Approval Conditions
for Operating
Mandatory Safety Training Courses

Part II – Module 3

Course Design and Specifications

For

(A) Training Course for New Operators of Crane

(B) Training Course for Experienced Operators of Crane

(C) Revalidation Training Course for Operators of Crane

Version Control Record

Version	Release Date	Effective Date	Significant Changes
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2.0	30 March 2021	30 June 2021	Sections 6A, 8A, 9A & 11A Annexes 1-6

Inquiry

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Contents

1. Overview

1.1 The terms and abbreviations adopted in this module follow those defined in Part I. This module is Part II – 3 of the AC which covers 3 types of crane operator training courses, i.e. 2 full courses and 1 revalidation course. This module should be read together with Part I of this AC.

1.2 Regulation 15A(1)(b) of the Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations ("the Regulation"), Cap 59J, requires that every person operating a crane in any industrial undertaking should hold a valid certificate issued by the specified body or by any other person specified by the Commissioner for Labour. In this regard, the Commissioner for Labour is empowered by the Regulation to specify person to run the following safety training courses and issue relevant certificates to trainees who have successfully completed the relevant training courses:

(A) Training Course for New Operators of Crane ("Full Course (New Operator)");

(B) Training Course for Experienced Operators of Crane ("Full Course (Experienced Operator)"); and

(C) Revalidation Training Course for Operators of Crane ("Revalidation Course").

1.3 Procedures for application for course recognition are stipulated in the GN. Applicant who wishes to run any full course or revalidation course should submit an application to CL for course recognition.

1.4 Unless stated otherwise, requirements stated in this module are applicable to any full course and revalidation course.

1.5 TCP should ensure that the course materials used should comply with the requirements of this module.

1.6 The objective of the full courses are to provide basic safety training to prospective crane operators so as to enhance their occupational safety and health awareness, attitude towards accident prevention and operational competence in connection with the operation of a crane and to prevent work accidents. The trainees will be issued with a certificate upon successful completion of the course.

1.7 Revalidation course aims to provide refresher training to holders of crane operator certificates, which are expiring or expired, so as to enhance or reinforce their occupational safety and health awareness, attitude towards accident prevention and operational competence in connection with the operation of a crane. Upon successful completion of the course, the trainee will be issued with a new certificate.

1.8 At the end of any full courses, the trainees should be able to:

1.8.1 Demonstrate the required competence and appropriate skills for safe operation of the type of crane involved;

1.8.2 Describe the basic legal requirements prescribed under relevant safety legislation applicable to safe operation of lifting appliances and lifting gear, including the understanding of their legal liabilities and consequences under the provisions of the relevant legislation;

1.8.3 Understand the construction, performance, maintenance and operation of the type of crane involved;

1.8.4 List potential hazards associated with the operation of lifting appliances and lifting gear and their preventive measures;

1.8.5 Describe the common types of work-related accidents in lifting operation; identify possible causes of, and means of preventing such occurrences;

1.8.6 Understand the importance of, and procedures for, reporting accidents and dangerous occurrences;

1.8.7 Grasp the types, purposes, correct selection procedures and the proper use of personal protective equipment commonly required in operating the type of crane involved; and

1.8.8 Demonstrate the necessary safety attitude to safeguard themselves and other workers while operating the type of

crane involved.

1.9 At the end of revalidation course, the trainees should be able to:

1.9.1 Describe the basic legal requirements prescribed under relevant safety legislation applicable to safe operation of lifting appliances and lifting gear, including the understanding of their legal liabilities and consequences under the provisions of the relevant legislation;

1.9.2 List potential hazards associated with the operation of lifting appliances and lifting gear and their preventive measures;

1.9.3 Describe the typical/alarming accidents (including causes and related preventive measures) associated with the operation of crane, in particular those occurred during the five years preceding the conduct of the revalidation course;

1.9.4 Describe new technological advancements and developments in work procedures or equipment usage associated with the operation of crane, particularly those that occurred during the five years preceding the conduct of the revalidation course;

1.9.5 Grasp the types, purposes, correct selection procedures and the proper use of personal protective equipment commonly required in operating the type of crane involved; and

1.9.6 Demonstrate the necessary safety attitude to safeguard themselves and other workers while operating the type of crane involved.

2. Admission criteria

2.1 Full course (New Operator) is run for trainee who

- does not possess experience in operating the type of crane involved and without holding a relevant operator certificate; or
- possesses a relevant operator certificate which has expired for more than 6 months.

2.2 Full course (Experienced Operator) is run for trainee who

- possesses prior knowledge and experience in operating the type of

crane involved but without holding a relevant operator certificate, and his/her experience has to be verified in writing by the employers that the applicant has actively engagement in the operation of the type of crane involved at least one year; or

- possesses a relevant operator certificate which has expired for more than 6 months.

2.3 A TCP should ensure that applicant to be admitted to a revalidation course should

- at the time of application, be holding a relevant operator certificate which either will expire within 6 months or has expired for not more than 6 months; and
- possess at least 3 years of experience for the past 5 years preceding application and attendance of the revalidation course and his/her experience has to be verified in writing by the employers that the applicant has actively engagement in the operation of the type of crane involved in specified years of working.

2.4 A TCP should ensure that trainee admitted to its full course (new operator), full course (experienced operator) and revalidation course has attained the age of 18 years.

3. Qualifications of trainer

3.1 A TCP should ensure that its trainer on the ***theory session*** of either crane operator training course should at least possess the following:

3.1.1 Relevant academic and professional qualifications, such as a degree, higher diploma or certificate in engineering and/or safety and health discipline (preferably registered safety officer);

3.1.2 Sufficient professional training in delivery of training course (e.g. have successfully completed an acceptable instructional-skills training course, such as the certificate course of Basic Instructional Techniques by the Hong Kong

Institute of Education or the certificate course of Occupational Safety and Health Trainer by the Occupational Safety and Health Council ("OSHC") or the certificate course of Effective Site Safety Training and Instructing Techniques Course by Construction Industry Council Training Academy ("CICTA") or equivalent); and

3.1.3 Substantial experience on operation of the type of crane involved (normally three years' relevant experience is preferred).

3.2 A TCP should ensure that its trainer on the ***practical session*** of full course should at least possess the following:

3.2.1 Adequate training on operation of the type of crane involved (e.g. possession of a certificate of competency issued by the manufacturer/supplier of the relevant type of crane or valid operator certificate of the relevant type of crane); and

3.2.2 Substantial experience on operation of the type of crane involved (normally three years' relevant experience is preferred).

3.3 A TCP should ensure that its trainer possesses a Continuing Education Diploma in Occupational Safety and Health Practices issued by OSHC or equivalent, or both mandatory basic safety training and a certificate of Safety Supervisor Course issued either by OSHC or CICTA or equivalent.

4. Trainees to trainer ratio

4.1 A TCP should ensure that the maximum ratio of trainees to trainer is 15 to 1 for theory session of either crane operator training course and is 1 to 1 for the practical session of full course.

5. Class size

5.1 A TCP should ensure that the maximum size of a class is 15 trainees and it is the same for the full course and the revalidation course.

6. Course duration

6.1 The course duration of full course (New Operator) for various types of crane should depend on the type of crane involved. The general criterion of determining the minimum course duration is to give a reasonable reflection on the complexity and gravity of the crane involved and to ensure that adequate time should be provided to trainees to practise the basic operating skills of the crane involved. Therefore, the course duration may vary from one case to another. In general, the course duration (7 hours per day, but excluding break between half-day sessions or lunch time) should be ranging **from two weeks to two months** and it should include reasonable time distribution between theory session and practical session, a hands-on session for personal protective equipment of 1 hour, a written examination session of 30 minutes (examination of non-standardised part of course content), a practical examination session of 30-60 minutes and a total of not more than 30 minutes recess time per day. A TCP should ensure that the minimum course duration of full course (New Operator) for a particular type of crane should be strictly followed the above requirements and clearly specified in the lesson plan submitted to the CL for approval.

6.2 A TCP should ensure that the minimum course duration of full course (Experienced Operator) for a particular type of crane should be 3 days (7 hours per day, but excluding break between half-day sessions or lunch time) and it should include 1 day in theory session and 2 days in practical session, a hands-on session for personal protective equipment of 1 hour, a written examination session of 30 minutes

(examination of non-standardised part of course content), a practical examination session of 30-60 minutes and a total of not more than 30 minutes recess time per day.

6.3 A TCP should ensure that the minimum course duration of revalidation course should be 7 hours (excluding break between half-day sessions or lunch time) and it should include a hands-on session for personal protective equipment of 30 minutes, a written examination session of 30 minutes (examination of non-standardised part of course content) and a total of not more than 30 minutes recess time.

6A. Course duration of standardised part of course content

6A.1 Without prejudice to the generality of course duration under section 6.1, a TCP should ensure that a theory session, a written examination session and a review of examination paper session for the standardised part of course content of full course (New Operator) should be included as a part of the course duration as stipulated at **Annex 1**.

6A.2 Without prejudice to the generality of course duration under section 6.2, a TCP should ensure that a theory session, a written examination session and a review of examination paper session for the standardised part of course content of full course (Experienced Operator) should be included as a part of the course duration as stipulated in **Annex 1**.

6A.3 Without prejudice to the generality of course duration under section 6.3, a TCP should ensure that a theory session, a written examination session and a review of examination paper session for the standardised part of course content of revalidation course should be included as a part of the course duration as stipulated in **Annex 2**.

7. Attendance

7.1 A TCP should ensure that any trainee who is absent from the theory class for more than 15 minutes for any half-day sessions will be disqualified to attend the examination.

8. Lesson plan

8.1 Subject to section 8A, a TCP should devise and submit the lesson plan(s) of course(s) applied for recognition to the CL for approval.

8A. Lesson plan for standardised part of course content

8A.1 A TCP should ensure that the standardised part of course content of full course (New Operator) and full course (Experienced Operator) should be taught in accordance with the lesson plan stipulated at **Annex 1**.

8A.2 A TCP should ensure that the standardised part of course content of revalidation course should be taught in accordance with the lesson plan stipulated at **Annex 2**.

9. Course content

9.1 Subject to section 9A, a TCP should ensure that the course materials used should include all the topics and details stipulated at **Annex 3**. The TCP should also supplement additional materials in accordance with the needs of the trainees and the latest safety information. The course content should be submitted to the CL for prior approval.

9A. Standardised part of course content

9A.1 A TCP should ensure the course materials used for the standardised

part of course content of full course (New Operator) and full course (Experienced Operator) should include all the topics and details stipulated at **Annex 4**. The course content includes the reference teaching time and the additional requirements for the delivery. The TCP should also supplement additional materials in accordance with the needs of the trainees and the latest safety information.

9A.2 A TCP should ensure the course materials used for the standardised part of course content of revalidation course should include all the topics and details stipulated at **Annex 5**. The course content includes the reference teaching time and the additional requirements for the delivery. The TCP should also supplement additional materials in accordance with the needs of the trainees and the latest safety information.

10. Display, demonstration and practising

10.1 A TCP should provide suitable and sufficient equipment (including safety helmet, safety shoes/boots, safety harness with lifeline and fall-arresting device, safety gloves, ear and eye protectors, respirator, portable fire extinguisher etc.) for the purpose of display, demonstration and practising.

10.2 A TCP should ensure that demonstration of the above personal protective equipment to trainees is provided and that all trainees should have practice on the use of them.

