



Lift Training Standard

V3

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CONTENTS

| | | |
|-----|---|----|
| 1. | LIST OF ABBREVIATIONS | 5 |
| 2. | TERMS AND DEFINITIONS | 5 |
| 3. | CHANGE LOG | 6 |
| 4. | SCOPE | 9 |
| 5. | GENERAL REQUIREMENTS FOR THE LIFT TRAINING | 9 |
| 5.1 | Overview | 10 |
| 5.2 | Target Group | 10 |
| 5.3 | Validity Period | 10 |
| 5.4 | Aims and Objectives | 10 |
| 5.5 | Duration of the Lift Training Standard Modules | 11 |
| 5.6 | Course Codes | 11 |
| 5.7 | Participant Prerequisites | 12 |
| 5.8 | Instructor Qualification Prerequisites | 12 |
| 6. | USING THIS STANDARD TO DEVELOP TRAINING | 12 |
| 7. | LIFT USER MODULE | 14 |
| 7.1 | Aims and Objectives for the Lift User Module | 14 |
| 7.2 | Duration of the Lift User Module | 14 |
| 7.3 | Instructor to Participant Ratio | 14 |
| 7.4 | Lift User Module Timetable | 15 |
| 7.5 | Detailed Description of the Lift User Module | 16 |
| | Lesson 1 - Introduction to the training | 16 |
| | Lesson 2 - Legislation | 22 |
| | Lesson 3 - General use of lifts | 22 |
| | Lesson 4 - Inspection on lift prior to use | 26 |
| | Lesson 5 - Operation of lift (practical exercise) | 30 |
| | Lesson 6 - Evacuation of lift | 37 |
| | Lesson 7 - Shutdown after use | 39 |
| | Lesson 8 - Training review | 41 |
| 8. | LIFT COMMISSION AND INSPECTION MODULE | 43 |
| 8.1 | Aims of the Lift Commission and Inspection Module | 43 |
| 8.2 | Course Participants Prerequisites for the Lift Commission and Inspection Module | 43 |
| 8.3 | LCI Module Instructor's Qualification | 43 |
| 8.4 | Duration of the Lift Commission and Inspection Module | 43 |
| 8.5 | Instructor to Participant Ratio | 44 |



| | | |
|-----|--|-----------|
| 8.6 | Lift Commission and Inspection Module timetable | 44 |
| 8.7 | Detailed Description of the Lift Commission and Inspection Module | 47 |
| | Lesson 1 - Introduction to the Training..... | 47 |
| | Lesson 2 - Legislation and documentation | 52 |
| | Lesson 3 - Safety when working on a lift in a WTG | 54 |
| | Lesson 4 - gates and Fences..... | 56 |
| | Lesson 5 - Cabin and its attachment parts..... | 58 |
| | Lesson 6 - Cabin guide unit..... | 60 |
| | Lesson 7 - Top obstruction device | 64 |
| | Lesson 8 - Bottom obstruction device | 66 |
| | Lesson 9 - Lift door lock / electrical inter-lock..... | 69 |
| | Lesson 10 - Lift operation panel/manoeuvre panel..... | 71 |
| | Lesson 11 - Suspension/crossbeam | 73 |
| | Lesson 12 - Drive and safety wire rope and rack | 76 |
| | Lesson 13 - Traction hoist | 81 |
| | Lesson 14 - Wire rope redirection inside the cabin | 86 |
| | Lesson 15 - Fall arrest device (FAD) | 87 |
| | Lesson 16 - Supply Cable | 88 |
| | Lesson 17 - Test and training review | 90 |
| 9. | LIFT COMMISSION, INSPECTION, INSTALLATION AND MAINTENANCE MODULE | 94 |
| 9.1 | Aims of the Lift Commission, Inspection, Installation and Maintenance Module | 94 |
| 9.2 | Course Participants Prerequisites for the Lift Commission, Inspection, Installation and Maintenance Module | 94 |
| 9.3 | LCIIM Module Instructor's Qualification | 94 |
| 9.4 | Duration of the Lift Commission, Inspection, Installation and Maintenance Module | 94 |
| 9.5 | Instructor to Participants Ratio | 95 |
| 9.6 | Lift Commission, Inspection, Installation and Maintenance Module Timetable | 95 |
| 9.7 | Formative Post-lesson Evaluations | 98 |
| 9.8 | Detailed Description of the Lift Commission, Inspection, Installation and Maintenance Module | 99 |
| | Lesson 1 - Introduction to the training | 99 |
| | Lesson 2 - Legislation and documentation | 104 |
| | Lesson 3 - Safety when working on a lift in a WTG | 106 |
| | Lesson 4 - Gates and fences..... | 108 |
| | Lesson 5 - Cabin and its attachment parts..... | 110 |
| | Lesson 6 - Cabin guide unit..... | 113 |
| | Lesson 7 - Top obstruction device | 117 |
| | Lesson 8 - Bottom obstruction device | 119 |
| | Lesson 9 - Lift door lock and electrical inter-lock | 122 |
| | Lesson 10 - Lift operation panel / manoeuvre panel..... | 124 |
| | Lesson 11 - Suspension/crossbeam | 126 |
| | Lesson 12 - Drive and safety wire rope and rack | 129 |
| | Lesson 13 - Traction hoist | 135 |



Lesson 14 - Wire rope redirection inside the cabin 141

Lesson 15 - Fall arrest device (FAD) 141

Lesson 16 - Supply Cable 143

Lesson 17 - Test and training review 146

ANNEX 1 - EQUIPMENT LIST 149

ANNEX 2 - GUIDELINE FOR WARM-UP EXERCISES..... 152

ANNEX 3 - MANUAL HANDLING RISK ASSESSMENT 159

ANNEX 4 - VERSION HISTORY 168



1. LIST OF ABBREVIATIONS

| | |
|-------|--|
| FAD | Fall arrest device |
| GWO | Global Wind Organisation |
| LCI | Lift Commission and Inspection |
| LCIIM | Lift Commission, Inspection, Installation, and Maintenance |
| LOP | Lift operation panel/manoeuvre panel |
| LU | Lift User |
| PPE | Personal protective equipment |
| WINDA | GWO training record database |
| WTG | Wind turbine generator |

2. TERMS AND DEFINITIONS

| Term | Definition |
|----------------------------------|--|
| Accident prevention regulations | The local accident prevention regulations and general safety regulations apply to the use of this product in addition to those described in this manual. |
| As low as reasonably practicable | This means that a risk is identified and controlled to a lower level weighted against the effort, time and money needed to control it. |
| Bowden Cable | Device interrupting the release of the manual brake, when obstacles are detected, when no-power-descent is performed. |
| Fall Arrest device | Safety brake systems. Safety catch device. Secondary brake. |
| Human Factors | Human factors are an established science that uses many disciplines (like anatomy, physiology, physics, and biomechanics) to understand how people perform under different circumstances and environments. |
| Illustrations | Illustrations are provided for basic understanding and can differ from the actual lift model. |



Lessons Instructors' tool to test the participants learning outcome. The questions must aim at the content and taxonomic level in the relevant learning objectives and should be challenging the participants on their professional level.

Lift Operation Panel Control Panel and Manoeuvre Panel - where all operations of the lift can be executed.

Must For clarity where the word 'must' is used in this standard it shall have the same meaning as 'shall'.

Operating personnel Any person or persons who are responsible for the operation.

Operator The operator is the organisation (or person) who causes the product to be used.

Option An option is the choice of a particular additional installation or equipment for the product. It is possible that the product which you are operating is fitted with none or only a few of these options.

Pre-use Inspection An inspection of the lift and the lift environment prior to use (may also be referred to as daily inspection).

Shall Verbal form used to indicate requirements strictly to be followed in order to conform to this training standard and from which no deviation is permitted.

Should Verbal form used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required.

Toolbox Talk A job site safety briefing covering the risks and hazards of the task being performed.

3. CHANGE LOG

| Amendment date | Version | Approved by & date | Description of changes |
|----------------|---------|--------------------|------------------------|
| 2 May 2023 | 3 | GWO TC 2023 | |

Changes throughout

- New layout
- MAC deleted throughout the standard.

Section 2 Terms and Conditions

- New text added- As low as reasonably practicable

Section 4 Scope



- Text revised and updated

General Requirements for the Lift Training

Section 5.1 Overview

- The template provides a table for split modules; the original content does not mention a split module. The original content is adopted.

Section 5.4 Duration

- Text updated to clarify instructions

Table 5-4.1 Duration

- Lift Commission, Inspection, Installation and Maintenance Module: Deleted 2 days

Section 5.7 Participant Prerequisites for the Lift modules

- Text replaced to: All personnel participating must meet the participant prerequisites described in the GWO Requirements for Training.

Section 5.8 and 5.9

- Section-Deleted

Section 6 Using this Standard to Develop Training

- Text revise and updated according to GWO standards

Lift User Module

Section 7.2 Duration of the Lift User module

- Text updated to clarify instructions

Section 7.3 Digital training

- Section-Deleted

Section 7.5 Lift User Module timetable

- Text updated to clarify instructions

Lift Commission and Inspection Module

Section 8.4 Duration of the Lift Commission and Inspection Module

- Text updated to clarify instructions

Section 8.5 Digital training

- Section- Deleted



Section 8.6 Lift Commission and Inspection Module Timetable

- Text updated to clarify instructions

Lift Commission, Inspection, Installation and Maintenance Module

Section 9.4 Duration of the Lift Commission, Inspection, Installation and Maintenance Module

- Text updated to clarify instructions

Section 9.5. Digital training

- Section- Deleted

Section 9.7. Lift Commission, Inspection, Installation and Maintenance Module Timetable

- Text updated to clarify instructions

Section 9.8. Formative post-lesson evaluation

- Text revised and updated

Equipment list

- Revised and updated according to GWO standards
-



4. SCOPE

Global Wind Organisation is a non-profit body founded by the wind turbine manufacturers and owners. Our members strive for an injury free work environment in the wind turbine industry, setting common international standards for safety training and emergency procedures.

This standard describes the requirements for lift training courses that are recommended by the members of GWO. This standard comprises of three modules:

1. Lift User Module
2. Lift Commission and Inspection Module
3. Lift Commission, Inspection, Installation and Maintenance Module

The members of the Global Wind Organisation (GWO) recognise trained persons as competent within use, inspection, installation and maintenance of lifts in the wind industry and accept the trained person as possessing the required abilities to use, commission, inspect, install, maintain, and evacuate a lift where they as duty-holders are accountable for safety.

This standard has been developed in response to the demand for recognisable lift training in the industry and has been prepared in co-operation between the members of GWO based on risk assessments and factual incident and accident statistics from G+ and the wind industry.

General feedback on this document can be sent to info@globalwindsafety.org See globalwindsafety.org on how to raise a complaint about a training provider or report a safety incident occurring during training.

5. GENERAL REQUIREMENTS FOR THE LIFT TRAINING

Upon completion of the GWO Lift User Module training (LU), participants will be aware of the risks and hazards encountered in the use of lifts within the wind industry. Furthermore, they will be able to control and mitigate those risks and hazards. The GWO Lift User Module training will also equip participants with the ability to take responsibility and appropriately respond in the event of a hazardous situation and to increase their safety through proper use of personal protective equipment, emergency equipment, procedures, and safe craftsmanship.

Upon completion of the GWO Lift Commission and Inspection Module training (LCI), participants will be aware of the risks and hazards encountered when doing commissioning inspections of lifts within the wind industry. Furthermore, they will be able to control and mitigate those risks and hazards. The GWO Lift Commission and Inspection Module training will also equip participants with the ability to take responsibility and appropriately respond in the event of a hazardous situation and to increase their safety through proper use of personal protective equipment, emergency equipment, procedures, and safe craftsmanship.

Upon completion of the GWO Lift Commission, Inspection, Installation and Maintenance training Module (LCIIM), participants will be aware of the risks and hazards encountered when doing commissioning, inspection, installation, and maintenance of lifts within the wind industry. Furthermore, they will be able to control and mitigate those risks and hazards. The GWO Lift Commission, Inspection, Installation and Maintenance Module training will also equip participants with the ability to take responsibility and appropriately respond in the event of a hazardous situation and



to increase their safety through proper use of personal protective equipment, emergency equipment, procedures, and safe craftsmanship.

5.1 Overview

The GWO Lift Standard's modules are a mix of theoretical and practical elements focusing on developing the needed knowledge, skills, and abilities for a wind employee to operate, commission, inspect, install, maintain, and evacuate a lift in a WTG.

The Lift Standard's modules have a generic focus in relation to different lift types and systems, and the initiative and responsibility to follow guidance in relevant manuals when needed is a basic part of the learning objectives in these modules.

5.2 Target Group

Target group for the Lift User Module training is personnel working on WTGs within the wind industry where the use of lifts is required for transportation of personnel and equipment inside the WTG.

Target group for the Lift Commission and Inspection Module training is personnel working on WTGs within the wind industry who shall inspect the installation and functioning of lifts in a WTG for the purpose of commissioning of the lift.

Target group for the Lift Commission, Inspection, Installation and Maintenance Module training is personnel working on WTGs within the wind industry by commissioning, inspecting, installing, and doing maintaining work on lifts in a WTG.

5.3 Validity Period

The Lift Standard trainings are enduring qualifications and therefore a validity period does not apply to these trainings. This assumes that the participant is actively working with the use, inspection, installation, and maintenance respectively of lifts.

5.4 Aims and Objectives

Training in accordance with this Lift Standard will enable participants to take responsibility to support and care for themselves and others while operating and working on a lift in the wind industry.

The Lift User Module is aimed at using a lift in the wind industry.

The Lift Commission and Inspection Module is aimed at inspection and testing a lift in the wind industry after pre-assembly in the WTG.

The Lift Commission, Inspection, Installation and Maintenance Module is aimed at doing commissioning, inspection, installing, and maintaining work on a lift in a WTG.

These aims are fulfilled when the participants possess the required knowledge, skills, and abilities to conduct assigned tasks and operations in a lift safely and efficiently.

A prerequisite for being able to do this is that the relevant manuals and guides are at hand and used at all times.



5.5 Duration of the Lift Standard Training

The total contact time for completing the Lift Standard training is *25 hours and 0 minutes*. This is based on the times given in the module timetables and summarised in table 5.4.1 below.

The training provider must not exceed the time per day given in table 5.4.2 below.

| Modules | Duration |
|--|--------------------|
| Lift User Module | 4 hours 0 minutes |
| Lift Commission and Inspection Module | 7 hours 0 minutes |
| Lift Commission, Inspection, Installation and Maintenance Module | 14 hours 0 minutes |

Table 5.4.1 - Duration of the GWO Lift Training Standard Modules

| | Maximum Duration Per Day |
|--------------------|--------------------------|
| Contact time | 8 hours |
| Total training day | 10 hours |

Table 5.4.2 – Maximum durations for training days

Note *Contact time includes delivery of course lesson content, practical exercises and activities directly related to these.*

The total training day includes contact time, meals and breaks and travel between training sites (where applicable).

If a participant fails to meet the demands of a lift training, they shall attend a new lift training.

5.6 Course Codes

| Module | Course Code |
|--|-------------|
| Lifter User Module | LU |
| Lift Commission and Inspection Module | LCI |
| Lift Commission, Inspection, Installation and Maintenance Module | LCIIM |

Table 5.6.1 – GWO Lift Standard Module course codes



5.7 Participant Prerequisites

All personnel participating must meet the participant prerequisites described in the GWO Requirements for Training.

5.8 Instructor Qualification Prerequisites

A competent GWO Lift Standard instructor must adhere to the instructor requirements for GWO training.

6. USING THIS STANDARD TO DEVELOP TRAINING

The training in this standard is designed around the GWO taxonomy described in the GWO Requirements for Training. Theoretical and practical activities must be delivered according to the defined taxonomic level in order to reach the described learning objectives.

When teaching about equipment, a generic approach shall be applied aiming to avoid additional potential product specific formal training after completion of this training. However, national or regional legislation, company gap analysis and location specific risk assessments may require additional product specific familiarisation which is the responsibility of the duty holder.

In addition to this, all training based on this standard including all related resources shall, as a minimum, meet the requirements described in the GWO Requirements for Training.



GLOBAL WIND
ORGANISATION

Lift User Module

(LU)



7. LIFT USER MODULE

7.1 Aims and Objectives for the Lift User Module

The aim of GWO Lift User Module training is to enable the participant to use a lift in a WTG correctly. The training will provide the participant knowledge of multiple guiding systems and lift types in WTG. Furthermore, the participant will learn to perform the necessary pre-use inspections and emergency actions – and when needed take guidance in relevant manuals.

Overall learning objective:

- 1) The participants can on their own **take responsibility** for using a WTG lift correctly and safely and will on their own initiative seek guidance when needed (Ability, basic level).

7.2 Duration of the Lift User Module

The total contact time for completing the Lift User module is estimated to be 4 hours and 0 minutes.

The training provider must not exceed the time per day given in the table 7.2.1 below.

| | Maximum Duration Per Day |
|--------------------|--------------------------|
| Contact time | 8 hours |
| Total training day | 12 hours |

Table 7.2.1 – Maximum durations for training day

Note *Contact time includes delivery of course lesson content, practical exercises and activities directly related to these.*

The total training day includes contact time, meals and breaks and travel between training sites (where applicable).

7.3 Instructor to Participant Ratio

The ratio shown for theory sessions indicates the maximum number of participants per instructor attending the course.

Practical ratios indicate the maximum number of participants to be supervised by an instructor during each activity.

| Module | Session | Instructor to Participant Ratio |
|-----------|-----------|---------------------------------|
| Lift User | Theory | 1:12 |
| | Practical | 1:6 |



Table 7.3.1 – GWO Lift User Module participant ratio

Note When participants are split in more than one location for practical training, the ratio shall be 1 instructor per location.

7.4 Lift User Module Timetable

The order in which elements of this module are delivered may vary according to the didactical choices of the delivering training provider.

The delivery of this module must comply with the requirements described in the GWO Requirements for Training.

| Lesson | Element | Duration |
|------------------------------------|---|----------|
| 1. Introduction to the training | 1.1 Safety instructions and emergency procedures | |
| | 1.2 Facilities | |
| | 1.3 Introduction | |
| | 1.4 Scope and main learning objectives | |
| | 1.5 Ongoing assessments (participant assessment form) | |
| | 1.6 Motivation | |
| | 1.7 Human factors | |
| | 1.8 Personal Protective Equipment | |
| | TOTAL | 40 min. |
| 2. Legislation | | |
| | TOTAL | 10 min. |
| 3. General use of lifts | 3.1 Standards for use of lifts | |
| | 3.2 Transport of personnel and equipment | |
| | 3.3 Lift functionality | |
| | 3.4 General safety in use of lifts | |
| | TOTAL | 20 min. |
| 4. Inspection of lift prior to use | 4.1 General purpose of pre-use inspection | |
| | 4.2 Pre-use inspection checklist | |
| | 4.3 Pre-use inspection steps, outside the lift | |
| | 4.4 Pre-use inspection steps, inside the lift | |
| | 4.5 Inspection of lift - safety | |
| | TOTAL | 25 min. |



| | | | | |
|-------------|---|------|-----------------------------------|--|
| 5. | Operation of lift (practical exercises) | 5.1 | Initial safety precautions | |
| | | 5.2 | Pre-use inspection | |
| | | 5.3 | Stay in danger zone | |
| | | 5.4 | Safety in the lift travel range | |
| | | 5.5 | Safety inside the lift | |
| | | 5.6 | Fences and gates | |
| | | 5.7 | Faults and damage | |
| | | 5.8 | Empty transfer | |
| | | 5.9 | Unstable objects in the lift | |
| | | 5.10 | Safety when operating lift | |
| | | 5.11 | Emergency descent | |
| TOTAL | | | 90 min. | |
| 6. | Evacuation of lift | 6.1 | Operation of doors | |
| | | 6.2 | Rescue and evacuation plan | |
| | | 6.3 | Evacuation of lift | |
| TOTAL | | | 15 min. | |
| 7. | Shutdown after use | 7.1 | Lift in parking position, general | |
| | | 7.2 | Shutdown procedure | |
| TOTAL | | | 15 min. | |
| 8. | Training review | 8.1 | Training review | |
| | | 8.2 | Feedback session | |
| TOTAL | | | 25 min. | |
| GRAND TOTAL | | | 240 min. | |

Table 7.4.1 – GWO Lift User training Module timetable

7.5 Detailed Description of the Lift User Module

LESSON 1 - INTRODUCTION TO THE TRAINING

40 min.

The aim of this lesson is for the participants to be motivated and to engage in the training safely at a training facility, while recognising what is expected of them during the training.

After having successfully completed this lesson, the participants can:



- 1) **Take responsibility** of their own safe engagement and learning during the training (Ability, intermediate level)
- 2) **Name** and point out local emergency procedures and facilities (Knowledge, basic level)
- 3) **Discuss** the relevant human factors and explain their implications (Knowledge, intermediate level)

ELEMENT 1.1 - SAFETY INSTRUCTIONS AND EMERGENCY PROCEDURES

Learning objective:

- 4) The participants **show interest** or curiosity in the safety and emergency procedures at the training facility (Ability, basic level)



The instructor shall:

- 1.1.1 Explain, present, and ask involving questions aiming at:
 - a. safety instructions according to internal procedures
 - b. emergency procedures and emergency exits in the areas where the participants can be expected to be located during the course



The participants shall:

- 1.1.2 Engage in answering questions on local safety and emergency procedures

ELEMENT 1.2 - FACILITIES

Learning objective:

- 5) The participants can **recognise** the location of facilities at the training location (Knowledge, basic level)



The instructor shall:

- 1.2.1 Present a general description of the facilities at the training location (administration, dining area, restrooms, toilets, etc.)
- 1.2.2 Alternative activity: lead a tour and point out facilities



The participants shall:

- 1.2.3 Note relevant facilities and ask questions when in doubt

ELEMENT 1.3 - INTRODUCTION

Learning objective:

- 6) The participants **show interest** in fellow participants and in the course content and design (Ability, basic level)



The instructor shall:

- 1.3.1 Present and ask involving questions aiming at the programme of the Lift User Module training, including breaks and mealtimes:
- 1.3.2 Give a short introduction of themselves, including their backgrounds as instructors
- 1.3.3 Ask for participants' expectations of the training and their learning or development



The participants shall:

- 1.3.4 Give a short introduction to themselves, including job function and expected primary geographic work location and share expectations on the training

ELEMENT 1.4 - SCOPE AND MAIN LEARNING OBJECTIVES

Learning objective:

- 7) The participants can **recognise** the scope and main objectives of the Lift User Module (Knowledge, basic level)



The instructor shall:

- 1.4.1 Present the scope and main learning objectives of the Lift User Module:
- 1.4.2 Involve participants with questions on their understanding and individual experiences on lift user training



The participants shall:

- 1.4.3 Engage in answering questions and share experiences on lift user training and their use of lifts in WTG

ELEMENT 1.5 - ONGOING ASSESSMENT (PARTICIPANT ASSESSMENT FORM)

Learning objective:

- 8) The participants **recognise** the assessment procedure and aim of the ongoing assessment (Knowledge, basic level)



The instructor shall:

- 1.5.1 Explain the reasons for the ongoing assessment:
- 1.5.2 Present the layout of the GWO participant assessment form and explain how it will be used



The participants shall:

- 1.5.3 Engage themselves in discussion and ask questions when in doubt in relation to the assessment procedure

ELEMENT 1.6 - MOTIVATION

Learning objective:

- 9) The participants **show interest** and willingness to engage in the learning activities (Ability, basic level)



The instructor shall:

- 1.6.1 Explain and lead a discussion on:
- a. the importance or personal involvement in the course
 - b. the definition of and the need for lift user understandings and abilities



The participants shall:



- 1.6.2 Engage themselves in discussion and share experiences on the use of lifts as well as on engaging in training sessions in general

Note *Positive motivation is the driving force for commitment, and the instructor should make a focused effort to support growth of the necessary attitude and motivation in the participant*

ELEMENT 1.7 - HUMAN FACTORS

The aim of the element is to draw the participant's attention on how human performance and taking responsibility influences a safe work environment, and to prepare for the continued focus on human factors during practical training and exercises.

Learning objectives:

- 10) The participants can **describe** the relevant human factors, and their implications. (Knowledge, basic level)
- 11) The participants **show interest** and willingness to focus on human factors and their own performance during the following practical training and exercises (Ability, basic level)



The instructor shall:

- 1.7.1 Present how human factors influence accidents in the wind industry (relevant statistics may be applied):
- 1.7.2 Lead a discussion about the role of the individual in improving human performance and how this can improve the safety of offshore operations
- 1.7.3 Ensure that constructive feedback on the participant's performance involve human factor criteria when these are defined in the learning objective such as the ability to take responsibility or to act independently

Facts and Human Factor Criteria:

The consequences of human factor in accidents in the wind industry are influenced by the following terms and conditions:

- a. attention and perception
- b. group behaviour and peer pressure
- c. weather conditions
- d. weather delays
- e. noise levels



- f. site layout and housekeeping
- g. fitness and health
- h. domestic and work-related stress
- i. workload (both overload and underload)
- j. fatigue
- k. time pressure and deadlines
- l. alcohol, medication, and substance abuse



The participants shall:

- 1.7.4 Engage in discussions and share experiences on how human factors influence accidents in lifts and in WTG in general, engage in the received feedback and take responsibility on their own performance and development during the training

ELEMENT 1.8 - PERSONAL PROTECTIVE EQUIPMENT

Learning objectives:

- 12) The participants can **describe** the need for correct PPE (Knowledge, basic level)
- 13) The participants can identify and **describe** the correct use of PPE (Knowledge, basic level)



The instructor shall:

- 1.8.1 Ask questions on the participants' knowledge on the relevant PPE equipment including: helmet, shoes, safety glasses, gloves, high visibility clothing (harness and fall-arrest may be presented):



The participants shall:

- 1.8.2 Engage in instructor's questions and share experiences on the use of PPE

Note *This element may be conducted in relation to the practical exercises*

PPE is expected knowledge, and the learning activity should only be conducted when necessary



LESSON 2 - LEGISLATION

10 min.

The aim of this lesson is to enable the participants to comply with national/local-specific, company-specific, and brand-specific legislation and manuals when using a lift in WTG.

After having successfully completed Lesson 2 of the Lift User Module, the participants:

- 14) Can **explain** how brand-specific, company-specific, or national/local-specific legislation may affect the safe use of lifts (Knowledge, intermediate level)
- 15) Will on own **initiative** search for relevant legislation and manuals on site (Ability, basic level)



The instructor shall:

- 2.1.1 Present examples of the positive effect of applying legislations and of failing to apply relevant legislation. Examples of local legislation are: fire precautions or parking of lift during working hours:
- 2.1.2 Facilitate group discussion on the effect on applying relevant legislation and instructions, and how human factors may influence this



The participants shall:

- 2.1.3 Engage in group discussion and share experiences on legislation in relation to the use of lifts in WTG

Note *The need for using relevant lift manuals and instructions must be emphasised and trained in all learning activities during the training*

LESSON 3 - GENERAL USE OF LIFTS

20 min.

The aim of this lesson is to introduce a general understanding of the features and functionality of lifts in WTG with particular focus on general safety in the use of lifts. During the module, analogies and differences between lift types, brands and systems will be addressed.

