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RESOLUTION A.437(XI)  
adopted on 15 November 1979  
TRAINING OF CREWS IN FIRE-FIGHTING

THE ASSEMBLY,

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

BEARING IN MIND disastrous fires in ships, some of which result in heavy loss of life,

RECALLING the relevant regulations of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, and resolutions of the International Conference on Training and Certification of Seafarers, 1978,

CONSIDERING it essential that adequate instruction in fire prevention and fire-fighting be given to those engaged in all departments on board ship, and that this should be given as far as practicable and appropriate in pre-sea training courses or other shore-based courses,

NOTING FURTHER that continuous updating of shore-based training in fire-fighting will be ensured by carrying out fire drills described and required in the International Convention for the Safety of Life at Sea, 1974, Chapter III, Regulations 25 and 26,

RECALLING resolution A.124(V) which recommends that all seafarers should be trained in fire prevention and fire-fighting,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its forty-first session,

1. RECOMMENDS that each Member Government should aim at training all its seafarers in fire prevention and fire-fighting to an extent appropriate to their functions on board ship and that to this end:

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- (a) All seafarers should be instructed in the dangers of fire in ships and the ways in which fires are caused;
- (b) Training in the prevention and extinguishment of fires should be given as soon as possible in the career of every seafarer, preferably in pre-sea courses;
- (c) In preparing the syllabus for the basic fire-fighting training applicable to all seafarers, competent authorities should take into account Annex 1 to the present resolution;
- (d) Masters, officers and as far as practicable other key personnel who may also have to control fire-fighting operations should have advanced training in techniques for fighting fire with particular emphasis on organization, tactics and command;
- (e) In drawing up a syllabus for advanced training, competent authorities should take into account Annex 2 to the present resolution;
- (f) Specialized additional training in fire-fighting should be provided to masters, officers and ratings of oil, chemical and liquefied gas tankers in accordance with resolutions 10, 11 and 12 of the International Conference on Training and Certification of Seafarers, 1978;
- (g) Where training in fire-fighting is not included in the qualifications for other certificates, consideration should be given to the issue of special certificates indicating that the holder has attended a specified course of training in fire-fighting;

REVOKES resolution A.124(V).

ANNEX 1

BASIC TRAINING OF CREWS IN FIRE-FIGHTING

1 Basic fire-fighting training should include at least the following theoretical and practical elements.

2 Theory

2.1 The three elements of fire and explosion (the fire triangle):

- .1 fuel;
- .2 source of ignition;
- .3 oxygen.

2.2 Ignition sources:

- .1 chemical;
- .2 biological;
- .3 physical.

2.3 Flammable materials:

- .1 flammability;
- .2 ignition point;
- .3 burning temperature;
- .4 burning speed;
- .5 thermal value;
- .6 lower flammable limit (LFL);
- .7 upper flammable limit (UFL);
- .8 flammable range;
- .9 inerting;
- .10 static electricity;
- .11 flash point;
- .12 auto-ignition.

2.4 Fire hazard and spread of fire:

- .1 by radiation;
- .2 by convection;
- .3 by conduction.

2.5 Reactivity.

2.6 Classification of fire and applicable extinguishing agents.

2.7 Main causes of fire on board ships:

- .1 oil leakage in engine room;
- .2 cigarettes;
- .3 overheating (bearings);
- .4 galley appliances (stoves, flues, fryers, hotplates, etc.);
- .5 spontaneous ignition (cargo wastes, etc.);
- .6 hot work (welding, cutting, etc.);
- .7 electrical apparatus (short circuit, non-professional repairs);
- .8 reaction, self-heating and auto-ignition.



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2.8 Fire prevention.

2.9 Fire detection:

- .1 fire and smoke detection systems;
- .2 automatic fire alarm.

