PLVAC Paper No.18/2004

PROVISIONAL LOCAL VESSELS ADVISORY COMMITTEE

Draft Code of Practice for Strength Calculations, Test and Examination of Derrick Cranes on Local Vessels

Background

1. The forthcoming proposed Shipping and Port Control (Cargo Handling) (Amendment) Regulation ** stipulates that the owners of derrick cranes on local vessels and the persons in charge of works should ensure those derrick cranes which were installed or altered after the (Amendment) Regulation comes into force to keep the strength calculations, rigging diagrams and as fitted drawings on board for inspection by Marine Department on demand. The above strength calculations and drawings, etc. must be certified by a competent examiner.

Summary of the Code

2. Derrick cranes are widely used on local vessels. The Draft Code of Practice for Strength Calculations, Test and Examination of Derrick Cranes on Local Vessels covers general recommendations for the strength calculations, rigging diagrams, test and examination, and thorough examination of the derrick cranes fitted on local vessels.

3. The Code clearly states that the aim of the strength calculation of a derrick crane is to assess its safe working load. Strength calculation should include the calculations for the strength of derrick boom, mast, supporting structure, permanent attachments and any other associated items and fittings. When more than one arrangement of rigging is designed for a derrick crane, calculations are to be made for each arrangement. The strength calculation should be based on an internationally recognized code, rules or standard (such as the *Rules for the Statutory Survey of Lifting Equipment* issued by the Ships Survey Bureau of the People's Republic of China, and the *Code for Lifting Appliances in a Marine*

Environment issued by Lloyd's Register of Shipping). Any deviation from the code, standard or rules being applied must be fully justified.

4. The Code also states that a derrick crane and its permanent attachments, accessories, wire rope slings, and other lifting gear including pulley blocks, shackles, swivels, hooks, rings, grabs, etc., should be test and examined in accordance with the Regulation. A competent examiner should carry out the functional test of a derrick crane carefully, and the braking system of the winch should also be tested. After the test and examination, the competent examiner should make entries in the Register of Lifting Appliances and Lifting Gear and issue Certificates of Test and Examination.

Consultation

5. The industry (including the employers associations and workers union of the trade, safety and health committees under the Occupational Safety and Health Council, institutes of engineers and associations of safety officers) was consulted on the Code, and the Code has been revised after consideration of their comments.

6. Members are invited to comment and endorse the proposal of this Code.

Marine Industrial Safety Section, Marine Department
Hong Kong SAR Government
September 2004

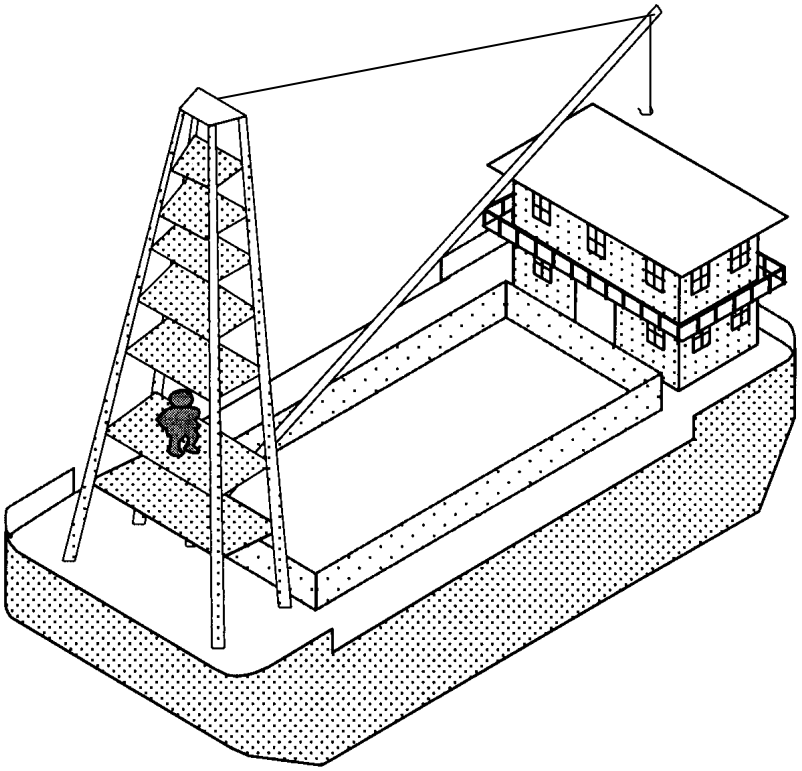
** The provisions regulating local vessels under the Shipping and Port Control (Cargo Handling) (Amendment) Regulation will be replaced by relevant provisions under the Merchant Shipping (Local Vessels) (Works) Regulation when the Merchant Shipping (Local Vessels) Ordinance (Cap.548) comes into force.

Fourth Draft [August 2004]

First Draft was issued on March 2001
Second Draft was issued on October 2002
Third Draft was issued on April 2003

DRAFT CODE OF PRACTICE FOR

STRENGTH CALCULATIONS, TEST AND EXAMINATION OF DERRICK CRANES ON LOCAL VESSELS



Marine Industrial Safety Section
Marine Department, HKSAR
August 2004

Record on Updating and Amendments

This Code of Practice is issued under section 44A of the Shipping and Port Control Ordinance through the Gazette Notice. Subsequent updating and amendments would be notified to the industry through further notice in the Gazette from time to time. This record sheet is intended for good record keeping of this Code of Practice.

Amendment No.	Gazette No.	Gazette Date	Effect Date	Topic Areas / pages

CONTENTS

Forward

Derrick cranes are widely used for lifting operations in Hong Kong on the local dumb steel lighters. Statistics show that the failure of derrick cranes have been the cause of serious accidents resulting in bodily injuries and property damage. Accidents can be avoided if derrick cranes are properly designed, tested and examined, maintained and safely operated.

This Code of Practice provides a practical guide to the local marine industry especially to the competent examiners on how to calculate the strength of derrick cranes, and to carry out tests and examinations.

This is an approved code of practice issued by the Director of Marine under Section 44A(1) of the Shipping and Port Control Ordinance (the "Ordinance"), Cap. 313. It is important to note that compliance with this Code of Practice does not, of itself, confer immunity from legal obligations in Hong Kong. Owners of derrick cranes, masters of local vessels and persons in charge of works are also reminded to observe other legal requirements during the installation and operation of derrick cranes.

Section 44A(4) of the Ordinance stipulates that a failure by any person to observe a provision of an approved code shall not of itself cause him to incur any criminal liability, but where –

(a) in any criminal proceedings the defendant is alleged to have committed an offence either -
    (i) by reason of a contravention of or a failure to comply with, whether by act or omission, the Ordinance or regulations under the Ordinance; or
    (ii) by reason of a failure to discharge or perform a duty imposed by the Ordinance or such regulations; and
(b) the matter to which the alleged contravention or failure relates is one to which, in the opinion of the court, an approved codes relates,

then the section 44A(5) of the Ordinance shall apply as regards to the proceedings.

Section 44A(5) of the Ordinance stipulates that in any criminal proceedings to which the section applies, the following, namely -

(a) compliance with a provision of an approved code found by the court to be relevant to a matter to which a contravention or failure alleged in the proceedings relates;
(b) a contravention of or failure to comply with, whether by act or omission, any such provision so found,

may be relied on by any party to the proceedings as tending to establish or to negative any liability which is in question in the proceedings.

Footnote: The provisions of the Shipping and Port Control Ordinance, Cap.313, and the Shipping and Port Control (Works) Regulations which are quoted in this Code of Practice will be replaced by the relevant provisions of the Merchant Shipping (Local Vessels) Ordinance, Cap.548, and the Merchant Shipping (Local Vessels) (Works) Regulation respectively after the Ordinance (Cap.548) comes into force.

1. Scope

1.1 This Code of Practice covers general recommendations for the strength calculation, rigging diagram and as fitted drawing, and requirements for the test, examination and thorough examination of the derrick cranes fitted on locally licensed vessels such as dumb steel lighters and motorized lighters.

1.2 Except paragraph 4.8, all provisions of section 4 "Strength Calculation, Rigging Diagram & As Fitted Drawing" of this Code of Practice are generally applicable to the derrick cranes which are newly installed or to the existing derrick cranes which are substantially altered after the [date of commencement of the Shipping and Port Control (Cargo Handling) (Amendment) Regulation].

1.3 Many of the provisions of this Code of Practice relate to statutory obligations under the Shipping and Port Control Ordinance and Shipping and Port Control (Works) Regulations.

1.4 The relevant statutory regulations are indicated at the left column of the provisions of this Code of Practice. These are mandatory requirements which are to be complied with.

2. Interpretation

2.1 **Competent examiner (合資格檢驗員)**

Shipping and Port Control (Works) Regulations Reg.2

A competent examiner means a person who is a registered professional engineer registered under the Engineers Registration Ordinance (Cap.409) within a discipline specified in Schedule 3 of the Shipping and Port Control (Works) Regulations, or [classification societies recognized by the Director of Marine]. **

Shipping and Port Control (Works) Regulations

A competent examiner should be by reason of his qualifications, training and experience, competent to carry out any test or examination of a lifting appliance or lifting gear for the purposes of these regulations.

Shipping and Port Control (Works) Regulations Schedule 3

As at the date of publication of this Code of Practice, mechanical, and marine and naval architecture are the disciplines specified in Schedule 3 of Shipping and Port Control (Works) Regulations. The said Schedule 3 is attached in Appendix 2.

2.2 **Competent person (合資格的人)**

Reg.2

A competent person means a person who, by reason of his training and practical experience, is competent to perform an inspection on lifting gear.

An experienced derrick crane operator who has attended the Shipboard Crane Operator Safety Training Course may be appointed by the owner of lifting gear as a competent person to perform periodic inspections on lifting gear.

2.3 **Crane (起重機)**

Shipping and Port Control Ordinance Section 36

It means any appliance equipped with mechanical means of hoisting and lowering a load and for transporting the load while suspended; and also all chains, ropes, swivels, or other tackle (down to and including the hook), used in the operation of the appliance; but does not include -

(a) a hoist block running on a fixed rail or wire;

(b) a stacker or conveyor whereby a load is moved by means of a belt or platform; or

(c) an earth or mineral moving or excavating appliance not fitted with a grab.

** Department of Justice to be consulted

2.4 **Derrick crane (人字吊臂起重機)**

It means a derrick system being designed and operated as a crane. It is a derrick fitted with an operating winch of such design that the derrick boom can be slewed while suspending a load. A derrick system includes the winch, derrick boom, mast, permanent attachments and accessories. Currently most of the local designed derricks installed on dumb steel lighters are derrick cranes. A figure of a typical derrick crane installed on a local dumb steel lighter is shown on the cover page of this Code of Practice.

2.5 **Lifting Appliance (起重裝置)**

Shipping and Port Control Ordinance Section 36

It means a crane, winch, hoist, derrick boom, sheer legs, excavator, pile driver, pile extractor, fork lift truck or other self-propelled machine, and any other description of lifting appliance, derrick and mast bands, goose-necks, eyebolts, and all other permanent attachments to a derrick, mast or deck, used on a vessel for the purposes of hoisting or lowering in connection with works.

2.6 **Lifting Gear (起重工具)**

Section 36

It includes a chain sling, rope sling, canvas sling, net, tray, board, box, bull rope, snotter, can hook or other means of supporting cargo and attachments thereto including a ring, link, hook, plate, clamp, shackle, swivel, eyebolt, bridle, beam, spreader, rope and wire, used on a vessel in connection with works.

2.7 **Person in Charge of Works (工程負責人)**

Section 36

A person in charge of works means -

(a) the owner or master of, or other person having control over, the vessel on, to or by means of which any works are to be, or are being, carried out; or

(b) a principal contractor or sub-contractor, if any, who contracts to carry out, or who carries out, any works; or

(c) any other person having for the time being in command or charge of any works being carried out on, to or by means of a vessel.

2.8 **Stress-bearing part (受力部份)**

In relation to a substantial alteration, modification or repair of a derrick crane, it includes the boom, gooseneck bearing assembly, mast and anchor plate on the deck.