10.3 A TCP should ensure that the training venue for the practical session should be sufficient, suitable, safe and appropriate for the type of cranes involved.

10.4 A TCP should ensure that the crane involved in the practical training should comply with all the legal requirements as delineated under the relevant legislation and should be solely used for training during the practical session.

11. Examination

11.1 A TCP should ensure that every trainee attending the examination should meet the required attendance and the requirement of completing the hands-on practice.

11.2 A TCP should ensure that the trainee should pass the written examination (including the examination of non-standardised part of course content and the examination of standardised part of course content respectively), the practical examination and also perform all critical skills competently in the practical examination before qualifying him/her to get the certificate.

For examination of non-standardised part of course content

11.3 The TCP should submit at least 3 sets of examination papers, each consisting of 20 different multiple-choice questions, their model answers and marking schemes to the CL for approval.

11.4 Time allowed for the written examination is 30 minutes and the passing mark is 50%. The time allowed for the practical examination (30 – 60 minutes) and its passing mark may varied depending on the complexity and the number of critical skills to be examined of the type of crane involved.

11A. Examination of standardised part of course content

11A.1 Without prejudice to section 11.3, a TCP should ensure that the examination papers of standardised part of course content used are issued and specified by LD.

11A.2 A TCP should provide the answer sheet at **Annex 6** to the trainee for the examination.

11A.3 A TCP should ensure that the invigilator and the trainee should sign on the answer sheet.

11A.4 Without prejudice to section 11.4, time allowed for the examination of standardised part of course content is 10 minutes and the passing mark is 50%.

11A.5 A TCP should arrange the examination of non-standardised part of course content to be conducted immediately after the examination of standardised part of course content.

12. Validity period of certificate

12.1 A TCP should ensure that the validity period of certificate of crane operator issued is 5 years.

12.2 For full course (New Operator) and full course (Experienced Operator), validity period of the certificate should be counted from the date when the trainee successfully completes the course.

12.3 For revalidation courses, validity of the certificate should be counted from the day—

12.3.1 immediately after the expiry date of the current certificate if the revalidation course is successfully completed within 6 months prior to expiry of the current certificate, or

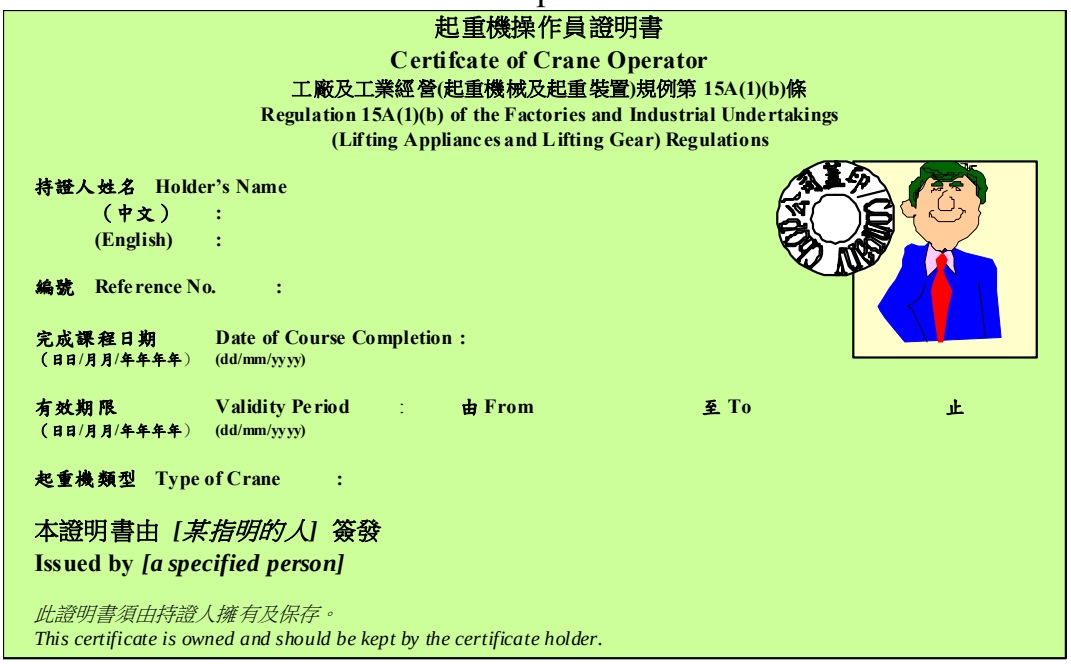
12.3.2 of completing the revalidation course if the revalidation course is successfully completed within 6 months after expiry of the current certificate.

13. Standard certificate format

13.1 A TCP should ensure that the front side of the certificate of crane operator should be designed with the required words, in the format as shown in **Figure 1** and according to the specifications below. The

reverse side is left to the TCP to include other information as appropriate, which should be commensurate with the purpose of the certificate.

Figure 1: Required Words and Design Format of the Front Side of Certificate of Crane Operator



(not to scale)

13.1.1 The certificate should be made of durable materials, either laminated or plastic, and in standard size of 85 mm x 55 mm;

13.1.2 A photograph (minimum size of not less than 20 mm x 25 mm) of the trainee should be incorporated into the certificate for easy identification;

13.1.3 For laminated card, the corner of the trainee's photo should be stamped with the TCP's company's chop;

13.1.4 For plastic card, the trainee's photo should be printed on the card;

13.1.5 Unless otherwise specified, information on the certificate should be printed in both Chinese and English;

13.1.6 The certificate should contain the following information:

- The name of certificate, i.e. "起重機操作員證明書" and "Certificate of Crane Operator";
- The empowering legislation, i.e. "工廠及工業經營（起重機械及起重裝置）規例第 15A(1)(b)條" and "Regulation

15A(1)(b) of the Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations";

- The Chinese and English name as printed on the Hong Kong Identity Card (or equivalent identity documents) of the certificate holder;
- Reference number of the certificate (an "R" should be appended to the last digit of the reference number to denote that the certificate is issued for a revalidation course);
- Date of Course Completion (in the format of DD/MM/YYYY);
- Validity period with starting date and expiry date (in the format of DD/MM/YYYY);
- Type of crane;
- Name of the certificate issuing course provider; and
- The wordings of "此證明書須由持證人擁有及保存。" and "This certificate is owned and should be kept by the certificate holder."

14. Training records

14.1 A TCP should submit the record of every certificate issued according to the required details stipulated in Table 1 as well as the name of the course.

Table 1：Example of Training Records

HKID/ Passport No. (TRT1)	Name of trainee (TRT2)	Class Ref. (TRC1)	Name of Trainer (TRC2)	Date of Course completion (TRC3)	Certificate Effective Date (TRT3)	Certificate Expiry Date (TRT4)	Certificate Serial No. (TRT5)
A123456(1)	Chan Siu On	ABC1	HAU To-si	13/06/2011	13/06/2011	12/06/2016	W396000201R
A123457(2)	Chan Siu Chuen	ABC1	HAU To-si	13/06/2011	23/09/2011	22/09/2016	W396000202R
A123458(3)	Chan Siu Feng	ABC2	HAU To-si	18/06/2011	18/06/2011	17/06/2016	W396000203
A123459(4)	Chan Siu Lin	ABC2	HAU To-si	18/06/2011	18/06/2011	17/06/2016	W396000204

Annex 1

Lesson Plan for Standardised Part of Course Content of Training Courses for New Operators and Experienced Operators of Crane

Section	Topic & Content	Time (Minutes)
1	Relevant Occupational Safety and Health Legislation Applicable to Crane	35
2	Handling of Accidents and Dangerous Occurrences and Reporting Procedures	5
3	Commonly Used Personal Protective Equipment	20
4	Written Examination	10
5	Review of the Examination Paper After the Examination	5
	Total Time【Class+Exam+Review】	**75**

Note: The teaching times allocated for Sections 1 to 3 are for reference.

Annex 2

Lesson Plan for Standardised Part of Course Content of Revalidation Training Course for Operators of Crane

Section	Topic & Content	Time (Minutes)
1	Relevant Occupational Safety and Health Legislation Applicable to Crane	25
2	Handling of Accidents and Dangerous Occurrences and Reporting Procedures	5
3	Commonly Used Personal Protective Equipment	15
4	Written Examination	10
5	Review of the Examination Paper After the Examination	5
	Total Time【Class+Exam+Review】	**60**

Note: The teaching times allocated for Sections 1 to 3 are for reference.

Annex 3

Outline of Course Content for Training for Operators of Crane

(A) Full Course (New / Experienced Operator)

1. Standardised Part of Course Content at **Annex 4**:

   - Relevant Occupational Safety and Health Legislation Applicable to Crane
   - Handling of Accidents and Dangerous Occurrences and Reporting Procedures
   - Commonly Used Personal Protective Equipment

   (Note: Suitable course content should be selected for interactive discussion with trainees)

2. Detailed construction, performance, maintenance, operation and limitations of the type of crane involved, including interpretation of the load charts, automatic safe load indicators, etc.

3. Potential hazards in lifting operations and their prevention, including:
   - lifting operation using lifting appliances and gear;
   - working at height (e.g. on cranes, top of containers etc.);
   - handling and stacking of cargoes and containers;
   - co-ordination of different work processes;
   - preventive maintenance of appliances, gear and hand tools;
   - emergency preparedness, evacuation procedures and first-aid equipment.

   .

4. An overview of common types of work-related accidents in lifting operation, their possible causes of, and means of preventing such occurrences.

5. Basic operating skills for the type of crane involved. The skills should include:
   - conduct routine checks in accordance with manufacturer's

specifications and operation/ maintenance manual or equivalent;

- plan work (including work area inspection);
- check controls and equipment in accordance with manufacturer's specifications and operation/ maintenance manual or equivalent;
- lift load;
- shut down machine in accordance with manufacturer's specifications and operation/maintenance manual or equivalent;
- secure site.

6. The trainees are required to undergo practical training. The practical training should be composed of actual hands-on practical training of the crane involved. This should embrace the limitations and operating instructions and procedures, planning the lift, implementing the lift, and slinging techniques and so forth. The trainee should be closely overseen and coached by a practical trainer. The trainee should be able to demonstrate the basic operating skills required for the safe operation of the crane involved after the completion of the practical session.

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(B) Revalidation course

1. Standardised Part of Course Content at **Annex 5**:

   - Relevant Occupational Safety and Health Legislation Applicable to Crane
   - Handling of Accidents and Dangerous Occurrences and Reporting Procedures
   - Commonly Used Personal Protective Equipment

   (Note: Suitable course content should be selected for interactive discussion with trainees)

2. Potential hazards in lifting operations and their prevention, including:
   - lifting operation using lifting appliances and gear;
   - working at height (e.g. on cranes, top of containers etc.);
   - handling and stacking of cargoes and containers;
   - co-ordination of different work processes;
   - preventive maintenance of appliances, gear and hand tools;
   - emergency preparedness, evacuation procedures and first-aid equipment.

3. An overview of typical/alarming accidents (including causes and related preventive measures) associated with the operation of crane, in particular those occurred during the five years preceding the conduct of the course.

4. An overview of new technological advancements and developments in work procedure or equipment usage associated with the operation of crane, particularly those that occurred during the five years preceding the conduct of the course.

Annex 4
Standardised Part of Course Content of Training Courses for New Operators and Experienced Operators of Crane

Standardised Part of Course Content of Training Courses for New Operators and Experienced Operators of Crane

Section 15A(1)(b) of Factories and Industrial Undertakings

(Lifting Appliances and Lifting Gear) Regulations

Occupational Safety and Health Branch
Labour Department

The Course Content is prepared by
The Occupational Safety and Health Branch
Labour Department

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Section **Page**

Note: Suitable course content should be selected for interactive discussion with trainees.

