DETAILED TRAINING SYLLABUS

SPECIFIC LEARNING OBJECTIVES

1 PERSONAL SURVIVAL TECHNIQUES

1.1 INTRODUCTION, SAFETY AND SURVIVAL (0.50 HR)

1.1.1 Safety guidance

.1 state the safety rules laid down by the chief instructor, which must be obeyed during the course (especially during practical drills)

1.1.2 Principles of survival at sea

.1 state the principles of survival at sea as:

- regular training and drills
- preparedness for any emergency
- knowledge of actions to be taken:
  - ~ when called to survival craft stations
  - ~ when required to abandon ship
  - ~ when in the water
  - ~ when aboard a survival craft
    - knowledge of the main dangers to survivors

1.1.3 Definitions, survival craft and appliances

.1 define

- ~ survival craft
- ~ rescue boat
- ~ float-free launching
- ~ free-fall launching
- ~ immersion suit
- ~ inflatable appliance
- ~thermal protective aid
- ~launching appliance

1.2 EMERGENCY SITUATIONS (0.25 HRS)

1.2.1 Types of emergencies

.1 list emergencies leading to fires or the foundering of ships as:

- ~ collision
- ~ stranding
- ~ adverse reaction of dangerous goods or hazardous bulk materials
- ~ shifting of cargo
- ~ engine room explosion or fire

1.2.2 Precautions

.1 list the precautions which are taken against such emergencies

1.2.3 Fire provisions

.1 describe generally the means provided to combat fire

1.2.4 Foundering

.1 describe generally the means provided in case of foundering

1.2.5 Crew expertise

.1 explain that the effectiveness of the means provided depends on the expertise of the personnel

1.2.6 Muster list and emergency signals

.1 explain the need for:

- ~ muster list
- ~ emergency signals
- ~ emergency drills

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1.2.7 Crew and emergency instructions .1 state that as soon as possible after joining a ship, personnel should acquire knowledge of: ~ the meaning of emergency signals ~ instructions on the muster list and their duties ~ the location and use of life-saving equipment ~ the location and use of fire-fighting equipment ~ escape routes and equipment ~ emergencies involving the sinking of the ship ~ the means provided for survival on ship and survival craft 1.2.8 Extra equipment and survival .1 describe extra equipment which is to be taken from the ship to the survival craft if time permits 1.2.9 Abandoning ship – complications .1 explain the complications in abandoning ship caused by: ~ some of the survival craft not capable of being launched ~ absence of lighting ~ absence of personnel assigned to certain duties
1.3 EVACUATION (0.50) 1.3.1 Abandoning ship – last resort .1 state that the ship usually offers the best chance of survival and that abandoning ship should only be undertaken if all other measures fail 1.3.2 Personal preparation for abandoning ship .1 explain how to prepare oneself for abandoning ship 1.3.3 Need to prevent panic .1 explain the need to prevent panic 1.3.4 Crew duties to passengers .1 describe duties with respect to passengers 1.3.5 Crew duties – launching survival craft .1 describe duties with respect to the launching of survival craft 1.3.6 Master's orders to abandon ship .1 state that the order to abandon ship comes from the master 1.3.7 Means of survival .1 describe as essential for survival after the ship has been abandoned: - a means of keeping afloat - a means of keeping warm - drinking water and food - a means of communicating with ships or rescue services
1.4 SURVIVAL CRAFT AND RESCUE BOATS (0.50 HRS) 1.4.1 Lifeboats .1 list different types of lifeboats as: ~ open ~partially enclosed ~ self-righting partially enclosed ~ totally enclosed ~ totally enclosed with a self-contained air support system ~ fire-protected .2 state that for passenger ships the capacity of the lifeboats is generally

