste, etc. In case of spillage of such substances, different types of a biohazard may develop. Some spilled goods of class 6.2 could create illness of crew members after skin contact or inhalation. Whereas washing overboard is advised for on-deck spillage, waiting for expert ADVICE is recommended for under-deck spillages. Any skin contact or inhalation of mists or dusts should be avoided. Expert ADVICE is particularly important in respect of exposure risk, decontamination methods and reporting procedures (see SPILLAGE SCHEDULE S-T).

12.7.5 Most toxic substances and many infectious substances are also toxic to marine animals. Consult safety data sheets or experts for individual properties if needed.

12.8 Radioactive material – class 7

12.8.1 Many radioactive materials are transported in packages designed to retain their containment and shielding under accident conditions. Failure of the containment resulting in spillage that could be a significant hazard to personnel would only be expected under very severe conditions. Damp surfaces on undamaged or slightly damaged packages are seldom an indication of packaging failure. If a packaging of radioactive material appears to have leaked its accidental contents, expert ADVICE should be sought.

12.8.2 Some packages may have both a class 7 label and other hazard labels. Such additional hazards may be greater than the radiation hazard. In that case, actions as specified in the applicable SPILLAGE SCHEDULES should be followed.

12.8.3 Although radiation monitors are not required by regulation on board ships, applicable relevant provisions on segregation, separation or radiation protection programme (e.g. section 1.5.2 and paragraph 7.1.4.5.18 of the IMDG Code) or the INF Code may require monitors on board. For ships carrying radiation monitoring equipment, monitoring the extent of contamination is possible.

12.8.4 Spillage may constitute a release of any solid, liquid or gaseous radioactive material from its packaging. Personal protection material and equipment on board cannot generally provide protection against the health effects of penetrating ionizing radiation. Therefore, to protect personnel from the potential effects of radiation from spilled cargo (which may include the release from the packaging of special form radioactive material), two parameters are important when responding to spillages of these materials: TIME and DISTANCE. Entry of personnel into the area involving the spill of radioactive material should be limited to the shortest time possible, and the distance between the spillage and any personnel should be maximized. In addition, radiation contamination of personnel by inhalation, ingestion or skin contact should be of concern, and appropriate protective actions should be taken (protective clothing and self-contained breathing apparatus is recommended in all cases) (see SPILLAGE SCHEDULE S-S).

12.9 Corrosive substances – class 8

12.9.1 Corrosive solids and liquids can permanently damage human tissue. Some substances may corrode steel and destroy other materials (e.g. personal protection equipment). Corrosive vapours are highly toxic, often lethal by destroying lung tissue. All corrosive chemicals will be dangerous to human health (toxic). Avoid direct contact with the skin, protect against inhalation of vapours or mists. The use of self-contained breathing apparatus and appropriate chemical protection (e.g. chemical suit) is recommended in all cases. Washing spillages and forcing vapours overboard with water spray is the method in all cases. It is important to shut off, close and secure all ventilation leading into the accommodation of choice, machinery spaces and the bridge. All personnel should stay away from effluent (see SPILLAGE SCHEDULE S-B).

12.9.2 Some corrosive substances are also flammable. In these cases, the safety advice for both flammable and corrosive substances should be followed. Use of copious quantities of water and water spray is recommended. In general, the flammability hazard is more important than the corrosive properties for the safety of the ship and the crew (see e.g. SPILLAGE SCHEDULES S-C and S-G).

12.10 Miscellaneous dangerous substances and articles and environmentally hazardous substances – class 9

This class contains miscellaneous dangerous substances that do not fit easily under the criteria for other hazard classes. Nonetheless, these substances represent hazards. There are no common properties that apply to all goods of this class. They have been allocated to the relevant EmS SPILLAGE SCHEDULE according to their hazards in the event of a spillage.

12.11 Marine pollutants

12.11.1 A number of substances within all classes have also been designated as marine pollutants because they are hazardous to marine life. Packages containing these substances will bear a marine pollutant mark.

12.11.2 In the case of spillage, it is important to be aware that any marine pollutant which is washed overboard will pollute the sea and must therefore be reported in accordance with the Reporting procedures by the fastest telecommunication channel available with the highest possible priority to the nearest coastal State (see Reporting procedures).

12.11.3 It is, however, more important to ensure the safety of the crew and the integrity of the laden ship, rather than to prevent pollution of the sea by marine pollutants.

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General guidelines for SPILLAGE

- Think of safety first!
- Avoid any contact with dangerous substances. Do not walk through spilled liquids or dust (solids).
- Keep away from vapours or gases.
- Sound alarm.
- Keep the bridge and living quarters upwind if possible.
- Wear full protective clothing resistant to chemical attack and self-contained breathing apparatus.
- Locate stowage position of leaking cargo.
- Identify cargo.
- Obtain UN numbers and the EmS SPILLAGE SCHEDULE of dangerous goods involved.
- Consider which measures of the EmS SPILLAGE SCHEDULE are applicable and should be followed.
- Be prepared to use the Medical First Aid Guide (MFAG).
- Contact the designated person of the company responsible for the operation of the ship to obtain expert advice on dangerous goods emergency response measures.