1. Relevant Occupational Safety and Health Legislation Applicable to Crane

[Reference teaching time for Section 1: 35 mins]

1.1 Occupational Safety and Health Ordinance and the Subsidiary Regulations (Chapter 509)

Purposes

- To ensure the safety and health of employees when they are at work
- To prescribe the occupational safety and health measures
- To improve the safety and health standards applicable to workplaces
- To improve the safety and health aspects of working environments of employees

Coverage

- This ordinance covers almost all workplaces - places where employees work, including offices, shopping arcades, supermarkets, hospitals, construction sites, etc.
- However, there are a few exceptions, including places where only self-employed persons work and domestic premises where the only employees are domestic servants.
- Every employer must, so far as reasonably practicable, ensure the safety and health at work of all his employees.

Subsidiary Regulations include:

- Occupational Safety and Health Regulation
- Occupational Safety and Health (Display Screen Equipment) Regulation

1.2 Factories and Industrial Undertakings Ordinance and the Subsidiary Regulations (Chapter 59)

- Provide for the safety and health protection to workers in the industrial sector
- Coverage
  - factories
  - construction sites
  - catering establishments
  - cargo and container handling undertakings
  - repair workshops and other industrial workplaces
- **General Duties of Proprietors**

Every proprietor of an industrial undertaking must, so far as is reasonably practicable, ensure the safety and health at work of all persons employed by him. The matters to which that duty extends include:

- providing and maintaining plant and work systems that do not endanger safety or health;
- making arrangements for ensuring safety and health in connection with the use, handling, storage or transport of plant or substances;
- providing all necessary information, instruction, training and supervision for ensuring safety and health;
- providing and maintaining all parts of the workplace and means of access to and egress from the workplace that is safe and without risk to health; and
- providing and maintaining a working environment that is safe and without risk to health.

- **General Duties of Persons Employed**
  - every person employed at an industrial undertaking must take reasonable care for the safety and health of himself and others; and
  - co-operate with the proprietor of an industrial undertaking to enable any duty or requirement for securing the safety and health of persons employed at the industrial undertaking to be performed or complied with.

Subsidiary Regulations under Factories and Industrial Undertakings Ordinance

- Under the Factories and Industrial Undertakings Ordinance, there are subsidiary regulations covering various aspects of hazardous work activities in factories, building and engineering construction sites, catering establishments, cargo and container handling undertakings and other industrial workplaces. The subsidiary regulations prescribe detailed safety and health standards on work situations, plant and machinery, processes and substances.
- Subsidiary regulations under Factories and Industrial Undertakings Ordinance include Factories and Industrial Undertakings Regulations, Construction Sites (Safety) Regulations, Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations, Factories and Industrial Undertakings (Suspended Working Platforms) Regulation, Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, Factories and Industrial Undertakings (Dangerous Substances) Regulations, Factories and Industrial Undertakings (Electricity) Regulations, Factories and Industrial Undertakings (Guarding and Operation of Machinery) Regulations, Factories and Industrial Undertakings (Safety Management) Regulation, Factories and

Industrial Undertakings (Confined Spaces) Regulation, Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation, etc.

1.3 Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations (Chapter 59J)

Application

- The regulations apply to lifting appliances and lifting gear used for raising or lowering or as a means of suspension in any industrial undertaking.

Interpretation

- "Automatic safe load indicator" means a device intended to be fitted to a crane that automatically gives an audible and visible warning to the operator thereof that the crane is approaching its safe working load and that automatically gives a further audible and visible warning when the crane has exceeded its safe working load.
- "Competent examiner", in relation to the carrying out of any test and examination required by these regulations, means a person who is:
  - providing and maintaining plant and work systems that do not endanger safety or health;
  - a registered professional engineer registered under the Engineers Registration Ordinance (Cap. 409) within a relevant discipline specified by the Commissioner; and
  - by reason of his qualifications, training and experience, competent to carry out the test and examination.
- "Competent person", in relation to any duty required to be performed by him under these regulations, means a person who is:
  - appointed by the owner required by these regulations to ensure that the duty is carried out by a competent person; and
  - by reason of training and practical experience, competent to perform the duty.
- "Construction site" means a place where construction work is undertaken and includes any area in the immediate vicinity which is used for the storage of materials or plant used or intended to be used for the purpose of the construction work.
- "Crane" means any appliance equipped with mechanical means of raising 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 a crane; but does not include:

- a hoist block running on a fixed rail or wire;
- a stacker or conveyer whereby a load is moved by means of a belt or platform; or
- an earth or mineral moving or excavating appliance not fitted with a grab.

- "Lifting appliance" means a crab, winch, teagle, pulley block or gin wheel used for raising or lowering, and a crane, sheerlegs, excavator, pile driver, pile extractor, dragline, aerial ropeway, aerial cableway transporter or overhead runway, and also any part of any such appliance.
- "Lifting gear" means a chain sling, rope sling, ring or similar gear, and a link, hook, plate clamp, shackle, swivel or eyebolt.
- "Raising or lowering as a means of suspension" means raising or lowering or as a means of suspension of a load on a lifting appliance or lifting gear.
- "Safe working load", in relation to a lifting appliance or to lifting gear, means either:
  - the appropriate safe working load for operating the lifting appliance or lifting gear as specified in the current certificate of test and thorough examination delivered in the approved form by a competent examiner in respect of that lifting appliance or lifting gear for the purposes of these regulations; or
  - where no such certificate is required, the relevant safe working load shown in the table referred to in regulation 18(1)(b).
- "Thorough examination" means a visual examination, 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 the visual examination shall be supplemented if necessary by other means such as a hammer test and, parts of the lifting appliance or lifting gear shall be dismantled.

Lifting Appliances

- **Construction**
  - All lifting appliances shall be of good mechanical construction, made of strong and sound materials, free from patent defect and properly maintained. Adequate arrangements shall be made for fixing and anchoring the appliance to secure its safety. A lifting appliance shall be adequately and securely supported and every structure supporting it is of good construction and adequate strength, of sound materials and free from patent defect.
- **Automatic Safe Load Indicator Required**
  - A crane shall be fitted with an automatic safe load indicator that:

(a) functions properly;

(b) has been tested by a competent examiner on each occasion that a test and thorough examination of the crane is so required and a certificate in the approved form is received from the competent examiner who has made a statement to the effect that the automatic safe load indicator is in good working order; and

(c) has been inspected by a competent person and determined to be in safe working order during each inspection of the crane so required and a certificate in the approved form is received from the competent person who has made a statement to the effect that the automatic safe load indicator is in good working order.

- **Poles or Beams Supporting Pulley Blocks or Gin Wheels**
  - A pulley block or gin wheel which is suspended from or supported by a pole or beam shall be effectively secured to the pole or beam. The pole or beam suspending or supporting the pulley block or gin wheel shall be of adequate strength for the purpose for which it is intended to be used, and adequately and properly secured so as to support the block or wheel and the load with safety and to prevent undue movement of the pole or beam.
- **Lifting Appliances to be Tested and Examined Prior to Use, Report by Competent Examiner, Periodical Inspection by a Competent Person and Anchoring and Ballasting of Cranes**
  - Frequency of Test, Examination and Inspection :

Item	Test and Examination	Testing	Examination	Inspection	Report form
LIFTING APPLIANCE (other than a crane, crab or winch)	Before use	—	—	—	Form 4
CRANE, CRAB OR WINCH	During the preceding 4 years before use	—	—	—	Form 3
LIFTING APPLIANCE (other than a crane, crab or winch)	Before use after undergone substantial repair, re-erection, failure, overturning or collapse	—	—	—	Form 4
CRANE, CRAB OR WINCH	Before use after undergone substantial repair, re-erection, failure, overturning or collapse	—	—	—	Form 3

LIFTING APPLIANCE	—	—	At least once in the preceding 12 months	—	Form 5
LIFTING APPLIANCE	—	—	—	Within the preceding 7 days	Form 1
CRANE	—	After erection, removal to a new location, adjustment of any component member (being a removal or adjustment which involves changes in the arrangements for anchoring or ballasting)	Before erection (for all of the devices used for the anchoring or ballasting)	—	Form 2
CHAINS, ROPES AND LIFTING GEAR (except a fibre rope or sling)	before use	—	—	—	Form 6
CHAINS, ROPES AND LIFTING GEAR	—	—	In the preceding 6 months before use	—	Form 7

- **Stability of Lifting Appliances**
  - Before a lifting appliance is used at or moved in an industrial undertaking, appropriate precautions shall be taken to ensure its stability.
  - For the purpose of securing the stability of the crane before taken into use:
    (a) the crane shall be securely anchored, or adequately weighted by suitable ballast which is properly placed on the structure of the crane and secured in a manner sufficient to prevent the ballast from being accidentally displaced; and
    (b) no part of any rail on which the crane is mounted, or any sleeper supporting such rail, shall be used as an anchorage.
- **Anchoring and Ballasting of Cranes**
  - If the competent examiner making the test after the erection of the crane, or after the removal of a crane to a new location, or any adjustment to any component member of a crane (being a removal or adjustment which involves changes in the arrangements for anchoring or ballasting the crane) considers that the maximum load which may safely be lifted by that crane as erected is less than the safe working load of the crane he shall specify the new maximum load in his certificate and in which case, the new maximum load shall be the modified safe working load.
  - Where a maximum load has been specified, a loading diagram shall be

affixed in a position where it can readily be seen by the crane driver. The loading diagram shall be:

(a) appropriate to the stability of the crane as at the time of the test (taking into account, in the case of a crane mounted on wheels, the conditions of the track); and

(b) indicating the modified safe working load.

The modified safe working load shall be deemed to be the safe working load of the crane as erected.

- **Stability of Cranes Secured by Removable Weights**
  - Where the stability of a crane is secured by means of removable weights, a diagram or notice indicating the position and amount of the weights shall be affixed to the crane in a place where it can easily be seen before it is used.
- **Use of Cranes in Bad Weather**
  - No crane shall be used under weather conditions likely to endanger its stability.
  - Before a crane is taken into use after exposure to weather conditions likely to have affected the stability of the crane:
    (a) the devices used for the anchoring or ballasting of the crane shall be examined and the crane shall be tested by a competent examiner as soon as practicable after such exposure and a certificate in the approved form shall be obtained from the competent examiner who has made a statement to the effect that it is in safe working order;
    (b) in the event of the anchorage or ballast being found on such test to be unsafe, steps that will again ensure the crane's stability shall be taken as soon as practicable.
- **Erection, Dismantling or Alteration of Cranes to be under Supervision of a Competent Person**
  - A crane shall not be erected or dismantled; or the structure thereof, as originally designed, shall not be altered except under the supervision of a competent person.
- **Multiple Lifting Appliances**
  - Where more than one lifting appliance is used to raise or lower one load:
    (a) each lifting appliance shall be so arranged and fixed that it is at no time loaded beyond its safe working load or rendered unstable in the raising or lowering of the load; and
    (b) a competent person shall be specially appointed to supervise the operation.
- **Load to be Safely Secured**

- Before a lifting appliance is used, every part of any load to be raised or lowered shall be:
  (a) securely suspended or supported; and
  (b) adequately secured so as to prevent danger arising to persons or property as a result of the slipping or displacement of any part of the load.
- Where, by reason of the nature or position of the operation, a load while being moved on a lifting appliance or on lifting gear is liable to come into contact with any object so that the object may become displaced, all reasonable steps shall be taken to ensure that no person lawfully on or near the industrial undertaking upon which the lifting appliance or lifting gear is being used is endangered by the displacement of the object.
- Where a receptacle is used in connection with any lifting appliance or lifting gear for raising or lowering stones, bricks, tiles, slates, or other objects, the receptacle shall be enclosed or to be so constructed or designed to prevent the accidental fall of any of such objects. This provision does not apply to a grab, shovel or similar excavating receptacle if effective steps have been taken to prevent persons being endangered by a fall of objects therefrom.