3. Responsibility

3.1 Owner, Master and Person in Charge of Works

3.1.1 It shall be the duty of the owner of a derrick crane, master and the person in charge of works to ensure that the derrick crane has been properly tested and examined, and the Register of Lifting Appliances and Lifting Gear, the certified strength calculations, rigging diagrams and as fitted drawings are kept on board the local vessel before the derrick crane is being taken into use.

Shipping and Port Control (Works) Regulations Reg.20, 23(4) & 25A(1)

3.1.2 After a derrick crane being taken into use, it shall be the duty of its owner, master and the person in charge of works to ensure that the derrick crane is properly maintained in a safe working condition.

Reg.17(b)

3.1.3 The owner, master and the person in charge of works should monitor the routine maintenance work of the crane.

3.1.4 All derrick cranes installed on local vessels are required to undergo strength calculations, and to have rigging diagrams and as fitted drawings. But those derrick cranes which were installed before the [date of commencement of the Shipping and Port Control (Cargo Handling) (Amendment) Regulation] are exempted from such requirements. All the strength calculations, rigging diagrams and as fitted drawings of the derrick cranes must be certified by a competent examiner.

Reg.25A(2)&(3)

3.1.5 When a substantial alteration or modification is to be made to any stress-bearing part of a derrick crane (such as the extension or change of a boom, change of the mast structure), whether it had been installed before the [date of commencement of the Shipping and Port Control (Cargo Handling) (Amendment) Regulation] or not, it is required to undergo strength calculations, and the strength calculations, rigging diagrams and as fitted drawings are to be prepared/revised and certified by a competent examiner.

Reg.25A(3)

3.2 Competent Examiner

3.2.1 A competent examiner shall test and examine a derrick crane in accordance with the procedure set out in Schedule 1 of the Shipping and Port Control (Works) Regulations. The said Schedule 1 is attached in Appendix 1.

3.2.2 All tests and all examinations of a derrick crane must be done or witnessed by the competent examiner personally.

Reg.50(1)

3.2.3 A competent examiner who tests and examines a derrick crane, shall deliver to the owner of the derrick crane or to the master of the local vessel, a Certificate of Test and Examination of Winches, Derricks and Their Accessory Gear (Form 2) containing all the particulars required to be entered in the Certificate with regard to the test and examination. A sample of Form 2 is shown in Appendix 3.

Reg.50(2)

3.2.4 A competent examiner who thoroughly examines a derrick crane shall, on production to him of the Register of Lifting Appliances and Lifting Gear, enter in the Register a certificate of thorough examination and all the particulars required to be entered in the Register with regard to the examination.

Shipping and Port Control Ordinance Section 75

3.2.5 Any competent examiner who delivers a certificate of test and examination or enters in a register a certificate of thorough examination which to his knowledge is false as to a material particular commits an offence.

3.2.6 A competent examiner should certify strength calculations of a derrick crane (which is installed, altered or modified after the [date of commencement of the Shipping and Port Control (Cargo Handling) (Amendment) Regulation]) only if he has checked that the calculations is prepared based on acceptable standards and the derrick crane is manufactured in accordance with the design.

3.2.7 A competent examiner may hire different disciplines of professionals to assist him if he considers necessary.

3.2.8 Competent examiners must keep themselves fully acquainted of the current legislation and technical codes or standards including any amendments to them from time to time.

4. Strength Calculation, Rigging Diagram & As Fitted Drawing

4.1 Application

Shipping and Port Control (Works) Regulations Reg.25A

4.1.1 After the [date of commencement of the Shipping and Port Control (Cargo Handling) (Amendment) Regulation], all derrick cranes newly installed on local vessels are required to undergo strength calculations.

Reg.25A

4.1.2 After the [date of commencement of the Shipping and Port Control (Cargo Handling) (Amendment) Regulation], when a substantial alteration or modification is to be made to any stress-bearing part of a derrick crane (such as the extension or change of a boom, change of the mast structure), it is required to undergo strength calculations.

4.2 Design and Construction of Derrick Crane

Reg.17(a)

4.2.1 Derrick cranes should be of good mechanical construction and design, made of strong and sound materials, and free from patent defect.

4.2.2 All parts and accessories of a derrick crane including counterweights should be properly designed and constructed.

Reg.17(c)&(d)

4.2.3 The arrangements for fixing and anchoring a derrick crane are to be adequate to secure its safety. Adequate measures should be taken to prevent the foot of derrick boom being accidentally lifted out of its socket or support.

Reg.28

4.2.4 A derrick crane shall be provided with such means so as it will reduce to a minimum the risk of the accidental descent of a load while being hoisted or lowered.

4.2.5 The capacity of the braking mechanism of the derrick winch should be adequate to ensure the braking effect in extreme weather and operating condition.

4.2.6 For a derrick crane which is installed on a local vessel and the keel of which is laid (or the construction work of which is begun) after the [date of commencement of the Shipping and Port Control (Cargo Handling) (Amendment) Regulation], the winch of the derrick crane should be designed as failsafe so that a load will not suddenly descend due to the failure of the control system of the winch. In so far as reasonably practicable, all controls should be of a kind that inhibits inadvertent operation and stops all motions when they are not held in the operating position, i.e. of the "deadman" design. The winch is to be so constructed that the load cannot fall by its own weight when the prime mover is disconnected from the winch.

4.2.7 A new derrick crane should be fitted with a safety device such as limit switches or alarms to prevent the boom being slewed to extreme positions where excessive stress would be induced to the boom.

4.3 Strength Calculation for Assessing Safe Working Load

4.3.1 The aim of strength calculation of a derrick crane is to assess its safe working load.

4.3.2 Strength calculation for a derrick crane should include the calculations for the strength of derrick boom, mast, supporting structures, permanent attachments and any other associated items and fittings.

4.3.3 Factors to be considered in the strength calculation :-

a) the recognized code or standard which the materials fabricated for the derrick boom and associated fittings complying with;
b) the welding design and workmanship of structural parts such as anchor plates, mast or boom;
c) the angle of heel and trim of the vessel during lifting operation in calculating forces and tensions of the derrick boom, mast and the system;
d) waves and swells normally experienced in the harbour, and loads due to vessel motions;
e) the wind loading;
f) the frictional forces of the system; and
g) other loads considered necessary.

4.3.4 Calculations are to be made for conditions with the derrick boom at its lowest and highest operating angles to the horizontal, and in no case the lowest angle is greater than 45◦ To horizontal.

4.3.5 Competent examiners should specify the operating angle ranges of the derrick booms including the luffing and slewing limits.

4.3.6 In the strength calculation of the mast, consideration should be made to the following least favourable combinations of loading imposed :-

a) the boom at the lowest operating angle to horizontal;
b) the boom slewed to extreme angles; and
c) the boom at any other operating position which may impose greater loading to the mast than above.

4.3.7 A competent examiner should ascertain the vessel is stable during the lifting operations of the derrick crane. Stability calculation should be made in accordance with the *Code of Practice – Safety Standards for Class I, II and III Vessels* issued by Marine Department.

4.3.8 A competent examiner should ascertain that the structures of the vessel can withstand the loadings at all times of the derrick crane operation and it is complied with the licensing conditions of the vessel.

4.3.9 Where more than one arrangement of rigging is designed for a derrick crane, calculations are to be made for each arrangement.

Schedule 1

4.3.10 The safe working load of any wire rope used for a derrick crane should not exceed 20 per cent of the breaking load of the wire rope.

4.3.11 Force diagrams or other equivalent methods should be used in the calculations. The weight of the derrick boom and tackle is to be included in the calculations. Calculations are to be made for the least favourable combinations of loading which may be imposed. Calculations should result in arriving at a safe working load of the derrick crane for specified operating condition and rigging arrangement.

4.3.12 The strength calculation should be based on a nationally or internationally recognized code, rules or standard such as the *Rules for the Statutory Survey of Lifting Equipment* issued by the Ships Survey Bureau of the People's Republic of China, the *Code for Lifting Appliances in a Marine Environment* issued by Lloyd's Register of Shipping, or codes and rules of other recognized classification societies. The nine recognized classification societies are listed in Appendix 4.

4.3.13 A code, standard or rules should be applied in its entirety as far as reasonably practicable. Any deviation from the code, standard or rules being applied must be fully justified. Calculation in areas not covered by the applied code, standard or rules should be based on sound engineering principles.

4.3.14 The competent examiner should ensure that the derrick crane is safe while the calculation has accommodated all the loads which the component/structure can sustain in the least favourable condition of loading which may be implied. The calculations should be certified by a competent examiner.

4.4 Rigging Diagram & As Fitted Drawing

4.4.1 Rigging diagrams should include all rigging arrangements which will be used in the operations of the derrick crane. Particulars including the safe working loads and/or sizes of pulley blocks, shackles, wire ropes, etc. should be specified.

4.4.2 The as fitted drawings should include the general arrangements of the winch, derrick boom, mast, permanent attachments, accessories, and

the arrangements for preventing the lifting of the foot of derrick out its socket.

4.5 Certified Copies

4.5.1 All the strength calculations, rigging diagrams and as fitted drawings of the derrick cranes must be certified by a competent examiner.

Reg.25A(2)

4.5.2 Competent examiners should submit certified copies of strength calculations, rigging diagrams and as fitted drawings of the derrick cranes to Marine Department for record purpose.

4.5.3 A set of certified duplicate copy of them should be kept on board the local vessel.

Reg.25A(1)

4.6 Alteration

4.6.1 When a substantial alteration is made to any stress-bearing part of a derrick crane (such as the extension or change of a boom, change of the mast structure), the derrick crane is required to undergo/revise the strength calculations.

Reg.25A(3)

4.6.2 In no case should the original safety factor of the equipment complying with the code, rules or standard be reduced.

4.7 Ascertaining Safe Working Load

After having determined the safe working load of a derrick crane through the process of strength calculation, the derrick crane must be tested and examined by a competent examiner.

4.8 Transitional Arrangement and Good Construction and Design

4.8.1 For ascertaining the safe working loads of the derrick cranes which have been installed before the Shipping and Port Control (Cargo Handling) (Amendment) Regulation comes into force, competent examiners should observe the guidelines given in the Guidance Notes shown in Appendix 5.

4.8.2 The requirements set out in paragraphs 4.2.1, 4.2.2, 4.2.3, 4.2.4 and 4.2.5 in this section concerning the design and construction of derrick cranes are also applicable to all derrick cranes which have been installed before the Shipping and Port Control (Cargo Handling) (Amendment) Regulation comes into force.

5. Test and Examination

5.1 Frequency of Test and Examination

Reg.20

Before being taken into use, after any substantial alteration or repair to any stress-bearing part, and once at least in every 4 years after being taken into use, all derrick cranes should be tested and examined by a competent examiner.

5.2 Permanent Attachments, Accessories and Ropes

5.2.1 Before being taken into use, every item of lifting gear including a pulley block, shackle, swivel, hook, wire rope sling and lifting frame which is a permanent attachment or accessory to a derrick crane should be tested and examined by a competent examiner in accordance with the provisions in paragraphs 3 & 4 of Schedule 1 of the Shipping and Port Control (Works) Regulations, except a steel grab which should be tested with not less than its normal grabbing load. After the test and examination of a lifting gear, the particulars required should be entered into the Certificate of Test and Examination of Pulley Blocks (Form 4) and Certificate of Test and Examination of Lifting Gear (Form 5) respectively by the competent examiner. For further details of the certificates and recording of the test and examination, please refer to section 7.

Schedule 1 para.3&4

Reg.23(1)

5.2.2 The wire ropes rigged to a derrick crane should be tested and examined by a competent examiner in accordance with paragraph 5 of Schedule 1 of the Shipping and Port Control (Works) Regulations. A Certificate of Test and Examination of Wire Ropes (Form 6) containing all particulars required should then be issued by the competent examiner. If the wire rope is tested by the manufacturer or a laboratory in Hong Kong or other territory and the competent examiner is satisfied that it is tested properly in accordance with paragraph 5 of Schedule 1, he may certified it after carrying out the examination of the wire rope. For further details of the certificates and recording of the test and examination, please refer to section 7.

Schedule 1 para.5

Reg.23(1)

5.2.3 The wire rope slings with ferrule-secured eye terminations when rigged to a derrick crane should be individually proof load tested and examined by a competent examiner. The proof load should be at least twice the safe working load. After test and examination, the particulars required should be entered into the Certificate of Test and Examination of Lifting Gear (Form 5) by the competent examiner.