Precaution: Contamination of the skin with any dangerous goods should be removed and washed immediately.

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Emergency schedules for SPILLAGE

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SPILLAGE SCHEDULE Alfa

S–A

TOXIC SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid contact, even when wearing protective clothing. Stop leak if practicable. Contaminated clothing should be washed off with water and then removed.
Spillage on deck	**Packages (small spillage)**	Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
	Cargo transport units (large spillage)	Keep bridge and living quarters upwind. Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
Spillage under deck	**Packages (small spillage)**	Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate. Keep clear. ***Liquids:*** Provide good ventilation of the space. Restrict flow of liquid to an enclosed area (e.g. by barricading with inert material or cement if available). ***Solids:*** Collect spillage. Dispose of overboard. Otherwise, keep clear. Radio for expert ADVICE.
	Cargo transport units (large spillage)	Keep clear. Radio for expert ADVICE. After hazard evaluation by experts, you may proceed. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapour evaporate, keep clear. Where the ventilation system is used, particular attention should be taken to prevent toxic vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. ***Liquids:*** Provide good ventilation of the space. Wash down to the bottom of the hold. Pump overboard. ***Solids:*** Collect spillage. Keep spilt solids dry and cover with plastic sheet. Dispose of overboard. Otherwise, close hatches. Wait until the ship arrives in port.
Special cases:		
Marine pollutant mark		Keep disposal overboard as low as possible. Dilute with copious quantities of water. Report incident according to MARPOL reporting requirements.
UN 3546		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Bravo

S–B

CORROSIVE SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid contact, even when wearing protective clothing. Keep clear of effluent. Keep clear of evolving vapours. Even short-time inhalation of small quantities of vapour can cause breathing difficulties. Use of water on the substance may cause a violent reaction and produce toxic vapours. Substance may damage ship's construction materials. Contaminated clothing should be washed off with water and then removed.
Spillage on deck	**Packages (small spillage)**	Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
	Cargo transport units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
Spillage under deck	**Packages (small spillage)**	Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapour evaporate. Keep clear. ***Liquids:*** Provide good ventilation of the space. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. ***Solids:*** Collect spillage. Dispose of overboard. Wash residues down to the bottom of the hold. Use copious quantities of water. Pump overboard.
	Cargo transport units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Do not enter space. Keep clear. Radio for expert ADVICE. After hazard evaluation by experts, you may proceed. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate, keep clear. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. ***Liquids:*** Provide good ventilation of the space. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. ***Solids:*** Collect spillage. Dispose of overboard. Wash residues down to the bottom of the hold. Use copious quantities of water. Pump overboard.
Special cases: **Marine pollutant mark** **UN 2802, UN 2809, UN 3506** **UN 3547**		 Report incident according to MARPOL reporting requirements. No reaction with water. Not highly corrosive to protective clothing. Collect spillages if practicable. Try to avoid disposal overboard. Radio for expert ADVICE. Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Charlie

S–C

FLAMMABLE, CORROSIVE LIQUIDS

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid contact, even when wearing protective clothing. Keep clear of effluent. Keep clear of evolving vapours. Even short-time inhalation of small quantities of vapour can cause breathing difficulties. Use of water on the substance may cause violent reaction and produce toxic vapours. Substance may damage the ship's construction materials. Spillage or reaction with water may evolve flammable vapours. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Contaminated clothing must be washed off with water and then removed.
Spillage on deck	**Packages (small spillage)**	Wash overboard with copious quantities of water. Do not direct water jets straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
	Cargo transport units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Wash overboard with copious quantities of water. Do not direct water jets straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
Spillage under deck	**Packages (small spillage)**	Provide adequate ventilation. Do not enter deck without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate, keep clear. ***Liquids:*** Provide good ventilation of the space. Use water spray on effluent in hold to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. ***Solids:*** Collect spillage. Dispose of overboard. Wash residues down to the bottom of the hold. Use copious quantities of water. Pump overboard.
	Cargo transport units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Do not enter space. Keep clear. Radio for expert ADVICE. After hazard evaluation by experts, you may proceed. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate, keep clear. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. ***Liquids:*** Provide good ventilation of the space. Use water spray on effluent to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. ***Solids:*** Collect spillage. Dispose of overboard. Wash residues down to the bottom of the hold. Use copious quantities of water. Pump overboard.
Special cases: **Marine pollutant mark** **UN 2029, UN 3484**		 Report incident according to MARPOL reporting requirements. Self-ignition of spilt material is possible.

