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Service personnel for the maintenance, thorough examination, operational testing, overhaul and repair of lifeboats (including free-fall lifeboats) and rescue boats (including fast rescue boats), launching appliances and release gear —

Part 3:
Level 1 technician training



Reference number
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Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	3
3 Terms and definitions	3
4 Level 1 Service Technician Stage 1 technical training	3
4.1 General	3
4.2 Candidate pre-requisites for Level 1 Service Technician Stage 1 technical training	3
4.3 Aims and objectives of Level 1 Service Technician Stage 1 technical training	3
4.3.1 Aim	3
4.3.2 Key objectives	3
5 Learning outcomes of Level 1 Service Technician Stage 1 technical training	4
5.1 General	4
5.2 Theory learning outcomes	4
5.2.1 Module 1 — Work, health and safety issues while conducting activities on board	4
5.2.2 Module 2 — Survival craft	4
5.2.3 Module 3 — Release gear	4
5.2.4 Module 4 — Davits	5
5.2.5 Module 5 — Winches	5
5.3 Practical learning outcomes	6
5.3.1 Module 1 — Work, health and safety issues while conducting activities on-board	6
5.3.2 Module 2 — Survival craft	6
5.3.3 Module 3 — Release gear	7
5.3.4 Module 4 — Davits	8
5.3.5 Module 5 — Winches	8
6 Candidate performance assessment Level 1 Service Technician Stage 1 technical training — Candidate performance assessment	9
6.1 General	9
6.2 Continuous assessment	9
6.3 Final assessment	9
7 Duration and timing of Level 1 Service Technician Stage 1 technical training	10
7.1 General	10
7.2 Contact time	10
8 Level 1 Service Technician Stage 1 technical training programme	10
8.1 General	10
8.2 Overview of training modules	11
8.2.1 Module 1 — Work, health and safety issues while conducting activities on board	11
8.2.2 Module 2 — Survival craft	11
8.2.3 Module 3 — Release gear	11
8.2.4 Module 4 — Davits	11
8.2.5 Module 5 — Winches	12
8.3 Module 1 — Work, health and safety issues while conducting activities on board	12
8.3.1 Element 1. – Intervention communications and documentation	12
8.3.2 Element 1.2 – On-board safety	13
8.4 Module 2 — Survival craft	13
8.4.1 Element 2.1 – Annual general inspection, examination and maintenance requirements for lifeboats (including free-fall lifeboat), rescue boat (including fast rescue boats) with inboard engines	13

8.4.2	Element 2.2 – Additional specific inspection examination, maintenance and overhaul requirements for totally enclosed lifeboats.....	15
8.4.3	Element 2.3 – Additional specific inspection examination maintenance and overhaul requirements for rescue boats (including fast rescue boats).....	15
8.5	Module 3 — Release gear.....	16
8.5.1	Element 3.1 – Specific rules and regulations requirements relating to release gear.....	16
8.5.2	Element 3.2 – Release gear specialised tooling and lubricant requirements.....	16
8.5.3	Element 3.4 – Cables for control and release.....	16
8.5.4	Element 3.5 – Design and construction of release gear.....	17
8.5.5	Element 3.6 – Annual thorough examination and operational test of release gear.....	17
8.5.6	Element 3.7 – Five-year thorough examination, overhaul and overload operational test of release gear in accordance with manufacturer's service technical documentation.....	19
8.6	Module 4 — Davits.....	20
8.6.1	Element 4.1 – Specific rules and regulations requirements relating to davits.....	20
8.6.2	Element 4.2 – Design and construction of davits.....	20
8.6.3	Element 4.3 – Annual thorough examination and operational test of davits.....	20
8.7	Module 5 — Winches.....	22
8.7.1	Element 5.1 – Specific rules and regulations requirements relating to winches.....	22
8.7.2	Element 5.2 – Design and construction of winches.....	22
8.7.3	Element 5.3 – Annual thorough examination and operational test of winches.....	22
8.7.4	Element 5.4 – Five-year thorough examination, overhaul and overload operational test of winches.....	24
9	Level 1 Service Technician Stage 2 controlled environment experience and assessment	25
9.1	General.....	25
9.2	Candidate pre-requisites for Level 1 service technician Stage 2 controlled environment experience and assessment.....	25
9.3	Aims and objectives of Level 1 Service Technician Stage 2 controlled environment experience and assessment.....	25
9.3.1	Aim.....	25
9.3.2	Objectives.....	25
10	Learning outcomes of Level 1 Service Technician Stage 2 controlled environment experience and assessment	26
10.1	General.....	26
10.2	Practical learning outcomes.....	26
11	Duration and timing of Level 1 Service Technician Stage 2 controlled environment experience and assessment	26
	Annex A (informative) Equipment covered by the training	27
	Annex B (informative) Assessment checklist — Level 1 Service Technician Stage 1 technical training	28
	Annex C (informative) Assessment checklist — Level 1 Service Technician Stage 2 controlled environment experience and assessment	45
	Bibliography	47

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, SC 1 *Maritime safety*.

A list of all parts in the ISO/PAS 23678 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The industry recognises that a major objective is to prevent accidents and incidents from occurring. A global network of competent personnel employed by authorized service providers is vital for lifesaving appliances to remain fit for purpose, sustaining crew confidence and contributing to the prevention of incidents and accidents.

It has been recognized from the new requirements in IMO Resolution MSC.402 (96) for maintenance, thorough examination, operational testing, overhaul and repair of lifeboats (including free-fall lifeboats) and rescue boats (including fast rescue boats), launching appliances, and release gear (henceforth referred to as "the IMO Requirements") adopted 19th May 2016 and entering into force 1st January 2020, that it is necessary to develop an International Standard. This necessity is based on the IMO Requirement in paragraph 7.1.1:

"Employment and documentation of personnel certified in accordance with a recognized national, international or industry standard as applicable, or a manufacturer's established certification programme. In either case, the certification programme shall comply with section 8 for each make and type of equipment for which service is to be provided;"

This document and the associated ISO/PAS 23678-1, ISO/PAS 23678-2 and ISO/PAS 23678-4 have been developed to achieve three key objectives.

1. The first objective was to develop training documents that would support the IMO Requirements, section 7, paragraph 7.1.1.
2. The second objective was to develop training documents that would provide a consistent, reliable, and standardised approach to training and provide a clear auditable trail for interested parties to grant authorisation supporting the IMO Requirements, section 3, to approved service providers.
3. The third objective was to develop training documents that would enable personnel certified by authorized service providers to develop and maintain competencies identified by industry experts to a Level that enables them to competently work unsupervised on equipment covered by this document.

This document has been developed by identifying common design features in relation to survival craft, davits, winches and release gear makes and types for which service is to be provided. This has been achieved by conducting professional discussions with disciplined experts, to obtain the appropriate information to develop a training programme that is fit for purpose. Successfully completing the service technician training in ISO/PAS 23678-2, ISO/PAS 23678-3 and ISO/PAS 23678-4 enables personnel certified by an authorized service provider to meet the IMO Requirements, section 7, paragraph 7.1.1, and section 8.

The ISO/PAS 23678-series on service technician training consists of:

- Part 1 Guidance to training providers; describes the competence route of the candidate and the resources that the training provider needs to deliver the training.
- Part 2 Initial training; describes the training programme for initial familiarisation and induction training that is classroom education. The training programme focuses on introducing individuals to the complex terminology, rules and regulations, organisations, health and safety which a service technician needs to understand in order to carry out their role.
- Part 3 Level 1 training; describes the controlled environment education and training delivered at a training school. The training programme focuses on the technical training for type specific lifesaving appliances.
- Part 4 Level 2 in-field competence; describes the requirements for initial in-field and ongoing competence assessments.

NOTE ISO/PAS 23678-1, ISO/PAS 23678-2 and ISO/PAS 23678-3 are referencing typical in-house/training school training programmes. ISO/PAS 23678-4 is typical in-field performance of the personnel trained and recording of their competence.

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Service personnel for the maintenance, thorough examination, operational testing, overhaul and repair of lifeboats (including free-fall lifeboats) and rescue boats (including fast rescue boats), launching appliances and release gear —

Part 3: Level 1 technician training

1 Scope

This document establishes a uniform, safe and consistent approach to the technical training of personnel for the maintenance, thorough examination, operational testing, overhaul and repair of lifeboats (including free-fall lifeboats) and rescue boats (including fast rescue boats), launching appliances and release gear.