5.3 **Test of Derrick Crane**

Schedule 1

5.3.1 The test and examination of a derrick crane should be carried out in accordance with Schedule 1 of the Shipping and Port Control (Works) Regulations. The said Schedule 1 is shown in Appendix 1.

5.3.2 For testing and examining an existing derrick crane without strength calculation, competent examiners should also observe the guidelines given in the Guidance Notes shown in Appendix 5.

5.3.3 Before testing a derrick crane on a local vessel afloat, the competent examiner should ascertain the allowable freeboard of the vessel, the depth of water below the vessel's keel to ensure no grounding occurred during the test, and the weather and sea state conditions. The test to a derrick crane should not be carried out in adverse weather or sea state conditions. The competent examiner should also ascertain that the vessel would be in stable conditions during the test.

5.3.4 The mooring lines of the vessel should not be too slack or of excessive tension, and it is free to allow the vessel to take up a natural list in the water during the test.

5.3.5 A thorough examination of the derrick crane should be made before applying proof loads. It should include the examination of the fixing and anchoring of the derrick system. For further details of thorough examination, please refer to section 6 of this Code of Practice. A functional test without any load to ensure the correct operation of controls, brakes and other devices should be carried out. The derrick boom should be positioned to port and starboard, and at maximum and minimum operating angles to horizontal.

5.3.6 If it is designed to carry persons by means of the derrick crane, the slow speed of hoisting and lowering, and the emergency stop device are to be functionally tested. Any cage for carrying persons must be of good construction, sound material and adequate strength, and is provided with suitable means to prevent any person from falling out.

5.3.7 The derrick boom should be set at the minimum operating angle to horizontal and the safe working load should be applied. The derrick crane should be operated through all motions, and the hoist and brakes where applicable being proved capable of sustaining the load.

Schedule 1 para.1

5.3.8 The proof load should then be applied with the derrick boom set at the minimum operating angle to horizontal. The derrick crane is to be tested in accordance with paragraph 1 of Schedule 1 of the Shipping and Port Control (Works) Regulations. The said Schedule 1 is shown in Appendix 1.

5.3.9 The brakes of a winch of a derrick crane should be tested :-

a) by hoisting a load equal to the safe working load, lowering the load at the normal working speed for approximately 3 metres and then applying the brakes, the test being applied with the derrick crane at each extremity of slew or luff and in its midship position; and

b) holding the proof load with the winch drive disengaged.

5.3.10 All brakes are capable of arresting the motion of the drum that they serve, smoothly and without snatching.

5.4 Examination

Schedule 1 para.4

After being tested with proof load, the derrick crane should be thoroughly examined so as to ensure that no part of the derrick crane including the boom, mast, any other structural part, winch and permanent attachments has been damaged during the test.

5.5 Certification

After the test and examination of the derrick crane has been satisfactorily completed, the competent examiner should issue a Certificate of Test and Examination of Winches, Derricks and Their Accessory Gear (Form 2) containing all particulars required. If the derrick crane is designed for carrying persons, the functional tests of the slow speed and emergency stop are to be recorded and included in Form 2. For details of entries in Form 2, please refer to section 7.

5.6 Safe Working Load Marking and Angle Indicator

Reg. 25

5.6.1 Every derrick crane should have the safe working load plainly marked upon it.

5.6.2 The range of operating angle to horizontal of the boom should also be marked together with the safe working load. To enable the crane operator to ascertain the operating angle to horizontal during daily operations, an angle indicator should be installed and functionally tested.

Reg. 24,25

5.6.3 Every pulley block should be stamped with its safe working load. Suitable means should be provided to enable any person using a chain or wire rope sling to ascertain the safe working load for such chain or sling under such conditions as it may be used. Chain slings should be marked with the safe working load in plain figures or letters upon the sling or upon a tablet or ring of durable material attached securely thereto. Wire rope slings should be marked in the similar manner or a notice or notices should be so exhibited as to be easily read by any person concerned, stating the safe working loads for the various sizes of wire rope slings used.

6. Thorough Examination

6.1 General

Reg.2

6.1.1 "Thorough examination", in respect of a derrick crane or its accessory lifting gear, means a visual examination, supplemented if necessary by other means such as a hammer test, carried out as carefully as the conditions permit, in order to arrive at a reliable conclusion as to the safety of the parts examined; and if necessary for the purpose, by the dismantling of the parts of the derrick crane.

6.1.2 The annual thorough examination of a derrick crane is basically a visual examination of the crane and its attachments. If any part is suspected to have deteriorated, then dismantling of the part or non-destructive tests may be required.

6.1.3 Non-destructive tests such as ultrasonic, radiographic and magnetic particle test may be employed for the thorough examination.

6.1.4 A visual examination includes the check and examination of the state of individual items of a derrick crane. The purpose of visual examination is to identify any problems that are likely to affect integrity. Components of the hoisting mechanism, controlling devices, brake linings, connecting hardware and joints of a pneumatic system should be visual examined.

6.1.5 Thorough examination should include the check of the dimensional tolerances and distortions of the components such as a wire rope, brake lining or shackle, that may affect the performance and function of a derrick crane.

6.2 Frequency of Examination

Reg.20(2)

After being taken into use, all derrick cranes shall be thoroughly examined by a competent examiner once at least in every 12 months.

6.3 Locking Arrangement of Winch

At the thorough examination of a derrick crane, the locking arrangement between driving winch clutch and the pawl sustaining the wire drum should be examined. The spring or other locking arrangement to prevent the accidental movement or displacement of the lever, handle, switch or other device used for controlling the operation of a derrick crane should also be examined.

6.4 Structure

The connection between the structural members such as the mast of the derrick crane and hull structure should be examined and ascertained in good order.

6.5 Permanent Attachments, Accessories and Ropes

Reg.17 & 20(2)

At the thorough examination of a derrick crane, its permanent attachments and accessories, such as a pulley block, shackle, swivel, hook, lifting frame, grab, counterweight mechanism and wires ropes, should be thoroughly examined.

6.6 Dismantling of Parts

Once at least in every 4 years, at the thorough examination or at the test and examination of a derrick crane, the stress-bearing parts such as the gooseneck pin, topping lift swivel assembly at the mast, braking system and slewing guy anchor arrangement must be dismantled for open-up examination so as to arrive at a reliable conclusion as to the safety of those parts examined. After the derrick crane has been assembled, it should be functionally tested.

6.7 Limits of Weardown and Corrosion

6.7.1 Structural members of a derrick crane in which amount of wear and tear reaches 10% of the original dimension are to be repaired or renewed.

6.7.2 For the gooseneck pin, the limit of clearance between the pin and the bracket hole is to be 5% of the original diameter.

6.7.3 For a lifting gear, the limits of weardown and corrosion are as follows:

a) 5% on any diameter
b) 2% on any diameter of a pin in a hole.

Reg.22(3)

6.7.4 The wire ropes should be discarded if in any length of 8 diameters the total number of visible broken wires exceeds 10% of the total number of wires, or the rope shows signs of excessive wear, corrosion or other defect which renders it unfit for use.

6.8 Functional Test

Having finished the visual and dimensional or open-up examinations and there is no deficiency or irregularity noted, a functional test should be conducted to check the function of the various operating systems of the derrick crane. A no-load test is first conducted and it consists of checks on the lifting or lowering, luffing and slewing mechanisms, and the brake operation such as the fail-safe mode (if fitted). When the derrick crane is found in safe working order under no-load test, a similar test is conducted with a load, which is not less than a half of the safe working load of the crane, to verify the performance of the crane.

6.9 Records

Reg.50(2)

After the thorough examination of a derrick crane has been satisfactorily completed, the competent examiner should enter in the Register of Lifting Appliances and Lifting Gear a certificate of thorough examination and all particulars (such as parts dismantled) required to be entered in the Register. For details of entries in the Register, please refer to section 7.

7. Certificates and Register Entries

7.1 Test and Examination

7.1.1 Where a competent examiner tests and examines a derrick crane, a Certificate of Test and Examination of Winches, Derricks and Their Accessory Gear (Form 2) containing all particulars required with regard to the test and examination is to be issued by the competent examiner. A sample of Form 2 is shown in Appendix 3.

Reg.23(1)
Reg.50(1)

7.1.2 The particulars required include the situation and description of derrick crane and its accessory gear, name of vessel and or licence number, length of derrick boom, rigging arrangements including particulars of wire ropes and grab [if any], angle to the horizontal of derrick boom, proof load, safe working load, function tests of the slow speed and emergency stop for carrying persons, and slewing limits.

7.1.3 The competent examiner should also enter in Part 1 of the Register of Lifting Appliances and Lifting Gear (Form 1) of the local vessel a certified record of the test and examination of the derrick crane. The owner of the derrick crane/vessel and the person in charge of works should ensure that the certificate is attached to the Register of Lifting Appliances and Lifting Gear of the local vessel and the record of the test and examination is entered in the Register. A sample of Form 1 is shown in Appendix 3.

7.1.4 After the test and examination of the permanent attachments or accessories (including the pulley blocks, shackles, swivels and hooks, and wire ropes) of a derrick crane, the particulars required should be entered into the Certificate of Test and Examination of Pulley Blocks (Form 4), Certificate of Test and Examination of Lifting Gear (Form 5), or Certificate of Test and Examination of Wire Rope (Form 6) as appropriate by the competent examiner. Samples of Form 4, Form 5 and Form 6 are shown in Appendix 3.

Reg.23(1)
Reg.50(1)

7.1.5 The competent examiner should also enter in Part 3 of the Register of Lifting Appliances and Lifting Gear of the local vessel a certified record of the test and examination of the lifting gear (including a pulley block, shackle, swivel or hook).

7.1.6 The owner of the derrick crane/vessel and the person in charge of works should ensure that the certificates of test and examination are attached to the Register of Lifting Appliances and Lifting Gear of the local vessel and the records of the test and examination are entered in the Register.

Reg.23(1)

7.2 Thorough Examination Entries

Reg.50(2)

Where a competent examiner thoroughly examines a derrick crane and the permanent attachments or accessories, he should enter in both Part 1 and Part 3 of the Register of Lifting Appliances and Lifting Gear of the local vessel a certificate of thorough examination and all the particulars required to be entered including any defects found.

7.3 Forms

Reg.54

The forms (Form 1 to Form 6) specified by the Director of Marine are shown in Appendix 3.

7.4 Transitional Arrangement

A proper former Register of Lifting Appliances and Lifting Gear or Certificate of Test and Examination of lifting gear or wire rope (former Form 1 to Form 6) should be deemed to be a Register of Lifting Appliances and Lifting Gear or Certificate of Test and Examination of lifting gear or wire rope under the Shipping and Port Control (Works) Regulations in respect of the vessel until one year after the [date of publication in gazette of the Shipping and Port Control (Cargo Handling) (Amendment) Regulation].

References

1. *A Guide to the Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations*, 1998, issued by Labour Department, Hong Kong SAR.

2. *British Standard BS 7121: Part 2:1991 Code of Practice for Safe Use of Cranes Part 2. Inspection, Testing and Examination*, published by British Standard Institution, U.K.

3. *Code for Lifting Appliances in a Marine Environment*, published by Lloyd's Register of Shipping.

4. *Code of Practice for Safe Use of Mobile Cranes and Tower Cranes*, 1998, issued by Labour Department, Hong Kong SAR.

5. *Code of Practice - Safety Standards for Class I, II and III Vessels*, issued by Marine Department, Hong Kong SAR.

6. *Guidance for Cargo Handling Appliances*, 1995, published by Nippon Kaiji Kyokai, Japan.

7. *Guidance Notes on Inspection, Thorough Examination and Testing of Lifting Appliances and Lifting Gear*, 2001, published by Labour Department, Hong Kong SAR.

8. *Guide to Safety and Health in Dock Work*, 1988, published by International Labour Office, Geneva.

9. *Marine Orders, Part 32 (Cargo and Cargo Handling Equipment and Safety Measures)*, 1986, published by Department of Transport, Australia.

10. *OSHA Crane Safety Handbook*, 1995, published by J.J.Keller & Associates, Inc., U.S.A.

11. *Rules and Guidance for the Survey and Construction of Cargo Handling Appliances*, 1987, published by Nippon Kaiji Kyokai, Japan.