- **Precautions to be Taken where Lifting Appliance Has Travelling or Slewing Motion**
  - An unobstructed passageway of 600 mm wide or more shall be maintained between the slewing or other moving parts of lifting appliances and the guard rails, fences or other fixtures.
  - If the passageway cannot be maintained at any particular place, access to place shall be prevented when the appliance is in use.
- **Platforms for Crane Drivers and Signallers**
  - Every platform for the person driving or operating a crane, or for any signaller, shall be:
    (a) of sufficient area for the persons employed on it;
    (b) closely planked or plated; and
    (c) provided with safe means of access.
  - If any such platform has a side from which persons may fall a distance of more than 2 m, the following shall be provided:
    (a) a suitable guard rail of adequate strength to a height of at least 900mm above the platform and above any raised standing place on the platform;
    (b) toe boards at a height of not less than 200 mm above the level of the platform and any raised standing place on it. The boards shall be so

placed as to prevent as far as possible the fall of persons, materials and tools from the platform; and

(c) the space between any toe board on the platform and the lowest guard rail above it shall not exceed 700 mm.

Such guard rail or toe board may be removed or remain unerected only when it is necessary for persons or materials to go to or leave the platform.

- **Cabins for Drivers**
  - The owner of a power-driven lifting appliance shall provide a suitable cabin which:
    (a) gives the driver or operator adequate protection from the weather; and
    (b) is so constructed as to –
      (i) give him a clear and unrestricted view that will enable him to use the appliance safely; and
      (ii) give ready access to those parts of the appliance that are within the cabin.
  - These requirements shall not apply:
    (a) where the driver or operator is indoors or otherwise adequately protected from the weather;
    (b) to a lifting appliance mounted on wheels and having a maximum safe working load of 1 tonne or less;
    (c) to any machine incorporating a lifting appliance where the primary purpose of that machine is not that of a lifting appliance; or
    (d) to a lifting appliance intended for occasional use or for use for only short periods.
- **Marking of Safe Working Loads**
  - A crane or lifting appliance shall be clearly and legibly marked with means of identification and the safe working load for the time being applicable to the crane or lifting appliance, in English and Chinese.
  - A crane (including a crane with a derricking jib) with variable operating radii shall be clearly and legibly marked with safe working load at various radii of the jib, trolley or crab.
  - In the case of a crane with a derricking jib, the maximum permissible radius at which the jib may be worked should be clearly and legibly marked on it.
  - Such crane shall have an accurate indicator visible to the driver, showing radius of jib, trolley or crab at any time and safe working load for that radius.
- **Load Not to Exceed the Safe Working Load**
  - Maximum safe working load of lifting appliances shall not be exceeded,

except when tests of such appliances are being done by competent examiners.

- **Competent Person to be in Charge if Load Left Suspended**
  - Load shall not be left suspended from a lifting appliance unless a competent person is in charge of it during the period of suspension.
- **Scotch and Guy Derrick Cranes**
  - The jib of a Scotch derrick crane shall not be erected between the backstays, and the crane shall not be used to move any load lying in the angle between the backstays.
  - Precautions shall be taken against the foot of the king post of a Scotch derrick crane being lifted from the socket or support whilst in use.
  - If the guys of a guy derrick crane cannot be fixed at approximately equal angles to the mast so that the angles between adjacent pairs of guys are approximately equal, measure to ensure the stability of the crane shall be taken.
- **Cranes with Derricking Jibs**
  - The cranes shall be provided with properly maintained and effective locking arrangement between the derricking clutch and the pawl sustaining the derricking drums unless the hoisting and derricking drums are independently driven or the derricking drum driving mechanism is self-locking.
- **Restriction on the Use of Cranes**
  - The hoisting mechanism of a crane shall not be used except for raising or lowering loads vertically, unless it can be used otherwise without imposing undue stress or endangering the stability and unless a competent person supervises the operation.
  - Any crane that has a derricking jib shall not be used with the jib extended at a greater radius than that specified in the certificate of test and thorough examination relating to that crane.
- **Operators of Cranes and Lifting Appliances**
  - A crane shall only be operated by a person who:
    (a) has attained the age of 18 years;
    (b) holds a valid certificate issued by the Construction Industry Council (formerly known as Construction Industry Training Authority) or by any other person specified by the Commissioner; and
    (c) is competent to operate the crane by virtue of his experience.
  - A power-driven lifting appliance, other than a crane, shall only be operated by a person who:
    (a) has attained the age of 18 years; and

(b) in the opinion of the owner, is trained and competent to operate the appliance.

These requirements shall not apply where a trainee is operating a lifting appliance under the supervision of a person who meets the requirements of above regulations.

- **Operation of Lifting Appliances**
  - If the operator of a lifting appliance does not have a clear and unrestricted view which is necessary for the safe working of the appliance, one or more persons shall be appointed and stationed to give effective signals to the operator of the lifting appliance to ensure its safe working.
  - Any person appointed to give signal shall not be under the age of 18 years unless he is a trainee and acts under the supervision of a competent person.
  - If it is impracticable to comply with the first paragraph, effective signalling arrangements or means of communication shall be provided between the operator of the lifting appliance and the person employed in the loading or unloading of the appliance to ensure its safe working.
- **Brakes, Controls, Safety Devices, etc.**
  - Every crane, crab and winch shall be provided with an efficient brake or brakes or other similar safety devices to prevent a suspended load from falling uncontrollably or dangerously.
  - Every lever, handle, switch, or other device used for controlling the operation of any part of the lifting appliance shall, where practicable, be provided with a suitable spring or other locking arrangement to prevent the accidental movement or displacement of the level etc. Such lever, handle, switch or other device shall bear clear markings to indicate its purpose and the mode of operation.
  - The rotating handles of a manually operated winch or non-derricking jib crane do not require markings to indicate their purpose and operation mode.
  - Effective measures are required to be taken to prevent an overhead travelling crane from coming within 6 m of a place where any person working on or near the wheel track is liable to be struck by the overhead travelling crane.
  - Where any person is employed or working above floor level and is liable to be struck by an overhead travelling crane or its suspended load, effective precautions are to be taken to ensure that such person is warned of the approach of the crane. This does not apply when the person's work is connected with or dependent on the movements of the crane.
- **Drums and Pulleys**

- Every drum or pulley on which a rope of any lifting appliance is carried shall be of sufficient diameter and construction for the rope used. Every rope which terminates at the winding drum of a lifting appliance shall be properly secured to the drum. At least two turns of the rope shall remain on the drum at every operating position of the lifting appliance.

Chains, Ropes and Lifting Gear

- **Construction, Testing, Examination and Safe Working Load of Chains, Ropes and Lifting Gear**
  - Chains, ropes and lifting gear shall be of good construction, sound material, adequate strength, and shall be free from patent defect. They shall be marked with safe working load and means of identification.
  - A table in English and Chinese showing the safe working loads of each kind and size of chain, rope or lifting gear in use, and, in the case of a multiple sling, the safe working load at different angles of the legs, shall be posted in a prominent position within the industrial undertaking. Only chain, rope or lifting gear shown in the table shall be used.
  - No chain, rope or lifting gear shall be used for any load exceeding its safe working load shown in the table.
  - No chain, rope or lifting gear (except a fibre rope or fibre-rope sling) shall be used unless it has been tested and thoroughly examined by a competent examiner in the manner prescribed in the First Schedule (Please see Appendix II) and a certificate in the approved form in which the competent examiner has made a statement to the effect that it is in safe working order has been obtained.
  - Each chain, rope and lifting gear in use shall be thoroughly examined by a competent examiner in the preceding 6 months before it is used and a certificate in the approved form in which the competent examiner has made a statement to the effect that it is in safe working order has been obtained.
  - Each chain, rope and lifting gear shall be inspected before use on each occasion by a competent person.
  - Every chain shall not be shortened by tying knots in it nor shall it be damaged by sharp edges.
  - The chain, rope or lifting gear in use shall be clearly and legibly marked on it its safe working load together with an appropriate mark to distinguish it from other similar lifting gear.
  - The chain, rope or lifting gear shall not be loaded beyond its safe working load except for the purpose of testing or examination by a competent

examiner.

- A wire rope shall not be used for raising or lowering or as a means of suspension if in any length of 10 diameters, the total number of visible broken wires exceeds 5% of the total number of wires in the rope.

- **Multiple Slings**
  - The upper ends of the sling legs of a double or multiple sling used in raising or lowering or as a means of suspension shall be connected by means of a shackle, ring or link of adequate strength.
  - A double or multiple sling shall not be used in raising or lowering or as a means of suspension if the safe working load of any sling leg is exceeded as a result of the angle between the sling legs.

Miscellaneous

- **Carrying of Persons by means of Lifting Appliances**
  - A person may be raised, lowered or carried by a power-driven lifting appliance:
    (a) on the driver's platform in the case of a crane;
    (b) on a suspended scaffold of such design and construction as ensures the safety of any person carried by it;
    (c) without the use of a builder's lift or tower working platform to which the Builders' Lifts and Tower Working Platforms (Safety) Ordinance (Cap. 470) applies or a suspended scaffold where its use is impracticable, provided that:
      (i) the appliance can be operated from one position only;
      (ii) the appliance is so constructed that the brake is applied when the control lever, handle or switch is not held in the operating position;
      (iii) where the person is carried in a chair, cage, skip or other receptacle at least 900 mm deep, the receptacle is of good construction, sound material and adequate strength, and is provided with suitable means to prevent any occupant from falling out and does not contain material or tools liable to interfere with his hand hold or otherwise endanger him, or where the person is carried in a boatswain's chair or other similar plant or equipment less than 900 mm deep, a suitable safety belt attached to an independent lifeline is provided to and worn by the occupant and the lifeline is securely suspended;
      (iv) suitable measures are taken to prevent such chair, cage, skip or

other receptacle from spinning or tipping in a manner dangerous to any occupant; and

(v) if a hook is fitted to the lifting appliance, it is so designed and maintained as to prevent the accidental displacement of such chair, cage, skip or receptacle from the hook

(d) from an aerial ropeway or cableway or an overhead runway, provided that the provisions of subparagraph (c)(ii), (iii), (iv) and (v) above are complied with.

- **Keeping and Displaying of Certificates and Reports**
  - The certificates and reports issued in respect of any test, examination or inspection of lifting appliances, chains, ropes or lifting gear (whether the equipment is still in use or not) shall be kept in a safe place.
  - shall not be disposed of until 2 years after the date of issue thereof or the date on which the lifting appliance, chain, rope or lifting gear is disposed of.
  - The certificates or reports shall be made available for inspection at all reasonable time by an occupational safety officer who requests to see them.
  - A copy or an extract from any certificate or report shall be delivered to an occupational safety officer upon his request in writing within such period (being not less than 7 days) as may be specified in the request.
  - A copy of the relevant and the most recent certificate or report shall be displayed in the driving cabin or other prominent place on the equipment to which it relates or in a prominent place nearby.