SPILLAGE SCHEDULE Delta

S–D

FLAMMABLE LIQUIDS

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Stop leak if practicable. Avoid contact, even when wearing protective clothing. Spillage may evolve flammable vapours. Contaminated clothing must be washed off with water and then removed.
Spillage on deck	**Packages (small spillage)**	Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
	Cargo transport units (large spillage)	Keep bridge and living quarters upwind. Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
Spillage under deck	**Packages (small spillage)**	Shut off all possible sources of ignition in the space. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If the atmosphere cannot be checked, do not enter. Let vapours evaporate, keep clear. Provide good ventilation of the space. Use water spray on effluent in hold to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Pump overboard.
	Cargo transport units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Do not enter space. Keep clear. Radio for expert ADVICE. After hazard evaluation by experts, you may proceed. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapour evaporate, keep clear. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied areas of the vessel, e.g. living quarters, machinery spaces, working areas. Provide good ventilation of the space. Use water spray on effluent in the space to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard.
Special cases:		
Marine pollutant mark		Report incident according to MARPOL reporting requirements.
UN 2749		Self-ignition of spilt material is possible.
UN 3359		This is a cargo transport unit under fumigation. When opened, it will be ventilated. However, experience has shown that toxic fumigants will stay within packaging material and in non-ventilated areas. Obtain information about the fumigation agent.
UN 3540		Substances might be spilled when the articles are damaged. Undamaged articles can be collected and repacked.

SPILLAGE SCHEDULE Echo

S–E

FLAMMABLE LIQUIDS, FLOATING ON WATER

General comments		Avoid sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools). Liquid is flammable and spillage may evolve flammable vapours. Wear suitable protective clothing and self-contained breathing apparatus. Stop leak if practicable. In general, substances covered under this schedule will have fuel-oil-like properties. They are immiscible with water and are liable to float on the surface of water. The use of inert absorbent material, as used in machinery spaces, is appropriate in all cases. For sticky liquids, shovels may be used, preferably shovels made of non-sparking or non-ferrous material. You may use light oil or soap-like products (surfactants) to clean small areas. Clean the area thoroughly because of the flammability hazard. Any pumping of spilled liquid overboard will create an oil spill on the sea surface. In this case, contact coastal authorities. Report discharge overboard according to MARPOL reporting requirements.
Spillage on deck	**Packages (small spillage)**	Collect spillage in oil drums, metal boxes or salvage packagings. You may use inert absorbent material.
	Cargo transport units (large spillage)	Restrict flow of leakage to an enclosed area (e.g. by diking with inert material or cement). Collect spillage in oil drums, metal boxes or salvage packagings. You may use inert absorbent material. Otherwise, wash overboard with copious quantities of water.
Spillage under deck	**Packages (small spillage)**	Shut off possible sources of ignition in the space. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate. Collect spillage in oil drums, metal boxes or salvage packagings. You may use inert absorbent material. Keep collected spillages in well ventilated areas or on deck only.
	Cargo transport units (large spillage)	Shut off possible sources of ignition in the space. Provide adequate ventilation. Do not enter deck without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Provide good ventilation of the space. Use water spray on effluent in the space to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Use copious quantities of water. Treat effluent according to Shipboard Oil Pollution Emergency Plan. Otherwise, radio for expert ADVICE.
Special cases:		
UN 1136, UN 1993		These substances may be miscible with water and hence not float on the surface. In this case, SPILLAGE SCHEDULE S–D will be appropriate.
UN 1139, UN 1263, UN 1866		No thorough cleaning of spillage site necessary. Residues will dry out and coat surfaces.

SPILLAGE SCHEDULE Foxtrot

S–F

WATER-SOLUBLE MARINE POLLUTANTS

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Stop leak if practicable. Substances covered under this schedule will present a hazard to the marine environment. Try to avoid disposal overboard. The use of inert absorbent material, as used in machinery spaces, is appropriate in all cases. For sticky liquids, shovels may be used. Discharge of spilled substance overboard will damage the marine environment, including living resources of the sea. In this case, contact coastal authorities. Report discharge overboard according to MARPOL reporting requirements.
Spillage on deck	**Packages (small spillage)**	***Liquids:*** Smother spillage with inert absorbent material. Collect spillage in oil drums, metal boxes or salvage packagings. ***Solids:*** Collect material.
	Cargo transport units (large spillage)	Restrict flow of leakage to an enclosed area (e.g. by barricading with inert material or cement if available). ***Liquids:*** Collect spillage in empty tanks, oil drums, metal boxes or salvage packagings. You may use inert absorbent material. ***Solids:*** Collect spillage in oil drums or metal boxes.
Spillage under deck	**Packages (small spillage)**	***Liquids:*** Smother spillage with inert absorbent material. Collect spillage in oil drums, metal boxes or salvage packagings. ***Solids:*** Collect material.
	Cargo transport units (large spillage)	Restrict flow of leakage to an enclosed area (e.g. by barricading with inert material or cement if available). ***Liquids:*** Collect spillage in empty tanks, oil drums, metal boxes or salvage packagings. You may use inert absorbent material. ***Solids:*** Collect spillage in oil drums or metal boxes. Otherwise, wash down to the bottom of the hold. Use copious quantities of water. Treat effluent according to Shipboard Oil Pollution Emergency Plan.
Special cases: None.		