2.10 Fire-fighting equipment:

.1 fixed installations on board and locations:

- .1.1 fire mains, hydrants;
- .1.2 international shore connexion;
- .1.3 smothering installations, carbon dioxide (CO<sub>2</sub>), foam;
- .1.4 halogenated hydrocarbons;
- .1.5 pressure water spray system in special category spaces, etc.;
- .1.6 automatic sprinkler system;
- .1.7 emergency fire pump, emergency generator;
- .1.8 chemical powder applicants;
- .1.9 general outline of required and available mobile apparatus;

.2 fireman's outfits and personal equipment, location on board:

- .2.1 fireman's outfit, personal equipment;
- .2.2 breathing apparatus;
- .2.3 resuscitation apparatus;
- .2.4 smoke helmet or mask;
- .2.5 fireproof life-line and harness;

.3 general equipment:

- .3.1 fire hoses, nozzles, connexions, fire axes;
- .3.2 portable fire extinguishers;
- .3.3 fire blankets.

2.11 Construction and arrangements:

- .1 escape routes;
- .2 means for gas freeing tanks;
- .3 Class A, B and C divisions;
- .4 inert gas systems.

2.12 Ship fire-fighting organization:

- .1 general alarm;
- .2 fire control plans, muster stations and duties of individuals;
- .3 communications, including ship-shore when in port;
- .4 personnel safety procedures;
- .5 periodic shipboard drills;
- .6 patrol systems.

2.13 Practical knowledge of resuscitation methods.

2.14 Fire-fighting methods:

- .1 sounding the alarm;
- .2 locating and isolating;
- .3 jettisoning;

- .4 inhibiting;
- .5 cooling;
- .6 smothering;
- .7 extinguishing;
- .8 reflash watch.

2.15 Fire-fighting agents:

- .1 water, solid jet, spray, fog, flooding;
- .2 foam, high, medium and low expansion;
- .3 carbon dioxide (CO<sub>2</sub>);
- .4 halon;
- .5 aqueous film forming foam (AFFF);
- .6 dry chemicals, powder.

3 Practice

Every seafarer should undergo the following practical training and satisfy the Administration that he possesses ability to:

- .1 use various types of portable fire extinguishers;
- .2 use self-contained breathing apparatus;
- .3 extinguish smaller fires, e.g. electrical fires, oil fires, propane fires;
- .4 extinguish extensive fires with water (jet and spray nozzles);
- .5 extinguish fires with either foam, powder or any other suitable chemical agent;
- .6 enter and pass through with life-line but without breathing apparatus a compartment into which high expansion foam has been injected;
- .7 fight fire in smoke-filled enclosed spaces wearing self-contained breathing apparatus;
- .8 extinguish fire with water fog, or any other suitable fire-fighting agent in an accommodation room or simulated engine room with fire and heavy smoke;
- .9 extinguish oil fire with fog applicator and spray nozzles, dry chemical powder or foam applicators;
- .10 effect a rescue in a smoke-filled space wearing breathing apparatus.

4 Every seafarer should satisfy the Administration that he is aware of the necessity of maintaining a state of readiness on board.

5 The practical training listed should take place in spaces which provide truly realistic training conditions, e.g. simulated shipboard conditions, and whenever possible and practical should also be carried out in darkness.

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## ANNEX 2

### ADVANCED TRAINING IN FIRE-FIGHTING

Having completed the training outlined in Annex 1, masters, officers and other key personnel who may also have to control fire-fighting operations should be given additional advanced training which should include the following:

- .1 fire control aboard ships;
  - .2 the organization of fire parties;
  - .3 training of fire parties;
  - .4 fire-fighting procedures at sea;
  - .5 fire-fighting procedures in port;
  - .6 the hazards associated with the storage and handling of materials (paints, etc.);
  - .7 inspection and servicing of fixed fire extinguishing systems;
  - .8 inspection and servicing of fire detection systems;
  - .9 inspection and servicing of portable and mobile fire extinguishing equipment;
  - .10 inspection and servicing of other fire-fighting equipment;
  - .11 use of water for fire extinguishing, the effect on ship stability, precautions and corrective procedures;
  - .12 ventilation control;
  - .13 control of fuel and electrical system;
  - .14 fire-fighting process hazards (dry distillation, chemical reactions, boiler uptake, fires, etc.);
  - .15 first aid including cardio-pulmonary resuscitation;
  - .16 fire investigation and reporting;
  - .17 fire-fighting involving dangerous goods.
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