It also provides the necessary information for interested parties to grant authorization, effectively evaluate and audit training, supporting the IMO Requirements, Section 3.

It specifies the training requirements for the Level 1 controlled environment education and technical training for personnel certified by a manufacturer or an authorized service provider to carry out maintenance, thorough examination, operational testing, overhaul and repair of lifeboats (including free-fall lifeboats) and rescue boats (including fast rescue boats), launching appliances and release gear.

The Level 1 training is split into two Stages, both covered in this document:

- Stage 1, Service Technician technical controlled environment education and training, has five modules that consist of classroom-based theory followed by practical sessions. The five modules encompass the scope and range of technical knowledge and skills required to assume type specific design coverage of survival craft, release systems, davits and winches. The modules focus on supporting the requirements in part of the IMO Requirements, paragraphs 8.1, 8.2.1.1-8.2.1.6, 8.2.2, and 8.2.3.
- Stage 2, Service Technician technical controlled environment experience and assessment, where candidates undertake a minimum of four supervised scenarios-based practical exercises assessments covering the range of type specific complete systems for which they will be certified.

This document is intended to be used in conjunction with ISO/PAS 23678-1, ISO/PAS 23678-2 and ISO/PAS 23678-4.

This document is applicable to the following types of lifeboats (including free-fall lifeboats), rescue boats (including fast rescue boats), launching appliances and release gear.

Survival craft types:

- a) single fall totally enclosed lifeboats with sprinkler and air systems;
- b) twin fall totally enclosed lifeboats with sprinkler and air systems;
- c) partially enclosed lifeboats;
- d) tender lifeboats;

- e) freefall lifeboats;
- f) open lifeboat;
- g) inflatable rescue boats;
- h) rigid rescue boats;
- i) semi ridged inflatable rescue boats;
- j) rigid fast rescue boats;
- k) rigid inflatable fast rescue boats.

Survival craft propulsion system types:

- a) inboard diesel engines;
- b) outboard engines;
- c) propeller drives;
- d) jet drives.

Davit types:

- a) gravity single and twin fall outrigger;
- b) hydraulic single pivoting/luffing;
- c) hydraulic multi pivot/luffing;
- d) telescopic;
- e) gravity roller track;
- f) gravity free fall primary;
- g) free fall hydraulic secondary;
- h) A-frame hydraulic;
- i) single arm slewing (manual, electric);
- j) davits with stored power systems.

Winch types:

- a) twin drum;
- b) single drum;
- c) gravity-lowering, electric hoisting;
- d) gravity-lowering hydraulic hoisting;
- e) hydraulic hoisting and lowering.

Hook release system types:

- a) on-load/off load (load not over centre);
- b) on-load/offload (load over centre);
- c) off load;

- d) freefall hydraulic;
- e) automatic.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the terms, definitions and abbreviated terms given in ISO/PAS 23678-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Level 1 Service Technician Stage 1 technical training

4.1 General

This programme is designed to meet the technical controlled environment training and assessment requirements for all prospective service technicians. The Level 1 Service Technician training document explains how competence shall be assessed and certified.

4.2 Candidate pre-requisites for Level 1 Service Technician Stage 1 technical training

- a) hold or be working towards a nationally recognised qualification in engineering or mechanics, but not unduly excluding similar qualifications; and
- b) hold a valid Initial Service Technician certificate.

4.3 Aims and objectives of Level 1 Service Technician Stage 1 technical training

4.3.1 Aim

This programme is designed for individuals who have completed the Initial Service Technician training and need to gain the technical theoretical and practical knowledge to enable them to carry out maintenance thorough examination, operational testing, repair and overhaul of lifeboats (including free-fall lifeboats), rescue boats (including fast rescue boats), launching appliances and on-load release gear under supervision.

4.3.2 Key objectives

The key objectives are:

- a) ensure candidates can interpret technical documentation developed by the manufacturers and apply the information to their role;
- b) ensure candidates can identify, interpret and apply to their role key legislation, industry guidelines, rules, regulations and conventions;
- c) ensure candidates have the required technical underpinning knowledge and practical skills to carry out maintenance thorough examination, operational testing, repair and overhaul of lifeboats

(including free-fall lifeboats), rescue boats (including fast rescue boats), launching appliances and on-load release gear, as applicable;

- d) ensure candidates can write reports and complete associated documentation;
- e) ensure candidates can demonstrate in their working environment basic safety and awareness.

5 Learning outcomes of Level 1 Service Technician Stage 1 technical training

5.1 General

The learning outcomes for Level 1 Service Technician training are specified in 5.2 and 5.3. During the training programme, candidates shall be required to demonstrate they have the skills and understanding required to be deemed competent in relation to the training outcomes.

5.2 Theory learning outcomes

5.2.1 Module 1 — Work, health and safety issues while conducting activities on board

To successfully complete the Service Technician Level 1 Stage 1 training programme, candidates shall be able to:

- a) explain the people that needs to be informed and the documentation that needs to be checked, verified and completed before commencing work;
- b) explain the safety checks that need to be considered before commencing work on lifeboats (including free fall lifeboats), rescue boats (including fast rescue boats), launching appliances and release gear;
- c) explain specialised equipment requirements including PPE; and
- d) explain the documents that need to be consulted, interpreted, applied and completed to inspect, maintain, thoroughly examine, operationally test, overhaul and repair lifeboats (including free fall lifeboats), rescue boats (including fast rescue boats), launching appliances and release gear.

5.2.2 Module 2 — Survival craft

To successfully complete the Level 1 training programme, candidates shall be able to:

- a) identify and explain the function of the individual components related to lifeboats (including free fall lifeboats), rescue boats (including fast rescue boats);
- b) identify and explain the specific lubricant requirements for lifeboats (including free fall lifeboats) and rescue boats (including fast rescue boats); and
- c) explain the specific procedures that apply to the inspection, maintenance, thorough examination, operational testing, overhaul and repair of lifeboats (including free fall lifeboats), rescue boats (including fast rescue boat), supporting the IMO Requirements, paragraph 6.2.3.

5.2.3 Module 3 — Release gear

To successfully complete the Level 1 training programme, candidates shall be able to:

- a) explain the specific design and construction features of distinct various makes and types of release gears;
- b) identify and explain the function of the individual components that make up the distinct designs associated with specific makes and types of release gears;

- c) explain the common faults that can occur and potential solutions to resolve them in relation to the distinct designs associated with specific makes and types of release gears;
- d) identify and explain the generic maintenance and examination criteria in relation to release gears; and
- e) identify and explain the specific procedures to carry out maintenance thorough examination, operational testing, repair and overhaul, in relation to the distinct designs associated with specific makes and types of release gears found in lifeboats (including free-fall lifeboats) and rescue boats (including fast rescue boats).

5.2.4 Module 4 — Davits

To successfully complete the Level 1 training programme, candidates shall be able to:

- a) explain the various design and construction features of davits;
- b) explain the common faults that can occur and potential solutions to resolve them in relation to the specific designs of davits;
- c) explain how to carry out non-destructive tests on davit components to check for cracks and the integrity of welds;
- d) identify and explain the function of the individual davit components used for launching lifeboats (including free-fall lifeboats), rescue boats (including fast rescue boats) and davit-launched liferafts; and
- e) identify and explain the specific procedures to carry out maintenance thorough examination, operational testing, repair and overhaul of specific makes and types of davits used to launch lifeboats (including free-fall lifeboats) and rescue boats (including fast rescue boats).

5.2.5 Module 5 — Winches

To successfully complete the Level 1 training programme, candidates shall be able to:

- a) explain the specific design and construction features of the various specific makes and types of winches;
- b) explain the common faults that can occur and potential solutions to resolve them in relation to the specific designs of winches;
- c) identify and explain the function of specific individual components associated with specific makes and types of winches used to launch lifeboats (including free-fall lifeboats), rescue boats (including fast rescue boats) and davit-launched liferafts;
- d) identify and explain the specific procedures to carry out maintenance thorough examination, operational testing, repair and overhaul, in relation to the distinct designs associated with specific makes and types of winches used to launch lifeboats (including free-fall lifeboats) and rescue boats (including fast rescue boats);
- e) explain the construction of wire ropes; and
- f) explain the specific procedures that apply to the inspection, maintenance, thorough examination, exchange and discard of wire ropes.