12. *Rules for the Statutory Survey of Lifting Equipment*, 1999, published by the Ships Survey Bureau of the People's Republic of China.

Appendix 1

Schedule 1 of Shipping and Port Control (Works) Regulations

SCHEDULE 1 [regulations 2, 20, 21, 22, 23A, 33 & 54A]

PROCEDURE FOR TESTING AND EXAMINING LIFTING APPLIANCES AND LIFTING GEAR

1. (1) Every winch, together with its accessories (including any derrick, gooseneck, eye-plate, eyebolt, or other attachments) shall be tested with a proof load which shall exceed the safe working load as follows-

(a) if the safe working load is less than 20 tonnes, the proof load shall exceed the safe working load by at least 25 per cent;

(b) if the safe working load is 20 tonnes or more but not more than 50 tonnes, the proof load shall exceed the safe working load by at least 5 tonnes;

(c) if the safe working load is more than 50 tonnes, the proof load shall exceed the safe working load by at least 10 per cent.

(2) The proof load shall be applied either-

(a) by hoisting movable weights; or

(b) by means of a spring or hydraulic balance or a similar appliance,

with the derrick at an angle to the horizontal which shall be specified in the certificate of the test.

(3) In the case of sub-paragraph (2)(a), after the movable weights have been hoisted, the derrick shall be swung as far as practicable first in one direction and then in the other and in the case of sub-paragraph (2)(b) the proof load shall be applied with the derrick swung as far as practicable first in one direction and then in the other.

2. (1) Every crane and every other lifting appliance, together with its accessories, other than a lifting appliance referred to in paragraph 1, shall be tested with a proof load which shall exceed the safe working load as follows-

(a) if the safe working load is less than 20 tonnes, the proof load shall exceed the safe working load by at least 25 per cent;

(b) if the safe working load is 20 tonnes or more but not more than 50 tonnes, the proof load shall exceed the safe working load by at least 5 tonnes;

(c) if the safe working load is more than 50 tonnes, the proof load shall exceed the safe working load by at least 10 per cent.

(2) The proof load shall be hoisted and then swung as far as is practicable first in one direction and then in the other.

(3) Where a crane with a jib which has a variable vertical operating radius is to be tested, the test shall be carried out by applying a proof load in accordance with sub-paragraph (1) at both the maximum radius and the minimum radius of the jib.

(4) Where in testing a hydraulic crane or hoist it is, because of the limitation of pressure, impossible to hoist a load which exceeds the safe working load by 25 per cent, it is sufficient compliance with this paragraph if the crane has the greatest possible load applied to it.

3. Every item of lifting gear (whether an accessory to any lifting appliance or not) shall be tested with a proof load in accordance with the following provisions-

(a) if the item is a chain, ring, hook, shackle, or swivel, the proof load shall be at least twice the safe working load;

(b) if the item is a single sheave pulley block or if a shackle is attached thereto, the proof load shall be at least 4 times the safe working load;

(c) if the item is a multiple sheave pulley block with a safe working load of not more than 20 tonnes, the proof load shall be at least twice the safe working load;

(d) if the item is a multiple sheave pulley block with a safe working load of more than 20 tonnes but not more than 40 tonnes, the proof load shall exceed the safe working load by at least 20 tonnes;

(e) if the item is a multiple sheave pulley block with a safe working load of more than 40 tonnes, the proof load shall be at least 1 1/2 times the safe working load.

4. After being tested in accordance with paragraph 1, 2 or 3, each lifting appliance (including its accessories) and all lifting gear shall be examined so as to ensure that no part of the lifting appliance or lifting gear has been damaged during the test. For the purpose of carrying out the examinations of a pulley block the sheaves and pins of the block shall be removed.

5. Where any wire rope is tested, a sample of the rope shall be tested to destruction, and the safe working load shall not exceed 20 per cent of the breaking load of the sample tested.

Appendix 2

Schedule 3 of Shipping and Port Control (Works) Regulations

SCHEDULE 3 [regs.2 & 54A]

DISCIPLINES OF REGISTERED PROFESSIONAL ENGINEERS FOR COMPETENT EXAMINER

1. Marine and Naval Architecture.
2. Mechanical

Appendix 3

Forms Specified by Director of Marine

Under the Shipping and Port Control (Works) Regulations and
the Merchant Shipping (Local Vessels) Ordinance for the purposes
of the Merchant Shipping (Local Vessels) (Works) Regulation

a) Form 1 - Register of Lifting Appliances and Lifting Gear

b) Form 2 - Certificate of Test and Examination of Winches, Derricks and Their Accessory Gear

c) Form 3 - Certificate of Test and Examination of Lifting Appliances and Their Accessory Gear other than Derricks

d) Form 4 - Certificate of Test and Examination of Pulley Blocks

e) Form 5 - Certificate of Test and Examination of Lifting Gear

f) Form 6 - Certificate of Test and Examination of Wire Rope

HONG KONG

香 港

HKSAR Emblem

表格一
FORM 1

香港特別行政區政府海事處

MARINE DEPARTMENT
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

船舶及港口管制(工程)規例
商船(本地船隻)(工程)規例

SHIPPING AND PORT CONTROL (WORKS) REGULATIONS

MERCHANT SHIPPING (LOCAL VESSELS) (WORKS) REGULATION

海事處處長指明的表格

起重裝置及起重工具登記冊

(船舶貨物處理機械及工具登記冊)

Form specified by the Director of Marine for

REGISTER OF LIFTING APPLIANCES AND LIFTING GEAR

(Register of Ship's Cargo Handling Machinery and Gear)

本表格的編訂是根據國際勞工組織認可的測試及檢驗船上裝卸貨物的起重機械及工具標準國際證明書格式
This Register is based on the standard international form of register approved by the International Labour Organisation for the test and examination of lifting machinery and gear used in the loading and unloading of ships.

船名
Name of Vessel _____

擁有權證明書號碼、牌照號碼或船舶登記號碼
Certificate of Ownership Number, Licence Number or Official Number _____

船籍港 **Port of Registry** _____

船隻擁有人/ 船東的名稱
Name of Owner _____

_____

_____

地址 **Address** _____

_____

_____

_____

第一部份 人字吊臂及人字吊臂、桅杆及甲板的固定配件(包括制動鏈)的週年徹底檢驗及每四年一次的徹底檢驗

PART 1 ANNUAL AND QUADRENNIAL THOROUGH EXAMINATION OF DERRICK AND PERMANENT ATTACHMENTS (INCLUDING BRIDLE CHAINS) TO THE DERRICKS, MAST AND DECKS.

倘若全部人字吊臂及上述的工具是於同日進行徹底檢驗，可在第(1)欄內寫上「全部人字吊臂及上述的工具」。否則須清楚說明在所述日期曾被徹底檢驗的各部件。第(3)欄應清楚說明在每四年一次的徹底檢驗中曾拆下檢驗的部件。

If all the derricks and above-named gear are thoroughly examined on the same date, it will be sufficient to enter in column (1) "All derricks and above-named gear". If not, the parts which have been thoroughly examined on the dates stated must be clearly indicated. Column (3) should show clearly the parts being dismantled at the quadrennial thorough examination.

接受檢驗的人字吊臂及固定配件的位置及說明，及其可資識別的號碼或記號(如有)　(須提供足夠資料以識別該人字吊臂，例如：船艙編號，吊桿長度，索具布置資料等) Situation and description of derrick and permanent attachments examined, with distinguishing number or mark (if any) (Sufficient particulars must be given to identify the derrick - e.g. the number of the hold, length of the derrick boom, rigging particulars, etc.) **(1)**	**測試及檢驗證明書編號** Number of Certificate of Test and Examination **(2)**	**現證明第(1)欄內所示的人字吊臂及固定配件曾於本人附加簽署的日期由本人進行徹底檢驗，並無發現任何足以影響其安全工作情況的缺點，而其他發現的缺點已列於第(3)欄。** I certify that on the date to which I have appended my signature the derrick and permanent attachments shown in column (1) was thoroughly examined by me and no defects affecting its safe working condition were found and other defects found are shown in column (3). **合資格檢驗員的簽署/印章、姓名、資格和聯絡電話及日期** Signature/chop, name, qualification and contact telephone number of competent examiner and date	**備註(用縮寫簽署及註明日期)** Remarks (To be initialled and dated) **(3)**
		(簽署/印章 Signature/chop) **姓名**Name : ..... **資格** Qualification : ..... **聯絡電話** Contact Telephone No.: ..... **日期** Date :	
		(簽署/印章 Signature/chop) **姓名**Name : ..... **資格** Qualification : ..... **聯絡電話** Contact Telephone No.: ..... **日期** Date :	
		(簽署/印章 Signature/chop) **姓名**Name : ..... **資格** Qualification : ..... **聯絡電話** Contact Telephone No.: ..... **日期** Date :	

第二部份
PART 2

起重裝置及其附件工具(人字吊臂及其固定配件除外)的週年徹底檢驗及每四年一次的徹底檢驗
ANNUAL AND QUADRENNIAL THOROUGH EXAMINATION OF LIFTING APPLIANCES AND ACCESSORY GEAR OTHER THAN DERRICKS AND PERMANENT ATTACHMENTS THERETO

倘若全部起重裝置及其附件工具是於同日進行徹底檢驗，可在第(1)欄內寫上「全部起重裝置及其上述工具」。否則須清楚說明在所述日期曾被徹底檢驗的各部件。第(3)欄應清楚說明在每四年一次的徹底檢驗中曾拆下檢驗的部件。

If all the lifting appliances and above-named gear are thoroughly examined on the same date, it will be sufficient to enter in column (1) "All lifting appliances and above-named gear". If not, the parts which have been thoroughly examined on the dates stated must be clearly indicated. Column (3) should show clearly the parts being dismantled at the quadrennial thorough examination.

接受檢驗的起重裝置及其附件工具的位置及說明，及其可資識別的號碼或記號(如有)　(須提供足夠資料以識別該起重裝置，例如：船艙編號、起重機型號及識別編號、吊臂長度，索具布置資料等) Situation and description of lifting appliances and accessory gear examined, with distinguishing number or mark (if any) (Sufficient particulars must be given to identify the lifting appliance - e.g. the number of the hold, model number and identification number of the crane, length of the jib, rigging particulars, etc.) **(1)**	**測試及檢驗證明書編號** Number of Certificate of Test and Examination **(2)**	**現證明第(1)欄內所示的起重裝置及其附件工具曾於本人附加簽署的日期由本人進行徹底檢驗，並無發現任何足以影響其安全工作情況的缺點，而其他發現的缺點已列於第(3)欄。** I certify that on the date to which I have appended my signature the lifting appliances and accessory gear shown in column (1) was thoroughly examined by me and no defects affecting its safe working condition were found and other defects found are shown in column (3). **合資格檢驗員的簽署/印章、姓名、資格和聯絡電話及日期** Signature/chop, name, qualification and contact telephone number of competent examiner and date	**備註(用縮寫簽署及註明日期)** Remarks (To be initialled and dated) **(3)**
		(簽署/印章 Signature/chop**) 姓名**Name : …… **資格** Qualification : …… **聯絡電話** Contact Telephone No.: …… **日期** Date : ……	
		(簽署/印章 Signature/chop**) 姓名**Name : …… **資格** Qualification : …… **聯絡電話** Contact Telephone No.: …… **日期** Date : ……	
		(簽署/印章 Signature/chop**) 姓名**Name : …… **資格** Qualification : …… **聯絡電話** Contact Telephone No.: …… **日期** Date : ……	

第三部份 起重工具的週年徹底檢驗

PART 3 ANNUAL THOROUGH EXAMINATION OF LIFTING GEAR

所有鏈條(附於人字吊臂或桅杆上的制動鏈除外)及所有環、鉤、鉤環或轉環及滑輪組，均須每12個月由合資格檢驗員徹底檢驗至少一次。

All chains, other than bridle chains attached to derricks or masts, and all rings, hooks, shackles, swivels and pulley blocks shall be thoroughly examined by a competent examiner once at least in every 12 months.