1.4 Construction Sites (Safety) Regulations (Chapter 59I)

These regulations control the construction, maintenance, use and operation of hoists, scaffolds and working platforms. There are also provisions for the use of personal protective equipment for protection against falling of person, falling objects and drowning in a construction site. There are miscellaneous safety requirements such as prevention of inhalation of dust and fumes, protection of eyes and the provision of first aid facilities.

Part VA of the Construction Sites (Safety) Regulations provides a greater degree of safety to persons working on construction sites, in particular in relation to preventing falls from heights. The contractors have the general duty to make and keep every place of work on a construction site safe, and in particular, to take suitable and adequate steps to prevent persons from falling from a height of 2

metres or more, such as provision, use and maintenance of working platforms, guard-rails, barriers, toe-boards and fences, coverings for openings, gangways and runs, etc.

1.5 Factories and Industrial Undertakings (Cargo and Container Handling) Regulations (Chapter 59K)

These regulations provide for the requirements on safety of workers employed in industrial undertakings of loading, unloading or handling of cargo and goods at docks, quays or wharves as well as those employed in industrial undertakings of loading, unloading, handling, stacking, unstacking, storing or maintaining (including repairing) of freight containers. They also stipulate requirements on the provision of first aid facilities at docks, quays and wharves.

1.6 Factories and Industrial Undertakings (Loadshifting Machinery) Regulation (Chapter 59AG)

Loadshifting machines used in the industrial undertakings are operated by a person who has attained the age of 18 years, attended a relevant training course and holds a valid certificate. Fork-lift trucks used in industrial undertakings; bulldozers, loaders, excavators, trucks or lorries, compactors, dumpers, graders, locomotives, and scrapers used on construction site are within the ambit of the Regulation. However, the Regulation does not apply to the operator of a truck or lorry who holds a valid driving licence under the Road Traffic Ordinance (Cap. 374).

1.7 Code of Practice

The Code of Practice (hereinafter referred as the Code) is approved and issued by the Commissioner for Labour under Section 7A of the Factories and Industrial Undertakings Ordinance, Chapter 59 of the Laws of Hong Kong (hereinafter referred as the FIUO). It provides a practical guidance to proprietors of industrial undertakings and the employees for compliance with the requirements under the provisions of the Sections 6A and 6B of FIUO concerning the general duties of proprietor and employee. It is important to note that compliance with the Code does not of itself confer immunity from legal obligations.

The Code has a special legal status. Although failure to observe any guidance contained in the Code is not in itself an offence that failure may be taken by a court in criminal proceedings as a relevant factor in determining whether or not a

person has breached any of the provisions of the regulations to which the guidance relates.

Codes of practice that are often used include:

- Code of Practice on Mechanical Handling Safety in Container Yards
- Code of Practice for Safe Use of Mobile Cranes
- Code of Practice for Safe Use of Tower Cranes
- Code of Practice for Safety and Health at Work (Land-based Construction Over Water – Prevention of Fall)

1.7.1 The content related to the responsibilities of competent persons in the "Code of Practice for Safe Use of Mobile Cranes", the "Code of Practice for Safe Use of Tower Cranes" and the "Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations" include:

- Routine checks
  - Inspection within the preceding 7 days before use
  - Delivery of a certificate in the approved form to the owner
- Automatic safe load indicator
  - Conducting inspection
  - Making a statement to the effect that the automatic safe load indicator is in good working order in the certificate
  - Delivery of the certificate to the owner
- Supervision of the erection, dismantling or alteration of cranes
- Supervision of the operation of cranes when the cranes are used for multiple lifting operation
- In charge of the load during the period of suspension
- Supervision of the operation of crane when the crane is used to drag a load not in a vertical direction
- The person operating lifting appliance shall not be under the age of 18 years unless he acts under the supervision of a competent person
- Lifting gears (such as chains and ropes) shall be inspected before use on each occasion by a competent person
- Providing advice on the safe system of work
- Supervision of the use of partially extended outriggers of cranes
- Proximity of other cranes
  - Co-ordination and supervision
  - Informing all the personnel involved
- Supervision of the travelling of long jib crane in the place of work

- Travelling with suspended loads
  - Supervision of the travelling with suspended loads
  - Providing relevant preventive measures before travelling on slopes

1.7.2 The content related to crane standing or supporting conditions, and mode of operation and control in the "Code of Practice for Safe Use of Mobile Cranes" include:

Crane standing or supporting conditions

- Mobile cranes should only be operated on uniform, level and firm ground with sufficient load bearing capacity to withstand the maximum in-service loadings of the crane. It should be noted that wind loadings and dynamic effect should also be taken into account.
- In order to avoid the sinkage or collapse of the supporting surface and overturning or collapse of the crane (especially the operation of heavy cranes), the loading should be distributed over a sufficiently large area. Steel plates of adequate strength, suitable mats or suitable timber blocking should therefore be used.
- If outriggers are provided, the beams should be fully extended as far as practicable. The jacks should be suitably extended so that all the crane tyres are clear of the ground.
- The mat or timber blocking should be at least 3 times larger in area than the float (unless a smaller area is specified by the manufacturer) and completely support the float. For timber blocking, it should be tightly spaced and level to guarantee a right angle (90 degrees) between the cylinder and the float of the outrigger.
- Advice should be sought from the manufacturer regarding the particular data and information on weights and loadings of the crane. Besides, the supporting surface should be frequently examined during the operation to ensure that there has been no movement or sinkage affecting the crane's stability (especially the operation of heavy cranes).

Mode of operation

- Before starting any lifting operation with a crane, the operator should ensure that he has a clear and unrestricted view of the load and operational area; if not, he should act under the directions of an authorized signaller who is positioned to have such a clear and uninterrupted view (especially the operation of crane by using remote control).

1.7.3 The content related to precautions to be taken in fitting the slings (rigging) in the "Code of Practice for Safe Use of Mobile Cranes" and the "Code of Practice for Safe Use of Tower Cranes" include:

- When fitting the sling to a load, steps should be taken to ensure that:
  - sling legs are free of kinks or any tendency to kink;
  - only the eye termination with thimble is placed on the crane hook;
  - the terminations are properly seated without overcrowding;
  - the load is effectively secured by the sling;
  - the relevant leg angle does not exceed that for which the sling is rated and marked;
  - the sling is not bent around any corners that might damage or reduce the effective strength of the sling. Where necessary suitable packing pieces should be used;
  - when using choke hitch:
    (i) the angle of choke is allowed to form itself naturally and is not forced;
    (ii) a thimble or stirrup is used where practicable at the eye to reduce damage to the rope and thereby prolong the life of both the eye and the main part of the rope; and
  - a tag line or control rope is available for assisting in the control of the swing or rotation of the load.

1.8 Road Traffic (Construction and Maintenance of Vehicles) Regulations and Code of Practice for the Loading of Vehicles

As stipulated under the Road Traffic (Construction and Maintenance of Vehicles) Regulations, the overall height of a crane lorry (including the load and equipment it carries) must not exceed 4.6 metres when running on roads. The Code of Practice for the Loading of Vehicles, which reminds crane operators to have the crane lowered and returned to its stowed position after operating the crane attached to the vehicle. The Code of Practice also recommends the installation of warning systems on vehicles to alert drivers if the cranes are out of their stowed position when the vehicles are in motion.
(Note: The Code of Practice for Safe Use of Mobile Cranes and the manufacturer's instructions or recommendations for crane travelling and transportation in industrial undertakings should be followed regarding the restrictions in jib length, jib suspension and counterweights, and the maintenance of the stability of the crane.)

2. Handling of Accidents and Dangerous Occurrences and Reporting Procedures

[Reference teaching time for Section 2: 5 mins]

2.1 Handling of Work Injury

- For any work injury to a worker, the worker should inform the supervisor immediately and receive suitable treatment.
- Unless a worker has received adequate first aid training, the worker should not move the victim.
- If a worker is seriously injured or needs to be hospitalized, the supervisor should inform the safety department and call police immediately.
- If a worker falls from height, inform the first aider to take care of the worker but do not move the worker.

2.2 Reporting Workplace Accidents and Dangerous Occurrences

Reports of Accidents resulting in death or serious bodily injury

- The employer should notify it to an occupational safety officer of the Labour Department within 24 hours after the time when the accident occurred.

Reports of Accidents resulting in Incapacity

- According to the Employees' Compensation Ordinance, for an accident that results in an employee being incapacitated from working for a period exceeding 3 days, the employer should report it in writing to the Labour Department within 14 days after the date of the accident.

Reporting Dangerous Occurrences (For example, collapse of crane, disintegration of grinding wheel, etc.)

- Every dangerous occurrence which occurs at a workplace, whether any personal injury has been caused or not, shall be reported to the Labour Department within 24 hours of its occurrence.

3. Commonly Used Personal Protective Equipment

[Reference teaching time for Section 3: 20 mins (excluding time for demonstration and hands-on practice)]

- Personal protective equipment (PPE) is intended to be worn or otherwise used by a person at work and protects the person against one or more hazards to his/her safety or health. Use of PPE is the last resort when controlling the sources of accident is impracticable. PPE should be handled with care and stored properly when not in use. The equipment should be kept clean and maintained in good condition.
- Employer have duties on guidance, training and supervision with respect to use of PPE. They should ensure that their employees know why and when PPE is used, its maintenance or replacement schedule and limitations.
- PPE should be provided by employers. Employees must wear PPE for the entire period of exposure to hazards.

3.1 Personal Protective Equipment

3.1.1 Safety Helmets with Chin Straps **[Explain by means of the real object of PPE or powerpoint]**

- Wear a safety helmet on a construction site under all circumstances.
- A safety helmet is primarily intended to protect the top of the head from being injured by falling objects.
- A suitable safety helmet should bear appropriate marking indicating the conformity to certain international/ national standards such as European Standard.
- A safety helmet should be equipped with a chin strap.
- Keep the harness of a safety helmet clean and make sure that it fits well.
- Do not drill any holes on a safety helmet or use it for pounding.

3.1.2 Safety Shoes **[Explain by means of the real object of PPE or powerpoint]**

- Safety shoes should have steel toe caps, steel soles, slip-proof and water-proof characteristics.

3.1.3 Safety Gloves **[Explain by means of the real object of PPE or powerpoint]**

- Protect hands from getting injured by abrasion; cuts and punctures; contact with chemicals; electric shock; skin infection.
- Types of safety gloves include rubber gloves, steel, mesh gloves, leather gloves, wrist and arm protective devices.
- Workers should not wear cotton gloves for operating a machine with revolving parts so as to avoid causing injury to hands due to entangling of cotton gloves with the revolving parts of the machine.

3.1.4 Ear Protectors [Explain by means of the real object of PPE or powerpoint]

- Ear muffs are the most efficient noise isolation ear protectors.
- Wear ear protectors in areas with high noise levels.
- Properly wear ear protectors according to the manufacturer's instructions.
- Do not reuse disposable ear plugs.
- Clean ear protectors regularly.

3.1.5 Eye Protectors [Explain by means of the real object of PPE or powerpoint]

- When there is a risk of eye injury, such as in concrete breaking or using abrasive wheels, suitable eye protectors should be worn.
- Take proper care of the eye protectors provided to you.
- Replace damaged or defective eye protectors immediately.
- Ensure that eye protectors are comfortable to wear, and keep clean.