5.3 Practical learning outcomes

5.3.1 Module 1 — Work, health and safety issues while conducting activities on-board

To successfully complete the Level 1 training programme, candidates shall be able demonstrate:

- a) safety checks that need be completed prior to commencing work on lifeboats (including free fall lifeboats) rescue boats (including fast rescue boats), launching appliances and release gear;
- b) how to interpret and apply the relevant documentation for the maintenance, thorough examination, operational testing, overhaul and repair of lifeboats (including freefall lifeboats), rescue boats (including fast rescue boats), launching appliances and release gear;
- c) how to complete checklists and compile reports; and
- d) how to carry out the required safety checks and attach maintenance/hanging off pendants and secondary safety devices.

5.3.2 Module 2 — Survival craft

To successfully complete the Level 1 training programme, candidates shall be able demonstrate how to maintain, thoroughly examine and check for satisfactory condition and operation specific makes and types of survival craft (see [Table A.1](#)), supporting the IMO Requirements, paragraph 6.2.3, and the manufacturer's technical documentation. To include:

- a) structure of the boat, including fixed and loose equipment;
- b) the external boundaries of the internal void spaces as far as practicable;
- c) inboard engines and gearbox;
- d) outboard engines;
- e) engine bed and mounts;
- f) primary and secondary start systems;
- g) exhaust system;
- h) propulsion system, stern tubes, stern glands;
- i) lifeboats sprinkler system;
- j) lifeboats air supply;
- k) maneuvering system;
- l) power supply;
- m) bailing system;
- n) fender and skate arrangements;
- o) lifeboat inflatable righting/anti-entrapment equipment;
- p) rescue boat (including fast) righting system.

5.3.3 Module 3 — Release gear

5.3.3.1 Operation and tooling

To successfully complete the Level 1 training programme, candidates shall be able to demonstrate:

- a) how to correctly operate release gear for lifeboats (including free-fall lifeboats), rescue boats (including fast rescue boats) and davit-launched liferafts; and
- b) the ability to use specialized tooling and apply the correct lubricants to the applicable components.

5.3.3.2 Annual thorough examination and operational test

To successfully complete the Level 1 training programme, candidates shall be able to demonstrate how to thoroughly examine and check for satisfactory condition and operation specific makes and types of release systems (see [Table A.1](#)), supporting the IMO requirements, paragraphs 6.2.4 to 6.2.8, and the manufacturer's technical documentation. To include:

- a) central release units;
- b) hydrostatic interlock systems with diaphragms;
- c) hydrostatic interlock systems with floats;
- d) cables for control and release;
- e) hook assemblies with fastening/locking devices with flat to flat cams;
- f) hook assemblies with fastening/locking devices with curve to curve cams;
- g) hook assemblies with fastenings/locking devices with curve to flat cams;
- h) hook assemblies with fastenings/locking devices with up and down pins;
- i) hook assemblies with fastenings/locking devices with amplification arms, intermediary hooks, arresting levers;
- j) free fall hydraulic hook assemblies;
- k) automatic hook assemblies;
- l) how to check excessive free play and tolerances of release gear against the specifications of the manufacturer's technical documentation;
- m) how to carry out the annual operational tests of davit-launched lifeboats and rescue boats on-load release function with a simulated load;
- n) how to carry out the operational test of the davit-launched liferaft automatic release function.

5.3.3.3 Five-year thorough examination, overhaul and overload operational test

To successfully complete the Level 1 training programme, candidates shall be able to demonstrate how to overhaul, thoroughly examine and check for satisfactory condition and operation specific makes and types of release systems (see [Table A.1](#)), supporting the IMO Requirements, paragraph 6.3.3, and the manufacturer's technical documentation. To include:

- a) how to dismantle and re-assemble specific makes and types of hook assemblies with fastening/locking devices with flat to flat cams, curve to curve cams, curve to flat cams, up and down pins, amplification arms, intermediary hooks and arresting levers;
- b) how to dismantle and re-assemble specific makes and types of central release units;

- c) how to dismantle and re-assemble specific makes and types of hydrostatic units;
- d) how to carry out examinations with regards to tolerances and design requirements of specific makes and types of release gear as specified by the manufacturer;
- e) how to adjust specific makes and types of release gear systems after assembly to operate correctly;
- f) how to identify and rectify the faults that can occur related to specific makes and types of release gear;
- g) how to replace service exchange release gear;
- h) how to examine vital parts with regards to defects and cracks; and
- i) how to carry out the 5-yearly overload operational test of davit-launched lifeboats and rescue boats using a simulated load.

5.3.4 Module 4 — Davits

To successfully complete the Level 1 training programme, candidates shall be able to demonstrate how to overhaul, thoroughly examine and check for satisfactory condition and operation specific makes and types of davits (see [Table A.1](#)), supporting the IMO Requirements, paragraphs 6.2.9.1 to 6.2.9.4, and the manufacturer's technical documentation. To include:

- a) how to carry out the necessary safety checks prior to approaching davits;
- b) safely operate specific makes and types of davits;
- c) davit or other launching structures, with regards to corrosion, misalignments, deformation and excessive free play;
- d) sheaves, rollers, floating blocks for wear, corrosion and excessive free play;
- e) fall wires for kinks, damage, corrosion and lubrication;
- f) the function of limit switches;
- g) mechanical restraints;
- h) hydraulic systems;
- i) stored power systems; and
- j) electrical systems.

5.3.5 Module 5 — Winches

To successfully complete the Level 1 training programme, candidates shall be able to demonstrate how to overhaul, thoroughly examine and check for satisfactory condition and operation specific makes and types of winches (see [Table A.1](#)), supporting the IMO requirements, paragraphs 6.2.9. and 6.3, and the manufacturer's technical documentation. To include:

- a) winch foundations;
- b) remote-control systems, electrical, operating cables, pulleys;
- c) power supply systems;
- d) lubricants;
- e) multiple disc holding/static brake;
- f) holding/static brakes with brake bands;

- g) holding/static brakes with friction pads;
- h) centrifugal brakes with friction pads;
- i) lowering brakes with hydraulic pumps;
- j) drum, bearings, gearing, pinions, chains;
- k) sprag clutches, overrunning clutches;
- l) hydraulic systems;
- m) wire ropes, corrosion, damage, replacement;
- n) how to carry out the annual operational test; and
- o) how to carry out the 5-yearly operational test.

6 Candidate performance assessment Level 1 Service Technician Stage 1 technical training — Candidate performance assessment

6.1 General

6.1.1 Candidates attending Level 1 Service Technician Stage 1 technical training shall be given a series of explanations and demonstrations identifying what they are expected to know and to do. This shall be followed by practical exercises allowing them to demonstrate their knowledge and understanding of the course content. Assessment of the candidates' performance shall be against the stated training outcomes. Candidates shall have a 100 % course attendance of the recommended contact time (see [7.2](#)).

6.1.2 Assessment of candidates shall be a summation of the following components:

- a) continuous assessment;
- b) final assessment by an assessor.

6.2 Continuous assessment

6.2.1 The purpose of the continuous assessment is to ensure candidates are acquiring the necessary skills, knowledge, and understanding of the subject matter being covered. This shall be achieved by direct observation of practical work and oral/written questioning. Certification bodies shall ensure they have procedures within their quality management system to deal with absence and demonstration of competence.

6.2.2 Any candidate failing to meet the expected outcomes as the course progresses can be given additional training. However, it should be clear that time to do this within the contact time is limited, and the candidate would have to show, through repeating tests and practice sessions, that they have bridged the gap in their knowledge and understanding and can demonstrate competence. Certification bodies shall ensure they have procedures within their quality management system to deal with absence and demonstration of competence.

6.3 Final assessment

6.3.1 The final assessment shall be conducted by an assessor who may also be involved in the delivery of the training programme. It shall take the form of direct observation. Documentary evidence for the continuous assessment shall be provided for the final assessment.

6.3.2 If a candidate is deemed “not yet competent” (NYC), in the opinion of the trainer/assessor after reasonable tuition, and is unable to meet the learning outcomes of any individual module, only the training outcomes that the candidate has not been able to achieve competence in needs be repeated.

6.3.3 All candidate assessment forms and test documentation shall be retained for audit purposes. See [Annex B](#) for examples of assessment checklists.

