

- (a) determine and plot the ship's position on the appropriate chart as soon as practicable and at sufficiently frequent intervals check when circumstances permit, by taking bearings of fixed navigational marks or readily identifiable shore objects, whether the ship is remaining securely at anchor;
- (b) ensure that an efficient look-out is maintained;
- (c) ensure that inspection rounds of the vessel are made periodically;
- (d) observe meteorological and tidal conditions and the state of the sea;
- (e) notify the master and undertake all necessary measures if the vessel drags the anchor;
- (f) ensure that the state of readiness of the main engines and other machinery is in accordance with the master's instructions;
- (g) if visibility deteriorates notify the master and comply with the applicable regulations for preventing collisions at sea;
- (h) ensure that the vessel exhibits the appropriate lights and shapes and that appropriate sound signals are made at all times;
- (i) take measures to protect the environment from pollution by the ship and comply with the applicable pollution regulations.

RESOLUTION A.286(VIII)

*Adopted on 20 November 1973
Agenda item 10*

**RECOMMENDATION ON TRAINING AND QUALIFICATIONS
OF OFFICERS AND CREWS OF SHIPS CARRYING
HAZARDOUS OR NOXIOUS CHEMICALS IN BULK**

THE ASSEMBLY,

NOTING Article 16(i) of the Convention on the Inter-Governmental Maritime Consultative Organization concerning the functions of the Assembly,

RECOGNIZING the importance and urgency of establishing mandatory minimum requirements for the training of officers and key ratings having special responsibilities for handling hazardous or noxious chemicals in bulk,

HAVING CONSIDERED the Reports of the Maritime Safety Committee on its twenty-seventh and twenty-eighth sessions,

RESOLVES:

- (a) to endorse the Recommendation on Training and Qualifications of Officers and Crews of Ships Carrying Hazardous or Noxious Chemicals in Bulk, the text of which is at Annex hereto;
- (b) to urge all Member Governments to give effect to the contents of the Recommendation as soon as practicable.

ANNEX

RECOMMENDATION ON TRAINING AND QUALIFICATIONS OF OFFICERS AND CREWS OF SHIPS CARRYING HAZARDOUS OR NOXIOUS CHEMICALS IN BULK

THE MARITIME SAFETY COMMITTEE,

BEING AWARE of the possible dangers to human life and to the environment from accidents involving the handling and carriage of hazardous or noxious chemicals in bulk,

NOTING that the shipment of these cargoes is rapidly increasing,

RECOGNIZING that suitable arrangements for the mandatory training of officers and key ratings having special responsibility for handling such cargoes are not widely available,

BEING OF THE OPINION that mandatory minimum requirements should be established as soon as practicable,

RECOMMENDS:

- (a) Member Governments to take account of the guidance contained in the Appendix to this recommendation on training and qualification of officers and crews of ships carrying hazardous or noxious chemicals in bulk;
- (b) that special training should be given to officers and ratings having special responsibility in connexion with cargo handling and equipment in ships carrying hazardous or noxious chemicals in bulk; and training courses for that purpose should be of adequate duration and supplemented by practical instruction at sea or in a suitable shore-based installation, e.g. bulk chemical handling terminal;
- (c) that Member Governments should satisfy themselves as to the standard of competency of officers and ratings having special responsibility in connexion with cargo operations in these ships. An Administration may, for example, require that such officers and ratings shall have undergone special training and have completed some minimum period of service in suitable ships as indicated above. Alternatively, the officer or rating should have completed a substantial period of service in chemical tankers and have satisfied the Administration as to his standard of specialized knowledge;
- (d) that all other personnel serving on ships carrying hazardous chemicals in bulk should be given training relevant to their duties.

APPENDIX

TRAINING AND QUALIFICATIONS OF OFFICERS AND CREWS OF SHIPS CARRYING HAZARDOUS OR NOXIOUS CHEMICALS IN BULK

1. TRAINING OF OFFICERS AND RATINGS RESPONSIBLE FOR CARGO HANDLING AND EQUIPMENT

It is considered that any training should be divided into two parts, the general part of principles involved and a part dealing with the application of the principles to ship operation. Any of this training may be given at sea or ashore. Such training should be supplemented by practical instruction at sea, and, where appropriate, in a suitable shore-based installation. All training/instruction must be given by a properly qualified person.