接受檢驗的起重工具的位置及說明，及其可資識別的號碼或記號 Situation and description of lifting gear examined, with distinguishing number or mark (1)	**測試及檢驗證明書編號** Number of Certificate of Test and Examination (2)	**現證明第(1)欄內所示的起重工具曾於本人附加簽署的日期由本人進行徹底檢驗，並無發現任何足以影響其安全工作情況的缺點，而其他發現的缺點已列於第(3)欄。** I certify that on the date to which I have appended my signature the gear shown in column (1) was thoroughly examined by me and no defects affecting its safe working condition were found and other defects found are shown in column (3). **合資格檢驗員的簽署/印章、姓名、資格和聯絡電話及日期** Signature/chop, name, qualification and contact telephone number of competent examiner and date	**備註(用縮寫簽署及註明日期)** Remarks (To be initialled and dated) (3)
		(簽署/印章Signature/chop) 姓名Name : …… 資格 Qualification : …… 聯絡電話Contact Telephone No.: …… 日期 Date : ……	
		(簽署/印章Signature/chop) 姓名Name : …… 資格 Qualification : …… 聯絡電話Contact Telephone No.: …… 日期 Date : ……	
		(簽署/印章Signature/chop) 姓名Name : …… 資格 Qualification : …… 聯絡電話Contact Telephone No.: …… 日期 Date : ……	

起重工具的週期檢查
PERIODIC INSPECTIONS OF LIFTING GEAR

所有鏈條(附於人字吊臂或桅杆上的制動鏈除外)及所有環、鉤、鉤環或轉環及滑輪組，均須於緊接其每次使用之前由合資格的人檢查，但如已於前3個月內接受檢查，則屬例外。

All chains, other than bridle chains attached to derricks or masts, and all rings, hooks, shackles, swivels and pulley blocks shall be inspected by a competent person immediately before each occasion on which they are used, unless they have been inspected within the preceding 3 months.

現證明第(1)欄內所示的起重工具曾於本人附加簽署的日期由本人進行檢查，
並無發現任何足以影響其安全工作情況的缺點，而其他發現的缺點已列於第(4)欄。

I certify that on the date to which I have appended my signature the gear shown in column (1) was inspected by me and no defects affecting its safe working condition were found and other defects found are shown in column (4).

合資格的人的簽署、姓名及日期 Signature and name of competent person and date			**備註(用縮寫簽署及註明日期)** Remarks (To be initialled and dated) (4)
(簽署 Signature) **姓名** Name : ..... **日期** Date :	(簽署 Signature) **姓名** Name : ..... **日期** Date :	(簽署Signature) **姓名** Name : ..... **日期** Date :	
(簽署 Signature) **姓名** Name : ..... **日期** Date :	(簽署 Signature) **姓名** Name : ..... **日期** Date :	(簽署 Signature) **姓名**Name : ..... **日期**Date :	
(簽署 Signature) **姓名** Name : ..... **日期** Date :	(簽署 Signature) **姓名** Name : ..... **日期** Date :	(簽署 Signature) **姓名** Name : ..... **日期** Date :	

第四部份 鋼絲纜索的週期檢查

PART 4 PERIODIC INSPECTIONS OF WIRE ROPES

所有一般作升降之用的鋼絲纜索，須每3個月由合資格的人檢查至少一次，但在上述纜索有任何鋼絲斷裂後，則須每一個月檢查至少一次。

Every wire rope in general use for hoisting or lowering shall be inspected by a competent person once at least in every 3 months, except that after any wire has broken in such rope it shall be inspected once at least in every month.

接受檢查的鋼絲纜索的尺碼及說明，及其可資識別的號碼或記號(如有) Size and description of wire ropes inspected, with distinguishing number or mark (if any) (1)	**測試及檢驗證明書編號** Number of Certificate of Test and Examination (2)	**現證明第(1)欄內所示的鋼絲纜索曾於本人附加簽署的日期由本人進行檢查，並無發現任何足以影響其安全工作情況的缺點，而其他發現的缺點已列於第(3)欄。** I certify that on the date to which I have appended my signature the wire ropes shown in column (1) was inspected by me and no defects affecting its safe working condition were found and other defects found are shown in column (3).	
		合資格的人的簽署、姓名及日期 Signature and name of competent person and date	**備註(用縮寫簽署及註明日期)** Remarks (To be initialled and dated) (3)
		(簽署 Signature) 姓名 Name : ..... 日期 Date :	
		(簽署 Signature) 姓名 Name : ..... 日期 Date :	
		(簽署 Signature) 姓名 Name : ..... 日期 Date :	

測試證明書編號 Test Certificate No. ……..

表格二
FORM 2

HKSAR Emblem

香港特別行政區政府海事處
MARINE DEPARTMENT
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

船舶及港口管制(工程)規例
商船(本地船隻)(工程)規例
SHIPPING AND PORT CONTROL (WORKS) REGULATIONS
MERCHANT SHIPPING (LOCAL VESSELS) (WORKS) REGULATION

海事處處長指明的表格

絞車、人字吊臂及其附件工具的測試及檢驗證明書

Form specified by the Director of Marine for

CERTIFICATE OF TEST AND EXAMINATION OF WINCHES, DERRICKS AND THEIR ACCESSORY GEAR

船名 Name of vessel: ……

擁有權證明書號碼/牌照號碼/船舶登記號碼
Certificate of Ownership No./ Licence No./ Official No.: ……..…. …. …..

起重裝置擁有人的名稱 Name of owner of the lifting appliance: ……. ……

起重裝置製造日期 Date of manufacture of the lifting appliance: ……

起重裝置及附件工具的位置及說明，及其可資識別的號碼或記號(如有)(須提供足夠資料以識別該起重裝置，例如：船艙編號，吊桿長度，索具布置資料等) Situation and description of lifting appliance and accessory gear, with distinguishing number or mark (if any) (Sufficient particulars must be given to identify the lifting appliance - e.g. the number of the hold, length of the derrick boom, rigging particulars, etc.) (1)	**試驗時，吊桿與水平線的角度** Angle to the horizontal of derrick boom while the load was applied (2)	**施加的驗證負荷(以公噸為單位)** Proof load applied (tonnes) (3)	**在第(2)欄所示的角度時的安全操作負荷(以公噸為單位)** Safe working load at the angle shown in column (2). (tonnes) (4)

(5) **已進行的特殊功能測試** (例如：防障控制、用以載人的慢速和緊急停止)： …… …… … ……

Special functional tests done (e.g. failsafe control, slow speed and emergency stop for carrying persons)：…… … ……

本人(合資格檢驗員姓名) ……，**現證明本人曾於二○ 年 月 日 依照《船舶及港口管制(工程)規例》/《商船(本地船隻)(工程)規例》附表一的規定，在該船隻上測試及檢驗本證明書所指的裝置及其附件工具，該起重裝置及其附件工具曾承受驗證負荷而並無損壞及永久變形，且上述各項均屬確實無訛。**

I (name of competent examiner) ……. ……. , hereby certify that on …… 20 …… the appliance together with the accessory gear described in this certificate was tested and examined by me on the vessel in

accordance with the Schedule 1 of Shipping and Port Control (Works) Regulations / Merchant Shipping (Local Vessels) (Works) Regulation, that it had withstood the proof load without injury or permanent deformation, and that the above particulars are correct.

合資格檢驗員簽署/印章 …… **簽發日期** ……. ….…
Signature/chop of Competent Examiner Date of Certificate

資格 Qualification : …… ……

通訊地址 Corresponding Address: ……
……

電話號碼 Tel.No. : ……

傳真號碼 Fax.No. : ……

本表格的編訂是根據國際勞工組織認可的測試及檢驗船上裝卸貨物的起重機械及工具標準國際證明書格式

This form is based on the standard international form of certificate approved by the International Labour Organization for the test and examination of lifting machinery and gear used in the loading and unloading of ships.

附註

甲. 在驗證前，合資格檢驗員須對該起重裝置及起重工具的設計、構造、強度、布置和安全系數滿意，及對在測試及檢驗證明書上說明的安全操作負荷，認為合適及滿意。合資格檢驗員應遵從相關的工作守則，如《本地船隻上的人字吊臂起重機強度計算、測試及檢驗工作守則》提供的指引。

乙. 船舶及港口管制(工程)規例、及商船(本地船隻)(工程)規例訂明，絞車連同其附件的測試與檢驗程序如下：

1. (1) 每一絞車連同其附件(包括任何人字吊臂、鵝頸形管、環端板、有眼螺栓或其他配件)均須以超逾安全操作負荷的驗證負荷進行測試，超逾之量如下 -

(a) 如安全操作負荷低於20公噸，則驗證負荷須超逾安全操作負荷最少百分之二十五；

(b) 如安全操作負荷為20公噸或以上但不高於50公噸，則驗證負荷須超逾安全操作負荷最少5 公噸；

(c) 如安全操作負荷高於50公噸，則驗證負荷須超逾安全操作負荷最少百分之十。

(2) 驗證負荷須以下列任何方式施加 -

(a) 升起可移動的定量重物；或

(b) 使用彈簧或液壓水平秤或類似裝置，

按測試證明書內指明的人字吊臂與水平線之間的角度施加。

(3) 如屬第(2)(a)節施加的驗證負荷，則在可移動的定量重物升起後，人字吊臂須在切實可行範圍內盡可能先向一個方向擺動，再反向擺動；如屬第(2)(b)節施加的驗證負荷，在施加的驗證負荷時人字吊臂須在切實可行範圍內盡可能先向一個方向擺動，再反向擺動。

2. 測試後，每部起重裝置(包括其附件)及所有起重工具均須予以檢驗，以確保並無起重裝置或起重工具的任何部份在測試中受損害。為對滑輪組進行檢驗，滑輪組的輪子及輪栓須予除下。

丙. 試吊驗證負荷時，人字吊臂應以正常索具佈置，及吊桿與水平線的角度不應超逾30度，若不實際可行時，以最低可行角度，惟不應超逾45度驗證。測試時的角度應註明在本表格第(2)欄內。所有驗證負荷應以準確的秤覆檢。

丁. 施行測試時，應在實際可行下儘可能使用可移動的定量重物；在船隻上測試起重裝置時，應常使用可移動的定量重物。若在更換或更新後而並未備有可移動的定量重物，則可使用準確的彈簧或液壓水平秤，而此等測試不應被確定為滿意，除非儀器的負荷指示器顯示有不少於五分鐘的穩定負荷時段。

戊. 第(4)欄的安全操作負荷適用於搖擺的人字吊臂或人字吊臂起重機。當使用固定的人字吊臂時，例如"雙桿連吊法"，重要的是，應以人字吊臂的實際使用情況及索具布置方式去確定安全操作負荷。當測試時，所有在正常時操作的動作應以慢速進行。

己. 若然是重型人字吊臂，應小心布置圍帶及牽索。

庚. "公噸"意指一"公噸"是一千千克。

Notes

A. The competent examiner should satisfy himself prior to proof testing that the design, construction, strength and arrangement of the lifting appliances and lifting gear are adequate with a good factor of safety for the appropriate safe working load as shown in the certificate of test and examination. The competent examiner should observe the guidance provided in the relevant codes of practice, such as the Code of Practice for Strength Calculations, Test and Examination of Derrick Cranes on Local Vessels.

B. Shipping and Port Control (Works) Regulations and Merchant Shipping (Local Vessels) (Works) Regulation state that the procedure for testing and examining winches together with their accessory gear is as follows:

1. (1) Every winch, together with its accessories (including any derrick, gooseneck, eye-plate, eyebolt, or other attachments) shall be tested with a proof load which shall exceed the safe working load as follows-
   (a) if the safe working load is less than 20 tonnes, the proof load shall exceed the safe working load by at least 25 per cent;
   (b) if the safe working load is 20 tonnes or more but not more than 50 tonnes, the proof load shall exceed the safe working load by at least 5 tonnes;
   (c) if the safe working load is more than 50 tonnes, the proof load shall exceed the safe working load by at least 10 per cent.
   (2) The proof load shall be applied either-
   (a) by hoisting movable weights; or
   (b) by means of a spring or hydraulic balance or a similar appliance,
   with the derrick at an angle to the horizontal which shall be specified in the certificate of the test.
   (3) In the case of sub-paragraph (2)(a), after the movable weights have been hoisted, the derrick shall be swung as far as practicable first in one direction and then in the other and in the case of sub-paragraph (2)(b) the proof load shall be applied with the derrick swung as far as practicable first in one direction and then in the other.
2. After being tested, each lifting appliance (including its accessories) and all lifting gear shall be examined so as to ensure that no part of the lifting appliance or lifting gear has been damaged during the test. For the purpose of carrying out the examinations of a pulley block the sheaves and pins of the block shall be removed.