SPILLAGE SCHEDULE Golf

S–G

FLAMMABLE SOLIDS AND SELF-REACTIVE SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable.
Spillage on deck	**Packages (small spillage)**	Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). Collect and contain spillage if practicable. Dispose of overboard. Collect spillage using soft brushes and plastic trays.
	Cargo transport units (large spillage)	Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). Collect and contain spillage if practicable. Dispose of overboard. Collect spillage using soft brushes and plastic trays.
Special cases: **UN 3541**		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Hotel

S–H

FLAMMABLE SOLIDS (MOLTEN MATERIAL)

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable. Do not touch or walk on spilled material.
Spillage on deck	**Packages (small spillage)**	Smother with dry inert material. Dispose of overboard.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	
	Cargo transport units (large spillage)	
Special cases: None.		

SPILLAGE SCHEDULE India

S–I

FLAMMABLE SOLIDS (REPACKING POSSIBLE)

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable.
Spillage on deck	**Packages (small spillage)**	Collect spillage and repack if practicable. Otherwise, wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Collect spillage and repack if practicable.
	Cargo transport units (large spillage)	
Special cases: None.		

SPILLAGE SCHEDULE Juliet

S–J

WETTED EXPLOSIVES AND CERTAIN SELF-HEATING SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable. Dried out material may explode if exposed to heat, flame, friction, or shock.
Spillage on deck	**Packages (small spillage)**	Keep spillage wet. Dispose of solid material overboard. Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Keep spillage wet. Collect and contain spillage if practicable. Dispose of overboard. Collect spillage using soft brushes and plastic trays.
	Cargo transport units (large spillage)	
Special cases: **UN 3542**		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Kilo

S–K

TEMPERATURE-CONTROLLED SELF-REACTIVE SUBSTANCES

General comments		If smoke is observed, see FIRE SCHEDULE F-F. Check temperature reading if possible. If temperature is increasing: see FIRE SCHEDULE F-F. Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear.
Spillage on deck	**Packages (small spillage)**	Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo transport units (large spillage)	Wash overboard with copious quantities of water. Keep clear of effluent. Leave units closed.
Spillage under deck	**Packages (small spillage)**	Not applicable. According to the IMDG Code, under deck stowage not allowed. Radio for expert ADVICE.
	Cargo transport units (large spillage)	
Special cases:		

SPILLAGE SCHEDULE Lima

S–L

SPONTANEOUSLY COMBUSTIBLE, WATER-REACTIVE SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. DO NOT USE WATER.
Spillage on deck	**Packages (small spillage)**	Avoid getting water on spilled substances or inside cargo transport units. Smother with dry inert material. Dispose of overboard immediately.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Not applicable. According to the IMDG Code, under deck stowage not allowed. Radio for expert ADVICE.
	Cargo transport units (large spillage)	
Special cases: **UN 2210, UN 2968**		These substances are allowed to be carried under deck. Take action as given for on deck stowage.

SPILLAGE SCHEDULE Mike

S–M

HAZARD OF SPONTANEOUS IGNITION

General comments		Substances covered by this schedule may ignite within 5 minutes after contact with air. See firefighting guidance: FIRE SCHEDULE F–G.
Spillage on deck	**Packages (small spillage)**	
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	
	Cargo transport units (large spillage)	
Special cases: **UN 3542**		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE November

S–N

SUBSTANCES REACTING VIGOROUSLY WITH WATER

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable.
Spillage on deck	**Packages (small spillage)**	If dry, contain and collect spillage if practicable. Dispose of overboard. Avoid contact with water except to wash residues overboard with copious quantities of water. Keep clear of effluent.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Provide adequate ventilation. Check atmosphere before entering space (toxicity and explosion hazards). If atmosphere cannot be checked, do not enter. Do not enter space without self-contained breathing apparatus. Keep dry. Collect spillages using soft brushes and plastic trays. *If dry*, collect and contain spillage if practicable. Dispose of overboard. *If wet*, use inert absorbent material. Do not use combustible material. Dispose of overboard.
	Cargo transport units (large spillage)	
Special cases: **UN 3543**		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Oscar

S–O

SUBSTANCES DANGEROUS WHEN WET (NON-COLLECTABLE ARTICLES)