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sufficient for every person on board .3 state that for cargo ships the capacity of the lifeboats is generally twice the number of persons on board .4 describe briefly the following lifeboats: - open - partially enclosed - self-righting partially enclosed - totally enclosed - self-righting totally enclosed - totally enclosed with a self-contained air support system - fire protected .5 describe how lifeboats are launched by: ~ davits ~ free fall method .6 state precautions which have to be taken to ensure personal safety while launching lifeboats .7 describe the means of embarkation 1.4.2 Life Rafts .1 list two main types of life rafts as: ~ inflatable ~ rigid .2 describe the two types .3 describe the float-free arrangements for life rafts 1.4.3 Rescue boats .1 state the minimum number of rescue boats on a passenger ship .2 state the minimum number of rescue boats on a cargo ship .3 describe the requirements which allow a lifeboat to be classed as a rescue boat
1.5 PERSONAL LIFE-SAVING APPLIANCES (0.75 HR) 1.5.1 Lifebuoys .1 describe how lifebuoys are distributed over the ship .2 describe the requirements for additional equipment attached to lifebuoys 1.5.2 Lifejackets .1 state the total number of lifejackets provided for: ~ a passenger ship ~ a cargo ship .2 state that lifejacket buoyancy may be achieved by: ~ packing with buoyant material ~ inflating .3 list equipment on lifejackets as: ~ fixed or flashing light ~ whistle firmly secured by a cord 1.5.3 Immersion suits .1 describe an immersion suit .2 state that an immersion suit should be available to every person assigned to crew the rescue boat .3 state that for passenger and cargo ships with non-enclosed lifeboats at least three immersion suits shall be carried for each lifeboat

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1.5.4 Thermal protective aids .1 state the main purpose of a thermal protective aid .2 state that for passenger and cargo ships with non-enclosed lifeboats a thermal protective aid must be provided for persons not provided with an immersion suit
1.6 PERSONAL LIFE-SAVING APPLIANCES (DEMONSTRATIONS) (1.75 HRS) 1.6.1 Lifebuoys .1 take a lifebuoy from stowage, throws it into the water and checks that the following function as intended: - lifebuoy - the self-igniting lights - the self-activating smoke signals - the buoyant lifelines 1.6.2 Lifejackets .1 don a non-inflatable lifejacket correctly within a period of 1 minute, and without assistance .2 jump into the water from a height while wearing the lifejacket .3 swim a short distance while wearing the lifejacket .4 test the whistle on the lifejacket 1.6.3 Inflatable lifejackets .1 don an inflatable lifejacket correctly within a period of 1 minute, and without assistance .2 jump into the water from a height while wearing the inflatable lifejacket .3 swim a short distance while wearing the inflatable lifejacket .4 test the whistle on the lifejacket .5 test the non-automatic methods of inflation 1.6.4 Immersion suits .1 unpack and don an immersion suit without assistance within 2 minutes .2 while wearing immersion suit and lifejacket: ~ climb up and down a vertical ladder at least 5m in length ~ jump from a height of not less than 4.5 m into the water ~ swim a short distance and board a survival craft ~ perform assigned duties during a simulated abandonment 1.6.5 Thermal protective aids .1 unpack and don a thermal protective aid without assistance whilst in a survival craft or rescue boat .2 remove a thermal protective aid which impedes swimming in not more than two minutes 1.6.6 Personal survival without a lifejacket .1 demonstrate how to keep afloat without the use of a lifejacket or immersion suit 1.6.7 Boarding survival craft .1 board a life raft from the ship and from the water .2 help others board .3 demonstrate the use of equipment, including a sea anchor .4 right a capsized life raft .5 demonstrate how to abandon a life raft
1.7 SURVIVAL AT SEA (0.25 HR)