After successfully having completed this lesson of the Lift User Module, the participants:

- 16) **Show interest** in following the standards and norms for using a lift in WTG correct and safely (Ability, basic level)

Note *Theory elements may be implemented in any order depending on the instructor's didactic considerations*



Note *Theory elements from this lesson should be completed during the practical training in Lessons 5 and 6 when feasible and relevant*

ELEMENT 3.1 - STANDARDS FOR USE OF LIFTS

Learning objective:

- 17) The participants can **recognise** the standards and norms for using a lift in WTG correct and safely (Knowledge, basic level)



The instructor shall:

- 3.1.1 Lead a discussion on:
 - a. purpose for use
 - b. correct use, in general
 - c. limits for use
 - d. installed safety equipment



The participants shall:

- 3.1.2 Engage in group discussion and share experiences on safety and the use of lifts and how human factors may influence this

ELEMENT 3.2 - TRANSPORT OF PERSONNEL AND EQUIPMENT

Learning objectives:

- 18) The participants can **describe** the risk of transferring more than the maximum permitted number of people or payload (Knowledge, basic level)
- 19) The participants can **recognise** that the transport of people in automatic drive is prohibited (Knowledge, basic level)
- 20) The participants can **explain** the consequences of overloading the lift (Knowledge, intermediate level)
- 21) The participants can **describe** how to 'overload auto-stop' to descend (Knowledge, basic level)



- 22) The participants can **describe** how to use the lift by use of send/call station on different lift brands (Knowledge, basic level)
- 23) The participants can **describe** the necessity of using a two-way communication system when using the plant (Knowledge, basic level)
- 24) The participants **show interest** and will take responsibility for the most important passenger safety issues within the lift, e.g. attachment point requirements and load distribution (Ability, basic level)



The instructor shall:

- 3.2.1 Explain criteria and potential hazards for transportation of personal and equipment in a lift
- 3.2.2 Facilitate a discussion on:
 - a. risks, hazards, and responsibilities when transporting personnel and equipment in a WTG lift
 - b. overload, automatic safety precautions and communication
 - c. human factors influences on safety during transportation of personal and equipment in a lift



The participants shall:

- 3.2.3 Engage in group discussions and share experiences on the use of lifts and how human factors may influence this

Suggestions for alternative or additional learning activities:

- 3.2.4 The participants discuss in smaller groups appointed topics related to transportation of personal and equipment in a lift and share conclusions and reflections in plenum. The instructor shall provide constructive feedback to the groups
- 3.2.5 The participants answer questionnaire on transporting personnel or equipment in lifts. Questions must support and challenge the participants' reflections and decision making

ELEMENT 3.3 - LIFT FUNCTIONALITY

Learning objectives:

- 25) The participants can **recognise** differences of most common limit switch types on different lift brands (Knowledge, basic level)



- 26) The participants can **describe** the function of the bottom and top switches, and recognises the importance of inspecting and performing function test of bottom a top switch (Knowledge, basic level)
- 27) The participants can **recognise** differences between doors and gates (Knowledge, basic level)
- 28) The participants can **describe** the use of key for safety locking (Knowledge, basic level)
- 29) The participants can **describe** the general function of fences/gates in a safety perspective (Knowledge, basic level)
- 30) The participants can **explain** how to open the door during normal operation (in safe zone) and in emergency situations (Knowledge, intermediate level)



The instructor shall:

- 3.3.1 Explain general functionalities of lifts in WTGs and show examples on the topics: operation related, as well as safety related
- 3.3.2 Facilitate group discussions on:
 - a. functionalities of lifts in WTG
 - b. opening doors in normal and emergency situations



The participants shall:

- 3.3.3 Engage in group discussions and share experiences on the use of lifts

ELEMENT 3.4 - GENERAL SAFETY IN USE OF LIFT

Learning objectives:

- 31) The participants can **describe** the risks of entering the area where the lift is landing in its lowest position (Knowledge, basic level)
- 32) The participants **show interest** and willingness to respect safety distances in the work area (Ability, basic level)
- 33) The participants can **describe** the risks from leaving the lift at other positions than the prescribed points (Knowledge, basic level)
- 34) The participants can **explain** the function of the safety brake (Knowledge, intermediate level)



- 35) Participants can **explain** the safety function of overspeed system (Knowledge, intermediate level)
- 36) The participants can **recognise** a standard rescue concept template (Knowledge, basic level)
- 37) The participant **recognises** special conditions and restrictions in connection with use of lifts during fire in the WTG



The instructor shall:

- 3.4.1 Explain general functionalities of lifts in WTG and show illustrative examples from different brands and guiding systems, including:
 - a. fixed guiding
 - b. wire/cable guiding
 - c. rack and pinion
- 3.4.2 Facilitate group discussions on:
 - a. functionalities of lifts in WTG
 - b. opening doors in normal and emergency situations
 - c. restrictions for using lifts during fire in the WTG
- 3.4.3 Provide constructive feedback to the groups



The participants shall:

- 3.4.4 Engage in group discussions and share experiences on the use of different brands of lifts
- 3.4.5 Suggestion: In small groups, each group discusses their appointed topic, prepares a short presentation, and presents their key (learning) points in plenum

LESSON 4 - INSPECTION ON LIFT PRIOR TO USE

25 min.

The aim of this lesson is to prepare the participant to conduct inspections prior to the use of lifts and to understand the necessity of following checklist and seeking guidance when needed. The lesson will cover multiple lift brands, types and systems.



After successfully having completed this lesson of the Lift User Module training, the participants can:

- 38) **Take the responsibility** for only using the plant when all components are inspected and considered in a technically flawless condition, and to seek guidance when needed (Ability, basic level)

Note *Inspection of lifts will be practiced during the practical training, and theory elements from this lesson may be completed during the practical training in Lessons 5 and 6 when feasible and relevant*

ELEMENT 4.1 - GENERAL PURPOSE OF PRE-USE INSPECTION

Learning objective:

- 39) The participants can **recognise** that pre-use inspections are required before use of the lift (Knowledge, basic level)



The instructor shall:

- 4.1.1 Describe possible risks and hazards in using lifts that can be avoided by a pre-use inspection:
- 4.1.2 Ask involving questions to challenge the participants' understanding and to collect participants' experiences



The participants shall:

- 4.1.3 Engage in Q&A and share own experiences on pre-use inspections of lifts

ELEMENT 4.2 - PRE-USE INSPECTION CHECKLIST

Learning objective:

- 40) The participants **show interest** in obtaining the specific instructions and follow the brand's checklist (Ability, basic level)



The instructor shall:

- 4.2.1 Present (or hand out) an example of a pre-use inspection checklist and lead a discussion on the most important points in the checklist



The participants shall:

- 4.2.2 Engage in the group discussions and share experiences on the pre-use inspections of lifts

ELEMENT 4.3 - PRE-USE INSPECTION STEPS, OUTSIDE THE LIFT

Learning objectives:

- 41) The participants can **take responsibility** for checking cables and wires and on their own
- 42) The participants can **recognise** different types of wear and damage wires and cables can have (Knowledge, basic level)
- 43) The participants can **take responsibility** to follow the inspection list for top and bottom switches, and on their own initiative seek guidance when needed (Ability, basic level)
- 44) The participants can **responsibly** conduct function test of top and bottom switches (Ability, basic level)
- 45) The participants can **act independently** to open and close a door or gate correctly (Ability, intermediate level)



The instructor shall:

- 4.3.1 Describe and show examples of wear and damages on wires and cables that can be discovered by a pre-use inspection
- 4.3.2 Facilitate group discussion on possible risks and hazards in using lifts with damaged wires or cables
- 4.3.3 Present example of an inspection list for top and bottom switches and describe the procedure for function test
- 4.3.4 Conduct a practical exercise on doing the pre-use inspection steps outside the lift
- 4.3.5 Provide feedback on discussions and on participants' professional and human performance and experiences during the practical exercise



The participants shall:

- 4.3.6 Engage in group discussions and practical exercises, receive feedback constructively and share own experiences on the inspection responsibility



ELEMENT 4.4 - PRE-USE INSPECTION STEPS, INSIDE THE LIFT

Learning objectives:

- 46) The participants can **recognise** different overload protection systems (Knowledge, basic level)
- 47) The participants can **explain** the principles of performing an overload inspection (Knowledge, intermediate level)
- 48) The participants can **perform** a function test of overload system (Skills, intermediate level)



The instructor shall:

- 4.4.1 Present overload protection systems from multiple lift brands
- 4.4.2 Facilitate group discussion on the principles of performing an overload inspection
- 4.4.3 Conduct skills training on performing an overload inspection
- 4.4.4 Provide feedback on discussions, skills training, and participants' experiences



The participants shall:

- 4.4.5 Engage in group discussions and skills training, receive feedback constructively and share own experiences on the inspection of lifts

ELEMENT 4.5 - INSPECTION OF LIFT – SAFETY

Learning objectives:

- 49) The participants can **describe** the procedures of how to inspect relevant components (Knowledge, basic level)
- 50) The participants can **explain** the relations between technically flawless components and the mitigation of risks, including sufficient lightning (Knowledge, Intermediate level)



The instructor shall:

- 4.5.1 Present and sum-up the procedures of how to inspect relevant components of the lift



- 4.5.2 Facilitate group discussions on procedures of how to inspect relevant components in different lift brands and models
- 4.5.3 Facilitate group discussions on the relations between technically flawless components and the mitigation of risk
- 4.5.4 Provide constructive feedback on discussions and the participants' shared experiences on inspection of lifts in relation to safety



The participants shall:

- 4.5.5 Engage in group discussions and share own experiences on inspection of lifts in relation to safety

Suggestion for alternative learning activity: The participants answer a questionnaire on relevant topics. Questions must support the participants' reflections and taking decisions.

LESSON 5 - OPERATION OF LIFT (PRACTICAL EXERCISE)

90 min.

The aim of this lesson is to enable the participant to independently use a lift in a WTG safely and responsibly in routine work situations and on own initiative to seek brand-specific or other guidance or help when needed.

After successfully having completed this lesson of the GWO Lift User Module, the participants can:

- 51) **Take responsibility** for only using the plant when all protective measures and devices are in place (Ability, basic level)
- 52) **Take responsibility** for performing a pre-use inspection of a lift by using the actual manual and checklist and on their own initiative seek further guidance when needed (Ability, intermediate level)

Note *Lesson 5 may be conducted as a coherent exercise covering learning objectives from Lesson 5 and additional elements from other lessons where feasible. Furthermore, relevant theory should be applied during the practical exercises*

ELEMENT 5.1 - INITIAL SAFETY PRECAUTIONS

Learning objectives:

- 53) The participants will on their own **take initiative** to wear PPE when entering WTG (Ability, basic level)
- 54) The participants **take responsibility** for maintaining and applying PPE in accordance with standing procedures (Ability, intermediate level)



- 55) The participants **show interest** in the requirement for safe working (human factors) (Ability, basic level)
- 56) The participants **take responsibility** to not enter a site when feeling ill or drowsy or in other ways unfit to work (human factors) (Ability, basic level)



The instructor shall:

- 5.1.1 Design and conduct learning activities where the learning objectives are practised:
 - a. donning, wearing, and applying PPE
 - b. personal conditions for work
- 5.1.2 Provide feedback on the participants' professional and human performance during the practical training



The participants shall:

- 5.1.3 Engage in the practical training moments, take initiative, and receive feedback constructively

ELEMENT 5.2 - PRE-USE INSPECTION

Learning objectives:

- 57) The participants can **take responsibility** to perform a pre-use inspection of the lift by following the pre-use inspection check list (Ability, intermediate level)
- 58) The participants can **copy** the procedures to open and close a door or gate (Skills, basic level)



The instructor shall:

- 5.2.1 Facilitate the pre-inspection exercise by offering guidance or support when needed



The participants shall:

- 5.2.2 On their own perform the pre-use inspection by following the relevant manual, guide, or pre-use inspection check list



Note *To activate several participants at the same time, the pre-use inspections may be conducted in buddy-teams; one guiding (by following the manual) and the other performing the inspection. This also reinforces the learning.*

Note *The following elements in Lesson 5 may be covered during the pre-use inspection exercise*

ELEMENT 5.3 - STAY IN DANGER ZONE

Learning objectives:

- 59) The participants can **explain** the risks of staying in the danger zone when the lift is turned on (Knowledge, Intermediate level)
- 60) The participants can **take the responsibility** that no one is in the danger zone when the lift is switched on (Ability, basic level)



The instructor shall:

- 5.3.1 Design and conduct learning activities where the learning objectives are practised:
 - a. risk of staying in the danger zone
 - b. clearing the danger zone
- 5.3.2 Provide feedback on the participants' professional and human performance during the practical training



The participants shall:

- 5.3.3 Engage in the practical training moments, take initiative and responsibility, and receive feedback constructively

ELEMENT 5.4 - SAFETY IN THE LIFT TRAVEL RANGE

Learning objectives:

- 61) The participants can **describe** the hazards of obstacles in the travel range of the lift (Knowledge, basic level)
- 62) The participants can **take responsibility** for making sure that there are no obstacles in the travel range of the lift (Ability, basic level)



The instructor shall:

- 5.4.1 Design and conduct learning activities where the learning objectives are practised:
 - a. obstacles in the travel range
- 5.4.2 Provide feedback on the participants' professional and human performance during the practical training



The participants shall:

- 5.4.3 Engage in the practical training moments, take responsibility, and receive feedback constructively

ELEMENT 5.5 - SAFETY INSIDE THE LIFT

Learning objectives:

- 63) The participants **take initiative** and **responsibility** to always attach themselves to the yellow anchorage points with PPE (Ability, intermediate level)
- 64) The participants can **describe** the position and function of the manoeuvre panel (Knowledge, basic level)



The instructor shall:

- 5.5.1 Design and conduct learning activities where the learning objectives on safety inside the lift are practised:
 - a. PPE attachment
 - b. manoeuvre panel functions
- 5.5.2 Provide feedback on the participants' professional and human performance during the practical training



The participants shall:

- 5.5.3 Engage in the practical training moments and receive feedback constructively

ELEMENT 5.6 - FENCES AND GATES

Learning objectives:



- 65) The participants can **perform** correct basic electrical/mechanical functioning of fences and gates (Skills, intermediate level)
- 66) The participants can **take responsibility** to make safe entry and exit between lift and platform (Ability, basic level)
- 67) The participants can **operate** the gates **responsibly** (Ability, basic level)



The instructor shall:

- 5.6.1 Design and conduct learning activities where the learning objectives are practised:
 - a. functioning of fences and gates
 - b. safe entry and exit between lift and platform
- 5.6.2 Provide feedback on the participants' professional and human performance during the practical training



The participants shall:

- 5.6.3 Engage in the practical training moments and receive feedback constructively

ELEMENT 5.7 - FAULTS AND DAMAGE

Learning objectives:

- 68) The participants will on their own **initiative** consult the rescue concept before putting the lift into use (Ability, basic level)
- 69) The participants can **explain** actions to be taken when faults or damage on the lift system are found (Knowledge, intermediate level)
- 70) The participants can **take responsibility** and **initiative** to activate 'Emergency Stop' when faults or damage on the lift system are found (Ability, intermediate level)
- 71) The participants can **describe** what happens when there is a power failure and what to do (Knowledge, basic level)



The instructor shall:



- 5.7.1 Design and conduct learning activities where the learning objectives in this element are practised
- 5.7.2 Provide feedback on the participants' professional and human performance



The participants shall:

- 5.7.3 Engage in the practical training moments and receive feedback constructively

ELEMENT 5.8 - EMPTY TRANSFER

Learning objective:

- 72) The participants **take initiative** to use the control unit on the outside of the cabin for empty transfer (Ability, intermediate level)



The instructor shall:

- 5.8.1 Design and conduct learning activities where the use of the control unit on the outside of the cabin for empty transfer practised
- 5.8.2 Provide feedback on the participants' professional and human performance



The participants shall:

- 5.8.3 Engage in the practical training moments on the use of the control unit on the outside of the cabin for empty transfer and receive feedback constructively

ELEMENT 5.9 - UNSTABLE OBJECTS IN THE LIFT

Learning objectives:

- 73) The participants can **describe** the hazards of carrying unstable objects in the lift (Knowledge, basic level)
- 74) The participants **show interest** and willingness to avoid carrying unstable objects in the lift (Ability, basic level)
- 75) The participants can **describe** the hazards of doing rhythmic or sudden movements in the lift (Knowledge, basic level)



The instructor shall:

- 5.9.1 Demonstrate examples of the hazards of carrying unstable objects in the lift
- 5.9.2 Design and conduct learning activities where carrying unstable objects in the lift are practised
- 5.9.3 Provide feedback on the participants' professional and human performance



The participants shall:

- 5.9.4 Engage in the practical training moments on carrying unstable objects in the lift and receive feedback constructively

ELEMENT 5.10 - SAFETY WHEN OPERATING LIFT

Learning objectives:

- 76) The participants can **take responsibility** for using the safety brake and on their own **initiative** seek guidance when needed (Ability, basic level)
- 77) The participants can **take responsibility** for conducting the correct procedure after an activation of overspeed system and on own **initiative** seek guidance when needed (Ability, basic level)
- 78) The participants can **recognise** hazards due to wind conditions (Knowledge, basic level)
- 79) The participants can **explain** the necessity of complying with all safety instructions, markings, and protective safety measures on the plant (Knowledge, Intermediate level)
- 80) The participants **take responsibility** for complying with all safety instructions and markings on the plant (Ability, intermediate level)
- 81) The participants can **explain** consequences of exposing components to impact loads or spilling acid or corrosive substances (Knowledge, intermediate level)



The instructor shall:

- 5.10.1 Design and conduct learning activities involving safety brakes and overspeed systems, where the learning objectives are practised
- 5.10.2 Provide feedback on the participants' professional and human performance



The participants shall:

5.10.3 Engage in the practical training moments and receive feedback constructively

ELEMENT 5.11 - EMERGENCY DESCENT

Learning objectives:

- 82) The participants can **perform** emergency descent of the lift (Skills, intermediate level)
- 83) The participants can **explain** conditions when not to use emergency descent and **discuss** alternative actions to be taken (Knowledge, intermediate level)
- 84) The participants will on their own **initiative** seek guidance from manuals and directives on when not to do the emergency descent (Ability, intermediate level)



The instructor shall:

- 5.11.1 Explain conditions when not to use emergency descent and present alternative actions to be taken
- 5.11.2 Design and conduct learning activities where emergency descent procedure is practiced (see element 6.3)
- 5.11.3 Provide feedback on the participants' professional and human performance



The participants shall:

- 5.11.4 Engage in the practical training of emergency descent and receive feedback constructively

LESSON 6 - EVACUATION OF LIFT

15 min.

The aim of this lesson is to prepare the participants to evacuate a lift safely and responsibly.

Having successfully completed this lesson of the Lift User Module, the participants

- 85) **Show interest** in how to evacuate a lift safely and responsibly and will on own initiative seek guidance when needed (Ability, basic level)



Note *Lesson 6 may be conducted as a coherent exercise covering learning objectives from Lesson 6 and additional elements from other lessons where relevant.*

ELEMENT 6.1 - OPERATION OF DOORS

Learning objectives:

- 86) The participants can **explain** how to operate doors in case of an emergency situation (Knowledge, intermediate level)
- 87) The participants can **take the responsibility** to open the doors in emergency or out of safe zone (Ability, intermediate level)



The instructor shall:

- 6.1.1 Present and explain how to open different types of lift doors in emergency situations
- 6.1.2 Design and conduct learning activities on practicing how to operate doors in case of an emergency situation
- 6.1.3 Provide feedback on the participants' professional and human performance



The participants shall:

- 6.1.4 Engage in the practical training of operating doors in case of emergency situations and receive feedback constructively

ELEMENT 6.2 - RESCUE AND EVACUATION PLAN

Learning objectives:

- 88) The participants will **take responsibility** to follow rescue and evacuation plans and manuals and ensure safe shutdown of lifts (including sending the right information to the site lead, manufacturer, etc.) (Ability, basic level)
- 89) The participants **take initiative** to apply guidance from relevant documents to carry out an emergency rescue (Ability, basic level)



The instructor shall:



- 6.2.1 Present a rescue and evacuation plan
- 6.2.2 Demonstrate a safe shutdown procedure of the lift
- 6.2.3 Design and conduct learning activities where emergency descent procedure is practiced, and a rescue and evacuation plan are applied
- 6.2.4 Provide feedback on the participants' professional and human performance



The participants shall:

- 6.2.5 Engage in the practical training moments and receive feedback constructively

ELEMENT 6.3 - EVACUATION OF LIFT

Learning objective:

- 90) The participants **show interest** and willingness to perform evacuation of a lift correct and safely (Ability, basic level)



The instructor shall:

- 6.3.1 Demonstrate how to evacuate a lift and explain all safety precautions during the evacuation
- 6.3.2 Describe examples of how to evacuate different lift types
- 6.3.3 Involve all participants by raising questions related to the evacuation procedure with special attention to safety, including fall protection



The participants shall:

- 6.3.4 Engage in answering questions and share experiences of lift evacuations and other experiences related to working at heights and fall protection

Note *Evacuation of lifts should not be practiced, as these principles and skills are trained in GWOs Basic Safety Training: Working at Heights Module*

LESSON 7 - SHUTDOWN AFTER USE

15 min.



The aim of this lesson is to enable the participants to shut down a lift correctly after use.

Having successfully completed this lesson of the Lift User Module, the participants can:

91) **Take responsibility** for leaving the lift in parking position (Ability, basic level)

ELEMENT 7.1 - LIFT IN PARKING POSITION, GENERAL

Learning objectives:

- 92) The participants can **explain** how leaving the lift in parking position can mitigate risks (Knowledge, intermediate level)
- 93) The participants can **take responsibility** for leaving the lift in parking position and on their own initiative seek guidance in manuals and directives when needed (Ability, basic level)



The instructor shall:

- 7.1.1 Describe related risks and explain how leaving the lift in parking position can mitigate risks
- 7.1.2 Lead a discussion on potential risks if not leaving the lift in parking position



The participants shall:

- 7.1.3 Engage in group discussion and share experiences from lift shutdowns

ELEMENT 7.2 - SHUTDOWN PROCEDURE

Learning objective:

- 94) The participants can **describe** how to shut down the lift after use (Knowledge, basic level)



The instructor shall:

- 7.2.1 Present principles and responsibilities in relation to lift shutdown procedures for different situations, e.g.:
 - a. out of order
 - b. leaving from the base of tower



- c. leaving from nacelle

7.2.2 Engage the participants in short discussion on shutdown procedures and experiences



The participants shall:

7.2.3 Engage in the discussion and share their experiences on shutdown procedures

LESSON 8 - TRAINING REVIEW

25 min.

ELEMENT 8.1 - TRAINING REVIEW



The instructor shall:

8.1.1 Re-present the overall aims and learning objectives of the module for the participants' comparison of their learning outcomes and the achievement of their previously stated expectations for the module



The participants shall:

8.1.2 Reflect on their learning outcome and key takeaways from the Lift User Module, aiming to achieve a high learning transfer from the module to their way of working by means of e.g.:

- a. group discussions
- b. questions & answers in class, or where suitable

Note *The instructor may additionally conduct a local evaluation of the training*

ELEMENT 8.2 - FEEDBACK SESSION



The instructor shall:

8.2.1 Give an overall feedback and feed forward on the participants' learning outcome inspired by the training as well as from the training review session

8.2.2 Encourage the participants to examine and grow awareness of which specific elements in their own WTG type/ WTG environment differ from the training scenario environment (to visualise and enhance learning transfer) and to discuss with colleagues about the Lift User Module content, methods and techniques are similar or different to the local specific conditions identified after the module completion



GLOBAL WIND
ORGANISATION

Lift Commission and Inspection Module

(LCI)



8. LIFT COMMISSION AND INSPECTION MODULE

8.1 Aims of the Lift Commission and Inspection (LCI) Module

The aim of this module is to enable the lift technician to inspect the lift after installation in a WTG with the purpose of commissioning; to take correct measures to acquire assistance; and perform simple adjustments or replacement of parts in a lift in a WTG.

Fundamental for the training is the wind technician's attention to, and awareness of, always following and seeking guidance from the relevant lift manuals and instructions.

The overall learning objective of this module is:

- 95) The participants can **solve** routine tasks in relation to the commissioning and inspection of lifts in a WTG following relevant guides and manuals (Ability, basic level).

8.2 Course Participants Prerequisites for the Lift Commission and Inspection Module

GWO Lift User training or similar brand specific user training is a prerequisite to participate in the Lift Commission and Inspection Module training.

Basic technical experience and knowledge (primarily mechanical and electrical) is necessary to be able to get full benefit from the training.

8.3 LCI Module Instructor's Qualification

As an addition to GWOs Requirements for Training, a competent LCI module instructor must be certified as such by a competent instructor or train-the-trainer.

Note *A competent instructor or train-the-trainer must hold the sufficient lift technical experience on multiple lift types obtained by (for example) work experience, lift trainings and manufacturer led lift trainings.*

8.4 Duration of the Lift Commission and Inspection Module

The total contact time for completing the Lift Commission and Inspection Training Module is 7 hours and 0 minutes.

The training provider must not exceed the times per day given in table 8.4.1 below.

| | Maximum Duration Per Day |
|--------------------|--------------------------|
| Contact time | 8 hours |
| Total training day | 12 hours |

Table 8.4.1 – Maximum durations for training day



8.5 Instructor to Participant Ratio

| Module | Session | Instructor to Participant Ratio |
|---------------------------------------|-----------|---------------------------------|
| Lift Commission and Inspection Module | Theory | 1:12 |
| | Practical | 1:6 |

Table 8.5.1 - GWO Lift Commission and Inspection Module instructor to participant ratio

8.6 Lift Commission and Inspection Module timetable

The order in which elements of this Lift Standard training are delivered may vary according to the didactical choices of the delivering training provider.