7 Duration and timing of Level 1 Service Technician Stage 1 technical training

7.1 General

7.1.1 The modules can be delivered individually if necessary. If the course modules are delivered individually, the training programme shall be completed in full within 18 months of commencement of the first module.

7.1.2 If the modules are not completed within the 18 months period, the training programme shall be undertaken again.

7.2 Contact time

7.2.1 The optimum recommended 'contact time' for the complete training programme is 160 h. Contact time includes instruction and assessment activities Contact time does not include course administration, lunch and refreshment breaks.

7.2.2 The optimum recommended contact time for the individual modules are as follows:

- a) module 1: incorporated into modules 2 to 5;
- b) module 2: 40 h;
- c) module 3: 40 h;
- d) module 4: 40 h;
- e) module 5: 40 h.

7.2.3 It is suggested that a ratio of 20 % theory to 80 % practical is appropriate.

8 Level 1 Service Technician Stage 1 technical training programme

8.1 General

The training programme is designed to help candidates achieve the stated learning outcomes specified in Clause 5. To make efficient use of time and ensure effective learning, there should be, wherever practicable, an integration of the three phases of explanation, demonstration, and practise. Full use should be made of visual aids and course handout material and training equipment.

Candidates shall be issued with course notes relevant to the Level 1 Service Technician, Stage 1 technical training. These notes shall be suitable for use as a reference manual during the course.

All training shall be supporting the applicable sections of the IMO Requirements and manufacturer's technical documentation.

8.2 Overview of training modules

Prior to the start of each module, the following shall be included as part of the introduction by training staff:

- a) aim – the main purpose of the module;
- b) learning outcomes – what the candidates are expected to learn and how the learning outcomes shall be achieved;
- c) timetable – training module duration and timing;
- d) assessment – how candidates shall be assessed and what they shall be assessed against;
- e) staff – who shall be delivering the training and carrying out the assessments and the roles of training and support staff.

The Level 1 Service Technician, Stage 1 technical training programme is comprised of the modules and elements given in [8.2.1](#) to [8.2.5](#).

8.2.1 Module 1 — Work, health and safety issues while conducting activities on board

- a) element 1.1 – Intervention communications and documentation;
- b) element 1.2 – Onboard safety.

8.2.2 Module 2 — Survival craft

- a) element 2.1 – Annual general inspection, examination and maintenance requirements for lifeboats (including free-fall lifeboats), rescue boats (including fast rescue boats);
- b) element 2.2 – Additional specific inspection, examination and maintenance and overhaul requirements for lifeboats (including free-fall lifeboats);
- c) element 2.3 – Additional specific inspection, examination and maintenance and overhaul requirements for rescue boats (including fast rescue boats).

8.2.3 Module 3 — Release gear

- a) element 3.1 – Specific rules and regulations requirements relating to release gear;
- b) element 3.2 – Release gear specialised tooling and lubricant requirements;
- c) element 3.4 – Cables for control and release;
- d) element 3.5 – Design and construction of release gear;
- e) element 3.6 – Annual maintenance thorough examination, inspection repair and overhaul and operational test of release gear;
- f) element 3.7 – Five-year thorough examination, overhaul and overload operational test.

8.2.4 Module 4 — Davits

- a) element 4.1 – Specific rules and regulations requirements relating to launching appliances;
- b) element 4.2 – Design and construction of davits;
- c) element 4.3 – Annual thorough examination and operational test of davits.

8.2.5 Module 5 — Winches

- a) element 5.1 – Specific rules and regulations requirements relating to winches;
- b) element 5.2 – Design and construction of winches;
- c) element 5.3 – Annual thorough examination and operational test of winches;
- d) element 5.4 – Five-year thorough examination, overhaul and overload operational test of winches.

8.3 Module 1 — Work, health and safety issues while conducting activities on board

8.3.1 Element 1. – Intervention communications and documentation

8.3.1.1 Training staff shall give an overview regarding the people that need to be interfaced with in relation to the scope of the intervention. To include:

- a) intervention brief;
- b) discussing and liaising with appropriate persons the scope of work:
 - i. ships superintendent,
 - ii. master or person in charge,
 - iii. recognized organisation surveyor.

8.3.1.2 Training staff shall explain the documents that need to be checked, verified, interpreted and completed during interventions. To include:

- a) appropriate documentation for the scope of work, including:
 - i. toolbox talks, and
 - ii. work permits;
- b) documents that need to be verified, consulted, interpreted and applied to inspect, maintain, thoroughly examine, operationally test, overhaul and repair lifeboat (including free fall lifeboats) rescue boats (including fast rescue boats), launching appliances and release gear, which are:
 - i. records of inspections and routine on-board maintenance carried out by the ship's crew, checklists for the weekly/monthly inspections, covered in SOLAS Regulations III/20.6 and III/ 20.7,
 - ii. risk assessments,
 - iii. method statements,
 - iv. manufacturer's technical documentation,
 - v. company procedures,
 - vi. rules and regulations, and
 - vii. equipment certification;
- c) checklists and reports.

8.3.2 Element 1.2 – On-board safety

8.3.2.1 Training staff shall explain the safety checks that need to be carried out prior to commencing work. To include:

- a) specialised equipment requirements, including PPE;
- b) exterior visual checks for hazards, corrosion, security, alignment:
 - i. decks, gratings and handrails,
 - ii. davit structure, foundations, sheaves, pad eyes,
 - iii. mechanical restraints, gripe wires, tricing pendants, browsing in tackle,
 - iv. winch foundations, static brake status;
- c) the importance of establishing the crew's competency in relation to turning out of the lifeboat.

8.3.2.2 Training staff shall explain the equipment that needs removing and attaching prior to commencing work. To include:

- a) removing:
 - i. gripe wire,
 - ii. browsing in tackle,
 - iii. harbour pins;
- b) attaching:
 - i. maintenance pendants,
 - ii. secondary safety devices,
 - iii. tricing pendants.

8.4 Module 2 — Survival craft

8.4.1 Element 2.1 – Annual general inspection, examination and maintenance requirements for lifeboats (including free-fall lifeboat), rescue boat (including fast rescue boats) with inboard engines

8.4.1.1 Training staff shall explain the design, construction and function of the individual components that are found in a range of specific makes and types of lifeboats (including free-fall lifeboat) and rescue boats (including fast rescue boats) (see [Table A.1](#)).

8.4.1.2 Training staff shall ensure the practical sessions include the required work health and safety procedures candidates shall follow.

8.4.1.3 Training staff shall explain and demonstrate, and then allow candidates to practise on, how to maintain, thoroughly examine, and check for satisfactory condition and operation, supporting the IMO Requirements, paragraph 6.2.3, the following:

- a) hull:
 - i. keel shoe,

- ii. counter plate;
- b) external and internal equipment and fittings;
- c) external boundaries of the internal void spaces as far as practicable;
- d) inboard engines:
 - i. bed and feet,
 - ii. primary and secondary start systems,
 - iii. fuel systems,
 - iv. gauges,
 - v. controls,
 - vi. cooling system,
 - vii. belts,
 - viii. exhaust systems,
 - ix. gear box,
 - x. filter changes,
 - xi. alternator,
 - xii. wiring loom;
- e) propulsion systems:
 - i. couplings,
 - ii. shafts,
 - iii. stern tube,
 - iv. propeller,
 - v. bearings;
- f) maneuvering system:
 - i. control cables,
 - ii. rudder, pintles and skegs,
 - iii. emergency tiller,
 - iv. hydraulics;
- g) power supply;
- h) bailing system;
- i) fender and skate arrangements;
- j) specific lubricant requirements and replacement:
 - i. greases,
 - ii. engine oils,

- iii. hydraulic fluids,
- iv. gear box oils.

8.4.2 Element 2.2 – Additional specific inspection examination, maintenance and overhaul requirements for totally enclosed lifeboats

Training staff shall explain and demonstrate, and then allow candidates to practise on, how to maintain, thoroughly examine, and overhaul check for satisfactory condition and operation, specific makes and types of lifeboats (see [Table A.1](#)). To include:

- a) enclosures and canopies:
 - i. entrance doors including seals,
 - ii. non – access hatches including seals;
- b) sprinkler systems:
 - i. pumps,
 - ii. belts,
 - iii. valves,
 - iv. pipe work,
 - v. sea water intake;
- c) air supply:
 - i. cylinders,
 - ii. hoses, connections, fittings,
 - iii. valves and regulators,
 - iv. gauges,
 - v. security;
- d) lifeboat inflatable righting/anti entrapment equipment.