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1.7.1 Dangers to survivors .1 describe dangers as: ~ heat stroke, sun stroke, exposure to cold and hypothermia ~ effects of seasickness ~ failure to maintain body fluids correctly, causing dehydration ~ drinking sea water ~ sharks 1.7.2 Best use of survival craft facilities .1 describe how to clear away from ship .2 explain protective measures against heat stroke, sun stroke, exposure and hypothermia .3 state effects of seasickness, and how to combat them .4 explain prudent use of fresh water and food and the need to avoid dehydration .5 explain measures for survival in case of fire or oil on the water .6 explain means of survival in shark-infested waters .7 explain correct use of a drogue or sea anchor to reduce drift .8 list duties of a lookout .9 describe means of facilitating detection by others .10 list the means of maintaining morale .11 describe use and working of shark repellents .12 explain means of survival if in water and not in lifeboat or life raft
1.8 HELICOPTER ASSISTANCE (0.50 HRS) 1.8.1 Communicating with the helicopter .1 explain the hand and arm signals used .2 explain how to communicate with the helicopter through a shore station if the appropriate equipment is available 1.8.2 Evacuation from ship and survival craft .1 explain the need to have a pick-up space on the ship which is clear of masts, rigging and other impediments .2 describe the means of evacuation from lifeboats and life rafts 1.8.3 Helicopter pick-up .1 describe methods of pick-up by harness, stretcher and rescue net .2 explain hand and arm signals used for safe lifting .3 describe how a member of the helicopter crew can assist in pick-up .4 explain the importance of obeying instructions given by helicopter pilot or deputy 1.8.4 Correct use of helicopter harness .1 describe the harness/strop .2 demonstrate the correct way to don the harness and adopt a safe posture in it
1.9 EMERGENCY RADIO EQUIPMENT (0.50 HRS) 1.9.1 Search and Rescue Transponder (SART) .1 state how many pieces of SART are to be provided on board ships of: ~ 300 to 500 gross tonnage ~ 500 gross tonnage and upwards .2 demonstrate the use of SART .3 demonstrate how to mount the SART maximum practicable height

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1.9.2 Portable VHF transceiver .1 state how many pieces of portable VHF transceiver are to be provided on board ships of: ~ 300 to 500 gross tonnage ~ 500 gross tonnage and upwards .2 explain the battery requirements for portable VHF transceivers .3 demonstrate the use of the portable VHF transceiver .4 demonstrate how to recharge the battery 1.9.3 Emergency position-indicating radio beacons (EPIRBs) .1 state the purpose of EPIRBs .2 list the four types of EPIRBs and describe the use of each: - Float-free satellite EPIRBs - INMARSAT-E - Cospas/Sarsat - VHF EPIRBs - 121.5 MHz - 243 MHZ - Channel 70 .3 demonstrate how each one is activated REVIEW AND MASTERY TEST (0.25 HRS)
2 BASIC FIRE FIGHTING 2.1 INTRODUCTION, SAFETY AND PRINCIPLES (0.25 HR) 2.2.1 list the main aims of Annex 1 of resolution A.437(XI) as: ~ instructing all seafarers in the dangers of fire in ships and the ways in which fires are caused ~ training them, preferably before they take up employment on a sea-going ship, in the prevention and extinguishing of fires 2.2.2 state the safety rules laid down by the chief instructor which must be adhered to during the course, including during the practice drills 2.2.3 list the principles of survival in relation to fire as: ~ regular training and drills ~ preparedness for any fire emergency ~ knowledge of actions to be taken when called to fire stations ~ knowledge of escape routes ~ knowledge of dangers of smoke and toxic fumes
2.2 THEORY OF FIRE (0.50 HRS) 2.2.1 Conditions for fires .1 list conditions required for fire to occur as: - the presence of material which acts as a fuel - a source of ignition, e.g. chemical, biological and physical - the presence of oxygen .2 sketch how these three conditions can be represented as a triangle (the fire triangle) .3 sketch how the addition of a fourth condition, the “chain reaction”, leads to the concept of the ‘fire tetrahedron”, which represents a continuously burning fire 2.2.2 Properties of flammable materials .1 define:

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~ flammability ~ ignition point ~ burning temperature ~ burning speed ~ thermal value ~ lower flammable limit (LFL) ~ upper flammable limit (UFL) ~ flammable range ~ flashpoint ~ auto-ignition .2 give one example of how static electricity can occur .3 explain reactivity .4 explain ignition sources 2.2.3 Fire hazard and spread of fire .1 define: ~ conduction ~ radiation ~ heat flow ~ convection currents .2 state that spread of fire occurs as a result of equalization in temperature between fire and surroundings via: ~ conduction ~ radiation ~ heat flow ~ convection currents .3 list examples of each method of propagation .4 list fire hazards in the engine room, including: - combustible liquids – fuel and lubricating oils - oil leaks and oil-soaked insulation - hot surfaces, e.g. exhaust pipes, engine parts overheating - defects in lagging - hot work, e.g. welding, cutting by oxyacetylene torch - auto-ignition, e.g. oil dripping on hot surface .5 list hazards in galley, including: - combustible liquids, e.g. cooking oil, hot fat - hot surfaces, e.g. ovens, frying pans, flues - defective electrical connections .6 list hazards in accommodation, including: - combustible materials, e.g. furnishings, personal effects - matches and cigarette smoking - defective electrical connections .7 list hazards from cargoes, including self-heating cargo and spontaneous combustion - oxidizing cargoes and organic peroxides - compressed flammable gas - pyrophoric cargoes - explosives .8 list hazards from smokers and cigarettes, including:

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- temperature of a burning cigarette, which is 500°C - carelessness with cigarettes and matches, setting fire to bedclothes, waste-paper-bin contents and furnishings .9 list four phases of fire development as: - ignition (incipient) - developing (surface fire) - absolute fire (fire in depth in solids) - burning out .10 state the temperature of a normal fire and the temperature in burning metals .11 state the effect of temperature rise on the rate of the chain reaction, i.e. fire intensity 2.2.4 Classification of fires and appropriate extinguishing agents .1 list the classification letter and appropriate extinguishing agents for fires in the following substances: - wood, paper, textiles and similar materials - wood, paper, textiles and flammable liquids - flammable liquids, electrical equipment, flammable gases - wood, paper, textiles, flammable liquids, electrical equipment, flammable gases - combustible metals - flammable liquids, electrical equipment, flammable gases
2.3 FIRE PREVENTION (0.50 HRS) 2.3.1 Fire prevention principles .1 describe how to use the “fire triangle” and “fire tetrahedron” concepts to prevent and extinguish fires .2 give examples of how a fire can be prevented from spreading by reducing or blocking: ~ conduction ~ radiation ~ heat flow ~ convection currents 2.3.2 Ship construction arrangements .1 list the basic principles .2 state how escape routes are protected .3 describe class A, B and C divisions .4 list the means for gas-freeing tanks .5 describe the purpose of and the means for inerting cargo spaces .6 explain briefly the fire-prevention arrangements required in cargo spaces 2.3.3 Safe practices .1 list general safety procedures, including: - no smoking in hazardous areas - ability to raise the fire alarm quickly - ability to extinguish fire by using portable extinguishers and other methods - ability to recognize fire hazards and to take the necessary steps to prevent fire .2 for the engine room, list measures for reducing fire hazards, which

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include: - ensuring insulation and lagging are kept in good condition - eliminating oil leaks and preventing accumulation of oil - taking proper fire precautions when welding or burning is being carried out - checking that caps and cocks for sounding pipes to oil tanks are closed - maintaining a clean engine room, removing oil-soaked rags .3 for the galley, list measures for reducing fire hazards, which include: - keeping extraction-fan flues clean - ensuring cooking oils do not spill on top of the stove or overheat in electrical cooking pans - keeping electrical installations well maintained .4 for the accommodation areas, list measures for reducing fire hazards, which include: - no smoking in bed - no unauthorized electrical fittings - no emptying of ashtrays into waste-paper bins without ensuring all cigarette ends are extinguished .5 for cargo spaces, lists measures for reducing fire hazards, which include: - ensuring hatches are correctly cleaned - ensuring cargo is stowed and ventilated in accordance with the rules - prohibition of smoking during cargo-working periods - securing of cargo - inerting the atmosphere in cargo compartments when required
2.4 FIRE DETECTION (0.50 HR) 2.4.1 Fire and smoke detection systems .1 describe the construction of an automatic fire-detection system .2 state the main types of automatic fire detectors .3 describe the characteristics of each main type of smoke or fire detector .4 list the alarms or actions which may be activated by a detector .5 state the benefit of an automatic sprinkler system in regard to fire detection in passenger and crew accommodation .6 state which detection system pertains to: ~ cargo spaces ~ engine room and other machinery spaces ~ accommodation ~ bridge and other control rooms 2.4.2 Automatic fire alarm .1 describe the operation of an automatic fire alarm .2 describe a system which has fire zones and state where such a system may be installed in a ship .3 describe the benefits of a zoned system
2.5 FIXED FIRE-EXTINGUISHING SYSTEMS (0.50 HRS) 2.5.1 General .1 list the general requirements for a fixed system, including the following: - the medium used must not produce toxic gases - the quantity of the medium must be adequate for the spaces which are to be protected