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable.
Spillage on deck	**Packages (small spillage)**	Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Do not enter space without self-contained breathing apparatus. *If dry*, collect and contain spillage if practicable. Keep dry. Dispose of overboard. Avoid contact with water except to wash residues with copious quantities of water. Keep clear of effluent. *If wet*, wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. If gas is developing, provide good ventilation of the hold. Use water spray on effluent in hold to avoid ignition of flammable vapours.
	Cargo transport units (large spillage)	Do not enter space without self-contained breathing apparatus. *If dry*, collect and contain spillage if practicable. Keep dry. Dispose of overboard. Avoid contact with water except to wash residues with copious quantities of water. Keep clear of effluent. *If wet*, wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. If gas is developing, provide good ventilation of the hold. Use water spray on effluent in hold to avoid ignition of flammable vapours. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied spaces of the ship, e.g. living quarters, machinery spaces, working areas.
Special cases: **UN 1295**		Beware of a highly flammable atmosphere.

SPILLAGE SCHEDULE Papa

S–P

SUBSTANCES DANGEROUS WHEN WET (COLLECTABLE ARTICLES)

General comments		Wear suitable protective clothing and self-contained breathing apparatus.
Spillage on deck	**Packages (small spillage)**	Contain and collect spillage if practicable. Dispose of overboard.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Contain and collect spillages if practicable. Dispose of overboard.
	Cargo transport units (large spillage)	
Special cases: **UN 3257, UN 3258** **UN 3316** **UN 3363, UN 3548**		Hot substance. No hazard when cool. If FIRST AID KIT, collect articles and repack. Substances might be spilled when the articles or machinery are damaged. Undamaged articles can be collected. Take care of hazardous properties according to transport documents or radio for expert ADVICE.

SPILLAGE SCHEDULE Quebec

S–Q

OXIDIZING SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. May ignite combustible material (e.g. wood, paper, clothing). Stop leak if practicable.
Spillage on deck	**Packages (small spillage)**	Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Do not enter space without self-contained breathing apparatus. *If dry*, contain and collect spillage if practicable. Dispose of overboard. *If wet*, use inert absorbent material. Do not use combustible material. *If liquid*, wash down to the bottom of the hold, using copious quantities of water. Pump overboard. Dispose of overboard.
	Cargo transport units (large spillage)	Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. *If dry*, contain and collect spillage if practicable. Dispose of overboard. *If wet*, use inert absorbent material. Do not use combustible material. *If liquid*, wash down to the bottom of the hold, using copious quantities of water. Pump overboard. Dispose of overboard.
Special cases: **UN 3544**		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Romeo

S–R

ORGANIC PEROXIDES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Contact of substance (or vapour) with eyes may cause blindness within minutes. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable. Substances covered by this schedule are liable to explode by exposure to heat or ignition. In case of *smoke evolution*, see appropriate FIRE SCHEDULE. Radio for expert ADVICE or contact manufacturer.
Spillage on deck	**Packages (small spillage)**	Wash overboard with copious quantities of water. Keep clear of effluent. Collect damaged or leaking receptacles and dispose of overboard. Handle with care.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Not applicable. According to the IMDG Code, under deck stowage not allowed. Radio for expert ADVICE.
	Cargo transport units (large spillage)	
Special cases: **UN 3545**		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Sierra (Part 1 of 2)

S–S

RADIOACTIVE MATERIAL

General comments		Evacuate compartment or downwind area of non-essential personnel. Provide respiratory protection to personnel in downwind area. For ships carrying radiation monitoring equipment, measure radiation levels. In this case, assess the extent of contamination and resultant radiation level of the package, the adjacent areas and, if necessary, all other material which has been carried in the conveyance. Define a zone for restricted entry. Personnel should not enter this zone without suitable protective clothing and self-contained breathing apparatus. Limit entry of personnel to the restricted zone for the shortest time possible. Cover liquid spill with inert absorbent materials, if available. Cover powder spills with plastic sheet or tarpaulin to minimize spread. If exposure of personnel is suspected, clean body and hair with warm water and soap; discharge resultant washings directly overboard. Record the names of potentially exposed persons. Ensure medical examination of these persons after reaching any medical staff. Emergency procedures, if established for the ship or the specific cargo by relevant authorities or the shipper, should be followed. For ships carrying radiation monitoring equipment, continue monitoring the radiation levels. Radio for expert ADVICE.
Spillage on deck	**Packages (small spillage)**	Wash spillages overboard with copious quantities of water. Keep clear of effluent. Packages damaged or leaking radioactive contents may be removed to an acceptable restricted access interim location. Isolate and sheet over. Do not remove packages from restricted access zone until approved by the competent authority.
	Cargo transport units (large spillage)	Let released gas escape. Keep clear. Use water spray to protect bridge, living quarters and personnel from precipitation of vapours (water curtain). Absorb liquid spillage, where practicable, using absorbent material. Isolate and sheet over. Packages damaged or leaking radioactive contents may be removed to an acceptable restricted access interim location. Isolate and sheet over. Do not remove packages from restricted access zone until approved by the competent authority. Wash residues of liquids or solids overboard with copious quantities of water (use spray nozzles). Do not allow water to enter receptacles.
Spillage under deck	**Packages (small spillage)**	Provide adequate ventilation. Let released gas escape, keep clear. Where a ventilation system is used, particular attention should be taken in order to prevent radioactive vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Keep solids dry. Absorb liquid spillage, where practicable, using inert absorbent material. Isolate and sheet over. Packages damaged or leaking radioactive contents may be removed to an acceptable restricted access interim location. Isolate and sheet over. Do not remove packages from restricted access zone until approved by the competent authority. Keep working period of emergency team in space as short as possible.
	Cargo transport units (large spillage)	Do not enter space. Radio for expert ADVICE. ***If liquid, or vapour is developing:*** Where a ventilation system is used, particular attention should be taken in order to prevent radioactive vapours entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Use water spray to protect bridge, living quarters and personnel from precipitation of vapours evolving from the hold (water curtain).