The delivery of this module must comply with the requirements described in the GWO Requirements for Training.

| Lesson | Element | Duration |
|---|---|----------|
| 1. Introduction to the training | 1.1 Safety instructions and emergency procedures | |
| | 1.2 Facilities | |
| | 1.3 Introduction | |
| | 1.4 Scope and main learning objectives | |
| | 1.5 Ongoing assessments (participant assessment form) | |
| | 1.6 Motivation | |
| | 1.7 Human factors | |
| | 1.8 Personal protective equipment | |
| | TOTAL | 30 min. |
| 2. Legislation and documentation | 2.1 Lift manufacturer's user manual and guides | |
| | 2.2 Local and national legislation | |
| | TOTAL | 15 min. |
| 3. Safety when working on a lift in a WTG | 3.1 Hazardous energy | |
| | 3.2 Work areas in the WTG | |
| | TOTAL | 25 min. |
| 4. Gates and fences | 4.1 Outside the lift | |
| | 4.2 Gate locking systems | |
| | 4.3 Guard locking control system | |
| | 4.4 Upper and lower hatches | |
| | TOTAL | 15 min. |



| | | | | |
|-----|--|------|---|---------|
| 5. | Cabin and its attachment parts | 5.1 | The cabin – in general | |
| | | 5.2 | Fasteners and anchor points | |
| | | 5.3 | Service light and emergency light | |
| | | | TOTAL | 25 min. |
| 6. | Cabin guide unit | 6.1 | Introduction to lift guiding systems | |
| | | 6.2 | Guide ropes | |
| | | 6.3 | Guide wheels (LG, R&P) | |
| | | 6.4 | Roller guide unit | |
| | | 6.5 | Guide ladder inspection | |
| | | | TOTAL | 50 min. |
| 7. | Top obstruction device | 7.1 | Top obstruction device function | |
| | | 7.2 | Top obstruction flashing light | |
| | | 7.3 | Top obstruction in top position | |
| | | | TOTAL | 15 min. |
| 8. | Bottom obstruction device | 8.1 | Bottom obstruction device function | |
| | | 8.2 | Bottom obstruction device - Bowden cable | |
| | | 8.3 | Bottom obstruction flashing light | |
| | | 8.4 | Bottom obstruction device stop in the lowest position | |
| | | | TOTAL | 20 min. |
| 9. | Lift door lock / electrical inter-lock | 9.1 | Function test of the door lock | |
| | | 9.2 | Emergency unlocking | |
| | | 9.3 | Upper and lower hatches | |
| | | | TOTAL | 15 min. |
| 10. | Lift operation/manoeuvre panel | 10.1 | The lift operation / manoeuvre panel | |
| | | 10.2 | Operation hour counter | |
| | | 10.3 | Emergency rescue system | |
| | | | TOTAL | 15 min. |
| 11. | Suspension/crossbeam | 11.1 | Suspension/crossbeam | |
| | | 11.2 | Rope end attachments | |
| | | 11.3 | Bolts and bolts connections | |
| | | 11.4 | Upper and lower attack pinion (R&P) | |
| | | | TOTAL | 25 min. |



| | | | |
|--|-------|---|---------|
| 12. Drive and safety wire rope and rack | 12.1 | Drive ropes, in general | |
| | 12.2 | Tension weights | |
| | 12.3 | Grounding rotating unit | |
| | 12.4 | Rope ends | |
| | 12.5 | Counter rollers | |
| | 12.6 | Rope clamps | |
| | 12.7 | Rope attachments and bondings | |
| | 12.8 | Rope protection | |
| | 12.9 | Inspection of the rack | |
| | 12.10 | Grease the rack | |
| TOTAL | | | 40 min. |
| 13. Traction hoist | 13.1 | Traction hoist device | |
| | 13.2 | Operation hour counter | |
| | 13.3 | Labels and type plates on traction hoist | |
| | 13.4 | Drive unit, mechanical | |
| | 13.5 | Drive unit, electrical | |
| | 13.6 | Upper and lower gearbox | |
| | 13.7 | Electro-mechanical and centrifugal brakes | |
| | 13.8 | Load capacity system | |
| TOTAL | | | 35 min. |
| 14. Wire rope redirection inside the cabin | | Wire rope redirection inside the cabin | |
| TOTAL | | | 5 min. |
| 15. Fall arrest device (FAD) | 15.1 | Labels and type plates | |
| | 15.2 | General condition | |
| TOTAL | | | 30 min. |
| 16. Supply cable | 16.1 | Feed-in of supply cable | |
| | 16.2 | Strain relief | |
| | 16.3 | Cable bin | |
| TOTAL | | | 10 min. |
| 17. Test and training review | 17.1 | Theory test | |
| | 17.2 | Training review | |
| | 17.3 | Feedback session | |
| | 17.4 | Participant performance assessment | |



| | |
|-------------|----------|
| TOTAL | 50 min. |
| GRAND TOTAL | 420 min. |

Table 8.6.1 – GWO Lift Commission and Inspection Module timetable

8.7 Detailed Description of the Lift Commission and Inspection Module

LESSON 1 - INTRODUCTION TO THE TRAINING

30 min.

The aim of this lesson is for the participants to be motivated and to engage in the training safely at a training facility, while recognising what is expected of them during the training.

After having successfully completed Lesson 1 of the Lift Commission and Inspection Module, the participants can:

- 1) **Recognise** what is expected of them throughout the module (Knowledge, basic level)
- 2) **Name** and point out local emergency procedures and facilities (Knowledge, basic level)
- 3) **Discuss** the relevant human factors and explain their implications (Knowledge, intermediate level)
- 4) **Explain** the use of correct PPE (Knowledge, intermediate level)

ELEMENT 1.1 - SAFETY INSTRUCTIONS AND EMERGENCY PROCEDURES

Learning objective:

- 5) The participants **show interest** or curiosity in the safety and emergency procedures at the training facility (Ability, basic level)



The instructor shall:

1.1.1 Explain and ask involving questions aiming at:

- a. safety instructions according to internal procedures
- b. emergency procedures and emergency exits in the areas where the participants can be expected to be located during the course
- c. site-specific chemical safety rules and instructions



The participants shall:

- 1.1.2 Engage in answering questions on local safety and emergency procedures

ELEMENT 1.2 - FACILITIES

Learning objective:

- 6) The participants can **recognise** the location of facilities at the training location (Knowledge, basic level)



The instructor shall:

- 1.2.1 Present a general description of the facilities at the training location (administration, dining area, restrooms, toilets, etc)
- 1.2.2 Alternative activity: lead a tour and point out facilities



The participants shall:

- 1.2.3 Note relevant facilities and ask questions when in doubt

ELEMENT 1.3 - INTRODUCTION

Learning objective:

- 7) The participants **show interest** in fellow participants and the course content and design (Ability, basic level)



The instructor shall:

- 1.3.1 Explain and ask involving questions aiming at the programme of the Lift Commission and Inspection Module training, including breaks and mealtimes
- 1.3.2 Give a short introduction to themselves, including their background as instructors
- 1.3.3 Ask for participants' expectations of the training and their learning or development



The participants shall:



- 1.3.4 Give a short introduction to themselves, including job function and expected primary geographic work location and share expectations on the training

ELEMENT 1.4 - SCOPE AND MAIN LEARNING OBJECTIVES

Learning objective:

- 8) The participants can **recognise** the scope and main objectives of the Lift Commission and Inspection Module training (Knowledge, basic level)



The instructor shall:

- 1.4.1 Present the scope and main learning objectives of the Lift Commission and Inspection Module
- 1.4.2 Involve participants with questions on understanding and individual experiences on the use of lifts



The participants shall:

- 1.4.3 Engage in answering questions and share experiences on the use of lifts in WTG

ELEMENT 1.5 - ONGOING ASSESSMENT (PARTICIPANT ASSESSMENT FORM)

Learning objective:

- 9) The participants **recognise** the assessment procedure and the aim of the ongoing assessment (Knowledge, basic level)



The instructor shall:

- 1.5.1 Explain the reasons for the ongoing assessment
- 1.5.2 Explain the layout of the GWO participant assessment form and how it will be used



The participants shall:

- 1.5.3 Engage themselves in discussions and ask questions when in doubt in relation to the assessment procedure



ELEMENT 1.6 - MOTIVATION

Learning objective:

- 10) The participants **show interest** and willingness to engage in the learning activities (Ability, basic level)



The instructor shall:

- 1.6.1 Explain and lead a discussion on:

- a. the importance of personal involvement in the course
- b. the definition of and the need for lift understandings and abilities

Note *Positive motivation is the driving force for commitment. The instructor should make a focused effort to support growth of the necessary attitude and motivation in the participant*



The participants shall:

- 1.6.2 Engage themselves in discussions and share experiences on the use, inspection, commissioning of lifts in WTGs

Note *When participants succeed (by trying out on their own, bringing their relevant experience into play and applying learning points from the instructor's feedback) they develop both a positive attitude and a responsibility towards the subject and how they perform in the work situation*

ELEMENT 1.7 - HUMAN FACTORS

The aim of the element is to draw the participant's attention on how human behaviour and outlook influences a safe work environment, and to prepare for the continued focus on behaviour and taking responsibility during practical training and exercises.

Learning objectives:

- 11) The participants can **describe** the relevant human factors, and the implications of this (Knowledge, basic level)
- 12) The participants **show interest** and willingness to focus on human factors during the following practical exercises (Ability, basic level)



The instructor shall:

- 1.7.1 Present how human factors influence accidents in the wind industry (relevant statistics may be applied)
- 1.7.2 Lead a discussion about the role of the individual in improving human behaviours and how this can improve the safety of offshore operations
- 1.7.3 Ensure that constructive feedback on the participant's performance involve human factors criteria when these are defined in the learning objective such as the ability to take responsibility or to act independently

Facts and human factors criteria:

The consequences of human factors in accidents in the wind industry are influenced by the following terms and conditions:

- a. attention and perception
- b. group behaviour and peer pressure
- c. weather conditions
- d. weather delays
- e. noise levels
- f. site layout and housekeeping
- g. fitness and health
- h. domestic and work-related stress
- i. workload (both overload and underload)
- j. fatigue
- k. time pressure and deadlines
- l. alcohol, medication, and substance abuse



The participants shall:

- 1.7.4 Engage in discussions and share experiences of how human factors influence accidents in the use of lifts, engage in and reflect on received feedback and take responsibility on their own performance and development during the training



Note *The participants performance (from a human factors perspective) must be part of the feedback whenever feasible during the training*

ELEMENT 1.8 - PERSONAL PROTECTIVE EQUIPMENT

Learning objectives:

- 13) The participants can **describe** the need for correct PPE (Knowledge, basic level)
- 14) The participants can **recognise** and describe the correct use of PPE (Knowledge, basic level)
- 15) The participants will **show interest** and awareness of exposure to chemical lubrication products and take responsibility for acting correct (Ability, basic level)



The instructor shall:

- 1.8.1 Ask questions on the participants' knowledge on the relevant PPE equipment, including: helmet, safety shoes, safety glasses, gloves, high visibility clothing (harness and fall-arrest may be presented)
- 1.8.2 Lead a discussion on exposure to chemical lubrication products and mitigating actions



The participants shall:

- 1.8.3 Engage in instructor's questions and share experiences on the use of PPE and the exposure to chemical lubrication products

Note *PPE is expected knowledge, and the learning activity should only be conducted when necessary*

LESSON 2 - LEGISLATION AND DOCUMENTATION

15 min.

The aim of this lesson is to emphasise the need to (at all times) locate, seek guidance in, and use the relevant lift manuals and directives, and to enable the participants to comply with national legislation and company regulations and any brand specific recommendations when using and working on a lift in WTGs.

After having successfully completed Lesson 2 of the Lift Commission and Inspection Module, the participants can:



- 16) On their own, **take initiative** and **take responsibility** to follow lift manufacturer's user manual, regulations, and legislations as well as relevant national and international legislation when working on lifts in a WTG (Ability, intermediate level)

ELEMENT 2.1 - LIFT MANUFACTURERS' USER MANUAL AND GUIDES

Learning objectives:

- 17) The participants can **describe** where and how to find relevant documentation (manuals, risk-assessment, inspections- and installation forms etc.) (Knowledge, basic level)
- 18) The participants can **take responsibility** and, will on their own, **take initiative** to seek help or guidance when needed (Ability, intermediate level)
- 19) The participants can **act independently**, **take initiative**, and always **take responsibility** in applying relevant lift manuals and instructions when inspecting lifts in a WTG (Ability, intermediate level)

Note *The need for using relevant lift manuals and instructions must be emphasised and trained in all learning activities during the training.*

Note *Following the relevant lift manuals, participants must perform a daily pre-use inspection on the lift facility on before working on the lift. This is partly for safety reasons, partly to develop good and responsible habits.*



The instructor shall:

- 2.1.1 Present examples on relevant manuals or guides from different lift brands and lift types
- 2.1.2 Facilitate a discussion on where to find and how to use such relevant manuals and guides
- 2.1.3 Emphasise the necessity of always consulting relevant lift manuals and guides



The participants shall:

- 2.1.4 Engage in discussion about the importance of using relevant guides and manuals and share experiences on finding and applying manuals and guides in relation to the inspecting, installing, and maintaining of lifts in WTGs



ELEMENT 2.2 - LOCAL AND NATIONAL LEGISLATION

Learning objective:

- 20) The participants can **take responsibility** and will on their own initiative search for relevant legislation issues on site (Ability, intermediate level)



The instructor shall:

- 2.2.1 Present examples on where local and national legislation can be obtained
- 2.2.2 Ask for the participants experiences on finding and applying legislation



The participants shall:

- 2.2.3 Share their experiences on where local and national legislation can be obtained

Note *The use of relevant and type-specific manuals and application of legislation and regulations must be applied during any practical training whenever relevant and feasible*

LESSON 3 - SAFETY WHEN WORKING ON A LIFT IN A WTG

25 min.

The aim of this lesson is to enable the participants to take necessary safety precautions when inspecting, installing, and maintaining lifts in a WTG in accordance with the relevant manual and directives.

After having successfully completed Lesson 3 of the Lift Commission and Inspection Module, the participants can:

- 21) **Solve** routine safety tasks and take precautions in relation to inspections and commissioning of lifts in a WTG responsibly and will use their initiative to seek help or guidance when needed (Ability, basic level)

Note *Before commencing work and training on the lift or lift systems it is recommended, that the participants perform a daily check/before use inspection of the lift or lift systems. The competence to do so is prerequisite for attending the GWO LCI training. The motivation for this pre-use inspection is 1) to ensure safety when working on the lift, and 2) to re-cap knowledge, skills and abilities obtained from the Lift User Module training*



ELEMENT 3.1 - HAZARDOUS ENERGY

Learning objectives:

- 22) The participants can **take responsibility** of ensuring that the lift is in a controlled hazardous energy state (Ability, intermediate level)
- 23) The participants can **take responsibility** to de-energise the system and will use their own initiative to seek guidance in the relevant lift manuals (Ability, intermediate level)



The instructor shall:

- 3.1.1 Present and demonstrate examples of how to ensure that a lift is in a controlled hazardous energy state
- 3.1.2 Lead or facilitate discussion on risks and mitigating options in relation to a controlled hazardous energy state
- 3.1.3 Facilitate a short exercise, where the participants test how to de-energise the lift system or find necessary guidance in relevant manuals



The participants shall:

- 3.1.4 Engage in discussions and share experiences on hazardous energy states in WTGs
- 3.1.5 Test how to de-energise the lift system or find necessary guidance in relevant manuals

ELEMENT 3.2 - WORK AREAS IN THE WTG

Learning objectives:

- 24) The participants can **recognise** working areas with restricted space, where special care must be taken to work safely (Knowledge, basic level)
- 25) The participants **show interest** and awareness of slippery surfaces and proper housekeeping in the lift area (Ability, basic level)
- 26) The participants **show interest** and awareness of hazards from moving and stationary parts in the WTG (Ability, basic level)



The instructor shall:



- 3.2.1 Point out examples of restricted spaces, slippery surfaces, and proper housekeeping
- 3.2.2 Lead or facilitate discussion and ask for participants' experiences on restricted spaces, slippery surfaces, and proper housekeeping in relation to lifts in WTGs



The participants shall:

- 3.2.3 Engage in discussions and share experiences on the topic
- 3.2.4 Conduct a short questionnaire test to recap on the theory and safety issues from Lesson 3
- 3.2.5 Check own answers and solutions from the shown fact list on completion of the test

Note *The ability to take necessary safety precautions when using and working on lifts in a WTG must be practised during all practical training elements in this module when relevant*

LESSON 4 - GATES AND FENCES

15 min.

The aim of this lesson is to enable the participants to inspect and ensure the free movement of the gates and fences in the WTG.

After having successfully completed Lesson 4 of the Lift Commission and Inspection Module, the participants can:

- 27) **Explain** the principles of free movement of mechanical parts in gates and fences outside a lift (Knowledge, intermediate level)

ELEMENT 4.1 - OUTSIDE THE LIFT

Learning objective:

- 28) The participants can **take responsibility** of the free movement of mechanical parts in lift gates and fences (Ability, basic level)



The instructor shall:

- 4.1.1 Present and demonstrate examples of movement of mechanical parts in lift gates and fences
- 4.1.2 Lead or facilitate discussion on possible changes to the free movement of mechanical parts in lift gates and fences



The participants shall:

- 4.1.3 Engage in discussions and share experiences on movement of mechanical parts in lift gates and fences

ELEMENT 4.2 - GATE LOCKING SYSTEMS

Learning objectives:

- 29) The participants can **perform** a function test on a gate locking system: condition, cabling (Skills, intermediate level)
- 30) The participants can **describe** how to adjust a gate locking system following a relevant manual (Knowledge, basic level)



The instructor shall:

- 4.2.1 Present examples of different gate locking systems
- 4.2.2 Lead or facilitate discussion on adjustment of gate locking systems
- 4.2.3 Facilitate practical training on testing the functioning of gate locking systems



The participants shall:

- 4.2.4 Engage in discussions, share experiences, and practise how to function test a gate locking system

ELEMENT 4.3 - GUARD LOCKING CONTROL SYSTEMS

Learning objective:

- 31) The participants can **describe** the safety principles of connection a power cable power inlet plug to a guard locking control box outlet (Knowledge, basic level)



The instructor shall:

- 4.3.1 Present and demonstrate examples of different guard locking control boxes
- 4.3.2 Lead a discussion on the safety principles of connection a power cable power inlet plugs to a guard locking control box outlet



The participants shall:

- 4.3.3 Engage in discussions and share experiences on guard locking control boxes

ELEMENT 4.4 - UPPER AND LOWER HATCHES

Learning objective:

- 32) The participants can **describe** how to function test the operation of switches on upper and lower hatches (Knowledge, basic level)



The instructor shall:

- 4.4.1 Demonstrate how to function test the operation of switches on upper and lower hatches
- 4.4.2 Facilitate the practical training on how to function test the operation of switches on upper and lower hatches



The participants shall:

- 4.4.3 Engage in discussions, share experiences, and practise how to function test the operation of switches on upper and lower hatches
- 4.4.4 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 4
- 4.4.5 Check own answers and solutions from the shown fact list on completion of the test

LESSON 5 - CABIN AND ITS ATTACHMENT PARTS

25 min.

The aim of this lesson is to enable the participants to inspect the lift cabin and attachment parts to ensure the flawless condition.

After having successfully completed Lesson 5 of the Lift Commission and Inspection Module:

- 33) The participants can **take responsibility** of inspecting a lift and decide if the lift is in a flawless condition (Ability, intermediate level)



ELEMENT 5.1 - THE CABIN – IN GENERAL

Learning objectives:

- 34) The participants can **explain** how to do a visual inspection of a viewing windows in a lift (Knowledge, intermediate level)
- 35) The participants **show interest** in checking that adhesive signs for the start-up (and maintenance) certification are current, completed and have the correct dates (Ability, basic level)



The instructor shall:

- 5.1.1 Present and demonstrate examples of viewing windows in a lift
- 5.1.2 Lead or facilitate discussion on:
 - a. viewing windows in a lift and their potential faults.
 - b. adhesive signs for the start-up and maintenance certification



The participants shall:

- 5.1.3 Engage in discussions and share experiences on viewing windows and adhesive signs for the start-up and maintenance certification in a lift

ELEMENT 5.2 - FASTENERS AND ANCHOR POINTS

Learning objectives:

- 36) The participants can **explain** how to do visual inspection all fasteners (screws and bolts) in a lift (Knowledge, intermediate level)
- 37) The participants can **explain** how to do visual inspection of PPE anchors in a lift (Knowledge, intermediate level)
- 38) The participants can **describe** how to apply labelling (showing pictograms of PPE anchors) in a lift (when other language labels are needed) (Knowledge, basic level)
- 39) The participants can **describe** how to inspect labelling (showing pictograms of PPE anchors) in a lift (Knowledge, basic level)
- 40) The participants can **describe** the proper condition of yellow coating of PPE anchors (Knowledge, basic level)



The instructor shall:

- 5.2.1 Present fasteners and anchor points in a lift and supplement with examples from different lift types
- 5.2.2 Initiate group discussions and ask for conclusive reflections



The participants shall:

- 5.2.3 Share experiences and engage in group discussions on the purposes and challenges on fasteners and anchor points in lift cabins

ELEMENT 5.3 - SERVICE LIGHT AND EMERGENCY LIGHT

Learning objective:

- 41) The participants can **explain** how to do an inspection of the service light and emergency light in a lift (Knowledge, intermediate level)



The instructor shall:

- 5.3.1 Present and demonstrate examples of how to inspect and install the service light and emergency light in a lift
- 5.3.2 Lead a discussion on challenges of inspecting service lights and emergency lights in a lift



The participants shall:

- 5.3.3 Engage in discussions and share experiences on service lights and emergency lights in lifts
- 5.3.4 Practise how to inspect service lights and emergency lights in lifts
- 5.3.5 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 5
- 5.3.6 Check own answers and solutions from the shown fact list on completion of the test

LESSON 6 - CABIN GUIDE UNIT

50 min.



The aim of this lesson is to enable the participants to inspect the guiding system responsibly in accordance with and following instructions in the relevant manuals and inspection lists.

After successfully having completed Lesson 6 of the Lift Commission and Inspection Module:

- 42) The participants can **explain** how to do a visual inspection of the cabin guide units (with rollers) in a lift (Skills, intermediate level)

ELEMENT 6.1 - INTRODUCTION TO THE LIFT GUIDING SYSTEMS

Learning objective:

- 43) The participants can **explain** the characteristics of different lift guiding systems (Knowledge, intermediate level)



The instructor shall:

- 6.1.1 Introduce the lesson by presenting examples of guiding systems:

- a. wire guided
- b. ladder guided
- c. rack and pinion

- 6.1.2 Lead or facilitate discussion on lift guiding systems principles



The participants shall:

- 6.1.3 Engage in discussions and share experiences of different lift guiding systems

ELEMENT 6.2 - GUIDE ROPES

Learning objectives:

- 44) The participants can **perform** an inspection of labels on guide ropes (skills, intermediate level)
- 45) The participants can **explain** how to do a visual inspection of the guide ropes according to ISO 4309 (Knowledge, intermediate level)



- 46) The participants can **examine** guide ropes and recognise when these are in flawless condition e.g. diameter, broken threads, wear, and corrosion) at the lowest landing (Knowledge, basic level)
- 47) The participants can **perform** a rope tension inspection of the guide ropes (Skills, intermediate level)
- 48) The participants can **take initiative** and take responsibility to adjust guide ropes tension to the specified value (Ability, intermediate level)
- 49) The participants can **explain** how to do a visual inspection of the condition of the coiled-up of rope ends of the guide wires (Knowledge, intermediate level)
- 50) The participants can **perform** an adjustment of the wire ropes at the landings (Skills, intermediate level)
- 51) The participants can **explain** how to do a visual inspection of the wire rope fixings at the landings (Knowledge, intermediate level)



The instructor shall:

- 6.2.1 Present examples of guide ropes and cabin guide units
- 6.2.2 Facilitate practical training on guide ropes:
 - a. adjustment of guide rope tension
 - b. inspection (condition and tension)
- 6.2.3 Provide individual feedback to participants on their performance



The participants shall:

- 6.2.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 6.3 - GUIDE WHEELS (LG, R&P)

Learning objectives:

- 52) The participants can **describe** how to inspect:
 - a. guide wheel (upper front right and upper rear right)
 - b. guide wheel (upper front left and upper rear left)



- c. guide wheel (lower front right and lower rear left)
- d. guide wheel (lower front left and lower rear left)



The instructor shall:

- 6.3.2 Present examples of guide wheels and demonstrate how to inspect the guide wheels
- 6.3.3 Ensure participants understandings by having the participants describe how to inspect the guide wheels



The participants shall:

- 6.3.4 Follow the presentations and afterwards describe how to inspect guide wheels to the instructor or to fellow participants

ELEMENT 6.4 - ROLLER GUIDE UNIT

Learning objectives:

- 53) The participants can **explain** how to do a visual inspection of a roller guide unit (Knowledge, intermediate level)
- 54) The participants can inspect a roller guide unit and **recognise** when these are in flawless condition (Knowledge, basic level)
- 55) The participants can **take initiative** and take responsibility to require the roller guide unit changed when needed in accordance with the relevant manual (Ability, intermediate level)



The instructor shall:

- 6.4.1 Present and explain examples of roller guide units in both flawless and hampered conditions
- 6.4.2 Facilitate practical training on inspecting roller guide units
- 6.4.3 Provide individual feedback to participants on their performance



The participants shall:

- 6.4.4 Engage in discussions and share experiences on inspecting roller guide units



6.4.5 Receive and reflect on feedback

ELEMENT 6.5 - GUIDE LADDER INSPECTION

Learning objectives:

- 56) The participants can **describe** the safety inspection labels on the ladder according to relevant manuals (Knowledge, basic level)
- 57) The participants can **describe** how to do a visual inspection of the assembly between ladder sections and attachment points according to relevant manuals (Knowledge, basic level)
- 58) The participants can **describe** how to do a visual inspection of the omega flanges (of the ties to step of ladder) are not cracked, or broken, in the folds according to relevant manuals (Knowledge, basic level)
- 59) The participants can **recognise** that upper and lower braking skates are clean and firmly connected to the ladder according to relevant manuals (Knowledge, basic level)



The instructor shall:

- 6.5.1 Present and explain visual examples of assemblies between ladder sections and attachment points and skaters' connections in both flawless and hampered conditions
- 6.5.2 Lead or facilitate discussion on safety related risks on assemblies and flanges



The participants shall:

- 6.5.3 Engage in discussions and share experiences on omega flanges and assemblies between ladder sections and attachment points
- 6.5.4 Conduct a short questionnaire test to recap the theory and safety issues from lesson 6
- 6.5.5 Check own answers and solutions from the shown fact list on completion of the test

LESSON 7 - TOP OBSTRUCTION DEVICE

15 min.

The aim of this lesson is to enable the participants to inspect the top obstruction functionality in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 7 of the Lift Commission and Inspection Module:



- 60) The participants can on their own initiative **take responsibility** for function testing the functionality of the top obstruction device with sub-elements (Ability, intermediate level)

ELEMENT 7.1 - TOP OBSTRUCTION DEVICE FUNCTION

Learning objectives:

- 61) The participants can **perform** a function test of the top obstruction device and limit switches (Skills, intermediate level)



The instructor shall:

- 7.1.1 Present and demonstrate examples of top obstruction devices and limit switches on different lift types
- 7.1.2 Facilitate practical training on inspecting a top obstruction device and limit switch
- 7.1.3 Provide feedback on the participants' performance
- 7.1.4 Lead or facilitate discussion on top obstruction device functionalities



The participants shall:

- 7.1.5 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 7.2 - TOP OBSTRUCTION FLASHING LIGHT

Learning objective:

- 62) The participants can **explain** how to do function test of the top obstruction device flashing light (Knowledge, intermediate level)



The instructor shall:

- 7.2.1 Present and demonstrate examples of the top obstruction device flashing light
- 7.2.2 Lead or facilitate discussion on the top obstruction device flashing light



The participants shall:

- 7.2.3 Engage in discussions and share experiences on the element topic

ELEMENT 7.3 - TOP OBSTRUCTION IN TOP POSITION

Learning objective:

- 63) The participants can **perform** a function test of the top obstruction device (stop in top position) (Skills, intermediate level)



The instructor shall:

- 7.3.1 Demonstrate how to perform a function test of the top obstruction device (stop in top position)
- 7.3.2 Facilitate practical exercise on testing the top obstruction device (stop in top position)
- 7.3.3 Provide feedback to the participants on their performance



The participants shall:

- 7.3.4 Engage in practice, share experiences, and apply the received feedback in following exercises
- 7.3.5 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 7
- 7.3.6 Check own answers and solutions from the shown fact list on completion of the test

LESSON 8 - BOTTOM OBSTRUCTION DEVICE

20 min.