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- the piping system must have control vales - the release of a gas medium must not be automatic - the order to release the medium must be given by the captain or a senior officer .2 list typical fixed systems as: - carbon dioxide - sprinkler (wet and dry risers) - foam (low expansion) - foam (high expansion) - fire mains, hydrants - international shore connection - emergency generators, fire and bilge pumps - pressure water spray in special category spaces - chemical powder applicants 2.5.2 Smothering effect systems: carbon dioxide (CO_2) and foams .1 explain how CO_2 smothers a fire .2 state the dangers of CO_2 .3 state the actions to be taken when the CO_2 alarm sounds .4 state in which spaces CO_2 is used .5 explain the action of foam on a fire .6 describe the actions to be taken before CO_2 or foam is released in the fire zone .7 describe the different types of foam 2.5.3 Cooling effect systems: sprinklers, pressure spray .1 explain how a sprinkler system works .2 state in which spaces the sprinkler system is used .3 define the special category spaces in which manually operated pressure water spray systems are normally used .4 state the requirements for the number and positioning of hydrants .5 state the reason for fitting a shut-off valve to serve each hose .6 state the reason for fitting isolating valves on the fire main .7 describe an international shore connection, giving the principal dimensions, and state its purpose .8 describe how it is connected .9 state the minimum number of these connections which must be carried 2.5.4 Emergency fire pump (cargo ships) .1 state the number of acceptable jets of water which the emergency fire pump must be capable of supplying .2 state the requirements for the location of this pump .3 state the circumstances under which the emergency fire pump is used 2.5.5 Chemical powder applicants .1 describe a typical fixed powder apparatus with each container holding 250 kg of powder .2 explain how this equipment is used for best results
2.6 MISCELLANEOUS FIRE-FIGHTING EQUIPMENT (0.50 HRS) 2.6.1 Fire hoses and nozzles .1 state briefly the regulations concerning fire hoses and nozzles .2 explain how hoses are joined together and connected to fire hydrants

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.3 explain how a nozzle can be adjusted to produce a concentrated jet, a spray or a mist, and for which purpose each is used .4 explain correct maintenance and storage of hoses and nozzles 2.6.2 Mobile apparatus .1 list the types of mobile apparatus available, including: carbon dioxide cylinders powder containers with propellant gas foam-making equipment 2.6.3 Portable fire extinguishers .1 list the different types of portable extinguishers as: - water - foam - powder - carbon-dioxide .2 describe the operational principle of each type of extinguisher .3 state for which class of fire each type is suitable .4 state the normal capacity of each type of portable extinguisher .5 explain the procedures for having empty extinguishers recharged .6 describe a portable foam applicator and how it is connected to the fire main .7 state the normal capacity of such an applicator 2.6.4 Fireman's outfit .1 list the constituents of a fireman's outfit in three sections as: - personal equipment - breathing apparatus - fireproof lifeline with snaphook and harness .2 list the two main types of breathing apparatus which may be used .3 list their relative advantages and disadvantages .4 state the requirements for the lifeline .5 state the minimum number of fireman's outfits which must be carried on all ships 2.6.5 Breathing apparatus .1 describe a self-contained compressed-air-operated breathing apparatus (CABA) .2 demonstrate how to dismantle and reassemble a CABA .3 describe and demonstrate how to service a CABA .4 demonstrate the correct way to fit the face mask of a CABA and to check that it is airtight .5 lists the checks which must be make on a CABA before it is used and after it has been strapped on .6 demonstrate the correct breathing technique to give a low air consumption for a particular exertion when using a CABA .7 explain "dead volume" and its effect on air consumption in the CABA .8 explain the reasons for not remaining in a toxic atmosphere until the CABA air bottles are empty .9 explain the action which must be taken when the warning signal is given on a CABA that air pressure is low .10 describe a breathing apparatus having a smoke helmet, air pump, air