SPILLAGE SCHEDULE Sierra *(continued)* (Part 2 of 2)

S–S

RADIOACTIVE MATERIAL

Special cases:	
UN 2977, UN 2978, UN 3507	Avoid contact, even when wearing protective clothing. Keep clear of evolving vapours. Even short-time inhalation of small quantities of vapour can cause breathing difficulties. Bear in mind that gases are heavier than air. Measures should be taken to prevent leaking gases from penetrating into any other part of the ship. Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive and toxic vapours by using water spray to drive vapours away. Do not enter space without protective equipment. Keep clear. Radio for expert ADVICE.
UN 3332, UN 3333	If a special form radioactive material is identified as being outside its packaging, do not touch. Stay away and radio for expert ADVICE.
UN 2919, UN 3331	For radioactive material, *transported under special arrangement*, use special precautions, operational controls or emergency procedures as specifically designated by the competent authorities in their approval certificates and declared by the shipper in its transport documents.
Subsidiary labels class 4.2 or class 4.3	These are pyrophoric substances, water will ignite the material. DO NOT USE WATER. Radio for expert ADVICE.
Restowing of packages	
UN 2977, UN 3324, UN 3325, UN 3326, UN 3327, UN 3328, UN 3329, UN 3330, UN 3331	Check package labels and transport documents to determine whether packages contain fissile material. Prior to any restowing of these packages, radio for expert ADVICE.

SPILLAGE SCHEDULE Tango

S–T

DANGEROUS GOODS WITH BIOHAZARD

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid handling leaking or damaged packages or keep handling to a minimum. Inform the public health, veterinary or other competent authority if persons or the marine environment might have been exposed. A competent authority to which actual or suspected leakage is reported should notify the authorities of any countries in which the goods may have been handled, including countries of transit. Radio for expert ADVICE. Notify consignor/consignee.
Spillage on deck	**Packages (small spillage)**	Stop leak if practicable. Collect potentially contaminated packages or equipment. Isolate and sheet over. Wash spillage or residues overboard with copious quantities of water. Keep clear of effluent. Clean contaminated area thoroughly using bleach-like products (like sodium hypochlorite 1–6% solution or Javel water). Keep clear of effluent.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Do not enter space.
	Cargo transport units (large spillage)	
Special cases: None.		

SPILLAGE SCHEDULE Uniform (Part 1 of 2)

S–U

GASES (FLAMMABLE, TOXIC OR CORROSIVE)

General comments		Spaces and areas where leakages or spillages have occurred should be evacuated downwind immediately. Take care: Flames may be invisible. Leaking gas may be extremely cold. Measures should be taken to prevent leaking gases from penetrating into any other part of the ship. Bear in mind that some gases are heavier than air or may otherwise accumulate in lower or non-ventilated parts of the ship. Ensure that there is no smoking or any other open fire on board unless the leak has been closed and all spaces have been ventilated. Particular attention should be taken in order to prevent gases drifting into occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Wear protective clothing suitable for gas protection and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Even short inhalation of small quantities of gas can cause breathing difficulties. Keep clear of evolving gases. Avoid all skin contact. Let *spilt liquefied gas* evaporate. When in contact with cold liquefied gases, most materials become brittle and are likely to break without warning. Avoid all contact, even when wearing protective clothing. If practicable, protect ship's superstructure with copious quantities of water. Do not direct water jet onto the spill.
Spillage on deck	**Packages (small spillage)**	Let gas dissipate. Keep clear.
	Cargo transport units (large spillage)	Let gas dissipate. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against flammable or toxic gases by using water spray to drive gases away (water curtain). ***Spilt liquefied gas:*** Use water jets from as far as practicable to accelerate evaporation, not directing them straight onto the spill.
Spillage under deck	**Packages (small spillage)**	Do not enter space. Provide adequate ventilation. Where a ventilation system is used, particular attention should be taken in order to prevent gases penetrating into other areas of the ship. Let gas evaporate. Keep clear. Radio for expert ADVICE. Check atmosphere before entering (toxicity and explosion hazard). Do not enter space without self-contained breathing apparatus.
	Cargo transport units (large spillage)	Do not enter space. Provide adequate ventilation. Where a ventilation system is used, particular attention should be taken in order to prevent gases drifting into other areas of the ship. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against flammable or toxic gases by using water spray to drive gases away (water curtain). If practicable, use water spray to avoid ignition of flammable gases in the space. Radio for expert ADVICE. Check atmosphere before entering (toxicity and explosion hazard). Do not enter deck without self-contained breathing apparatus.