C. The proof load should be lifted with normal tackle with a derrick at an angle which should not be more than 30 degrees to the horizontal, or, when this is impracticable, at the lowest practicable angle but not exceeding 45 degrees. The angle at which the test was made should be inserted in column 2. All proof loads should be verified by an accurate weighing device.

D. In carrying out tests, movable weights should be used whenever practicable; they should always be used in the testing of lifting appliances aboard vessels. In the case of testing replacement or renewals where movable weights may not be available, an accurate spring or hydraulic balance may be used, in which case the test should not be regarded as satisfactory unless the indicator of the instrument remains constant under loads for a period of at least 5 minutes.

E. The safe working load in column 4 is applicable to a swinging derrick or derrick cranes. When using fixed derricks, such as 'Union Purchase' it is important that the safe working load should be determined with due regard to the actual conditions of use and the manner of rigging the derricks. All the motions which occur in normal operation should be carried out at a slow speed during the test.

F. In the case of heavy derricks, care should be taken that the appropriate shrouds and stays are rigged.

G. The expression 'tonne' means a 'tonne' of 1000 kilograms.

測試證明書編號 Test Certificate No. ……..

表格三
FORM 3

HKSAR Emblem

香港特別行政區政府海事處
MARINE DEPARTMENT
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

船舶及港口管制(工程)規例
商船(本地船隻)(工程)規例
SHIPPING AND PORT CONTROL (WORKS) REGULATIONS
MERCHANT SHIPPING (LOCAL VESSELS) (WORKS) REGULATION

海事處處長指明的表格

起重裝置及其附件工具(人字吊臂除外)的測試及檢驗證明書

Form specified by the Director of Marine for

CERTIFICATE OF TEST AND EXAMINATION OF LIFTING APPLIANCES AND THEIR ACCESSORY GEAR OTHER THAN DERRICKS

船名 Name of vessel: ……

擁有權證明書號碼/牌照號碼/船舶登記號碼
Certificate of Ownership No./
Licence No./Official No.: ……. ……

起重裝置擁有人的名稱 Name of owner of the lifting appliance: …. ……. ……

起重裝置製造日期 Date of manufacture of the lifting appliance: ….……

起重裝置及附件工具的位置及說明，及其可資識別的號碼或記號(如有) (須提供足夠資料以識別該起重裝置，例如：船艙編號，起重機型號及識別編號，吊臂長度，索具資料等) Situation and description of lifting appliance and accessory gear, with distinguishing number or mark (if any) (Sufficient particulars must be given to identify the lifting appliance - e.g. the number of the hold, model number and identification number of the crane, length of the jib, rigging particulars, etc.) (1)	**如為吊臂起重機，施加驗證負荷時的半徑(以米為單位)** For jib cranes, radius at which the proof load was applied (metres) (2)	**施加的驗證負荷(以公噸為單位)** Proof load applied (tonnes) (3)	**安全操作負荷(如為吊臂起重機，在第(2)欄所示的半徑時)(以公噸為單位)** Safe working load (for jib cranes at radius shown in column (2)). (tonnes) (4)

(5) **已進行的特殊功能測試** (例如：防障控制、用以載人的慢速和緊急停止)： ……. . . ……

Special functional tests done (e.g. failsafe control, slow speed and emergency stop for carrying persons) : ……..… ……..

本人(合資格檢驗員姓名) ……, **現證明本人曾於二○ 年 月 日 依照《船舶及港口管制(工程)規例》/《商船(本地船隻)(工程)規例》附表一的規定，在該船隻上測試及檢驗本證明書所指的起重裝置及其附件工具，該起重裝置及其附件工具曾承受驗證負荷而並無損壞及永久變形，且上述各項均屬確實無訛。**

I (name of competent examiner) ……. ……, hereby certify that on …… 20 …… the lifting appliance together with the accessory gear described in this certificate was tested and examined by me on the

vessel in accordance with the Schedule 1 of Shipping and Port Control (Works) Regulations / Merchant Shipping (Local Vessels) (Works) Regulation, that it had withstood the proof load without injury or permanent deformation, and that the above particulars are correct.

合資格檢驗員簽署/印章 …… **簽發日期** ……. ….…
Signature/chop of Competent Examiner Date of Certificate

資格 Qualification : …… ……

通訊地址Corresponding Address: ……

……

電話號碼 Tel.No. : ……

傳真號碼 Fax.No. : ……

本表格的編訂是根據國際勞工組織認可的測試及檢驗船上裝卸貨物的起重機械及工具標準國際證明書格式

This form is based on the standard international form of certificate approved by the International Labour Organization for the test and examination of lifting machinery and gear used in the loading and unloading of ships.

附註

甲. 在驗證前，合資格檢驗員須對該起重裝置及起重工具的設計、構造、強度、布置和安全系數滿意，及對在測試及檢驗證明書上說明的安全操作負荷，認為合適及滿意。

乙. 船舶及港口管制(工程)規例、及商船(本地船隻)(工程)規例訂明，起重裝置的測試與檢驗程序如下：

1. (1) 每部起重機及每部其他的起重裝置連同其附件(人字吊臂起重裝置除外)，均須以超逾安全操作負荷的驗證負荷進行測試，超逾之量如下 -

(a) 如安全操作負荷低於20公噸，則驗證負荷須超逾安全操作負荷最少百分之二十五；

(b) 如安全操作負荷為20公噸或以上但不高於50公噸，則驗證負荷須超逾安全操作負荷最少5 公噸；

(c) 如安全操作負荷高於50公噸，則驗證負荷須超逾安全操作負荷最少百分之十。

(2) 驗證負荷須先被升起，然後在切實可行範圍內盡可能先向一個方向擺動，再反向擺動。

(3) 如要測試具有可變垂直操作半徑的吊臂的起重機，則須按照第(1)節的規定，在吊臂處於最大及最小操作半徑的位置時施加驗證負荷以進行測試。

(4) 測試液壓起重機或吊重機時，凡因壓力限制而不可能升起超逾安全操作負荷百分之二十五的負荷物，則如已對起重機施加最大的負荷，即為已符合本段的規定。

2. 測試後，每部起重裝置(包括其附件)及所有起重工具均須予以檢驗，以確保並無起重裝置或起重工具的任何部份在測試中受損害。為對滑輪組進行檢驗，滑輪組的輪子及輪栓須予除下。

丙. 所有驗證負荷應以準確的秤覆檢。當以超逾安全操作負荷的驗證負荷進行測試時，所有在正常時操作的動作應以慢速進行。

丁. 起重機亦應以適當的安全操作負荷進行測試。測試時，所有在正常時操作的動作應以正常速度進行。

戊. "公噸"意指一"公噸"是一千千克。

Notes

A. The competent examiner should satisfy himself prior to proof testing that the design, construction, strength and arrangement of the lifting appliances and lifting gear are adequate with a good factor of safety for the appropriate safe working load as shown in the certificate of test and examination.

B. Shipping and Port Control (Works) Regulations and Merchant Shipping (Local Vessels) (Works) Regulation state that the procedure for testing and examining lifting appliances is as follows:

1. (1) Every crane and every other lifting appliance, together with its accessories (other than a derrick) shall be tested with a proof load which shall exceed the safe working load as follows -

(a) if the safe working load is less than 20 tonnes, the proof load shall exceed the safe working load by at least 25 per cent;

(b) if the safe working load is 20 tonnes or more but not more than 50 tonnes, the proof load shall exceed the safe working load by at least 5 tonnes;

(c) if the safe working load is more than 50 tonnes, the proof load shall exceed the safe working load by at least 10 per cent.

(2) The proof load shall be hoisted and then swung as far as is practicable first in one direction and then in the other.

(3) Where a crane with a jib which has a variable vertical operating radius is to be tested, the test shall be carried out by applying a proof load in accordance with sub-paragraph (1) at both the maximum radius and the minimum radius of the jib.

(4) Where in testing a hydraulic crane or hoist it is, because of the limitation of pressure, impossible to hoist a load which exceeds the safe working load by 25 per cent, it is sufficient compliance with this paragraph if the crane has the greatest possible load applied to it.

2. After being tested, each lifting appliance (including its accessories) and all lifting gear shall be examined so as to ensure that no part of the lifting appliance or lifting gear has been damaged during the test. For the purpose of carrying out the examinations of a pulley block the sheaves and pins of the block shall be removed.

C. All proof loads should be verified by an accurate weighing device. All the motions which occur in normal operation should be carried out at a slow speed during the test with a proof load which exceeds the safe working load.

D. Cranes should also be tested with the appropriate safe working load and all motions which occur in normal operation should be carried out at normal speed during the test.

E. The expression 'tonne' means a 'tonne' of 1000 kilograms.

測試證明書編號 Test Certificate No.: …….. …

表格四
FORM 4

HKSAR Emblem

香港特別行政區政府海事處
MARINE DEPARTMENT
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

船舶及港口管制(工程)規例
商船(本地船隻)(工程)規例
SHIPPING AND PORT CONTROL (WORKS) REGULATIONS
MERCHANT SHIPPING (LOCAL VESSELS) (WORKS) REGULATION

海事處處長指明的表格
滑輪組的測試及檢驗證明書

Form specified by the Director of Marine for
CERTIFICATE OF TEST AND EXAMINATION OF PULLEY BLOCKS

船名 Name of vessel: ……

擁有權證明書號碼/牌照號碼/船舶登記號碼
Certificate of Ownership No./
Licence No./Official No. : …. ……

滑輪組擁有人的名稱 Name of owner of the pulley block: .. ……

滑輪組的製造商或供應商的名稱及地址：..... ….....
Name and address of the maker or supplier ..... ….....

可資識別的號碼或記號 Distinguishing number or mark	**滑輪組的說明** Description of pulley block			**測試及檢驗日期** Date of test and examination	**施加的驗證負荷(以公噸為單位)** Proof load applied (tonnes)	**安全操作負荷(以公噸為單位)** Safe working load (tonnes)
	輪子的外直徑(以毫米為單位) Outside diameter of sheave (millimetres)	**說明軸栓及接頭配件是否用軟或高拉力鋼製造** State whether the axle pin and head fitting are of mild or high tensile steel	**接受測試及檢驗的數目** Number tested and examined			
(1)	(2)	(3)	(4)	(5)	(6)	(7)

本人(合資格檢驗員姓名) ……. ……, **現證明本人曾於二○ 年 月 日 依照《船舶及港口管制(工程)規例》/《商船(本地船隻)(工程)規例》附表一的規定，測試及檢驗本證明書所指的滑輪組，該滑輪組承受驗證負荷後被拆除檢驗，確定曾承受驗證負荷而並無變形，無裂縫、裂痕或其他毛病，且上述各項均屬確實無訛。**

I (name of competent examiner) …….. …… ….hereby certify that on …… 20 …… the pulley blocks described in this certificate were tested and examined by me in accordance with the Schedule 1 of Shipping

and Port Control (Works) Regulations / Merchant Shipping (Local Vessels) (Works) Regulation, that the sheaves and pins of the pulley blocks were removed after the application of the proof load and all parts then examined and found to have withstood the proof load without deformation and to be free from cracks, flaws or other defects, and that the above particulars are correct.

合資格檢驗員簽署/印章 …… **簽發日期** ……. …..…
Signature/chop of Competent Examiner Date of Certificate

資格 Qualification : …. ……

通訊地址Corresponding Address: ……
……

電話號碼 Tel.No. : ……

傳真號碼 Fax.No. : ……

本表格的編訂是根據國際勞工組織認可的測試及檢驗船上裝卸貨物的起重機械及工具標準國際證明書格式

This form is based on the standard international form of certificate approved by the International Labour Organization for the test and examination of lifting machinery and gear used in the loading and unloading of ships.