The aim of this lesson is to enable the participants to test the function and ensure the functionality of the bottom obstruction device and its sub-elements in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 8 of the Lift Commission and Inspection Module:

- 64) The participants can on own initiative **take responsibility** of function-testing the bottom obstruction device (with sub-elements) and ensure its functionality (Ability, intermediate level)



- 65) The participants will **take responsibility** to require repair of the bottom obstruction device, when needed according to the relevant manual (Ability, intermediate level)

ELEMENT 8.1 - BOTTOM OBSTRUCTION DEVICE FUNCTION

Learning objective:

- 66) The participants can **perform** a function test of the bottom obstruction device: mechanical parts and switches (Skills, intermediate level)



The instructor shall:

- 8.1.1 Demonstrate how to perform a function test of the bottom obstruction device: mechanical parts and switches
- 8.1.2 Facilitate practical training on testing the bottom obstruction device: mechanical parts and switches
- 8.1.3 Provide feedback to the participants on their performance



The participants shall:

- 8.1.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 8.2 - BOTTOM OBSTRUCTION DEVICE – BOWDEN CABLE

Learning objectives:

- 67) The participants can **perform** a function test of a bottom obstruction device Bowden cable (Skills, intermediate level)
- 68) The participants can **perform** a replacement or adjustment of a bottom obstruction device Bowden cable (Skills, intermediate level)



The instructor shall:

- 8.2.1 Demonstrate how to perform a function test, replacement, and adjustment of a bottom obstruction device Bowden cable
- 8.2.2 Facilitate practical training on testing and adjusting bottom obstruction device Bowden cable



8.2.3 Provide feedback to the participants on their performance



The participants shall:

8.2.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 8.3 - BOTTOM OBSTRUCTION FLASHING LIGHT

Learning objectives:

- 69) The participants can **explain** how to do function test of the bottom obstruction device flashing light (Knowledge, intermediate level)
- 70) The participants can **describe** how to replace the bottom obstruction device flashing light bulb according to the relevant manual (Knowledge, basic level)



The instructor shall:

- 8.3.1 Demonstrate how to perform a function test of the bottom obstruction device flashing light and bulb
- 8.3.2 Facilitate practical training on testing the flashing light and replacing the bulb
- 8.3.3 Provide feedback to the participants on their performance



The participants shall:

8.3.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 8.4 - BOTTOM OBSTRUCTION DEVICE STOP IN THE LOWEST POSITION

Learning objectives:

- 71) The participants can **perform** a function test of the bottom obstruction device (stop in the lowest position) (Skills, intermediate level)
- 72) The participants can **take responsibility** to require repair of the bottom obstruction device, when needed according to the relevant manual (Ability, intermediate level)



The instructor shall:

- 8.4.1 Demonstrate how to perform a function test of the bottom obstruction device (stop in the lowest position)
- 8.4.2 Facilitate practical exercise on testing the bottom obstruction device (stop in the lowest position)
- 8.4.3 Provide feedback to the participants on their performance



The participants shall:

- 8.4.4 Engage in practice, share experiences, and apply the received feedback in the following exercises
- 8.4.5 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 8
- 8.4.6 Check own answers and solutions from the shown fact list on completion of the test

LESSON 9 - LIFT DOOR LOCK / ELECTRICAL INTER-LOCK

15 min.

The aim of this lesson is to enable the participants to test the function of lift door lock in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 9 of the Lift Commission and Inspection Module:

- 73) The participants can **take responsibility** of function-testing the lift door lock / electrical inter-lock according to the relevant manual and instructions (Ability, intermediate level)

ELEMENT 9.1 - FUNCTION TEST OF THE DOOR LOCK

Learning objectives:

- 74) The participants can **take responsibility** of doing function test of the lift door lock following guidance in the relevant manuals (Ability, intermediate level)
- 75) The participants can **perform** a function test of the lift door lock and the electrical inter-lock in operation (skills, intermediate level)



The instructor shall:

- 9.1.1 Demonstrate how to perform a function test and replacement of the lift door lock
- 9.1.2 Facilitate practical training on testing the lift door lock and the electrical inter-lock
- 9.1.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

- 9.1.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 9.2 - EMERGENCY UNLOCKING

Learning objective:

- 76) The participants can **perform** a function test of the emergency unlocking of the lift door lock (Skills, intermediate level)



The instructor shall:

- 9.2.1 Demonstrate how to perform a function test of emergency unlocking of the lift door lock
- 9.2.2 Facilitate practical training on testing emergency unlocking of the lift door lock
- 9.2.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

- 9.2.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 9.3 - UPPER AND LOWER HATCHES

Learning objectives:

- 77) The participants can **describe** how to do a visual inspection of the placement of the pins in the axes of the upper and lower hatches (Knowledge, basic level)
- 78) The participants can **describe** how to inspect the operation of the magnet system or latch on the upper hatch (Knowledge, basic level)



- 79) The participants **show interest** in ensuring, that the handle strings of the upper and lower hatches are properly installed and have the correct length (Ability, basic level)



The instructor shall:

- 9.3.1 Demonstrate how to perform a visual inspection of the placement of the pins in the axes of the upper and lower hatches
- 9.3.2 Demonstrate how to inspect the condition and operation of the magnet system or latch on the upper hatch
- 9.3.3 Demonstrate and facilitate or lead a discussion on the installation and dimensions of the handle strings of the upper and lower hatches



The participants shall:

- 9.3.4 Engage in practice, share experiences, and apply the received feedback in following exercises
- 9.3.5 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 9
- 9.3.6 Check own answers and solutions from the shown fact list on completion of the test

LESSON 10 - LIFT OPERATION PANEL/MANOEUVRE PANEL

15 min.

The aim of this lesson is to enable the participants to verify and ensure that the lift operation/ manoeuvre panel is fully operational.

After successfully having completed Lesson 10 of the Lift Commission and Inspection Module:

- 80) The participants can on own initiative **take responsibility** of inspecting and testing the lift operation/ manoeuvre panel and require repair when needed according to the relevant manual (Ability, intermediate level)

ELEMENT 10.1 - THE LIFT OPERATION/MANOEUVRE PANEL

Learning objectives:



- 81) The participants can **explain** how to do a visual inspection of the lift operation manoeuvre panels (Knowledge, intermediate level)
- 82) The participants can **take responsibility** to carry out a function test on the manoeuvre panels: emergency stop - reset/ready inside/outside - selector switch - up/down inside/outside (Ability, intermediate level)



The instructor shall:

- 10.1.1 Present examples of manoeuvre panels in and outside lifts as well as at the lift base of the WTG and at the nacelle. In addition, demonstrate how to perform a function test and inspection on the panel
- 10.1.2 Lead or facilitate discussion on the lift operation manoeuvre panel



The participants shall:

- 10.1.3 Engage in discussions and share experiences on lift operation manoeuvre panels in lifts

ELEMENT 10.2 - OPERATION HOUR COUNTER

Learning objective:

- 83) The participants can **explain** how to do a visual inspection of the operation hour counter of the lift at the LOP (Knowledge, intermediate level)



The instructor shall:

- 10.2.1 Present examples of operation hour counters in manoeuvre panels in lifts and demonstrate how to perform a function test of the hour counter
- 10.2.2 Lead or facilitate discussion on the lift operation manoeuvre panel and operation hour counter



The participants shall:

- 10.2.3 Engage in discussions and share experiences on lift operation manoeuvre panels and operation hour counters in lifts



ELEMENT 10.3 - EMERGENCY RESCUE SYSTEM

Learning objective:

84) The participants can **describe** how to function test the emergency rescue system (Knowledge, basic level)



The instructor shall:

10.3.1 Demonstrate how to perform a function test of the emergency rescue system

10.3.2 Facilitate that participants practise how to function test the emergency rescue system



The participants shall:

10.3.3 Practise how to function test the emergency rescue system

10.3.4 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 10

10.3.5 Check own answers and solutions from the shown fact list on completion of the test

LESSON 11 - SUSPENSION/CROSSBEAM

25 min.

The aim of this lesson is to enable the participants to inspect the suspension/crossbeam and report errors and omissions in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 11 of the Lift Commission and Inspection Module:

85) The participants can **take the responsibility** for assessing the condition of the suspension/crossbeam, seek guidance in lift manuals and directives and decide relevant and responsible action in case of defects and damages including reporting (Ability, intermediate level)

ELEMENT 11.1 - SUSPENSION/CROSSBEAM

Learning objectives:



- 86) The participants can **explain** how to do a visual inspection of all parts for damage, cracks, corrosion (Knowledge, intermediate level)
- 87) The participants can **explain** how to do a visual inspection of all welds for damage and cracks (Knowledge, intermediate level)



The instructor shall:

- 11.1.1 Explain the importance of a flawless suspension/crossbeam and present examples of damage, cracks, and corrosion in connection to the suspension/crossbeam and its welds
- 11.1.2 Distribute images of examples of damages, cracks and corrosion to the participants and facilitate discussions in pairs on damage, cracks and corrosion and what actions to take, if such are discovered. Each pair should discuss one image for one minute, and then swap the images amongst the participants to initiate discussions on each new image in turn



The participants shall:

- 11.1.3 Engage in pairs in discussions inspired by distributed images and share their experiences on damages, cracks, and corrosion in connection to the suspension/crossbeam and its welds

ELEMENT 11.2 - ROPE END ATTACHMENTS

Learning objective:

- 88) The participants can **explain** how to do a visual inspection of the rope end attachment (Knowledge, intermediate level)



The instructor shall:

- 11.2.1 Present examples of rope end attachments
- 11.2.2 Lead or facilitate discussion on rope ends attachments



The participants shall:

- 11.2.3 Engage in discussions and share experiences on rope ends attachments



ELEMENT 11.3 - BOLTS AND BOLTS CONNECTIONS

Learning objective:

- 89) The participants can **explain** how to do a visual inspection of all bolts and bolt connections for completeness and tightness (Knowledge, intermediate level)



The instructor shall:

- 11.3.1 Present and demonstrate examples of how to do a visual inspection of all bolts and bolt connections for completeness and tightness
- 11.3.2 Lead or facilitate discussion on bolts and bolt connections completeness and tightness



The participants shall:

- 11.3.3 Engage in discussions and share experiences on bolt and bolt connections completeness and tightness and how to inspect them

ELEMENT 11.4 - UPPER AND LOWER ATTACK PINION (R&P)

Learning objective:

- 90) The participants can **describe** how to do a visual inspection of the upper and lower attack pinion (Knowledge, basic level)



The instructor shall:

- 11.4.1 Present and demonstrate examples of how to do a visual inspection of all bolts and bolt connections for completeness and tightness of the upper and lower attack pinion
- 11.4.2 Lead or facilitate a discussion on bolts and bolt connections and their completeness and tightness



The participants shall:

- 11.4.3 Engage in discussions and share experiences on bolt and bolt connections on the upper and lower attack pinion and their completeness and tightness
- 11.4.4 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 11



11.4.5 Check own answers and solutions from the shown fact list on completion of the test

LESSON 12 - DRIVE AND SAFETY WIRE ROPE AND RACK

40 min.

The aim of this lesson is to enable the participants to test and ensure the functionality of drive and safety ropes and racks in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 12 of the Lift Commission and Inspection Module:

- 91) The participants can **take responsibility** to do a visual inspection of drive and safety ropes according to ISO 4309 (Ability, intermediate level)

ELEMENT 12.1 - DRIVE ROPES, IN GENERAL

Learning objective:

- 92) The participants can **perform** a visual inspection of the diameter of drive rope and safety rope in unloaded state at three points: bottom, middle and top (Skills, intermediate level)



The instructor shall:

- 12.1.1 Demonstrate how to inspect drive and safety ropes
- 12.1.2 Facilitate practical training on inspecting drive and safety ropes
- 12.1.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

- 12.1.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 12.2 - TENSION WEIGHT

Learning objectives:



- 93) The participants can **explain** how to do a visual inspection on tension weights installations in accordance with the relevant manuals (Knowledge, intermediate level)
- 94) The participants can **explain** how to inspect tension weights to have distance/space above (full loaded lift) or below (unloaded lift) in accordance with the relevant manuals.(Knowledge, intermediate level)
- 95) The participants can **describe** how to do an adjustment on tension weights installations in accordance with the relevant manuals (Knowledge, basic level)



The instructor shall:

- 12.2.1 Demonstrate how to inspect and describe how to adjust tension weights according to relevant manuals and instructions
- 12.2.2 Facilitate practical training on inspecting tension weights
- 12.2.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

- 12.2.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 12.3 - GROUNDING ROTATING UNIT

Learning objective:

- 96) The participants can **describe** how to do a visual inspection of the grounding rotating unit (Knowledge, basic level)



The instructor shall:

- 12.3.1 Demonstrate how to inspect a grounding rotating unit
- 12.3.2 Facilitate a discussion on how to inspect a grounding rotating unit



The participants shall:

- 12.3.3 Engage in discussion on the grounding rotating unit and share experiences on grounding rotation units in lifts



ELEMENT 12.4 - ROPE ENDS

Learning objectives:

- 97) The participants can **explain** how to do a visual inspection of rope ends to ensure they are sufficiently coiled up (Knowledge, intermediate level)
- 98) The participants can **recognise** if cutting/shortening of rope ends is needed (Knowledge, basic level)



The instructor shall:

- 12.4.1 Present examples of how to visually inspect coiled up rope ends
- 12.4.2 Present examples of rope ends, where shortening of rope ends is needed
- 12.4.3 Lead or facilitate discussion on when to require assistance for shortening of rope ends



The participants shall:

- 12.4.4 Engage in discussions and share experiences on inspecting and shortening rope ends

ELEMENT 12.5 - COUNTER ROLLERS

Learning objective:

- 99) The participants can **describe** how to do a visual inspection of the upper and lower counter rollers (Knowledge, basic level)



The instructor shall:

- 12.5.1 Present examples of how to do a visual inspection of upper and lower counter rollers
- 12.5.2 Lead or facilitate a discussion on how to do a visual inspection (as guided in the relevant manuals) of upper and lower counter rollers and on what to do in case of irregularities



The participants shall:

- 12.5.3 Engage in discussions and share experiences on upper and lower counter rollers



ELEMENT 12.6 - ROPE CLAMPS

Learning objective:

100) The participants can **explain** how to do a visual inspection of the rope clamps (Knowledge, intermediate level)



The instructor shall:

- 12.6.1 Demonstrate of how to inspect rope clamps
- 12.6.2 Facilitate practical training on inspecting rope clamps
- 12.6.3 Provide feedback on the participants' performance



The participants shall:

- 12.6.4 Engage in practical training, share experiences on inspecting rope clamps and reflect on the received feedback to improve their performance

ELEMENT 12.7 - ROPE ATTACHMENTS AND BONDINGS

Learning objective:

101) The participants can **explain** how to do a visual inspection of the rope attachment and bondings (Knowledge, intermediate level)



The instructor shall:

- 12.7.1 Present examples of rope attachment and bondings
- 12.7.2 Lead or facilitate discussion on how to do a visual inspection of the rope attachment and bondings



The participants shall:

- 12.7.3 Engage in discussions and share experiences on rope attachment and bondings in WTG



ELEMENT 12.8 - ROPE PROTECTION

Learning objectives:

- 102) The participants can **explain** how to visually inspect whether the protective tube is mounted (Knowledge, intermediate level)
- 103) The participants can **explain** how to do a visual inspection of the rope protections installed at the rope guides (landing feed through) (Knowledge, intermediate level)



The instructor shall:

- 12.8.1 Present examples of different rope protection systems
- 12.8.2 Facilitate a discussion on how to inspect rope protection systems



The participants shall:

- 12.8.3 Engage in discussion on rope protection systems

ELEMENT 12.9 - INSPECTION OF THE RACK

Learning objectives:

- 104) The participants can **describe** how to inspect the function test the rack (Knowledge, basic level)
- 105) The participants can **describe** how to function test the operation of the rack proximity detector (Knowledge, basic level)
- 106) The participants **show interest** in seeking guidance in the relevant manuals if excessive wear on the rack is detected (Ability, basic level)



The instructor shall:

- 12.9.1 Present examples of wear on a rack and explain how to find guidance in the relevant maintenance manuals
- 12.9.2 Lead or facilitate discussion on wear on racks, how to do a visual inspection of the rack, and what to do in case of detecting excessive wear on the rack



The participants shall:

12.9.3 Engage in discussions and share experiences on wear on racks in WTG

ELEMENT 12.10 - GREASE THE RACK

Learning objective:

107) The participants can **describe** how to inspect if a rack and a pinion is sufficiently greased (Knowledge, basic level)



The instructor shall:

12.10.1 Present examples of how to recognise when a rack and a pinion is sufficiently greased, and explain how to find guidance in the relevant manuals



The participants shall:

12.10.2 Engage in discussions and share experiences on greasing rack and pinions in WTG

12.10.3 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 12

12.10.4 Check own answers and solutions from the shown fact list on completion of the test

LESSON 13 - TRACTION HOIST

35 min.

The aim of this lesson is to enable the participants to take responsibility of the general condition and functionality of the traction hoist in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 13 of the Lift Commission and Inspection Module:

108) The participants can **take responsibility** of visually inspecting the general condition of the traction hoist in a lift as guided in the relevant manuals (Ability, intermediate level)

109) The participants can **perform** a function test of the traction hoist as described in the relevant manuals (Skills, intermediate level)



ELEMENT 13.1 - TRACTION HOIST DEVICE

Learning objectives:

- 110) The participants can **perform** a function test of the traction hoist (Skills, intermediate level)
- 111) The participants can **perform** a visual inspection of the wire in the traction hoist in the lift (Skills, intermediate level)



The instructor shall:

- 13.1.1 Demonstrate how to test a traction hoist and inspect the wire in the traction hoist
- 13.1.2 Facilitate practical training on inspecting a traction hoist and wire
- 13.1.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

- 13.1.4 Engage in practice on inspecting a traction hoist and wire, share experiences, and apply the received feedback in following exercises

ELEMENT 13.2 - OPERATION HOUR COUNTER

Learning objectives:

- 112) The participants can **describe** how to do a visual inspection of the status on operation hour counter of the hoist (Knowledge, basic level)
- 113) The participants can **describe** an inspection of the hoist operation hour counter and rectify any issues following work instruction and lift maintenance manuals (Knowledge, basic level)



The instructor shall:

- 13.2.1 Present examples of hoist operation hour counters
- 13.2.2 Present examples of hoist operation hour counter issues, where rectifying action was needed
- 13.2.3 Lead or facilitate a discussion on how to inspect hoist operation hour counters



The participants shall:

- 13.2.4 Engage in discussions and share experiences on hoist operation hour counters

ELEMENT 13.3 - LABELS AND TYPE PLATES ON TRACTION HOIST

Learning objective:

- 114) The participants can **explain** how to do visual inspection of labels and type plates (Knowledge, intermediate level)



The instructor shall:

- 13.3.1 Present examples of labels and type plates
- 13.3.2 Lead or facilitate discussion on how and what to inspect in relation to labels and type plates



The participants shall:

- 13.3.3 Engage in discussions and share experiences on how and what to inspect in relation to labels and type plates

ELEMENT 13.4 - DRIVE UNIT, MECHANICAL

Learning objectives:

- 115) The participants can **perform** a visual inspection of an attachment to the lift (Skills, intermediate level)
- 116) The participants can **perform** a wear test of the centrifugal brake (speed test, downwards velocity during emergency descent) according to relevant manuals and guides (Skills, intermediate level)
- 117) The participants can **describe** how to do a visual inspection for leaks on drive unit and report according to the relevant lift manuals or instruction (Knowledge, basic level)



The instructor shall:

- 13.4.1 Demonstrate examples of:
- a. how to inspect the attachment to the lift



- b. how to do a wear test of centrifugal brake
- c. how to check the operation of motor break at top- and bottom drive unit
- d. how to do a speed test during emergency descent
- e. how to do a visual inspection for leaks on drive unit and report in case of leaks

13.4.2 Facilitate practical training on:

- a. how to do a wear test of centrifugal brake
- b. how to do a speed test during emergency descent



The participants shall:

- 13.4.3 Engage in the practical training, share experiences on hoist and drive units, and apply the received feedback in following learning activities

ELEMENT 13.5 - DRIVE UNIT, ELECTRICAL

Learning objective:

- 118) The participants can **explain** how to do a visual inspection of the wiring (EI) to drive unit (Knowledge, intermediate level)



The instructor shall:

- 13.5.1 Present examples of wiring (EI) to drive units
- 13.5.2 Facilitate practical training on how to inspect wiring (EI) to drive a unit and provide feedback on participants performance
- 13.5.3 Lead or facilitate discussion on safety when inspecting wiring (EI) to a drive unit



The participants shall:

- 13.5.4 Engage in the practical training and following discussions, share experiences on wiring (EI) to a drive unit, and reflect on the received feedback



ELEMENT 13.6 - UPPER AND LOWER GEARBOX

Learning objective:

- 119) The participants can **describe** how to do a visual inspection for oil leaks in the upper, and lower, gear box (Knowledge, basic level)



The instructor shall:

- 13.6.1 Present examples of how to inspect the upper, and lower, gear box
- 13.6.2 Present examples of oil leaks in the upper, and lower, gear box
- 13.6.3 Lead or facilitate discussion on how to react if oil leaks in the upper, or lower, gear box are detected



The participants shall:

- 13.6.4 Engage in discussions and share experiences on function and conditions of the upper, and lower, gear box

ELEMENT 13.7 - ELECTRO-MECHANICAL AND CENTRIFUGAL BRAKES

Learning objectives:

- 120) The participants can **describe** how to do a visual inspection of centrifugal and electro-mechanical brakes (Knowledge, basic level)
- 121) The participants can **perform** a function test on the electro-mechanical brakes and the centrifugal brakes and measurement of their diameter (R&P) (Skills, intermediate level)



The instructor shall:

- 13.7.1 Present examples of how to inspect the electro-mechanical brakes and the centrifugal brakes
- 13.7.2 Lead or facilitate discussion on inspections of the electro-mechanical brakes and the centrifugal brakes react if oil leaks in accordance with relevant the manuals



The participants shall:



- 13.7.3 Engage in discussions and share experiences on function and conditions of the electro-mechanical brakes and the centrifugal brakes and gear box

ELEMENT 13.8 - LOAD CAPACITY SYSTEM

Learning objectives:

- 122) The participants can **perform** function test on the load capacity system as described in the relevant manuals (Skills, intermediate level)
- 123) The participants can **describe** the principles of adjustment of the load capacity system (Knowledge, basic level)



The instructor shall:

- 13.8.1 Present key points in relation to inspection of the load capacity system in different lift types as described in the relevant manuals
- 13.8.2 Demonstrate how to inspect and adjust different kinds of load capacity systems in different lift types
- 13.8.3 Facilitate practical training on the inspection of different kinds of load capacity systems and provide feedback to the participants on their performance
- 13.8.4 Lead or facilitate discussion on differences between different load capacity systems in different lift types



The participants shall:

- 13.8.5 Take part in the practical training on inspecting load capacity systems
- 13.8.6 Participate in discussions and share experiences on lift load capacity systems
- 13.8.7 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 13
- 13.8.8 Check own answers and solutions from the shown fact list on completion of the test

LESSON 14 - WIRE ROPE REDIRECTION INSIDE THE CABIN

5 min.

The aim of this lesson is to enable the participants to inspect and ensure that the redirection pulleys are in accordance with the relevant manuals and inspection lists.



After successfully having completed Lesson 14 of the Lift Commission and Inspection Module:

- 124) The participants can **take responsibility** of ensuring, that the re-direction pulleys are functioning as described in relevant manuals and guides (Ability, intermediate level)



The instructor shall:

- 14.1.1 Lead or facilitate discussion on how to inspect redirecting pulleys according to relevant manuals and guides



The participants shall:

- 14.1.2 Engage in the discussions, share experiences on redirecting pulleys, and reflect on the received feedback

LESSON 15 - FALL ARREST DEVICE (FAD)

30 min.

The aim of this lesson is to enable the participants to inspect and test the function of the fall arrest device (FAD) in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 15 of the Lift Commission and Inspection Module:

- 125) The participants can **take responsibility** for function testing the fall arrest device (FAD) as described in the relevant manuals (Ability, intermediate level)

ELEMENT 15.1 - LABELS AND TYPE PLATES

Learning objectives:

- 126) The participants can **explain** how to do a visual inspection of labels and type plates on the FAD as described in the relevant manuals (Knowledge, intermediate level)
- 127) The participants can **explain** how to apply labels on the FAD (Knowledge, intermediate level)



The instructor shall:

- 15.1.1 Present examples of labels and type plates on FADs from relevant manuals
- 15.1.2 Demonstrate how to apply labels on FADs



- 15.1.3 Lead or facilitate a discussion on how and what to inspect in relation to labels and type plates in relation to FADs



The participants shall:

- 15.1.4 Engage in discussions and share experiences on how and what to inspect in relation to labels and type plates on FADs – and how to apply labels

ELEMENT 15.2 - GENERAL CONDITION

Learning objectives:

- 128) The participants can **explain** how to do a visual inspection of the general condition of a fall arrest device, following the relevant manuals (Knowledge, intermediate level)
- 129) The participants can **explain** how to do a visual inspection of wear on intake bushing (Knowledge, intermediate level)
- 130) The participants can **explain** how to do a visual inspection of the electrical wiring (Knowledge, intermediate level)
- 131) The participants can **explain** how to do a visual inspection of the centrifugal system as described in the relevant manual (Knowledge, intermediate level)
- 132) The participants can **perform** function and wear test of pinch and centrifugal pulley (Skills, intermediate level)



The instructor shall:

- 15.2.1 Present key points in relation to the inspection of the general condition of fall arrest devices in different lift types
- 15.2.2 Lead or facilitate discussion on differences between different fall arrest devices in different lift types



The participants shall:

- 15.2.3 Take active part in discussions and share experiences working with fall arrest devices

LESSON 16 - SUPPLY CABLE

10 min.