3.1.6 Respirator [Explain by means of the real object of PPE or powerpoint]

- Protect workers against dust; fibres, hazardous gases and fumes and prevent workers from oxygen deficiency.
- Types of breathing apparatus include: disposable cartridge respirators; full-face/half-face respirators; air-supplied hoods; self-contained respirators.
- When using breathing apparatus, it must be properly fitted on the wearer’s face.
- Breathing apparatus should be cleaned thoroughly after each use.

3.1.7 Safety Harness with Lifeline and Fall-arresting Device [Explain by means of the real object of PPE or powerpoint]

- The most suitable way to use a safety belt is to attach its snap-hook to a level

higher than the user's waist.

- When falling from height, a full body harness (commonly known as parachute type) could better reduce the downward momentum and protect the user's waist from injury than a general safety belt.
  - Before using a safety belt, the following should be considered: any defects on the safety belt, any suitable anchorage, independent lifeline and fall arresting device, and whether the standard is met or not.
  - When using a safety belt for fall protection, the safety belt should be attached to a fixed anchorage point or a fall arrester of an independent lifeline.

3.1.8 Protective Clothing **[Explain by means of the real object of PPE or powerpoint]**

- Protective clothing is being used as working clothes or uniform, it also protects workers against injuries caused by hazards such as contact with chemicals or flame, striking, stabbing, radiation, drowning, extreme cold, hot or adverse weather conditions.
- The types of protective clothing: General purpose protective clothing; disposable overalls; specialized protective clothing such as cold resistant clothing; chemical or radiation protective clothing; high visibility clothing, puncture-resistant aprons and lifejacket used for land-based work carried out adjacent to water.

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Annex 5
Standardised Part of Course Content of Revalidation Training Course for Operators of Crane

Standardised Part of Course Content of Revalidation Training Course for Operators of Crane

Section 15A(1)(b) of Factories and Industrial Undertakings

(Lifting Appliances and Lifting Gear) Regulations

Occupational Safety and Health Branch
Labour Department

The Course Content is prepared by
The Occupational Safety and Health Branch
Labour Department

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Contents

Section **Page**

Note: Suitable course content should be selected for interactive discussion with trainees.

1. Relevant Occupational Safety and Health Legislation Applicable to Crane

[Reference teaching time for Section 1 : 25 mins]

1.1 Occupational Safety and Health Ordinance and the Subsidiary Regulations (Chapter 509)

- The purposes include ensuring the safety and health of employees when they are at work, prescribing the occupational safety and health measures, improving the safety and health standards applicable to workplaces, and improving the safety and health aspects of working environments of employees.
- This ordinance covers almost all workplaces - places where employees work, including offices, shopping arcades, supermarkets, hospitals and construction sites, etc.
- Subsidiary regulations include Occupational Safety and Health Regulation and Occupational Safety and Health (Display Screen Equipment) Regulation.

1.2 Factories and Industrial Undertakings Ordinance and the Subsidiary Regulations (Chapter 59)

- Provide for the safety and health protection to workers in the industrial sector.
- Coverage of the Regulations includes factories, construction sites and catering establishments, etc.
- General Duties of Proprietors

  Every proprietor of an industrial undertaking must, so far as is reasonably practicable, ensure the safety and health at work of all persons employed by him. The matters to which that duty extends include providing and maintaining plant and work systems that do not endanger safety or health, and providing all necessary information, instruction, training and supervision for ensuring safety and health, etc.
- General duties of persons employed include that every person employed at an industrial undertaking must take reasonable care for the safety and health of himself and others, etc.
- Subsidiary regulations under Factories and Industrial Undertakings Ordinance include Factories and Industrial Undertakings Regulations, Construction Sites (Safety) Regulations, Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations, and Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, etc.

1.3 Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations (Chapter 59J)

Application

- The regulations apply to lifting appliances and lifting gear used for raising or lowering or as a means of suspension in any industrial undertaking.

Lifting Appliances

- **Construction**
  - All lifting appliances shall be of good mechanical construction, made of strong and sound materials, free from patent defect and properly maintained. Adequate arrangements shall be made for fixing and anchoring the appliance to secure its safety. A lifting appliance shall be adequately and securely supported and every structure supporting it is of good construction and adequate strength, of sound materials and free from patent defect.
- **Automatic Safe Load Indicator Required**
  - A crane shall be fitted with an automatic safe load indicator that:
    (a) functions properly;
    (b) has been tested by a competent examiner on each occasion that a test and thorough examination of the crane is so required and a certificate in the approved form is received from the competent examiner who has made a statement to the effect that the automatic safe load indicator is in good working order; and
    (c) has been inspected by a competent person and determined to be in safe working order during each inspection of the crane so required and a certificate in the approved form is received from the competent person who has made a statement to the effect that the automatic safe load indicator is in good working order.
- **Poles or Beams Supporting Pulley Blocks or Gin Wheels**
  - A pulley block or gin wheel which is suspended from or supported by a pole or beam shall be effectively secured to the pole or beam. The pole or beam suspending or supporting the pulley block or gin wheel shall be of adequate strength for the purpose for which it is intended to be used, and adequately and properly secured so as to support the block or wheel and the load with safety and to prevent undue movement of the pole or beam.
- **Lifting Appliances to be Tested and Examined Prior to Use, Report by**

Competent Examiner, Periodical Inspection by a Competent Person and Anchoring and Ballasting of Cranes

- Frequency of Test, Examination and Inspection :

Item	Test and Examination	Testing	Examination	Inspection	Report form
LIFTING APPLIANCE (other than a crane, crab or winch)	Before use	—	—	—	Form 4
CRANE, CRAB OR WINCH	During the preceding 4 years before use	—	—	—	Form 3
LIFTING APPLIANCE (other than a crane, crab or winch)	Before use after undergone substantial repair, re-erection, failure, overturning or collapse	—	—	—	Form 4
CRANE, CRAB OR WINCH	Before use after undergone substantial repair, re-erection, failure, overturning or collapse	—	—	—	Form 3
LIFTING APPLIANCE	—	—	At least once in the preceding 12 months	—	Form 5
LIFTING APPLIANCE	—	—	—	Within the preceding 7 days	Form 1
CRANE	—	After erection, removal to a new location, adjustment of any component member (being a removal or adjustment which involves changes in the arrangements for anchoring or ballasting)	Before erection (for all of the devices used for the anchoring or ballasting)	—	Form 2
CHAINS, ROPES AND LIFTING GEAR (except a fibre rope or sling)	before use	—	—	—	Form 6
CHAINS, ROPES AND LIFTING GEAR	—	—	In the preceding 6 months before use	—	Form 7

- **Stability of Lifting Appliances**

- Before a lifting appliance is used at or moved in an industrial undertaking, appropriate precautions shall be taken to ensure its stability.
- For the purpose of securing the stability of the crane before taken into use:
  (a) the crane shall be securely anchored, or adequately weighted by suitable ballast which is properly placed on the structure of the crane and secured in a manner sufficient to prevent the ballast from being accidentally displaced; and
  (b) no part of any rail on which the crane is mounted, or any sleeper supporting such rail, shall be used as an anchorage.

- **Anchoring and Ballasting of Cranes**
  - If the competent examiner making the test after the erection of the crane, or after the removal of a crane to a new location, or any adjustment to any component member of a crane (being a removal or adjustment which involves changes in the arrangements for anchoring or ballasting the crane) considers that the maximum load which may safely be lifted by that crane as erected is less than the safe working load of the crane he shall specify the new maximum load in his certificate and in which case, the new maximum load shall be the modified safe working load.
  - Where a maximum load has been specified, a loading diagram shall be affixed in a position where it can readily be seen by the crane driver. The loading diagram shall be:
    (a) appropriate to the stability of the crane as at the time of the test (taking into account, in the case of a crane mounted on wheels, the conditions of the track); and
    (b) indicating the modified safe working load.
    The modified safe working load shall be deemed to be the safe working load of the crane as erected.
- **Stability of Cranes Secured by Removable Weights**
  - Where the stability of a crane is secured by means of removable weights, a diagram or notice indicating the position and amount of the weights shall be affixed to the crane in a place where it can easily be seen before it is used.
- **Use of Cranes in Bad Weather**
  - No crane shall be used under weather conditions likely to endanger its stability.
  - Before a crane is taken into use after exposure to weather conditions likely to have affected the stability of the crane:
    (a) the devices used for the anchoring or ballasting of the crane shall be examined and the crane shall be tested by a competent examiner as

soon as practicable after such exposure and a certificate in the approved form shall be obtained from the competent examiner who has made a statement to the effect that it is in safe working order;

(b) in the event of the anchorage or ballast being found on such test to be unsafe, steps that will again ensure the crane's stability shall be taken as soon as practicable.

- **Erection, Dismantling or Alteration of Cranes to be under Supervision of a Competent Person**
  - A crane shall not be erected or dismantled; or the structure thereof, as originally designed, shall not be altered except under the supervision of a competent person.
- **Multiple Lifting Appliances**
  - Where more than one lifting appliance is used to raise or lower one load:
    (a) each lifting appliance shall be so arranged and fixed that it is at no time loaded beyond its safe working load or rendered unstable in the raising or lowering of the load; and
    (b) a competent person shall be specially appointed to supervise the operation.
- **Load to be Safely Secured**
  - Before a lifting appliance is used, every part of any load to be raised or lowered shall be:
    (a) securely suspended or supported; and
    (b) adequately secured so as to prevent danger arising to persons or property as a result of the slipping or displacement of any part of the load.
  - Where, by reason of the nature or position of the operation, a load while being moved on a lifting appliance or on lifting gear is liable to come into contact with any object so that the object may become displaced, all reasonable steps shall be taken to ensure that no person lawfully on or near the industrial undertaking upon which the lifting appliance or lifting gear is being used is endangered by the displacement of the object.
  - Where a receptacle is used in connection with any lifting appliance or lifting gear for raising or lowering stones, bricks, tiles, slates, or other objects, the receptacle shall be enclosed or to be so constructed or designed to prevent the accidental fall of any of such objects. This provision does not apply to a grab, shovel or similar excavating receptacle if effective steps have been taken to prevent persons being endangered by a fall of objects therefrom.
- **Precautions to be Taken where Lifting Appliance Has Travelling or**

Slewing Motion

- An unobstructed passageway of 600 mm wide or more shall be maintained between the slewing or other moving parts of lifting appliances and the guard rails, fences or other fixtures.
- If the passageway cannot be maintained at any particular place, access to place shall be prevented when the appliance is in use.

- **Platforms for Crane Drivers and Signallers**
  - Every platform for the person driving or operating a crane, or for any signaller, shall be:
    (a) of sufficient area for the persons employed on it;
    (b) closely planked or plated; and
    (c) provided with safe means of access.
  - If any such platform has a side from which persons may fall a distance of more than 2 m, the following shall be provided:
    (a) a suitable guard rail of adequate strength to a height of at least 900mm above the platform and above any raised standing place on the platform;
    (b) toe boards at a height of not less than 200 mm above the level of the platform and any raised standing place on it. The boards shall be so placed as to prevent as far as possible the fall of persons, materials and tools from the platform; and
    (c) the space between any toe board on the platform and the lowest guard rail above it shall not exceed 700 mm.