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line and fittings 2.6.6 Resuscitation apparatus .1 describe this apparatus .2 demonstrate how it is used to revive a person affected by smoke .3 explain how the use of this equipment may reduce the CABA wearer's endurance time in a smoke-filled space .4 demonstrate knowledge of other resuscitation methods 2.6.7 Fire blankets .1 describe a fire blanket .2 demonstrate how to use it .3 state where fire blankets are normally located
2.7 SHIP FIRE-FIGHTING ORGANIZATION (0.50 HR) 2.7.1 General emergency alarm .1 describe this signal as consisting of seven or more short blasts followed by one long blast on the ship's whistle and bells or klaxons or equivalent sounding elsewhere in the ship .2 describe the purpose of the special alarm operated from the navigating bridge to summon the crew to fire stations .3 list other possible fire alarms as including: - CO_2 - pump-room - manually operated - UMS fire-detection system 2.7.2 Fire control plans and muster list .1 describe the fire control plans and where they are located .2 describe the muster list .3 give examples of the duties of individual crew members 2.7.3 Communications .1 describe the methods of communication used during a fire emergency as: ~ messengers ~ telephones ~ walkie-talkies ~ ship-shore VHF ~ public address system 2.7.4 Personnel safety procedures .1 describe how a fire-fighting team is made up and state who is in charge .2 state that the fire zone may not be entered unless orders to do so have been given by the person in charge .3 state the need to be familiar with the area of the fire zone and with escape routes .4 state the need to be properly equipped to enter the fire zone, especially if the lights have failed and the space is full of smoke .5 state how one should be dressed .6 list what equipment is required, including: - breathing apparatus - hand lantern - axe - fireproof lifeline with fittings

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.7 explain the use of the lifeline for signaling .8 state the need to be flexible in filling vacancies in the necessary fire parties 2.7.5 Periodic shipboard drills .1 state the purpose of these drills .2 describe typical exercises for use during fire drills as including: ~ extinguishing a fire in a deep fryer ~ entering a closed room on fire ~ extinguishing a major deck fire ~ rescuing an unconscious person from a smoke-filled space 2.7.6 Patrol systems .1 state that on ships having more than 36 passengers an efficient patrol system must be maintained .2 list the duties of the patrol
2.8 FIRE-FIGHTING METHODS (0.50 HRS) 2.8.1 Knowledge of fire safety arrangements .1 state: ~ the location and use of fire alarms ~ the location and use of emergency controls .2 state the necessity of knowing how fire-fighting equipment works .3 state the necessity of being aware of potential fire hazards 2.8.2 Fire alarms and first actions .1 state as actions on discovering a fire: - activate the alarm - if possible, eliminate the cause of the fire - if possible, restrict ventilation 2.8.3 Fire fighting .1 explain the factors to be considered in deciding on fire-fighting methods: - accessibility of the location of the fire - personnel present at the location of the fire - reactions with the cargo - equipment and fire-fighting agents appropriate to the fire .2 explain the reasons for a re-flash watch
2.9 FIRE-FIGHTING DRILLS (4.00 HRS) 2.9.1 Small fires .1 demonstrate the correct use of portable fire extinguishers suited, respectively, for the following types of fire: - materials, e.g. wood - oil - fat - plastics - propane - electrical .2 demonstrate how to extinguish fires using a hose with water jet and spray nozzles and with foam applicator 2.9.2 Extensive fires .1 demonstrate the extinguishing of extensive firers of various types, including an oil fire, using as appropriate:

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~ water (jet, spray and fog application) ~ foams, including aqueous-film-forming type (AFFF) ~ powder, dry and wet ~ CO_2 2.9.3 Drills in smoke-filled spaces .1 demonstrate how to check and use the following breathing apparatus: - smoke helmet type with air pump and hose - compressed-air-operated breathing apparatus (CABA) .2 demonstrate entering a small room using CABA when the room is filled with non-toxic artificial smoke .3 demonstrate the use of the lifeline as a signal line in a smoke-filled space while wearing CABA .4 demonstrate how to search for persons (using dummies) in a smoke-filled space while wearing CABA .5 take part in team exercises communicating with other team members while wearing CABA in smoke-filled space .6 demonstrate the use of various types of portable fire extinguishers on fires in a smoke-filled space while wearing CABA .7 demonstrate extinguishing an extensive fire when wearing CABA in smoke-filled enclosed spaces, including an accommodation room or simulated engine room, and using as appropriate: - water (jet, spray or fog) - foam - powder REVIEW AND MASTERY TEST (0.25HRS)