The aim of this lesson is to enable the participants to inspect the supply cable and cable bin in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 16 of the Lift Commission and Inspection Module:

- 133) The participants can **take responsibility** to inspect a supply cable and cable bin as described in the relevant manuals (Skills, intermediate level)

ELEMENT 16.1 - FEED-IN OF SUPPLY CABLE

Learning objective:

- 134) The participants can **explain** how to do a visual inspection of the feed-in of a supply cable (Knowledge, intermediate level)



The instructor shall:

- 16.1.1 Demonstrate how to inspect a supply cable in accordance with the relevant manuals
- 16.1.2 Lead or facilitate discussion on safety issues in relation to inspecting feed-in of a supply cable



The participants shall:

- 16.1.3 Take active part in discussions and share experiences from working with feed-in of a supply cables

ELEMENT 16.2 - STRAIN RELIEF

Learning objective:

- 135) The participants can **explain** how to do a function test on a strain relief attached to the cabin (Knowledge, intermediate level)



The instructor shall:

- 16.2.1 Present and demonstrate examples of how to do function test of a strain relief at the cabin by following the relevant manuals
- 16.2.2 Lead or facilitate discussion on safety issues in relation to strain reliefs at the cabin



The participants shall:

- 16.2.3 Take active part in discussions and share experiences from working with strain reliefs at the cabin and differences and similarities between strain reliefs on different lift types

ELEMENT 16.3 - CABLE BIN

Learning objectives:

- 136) The participants can **explain** how to do a visual inspection of the cable bin condition (Knowledge, intermediate level)
- 137) The participants can **explain** how to do a visual inspection of the cable bin connection to the suspension/crossbeam (Knowledge, intermediate level)
- 138) The participants can **explain** how to tighten and replace the cable bin and the connections to the suspension/crossbeam according to the relevant manuals and guides (Knowledge, intermediate level)



The instructor shall:

- 16.3.1 Present examples of cable bin conditions
- 16.3.2 Demonstrate how to tighten and replace cable bin connections to suspension/crossbeam
- 16.3.3 Lead or facilitate discussion on when and how to tighten and replace cable bin connections to suspension/crossbeam



The participants shall:

- 16.3.4 Engage in discussions and share experiences on cable bins and seek information in relevant manuals
- 16.3.5 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 16
- 16.3.6 Check own answers and solutions from the shown fact list on completion of the test

LESSON 17 - TEST AND TRAINING REVIEW

50 min.



ELEMENT 17.1 - THEORY TEST

Note *The theory test must be conducted if the lesson-related questionnaires have not been sufficiently covering the theory content in the relevant lessons*



The instructor shall:

- 17.1.1 Facilitate a test recapping key safety theory topic
- 17.1.2 Present solutions and correct answers on completion of the test
- 17.1.3 Lead a discussion on participants reflections and answers



The participants shall:

- 17.1.4 Conduct a questionnaire test on intermediate level questions aiming at both knowledge, skills, and abilities (See to GWO Requirements for Training, Annex 5 Taxonomy Framework)
- 17.1.5 Check own answers and solutions from the shown fact list on completion of the test

Alternative or supplementary practical evaluation activity: The participants affix coloured notes on lift parts for example: red notes on parts that must be visually inspected; green notes on parts that must be tested; blue notes on parts that must be adjusted or replaced in connection to the commissioning inspection. The instructor decides relevant categories. The arguments for placing the different notes may be shared and discussed in the group

ELEMENT 17.2 - TRAINING REVIEW



The instructor shall:

- 17.2.1 Together with all participants, review the overall aims and learning objectives of the course so participants can compare how their learning outcome meet their, previously stated, course expectations



The participants shall:

- 17.2.2 Suggestion for activity: the participants reflect on their learning outcome and key takeaways from the training programme. The aim is to achieve a high learning transfer from the module to their way of working
 - a. questions and answers in class or, where suitable

Note *The training staff may additionally conduct a local evaluation on the training and the training facility*



ELEMENT 17.3 - FEEDBACK SESSION



The instructor shall:

- 17.3.1 Give the participants final feedback on the formal participant performance assessment and inform them whether they have passed (failed participants must be informed individually prior to the reflection session)
- 17.3.2 Give an overall feedback and feed forward on the participants' learning outcome inspired from the training as well as from the training-review session
- 17.3.3 Encourage the participants to examine and grow awareness of how specific elements in their own WTG type/WTG environment differ from the training scenario environment (to visualise and enhance learning transfer) and to discuss with colleagues' expectations and experiences on using a lift in WTG under the local specific conditions identified after course completion

ELEMENT 17.4 - PARTICIPANT PERFORMANCE ASSESSMENT

Assessment of learning outcomes:

- 17.4.1 Participants will be assessed according to the learning objectives stated in the training module description by means of direct observation and supplementary oral questions and dialogue, where appropriate
- 17.4.2 The assessment shall be conducted during practical scenarios based on the WTG environment
- 17.4.3 Each participant shall participate, as detailed, in the practical learning activities
- 17.4.4 The formal evaluation of knowledge of above scenarios shall be in accordance with the control measures form (template provided in the Requirements for Training). The instructor keeps the control measures forms until the completion/evaluation of the module
- 17.4.5 Training providers shall have a documented procedure in place for dealing with participants not meeting the stated learning outcomes. If a participant fails to meet the demands, they shall attend a new Lift Commission and Inspection Module training



Lift commission, Inspection, Installation and Maintenance Module

(LCIIM)



9. LIFT COMMISSION, INSPECTION, INSTALLATION AND MAINTENANCE MODULE

9.1 Aims of the Lift Commission, Inspection, Installation and Maintenance Module

The aim of this module is: to enable the lift technician to: install, inspect the lift prior to commissioning and perform maintenance; to take correct measures to acquire assistance; and perform simple adjustments or replacement of parts in a WTG lift.

Fundamental for the training is the wind technician's attention to, and awareness of, always following and seeking guidance from the relevant lift manuals and instructions.

The overall learning objective of this module is:

139) The participants can **solve** routine tasks in relation to the commissioning, inspection, installation, and maintenance of lifts in a WTG following relevant guides and manuals (Ability, basic level).

9.2 Course Participants Prerequisites for the Lift Commission, Inspection, Installation and Maintenance Module

GWO Lift User Module training or similar brand specific user training is a prerequisite to participate in the Lift Commission, Inspection, Installation and Maintenance Module training.

Basic technical experience and knowledge, primarily mechanical and electrical, is necessary to be able to get full benefit from the training.

9.3 LCIIM Module Instructor's Qualification

As an addition to the GWO Requirements for Training, a competent LCIIM module instructor must be acknowledged as such by a competent instructor or train-the-trainer.

Note *A competent instructor or train-the-trainer must hold the sufficient lift technical experience on multiple lift types obtained by, for example, work experience, lift trainings and manufacturer led lift trainings.*

The purpose of this is to ensure the necessary technical understanding of lift functionalities and is as such not lift brand specific.

9.4 Duration of the Lift Commission, Inspection, Installation and Maintenance Module

The total contact time for completing the Lift Commission, Inspection, Installation and Maintenance Training Module Training Module is 14 hours and 0 minutes.

The training provider must not exceed the times per day given in table 9.4.1 below.

Maximum Duration Per Day



| | |
|--------------------|----------|
| Contact time | 8 hours |
| Total training day | 12 hours |

Table 9.4.1 – Maximum durations for training day

Note *Contact time includes carrying out all learning activities and activities directly related to these. The total training day includes contact time, meals and breaks and travel between training sites (where applicable).*

9.5 Instructor to Participants Ratio

The ratio shown for theory sessions indicates the maximum number of participants that shall attend the course.

The ratio shown for practical sessions indicates the maximum number of participants to be supervised by one instructor during each activity.

| Module | Session | Instructor to Participant Ratio |
|--|-----------|---------------------------------|
| Lift Commission, Inspection, Installation and Maintenance Module | Theory | 1:12 |
| | Practical | 1:6 |

Table 9.5.1 - GWO Lift Commission, Inspection, Installation and Maintenance module instructor to participant ratio

9.6 Lift Commission, Inspection, Installation and Maintenance Module Timetable

The order in which elements of this Lift Module training are delivered may vary according to the didactical choices of the delivering training provider.

The delivery of this module must comply with the requirements described in the GWO Requirements for Training.

| Lesson | Element | Duration |
|---------------------------------|---|----------|
| 1. Introduction to the training | 1.1 Safety instructions and emergency procedures | |
| | 1.2 Facilities | |
| | 1.3 Introduction | |
| | 1.4 Scope and main learning objectives | |
| | 1.5 Ongoing assessments (participant assessment form) | |
| | 1.6 Motivation | |
| | 1.7 Human factors | |
| | 1.8 Personal Protective Equipment | |
| TOTAL | | 30 min. |



| | | | | |
|----|--|-----|---|----------|
| 2. | Legislation and documentation | 2.1 | Lift manufacturers’ user manuals and guides | |
| | | 2.2 | Local and national legislation | |
| | | | TOTAL | 15 min. |
| 3. | Safety when working on a lift in a WTG | 3.1 | Hazardous energy | |
| | | 3.2 | Work areas in the WTG | |
| | | | TOTAL | 25 min. |
| 4. | Gates and fences | 4.1 | Outside the lift | |
| | | 4.2 | Gate locking systems | |
| | | 4.3 | Guard locking control system | |
| | | 4.4 | Upper and lower hatches | |
| | | | TOTAL | 45 min. |
| 5. | Cabin and its attachment parts | 5.1 | The cabin – in general | |
| | | 5.2 | Fasteners and anchor points | |
| | | 5.3 | Service light and emergency light | |
| | | | TOTAL | 55 min. |
| 6. | Cabin guide unit | 6.1 | Introduction to lift guiding systems | |
| | | 6.2 | Guide ropes | |
| | | 6.3 | Guide wheels | |
| | | 6.4 | Roller guide unit | |
| | | 6.5 | Guide ladder inspection | |
| | | | TOTAL | 117 min. |
| 7. | Top obstruction device | 7.1 | Top obstruction device function | |
| | | 7.2 | Top obstruction flashing light | |
| | | 7.3 | Top obstruction in top position | |
| | | | TOTAL | 45 min. |
| 8. | Bottom obstruction device | 8.1 | Bottom obstruction device function | |
| | | 8.2 | Bottom obstruction device - Bowden cable | |
| | | 8.3 | Bottom obstruction flashing light | |
| | | 8.4 | Bottom obstruction device stop in the lowest position | |
| | | | TOTAL | 72 min. |
| 9. | Lift door lock and electrical inter-lock | 9.1 | Function test of the door lock | |
| | | 9.2 | Emergency unlocking | |



| | | | |
|--|-------|---|----------|
| | 9.3 | Upper and lower hatches | |
| | | TOTAL | 20 min. |
| 10. Lift operation/manoeuvre panel | 10.1 | The lift operation/ manoeuvre panel | |
| | 10.2 | Operation hour counter | |
| | 10.3 | Emergency rescue system | |
| | | TOTAL | 20 min. |
| 11. Suspension/crossbeam | 11.1 | Suspension/crossbeam | |
| | 11.2 | Rope end attachments | |
| | 11.3 | Bolts and bolts connections | |
| | 11.4 | Upper and lower attack pinion (R&P) | |
| | | TOTAL | 35 min. |
| 12. Drive and safety wire rope | 12.1 | Drive ropes, in general | |
| | 12.2 | Tension weights | |
| | 12.3 | Grounding rotating unit | |
| | 12.4 | Rope ends | |
| | 12.5 | Counter rollers | |
| | 12.6 | Rope clamps | |
| | 12.7 | Rope attachments and bondings | |
| | 12.8 | Rope protection | |
| | 12.9 | Inspection of the rack | |
| | 12.10 | Grease the rack | |
| | | TOTAL | 140 min. |
| 13. Traction hoist | 13.1 | Traction hoist device | |
| | 13.2 | Operation hour counter | |
| | 13.3 | Labels and type plates in traction hoist | |
| | 13.4 | Drive unit, mechanical | |
| | 13.5 | Drive unit, electrical | |
| | 13.6 | Upper and lower gearbox | |
| | 13.7 | Electro-mechanical and centrifugal brakes | |
| | 13.8 | Load capacity system | |
| | | TOTAL | 73 min. |
| 14. Wire rope redirection inside the cabin | 14.1 | Wire rope redirection inside the cabin | |
| | | TOTAL | 15 min. |



| | | | |
|------------------------------|------|------------------------------------|----------|
| 15. Fall arrest device (FAD) | 15.1 | Labels and type plates | |
| | 15.2 | General condition | |
| TOTAL | | | 63 min. |
| 16. Supply cable | 16.1 | Feed-in of supply cable | |
| | 16.2 | Strain relief | |
| | 16.3 | Cable bin | |
| TOTAL | | | 20 min. |
| 17. Test and training review | 17.1 | Theory test | |
| | 17.2 | Training review | |
| | 17.3 | Feedback session | |
| | 17.4 | Participant performance assessment | |
| TOTAL | | | 50 min. |
| GRAND TOTAL | | | 840 min. |

Table 9.6.1 - GWO Lift Commission, Inspection, Installation and Maintenance Module timetable

9.7 Formative Post-lesson Evaluations

The participants must conduct an individual theory questionnaire on each lesson, where this is indicated in the relevant element. These questionnaires serve both as a re-cap for the participants on the theoretical topics of the lessons, and they are the instructors' tool to evaluate the participants' theoretical learning outcome and understanding. Questions must be aimed at the lesson's content and posed at the taxonomic level in the relevant learning objectives. They should also challenge the participants according to their professional experience level.

The theory questionnaire can consist of multiple-choice or descriptive-answer questions, depending on the complexity of the taxonomy level of the learning objectives concerned.

The questionnaires must be conducted in accordance with the following criteria:

1. There shall be at least one question for each element in the lesson.
2. There shall be a time limit of maximum 1½ minutes per question.
3. The questionnaires must be done individually.
4. Where a participant does not understand the meaning of a question or a multiple-choice option, the instructor must facilitate the participant to understand the meaning of the question or the multiple-choice options.
5. Participants may use:
 - a. training material
 - b. handouts



c. own notes

Correct answers must be shared at the end of the questionnaire to allow the participants to check and evaluate their answers. To enhance learning, it is recommended letting peer participants evaluate each other's answers.

9.8 Detailed Description of the Lift Commission, Inspection, Installation and Maintenance Module

LESSON 1 - INTRODUCTION TO THE TRAINING

30 min.

The aim of this lesson is for the participants to be motivated and to engage in the training safely at a training facility, while recognising what is expected of them during the training.

After having successfully completed Lesson 1 of the Lift Commission, Inspection, Installation and Maintenance Module, the participants can:

- 1) **Recognise** what is expected of them throughout the module (Knowledge, basic level)
- 2) **Name** and point out local emergency procedures and facilities (Knowledge, basic level)
- 3) **Discuss** the relevant human factors and **explain** their implications (Knowledge, intermediate level)
- 4) **Explain** the use of correct PPE (Knowledge, intermediate level)

ELEMENT 1.1 - SAFETY INSTRUCTIONS AND EMERGENCY PROCEDURES

Learning objective:

- 5) The participants **show interest** or curiosity in the safety and emergency procedures at the training facility (Ability, basic level)



The instructor shall:

1.1.1 Explain and ask involving questions aiming at:

- a. safety instructions according to internal procedures
- b. emergency procedures and emergency exits in the areas where the participants can be expected to be located during the course
- c. site-specific chemical safety rules and instructions



The participants shall:

- 1.1.2 Engage in answering questions on local safety and emergency procedures

ELEMENT 1.2 - FACILITIES

Learning objective:

- 6) The participants can **recognise** the location of facilities at the training location (Knowledge, basic level)



The instructor shall:

- 1.2.1 Present a general description of the facilities at the training location (administration, dining area, restrooms, toilets, etc)
- 1.2.2 Alternative activity: lead a tour and point out facilities



The participants shall:

- 1.2.3 Note relevant facilities and ask questions when in doubt

ELEMENT 1.3 - INTRODUCTION

Learning objective:

- 7) The participants **show interest** in fellow participants and the course content and design (Ability, basic level)



The instructor shall:

- 1.3.1 Explain and ask involving questions aiming at the programme of the Lift Commission, Inspection, Installation and Maintenance Training Module, including breaks and mealtimes
- 1.3.2 Give a short introduction to themselves, including their background as instructors
- 1.3.3 Ask for participants' expectations of the training and their learning or development



The participants shall:

- 1.3.4 Give a short introduction to themselves, including job function and expected primary geographic work location and share expectations on the training

ELEMENT 1.4 - SCOPE AND MAIN LEARNING OBJECTIVES

Learning objective:

- 8) The participants can **recognise** the scope and main objectives of the Lift Commission, Inspection, Installation and Maintenance Module training (Knowledge, basic level)



The instructor shall:

- 1.4.1 Present the scope and main learning objectives of the Lift Commission, Inspection, Installation and Maintenance Module
- 1.4.2 Involve participants with questions on understanding and individual experiences on the use of lifts



The participants shall:

- 1.4.3 Engage in answering questions and share experiences on the use of lifts in WTG

ELEMENT 1.5 - ONGOING ASSESSMENTS (PARTICIPANT ASSESSMENT FORM)

Learning objective:

- 9) The participants **recognise** the assessment procedure and the aim of the ongoing assessment (Knowledge, basic level)



The instructor shall:

- 1.5.1 Explain the reasons for the ongoing assessment
- 1.5.2 Explain the layout of the GWO participant assessment form and how it will be used



The participants shall:



1.5.3 Engage themselves in discussions and ask questions when in doubt in relation to the assessment procedure

ELEMENT 1.6 - MOTIVATION

Learning objective:

- 10) The participants **show interest** and willingness to engage in the learning activities (Ability, basic level)



The instructor shall:

- 1.6.1 Explain and lead a discussion on:
- a. the importance of personal involvement in the course
 - b. the definition of and the need for lift understandings and abilities

Note *Positive motivation is the driving force for commitment. The instructor should make a focused effort to support growth of the necessary attitude and motivation in the participant*



The participants shall:

- 1.6.2 Engage themselves in discussions and share experiences on the use, installation, and maintenance of lifts in WTGs

Note *When participants succeed (by trying out on their own, bringing their relevant experience into play and applying learning points from the instructor's feedback) they develop both a positive attitude and a responsibility towards the subject and how they perform in the work situation*

ELEMENT 1.7 - HUMAN FACTORS

The aim of the element is to draw the participant's attention on how human behaviour and outlook influences a safe work environment, and to prepare for the continued focus on behaviour and taking responsibility during practical training and exercises.

Learning objectives:

- 11) The participants can **describe** the relevant human factors, and the implications of this (Knowledge, basic level)



- 12) The participants **show interest** and willingness to focus on human factors during the following practical exercises (Ability, basic level)



The instructor shall:

- 1.7.1 Present how human factors influence accidents in the wind industry. Relevant statistics may be applied
- 1.7.2 Lead a discussion about the role of the individual in improving human behaviours and how this can improve the safety of offshore operations
- 1.7.3 Ensure that constructive feedback on the participant's performance involve human factors criteria when these are defined in the learning objective such as the ability to take responsibility or to act independently

Facts and Human Factor Criteria:

The consequences of human factors in accidents in the wind industry are influenced by the following terms and conditions:

- a. attention and perception
- b. group behaviour and peer pressure
- c. weather conditions
- d. weather delays
- e. noise levels
- f. site layout and housekeeping
- g. fitness and health
- h. domestic and work-related stress
- i. workload (both overload and underload)
- j. fatigue
- k. time pressure and deadlines
- l. alcohol, medication, and substance abuse



The participants shall:



- 1.7.4 Engage in discussions and share experiences of how human factors influence accidents in the use of lifts, engage in and reflect on received feedback and take responsibility on their own performance and development during the training

Note *The participants performance (from a human factors perspective) must be part of the feedback whenever feasible during the training*

ELEMENT 1.8 - PERSONAL PROTECTIVE EQUIPMENT

Learning objectives:

- 13) The participants can **describe** the need for correct PPE (Knowledge, basic level)
- 14) The participants can **recognise** and **describe** the correct use of PPE (Knowledge, basic level)
- 15) The participants will **show interest** and awareness of exposure to chemical lubrication products and take responsibility for acting correct (Ability, basic level)



The instructor shall:

- 1.8.1 Ask questions on the participants' knowledge on the relevant PPE equipment, including: helmet, safety shoes, safety glasses, gloves, high visibility clothing (harness and fall-arrest may be presented)
- 1.8.2 Lead a discussion on exposure to chemical lubrication products and mitigating actions



The participants shall:

- 1.8.3 Engage in instructor's questions and share experiences on the use of PPE and the exposure to chemical lubrication products

Note *PPE is expected knowledge, and the learning activity should only be conducted when necessary*

LESSON 2 - LEGISLATION AND DOCUMENTATION

15 min.

The aim of this lesson is to emphasise the need to (at all times) locate, seek guidance in, and use the relevant lift manuals and directives, and to enable the participants to comply with national legislation and company regulations and any brand specific recommendations when using and working on a lift in WTGs.



After having successfully completed Lesson 2 of the Lift Commission, Inspection, Installation and Maintenance Module, the participants can:

- 16) On their own, **take initiative** and **take responsibility** to follow lift manufacturer's user manual, regulations, and legislations as well as relevant national and international legislation when working on lifts in a WTG (Ability, intermediate level)

ELEMENT 2.1 - LIFT MANUFACTURERS' USER MANUALS AND GUIDES

Learning objectives:

- 17) The participants can **describe** where and how to find relevant documentation (manuals, risk-assessment, inspections- and installation forms etc.) (Knowledge, basic level)
- 18) The participants can **take responsibility** and, will on their own, **take initiative** to seek help or guidance when needed (Ability, intermediate level)
- 19) The participants can **act independently**, **take initiative**, and always **take responsibility** in applying relevant lift manuals and instructions when inspecting, installing, and maintaining lifts in a WTG (Ability, intermediate level)

Note *The need for using relevant lift manuals and instructions must be emphasised and trained in all learning activities during the training*

Note *Following the relevant lift manuals, participants must perform a daily pre-use inspection on the lift facility on every training day. This is partly for safety reasons, partly to develop good and responsible habits*



The instructor shall:

- 2.1.1 Present examples on relevant manuals or guides from different lift brands and lift types
- 2.1.2 Facilitate a discussion on where to find and how to use such relevant manuals and guides
- 2.1.3 Emphasise the necessity of always consulting relevant lift manuals and guides



The participants shall:

- 2.1.4 Engage in discussion about the importance of using relevant guides and manuals and share experiences on finding and applying manuals and guides in relation to the inspecting, installing, and maintaining of lifts in WTGs



ELEMENT 2.2 - LOCAL AND NATIONAL LEGISLATION

Learning objective:

- 20) The participants can **take responsibility** and will on their **own initiative** search for relevant legislation issues on site (Ability, intermediate level)



The instructor shall:

- 2.2.1 Present examples on where local and national legislation can be obtained
- 2.2.2 Ask for the participants experiences on finding and applying legislation



The participants shall:

- 2.2.3 Share their experiences on where local and national legislation can be obtained

Note *The use of relevant and type-specific manuals and application of legislation and regulations must be applied during any practical training whenever relevant and feasible*

LESSON 3 - SAFETY WHEN WORKING ON A LIFT IN A WTG

25 min.

The aim of this lesson is to enable the participants to take necessary safety precautions when inspecting, installing, and maintaining lifts in a WTG in accordance with the relevant manual and directives

After having successfully completed Lesson 3 of the Lift Commission, Inspection, Installation and Maintenance Module, the participants can:

- 21) **Solve** routine safety tasks and precautions in relation to inspections, installation and maintaining of lifts in a WTG responsibly and will use their initiative to seek help or guidance when needed (Ability, basic level)

Note *Before commencing work and training on the lift or lift systems it is recommended, that the participants perform a daily check/before use inspection of the lift or lift systems. The competence to do so, is a prerequisite for attending the GWO LCIIM training. The motivation for this pre-use inspection is 1) to ensure safety when working on the lift, and 2) to re-cap knowledge, skills and abilities obtained from the Lift User Module training*



ELEMENT 3.1 - HAZARDOUS ENERGY

Learning objectives:

- 22) The participants can **take responsibility** of ensuring that the lift is in a controlled hazardous energy state (Ability, intermediate level)
- 23) The participants can **take responsibility** to de-energise the system and will use their own initiative to seek guidance in the relevant lift manuals (Ability, intermediate level)



The instructor shall:

- 3.1.1 Present and demonstrate examples of how to ensure that a lift is in a controlled hazardous energy state
- 3.1.2 Lead or facilitate discussion on risks and mitigating options in relation to a controlled hazardous energy state
- 3.1.3 Facilitate a short exercise, where the participants test how to de-energise the lift system or find necessary guidance in relevant manuals



The participants shall:

- 3.1.4 Engage in discussions and share experiences on hazardous energy states in WTGs
- 3.1.5 Test how to de-energise the lift system or find necessary guidance in relevant manuals

ELEMENT 3.2 - WORK AREAS IN THE WTG

Learning objectives:

- 24) The participants can **recognise** working areas with restricted space, where special care must be taken to work safely (Knowledge, basic level)
- 25) The participants **show interest** and awareness of slippery surfaces and proper housekeeping in the lift area (Ability, basic level)
- 26) The participants **show interest** and awareness of hazards from moving and stationary parts in the WTG (Ability, basic level)



The instructor shall:



- 3.2.1 Point out examples of restricted spaces, slippery surfaces, and proper housekeeping
- 3.2.2 Lead or facilitate discussion and ask for participants' experiences on restricted spaces, slippery surfaces, and proper housekeeping in relation to lifts in WTGs



The participants shall:

- 3.2.3 Engage in discussions and share experiences on the topic
- 3.2.4 Conduct a short questionnaire test to recap on the theory and safety issues from Lesson 3
- 3.2.5 Check own answers and solutions from the shown fact list on completion of the test

Note *The ability to take necessary safety precautions when using and working on lifts in a WTG must be practised during all practical training elements in this module when relevant*

LESSON 4 - GATES AND FENCES

45 min.

The aim of this lesson is to enable the participants to inspect and ensure the free movement of the gates and fences in the WTG.

After having successfully completed Lesson 4 of the Lift Commission, Inspection, Installation and Maintenance Module, the participants can:

- 27) **Explain** the principles of free movement of mechanical parts in gates and fences outside a lift (Knowledge, intermediate level)

ELEMENT 4.1 - OUTSIDE THE LIFT

Learning objectives:

- 28) The participants can **take responsibility** of ensuring the free movement of mechanical parts in lift gates and fences (Ability, basic level)
- 29) The participants can **explain** how to repair or replace mechanical parts in lift gates and fences applying guidance from relevant manuals when needed (Knowledge, intermediate level)



The instructor shall:



- 4.1.1 Demonstrate examples of movement of mechanical parts in lift gates and fences
- 4.1.2 Lead or facilitate discussion on possible challenges to the free movement of mechanical parts in lift gates and fences



The participants shall:

- 4.1.3 Engage in discussions and share experiences on movement of mechanical parts in lift gates and fences

ELEMENT 4.2 - GATE LOCKING SYSTEMS

Learning objectives:

- 30) The participants can **perform** a function test on a gate locking system (Skills, intermediate level)
- 31) The participants can **perform** an adjustment of a gate locking system (Skills, intermediate level)



The instructor shall:

- 4.2.1 Present examples of different gate locking systems
- 4.2.2 Lead or facilitate discussion on different gate locking systems
- 4.2.3 Facilitate practical training on testing the functioning of gate locking systems



The participants shall:

- 4.2.4 Engage in discussions, share experiences, and practise how to function-test a gate locking system

ELEMENT 4.3 - GUARD LOCKING CONTROL SYSTEM

Learning objectives:

- 32) The participants can **perform** an installation of a guard locking control box on the bottom platform fence (Skills, intermediate level)
- 33) The participants can **perform** an installation of a guard locking switch and its actuator on the fence door using supplied hardware (Skills, intermediate level)
- 34) The participants can **perform** an installation of a lift detection switch on its bracket on the bottom fence and connect to the socket on a guard locking control box (Skills, intermediate level)



- 35) The participants can **perform** a connection of a power cable power inlet plug to a guard locking control box outlet (Skills, intermediate level)



The instructor shall:

- 4.3.1 Present and demonstrate examples of different guard locking control boxes
- 4.3.2 Lead a discussion and facilitate the practical training on guard locking control boxes



The participants shall:

- 4.3.3 Engage in discussions, share experiences, and practise installation of guard locking control boxes

ELEMENT 4.4 - UPPER AND LOWER HATCHES

Learning objective:

- 36) The participants can **describe** how to function test the operation of switches on upper and lower hatches (Knowledge, basic level)



The instructor shall:

- 4.4.1 Demonstrate how to function test the operation of switches on upper and lower hatches
- 4.4.2 Facilitate the practical training on how to function test the operation of switches on upper and lower hatches



The participants shall:

- 4.4.3 Engage in discussions, share experiences, and practise how to function test the operation of switches on upper and lower hatches
- 4.4.4 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 4
- 4.4.5 Check own answers and solutions from the shown fact list on completion of the test

LESSON 5 - CABIN AND ITS ATTACHMENT PARTS

55 min.