    Such guard rail or toe board may be removed or remain unerected only when it is necessary for persons or materials to go to or leave the platform.
- **Cabins for Drivers**
  - The owner of a power-driven lifting appliance shall provide a suitable cabin which:
    (a) gives the driver or operator adequate protection from the weather; and
    (b) is so constructed as to –
      (i) give him a clear and unrestricted view that will enable him to use the appliance safely; and
      (ii) give ready access to those parts of the appliance that are within the cabin.
  - These requirements shall not apply:
    (a) where the driver or operator is indoors or otherwise adequately protected from the weather;
    (b) to a lifting appliance mounted on wheels and having a maximum safe working load of 1 tonne or less;

(c) to any machine incorporating a lifting appliance where the primary purpose of that machine is not that of a lifting appliance; or

(d) to a lifting appliance intended for occasional use or for use for only short periods.

- **Marking of Safe Working Loads**
  - A crane or lifting appliance shall be clearly and legibly marked with means of identification and the safe working load for the time being applicable to the crane or lifting appliance, in English and Chinese.
  - A crane (including a crane with a derricking jib) with variable operating radii shall be clearly and legibly marked with safe working load at various radii of the jib, trolley or crab.
  - In the case of a crane with a derricking jib, the maximum permissible radius at which the jib may be worked should be clearly and legibly marked on it.
  - Such crane shall have an accurate indicator visible to the driver, showing radius of jib, trolley or crab at any time and safe working load for that radius.
- **Load Not to Exceed the Safe Working Load**
  - Maximum safe working load of lifting appliances shall not be exceeded, except when tests of such appliances are being done by competent examiners.
- **Competent Person to be in Charge if Load Left Suspended**
  - Load shall not be left suspended from a lifting appliance unless a competent person is in charge of it during the period of suspension.
- **Scotch and Guy Derrick Cranes**
  - The jib of a Scotch derrick crane shall not be erected between the backstays, and the crane shall not be used to move any load lying in the angle between the backstays.
  - Precautions shall be taken against the foot of the king post of a Scotch derrick crane being lifted from the socket or support whilst in use.
  - If the guys of a guy derrick crane cannot be fixed at approximately equal angles to the mast so that the angles between adjacent pairs of guys are approximately equal, measure to ensure the stability of the crane shall be taken.
- **Cranes with Derricking Jibs**
  - The cranes shall be provided with properly maintained and effective locking arrangement between the derricking clutch and the pawl sustaining the derricking drums unless the hoisting and derricking drums are independently driven or the derricking drum driving mechanism is

self-locking.

- **Restriction on the Use of Cranes**
  - The hoisting mechanism of a crane shall not be used except for raising or lowering loads vertically, unless it can be used otherwise without imposing undue stress or endangering the stability and unless a competent person supervises the operation.
  - Any crane that has a derricking jib shall not be used with the jib extended at a greater radius than that specified in the certificate of test and thorough examination relating to that crane.
- **Operators of Cranes and Lifting Appliances**
  - A crane shall only be operated by a person who:
    (a) has attained the age of 18 years;
    (b) holds a valid certificate issued by the Construction Industry Council (formerly known as Construction Industry Training Authority) or by any other person specified by the Commissioner; and
    (c) is competent to operate the crane by virtue of his experience.
  - A power-driven lifting appliance, other than a crane, shall only be operated by a person who:
    (a) has attained the age of 18 years; and
    (b) in the opinion of the owner, is trained and competent to operate the appliance.

  These requirements shall not apply where a trainee is operating a lifting appliance under the supervision of a person who meets the requirements of above regulations.
- **Operation of Lifting Appliances**
  - If the operator of a lifting appliance does not have a clear and unrestricted view which is necessary for the safe working of the appliance, one or more persons shall be appointed and stationed to give effective signals to the operator of the lifting appliance to ensure its safe working.
  - Any person appointed to give signal shall not be under the age of 18 years unless he is a trainee and acts under the supervision of a competent person.
  - If it is impracticable to comply with the first paragraph, effective signalling arrangements or means of communication shall be provided between the operator of the lifting appliance and the person employed in the loading or unloading of the appliance to ensure its safe working.
- **Brakes, Controls, Safety Devices, etc.**
  - Every crane, crab and winch shall be provided with an efficient brake or brakes or other similar safety devices to prevent a suspended load from falling uncontrollably or dangerously.

- Every lever, handle, switch, or other device used for controlling the operation of any part of the lifting appliance shall, where practicable, be provided with a suitable spring or other locking arrangement to prevent the accidental movement or displacement of the level etc. Such lever, handle, switch or other device shall bear clear markings to indicate its purpose and the mode of operation.
- The rotating handles of a manually operated winch or non-derricking jib crane do not require markings to indicate their purpose and operation mode.
- Effective measures are required to be taken to prevent an overhead travelling crane from coming within 6 m of a place where any person working on or near the wheel track is liable to be struck by the overhead travelling crane.
- Where any person is employed or working above floor level and is liable to be struck by an overhead travelling crane or its suspended load, effective precautions are to be taken to ensure that such person is warned of the approach of the crane. This does not apply when the person's work is connected with or dependent on the movements of the crane.

- **Drums and Pulleys**
  - Every drum or pulley on which a rope of any lifting appliance is carried shall be of sufficient diameter and construction for the rope used. Every rope which terminates at the winding drum of a lifting appliance shall be properly secured to the drum. At least two turns of the rope shall remain on the drum at every operating position of the lifting appliance.

Chains, Ropes and Lifting Gear

- **Construction, Testing, Examination and Safe Working Load of Chains, Ropes and Lifting Gear**
  - Chains, ropes and lifting gear shall be of good construction, sound material, adequate strength, and shall be free from patent defect. They shall be marked with safe working load and means of identification.
  - A table in English and Chinese showing the safe working loads of each kind and size of chain, rope or lifting gear in use, and, in the case of a multiple sling, the safe working load at different angles of the legs, shall be posted in a prominent position within the industrial undertaking. Only chain, rope or lifting gear shown in the table shall be used.
  - No chain, rope or lifting gear shall be used for any load exceeding its safe working load shown in the table.
  - No chain, rope or lifting gear (except a fibre rope or fibre-rope sling) shall

be used unless it has been tested and thoroughly examined by a competent examiner in the manner prescribed in the First Schedule (Please see Appendix II) and a certificate in the approved form in which the competent examiner has made a statement to the effect that it is in safe working order has been obtained.

- Each chain, rope and lifting gear in use shall be thoroughly examined by a competent examiner in the preceding 6 months before it is used and a certificate in the approved form in which the competent examiner has made a statement to the effect that it is in safe working order has been obtained.
- Each chain, rope and lifting gear shall be inspected before use on each occasion by a competent person.
- Every chain shall not be shortened by tying knots in it nor shall it be damaged by sharp edges.
- The chain, rope or lifting gear in use shall be clearly and legibly marked on it its safe working load together with an appropriate mark to distinguish it from other similar lifting gear.
- The chain, rope or lifting gear shall not be loaded beyond its safe working load except for the purpose of testing or examination by a competent examiner.
- A wire rope shall not be used for raising or lowering or as a means of suspension if in any length of 10 diameters, the total number of visible broken wires exceeds 5% of the total number of wires in the rope.

- **Multiple Slings**
  - The upper ends of the sling legs of a double or multiple sling used in raising or lowering or as a means of suspension shall be connected by means of a shackle, ring or link of adequate strength.
  - A double or multiple sling shall not be used in raising or lowering or as a means of suspension if the safe working load of any sling leg is exceeded as a result of the angle between the sling legs.

Miscellaneous

- **Carrying of Persons by means of Lifting Appliances**
  - A person may be raised, lowered or carried by a power-driven lifting appliance:
    (a) on the driver's platform in the case of a crane;
    (b) on a suspended scaffold of such design and construction as ensures the safety of any person carried by it;
    (c) without the use of a builder's lift or tower working platform to which

the Builders' Lifts and Tower Working Platforms (Safety) Ordinance (Cap. 470) applies or a suspended scaffold where its use is impracticable, provided that:

(i) the appliance can be operated from one position only;

(ii) the appliance is so constructed that the brake is applied when the control lever, handle or switch is not held in the operating position;

(iii) where the person is carried in a chair, cage, skip or other receptacle at least 900 mm deep, the receptacle is of good construction, sound material and adequate strength, and is provided with suitable means to prevent any occupant from falling out and does not contain material or tools liable to interfere with his hand hold or otherwise endanger him, or where the person is carried in a boatswain's chair or other similar plant or equipment less than 900 mm deep, a suitable safety belt attached to an independent lifeline is provided to and worn by the occupant and the lifeline is securely suspended;

(iv) suitable measures are taken to prevent such chair, cage, skip or other receptacle from spinning or tipping in a manner dangerous to any occupant; and

(v) if a hook is fitted to the lifting appliance, it is so designed and maintained as to prevent the accidental displacement of such chair, cage, skip or receptacle from the hook

(d) from an aerial ropeway or cableway or an overhead runway, provided that the provisions of subparagraph (c)(ii), (iii), (iv) and (v) above are complied with.

- **Keeping and Displaying of Certificates and Reports**
  - The certificates and reports issued in respect of any test, examination or inspection of lifting appliances, chains, ropes or lifting gear (whether the equipment is still in use or not) shall be kept in a safe place.
  - shall not be disposed of until 2 years after the date of issue thereof or the date on which the lifting appliance, chain, rope or lifting gear is disposed of.
  - The certificates or reports shall be made available for inspection at all reasonable time by an occupational safety officer who requests to see them.
  - A copy or an extract from any certificate or report shall be delivered to an occupational safety officer upon his request in writing within such

period (being not less than 7 days) as may be specified in the request.

- A copy of the relevant and the most recent certificate or report shall be displayed in the driving cabin or other prominent place on the equipment to which it relates or in a prominent place nearby.

1.4 Construction Sites (Safety) Regulations (Chapter 59I)

These regulations control the construction, maintenance, use and operation of hoists, scaffolds and working platforms. There are also provisions for the use of personal protective equipment for protection against falling of person, falling objects and drowning in a construction site. There are miscellaneous safety requirements such as prevention of inhalation of dust and fumes, protection of eyes and the provision of first aid facilities.

Part VA of the Construction Sites (Safety) Regulations provides a greater degree of safety to persons working on construction sites, in particular in relation to preventing falls from heights. The contractors have the general duty to make and keep every place of work on a construction site safe, and in particular, to take suitable and adequate steps to prevent persons from falling from a height of 2 metres or more, such as provision, use and maintenance of working platforms, guard-rails, barriers, toe-boards and fences, coverings for openings, gangways and runs, etc.

1.5 Factories and Industrial Undertakings (Cargo and Container Handling) Regulations (Chapter 59K)

These regulations provide for the requirements on safety of workers employed in industrial undertakings of loading, unloading or handling of cargo and goods at docks, quays or wharves as well as those employed in industrial undertakings of loading, unloading, handling, stacking, unstacking, storing or maintaining (including repairing) of freight containers. They also stipulate requirements on the provision of first aid facilities at docks, quays and wharves.

1.6 Factories and Industrial Undertakings (Loadshifting Machinery) Regulation (Chapter 59AG)

Loadshifting machines used in the industrial undertakings are operated by a person who has attained the age of 18 years, attended a relevant training course and holds a valid certificate. Fork-lift trucks used in industrial undertakings; bulldozers,

loaders, excavators, trucks or lorries, compactors, dumpers, graders, locomotives, and scrapers used on construction site are within the ambit of the Regulation. However, the Regulation does not apply to the operator of a truck or lorry who holds a valid driving licence under the Road Traffic Ordinance (Cap. 374).