SPILLAGE SCHEDULE Uniform *(continued)* (Part 2 of 2)

S–U

GASES (FLAMMABLE, TOXIC OR CORROSIVE)

Special cases:	
UN 1001, UN 3374	Heated or roughly handled receptacles may explode even after several hours of being removed from external sources of heat. Cool for several hours by using water.
UN 1614	The gas is absorbed in a porous inert material, but will evaporate if the receptacle is damaged.
UN 3501	A flammable liquid, paste or powder may be expelled if the package is ruptured. Also consult SPILLAGE SCHEDULES S-D or S-G, as appropriate.
UN 3504	A flammable or toxic liquid, paste or powder may be expelled if the package is ruptured. Also consult SPILLAGE SCHEDULES S-D, S-G or S-A, as appropriate.
UN 3505	A flammable or corrosive liquid, paste or powder may be expelled if the package is ruptured. Also consult SPILLAGE SCHEDULES S-C or S-G, as appropriate.
UN 3537, UN 3539	Gases might be released when the articles are damaged. Undamaged articles can be collected and repacked.

SPILLAGE SCHEDULE Victor

S–V

GASES (NON-FLAMMABLE, NON-TOXIC)

General comments		Measures should be taken to prevent leaking gases from penetrating into any other part of the ship. Bear in mind that some gases are heavier than air or may otherwise accumulate in lower or non-ventilated parts of the ship. Particular attention should be taken in order to prevent gases drifting into occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Leaking gas may be extremely cold. Wear suitable protective clothing and self-contained breathing apparatus (suffocation hazard). Let *spilt liquefied gas* evaporate. When in contact with cold liquefied gases, most materials become brittle and are likely to break without warning. Avoid all contact, even when wearing protective clothing. If practicable, protect ship's superstructure with copious quantities of water. Do not direct water jet onto the spill.
Spillage on deck	**Packages (small spillage)**	Let gas dissipate. Keep clear.
	Cargo transport units (large spillage)	Let gas dissipate. ***Spilt liquefied gas:*** Use water jets from as far as practicable to accelerate evaporation, not directing them straight onto the spill. Keep clear of evolving gases.
Spillage under deck	**Packages (small spillage)**	Provide adequate ventilation. Stop leak if practicable. Otherwise, let gas evaporate. Keep clear. Check atmosphere before entering space (suffocation hazard). Do not enter space without self-contained breathing apparatus.
	Cargo transport units (large spillage)	Provide adequate ventilation. Stop leak if practicable. Otherwise, let gas evaporate. Keep clear. ***Spilt liquefied gas:*** Use water jets from as far as practicable to accelerate evaporation, not directing them straight onto the spill. Check atmosphere before entering space (suffocation hazard). Do not enter space without self-contained breathing apparatus.
Special cases:		
UN 2990, UN 3072		No suffocation hazard. Collect articles and repack.
UN 3502		A toxic liquid, paste or powder may be expelled if the package is ruptured. Also consult SPILLAGE SCHEDULE S-A.
UN 3503		A corrosive liquid, paste or powder may be expelled if the package is ruptured. Also consult SPILLAGE SCHEDULES S-C or S-G, as appropriate.
UN 3538		Gases might be released when the articles are damaged. Undamaged articles can be collected and repacked.