The aim of this lesson is to enable the participants to inspect the lift cabin and attachment parts to ensure the flawless condition.

After having successfully completed Lesson 5 of the Lift Commission, Inspection, Installation and Maintenance Module:

37) The participants can **take responsibility** of ensuring flawless condition of a lift (Ability, intermediate level)

ELEMENT 5.1 - THE CABIN – IN GENERAL

Learning objectives:

- 38) The participants can **explain** how to do a visual inspection of a viewing windows in a lift (Knowledge, intermediate level)
- 39) The participants **show interest** in checking that adhesive signs for the start-up and maintenance certification are current, completed and have the correct dates (Ability, basic level)



The instructor shall:

- 5.1.1 Present and demonstrate examples of viewing windows in a lift
- 5.1.2 Lead or facilitate discussion on:
 - a. viewing windows in a lift and their potential faults
 - b. adhesive signs for the start-up and maintenance certification



The participants shall:

- 5.1.3 Engage in discussions and share experiences on viewing windows and adhesive signs for the start-up and maintenance certification in a lift

ELEMENT 5.2 - FASTENERS AND ANCHOR POINTS

Learning objectives:

- 40) The participants can **perform** an inspection of all fasteners (screws and bolts) in a lift (Skills, intermediate level)



- 41) The participants can **explain** how to do visual inspection all fasteners (screws and bolts) in a lift (Knowledge, intermediate level)
- 42) The participants can **explain** how to do visual inspection of PPE anchors in a lift (Knowledge, intermediate level)
- 43) The participants can **describe** how to apply labelling (showing pictograms of PPE anchors) in a lift (when other language labels are needed) (Knowledge, basic level)
- 44) The participants can **describe** how to inspect labelling (showing pictograms of PPE anchors) in a lift (Knowledge, basic level)
- 45) The participants can **describe** the proper condition of yellow coating of PPE anchors (Knowledge, basic level)
- 46) The participants will on their own **take initiative** in repairing yellow coating of PPE anchors, when needed (Ability, intermediate level)



The instructor shall:

- 5.2.1 Present fasteners and anchor points in a lift and supplement with examples from different lift types
- 5.2.2 Initiate group discussions and ask for conclusive reflections
- 5.2.3 Facilitate practice on inspecting fasteners and anchor points
- 5.2.4 Facilitate practice on tightening fasteners (where tightening is allowed according to relevant legislation and documentation)



The participants shall:

- 5.2.5 Share experiences and engage in group discussions on the purposes and challenges on fasteners and anchor points in lift cabins
- 5.2.6 Practise how to tighten fasteners (where tightening is allowed according to relevant legislation and documentation) (5.2.3 and 5.2.4 may be conducted simultaneously: one group discussing and one group practising)

ELEMENT 5.3 - SERVICE LIGHT AND EMERGENCY LIGHT

Learning objectives:



- 47) The participants can **perform** an installation and connection of the service light and emergency light in a lift (Skills, intermediate level)
- 48) The participants can **explain** how to do an inspection of the service light and emergency light in a lift (Knowledge, intermediate level)



The instructor shall:

- 5.3.1 Present and demonstrate examples of how to inspect and install the service light and emergency light in a lift
- 5.3.2 Lead a discussion on challenges of inspecting service lights and emergency lights in a lift
- 5.3.3 Facilitate installations practice



The participants shall:

- 5.3.4 Engage in discussions and share experiences on service lights and emergency lights in lifts
- 5.3.5 Practise how to inspect and install service lights and emergency lights in lifts
- 5.3.6 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 5
- 5.3.7 Check own answers and solutions from the shown fact list on completion of the test

LESSON 6 - CABIN GUIDE UNIT

117 min.

The aim of this lesson is to enable the participants to install, maintain and inspect a lift guide system responsibly and re-install in accordance with and following instructions in the relevant manuals and inspection lists

After successfully having completed Lesson 6 of the Lift Commission, Inspection, Installation and Maintenance Module:

- 49) The participants can **explain** how to do a visual inspection of the cabin guide units (with rollers) in a lift (Skills, intermediate level)
- 50) The participants will **take initiative** and **take the responsibility** to adjust or change guide rope, cabin guide unit, and roller guide unit when needed (Ability, intermediate level)



ELEMENT 6.1 - INTRODUCTION TO LIFT GUIDING SYSTEMS

Learning objective:

- 51) The participants can **explain** the characteristics of different lift guiding systems (Knowledge, intermediate level)



The instructor shall:

- 6.1.1 Introduce the lesson by presenting examples of guiding systems:

- a. wire guided
- b. ladder guided
- c. rack and pinion

- 6.1.2 Lead or facilitate discussion on lift guiding systems principles



The participants shall:

- 6.1.3 Engage in discussions and share experiences of different lift guiding systems

ELEMENT 6.2 - GUIDE ROPES

Learning objectives:

- 52) The participants can **perform** an installation of the cabin guide units (with rollers) in the lift (Skills, intermediate level)
- 53) The participants can **perform** an installation of the guide ropes, including the coiling-up or cut (Skills, intermediate level)
- 54) The participants can **perform** an inspection of labels on guide ropes (skills, intermediate level)
- 55) The participants can **explain** how to do a visual inspection of the guide ropes according to ISO 4309 (Knowledge, intermediate level)
- 56) The participants can examine guide ropes and **recognise** when these are in flawless condition (e.g., diameter, broken threads, wear, and corrosion) at the lowest landing (Knowledge, basic level)
- 57) The participants can **perform** a rope tension inspection of the guide ropes (Skills, intermediate level)



- 58) The participants can **take initiative** and **take responsibility** to adjust guide ropes tension to the specified value (Ability, intermediate level)
- 59) The participants can **explain** how to do a visual inspection of the condition of the coiled-up of rope ends of the guide wires (Knowledge, intermediate level)
- 60) The participants can **perform** an installation of the wire rope fixings and an adjustment of the wire ropes at the landings (Skills, intermediate level)
- 61) The participants can **explain** how to do a visual inspection of the wire rope fixings at the landings (Knowledge, intermediate level)



The instructor shall:

- 6.2.1 Present examples of guide ropes and cabin guide units
- 6.2.2 Facilitate practical training on guide ropes:
 - a. installation and adjustment
 - b. fixing and adjustment
 - c. inspection (condition and tension)
- 6.2.3 Provide individual feedback to participants on their performance



The participants shall:

- 6.2.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 6.3 - GUIDE WHEELS

Learning objectives:

- 62) The participants can **describe** how to inspect:
 - a. guide wheel (upper front right and upper rear right)
 - b. guide wheel (upper front left and upper rear left)
 - c. guide wheel (lower front right and lower rear left)



d. guide wheel (lower front left and lower rear left)



The instructor shall:

- 6.3.2 Present examples of guide wheels and demonstrate how to inspect the guide wheels
- 6.3.3 Ensure participants understandings by having the participants describe how to inspect the guide wheels



The participants shall:

- 6.3.4 Follow the presentations and afterwards describe how to inspect guide wheels to the instructor or to a fellow participant

ELEMENT 6.4 - ROLLER GUIDE UNIT

Learning objectives:

- 63) The participants can **perform** an installation of a roller guide unit (Skills, intermediate level)
- 64) The participants can **explain** how to do a visual inspection of a roller guide unit (Knowledge, intermediate level)
- 65) The participants can inspect a roller guide unit and **recognise** when these are in flawless condition (Knowledge, basic level)
- 66) The participants can **take initiative** and **take responsibility** to change the roller guide unit when needed in accordance with the relevant manual (Ability, intermediate level)



The instructor shall:

- 6.4.1 Present and explain examples of roller guide units in both flawless and hampered conditions
- 6.4.2 Facilitate practical training on installing and inspecting roller guide units
- 6.4.3 Provide individual feedback to participants on their performance



The participants shall:

- 6.4.4 Engage in discussions and share experiences on installing and inspecting roller guide units



6.4.5 Receive and reflect on feedback

ELEMENT 6.5 - GUIDE LADDER INSPECTION

Learning objectives:

- 67) The participants can **describe** the safety inspection labels on the ladder according to relevant manuals (Knowledge, basic level)
- 68) The participants can **describe** how to do a visual inspection of the assembly between ladder sections and attachment points according to relevant manuals (Knowledge, basic level)
- 69) The participants can **describe** how to do a visual inspection of the omega flanges (of the ties to step of ladder) are not cracked or broken in the folds according to relevant manuals (Knowledge, basic level)
- 70) The participants can **recognise** that upper and lower braking skates are clean and firmly connected to the ladder according to relevant manuals (Knowledge, basic level)



The instructor shall:

- 6.5.1 Present and explain visual examples of assemblies between ladder sections and attachment points and skaters' connections in both flawless and hampered conditions
- 6.5.2 Lead or facilitate discussion on safety related risks on assemblies and flanges



The participants shall:

- 6.5.3 Engage in discussions and share experiences on omega flanges and assemblies between ladder sections and attachment points
- 6.5.4 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 6
- 6.5.5 Check own answers and solutions from the shown fact list on completion of the test

LESSON 7 - TOP OBSTRUCTION DEVICE

45 min.

The aim of this lesson is to enable the participants to inspect and ensure the top obstruction functionality in accordance with the relevant manuals and inspection lists

After successfully having completed Lesson 7 of the Lift Commission, Inspection, Installation and Maintenance Module:



- 71) The participants can on their own initiative **take responsibility** for function testing and ensuring the functionality of the top obstruction device with sub-elements (Ability, intermediate level)

ELEMENT 7.1 - TOP OBSTRUCTION DEVICE FUNCTION

Learning objectives:

- 72) The participants can **perform** a function test of the top obstruction device and limit switches (Skills, intermediate level)
- 73) The participants can **perform** a replacement and adjustment of the top obstruction device limit switch (Skills, intermediate level)



The instructor shall:

- 7.1.1 Present and demonstrate examples of top obstruction devices and limit switches on different lift types
- 7.1.2 Facilitate practical training on installing and inspecting a top obstruction device and limit switch
- 7.1.3 Provide feedback on the participants' performance
- 7.1.4 Lead or facilitate discussion on top obstruction device functionalities



The participants shall:

- 7.1.5 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 7.2 - TOP OBSTRUCTION FLASHING LIGHT

Learning objectives:

- 74) The participants can **explain** how to do function test of the top obstruction device flashing light (Knowledge, intermediate level)
- 75) The participants can **explain** how to replace the top obstruction device flashing light and bulb (Knowledge, intermediate level)



The instructor shall:



- 7.2.1 Present and demonstrate examples of the top obstruction device flashing light and how to replace it
- 7.2.2 Lead or facilitate discussion on the top obstruction device flashing light



The participants shall:

- 7.2.3 Engage in discussions and share experiences on the top obstruction device flashing light

ELEMENT 7.3 - TOP OBSTRUCTION IN TOP POSITION

Learning objectives:

- 76) The participants can **perform** a function test of the top obstruction device (stop in top position) (Skills, intermediate level)
- 77) The participants can **perform** an adjustment of the top obstruction device (stop in top position) (Skills, intermediate level)



The instructor shall:

- 7.3.1 Demonstrate how to perform a function test and adjustment of the top obstruction device (stop in top position)
- 7.3.2 Facilitate practical exercise on testing and adjusting the top obstruction device (stop in top position)
- 7.3.3 Provide feedback to the participants on their performance



The participants shall:

- 7.3.4 Engage in practice, share experiences, and apply the received feedback in following exercises
- 7.3.5 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 7
- 7.3.6 Check own answers and solutions from the shown fact list on completion of the test

LESSON 8 - BOTTOM OBSTRUCTION DEVICE

72 min.

The aim of this lesson is to enable the participants to test the function and ensure the functionality of the bottom obstruction device and its sub-elements in accordance with the relevant manuals and inspection lists.



After successfully having completed Lesson 8 of the Lift Commission, Inspection, Installation and Maintenance Module:

- 78) The participants can on own initiative **take responsibility** of function-testing the bottom obstruction device (with sub-elements) and ensure its functionality (Ability, intermediate level)

ELEMENT 8.1 - BOTTOM OBSTRUCTION DEVICE FUNCTION

Learning objectives:

- 79) The participants can **perform** a function test of the bottom obstruction device - mechanical parts and switches (Skills, intermediate level)
- 80) The participants can **perform** a replacement or adjustment of the bottom obstruction device - mechanical parts (Skills, intermediate level)



The instructor shall:

- 8.1.1 Demonstrate how to perform a function test and adjustment of the bottom obstruction device: mechanical parts and switches
- 8.1.2 Facilitate practical training on testing and adjusting the bottom obstruction device: mechanical parts and switches
- 8.1.3 Provide feedback to the participants on their performance



The participants shall:

- 8.1.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 8.2 - BOTTOM OBSTRUCTION DEVICE - BOWDEN CABLE

Learning objectives:

- 81) The participants can **perform** a function test of a bottom obstruction device Bowden cable (Skills, intermediate level)
- 82) The participants can **perform** a replacement or adjustment of a bottom obstruction device Bowden cable (Skills, intermediate level)



The instructor shall:

- 8.2.1 Demonstrate how to perform a function test, replacement, and adjustment of a bottom obstruction device Bowden cable
- 8.2.2 Facilitate practical training on testing and adjusting bottom obstruction device Bowden cable
- 8.2.3 Provide feedback to the participants on their performance



The participants shall:

- 8.2.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 8.3 - BOTTOM OBSTRUCTION FLASHING LIGHT

Learning objectives:

- 83) The participants can **explain** how to do function test of the bottom obstruction device: flashing light (Knowledge, intermediate level)
- 84) The participants can **perform** a replacement of the bottom obstruction device: flashing light and bulb (Skills, intermediate level)



The instructor shall:

- 8.3.1 Demonstrate how to perform a function test and replacement of the bottom obstruction device: flashing light and bulb
- 8.3.2 Facilitate practical training on testing the flashing light and replacing the bulb
- 8.3.3 Provide feedback to the participants on their performance



The participants shall:

- 8.3.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 8.4 - BOTTOM OBSTRUCTION DEVICE STOP IN THE LOWEST POSITION

Learning objectives:



- 85) The participants can **perform** a function test of the bottom obstruction device (stop in the lowest position) (Skills, intermediate level)
- 86) The participants can **perform** a replacement or adjustment of the bottom obstruction device lowering limit switch (Skills, intermediate level)
- 87) The participants can **perform** an adjustment of the operational function of the bottom obstruction device (Skills, intermediate level)
- 88) The participants can **perform** an adjustment of the bottom obstruction device (stop in the lowest position) (Skills, intermediate level)



The instructor shall:

- 8.4.1 Demonstrate how to perform a function test, adjustment, and replacement of the bottom obstruction device (stop in the lowest position)
- 8.4.2 Facilitate practical exercise on testing, replacing, and adjusting the bottom obstruction device (stop in the lowest position)
- 8.4.3 Provide feedback to the participants on their performance



The participants shall:

- 8.4.4 Engage in practice, share experiences, and apply the received feedback in the following exercises
- 8.4.5 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 8
- 8.4.6 Check own answers and solutions from the shown fact list on completion of the test

LESSON 9 - LIFT DOOR LOCK AND ELECTRICAL INTER-LOCK

20 min.

The aim of this lesson is to enable the participants to test the function of lift door lock and ensure its functionality in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 9 of the Lift Commission, Inspection, Installation and Maintenance Module:

- 89) The participants can on own initiative **take responsibility** of function-testing the lift door lock / electrical inter-lock according to the relevant manual and instructions (Ability, intermediate level)



ELEMENT 9.1 - FUNCTION TEST OF THE DOOR LOCK

Learning objectives:

- 90) The participants can **take responsibility** of doing function test of the lift door lock following guidance in the relevant manuals (Skills, intermediate level)
- 91) The participants can **perform** a function test of the lift door lock and the electrical inter-lock in operation (skills, intermediate level)
- 92) The participants can **perform** a replacement and repair of the electrical inter-lock according to the relevant manuals (Skills, intermediate level)



The instructor shall:

- 9.1.1 Demonstrate how to perform a function test and replacement of the lift door lock
- 9.1.2 Facilitate practical training on testing and replacing the lift door lock and the electrical inter-lock
- 9.1.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

- 9.1.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 9.2 - EMERGENCY UNLOCKING

Learning objectives:

- 93) The participants can **perform** a function test of the emergency unlocking of the lift door lock (Skills, intermediate level)



The instructor shall:

- 9.2.1 Demonstrate how to perform a function test of emergency unlocking of the lift door lock
- 9.2.2 Facilitate practical training on testing emergency unlocking of the lift door lock
- 9.2.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

9.2.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 9.3 - UPPER AND LOWER HATCHES

Learning objectives:

- 94) The participants can **describe** how to do a visual inspection of the placement of the pins in the axes of the upper and lower hatches (Knowledge, basic level)
- 95) The participants can **describe** how to inspect the operation of the magnet system or latch on the upper hatch (Knowledge, basic level)
- 96) The participants **show interest** in ensuring, that the handle strings of the upper and lower hatches are properly installed and have the correct length (Ability, basic level)



The instructor shall:

- 9.3.1 Demonstrate how to perform a visual inspection of the placement of the pins in the axes of the upper and lower hatches
- 9.3.2 Demonstrate how to inspect the condition and operation of the magnet system or latch on the upper hatch
- 9.3.3 Demonstrate and facilitate or lead a discussion on the installation and dimensions of the handle strings of the upper and lower hatches



The participants shall:

- 9.3.4 Engage in practice, share experiences, and apply the received feedback in following exercises
- 9.3.5 Conduct a short questionnaire test to recap the theory and safety issues from lesson 9
- 9.3.6 Check own answers and solutions from the shown fact list on completion of the test

LESSON 10 - LIFT OPERATION PANEL / MANOEUVRE PANEL

20 min.

The aim of this lesson is to enable the participants to verify and ensure that the lift operation/ manoeuvre panel is fully operational



After successfully having completed Lesson 10 of the Lift Commission, Inspection, Installation and Maintenance Module:

- 97) The participants can on own initiative **take responsibility** of inspecting and testing the lift operation/ manoeuvre panel (Ability, intermediate level)

ELEMENT 10.1 - THE LIFT OPERATION/MANOEUVRE PANEL

Learning objectives:

- 98) The participants can **explain** how to do a visual inspection of the lift operation manoeuvre panels (Knowledge, intermediate level)
- 99) The participants can **take responsibility** to carry out a function test on the manoeuvre panels: emergency stop - reset/ready inside/outside - selector switch - up/down inside/outside (Ability, intermediate level)



The instructor shall:

- 10.1.1 Present examples of manoeuvre panels in and outside lifts as well as at the lift base of the WTG and at the nacelle. In addition, demonstrate how to perform a function test and inspection on the panel
- 10.1.2 Lead or facilitate discussion on the lift operation manoeuvre panel



The participants shall:

- 10.1.3 Engage in discussions and share experiences on lift operation manoeuvre panels in lifts

ELEMENT 10.2 - OPERATION HOUR COUNTER

Learning objectives:

- 100) The participants can **explain** how to do a visual inspection of the operation hour counter of the lift at the LOP (Knowledge, intermediate level)
- 101) The participants can **explain** how to do replacement of the operation hour counter of the lift at the LOP (Knowledge, intermediate level)



The instructor shall:

- 10.2.1 Present examples of operation hour counters in manoeuvre panels in lifts and demonstrate how to perform a function test and how to replace the hour counter
- 10.2.2 Lead or facilitate discussion on the lift operation manoeuvre panel and operation hour counter



The participants shall:

- 10.2.3 Engage in discussions and share experiences on lift operation manoeuvre panels and operation hour counters in lifts

ELEMENT 10.3 - EMERGENCY RESCUE SYSTEM

Learning objective:

- 102) The participants can **describe** how to function test the emergency rescue system (Knowledge, basic level)



The instructor shall:

- 10.3.1 Demonstrate how to perform a function test of the emergency rescue system
- 10.3.2 Facilitate that participants practise how to function test the emergency rescue system



The participants shall:

- 10.3.3 Practise how to function test the emergency rescue system
- 10.3.4 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 10
- 10.3.5 Check own answers and solutions from the shown fact list on completion of the test

LESSON 11 - SUSPENSION/CROSSBEAM

35 min.

The aim of this lesson is to enable the participants to inspect the suspension/crossbeam and report errors and omissions in accordance with the relevant manuals and inspection lists.



After successfully having completed Lesson 11 of the Lift Commission, Inspection, Installation and Maintenance Module:

- 103) The participants can **take the responsibility** for assessing the condition of the suspension/crossbeam, seek guidance in lift manuals and directives and decide relevant and responsible action in case of defects and damages (Ability, intermediate level)

ELEMENT 11.1 - SUSPENSION/CROSSBEAM

Learning objectives:

- 104) The participants can **explain** how to do a visual inspection of all parts for damage, cracks, corrosion (Knowledge, intermediate level)
- 105) The participants can **explain** how to do a visual inspection of all welds for damage and cracks (Knowledge, intermediate level)



The instructor shall:

- 11.1.1 Explain the importance of a flawless suspension/crossbeam and present examples of damage, cracks, and corrosion in connection to the suspension/crossbeam and its welds
- 11.1.2 Distribute images of examples of damages, cracks and corrosion to the participants and facilitate discussions in pairs on damage, cracks and corrosion and what actions to take, if such are discovered. Each pair should discuss one image for one minute, and then swap the images amongst the participants to initiate discussions on each new image in turn



The participants shall:

- 11.1.3 Engage in pairs in discussions inspired by distributed images and share their experiences on damages, cracks, and corrosion in connection to the suspension/crossbeam and its welds

ELEMENT 11.2 - ROPE END ATTACHMENTS

Learning objective:

- 106) The participants can **explain** how to do a visual inspection of the rope end attachment (Knowledge, intermediate level)



The instructor shall:

- 11.2.1 Present examples of rope end attachments
- 11.2.2 Lead or facilitate discussion on rope ends attachments



The participants shall:

- 11.2.3 Engage in discussions and share experiences on rope ends attachments

ELEMENT 11.3 - BOLTS AND BOLTS CONNECTIONS

Learning objective:

- 107) The participants can **explain** how to do a visual inspection of all bolts and bolt connections for completeness and tightness (Knowledge, intermediate level)



The instructor shall:

- 11.3.1 Present and demonstrate examples of how to do a visual inspection of all bolts and bolt connections for completeness and tightness
- 11.3.2 Lead or facilitate discussion on bolts and bolt connections completeness and tightness



The participants shall:

- 11.3.3 Engage in discussions and share experiences on bolt and bolt connections completeness and tightness and how to inspect them

ELEMENT 11.4 - UPPER AND LOWER ATTACK PINION (R&P)

Learning objectives:

- 108) The participants can **describe** how to do a visual inspection of the upper and lower attack pinion (Knowledge, basic level)



The instructor shall:



11.4.1 Present and demonstrate examples of how to do a visual inspection of all bolts and bolt connections for completeness and tightness the upper and lower attack pinion

11.4.2 Lead or facilitate a discussion on bolts and bolt connections and their completeness and tightness



The participants shall:

11.4.3 Engage in discussions and share experiences on bolt and bolt connections on the upper and lower attack pinion and their completeness and tightness

11.4.4 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 11

11.4.5 Check own answers and solutions from the shown fact list on completion of the test

LESSON 12 - DRIVE AND SAFETY WIRE ROPE AND RACK

140 min.