8.4.3 Element 2.3 – Additional specific inspection examination maintenance and overhaul requirements for rescue boats (including fast rescue boats)

Training staff shall explain and demonstrate, and then allow candidates to practise on, how to maintain, thoroughly examine, and overhaul check for satisfactory condition and operation, in accordance with the manufacturer's technical documentation, specific makes and types of rescue boats (including fast rescue boats) (see [Table A.1](#)). To include:

- a) lifting bridle strong points;
- b) lifting yokes including foundation bolts;
- c) inflatable sponsons;
- d) outboard engines:
 - i. fuel systems,
 - ii. gauges,
 - iii. controls,

- iv. cooling system,
- v. gear box,
- vi. filters,
- vii. charging systems,
- viii. electrical systems;
- e) propulsion systems:
 - i. jet unit housing and impellor;
- f) righting systems:
 - i. A-frame,
 - ii. righting bag,
 - iii. cylinders, hoses, connections, fittings,
 - iv. inflation system.

8.5 Module 3 — Release gear

8.5.1 Element 3.1 – Specific rules and regulations requirements relating to release gear

Training staff shall explain the procedures for inspection, maintenance, thorough examination, operational testing overhaul and repair of release gear in accordance with the manufacturer's technical documentation. To include:

- a) SOLAS Regulation III/20 .11;
- b) the IMO Requirements, paragraphs 6.2.4, 6.2.5, 6.2.6, 6.2.7, 6.2.8, 6.3.3.

8.5.2 Element 3.2 – Release gear specialised tooling and lubricant requirements

Training staff shall identify the tooling and lubricant requirements to carry out inspection, maintenance, thorough examination, operational testing, overhaul and repair of release gear in accordance with manufacturer's technical documentation. To include:

- a) measuring tools and gauges;
- b) specialised tools;
- c) hydraulic hook test tools;
- d) specific lubricants.

8.5.3 Element 3.4 – Cables for control and release

Training staff shall give an overview of the various types of cables used to operate release gear. To include:

- a) types;
- b) stroke;
- c) fittings and fixings;
- d) routing;

- e) maintenance requirements.

8.5.4 Element 3.5 – Design and construction of release gear

Training staff shall explain the design, construction and function of the individual components that are found in a range of specific types of, release gear (see [Table A.1](#)) in accordance with manufacturer's technical documentation. To include:

- a) hook assemblies;
- b) central release units;
- c) hydrostatic units.

8.5.5 Element 3.6 – Annual thorough examination and operational test of release gear

8.5.5.1 Visual examinations

Training staff shall explain, demonstrate, and then allow candidates to practise on, the visual examinations to evaluate the satisfactory condition and operation of the individual components that make up specific types of release gear (see [Table A.1](#)). To include:

- a) wear;
- b) corrosion;
- c) damage;
- d) freedom of movement;
- e) alignment;
- f) deformation.

8.5.5.2 Tolerance, measurements, and free play

Training staff shall explain the specific tolerances, measurements, and free play in relation to the applicable individual components that are found in a range of specific types of release gear (see [Table A.1](#)) in accordance with manufacturer's technical documentation.

8.5.5.3 Hook assembly thorough examination

Training staff shall demonstrate, and then allow candidates to practise on, how to thoroughly examine, verify measurements and tolerances, clean and lubricate (where required) a range of specific types of release gear (see [Table A.1](#)) in accordance with manufacturer's technical documentation. As a minimum, but not limited to, for the following components:

- a) moveable hook:
 - i. fulcrum pins,
 - ii. bushes,
 - iii. locking pins;
- b) hook body;
- c) hook mousing plate, retainers, safety latches;
- d) legs:
 - i. keel shoes,

- ii. keel pins;
- e) on-load lift not over centre hook fastening locking devices:
 - i. rotating cams forward; flat to flat,
 - ii. rotating cams forward or reverse; curve to curve,
 - iii. rotating cams forward or reverse curve to flat,
 - iv. torsion cups,
 - v. up and down pins,
 - vi. intermediary hooks,
 - vii. amplification arms,
 - viii. arresting levers,
 - ix. hook lock indicators,
 - x. torsion springs;
- f) cables for release;
- g) trouble shooting.

8.5.5.4 Devices for activating release thorough examination

Training staff shall demonstrate, and then allow candidates to practise on, how to thoroughly examine, clean, lubricate, verify measurements and tolerances (where required) to a range of devices for activating release (see [Table A.1](#)) in accordance with manufacturer's technical documentation. This should be done as a minimum, but not limited to, for the following components:

- a) release handle/lever;
- b) hydrostatic locking levers;
- c) locking lever indicators;
- d) operating quadrants;
- e) locking pins;
- f) hydrostatic overrides;
- g) cables for control and release;
- h) hydrostatic units with:
 - i. diaphragms,
 - ii. floats,
 - iii. electronic sensors;
- i) hydraulic systems:
 - i. primary means of release,
 - ii. secondary emergency means of release;
- j) trouble shooting.

8.5.5.5 Annual operational test of release gear

Training staff shall demonstrate, and then allow candidates to practise on, how to carry out the annual operational function test on a range of release gear types (see [Table A.1](#)) in accordance with manufacturer's technical documentation. To include but not be limited to:

- a) on-load release gear; the use of appropriate test equipment to simulate the lifeboat, rescue boat and fast rescue boat in the light condition, supporting the IMO Requirements, paragraphs 6.2.5 and 6.2.7, including:
 - i. procedures,
 - ii. safety considerations, and
 - iii. load calculations;
- b) offload release gear operational function test, supporting the IMO Requirements, paragraph 6.2.6;
- c) automatic release hook function test, supporting the IMO Requirements, paragraph 6.2.8, including:
 - i. operational test of offload release function,
 - ii. operational test of on-load release function,
 - iii. measurement of trip forces, and
 - iv. measurement of closing force;
- d) free-fall hydraulic release gear operational function test, supporting the IMO Requirements, paragraph 6.2.7;
- e) examination of release gear and hook fastenings to ensure that the hook is completely reset, and no damage has occurred.

8.5.6 Element 3.7 – Five-year thorough examination, overhaul and overload operational test of release gear in accordance with manufacturer's service technical documentation

8.5.6.1 Training staff shall demonstrate, and then allow candidates to practise on, how to dismantle and reassemble, clean and lubricate, thoroughly examine, overhaul, verify measurements and tolerances against design requirements for a range of release gear (see [Table A.1](#)). As a minimum to include, but not be limited to, the components listed in [8.5.5.3](#) and [8.5.5.4](#).

8.5.6.2 Training staff shall demonstrate, and then allow candidates to practise on, how to adjust release gear systems after assembly to operate correctly. To include:

- a) establishing simultaneous release;
- b) trouble shooting.

8.5.6.3 Training staff shall demonstrate, and then allow candidates to practise on, how to carry out the 5-year overload test of release gear (see [Table A.1](#)) with a load equal to 1,1 times the weight of the survival craft and its full complement of persons and equipment. To include:

- a) on-load release gear; the use of appropriate test equipment to simulate the operational tests, supporting the IMO Requirements, paragraph 6.2.5, as applicable, but with a load equal to 1,1 times the weight of the survival craft or rescue boat and its full complement of persons and equipment:
 - i. procedures,
 - ii. load calculations,

- iii. safety considerations;
- b) offload release gear; carry out the operational test stated in the IMO Requirements, paragraph 6.2.6;
- c) free fall hydraulic; carry out the operational test stated in the IMO Requirements, paragraph 6.2.7;
- d) automatic; carry out the operational test stated in the IMO Requirements, paragraph 6.2.8;
- e) examining vital parts with regards to defects and cracks.

8.6 Module 4 — Davits

8.6.1 Element 4.1 – Specific rules and regulations requirements relating to davits

Training staff shall explain the procedures in accordance with manufacturer's technical documentation for inspection, maintenance, thorough examination, operational testing, overhaul and repair of davits. To include:

- a) SOLAS Regulation III/20.11;
- b) IMO Requirements, paragraph 6.2.9.