1.7 Code of Practice

The Code of Practice (hereinafter referred as the Code) has a special legal status. Although failure to observe any guidance contained in the Code is not in itself an offence that failure may be taken by a court in criminal proceedings as a relevant factor in determining whether or not a person has breached any of the provisions of the regulations to which the guidance relates.

Codes of practice that are often used include:

- Code of Practice on Mechanical Handling Safety in Container Yards
- Code of Practice for Safe Use of Mobile Cranes
- Code of Practice for Safe Use of Tower Cranes
- Code of Practice for Safety and Health at Work (Land-based Construction Over Water – Prevention of Fall)

1.7.1 The content related to the responsibilities of competent persons in the "Code of Practice for Safe Use of Mobile Cranes", the "Code of Practice for Safe Use of Tower Cranes" and the "Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations" include:

- Routine checks
  - Inspection within the preceding 7 days before use
  - Delivery of a certificate in the approved form to the owner
- Automatic safe load indicator
  - Conducting inspection
  - Making a statement to the effect that the automatic safe load indicator is in good working order in the certificate
  - Delivery of the certificate to the owner
- Supervision of the erection, dismantling or alteration of cranes
- Supervision of the operation of cranes when the cranes are used for multiple lifting operation
- In charge of the load during the period of suspension
- Supervision of the operation of crane when the crane is used to drag a load not in a vertical direction

- The person operating lifting appliance shall not be under the age of 18 years unless he acts under the supervision of a competent person
- Lifting gears (such as chains and ropes) shall be inspected before use on each occasion by a competent person
- Providing advice on the safe system of work
- Supervision of the use of partially extended outriggers of cranes
- Proximity of other cranes
  - Co-ordination and supervision
  - Informing all the personnel involved
- Supervision of the travelling of long jib crane in the place of work
- Travelling with suspended loads
  - Supervision of the travelling with suspended loads
  - Providing relevant preventive measures before travelling on slopes

1.7.2 The content related to crane standing or supporting conditions, and mode of operation and control in the "Code of Practice for Safe Use of Mobile Cranes" include:

Crane standing or supporting conditions

- Mobile cranes should only be operated on uniform, level and firm ground with sufficient load bearing capacity to withstand the maximum in-service loadings of the crane. It should be noted that wind loadings and dynamic effect should also be taken into account.
- In order to avoid the sinkage or collapse of the supporting surface and overturning or collapse of the crane (especially the operation of heavy cranes), the loading should be distributed over a sufficiently large area. Steel plates of adequate strength, suitable mats or suitable timber blocking should therefore be used.
- If outriggers are provided, the beams should be fully extended as far as practicable. The jacks should be suitably extended so that all the crane tyres are clear of the ground.
- The mat or timber blocking should be at least 3 times larger in area than the float (unless a smaller area is specified by the manufacturer) and completely support the float. For timber blocking, it should be tightly spaced and level to guarantee a right angle (90 degrees) between the cylinder and the float of the outrigger.
- Advice should be sought from the manufacturer regarding the particular data and information on weights and loadings of the crane. Besides, the supporting surface should be frequently examined during the operation to ensure that

there has been no movement or sinkage affecting the crane's stability (especially the operation of heavy cranes).

Mode of operation

- Before starting any lifting operation with a crane, the operator should ensure that he has a clear and unrestricted view of the load and operational area; if not, he should act under the directions of an authorized signaller who is positioned to have such a clear and uninterrupted view (especially the operation of crane by using remote control).

1.7.3 The content related to precautions to be taken in fitting the slings (rigging) in the "Code of Practice for Safe Use of Mobile Cranes" and the "Code of Practice for Safe Use of Tower Cranes" include:

- When fitting the sling to a load, steps should be taken to ensure that:
  - sling legs are free of kinks or any tendency to kink;
  - only the eye termination with thimble is placed on the crane hook;
  - the terminations are properly seated without overcrowding;
  - the load is effectively secured by the sling;
  - the relevant leg angle does not exceed that for which the sling is rated and marked;
  - the sling is not bent around any corners that might damage or reduce the effective strength of the sling. Where necessary suitable packing pieces should be used;
  - when using choke hitch:
    (i) the angle of choke is allowed to form itself naturally and is not forced;
    (ii) a thimble or stirrup is used where practicable at the eye to reduce damage to the rope and thereby prolong the life of both the eye and the main part of the rope; and
  - a tag line or control rope is available for assisting in the control of the swing or rotation of the load.

1.8 Road Traffic (Construction and Maintenance of Vehicles) Regulations and Code of Practice for the Loading of Vehicles

As stipulated under the Road Traffic (Construction and Maintenance of Vehicles) Regulations, the overall height of a crane lorry (including the load and equipment it carries) must not exceed 4.6 metres when running on roads. The Code of Practice for the Loading of Vehicles, which reminds crane operators to have the crane

lowered and returned to its stowed position after operating the crane attached to the vehicle. The Code of Practice also recommends the installation of warning systems on vehicles to alert drivers if the cranes are out of their stowed position when the vehicles are in motion.

(Note: The Code of Practice for Safe Use of Mobile Cranes and the manufacturer's instructions or recommendations for crane travelling and transportation in industrial undertakings should be followed regarding the restrictions in jib length, jib suspension and counterweights, and the maintenance of the stability of the crane.)

2. Handling of Accidents and Dangerous Occurrences and Reporting Procedures

[Reference teaching time for Section 2: 5 mins]

2.1 Handling of Work Injury

- For any work injury to a worker, the worker should inform the supervisor immediately and receive suitable treatment.
- Unless a worker has received adequate first aid training, the worker should not move the victim.
- If a worker is seriously injured or needs to be hospitalized, the supervisor should inform the safety department and call police immediately.
- If a worker falls from height, inform the first aider to take care of the worker but do not move the worker.

2.2 Reporting Workplace Accidents and Dangerous Occurrences

Reports of Accidents resulting in death or serious bodily injury

- The employer should notify it to an occupational safety officer of the Labour Department within 24 hours after the time when the accident occurred.

Reports of Accidents resulting in Incapacity

- According to the Employees' Compensation Ordinance, for an accident that results in an employee being incapacitated from working for a period exceeding 3 days, the employer should report it in writing to the Labour Department within 14 days after the date of the accident.

Reporting Dangerous Occurrences (For example, collapse of crane, disintegration of grinding wheel, etc.)

- Every dangerous occurrence which occurs at a workplace, whether any personal injury has been caused or not, shall be reported to the Labour Department within 24 hours of its occurrence.

3. Commonly Used Personal Protective Equipment

[Reference teaching time for Section 3: 15 mins (excluding time for demonstration and hands-on practice)]

- Personal protective equipment (PPE) is intended to be worn or otherwise used by a person at work and protects the person against one or more hazards to his/her safety or health. Use of PPE is the last resort when controlling the sources of accident is impracticable.
- PPE should be provided by employers. Employees must wear PPE for the entire period of exposure to hazards.

3.1 Personal Protective Equipment

3.1.1 Safety Helmets with Chin Straps **[Explain by means of the real object of PPE or powerpoint]**

- Wear a safety helmet on a construction site under all circumstances.
- A safety helmet is primarily intended to protect the top of the head from being injured by falling objects.
- A suitable safety helmet should bear appropriate marking indicating the conformity to certain international/ national standards such as European Standard.
- A safety helmet should be equipped with a chin strap.

3.1.2 Safety Shoes **[Explain by means of the real object of PPE or powerpoint]**

- Safety shoes should have steel toe caps, steel soles, slip-proof and water-proof characteristics.

3.1.3 Safety Gloves **[Explain by means of the real object of PPE or powerpoint]**

- Protect hands from getting injured by abrasion; cuts and punctures; contact with chemicals; electric shock; skin infection.
- Types of safety gloves include rubber gloves, steel, mesh gloves, leather gloves, wrist and arm protective devices.
- Workers should not wear cotton gloves for operating a machine with revolving parts so as to avoid causing injury to hands due to entangling of cotton gloves with the revolving parts of the machine.

3.1.4 Ear Protectors [Explain by means of the real object of PPE or powerpoint]

- Ear muffs are the most efficient noise isolation ear protectors.
- Wear ear protectors in areas with high noise levels.
- Properly wear ear protectors according to the manufacturer's instructions.

3.1.5 Eye Protectors [Explain by means of the real object of PPE or powerpoint]

- When there is a risk of eye injury, such as in concrete breaking or using abrasive wheels, suitable eye protectors should be worn.
- Take proper care of the eye protectors provided to you.
- Replace damaged or defective eye protectors immediately.
- Ensure that eye protectors are comfortable to wear, and keep clean.

3.1.6 Respirator [Explain by means of the real object of PPE or powerpoint]

- Protect workers against dust; fibres, hazardous gases and fumes and prevent workers from oxygen deficiency.
- Types of breathing apparatus include: disposable cartridge respirators; full-face/half-face respirators; air-supplied hoods; self-contained respirators.
- When using breathing apparatus, it must be properly fitted on the wearer’s face.
- Breathing apparatus should be cleaned thoroughly after each use.

3.1.7 Safety Harness with Lifeline and Fall-arresting Device [Explain by means of the real object of PPE or powerpoint]

- The most suitable way to use a safety belt is to attach its snap-hook to a level higher than the user’s waist.
- When falling from height, a full body harness (commonly known as parachute type) could better reduce the downward momentum and protect the user’s waist from injury than a general safety belt.
    - Before using a safety belt, the following should be considered: any defects on the safety belt, any suitable anchorage, independent lifeline and fall arresting device, and whether the standard is met or not.

- When using a safety belt for fall protection, the safety belt should be attached to a fixed anchorage point or a fall arrester of an independent lifeline.

3.1.8 Protective Clothing [Explain by means of the real object of PPE or powerpoint]

- Protective clothing is being used as working clothes or uniform, it also protects workers against injuries caused by hazards such as contact with chemicals or flame, striking, stabbing, radiation, drowning, extreme cold, hot or adverse weather conditions.
- The types of protective clothing: General purpose protective clothing; disposable overalls; specialized protective clothing such as cold resistant clothing; chemical or radiation protective clothing; high visibility clothing, puncture-resistant aprons and lifejacket used for land-based work carried out adjacent to water.

Occupational Safety and Health Branch
Labour Department

Annex 6

Answer Sheet for Standardised Part of Course Content of Training for Operators of Crane

Answer Sheet
for Standardised Part of Course Content of Training for Operators of Crane

Name of Course Provider : _____

Class Ref. (TRC1): _____ **Examination Paper Code :** _____

Date of Examination : _____ **Examination Start Time :** _____

Name of Trainee : _____ **Mark :** _____

Instructions to Trainees

1. **The examination paper consists of 6 multiple choice questions. Each correct answer carries 1 mark. Please answer all questions.**
2. **The passing mark of the examination is 3. The examination must be finished in 10 minutes.**
3. **Please read the questions carefully and put a tick in the answer box you choose for the question.**
4. **If you tick more than one answer box for one question, no marks will be awarded.**
5. **Please initial next to your final answer whenever amendment is made.**
6. **If you have any questions, please raise your hand and ask the examiner or invigilator.**

Question	Answer			
	A	B	C	D
1				
2				
3				
4				
5				
6				

Please tick only one box to denote if the trainee has used the question paper reading service and also if it is read in English.

Not required		Read in English		Read in language other than English	

Signature of Trainee : _____ **Date:** _____

Name and Signature of Invigilator : _____ **Date:** _____