The aim of this lesson is to enable the participants to test and ensure the functionality of drive and safety ropes and racks in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 12 of the Lift Commission, Inspection, Installation and Maintenance Module:

109) The participants can **take responsibility** to do a visual inspection and replacement of drive and safety ropes according to ISO 4309 (Ability, intermediate level)

ELEMENT 12.1 - DRIVE ROPES, IN GENERAL

Learning objectives:

110) The participants can **perform** a replacement of drive and safety ropes according to ISO 4309 (Skills, intermediate level)

111) The participants can **perform** a visual inspection of the diameter of drive rope and safety rope in unloaded state at three points: bottom, middle and top (Skills, intermediate level)

112) The participants can **explain** how to do correct greasing of the drive rope sufficiently according to the relevant manual (Knowledge, intermediate level)



The instructor shall:

- 12.1.1 Demonstrate how to inspect, grease, and replace drive and safety ropes
- 12.1.2 Facilitate practical training on inspecting and replacing drive and safety ropes
- 12.1.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

- 12.1.4 Engage in practice, share experiences, and apply the received feedback in following exercises

Note *Correct greasing of the drive rope e.g., 0.4 litres of e.g. HHS 2000 per 100 metre rope*

ELEMENT 12.2 - TENSION WEIGHTS

Learning objectives:

- 113) The participants can **explain** how to do a visual inspection on tension weights installations in accordance with the relevant manuals (Knowledge, intermediate level)
- 114) The participants can **explain** how to inspect tension weights to have distance/space above (full loaded lift) or below (unloaded lift) in accordance with the relevant manuals (Knowledge, intermediate level)
- 115) The participants can **perform** an adjustment on tension weights installations in accordance with the relevant manuals (Skills, intermediate level)
- 116) The participants can **perform** an adjustment of the tension weights to have distance/space above (full loaded lift) or below (unloaded lift) in accordance with the relevant manual (Skills, intermediate level)



The instructor shall:

- 12.2.1 Demonstrate how to inspect and adjust tension weights according to relevant manuals and instructions
- 12.2.2 Facilitate practical training on inspecting and adjusting tension weights
- 12.2.3 Provide feedback to the participants on their performance during the practical training



The participants shall:



12.2.4 Engage in practice, share experiences, and apply the received feedback in following exercises

ELEMENT 12.3 - GROUNDING ROTATING UNIT

Learning objectives:

117) The participants can **perform** a visual inspection of the grounding rotating unit (Skills, intermediate level)

118) The participants can **perform** a replacement of the grounding rotating unit (Skills, intermediate level)



The instructor shall:

12.3.1 Demonstrate how to inspect and replace a grounding rotating unit

12.3.2 Facilitate practical training on inspecting and replacing a grounding rotating unit

12.3.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

12.3.4 Engage in practice on the grounding rotating unit, share experiences, and apply the received feedback in following exercises

ELEMENT 12.4 - ROPE ENDS

Learning objectives:

119) The participants can **explain** how to do a visual inspection of the rope ends are sufficiently coiled up (Knowledge, intermediate level)

120) The participants can **recognise** if cutting/shortening of rope ends is needed (Knowledge, basic level)



The instructor shall:

12.4.1 Present examples of how to visually inspect coiled up rope ends

12.4.2 Present examples of rope ends, where shortening of rope ends is needed

12.4.3 Lead or facilitate discussion on shortening of rope ends



The participants shall:

- 12.4.4 Engage in discussions and share experiences on inspecting and shortening rope ends

ELEMENT 12.5 - COUNTER ROLLERS

Learning objective:

- 121) The participants can **explain** how to do a visual inspection of the upper and lower counter rollers (Knowledge, intermediate level)



The instructor shall:

- 12.5.1 Present examples of how to do a visual inspection of upper and lower counter rollers
- 12.5.2 Lead or facilitate a discussion on how to do a visual inspection (as guided in the relevant manuals) of upper and lower counter rollers and on what to do in case of irregularities



The participants shall:

- 12.5.3 Engage in discussions and share experiences on upper and lower counter rollers

ELEMENT 12.6 - ROPE CLAMPS

Learning objectives:

- 122) The participants can **explain** how to do a visual inspection of the rope clamps (Knowledge, intermediate level)
- 123) The participants can **perform** a replacement and tighten rope clamps (Skills, intermediate level)



The instructor shall:

- 12.6.1 Demonstrate examples of how to replace and tighten rope clamps
- 12.6.2 Facilitate practical training on replacing and tightening rope clamps
- 12.6.3 Provide feedback on the participants' performance



The participants shall:

- 12.6.4 Engage in practical training on replacing and tightening rope clamps, share experiences on the topic and reflect on the received feedback to improve their performance

ELEMENT 12.7 - ROPE ATTACHMENTS AND BONDINGS

Learning objective:

- 124) The participants can **explain** how to do a visual inspection of the rope attachment and bondings (Knowledge, intermediate level)



The instructor shall:

- 12.7.1 Present examples of rope attachment and bondings
- 12.7.2 Lead or facilitate discussion on how to do a visual inspection of the rope attachment and bondings



The participants shall:

- 12.7.3 Engage in discussions and share experiences on rope attachment and bondings in WTG

ELEMENT 12.8 - ROPE PROTECTION

Learning objectives:

- 125) The participants can **perform** an installation and replacement of the protective tube (Skills, intermediate level)
- 126) The participants can **explain** how to visually inspect whether the protective tube is mounted (Knowledge, intermediate level)
- 127) The participants can **explain** how to do a visual inspection of the rope protections installed at the rope guides (landing feed through) (Knowledge, intermediate level)
- 128) The participants can **perform** a replacement of the rope protections installed at the rope guides (landing feed through) (Skills, intermediate level)



The instructor shall:

- 12.8.1 Present examples of different rope protection systems
- 12.8.2 Demonstrate examples of how to install and replace different rope protection systems
- 12.8.3 Facilitate practical training on how to replace rope protections
- 12.8.4 Provide feedback on participants performance during the practical training



The participants shall:

- 12.8.5 Engage in the practical training on how to replace rope protections and reflect upon the received feedback

ELEMENT 12.9 - INSPECTION OF THE RACK

Learning objectives:

- 129) The participants can **describe** how to inspect, and function test the rack (Knowledge, basic level)
- 130) The participants can **describe** how to function test the operation of the rack proximity detector (Knowledge, basic level)
- 131) The participants **show interest** in seeking guidance in the relevant manuals if excessive wear on the rack is detected (Ability, basic level)



The instructor shall:

- 12.9.1 Present examples of wear on a rack and explain how to find guidance in the relevant maintenance manuals
- 12.9.2 Lead or facilitate discussion on wear on racks, how to do a visual inspection of the rack, and what to do in case of detecting excessive wear on the rack



The participants shall:

- 12.9.3 Engage in discussions and share experiences on wear on racks in WTG

ELEMENT 12.10 - GREASE THE RACK

Learning objective:



132) The participants can **describe** how to grease a rack and a pinion (Knowledge, basic level)



The instructor shall:

12.10.1 Present examples of how to grease a rack and a pinion and explain how to find guidance in the relevant maintenance manuals



The participants shall:

12.10.2 Engage in discussions and share experiences on greasing rack and pinions in WTG

12.10.3 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 12

12.10.4 Check own answers and solutions from the shown fact list on completion of the test

LESSON 13 - TRACTION HOIST

73 min.

The aim of this lesson is to enable the participants to take responsibility of the general condition and functionality of the traction hoist in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 13 of the Lift Commission, Inspection, Installation and Maintenance Module:

133) The participants can **take responsibility** of installing and visually inspecting the general condition of the traction hoist in a lift as guided in the relevant manuals (Ability, intermediate level)

134) The participants can **perform** a function test of the traction hoist as described in the relevant manuals (Skills, intermediate level)

ELEMENT 13.1 - TRACTION HOIST DEVICE

Learning objectives:

135) The participants can **perform** an installation of the traction hoist (Skills, intermediate level)



136) The participants can **perform** an installation of the wire in the traction hoist in the lift (Skills, intermediate level)



The instructor shall:

- 13.1.1 Demonstrate how to install a traction hoist and mount the wire in the traction hoist
- 13.1.2 Facilitate practical training on installing a traction hoist and wire
- 13.1.3 Provide feedback to the participants on their performance during the practical training



The participants shall:

- 13.1.4 Engage in practice on installing a traction hoist and wire, share experiences, and apply the received feedback in following exercises

ELEMENT 13.2 - OPERATION HOUR COUNTER

Learning objectives:

- 137) The participants can **describe** how to do a visual inspection of the status on operation hour counter of the hoist (Knowledge, basic level)
- 138) The participants can **describe** an inspection of the hoist operation hour counter and rectify any issues following work instruction and lift maintenance manuals (Knowledge, basic level)



The instructor shall:

- 13.2.1 Present examples of hoist operation hour counters
- 13.2.2 Present examples of hoist operation hour counter issues, where rectifying action was needed
- 13.2.3 Lead or facilitate a discussion on how to inspect hoist operation hour counters



The participants shall:

- 13.2.4 Engage in discussions and share experiences on hoist operation hour counters



ELEMENT 13.3 - LABELS AND TYPE PLATES ON TRACTION HOIST

Learning objectives:

- 139) The participants can **explain** how to install labels (in case of country specific labels) (Knowledge, intermediate level)
- 140) The participants can **explain** how to do visual inspection of labels and type plates (Knowledge, intermediate level)



The instructor shall:

- 13.3.1 Present examples of labels and type plates
- 13.3.2 Demonstrate how to install labels
- 13.3.3 Lead or facilitate discussion on how and what to inspect in relation to labels and type plates



The participants shall:

- 13.3.4 Engage in discussions and share experiences on how to apply labels as well as how and what to inspect in relation to labels and type plates

ELEMENT 13.4 - DRIVE UNIT, MECHANICAL

Learning objectives:

- 141) The participants can **perform** a removal and installation of the hoist following the relevant manuals (Skills, intermediate level)
- 142) The participants can **explain** how to lubricate traction sheave gears (Knowledge, intermediate level)
- 143) The participants can **perform** a visual inspection of an attachment to the lift (Skills, intermediate level)
- 144) The participants can **perform** a wear test of the centrifugal brake (speed test, downwards velocity during emergency descent) according to relevant manuals and guides (Skills, intermediate level)
- 145) The participants can **describe** how to do a visual inspection for leaks on drive unit and report according to the relevant lift manuals or instruction (Knowledge, basic level)



The instructor shall:

13.4.1 Demonstrate examples of:

- a. how to remove and install a hoist
- b. how to lubricate the gear
- c. how to inspect the attachment to the lift
- d. how to do a wear test of centrifugal brake
- e. how to check the operation of motor break at top- and bottom-drive unit
- f. how to do a speed test during emergency descent
- g. how to do a visual inspection for leaks on drive unit and report in case of leaks

13.4.2 Facilitate practical training on:

- a. how to remove and install a hoist
- b. how to lubricate the gear
- c. how to do a wear test of centrifugal brake
- d. how to do a speed test during emergency descent

Note *The practical training may be conducted as rotation training, where the participants practise the individual topics in pairs, changing topic every five minutes (or any duration fitting the learning plan)*



The participants shall:

13.4.3 Engage in the practical training, share experiences on hoist and drive units and apply the received feedback in following learning activities

ELEMENT 13.5 - DRIVE UNIT, ELECTRICAL

Learning objectives:

146) The participants can **explain** how to do a visual inspection of the wiring (EI) to drive unit (Knowledge, intermediate level)

147) The participants can **perform** an installation and replacement of the wiring (EI) to drive a unit in accordance with the relevant manual (Skills, intermediate level)



The instructor shall:

- 13.5.1 Present examples of wiring (EI) to drive units
- 13.5.2 Demonstrate how to install and replace wiring (EI) to a drive unit
- 13.5.3 Facilitate practical training on how to install and replace wiring (EI) to drive a unit and provide feedback on participants performance
- 13.5.4 Lead or facilitate discussion on safety when inspecting, installing, and replacing wiring (EI) to a drive unit



The participants shall:

- 13.5.5 Engage in the practical training and following discussions, share experiences on wiring (EI) to a drive unit, and reflect on the received feedback

ELEMENT 13.6 - UPPER AND LOWER GEARBOX

Learning objective:

- 148) The participants can **describe** how to do a visual inspection for oil leaks in the upper and lower gear box (Knowledge, basic level)



The instructor shall:

- 13.6.1 Present examples of how to inspect the upper, and lower, gear box
- 13.6.2 Present examples of oil leaks in the upper, and lower, gear box
- 13.6.3 Lead or facilitate discussion on how to react if oil leaks in the upper, or lower gear box are detected



The participants shall:

- 13.6.4 Engage in discussions and share experiences on function and conditions of the upper, and lower gear box

ELEMENT 13.7 - ELECTRO-MECHANICAL AND CENTRIFUGAL BRAKES

Learning objectives:



149) The participants can **describe** how to do a visual inspection of centrifugal and electro-mechanical brakes (Knowledge, basic level)

150) The participants can **perform** a function test on the electro-mechanical brakes and the centrifugal brakes and measurement of their diameter (R&P) (Skills, intermediate level)



The instructor shall:

13.7.1 Present examples of how to inspect the electro-mechanical brakes and the centrifugal brakes

13.7.2 Lead or facilitate discussion on inspections of the electro-mechanical brakes and the centrifugal brakes react if oil leaks (in accordance with relevant the manuals)



The participants shall:

13.7.3 Engage in discussions and share experiences on function and conditions of the electro-mechanical brakes and the centrifugal brakes and gear box

ELEMENT 13.8 - LOAD CAPACITY SYSTEM

Learning objectives:

151) The participants can **perform** function test on the load capacity system as described in the relevant manuals (Skills, intermediate level)

152) The participants can **perform** adjustment of the load capacity system (Skills, intermediate level)



The instructor shall:

13.8.1 Present key points in relation to inspection and installation of the load capacity system in different lift types as described in the relevant manuals

13.8.2 Demonstrate how to inspect, install, and adjust different kinds of load capacity systems in different lift types

13.8.3 Facilitate practical training on inspection, installation, and adjustment of different kinds of load capacity systems, and provide feedback to the participants on their performance

13.8.4 Lead or facilitate discussion on differences between different load capacity systems in different lift types



The participants shall:

- 13.8.5 Take part in the practical training on load capacity systems
- 13.8.6 Participate in discussions and share experiences on lift load capacity systems
- 13.8.7 Conduct a questionnaire test to recap the theory and safety issues from Lesson 13
- 13.8.8 Check own answers and solutions from the shown fact list on completion of the test

LESSON 14 - WIRE ROPE REDIRECTION INSIDE THE CABIN

15 min.

The aim of this lesson is to enable the participants to inspect and ensure that the redirection pulleys are in accordance with the relevant manuals and inspection lists.

After successfully having completed Lesson 14 of the Lift Commission, Inspection, Installation and Maintenance Module:

- 153) The participants can **take responsibility** of ensuring, that the re-direction pulleys are functioning as described in relevant manuals and guides (Ability, intermediate level)



The instructor shall:

- 14.1.1 Demonstrate how to install a wire into the redirecting pulleys according to relevant manuals and guides
- 14.1.2 Facilitate practical training on how to install a wire into the redirecting pulleys and provide feedback on participants performance
- 14.1.3 Lead or facilitate discussion on how to inspect redirecting pulleys



The participants shall:

- 14.1.4 Engage in the practical training and following discussions, share experiences on redirecting pulleys, and reflect on the received feedback

LESSON 15 - FALL ARREST DEVICE (FAD)

63 min.



The aim of this lesson is to enable the participants to install, inspect and test the function of the fall arrest device (FAD) in accordance with the relevant manuals and inspection lists

After successfully having completed Lesson 15 of the Lift Commission, Inspection, Installation and Maintenance Module:

- 154) The participants can **take responsibility** for installing and function testing the fall arrest device (FAD) as described in the relevant manuals (Ability, intermediate level)

ELEMENT 15.1 - LABELS AND TYPE PLATES

Learning objectives:

- 155) The participants can **explain** how to do a visual inspection of labels and type plates to the FAD as described in the relevant manuals (Knowledge, intermediate level)
- 156) The participants can **explain** how to apply labels to the FAD (Knowledge, intermediate level)



The instructor shall:

- 15.1.1 Present examples of labels and type plates to FADs from relevant manuals
- 15.1.2 Demonstrate how to apply labels to FADs
- 15.1.3 Lead or facilitate a discussion on how and what to inspect in relation to labels and type plates in relation to FADs



The participants shall:

- 15.1.4 Engage in discussions and share experiences on how and what to inspect in relation to labels and type plates on FADs – and how to apply labels

ELEMENT 15.2 - GENERAL CONDITION

Learning objectives:

- 157) The participants can **perform** an installation of a fall arrest device, following the relevant manuals (Skills, intermediate level)



- 158) The participants can **explain** how to do a visual inspection of the general condition of a fall arrest device (Knowledge, intermediate level)
- 159) The participants can **explain** how to do a visual inspection of wear on intake bushing (Knowledge, intermediate level)
- 160) The participants can **explain** how to do a visual inspection of the electrical wiring from the FAD (Knowledge, intermediate level)
- 161) The participants can **explain** how to do a visual inspection of the centrifugal system as described in the relevant manual (Knowledge, intermediate level)
- 162) The participants can **describe** how to install a pinch and centrifugal pulley in relation to relevant manual and directions (Knowledge, basic level)
- 163) The participants can **perform** a function and wear test on a pinch- and centrifugal pulley (Skills, intermediate level)



The instructor shall:

- 15.2.1 Present key points in relation to the inspection of the general condition of fall arrest devices in different lift types
- 15.2.2 Demonstrate how to install different types of fall arrest devices by following relevant manuals
- 15.2.3 Facilitate practical training on installation of a fall arrest device and provide feedback to the participants on their performance
- 15.2.4 Lead or facilitate a discussion on differences between different fall arrest devices in different lift types



The participants shall:

- 15.2.5 Engage in the practical training, reflect on the received feedback, and take active part in discussions and share experiences working with fall arrest devices

LESSON 16 - SUPPLY CABLE

20 min.

The aim of this lesson is to enable the participants to install and inspect the supply cable and cable bin in accordance with the relevant manuals and inspection lists.



After successfully having completed Lesson 16 of the Lift Commission, Inspection, Installation and Maintenance Module:

- 164) The participants can **take responsibility** of installing and inspecting a supply cable and cable bin as described in the relevant manuals (Skills, intermediate level)

ELEMENT 16.1 - FEED-IN OF SUPPLY CABLE

Learning objectives:

- 165) The participants can **explain** how to do a visual inspection of the feed in of a supply cable (Knowledge, intermediate level)
- 166) The participants can **perform** a re-installation of the feed in of a supply cable following relevant instructions and manual (Skills, intermediate level)



The instructor shall:

- 16.1.1 Demonstrate how to inspect and re-install feed in of a supply cable in accordance with the relevant manuals
- 16.1.2 Facilitate practical training on re-installing feed in of a supply cable and provide feedback to the participants on their performance
- 16.1.3 Lead or facilitate discussion on safety issues in relation to inspecting and re-installing feed in of a supply cable



The participants shall:

- 16.1.4 Engage in the practical training, reflect on the received feedback, and take active part in discussions and share experiences from working with feed in of a supply cable

ELEMENT 16.2 - STRAIN RELIEF

Learning objectives:

- 167) The participants can **explain** how to do a function test on a strain relief on the cabin (Knowledge, intermediate level)
- 168) The participants can **perform** an adjustment and replacement of a strain relief at the cabin according to the relevant manuals (Skills, intermediate level)



The instructor shall:

- 16.2.1 Present and demonstrate examples of how to do function test and how to adjust and replace a strain relief at the cabin by following the relevant manuals
- 16.2.2 Facilitate practical training on adjusting and replacing a strain relief at the cabin
- 16.2.3 Lead or facilitate discussion on safety issues in relation to strain reliefs at the cabin and differences and similarities between strain reliefs on different lift types



The participants shall:

- 16.2.4 Engage in the practical training, reflect on the received feedback, and take active part in discussions and share experiences from working with strain reliefs on the cabin

ELEMENT 16.3 - CABLE BIN

Learning objectives:

- 169) The participants can **explain** how to do a visual inspection of the cable bin condition (Knowledge, intermediate level)
- 170) The participants can **explain** how to do a visual inspection of the cable bin connection to the suspension/crossbeam (Knowledge, intermediate level)
- 171) The participants can **explain** how to tighten and replace the cable bin and the connections to the suspension/crossbeam according to the relevant manuals and guides (Knowledge, intermediate level)



The instructor shall:

- 16.3.1 Present examples of cable bin conditions
- 16.3.2 Demonstrate how to tighten and replace cable bin connections to suspension/crossbeam
- 16.3.3 Lead or facilitate discussion on when and how to tighten and replace cable bin connections to suspension/crossbeam



The participants shall:

- 16.3.4 Engage in discussions and share experiences on cable bins and seek information in relevant manuals
- 16.3.5 Conduct a short questionnaire test to recap the theory and safety issues from Lesson 16



16.3.6 Check own answers and solutions from the shown fact list on completion of the test

LESSON 17 - TEST AND TRAINING REVIEW

50 min.

ELEMENT 17.1 - THEORY TEST

Note *The theory test must be conducted if the lesson related questionnaires have not been sufficiently covered by the theory content of the relevant lessons*



The instructor shall:

- 17.1.1 Conduct a questionnaire test on intermediate level questions aiming at both knowledge, skills, and abilities (See GWO Requirements for Training, Annex 5 GWO Taxonomy Framework)
- 17.1.2 Check own answers and solutions (from the shown fact list) on completion of the test



The participants shall:

- 17.1.3 Facilitate a test recapping key safety theory topics
- 17.1.4 Present solutions and correct answers on completion of the test
- 17.1.5 Lead a discussion on participants reflections and answers

Alternative or supplementary practical evaluation activity: The participants affix coloured notes on lift parts for example: red notes on parts that must be inspected but not be replaced or repaired; green notes on parts that may be re-installed; blue notes on parts that must be maintained and so on. The instructor decides relevant categories. The arguments for placing the different notes may be shared and discussed in the group.

ELEMENT 17.2 - TRAINING REVIEW



The instructor shall:

- 17.2.1 Together with all participants, review the overall aims and learning objectives of the course so participants can compare how their learning outcome meet their, previously stated, course expectations



The participants shall:

- 17.2.2 Suggestion for activity: the participants reflect on their learning outcome and key takeaways from the training programme. The aim is to achieve a high learning transfer from the module to their way of working



Note *The training staff may additionally conduct a local evaluation on the training and the training facility*

ELEMENT 17.3 - FEEDBACK SESSION



The instructor shall:

- 17.3.1 Give the participants final feedback on the formal participant performance assessment and inform them whether they have passed (failed participants must be informed individually prior to the reflection session)
- 17.3.2 Give an overall feedback and feed forward on the participants' learning outcome inspired from the training as well as from the training-review session
- 17.3.3 Encourage the participants to examine and grow awareness of how specific elements in their own WTG type/WTG environment differ from the training scenario environment (to visualise and enhance learning transfer) and to discuss with colleagues' expectations and experiences on using a lift in WTG under the local specific

ELEMENT 17.4 - PARTICIPANT PERFORMANCE ASSESSMENT

Assessment of learning outcomes:

- 17.4.1 Participants will be assessed according to the learning objectives stated in the training module description by means of direct observation and supplementary oral questions and dialogue, where appropriate
- 17.4.2 The assessment shall be conducted during practical scenarios based on the WTG environment
- 17.4.3 Each participant shall participate, as detailed, in the practical learning activities
- 17.4.4 The formal evaluation of knowledge of above scenarios shall be in accordance with the control measures form (template provided in the Requirements for Training). The instructor keeps the control measures forms until the completion/evaluation of the module
- 17.4.5 Training providers shall have a documented procedure in place for dealing with participants not meeting the stated learning outcomes. If a participant fails to meet the demands, they shall attend a new Lift Commission, Inspection, Installation and Maintenance training



Annexes



ANNEX 1 - EQUIPMENT LIST

The following pages contain the lists of equipment required for delivering the lift training standard.

Note *All equipment shall be maintained and where appropriate, inspected and tested in accordance with current national standards/ legislation and manufacturers' recommendations.*

The equipment required for training must be available and must fulfil national legal requirements where applicable. The following tools, materials and equipment are needed for the execution of the course:

Training facility:

- a. Lift, lift mock-up or lift simulator requirements in detail.
 - a.i Functional lift setup including:
 - a.ii travelling distance must allow for test, inspection and work on relevant top and bottom obstruction devices and other relevant safety devices, mechanical devices and rescue systems as stated in the relevant lift manual.
 - a.iii gate/fence with original lock system. Additional mechanical and electrical lock systems must be visualised in illustrations.
 - a.iv tools, as needed, for the daily inspection, commission inspection, pre-assembly/installation, and maintenance of lifts.
- b. Documents
 - b.i relevant operation/user manuals, maintenance manuals, installation manuals and inspection manuals to ensure, that wire guided, ladder guided, and rack and pinion systems are included in the training.
 - b.ii example of daily inspection sheet.
 - b.iii example of logbook.
- c. Show and tell parts or visuals from relevant manufacturers covering wire/rope guided, ladder guided and rack and pinion lift systems other than the functional training lift. To include:
 - c.i hoist.
 - c.ii electro-mechanical brakes and the centrifugal brakes.
 - c.iii safety brake systems.
 - c.iv obstruction systems etc.
 - c.v Bowden cable installation to practise adjustments.



- c.vi guiding systems (cable/wire, rack and pinion, fixed).
- c.vii communications systems.
- d. PPE See table A3-31 (below).

| Equipment | Country Specific Equipment Standards | | | |
|--|--------------------------------------|-------------------|---|----------------------------|
| | Europe | North America | China | United Kingdom |
| Full Body Harness | EN 361+358 | ANSI/ASSP Z359.11 | GB 6095 +GB 6095 W/GB 6095 Q | BS EN 361+358 |
| Fall restraint lanyards | EN 358 | ANSI/ASSP Z359.3 | GB 24543 W/GB 24543 Q | BS EN 358 |
| Fall arrest lanyard including energy absorber | EN 354 and/or EN 355 | ANSI/ASSP Z359.13 | GB 24543 Z+GB/T 24538 | BS EN 354 and/or BS EN 355 |
| Industrial safety helmet with a chinstrap that is released with a force of no less than 150 N and no more than 250 N | EN 397 +A1 | ANSI Z89.1 Type I | GB 2811 | BS EN 397 +A1 |
| Vertical fall arrest system on a rigid anchor line | EN 353-1 | ANSI/ASSP Z359.15 | GB 24542/GB 24537/GB 24543 Z/GB 30862+GB/T 24538/GB 24544 | BS EN 353-1 |
| Self-Retracting Lifelines (Retractable type fall arresters) | EN 360 | ANSI/ASSP Z359.14 | GB 24544 | BS EN 360 |
| Anchor Points | EN795 | ANSI/ASSP Z359.18 | GB 30862 | BS EN795 |
| Slings | EN 354 + 795 | ANSI/ASSP Z359.12 | GB 24543 Z+GB 30862 | BS EN 354 + 795 |



| | | | | |
|---|---------|-------------------|--|------------|
| Connectors (Carabiners) | EN 362 | ANSI/ASSP Z359.12 | GB/T 23469 | BS EN 362 |
| Static ropes | EN 1891 | NFPA 1983 | GB/T 23268.2 | BS EN 1891 |
| Rescue devices with lifting capacity | EN 1496 | ANSI/ASSP Z359.4 | | BS EN 1496 |
| Devices for emergency decent | EN 341 | ANSI/ASSP Z359.4 | GB/T 38230 A or GB/T 38230 B or GB/T 38230 C | BS EN 341 |

Table A1-1 – Country specific equipment standards



ANNEX 2 - GUIDELINE FOR WARM-UP EXERCISES

Monday

Warm-up routine for wind technicians

Seven programmes, each with four exercises to be repeated twice; total duration approx. 10 minutes. The exercises are put together to achieve full-body warm-up and stretching.



1. Chest and shoulder stretch

Fold your hands behind you, push your chest forward and pull your arms back until you feel a good stretch in your chest and shoulders. Hold for 30 seconds.

Duration: 30 sec, Sets: 2



2. Arm Scissors

Stand with your feet together. Raise your arms forwards and upwards to approximately chest height. Breathe out and lift one arm towards the ceiling while lowering the other arm towards the floor with both palms facing forward. Continue moving both arms backwards until you feel a stretch in your pectoral muscles. Avoid arching your back.

Duration: 30 sec, Sets: 2



3. Stretch the back of your thigh and calf

Stand with one knee slightly bent and the other leg straight. Support your hands on the knee and keep your back straight. Slowly lower your upper body forwards until you feel a stretch on the back of your leg. Hold for 30 seconds and switch legs.

Duration: 30 sec, Sets: 2



4. Swing leg back and forth

Find support against a wall or hold onto a partner and swing your leg forwards and backwards. Try to keep your upper body steady in a good posture. Continue for 30 seconds, then switch legs. You can also practise your balance by not holding onto anything.

Duration: 30 sec, Sets: 2

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Tuesday

Warm-up routine for wind technicians

Seven programmes, each with four exercises to be repeated twice; total duration approx. 10 minutes. The exercises are put together to achieve full-body warm-up and stretching.



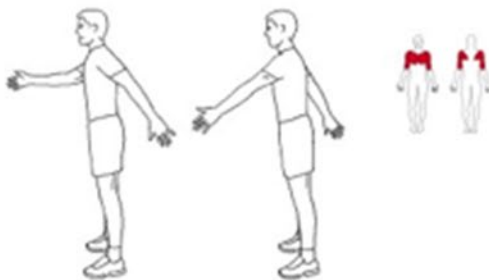
5. Sideward lunge

Stand with your legs together and your hands on your hips. Use your active leg to step to the side and place your weight on your active leg.

The movement stops when your foot hits the floor. In the end position, your active leg is bent and your supporting leg is almost straight. Press up and return to the starting position.

Repeat to the other side.