8.6.2 Element 4.2 – Design and construction of davits

Training staff shall explain the design, construction and function of components that are found in the range of specific types of davits (see [Table A.1](#)). To include, but not be limited to:

- a) foundations;
- b) structure;
- c) arms;
- d) gearing;
- e) hydraulic systems;
- f) stored power systems;
- g) electrical systems.

8.6.3 Element 4.3 – Annual thorough examination and operational test of davits

8.6.3.1 Training staff shall explain, demonstrate, and then allow candidates to practise on, how to safely operate a range of davits to carry out a function test (see [Table A.1](#)) in accordance with manufacturer's technical documentation.

8.6.3.2 Training staff shall explain, demonstrate, and then allow candidates to practise on, how to carry out the annual thorough examination for a range of specific types of davits (see [Table A.1](#)) to confirm the davit operates correctly and is in a satisfactory condition, in accordance with manufacturer's technical documentation. The examination shall include visual and physical examinations, as applicable, to evaluate corrosion, misalignments, deformation, cracks, wear, and excessive free play. Routine maintenance requirements shall also be carried out. As minimum to include, but not be limited to:

- a) foundation bolts;
- b) structure:
 - i. frames,
 - ii. pedestals/columns,

- iii. tracks,
- iv. ramps;
- c) arms:
 - i. rollers,
 - ii. sheaves,
 - iii. hydraulic rams,
 - iv. luffing cylinders,
 - v. pivots;
- d) gearing:
 - i. slewing gears,
 - ii. worm gears;
- e) fall wires:
 - i. floating blocks,
 - ii. master links,
 - iii. turnbuckles,
 - iv. shackles;
- f) hydraulic power packs:
 - i. oil and filters,
 - ii. hoses and ferrules,
 - iii. pipes and clamps,
 - iv. valves,
 - v. gauges,
 - vi. pump,
 - vii. reservoir;
- g) stored power systems:
 - i. cylinders,
 - ii. pipework,
 - iii. hoses and connections,
 - iv. gauges,
 - v. accumulator pre-charge and final pressures;
- h) electrical systems:
 - i. starter box,
 - ii. limit switches,

- iii. wiring,
- iv. motors;
- i) mechanical restraints:
 - i. gripes wires,
 - ii harbour pins,
 - iii. bowsing systems,
 - iv. tricing systems;
- j) remote controls.

8.7 Module 5 — Winches

8.7.1 Element 5.1 – Specific rules and regulations requirements relating to winches

Training staff shall explain the procedures for inspection, maintenance, thorough examination, operational testing, overhaul and repair of winches in accordance with manufacturer's technical documentation. To include:

- a) SOLAS Regulation III/20.11.1;
- b) IMO Requirements, paragraphs 6.2.9.5, 6.2.10, 6.3.1.

8.7.2 Element 5.2 – Design and construction of winches

Training staff shall explain the design, construction and function of the individual components that are found in a range of specific types of winches (see [Table A.1](#)). To include:

- a) braking systems;
- b) manual raise/payout;
- c) gearing;
- d) electrical systems;
- e) hydraulic systems.

8.7.3 Element 5.3 – Annual thorough examination and operational test of winches

8.7.3.1 Tolerances measurements and free play

Training staff shall explain the specific tolerances, measurements and free play in relation to the applicable individual components that are found in a range of specific types of winches (see [Table A.1](#)).

8.7.3.2 Thorough examinations

Training staff shall explain, demonstrate, and then allow candidates to practise on, how to carry out the annual thorough examination for a range of specific types of winches (see [Table A.1](#)) to confirm the winch operates correctly and is in a satisfactory condition. The examination shall include visual and physical examinations, as applicable, to evaluate corrosion, misalignments, deformation, cracks, wear and excessive free play. Routine maintenance requirements shall also be carried out. As a minimum to include:

- a) tooling requirements;

- b) strip down and reassembly sequence of the brake housing;
- c) cleaning and lubricating of components;
- d) winch foundation and fixing bolts;
- e) mechanical static/holding brake systems:
 - i. brake arm,
 - ii. pads with friction material,
 - iii. bands with friction material,
 - iv. multiple disks with friction material;
- f) hydraulic static/holding brake systems:
 - i. brake arm,
 - ii. hydraulic operating levers,
 - iii. pipework and fittings,
 - iv. multiple disks with friction material;
- g) centrifugal brake with:
 - i. friction pads,
 - ii. hydraulic pumps;
- h) clutches:
 - i. overrunning,
 - ii. freewheel,
 - iii. sprags;
- i) gearing:
 - i. spur and pinions,
 - ii. reduction gearing,
 - iii. planetary gearing,
 - iv. chains;
- j) remote control systems;
- k) power supply systems;
- l) hydraulic systems:
 - i. accumulators,
 - ii. hoses,
 - iii. fixtures and fittings;
- m) trouble shooting.

8.7.3.3 Annual operational test

Training staff shall explain, demonstrate, and then allow candidates to practise on, how to safely operate a specific range of winches (see [Table A.1](#)) and carry out the annual function test using the following methods and configuration of load:

- a) load calculations using load cells;
- b) load calculations using water or another suitable load mass;
- c) annual operational test stated in the IMO Requirements, paragraph 6.2.10, using an equivalent load mass to a survival craft;
- d) following the tests, the stressed structural parts shall be re-inspected where the structure permits the re-inspection.

8.7.4 Element 5.4 – Five-year thorough examination, overhaul and overload operational test of winches

8.7.4.1 Thorough examinations

Training staff shall demonstrate, and then allow candidates to practise on, how to dismantle and reassemble specific applicable components, to thoroughly examine, overhaul, verify measurements and tolerances against design requirements, clean, lubricate and replace parts (where required) for a range of winches (see [Table A.1](#)). As a minimum to include, but not be limited to, the applicable components listed in [8.7.3.2](#).

8.7.4.2 Overhaul

Training staff shall demonstrate, and then allow candidates to practise on, how to carry out the overhaul requirements for a specific range of winches (see [Table A.1](#)). To include but not be limited to:

- a) wire rope:
 - i. twin fall,
 - ii. single fall;
- b) clutch;
- c) brake pads;
- d) lubricants.

8.7.4.3 Overload operational test

Training staff shall explain, demonstrate, and then allow candidates to practise on, how to safely operate and carry out the 5-year overload test on a specific range winches (see [Table A.1](#)) by the following method and load configuration:

- a) five-year operational test of the winches of the launching appliances stated in the IMO Requirements, paragraph 6.3.1;
- b) following these tests, the stressed structural parts shall be respected where the structure permits the re-inspection.

9 Level 1 Service Technician Stage 2 controlled environment experience and assessment

9.1 General

The purpose of the Level 1 Service Technician Stage 2 controlled environment experience and assessment is to carry out holistic assessments on a complete system that encompasses the knowledge and skills candidates shall have obtained throughout the Initial and Level 1 Stage 1 technical training.

The Level 1 Service Technician Stage 2 controlled environment experience and assessment is designed to support the training and assessment in the IMO Requirements, paragraphs 8.2.1.4 to 8.2.1.7. This shall be achieved by scenario-based exercises that shall allow the candidates to be assessed in a simulated work environment under controlled conditions. Successful candidates shall be awarded a Level 1 certificate.

9.2 Candidate pre-requisites for Level 1 service technician Stage 2 controlled environment experience and assessment

- a) hold a valid Initial Service Technician certificate;
- b) have successfully completed Level 1, Stage 1 training.

9.3 Aims and objectives of Level 1 Service Technician Stage 2 controlled environment experience and assessment

9.3.1 Aim

To give candidates the opportunity to demonstrate competence by carrying out annual and 5 yearly interventions on complete systems.

9.3.2 Objectives

The objectives are:

- a) ensure candidates can interpret technical documentation developed by the manufacturers and apply the information to their role;
- b) ensure candidates can identify, interpret and apply to their role key legislation, industry guidelines, rules, regulations and conventions;
- c) ensure candidates can identify, interpret and apply to their role the procedures for maintenance, thorough examination, operational testing, repair and overhaul on a range of lifeboats (including free-fall lifeboats), rescue boats (including fast rescue boats), launching appliances and on-load release gear;
- d) ensure candidates have the required underpinning knowledge and practical skills to carry out maintenance, thorough examination, operational testing, repair and overhaul on a range of lifeboats (including free-fall lifeboats), rescue boats (including fast rescue boats), launching appliances and on-load release gear;
- e) ensure candidates can write reports and complete associated documentation;
- f) ensure candidates can demonstrate in their working environment basic safety and awareness.