A. General

- (i) Elementary Physics: An outline treatment including practical demonstration of the physical properties of chemicals carried in bulk; vapour pressure/temperature relationship. Influence of pressure on boiling temperature. Explanation of: saturated vapour pressure, diffusion, partial pressure, flammability limit, flashpoints and autoignition temperature. Practical significance of flashpoint and low flammable limit. Simple explanation of types of electrostatic charge generation.
- (ii) Elementary Chemistry: Chemical symbols and structures, elements of the chemistry of acids and bases, structure and properties of well-known chemicals carried, chemical reaction of well-known groupings, sufficient to enable proper utilization of Codes.
- (iii) Toxicity: Simple principles and explanation of basic concepts; toxicity limits, systemic poisons and irritants.
- (iv) Hazards:
- (a) Explosion and Flammability Hazards: Flammability limits. Sources of ignition and explosion.
 - (b) Health Hazards: Dangers of skin contact, inhalation and ingestion.
 - (c) Environment Hazards: Dangers to human and marine life from release of chemicals at sea. Effect of specific gravity and solubility. Danger from vapour cloud drift. Effect of vapour pressure and atmospheric conditions.
 - (d) Reactivity Hazards: Self-reaction; polymerization, effects of temperature, impurities as catalysts. Reaction with air, water and other chemicals.
 - (e) Corrosion Hazards: Dangers to personnel, attacks on constructional materials. Effects of concentration. Evolution of hydrogen.
- (v) Hazard Control: Inerting, water padding, drying agents, monitoring techniques. Anti-static measures. Ventilation. Segregation. Cargo inhibition. The importance of compatibility of materials.
- (vi) Safety Equipment and Protection of Personnel: The function of measuring instruments and similar equipment. Specialized fire-extinguishing appliances, breathing and escape apparatus. Protective clothing and equipment.

B. Shipboard Application

- (i) Regulations and Codes of Practice: Familiarization with IMCO, National and International Chamber of Shipping Codes and Port regulations. The importance of developing ships' emergency plans.

- (ii) Ship Design and Equipment of Chemical Tankers: A brief description of specialized piping, pumping and tank arrangements, over-flow control. Types of cargo pumps and their application to various types of cargo. Tank cleaning and gas freeing systems. Cargo tank venting and accommodation ventilation, air locks. Gauging systems. Tank temperature control systems. The safety factors of electrical systems.
- (iii) Ship Operations: Cargo calculation. Loading and discharging plans. Loading and discharge procedure, check lists, use of monitoring equipment. Gas freeing operations and tank cleaning operations (proper use of absorption and wetting agents and detergents). Use and maintenance of inert atmospheres. Control of entry into pumprooms and enclosed spaces. Use of detecting and safety equipment. Disposal of waste and washings. Precautions to be taken before the repair and maintenance of pumping, piping, electrical and control systems.
- (iv) Emergency Operations: (It is recommended that officers should have previously attended a basic fire-fighting course of an approved nature) Emergency plan. Emergency shutdown. Action in the event of failure of services essential to cargo. Fire-fighting on chemical tankers. Action following collision and/or spillages. First aid procedure and the use of resuscitation and decontamination equipment.

General Notes

It is recommended that as great a use as possible should be made of films and suitable visual aids, and that the opportunity should be taken to introduce discussion of the part to be played by safety organization on board ship, and the role of Safety Officers and Safety Committees.

2. TRAINING OF OTHER PERSONNEL

Such personnel should undergo training on board ship and, where appropriate, ashore, which must be given by a qualified person who has attained the required standard and is experienced in the carriage of this type of cargo.

- (i) Health Hazard and Prevention: Dangers of skin contact. Inhalation and swallowing cargo. The toxic properties of cargoes carried. Accidents to personnel and associated first aid. Lists of do's and don't's.
- (ii) Fire Prevention/Fire-fighting: (It is recommended that personnel should have attended a basic fire-fighting course of approved nature) Outline of portable apparatus and fixed installations. Methods of fire fighting for different chemicals. Fire and explosion prevention. Sources of ignition.
- (iii) Pollution and Prevention: Procedures to be followed to prevent air and water pollution.
- (iv) Safety Equipment and its use: The use of protective clothing and equipment, resuscitators, escape sets, rescue equipment.
- (v) Emergency Procedures: Familiarization with the emergency plan procedure.
- (vi) Cargo Equipment and Operations: (selected personnel) General description of cargo handling equipment. Safe loading and discharge procedure and precautions. Safe entry into enclosed spaces.