SPILLAGE SCHEDULE Whisky

S–W

OXIDIZING GASES

General comments		Areas containing leakages or spillages should be evacuated downwind immediately. These gases may ignite combustible material and enhance fire. Take care: Flames may be invisible. Leaking gas may be extremely cold. Measures should be taken to prevent leaking gases from penetrating into any other part of the ship. Ensure that there is no smoking or any other open fire on board unless the leak has been closed and all spaces have been ventilated. Particular attention should be taken in order to prevent gases drifting into occupied areas of the vessel, e.g. living quarters, machinery spaces, working areas. Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Even short inhalation of small quantities of gas can cause breathing difficulties. Keep clear of evolving gases. Avoid all skin contact. Let *spilt liquefied gas* evaporate. When in contact with cold liquefied gases, most materials become brittle and are likely to break without warning. Avoid all contact, even when wearing protective clothing. If practicable, protect ship's superstructure with copious quantities of water. Do not direct water jet onto the spill.
Spillage on deck	**Packages (small spillage)**	Let gas evaporate. Keep clear.
	Cargo transport units (large spillage)	Let gas evaporate. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against flammable or toxic gases by using water spray to drive gases away (water curtain). ***Spilt liquefied gas:*** Use water jets from as far as practicable to accelerate evaporation, not directing them straight onto the spill.
Spillage under deck	**Packages (small spillage)**	Do not enter space. Provide adequate ventilation. Where a ventilation system is used, particular attention should be observed in order to prevent gases penetrating into other areas of the ship. Let gas evaporate. Keep clear. Radio for expert ADVICE. Check atmosphere before entering space (toxicity and explosion hazard). Do not enter space without self-contained breathing apparatus.
	Cargo transport units (large spillage)	Do not enter space. Provide adequate ventilation. Where a ventilation system is used, particular attention should be observed in order to prevent gases drifting into other areas of the ship. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against gases by using water spray to drive gases away (water curtain). If practicable, use water spray to avoid ignition of gases in the space. Radio for expert ADVICE.
Special cases: **UN 1072, UN 1073**		This is concentrated oxygen. No inhalation hazard after a short distance from a leak. No skin irritation hazard.

SPILLAGE SCHEDULE X-Ray

S–X

EXPLOSIVE ITEMS AND ARTICLES

General comments		Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools). ***Electrostatic hazard:*** Electric charge may ignite ammunition. Keep spilled material away from generators of static electricity (e.g. mobile phones, friction of synthetic polymers like PVC gloves). Wear non-sparking footwear.
Spillage on deck	**Packages (small spillage)**	***Articles:*** Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and radio for expert ADVICE. ***Spilled substance:*** Keep wet. Wash spillage overboard with copious quantities of water.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	***Articles:*** Sweep or pick up articles. If the articles remain intact but appear damaged, separate and radio for expert ADVICE. ***Spilled substance:*** Keep wet. Collect spillage where practicable. Dispose of overboard.
	Cargo transport units (large spillage)	
Special cases: None.		

SPILLAGE SCHEDULE Yankee

S–Y

EXPLOSIVE CHEMICALS

General comments		Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools). Stop leak if practicable. ***Electrostatic hazard:*** Electric charge may ignite ammunition. Keep spilled material away from generators of static electricity (e.g. mobile phones, friction of synthetic polymers like PVC gloves). Wear non-sparking footwear. Some explosive mixtures are stabilized in such a way that water will separate explosives from the stabilizer, thus creating a higher risk. The explosive component becomes very sensitive to shock and heat. Radio for expert ADVICE.
Spillage on deck	**Packages (small spillage)**	***Articles:*** Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and ask for expert ADVICE. Wetted articles should be jettisoned. ***Spilled substance:*** Keep it under water. Wash spillages overboard with copious quantities of water.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	***Articles:*** Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and radio for expert ADVICE. Wetted articles should be jettisoned. ***Spilled substance:*** Keep it under water. Collect spillages where practicable. Dispose of overboard.
	Cargo transport units (large spillage)	
Special cases: None.		

SPILLAGE SCHEDULE Zulu

S–Z

TOXIC EXPLOSIVES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Even short inhalation of small quantities of gas can cause breathing difficulties or lead to severe poisoning. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools). ***Electrostatic hazard:*** Electric charge may ignite ammunition. Keep spilled material away from generators of static electricity (e.g. mobile phones, friction of synthetic polymers like PVC gloves). Wear non-sparking footwear. Particular attention should be taken in order to prevent developing gases drifting into occupied areas of the ship, e.g. living quarters, machinery, working areas. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against gases by using water spray to drive gases away (water curtain). Radio for expert ADVICE.
Spillage on deck	**Packages (small spillage)**	Let vapours dissipate, keep clear. ***Articles:*** Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and ask for expert ADVICE. ***Spilled substance:*** Keep wet. Wash spillage overboard with copious quantities of water. Keep clear of effluent.
	Cargo transport units (large spillage)	
Spillage under deck	**Packages (small spillage)**	Do not enter space without self-contained breathing apparatus. Check atmosphere before entering. Let vapours dissipate, keep clear. ***Articles:*** Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and ask for expert ADVICE. ***Spilled substance:*** Keep wet. Collect spillages where practicable. Dispose of overboard.
	Cargo transport units (large spillage)	
Special cases: None.		