10 Learning outcomes of Level 1 Service Technician Stage 2 controlled environment experience and assessment

10.1 General

The learning outcomes for Level 1 Service Technician Stage 2 controlled environment experience and assessment exercise scenarios are specified in [10.2](#).

During the scenario exercises, the candidates shall be required to demonstrate their skills and understanding in key areas.

See [Annex C](#) for examples of assessment checklists.

10.2 Practical learning outcomes

To successfully complete the Level 1 Service Technician Stage 2 controlled environment experience and assessment, candidates shall be able to demonstrate:

- a) ability to liaise and brief the appropriate persons in relation to the scope of work;
- b) ability to identify, verify, interpret and apply the documents required to carry out maintenance, thorough examination, operational testing, repair and overhaul of lifeboat (including free-fall lifeboats), rescue boats (including fast rescue boats), launching appliances and on-load release gear, as applicable;
- c) how to interpret technical documentation developed by the manufacturers and apply the information to their role;
- d) how to carry out an annual thorough examination and operational test for a complete system that includes outrigger davit with a gravity-lowering electric hoisting winch, totally enclosed lifeboat with a sprinkler and air system, and on-load release gear;
- e) how to carry out an annual thorough examination and operational test for a complete system that includes roller or pivoting or luffing davit with a gravity-lowering electric hoisting winch, open or partially enclosed lifeboat with offload release gear;
- f) how to carry out an annual thorough examination and operational test of a free fall "A" frame davit with a hydraulic hoisting and lowering winch;
- g) how to carry out an annual thorough examination and operational test of a complete system that includes a "A" frame or single arm slewing davit with a gravity-lowering electric hoisting winch, fast rescue boat with inflating self-righting system;
- h) how to carry out a five-year thorough examination, overhaul and overload operational test on a complete system;
- i) basic safety and awareness in their working environment;
- j) the ability to write accurate reports and complete associated documentation in order to issue a statement of fitness for purpose based on 5.3 of the IMO Requirements.

11 Duration and timing of Level 1 Service Technician Stage 2 controlled environment experience and assessment

Contact time: The optimum recommended 'contact time' for the assessments is 20 h. Contact time does not include course administration, lunch and refreshment breaks.

Annex A

(informative)

Equipment covered by the training

Table A.1 — Exercise assessment system type breakdown

Survival craft types	Davit types	Winch types	Release gear types
Lifeboat a) with sprinkler and air system Lifeboat a) Single fall or b) Twin fall or c) Free fall Lifeboat a) Open or b) Partially enclosed Rescue Boats a) Single fall rescue boat or b) Fast rescue boat	a) Fixed outrigger b) Free fall ramp c) Free fall A-frame d) Roller track gravity e) Hydraulic/luffing gravity-lowering f) Single arm slewing	Twin drum a. Gravity-lowering/ electric hoisting i. Holding/static brakes with friction pads ii. Holding/static brakes with mechanically operated multiple disks. iii. Holding/static brakes, multiple disks, hydraulically operated iv. Hydraulic pump lowering brake v. Centrifugal brakes with friction pads b. Gravity-lowering hydraulic hoisting Single Drum a. Gravity-lowering/ Electric hoisting i. Holding/Static brakes with friction pads ii. Centrifugal brakes with friction pads b. Hydraulic lowering and hoisting	Hook assemblies a) Off load/On load – lift not over centre release gear i) Flat to flat rotating cams ii) Forward or reverse curve to curve rotating cams iii) Curve to flat rotating cams iv) Up and down pins b) On load/Off load – lift over centre release gear c) Free fall hydraulic d) Automatic – lift over centre e) Off load – lift over centre Devices for activating release a) Central release units. b) Hydrostatic interlock with diaphragm c) Hydrostatic interlock with float d) Electronic sensors

Annex B (informative)

Assessment checklist — Level 1 Service Technician Stage 1 technical training

1)

CANDIDATE NAME:			
COMPANY NAME:			
START DATE:		END DATE:	
Module 1 – Work, health and safety issues while conduction activities on board		Assessment results	
ASSESSMENT CRITERIA	On completion of this training, the candidate should be able to explain :	Check mark initials	Evidence source*
1	Explain the people that need to be informed and the documentation that need to be checked, verified and completed before commencing work.		VQ /WT
2	Explain the safety checks that need to be considered before commencing work on lifeboat (including free fall lifeboats) rescue and fast rescue boats, launching appliances and release gear.		VQ /WT
3	Explain specialised equipment requirements including PPE.		VQ /WT
4	Explain the documents that need to be completed consulted, interpreted applied and to inspect, maintain, thoroughly examine, operationally test, overhaul and repair lifeboat (including free fall lifeboats) rescue and fast rescue boats, launching appliances and release gear.		VQ /WT
*Source of evidence: O = observation; S = simulation; VQ = verbal questioning; WT = written questions.			
√ = COMPETENT IN RELEVANT CRITERIA O = NOT YET COMPETENT IN RELEVANT CRITERIA. This may be overwritten with a √ if the candidate/s, following additional training, subsequently become competent in those particular criteria.			
INSTRUCTOR/ASSESSOR COMMENTS			

1) Trade names or trademarks of products given in this Annex are examples of suitable products available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of these products.

Module 2 – Survival Craft		Assessment results	
Make: Twin fall and single fall Type. TEMPSC, partially enclosed lifeboat, tender lifeboats open lifeboat, rescue boats, fast rescue boats			
ASSESSMENT CRITERIA	On completion of this training, the candidate should be able to explain :	Check mark initials	Evidence source*
5	Identify and explain the function of the individual components related to lifeboats, rescue boats including fast rescue boats.		VQ /WT
6	Identify and explain the specific lubricant requirements for lifeboats. Rescue boats and fast rescue boats.		
7	Explain the specific procedures that apply to the inspection, maintenance, thorough examination, operational testing, overhaul and repair of lifeboats (including free fall lifeboats), rescue boat including fast rescue boat supporting IMO Resolution MSC.402(96), paragraph 6.2.3		VQ /WT
*Source of evidence: O = observation; S = simulation; VQ = verbal questioning; WT = written questions.			
√ = COMPETENT IN RELEVANT CRITERIA O = NOT YET COMPETENT IN RELEVANT CRITERIA. This may be overwritten with a √ if the candidate/s, following additional training, subsequently become competent in those particular criteria.			
INSTRUCTOR/ASSESSOR COMMENTS			

Module 3 – Release gear Makes: a) Onload b) Offload c) Automatic . Types: Lift not over centre , such as Mills Titan, Norsafe Tor Mk 1& 2, Torsion Cup, Palfinger LHR 1 & LHR 2, Fassmer Duplex, Beihai BG Series, Shigi SZK Series, Survitec SafeLaunch, RocLoc Series. Lift-over-centre , such as SSI Triple 5 & LX, SureSafe.		Assessment results	
ASSESSMENT CRITERIA		On completion of this training, the candidate should be able to explain :	Check mark initials
8	Explain the specific design and construction features of the specific various makes and types of release gear.		VQ /WT
9	Identify and explain the function of specific individual components that make up the distinct designs associated with the common makes and types of release gear.		VQ /WT
10	Explain the common faults that can occur and potential solutions to resolve them in relation to the specific common designs of makes and types of release gear.		VQ /WT
11	Identify and explain the generic maintenance and examination criteria in relation to release gear.		VQ /WT
12	Identify and explain the specific procedures to carry out maintenance thorough examination, operational testing, repair and overhaul that cover the specific designs associated with the common makes and types of release gear found in lifeboats (including free-fall lifeboats), rescue and fast rescue boats.		VQ /WT
*Source of evidence: O = observation; S = simulation; VQ = verbal questioning; WT = written questions. √ = COMPETENT IN RELEVANT CRITERIA O = NOT YET COMPETENT IN RELEVANT CRITERIA. This may be overwritten with a √ if the candidate/s, following additional training, subsequently become competent in those particular criteria.			
Module 3 INSTRUCTOR/ASSESSOR COMMENTS			