附註

甲. 船舶及港口管制(工程)規例、及商船(本地船隻)(工程)規例訂明，滑輪組的測試與檢驗程序如下：

1. 每一起重工具(不論是否任何起重裝置的附件)，均須按照下述條文以驗證負荷進行測試 -

(a) 如該起重工具為單輪滑輪組，或如有一個 碌附加其上，則驗證負荷最少須為安全操作負荷的4倍；

(b) 如該起重工具為複輪滑輪組，而其安全操作負荷不高於20公噸，則驗證負荷最少須為安全操作負荷的兩倍；

(c) 如該起重工具為複輪滑輪組，而其安全操作負荷高於20公噸但不高於40公噸，則驗證負荷須超逾安全操作負荷最少20公噸。

(d) 如該起重工具為複輪滑輪組，而其安全操作負荷高於40公噸，則驗證負荷最少須為安全操作負荷的1-1/2倍。

2. 測試後，所有起重工具均須予以檢驗，以確保並無起重工具的任何部份在測試中受損害。為對滑輪組進行檢驗，滑輪組的輪子及輪栓須予除下。

乙. "公噸"意指一"公噸"是一千千克。

丙. 此表格不應被用作鏈條、環、 u 碌或轉環的測試及檢驗證明書，應該使用表格五。

Notes

A. Shipping and Port Control (Works) Regulations and Merchant Shipping (Local Vessels) (Works) Regulation state that the procedure for testing and examining pulley blocks is as follows:

1. Every item of lifting gear, (whether an accessory to any lifting appliance or not) shall be tested with a proof load in accordance with the following provisions -
   (a) if the item is a single sheave pulley block or if a shackle is attached thereto, the proof load shall be at least 4 times the safe working load;
   (b) if the item is a multiple sheave pulley block with a safe working load of not more than 20 tonnes, the proof load shall be at least twice the safe working load;
   (c) if the item is a multiple sheave pulley block with a safe working load of more than 20 tonnes but not more than 40 tonnes, the proof load shall exceed the safe working load by at least 20 tonnes;
   (d) if the item is a multiple sheave pulley block with a safe working load of more than 40 tonnes, the proof load shall be at least 1-1/2 times the safe working load.

2. After being tested, all lifting gear shall be examined so as to ensure that no part of the lifting gear has been damaged during the test. For the purpose of carrying out the examinations of a pulley block the sheaves and pins of the block shall be removed.

B. The expression 'tonne' means a 'tonne' of 1000 kilograms.

C. This form should NOT be used as a certificate of test and examination of chains, rings, hooks, shackles or swivels. Form 5 should be used.

測試證明書編號 Test Certificate No.: ……..

表格五
FORM 5

HKSAR Emblem

香港特別行政區政府海事處
MARINE DEPARTMENT
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

船舶及港口管制(工程)規例
商船(本地船隻)(工程)規例
SHIPPING AND PORT CONTROL (WORKS) REGULATIONS
MERCHANT SHIPPING (LOCAL VESSELS) (WORKS) REGULATION

海事處處長指明的表格
起重工具的測試及檢驗證明書

鏈條、鏈式吊索、纜吊索(纖維纜吊索除外)或類似的工具、
環 、 鏈 環 、 u 、 板 、 夾 鉗 、 u 環 、

Form specified by the Director of Marine for
CERTIFICATE OF TEST AND EXAMINATION OF LIFTING GEAR

CHAINS, CHAIN SLINGS, ROPE SLINGS (except a fibre rope sling) OR SIMILAR GEAR
RINGS, LINKS, HOOKS, PLATES, CLAMPS, SHACKLES, SWIVELS, EYE-BOLTS, GRABS AND CAGES.

擁有權證明書號碼/牌照號碼/船舶登記號碼
Certificate of Ownership No./
Licence No./Official No. : ….. ……. …… ……

船名 Name of vessel: ……

起重工具擁有人的名稱 Name of owner of the lifting gear: ……. … ……

起重工具的製造商、供應商或修理商的名稱及地址：..... …..... …. ……
Name and address of the maker, supplier or repairer ..... …..... ….. …..

可資識別的號碼或記號 Distinguishing number or mark (1)	項目說明 應包括尺碼、材料及任何熱處理的資料 Description of item This should include size, material and particulars of any heat treatment (2)	接受測試及檢驗的數目 Number tested and examined (3)	測試及檢驗日期 Date of test and examination (4)	施加的驗證負荷 (以公噸為單位) Proof load applied (tonnes) (5)	安全操作負荷 (以公噸為單位) Safe working load (tonnes) (6)

本人(合資格檢驗員姓名) ……., 現證明本人曾於二○ 年 月 日 依照《船舶及港口管制(工程)規例》/《商船(本地船隻)(工程)規例》附表一的規定，測試及檢驗本證明書所指的起重工具，該起重工具曾承受驗證負荷而經檢驗後發現並無裂縫、裂痕或其他毛病，且上述各項均屬確實無訛。

I (name of competent examiner) ……. ……..... ….hereby certify that on ….…… 20 ……

the lifting gear described in this certificate were tested and examined by me in accordance with the Schedule 1 of Shipping and Port Control (Works) Regulations / Merchant Shipping (Local Vessels) (Works) Regulation, that after the application of the proof load and the gear then examined and found to have withstood the proof load and to be free from cracks, flaws or other defects, and that the above particulars are correct.

合資格檢驗員簽署/印章 …… **簽發日期** ……. ….…
Signature/chop of Competent Examiner Date of Certificate

資格 Qualification : …… ……

通訊地址Corresponding Address: ……

……

電話號碼 Tel.No. : ……

傳真號碼 Fax.No. : ……

本表格的編訂是根據國際勞工組織認可的測試及檢驗船上裝卸貨物的起重機械及工具標準國際證明書格式

This form is based on the standard international form of certificate approved by the International Labour Organization for the test and examination of lifting machinery and gear used in the loading and unloading of ships.

附註

甲. 船舶及港口管制(工程)規例、及商船(本地船隻)(工程)規例訂明，起重工具的測試與檢驗程序如下：

1. 每一起重工具(不論是否任何起重裝置的附件)，均須按照下述條文以驗證負荷進行測試 -

(a) 如該起重工具為鏈條、環、 u 環或轉環，則驗證負荷最少須為安全操作負荷的兩倍。

2. 測試後，所有起重工具均須予以檢驗，以確保並無起重工具的任何部份在測試中受損害。

乙. 測試抓斗時，凡因設計限制而不可能抓起超逾安全操作負荷百分之二十五的負荷物，如已對抓斗施加最大的負荷，即為已符合要求。

丙. "公噸"意指一"公噸"是一千千克。

丁. 此表格不應被用作滑輪組的測試及檢驗證明書，應該使用表格四。

戊. 此表格不應被用作鋼絲纜索的測試及檢驗證明書，應該使用表格六。

Notes

A . Shipping and Port Control (Works) Regulations and Merchant Shipping (Local Vessels) (Works) Regulation state that the procedure for testing and examining lifting gear is as follows:

1. Every item of lifting gear, (whether an accessory to any lifting appliance or not) shall be tested with a proof load in accordance with the following provisions -
   (a) if the item is a chain, ring, hook, shackle, or swivel, the proof load shall be at least twice the safe working load.
2. After being tested, all lifting gear shall be examined so as to ensure that no part of the lifting gear has been damaged during the test.

B. Where in testing a grab it is, because of the limitation in design, impossible to grab a load which exceeds the safe working load by 25 per cent, it is sufficient compliance with requirements if the grab has the greatest possible load applied to it.

C. The expression 'tonne' means a 'tonne' of 1000 kilograms.

D. This form should NOT be used as a certificate of test and examination of pulley blocks. Form 4 should be used.

E. This form should NOT be used as a certificate of test and examination of wire rope. Form 6 should be used.

測試證明書編號 Test Certificate No.: …… 表格六
FORM 6

HKSAR Emblem

香港特別行政區政府海事處
MARINE DEPARTMENT
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

船舶及港口管制(工程)規例
商船(本地船隻)(工程)規例
SHIPPING AND PORT CONTROL (WORKS) REGULATIONS
MERCHANT SHIPPING (LOCAL VESSELS) (WORKS) REGULATION

海事處處長指明的表格
鋼絲纜索的測試及檢驗證明書

Form specified by the Director of Marine for
CERTIFICATE OF TEST AND EXAMINATION OF WIRE ROPE

船名 Name of vessel: ……

擁有權證明書號碼/牌照號碼/船舶登記號碼
Certificate of Ownership No./
Licence No./Official No.: …..… …… …..…

鋼絲纜索擁有人的名稱 Name of owner of the wire rope: ……. ……..

鋼絲纜索的製造商或供應商的名稱及地址：..... …..... …..... .....
Name and address of the maker or supplier ..... …..... …..... .....

鋼絲纜索的尺碼 (說明直徑或圓周) Size of wire rope (state whether diameter or circumference)	
索股數目 Number of strands	
每股鋼絲數目 Number of wires per strand	
捻索法 Lay	
鋼絲的拉力強度 Tensile strength of wire	
鋼絲纜索樣本的測試日期 Date of test of sample of the wire rope **(如果該鋼絲纜索是由製造商或在香港或外地的實驗所進行測試，請說明進行測試的公司名稱及地址)** (If the wire rope is tested by the manufacturer or a laboratory in Hong Kong or other territory, please state the name and address of the company making the test)	
此樣本斷裂時的負荷 (以公噸為單位) Load at which this sample broke (tonnes)	
安全操作負荷 (以公噸為單位) Safe working load (tonnes) **說明任何限制條件，例如滑輪的最小直徑、直接拉力負荷等** State any qualifying conditions, such as minimum pulley diameter, direct tensile load, etc.	

本人(合資格檢驗員姓名) …… **現證明本證明書所指的鋼絲纜索曾於二○ 年 月 日**

依照《船舶及港口管制(工程)規例》/《商船(本地船隻)(工程)規例》附表一的規定，進行測試及檢驗，且上述各項均屬確實無訛。

I (name of competent examiner) …… hereby certify that on …… 20 …… the wire rope described in this certificate was tested and examined in accordance with the Schedule 1 of Shipping and Port Control (Works) Regulations / Merchant Shipping (Local Vessels) (Works) Regulation, and that the above particulars are correct.

合資格檢驗員簽署/印章 ……
Signature/chop of Competent Examiner

簽發日期 ……
Date of Certificate

資格 Qualification : ……

通訊地址Corresponding Address: ……

……

電話號碼 Tel.No. : ……

傳真號碼 Fax.No. : ……

本表格的編訂是根據國際勞工組織認可的測試及檢驗船上裝卸貨物的起重機械及工具標準國際證明書格式

This form is based on the standard international form of certificate approved by the International Labour Organization for the test and examination of lifting machinery and gear used in the loading and unloading of ships.

附註

甲. 船舶及港口管制(工程)規例、及商船(本地船隻)(工程)規例訂明，鋼絲纜索的測試與檢驗程序如下：

凡測試鋼絲纜索，纜索樣本須測試至其毀壞，而鋼絲纜索的安全操作負荷不得超逾該測試樣本的斷裂負荷的百分之二十。

乙. 如果鋼絲纜索被用作吊索或吊索組合時，其安全操作負荷不能超逾該纜索的最低斷裂負荷的五分之一。

丙. "公噸"意指一"公噸"是一千千克。

Notes

A. Shipping and Port Control (Works) Regulations and Merchant Shipping (Local Vessels) (Works) Regulation state that the procedure for testing and examining wire rope is as follows:

Where any wire rope is tested, a sample of the rope shall be tested to destruction, and the safe working load shall not exceed 20 per cent of the breaking load of the sample tested.

B. In the case of a wire rope used as a sling or in a sling assembly, the safe working load of the rope itself should not exceed one-fifth of the minimum breaking load of the rope.

C. The expression 'tonne' means a 'tonne' of 1000 kilograms

Appendix 4

List of Recognized Classification Societies

a) American Bureau of Shipping

b) Bureau Veritas

c) China Classification Society

d) Det Norske Veritas

e) Germanischer Lloyds

f) Korean Register of Shipping

g) Lloyd's Register of Shipping

h) Nippon Kaiji Kyokai

i) RINA S.p.A

Appendix 5

Guidance Notes on Ascertaining the Safe Working Loads of Existing Derrick Cranes on Local Vessels

(for the derrick cranes that have been installed on local vessels before the [date of commencement of the Shipping and Port Control (Cargo Handling) (Amendment) Regulation])

1. This Guidance Notes provides practical guidance to the local marine industry especially to the competent examiners, on ascertaining the safe working loads of existing derrick cranes on local vessels, to ensure the smooth transition in the change in statutory requirements when the Shipping and Port Control (Cargo Handling) (Amendment) Regulation comes into force.