Module 4 – Davits		Assessment results		
Make: Twin fall and single fall				
Type Fixed outrigger, gravity roller track, hydraulic pivoting/luffing, single arm slewing, telescopic, A-frame, free fall				
ASSESSMENT CRITERIA		On completion of this training, the candidate should be able to explain :	Check mark initials	Evidence source*
13	The various design and construction features of davits.			VQ /WT
14	The common faults that can occur and potential solutions to resolve them in relation to the specific designs of davits.			VQ /WT
15	How to carry out non-destructive tests on davit components to check for cracks and the integrity of welds.			VQ /WT
16	Identify and explain the function of the individual components of davits used for launching lifeboats, rescue boats and davit-launched liferafts.			VQ /WT
17	Identify and explain the specific procedures to carry out; maintenance thorough examination, operational testing, repair and overhaul of specific makes and types of davits used to launch lifeboats (including free-fall lifeboats), rescue and fast rescue boats.			VQ /WT
*Source of evidence: O = observation; S = simulation; VQ = verbal questioning; WT = written questions.				
√ = COMPETENT IN RELEVANT CRITERIA				
O = NOT YET COMPETENT IN RELEVANT CRITERIA. This may be overwritten with a √ if the candidate/s, following additional training, subsequently become competent in those particular criteria.				
INSTRUCTOR/ASSESSOR COMMENTS				

Module 5 – Winches		Assessment results	
Make: Twin drum, single drum Type: gravity-lowering, electric hoisting, such as; SSI 5000, 2800, 14000, Palfinger W Series, BE Series, Zhenjiang Marine DP Series, Gravity-lowering hydraulic hoisting, Hydraulic hoisting and lowering			
ASSESSMENT CRITERIA	On completion of this training, the candidate should be able to explain :	Check mark initials	Evidence source*
18	Explain the specific design and construction features of the various common makes and types of winches.		VQ/WT/O
19	The common faults that can occur and potential solutions to resolve them in relation to the specific designs of winches.		VQ /WT
20	Identify and explain the function of specific individual components associated with specific makes and types of winches used to launch lifeboats, rescue boats and davit-launched liferafts.		VQ /WT
22	Identify and explain the specific procedures to carry out; maintenance thorough examination, operational testing, repair and overhaul, in relation to the distinct designs associated with specific makes and types of winches used to launch lifeboats (including free-fall lifeboats), rescue and fast rescue boats.		VQ /WT
22	The construction of wire ropes.		VQ /WT
23	The specific procedures that apply to the inspection, maintenance, thorough examination, exchange and discard of wire ropes.		VQ /WT
*Source of evidence: O = observation; S = simulation; VQ = verbal questioning; WT = written questions.			
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Module 5 INSTRUCTOR/ASSESSOR COMMENTS			

Module 1 – Work, health and safety issues while conduction activities on board		Assessment results		
ASSESSMENT CRITERIA		On completion of this training, the candidate should be able to demonstrate:	Check mark initials	Evidence source*
1	The safety checks that need completing prior to commencing work on lifeboats (including free fall lifeboats) rescue and fast rescue boats, launching appliances and release gear.			O/VQ
2	How to interpret and apply the relevant documentation for the maintenance, thorough examination, operational testing, overhaul and repair of lifeboats (including freefall lifeboats) rescue boats (including fast rescue boat), launching appliances and release gear.			O/VQ
3	How to complete manufacturer's checklist and compile reports.			O/VQ
4	How to carry out the required safety checks and attach maintenance/hanging off pendants, secondary safety and fall prevention devices.			O/VQ
*Source of evidence: O = observation; S = simulation; VQ = verbal questioning; WT = written questions.				
√ = COMPETENT IN RELEVANT CRITERIA O = NOT YET COMPETENT IN RELEVANT CRITERIA. This may be overwritten with a √ if the candidate/s, following additional training, subsequently become competent in those particular criteria.				
Module 1 INSTRUCTOR/ASSESSOR COMMENTS				
The above-named person was assessed against the range indicated in accordance with the assessment criteria and is considered Competent/Not yet Competent for Module 1 Level 1 Service Technician Stage 1 technical training				
Assessor name:		Assessor signature:		Date:
Candidates name:		Candidates signature:		Date:

Module 2 – Survival craft		Assessment results	
Make: Twin fall and single fall			
Type. TEMPSC, partially enclosed lifeboat, tender lifeboats open life-boat, rescue boats, fast rescue boats			
ASSESSMENT CRITERIA	On completion of this training, the candidate should be able to demonstrate:	Check mark initials	Evidence source*
How to maintain, thoroughly examine, check for satisfactory condition and operation supporting the requirements of IMO Resolution MSC.402 (96), paragraph 6.2.3, and the manufacturer's technical documentation.			
5	The structure of the boat including fixed and loose equipment.		O/VQ
6	The external boundaries of the internal void spaces as far as practicable.		O/VQ
7	Inboard engine and gearbox.		O/VQ
8	Outboard engines.		O/VQ
9	Engine bed and mounts.		O/VQ
10	Primary and secondary start systems.		O/VQ
11	Exhaust system.		O/VQ
12	Propulsion system, stern tubes, stern glands.		O/VQ
13	Lifeboats sprinkler system.		O/VQ
14	Lifeboats air supply.		O/VQ
15	Manoeuvring system.		O/VQ
16	Power supply.		O/VQ
17	Bailing system.		O/VQ
18	Fender and skate arrangements.		O/VQ
19	Lifeboat inflatable righting/anti-entrapment equipment.		O/VQ
20	Rescue boat (including fast rescue boats) righting system.		O/VQ
*Source of evidence: O = observation; S = simulation; VQ = verbal questioning; WT = written questions.			
√ = COMPETENT IN RELEVANT CRITERIA O = NOT YET COMPETENT IN RELEVANT CRITERIA. This may be overwritten with a √ if the candidate/s, following additional training, subsequently become competent in those particular criteria.			

Module 2 Practical**INSTRUCTOR/ASSESSOR COMMENTS**

The above-named person was assessed against the range indicated in accordance with the assessment criteria and is considered **Competent/Not yet Competent** for Module 2 Level 1 ASP Service Technician Stage 1 technical training.

Assessor name:	Assessor signature:	Date:
Candidates name:	Candidates signature:	Date:

Module 3 – Release gear Makes: a) Onload b) Offload Types: Lift not over centre , such as Mills Titan, Norsafe Tor Mk 1&2, Torsion Cup, Palfinger LHR 1 & LHR 2, Fassmer Duplex, Beihai BG Series, Shigi SZK Series, Survitec SafeLaunch, RocLoc, Schat Harding ARH 23, RRH 25 Lift-over-centre ; such as SSI Triple 5 & LX, SureSafe , Free fall hydraulic Automatic		Assessment results	
ASSESSMENT CRITERIA		On completion of this training, the candidate should be able to demonstrate:	Check mark initials
			Evidence source*
21	How to correctly operate release systems for lifeboats, rescue boats and davit-launched liferafts.		O /VQ
22	The ability to use specialized tooling and apply the correct lubricants to the applicable components.		O/VQ
Annual thorough examination and operational test Thoroughly examine and check for satisfactory condition and operation specific makes and types of release systems supporting the requirements of IMO Resolution MSC.402(96), paragraphs 6.2.4.to 6.2.8, and the manufacturer's technical documentation as minimum to include:			
23	Central release units.		O/VQ
24	Hydrostatic interlock systems with diaphragms.		O/VQ
25	Hydrostatic interlock systems with floats.		O/VQ
26	Cables for control and release.		O/VQ
27	Hook assemblies with fastenings/locking devices with flat to flat cams.		O/VQ
28	Hook assemblies with fastenings/locking devices with curve to curve cams.		O/VQ
29	Hook assemblies with fastenings/locking devices with curve to flat cams.		O/VQ
30	Hook assemblies with fastenings/locking devices with up and down pins.		O/VQ
31	Hook assemblies with fastenings/locking devices with amplification arms, intermediary hooks, arresting levers.		O/VQ
32	Free fall hydraulic hook assemblies.		O/VQ
33	Automatic hook assemblies.		O/VQ
34	How to check excessive free play and tolerances of release gear against the specifications of the manufacturer's technical documentation.		O/VQ
35	How to carry out the annual operational tests of davit-launched lifeboats and rescue boats on-load release function with a simulated load.		O/VQ
36	How to carry out the operational test of davit-launched liferaft automatic release function.		O/VQ