2. Each existing derrick crane on a local vessel should be tested and examined, and the safe working load for operating the derrick crane should be specified in the current Certificate of Test and Examination.

3. The safe working load of a derrick crane is the maximum load under specified conditions for which a derrick crane may be used. The margin between the safe working load and the ultimate load, under which a structural failure may occur, is a safety margin to allow for the various forces which will act on the derrick crane in operation. These include allowances for dynamic forces set up by normal operational movement of the crane and the load.

4. A derrick crane may be accompanied with strength calculation, rigging diagram and as fitted drawing when it is newly installed or has been substantially modified on the vessel. These are essential information in connection with the operational limitations and the conditions necessary for safe operation. The safe working loads of the derrick cranes are generally assessed in the strength calculations. A competent examiner should check the design and calculations in accordance with an acceptable standard before he can ascertain the safe working load of a derrick crane.

5. However, if the strength calculation, rigging diagram and as fitted drawing of a derrick crane are not available or those essential information are incomplete, the competent examiner must check through the current Certificate of Test and Examination of the derrick crane carefully. The competent examiner should inspect the derrick crane with reference to the current Certificate of Test and Examination and the past two years record of inspection and thorough examination of the crane in the Register of Lifting Appliances and Lifting Gear. The competent examiner may take measurements (such as the length and diameter of the derrick boom, height of the mast, sizes of wire ropes and other accessories) and carry out strength

calculations on the derrick crane, if he considers necessary.

6. When a competent examiner is satisfied with the condition of the derrick crane after the checking/inspection in Paragraph 4 or 5, he should carry out the test and examination to the crane. It is to confirm that the crane is structurally sound and fit for the use for which it is designed, and to ensure that the performance and capacity of the crane are in safe working order. The proof load test is a major criterion for assessing the safe working load of a derrick crane.

7. The competent examiner should test and examine an existing derrick crane in accordance with the procedure set out in Schedule 1 of the Shipping and Port Control (Works) Regulations and with the guidelines relevant to existing derrick cranes set out in the Code of Practice for Strength Calculations, Test and Examination of Derrick Cranes on Local Vessels.

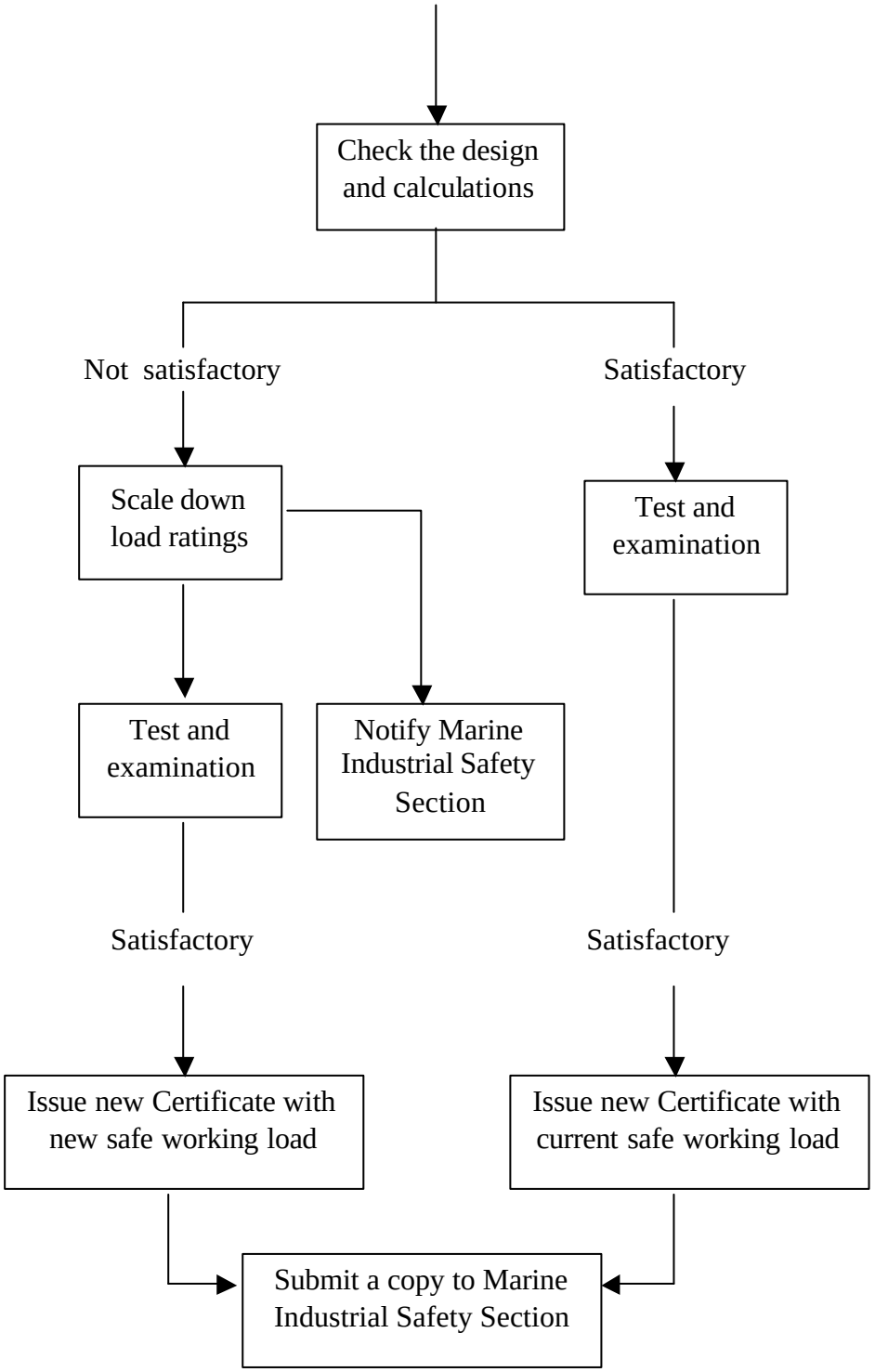
8. If the test and examination of the derrick crane are satisfactorily completed, then the safe working load of the crane is ascertained. The competent examiner can issue a new Certificate of Test and Examination to the owner of the derrick crane and submit a copy to the Marine Industrial Safety Section.

9. If the competent examiner is not satisfied with the condition of the derrick crane after the checking in Paragraph 4 or the inspection in Paragraph 5, and that the safe working load specified in the current Certificate of Test and Examination is not acceptable, then he may consider to scale down the load ratings of the crane. Any new safe working load is to be confirmed by the proof load test and examination in accordance with the procedure and guidelines stated in Paragraph 7. The competent examiner should notify the Marine Industrial Safety Section on any changes of the safe working load and submit a copy of Certificate of Test and Examination specified with the new safe working load. The flow charts in Annex: Case 1 & Case 2 illustrate the procedures for ascertaining safe working loads of existing derrick crane as described above.

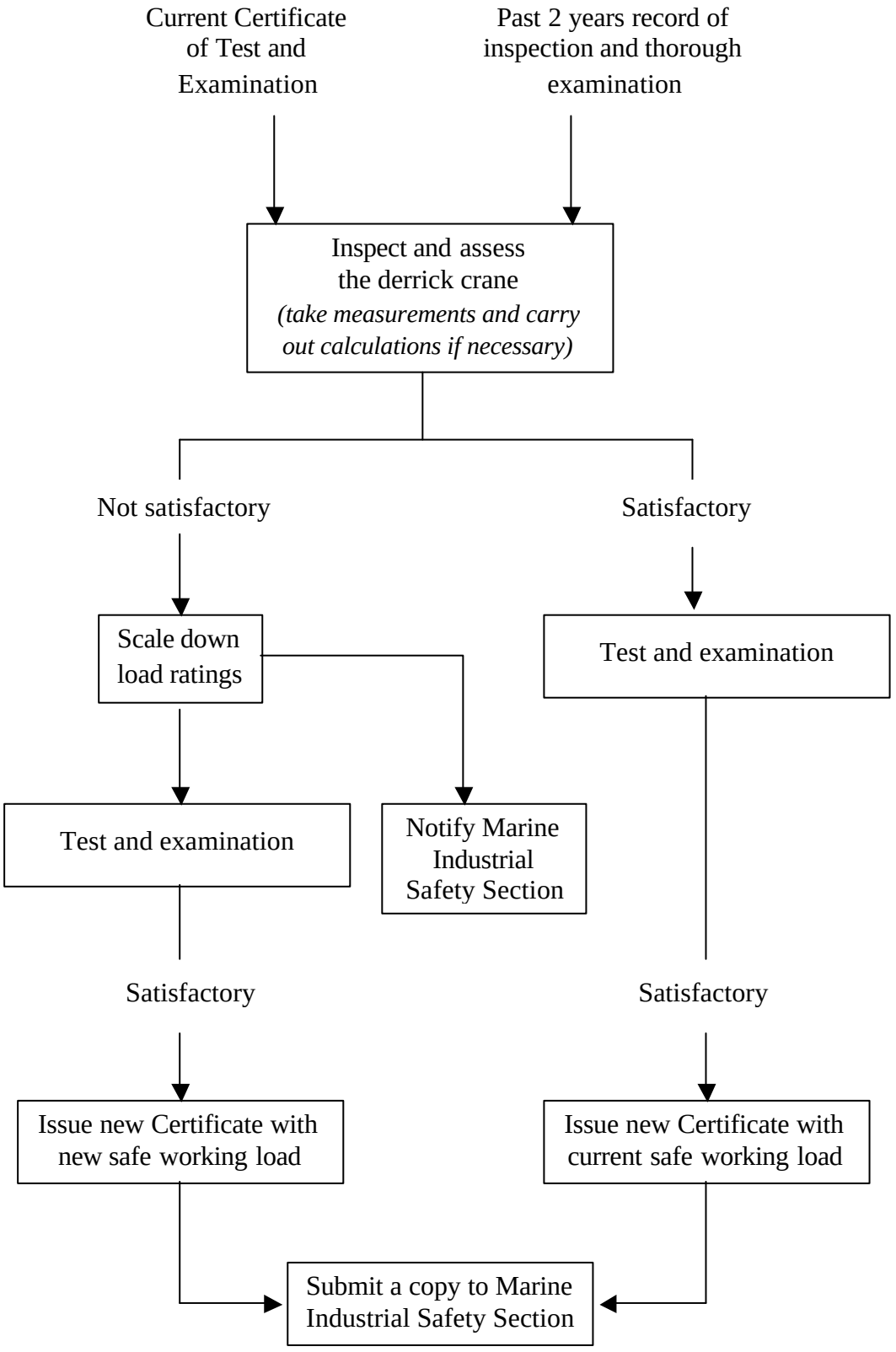
ANNEX

Flow Charts for Ascertaining Safe Working Loads of Existing Derrick Cranes

Case 1 : Derrick cranes with current Certificate of Test and Examination and all essential drawings & strength calculations



Case 2 : Derrick cranes with current Certificate of Test and Examination but the drawings/calculations not available or incomplete



Appendix 6

Marine Department Contacts

1. For reporting of shipboard industrial accidents and for enquiries on occupational safety and health matters relating to shipboard industrial operations including cargo handling, ship-repairing and marine construction during office hours -

   Marine Industrial Safety Section,
   Room 2315, Harbour Building,
   38 Pier Road,
   Central, Hong Kong.

   Tel.: 2852 4472, 2852 4477 Fax.: 2543 7209

2. For reporting of marine accidents during office hours -

   Marine Accident Investigation Section
   Room 2103, Harbour Building,
   38 Pier Road,
   Central, Hong Kong.

   Tel.: 2852 4511, 2852 4943 Fax.: 2543 0805

3. For enquiries on matters relating to dangerous goods carried by vessels during office hours -

   Dangerous Goods and Project Section
   Room 307, Harbour Building,
   38 Pier Road,
   Central, Hong Kong.

   Tel.: 2852 3085, 2852 4384 Fax.: 2815 8596

4. For reporting of marine and shipboard industrial accidents during and outside office hours -

   Vessel Traffic Centre

   Tel.: 2233 7801 Fax.: 2858 6646

5. Internet address of Marine Department -

   http://www.info.gov.hk/mardep