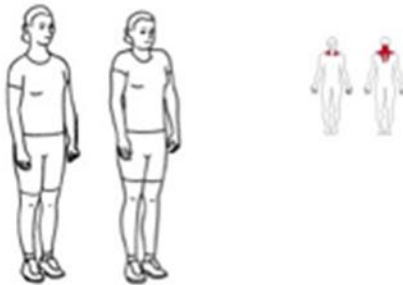
Sets: 2 , Reps: 10



6. Standing back and forth arm swing

Stand with the arms hanging straight down along your side. Relax the shoulders and swing the arms alternately back and forth.

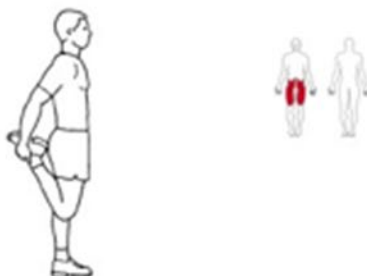
Sets: 2 , Duration: 30 sec



7. Shoulder Shrugs

Lift your shoulders as high as possible while you take a deep breath in, lower your shoulders while you exhale. Push your shoulders down as much as possible.

Sets: 2 , Duration: 30 sec



8. Stretch front side thigh and hip

Stand up straight. Grab one ankle and pull your heel towards your buttocks. Push your hips forwards until you feel the stretch on the front of your thigh. Keep your knees together. Hold for 30 seconds and switch legs.

Duration: 30 sec, Sets: 2

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Wednesday

Warm-up routine for wind technicians

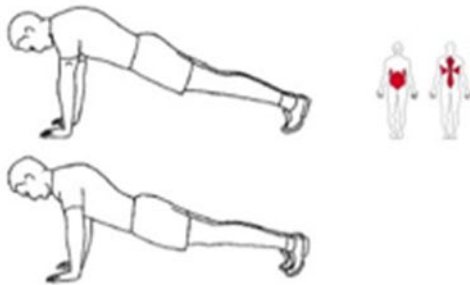
Seven programmes, each with four exercises to be repeated twice; total duration approx. 10 minutes. The exercises are put together to achieve full-body warm-up and stretching.



9. Static squat hold

Stand with your feet shoulder-width apart and your arms straight out in front of you. Move into a sitting position with your thighs approximately in a horizontal position and hold this position. Hold the position until you feel a stinging/warm sensation in your thighs (minimum 30 seconds). Push yourself back up again.

Sets: 2 , Duration: 30 sec



10. Scapular Push-ups

Support yourself on your arms and toes. Keep your body straight throughout the exercise. Try separating your shoulder blades by extending your upper back towards the ceiling.

Slowly lower your upper back, pulling your shoulder blades together.

Sets: 2 , Duration: 30 sec



11. Shoulder rotation w/ 90 degree abduction

Lift your arms with your elbows pointing to the sides. Bend your elbows to an approximately 90-degree angle. Move your arms so that they point upwards and downwards in an alternating motion. The movement should take place in the shoulder joints.

Sets: 2 , Duration: 30 sec



12. Stretch and bend your back

Stand on a mat with feet hip-width apart. Bend the knees and hips, and clasp your hands behind your knees. Breathe in and round your back, exhale while arching your back.

Sets: 2 , Duration: 30 sec

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Thursday

Warm-up routine for wind technicians

Seven programmes, each with four exercises to be repeated twice; total duration approx. 10 minutes. The exercises are put together to achieve full-body warm-up and stretching.



13. Push-ups

Rest on your hands and feet with your body straight and tense.

Your hands must be placed at a distance that is slightly wider than shoulder-width apart. Lower your upper body towards the floor and push up again without flexing your hips. If you cannot do 10 repetitions, perform the exercise on your knees.

Sets: 2 , Reps: 10



14. Squat

Stand with your feet shoulder-width apart and your arms straight out in front of you. Bend your knees to 90 degrees then press up again. Keep your back straight and your eyes looking straight ahead throughout the motion. Alternatively, hold the deep position for a few seconds before pressing back up.

Sets: 2 , Reps: 10



15. Neck stretch

Hold your hand over your collar bone. Bend your neck towards the opposite side of where your hand is and rotate your head to the same side as you bend your neck. Look down. Feel the stretch on the front of your neck. Hold for about 30 seconds.

Duration: 30 sec, Sets: 2



16. Standing side stretch

Lift one arm above your head and slowly bend your upper body to the opposite side. Feel the stretch on the side of your body. Hold the position for 30 seconds. Change sides and repeat the exercise.

Duration: 30 sec, Sets: 2

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Friday

Warm-up routine for wind technicians

Seven programmes, each with four exercises to be repeated twice; total duration approx. 10 minutes. The exercises are put together to achieve full-body warm-up and stretching.



17. Single leg squat

Stand on one leg with your arms straight, in front of you. Your passive leg may be put behind your active leg for support only. Bend your knee 90 degrees and push back up. Keep your back straight and look ahead throughout the movement. Repeat with opposite leg.

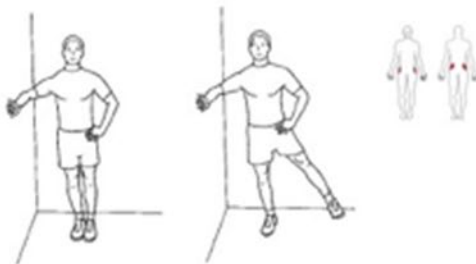
Sets: 2 , Reps: 10



18. Neck stretch

Place one hand on your head and gently pull your head down towards your shoulder. Relax the opposite shoulder. When you feel the stretch on the side of your neck, hold for 30 seconds. Switch sides and repeat the exercise.

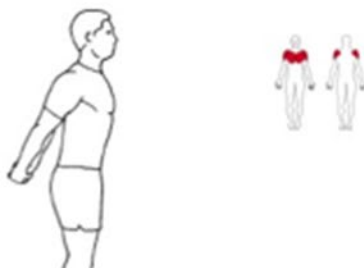
Sets: 2 , Duration: 30 sec



19. Standing outward leg lift

Stand next to a wall, using one hand for support. Extend your leg to the side and slowly return to the starting position. Keep your pelvis stable. You may also do the exercise without the wall or with the support of a partner.

Gentagelser: 10 , Sets: 2



20. Stretch your chest and shoulders

Fold your hands behind your back, open your chest and push your arms backwards until you feel a stretch in your chest and shoulders. Hold for 30 seconds.

Sets: 2 , Duration: 30 sec

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Saturday Warm-up routine for wind technicians

Seven programmes, each with four exercises to be repeated twice; total duration approx. 10 minutes.
The exercises are put together to achieve full-body warm-up and stretching.



21. Backwards leglift

Start in the push-up position with your hands placed under your shoulders. Pull your belly button towards your spine and tighten your leg and upper body muscles. Breathe in, lifting one straight leg towards the ceiling, then lower it again.

Switch legs until you have done a total of 10 repetitions.

Sets: 2 , Reps: 10



22. Hand on the back

Place your hand on your back and try to reach the opposite shoulder blade. Hold the position for 30 seconds. Switch arms.

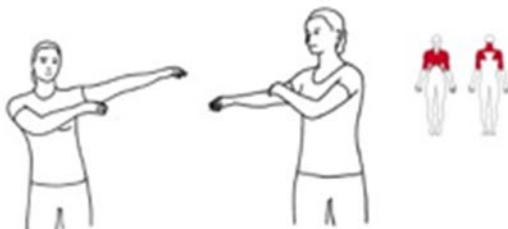
Duration: 30 sec, Sets: 2



23. Write the number eight

Stand with one arm straight at shoulder height. Write the number eight with this arm, switch arms and repeat. Perform the exercise for approximately 30 seconds with each arm.

Sets: 2 , Duration: 30 sec



24. Arm Swing w/torso rotation

Swing your arms freely from side to side. Let your upper body, hips and pelvis follow the motion. Stand balanced and steady on your feet. Keep the shoulders relaxed during the motion. Breathe naturally.

Sets: 2 , Duration: 30 sec

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Sunday

Warm-up routine for wind technicians

Seven programmes, each with four exercises to be repeated twice; total duration approx. 10 minutes. The exercises are put together to achieve full-body warm-up and stretching.



25. Reverse lunge

Stand with your feet together and your hands on your hips. Lift one leg and take a large step backwards shifting your weight backwards. When your leg touches the floor, slowly descend until your knee almost touches the floor and briefly hold the position. Press up and return to the starting position.

Sets: 2 , Reps: 10



26. Stretch of back and shoulders

Stand with your hands folded behind your head. Move your elbows slowly forwards and backwards. For each repetition, push a little bit further, increasing the range. But remember that it must not be painful.

Duration: 30 sec, Sets: 2



27. Stretch of neck and shoulder

Keep your hands behind your back, lower both shoulders and lean your head down toward one shoulder. Hold for 30 seconds and repeat for opposite side.

Duration: 30 sec, Sets: 2



28. Stretch of shoulders and upper back

Reach one arm up and behind your neck with fingers pointing towards the opposite shoulder blade. Reach the other arm behind your lower back with fingers pointing towards the opposite shoulder blade. Move your hands towards each other and if possible make your finger tips touch and grab hold. Hold the position for 30 seconds if you can. Do the same to the opposite side.

Duration: 30 sec, Sets: 2

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ANNEX 3 - MANUAL HANDLING RISK ASSESSMENT

This is an instructor guidance elaborating the concept of aggravating factors related to manual handling risk assessment.

The baseline of assessing manual lifts is the load weight and the distance from the spine in the lower back (the reaching distance), respectively.

While assessing manual handling, a number of additional risk factors to the lift must be considered, which, individually and especially combined, will enhance the strain on the musculoskeletal system. These factors are the, so called, aggravating factors.

Prior to delivering the Manual Handling Module, instructors should review local instructions and risks assessments for the tasks planned, including assessment of whether a given task should be solved by the participants by using a handling aid.

1. LOAD WEIGHT AND REACHING DISTANCE

The following guidance introduces some simple tools to help identify 'low-risk' manual handling tasks and introduces a hierarchy of control that can be used to help identify simple solutions to reduce risk from manual handling further. Tasks outside of these guidelines should be assessed by an appropriately qualified professional using more detailed assessment tools or a full manual handling risk assessment for the task.

Lifting and lowering filters

Use the guideline filters for lifting and lowering in figure annex 3 to help you identify low-risk tasks. The guideline filters do not set specific weight limits, so the guidelines are not 'safe limits' for lifting and carrying. They use broad assumptions or generalisations where, if met, the risk of injury is considered to be low.

Working outside the limits is likely to increase the risk of injury, which can lead to ill health. The guidelines are derived from lifting capacity data which show differences between men and women in the population (rather than individuals). Where the handling task falls within the filter guidelines, you do not normally need to do any other form of risk assessment unless you have individual workers who may be at significant risk. If you are unsure, complete a more detailed assessment.

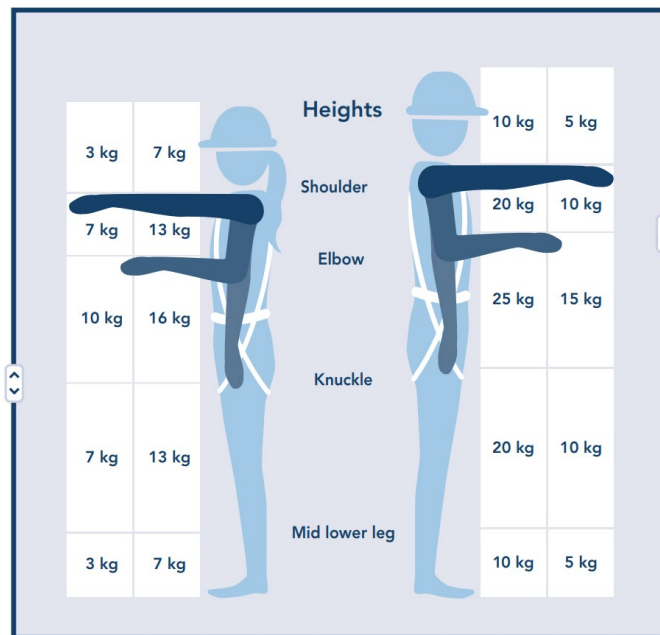


Figure Annex 3.1 – Lifting and lowering filters

Note *Figure Annex 3.1 assumes that the load is easily grasped with both hands and is handled in reasonable working conditions, with the worker in a stable body position.*

Risk assessment, lifting and lowering

6. Each box in figure Annex 3.1 contains a filter value for lifting and lowering in that zone. The filter values in the boxes are reduced if handling is done with arms extended, or at high or low levels, as that is where injuries are most likely to happen and will most likely be harmful to health. Such lifts must be evaluated separately.
7. Observe the work activity you are assessing and compare it to figure Annex 3.1. First, decide which zone or zones the worker's hands pass through when moving the load. Then assess the maximum weight being handled. If it is less than the value given in the matching box, it is within the guidelines.
8. If the worker's hands enter more than one zone during the operation, use the smallest weight. Use an in-between weight if the hands are close to a boundary between zones.
9. Lifting and lowering: "Do I need to make a more detailed assessment?" You will need to make a more detailed assessment using an appropriate tool or full risk assessment checklists (or equivalent) if:
 - e. the handling operation must take place with the hands outside the zones in figure Annex 3.1;
 - f. the weight exceeds those in figure Annex 3.1;
 - g. the handling involves torso twisting;

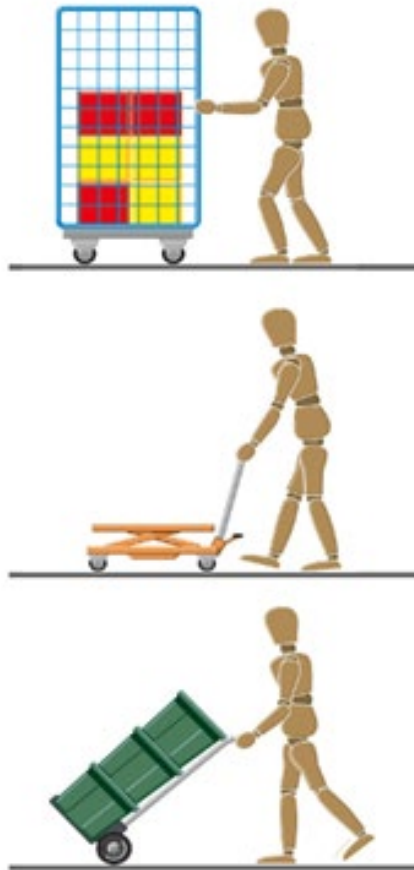


- h. the handling is more frequent than one lifts every two minutes;
- i. the handling is done by a team;
- j. the handling operations are complex, for example, the weights vary significantly or there are several start and finish locations;
- k. the lift does not meet the conditions given for using the guidelines, for example, if the load is difficult to grasp or handle;
- l. the person lifting may be at significant risk, for example, new or expectant mothers, young workers, those new to the job, or those with a disability, significant health problem or recent injury.

Carrying risk assessment

You can apply the filter weights for lifting and lowering in figure Annex 3.1 to carrying operations where the load:

- m. is held against the body
- n. is carried no further than about 10m without resting
- o. does not prevent the person from walking normally
- p. does not obstruct the view of the person carrying it
- q. does not require the hands to be held below knuckle height or much above elbow height
- r. Where you can carry the load securely on the shoulder without lifting it first (for example, by sliding it onto your shoulder), you can apply the filter values up to 20 m



Pushing and pulling risk assessment

In pushing and pulling operations, the load might be slid, rolled or moved on wheels. Observe the worker's general posture during the operation. Figure Annex 3.2 shows some acceptable push/pull postures. The task is likely to be low risk if:

- a. the force is applied with the hands
- b. the torso is largely upright and not twisted
- c. the hands are between hip and shoulder height
- d. the distance moved without a pause or break is no more than about 20m

“When do I need to make a more detailed assessment?”

If the load can be moved and controlled very easily, for example with one hand, you do not need to do a more detailed assessment. You should make a more detailed assessment using, for example, the RAPP tool or full risk assessment checklists (or equivalent) if:

- a. the posture shows that the task requires significant forces, for example, leaning
- b. here are extra risk factors like slopes, uneven floors, constricted spaces or trapping hazards

Figure Annex 3.2 – Pushing and pulling risk assessment¹

2. Aggravating factors

The aggravating factors of the lifting operation must be considered which, individually and especially in combination, will enhance the strain on the musculoskeletal system posing a risk of injury and manual handling harmful to health.

Examples of aggravating factors - categorised related to the four elements of the TILE principles:

Basic dynamic risk assessment – TILE principle

All manual handling tasks should be preceded by a basic dynamic risk assessment carried out by the persons planning to carry out the task before commencing the activity. This can be conducted using the simple and well known ‘TILE’ approach.

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| T - Task | I – Individual(s) | L - Load | E - Environment |
|----------|-------------------|----------|-----------------|
|----------|-------------------|----------|-----------------|

For *Task* considerations should include:

- a. no suitable handling aid available
- b. holding loads away from torso
- c. lifting below knee height or above shoulder height
- d. carrying, pushing, pulling or precise positioning of the load reaching upwards
- e. twisting or stooping
- f. large vertical movement
- g. long carrying distances
- h. strenuous pushing or pulling
- i. unpredictable movement of loads
- j. frequent or prolonged physical effort
- k. lifting for a longer period of time
- l. insufficient rest or recovery
- m. team effort²
- n. a work rate imposed by a process

For *Individual(s)* capability considerations should include:

- a. pose a risk to those with a health problem or a physical or learning difficulty
- b. no warm-up
- c. require unusual capability previous and pre-existing injuries
- d. pose a risk to those who are pregnant
- e. pose a risk to new workers/young people
- f. require special information/training

² Team handling is, in general, not a legitimate substitute for using handling aids



- g. unusual strength or height required for the activity
- h. specialist knowledge or training required

For the *Load* considerations should include:

- a. heavy
- b. bulky or unwieldy
- c. difficult to grasp
- d. difficult to grip
- e. unstable or unpredictable
- f. contents likely to move or shift
- g. intrinsically harmful (e.g., sharp/hot)
- h. sharp edges

For the *Work Environment* considerations should include:

- a. constraints on posture, e.g., working on knees, laying on back
- b. restricted spaces
- c. poor floors, e.g. greasy, wet, uneven
- d. variations in levels, e.g. stairs, thresholds
- e. hot/cold/humid conditions
- f. strong air movements, e.g. outside of tower, nacelle, etc.
- g. poor lighting conditions
- h. weather conditions; rain, gust, wind, temperature

Additionally, it is recommended to consider additional factors including whether the activity is hindered or enhanced by wearing particular protective clothing or PPE and work/organisation (psychosocial) factors such as training, sudden changes in workload, communication, consultation, etc.

3. Good handling technique

A good handling technique is no substitute for other risk-reduction steps, such as providing lifting aids, or improvements to the task, load or working environment. Moving the load by rocking, pivoting, rolling or sliding is preferable to lifting it in situations where there is limited scope for risk reduction. However, good handling technique forms a very valuable addition to other risk-control measures. To be successful, good handling technique needs both



training and practice. The training should be carried out in conditions that are as realistic as possible, emphasising its relevance to everyday handling operations in the workplace.

There is no single correct way to lift and there are many different approaches, each with merits and advantages in particular situations or individual circumstances. The content of training in good handling technique should be tailored to the particular handling operations likely to be carried out, beginning with relatively simple examples and progressing to more specialised handling operations as appropriate. For example:

1. Employees should be able to identify loads that may cause injury when handled. Increases in size often indicate an increase in weight and difficulty of handling.
2. Where the size of the item is less important than how full it is, e.g. in the case of a dustbin containing refuse, they should assess the load by looking inside it or use techniques such as rocking the load from side to side before attempting to lift it.
3. They should also treat unfamiliar loads with caution. Drums which appear to be empty or other closed containers should be tested, e.g. by trying to raise one end.
4. They should apply force gradually when testing loads. If employees feel too much strain, they should be encouraged to look for another way of handling the load safely.

The following list illustrates some important points which are relevant to a basic two-handed symmetrical lift. That is, a lift using both hands that takes place in front of and close to the body, without any twisting.

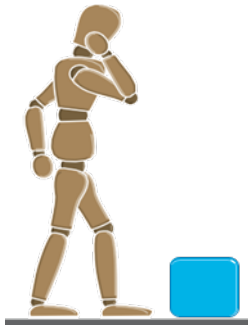
Basic lifting operations

Rocking a load to assess its ease of handling.



Figure 3 – Basic lifting operations³

³ UK Government Copyright (by permission)



Think before handling/lifting. Plan the lift/ handling activity. Where is the load going to be placed? Use appropriate handling aids where possible. Will help be needed with the load? Remove obstructions, such as discarded wrapping materials. For long lifts, such as from floor to shoulder height, consider resting the load mid-way on a table or bench to change grip.



Keep the load close to the waist. Keep the load close to the waist for as long as possible while lifting. The distance of the load from the spine at waist height is an important factor in the overall load on the spine and back muscles. Keep the heaviest side of the load next to the body. If a close approach to the load is not possible, try to slide it towards the body before attempting to lift it.



Adopt a stable position. The feet should be apart with one leg in front of the other (alongside the load if it is on the ground) to increase the stability of the worker's posture. The worker should be prepared to move their feet during the lift to maintain a stable posture. Wearing over- tight clothing or unsuitable footwear may make this difficult.

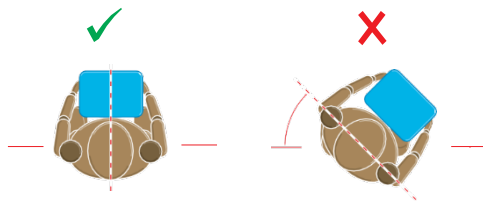


Ensure a good hold on the load. Where possible, hug the load as close as possible to the body. This may be better than gripping it tightly only with the hands.

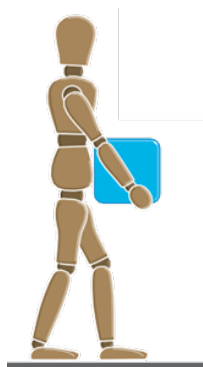
Moderate flexion (slight bending) of the back, hips and knees at the start of the lift is preferable to either fully flexing the back (stooping) or fully flexing the hips and knees (full/ deep squatting). Don't flex the back any further while lifting. This can happen if the legs begin to straighten before starting to raise the load. The worker should start the movement with the strong leg muscles while keeping the back posture constant.

Figure 3 – Basic lifting operations⁴

⁴ UK Government Copyright (by permission)



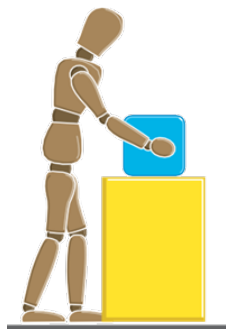
Avoid twisting the back or leaning sideways especially while the back is bent. Keep shoulders level and facing in the same direction as the hips. Turning by moving the feet is better than twisting and lifting at the same time.



Keep the head up when handling. Look ahead not down at the load once it has been held securely.

Move smoothly. Do not jerk or snatch the load as this can make it harder to keep control and can increase the risk of injury.

Don't lift or handle more than can be easily managed. There is a difference between what people can lift and what they can safely lift. If in doubt, seek advice or get help.



Put down, then adjust. If precise positioning of the load is necessary, put it down first, then slide it into the desired position.

Figure 3 – Basic lifting operations⁵

⁵ UK Government Copyright (by permission)



ANNEX 4 - VERSION HISTORY

| Amendment date | Version | Approved by & date | Description of changes |
|--|---------|--------------------|------------------------|
| Changes throughout | | | |
| <ul style="list-style-type: none"> New layout MAC deleted throughout the standard. | | | |
| Section 2 Terms and Conditions | | | |
| <ul style="list-style-type: none"> New text added- As low as reasonably practicable: This means that a risk is identified and controlled to a lower level weighted against the effort, time and money needed to control it. | | | |
| Section 4 Scope | | | |
| <ul style="list-style-type: none"> Text replaced to- Global Wind Organisation is a non-profit body founded by the wind turbine manufacturers and owners. Our members strive for an injury free work environment in the wind turbine industry, setting common international standards for safety training and emergency procedures. This standard describes the requirements for lift training courses that are recommended by the members of GWO. This standard comprises of three modules: <ol style="list-style-type: none"> Lift User Module Lift Commission and Inspection Module Lift Commission, Inspection, Installation and Maintenance Module The members of the Global Wind Organisation (GWO) recognise trained persons as competent within use, inspection, installation, and maintenance of lifts in the wind industry and accept the trained person as possessing the required abilities to use, commission, inspect, install, maintain, and evacuate a lift where they as duty-holders are accountable for safety. This standard has been developed in response to the demand for recognisable lift training in the industry and has been prepared in co-operation between the members of GWO based on risk assessments and factual incident and accident statistics from G+ and the wind industry. Disputes and potential non-conformities should be brought to the attention of the GWO Audit and Compliance Committee. | | | |
| Section 5.1 Overview | | | |
| <ul style="list-style-type: none"> The template provides a table for split modules; the original content does not mention a split module. The original content is adopted. | | | |
| Section 5.4 Duration | | | |
| <ul style="list-style-type: none"> Text replaced to: The total contact time for completing the Basic Safety Training Standard is 25 hours and 0 minutes. This is based on the times given in the module timetables and summarised in table 5-4.1 below. | | | |



Table 5-4.1 Duration

- Lift Commission, Inspection, Installation and Maintenance Module: Deleted 2 days

Section 5.7 Participant prerequisites for the lift modules

Text replaced to: All personnel participating must meet the participant prerequisites described in the GWO Requirements for Training.

Section 5.8 and 5.9

- Section-Deleted

Section 6 Using this Standard to Develop Training

- Text replaced to: The training in this standard is designed around the GWO taxonomy described in the GWO Requirements for Training. Theoretical and practical activities must be delivered according to the defined taxonomic level in order to reach the described learning objectives.
- In addition to this, all training based on this standard including all related resources shall, as a minimum, meet the requirements described in the GWO Requirements for Training

Section 7.2 Duration of the Lift User module

Text replaced to: The total contact time for completing the Lift User Module is 4 hours and 0 minutes. The training provider must not exceed the times per day given in table 7-2 below.

Section 7.3 Digital training

- Section-Deleted

Section 7.5 Lift User Module timetable

- Text replaced to: The order in which elements of this lift module training are delivered may vary according to the didactical choices of the delivering training provider. The delivery of this module must comply with the requirements described in the GWO Requirements for Training. The delivery of this module must comply with the requirements described in the GWO Requirements for Training.

Table 7-5 Approx. Duration

- Text replaced to: Duration.

Section 8.4 Duration of the Lift Commission and Inspection Module

- Text replaced to: The total contact time for completing the Lift Commission and Inspection Training Module is 7 hours and 0 minutes. The training provider must not exceed the times per day given in table 7-2 below.

Section 8.5 Digital training

- Section- Deleted

Table 6-8



- Text replaced to: Instructor to Participant Ratio

Section 8.6 Lift Commission and Inspection Module Timetable

- Text replaced to: The order in which elements of this Lift Module training are delivered may vary according to the didactical choices of the delivering training provider. The delivery of this module must comply with the requirements described in the GWO Requirements for Training.

Section 8.7 Detailed description of the Lift Commission and Inspection Module. Lesson 17, Element 1

- The new template order is adopted-The 'Instructor shall' and 'Course participant shall' are reversed in the original standard.

Table 8-7 Approx. Duration

- Text replaced to: Duration.

Section 9.4 Duration of the Lift Commission, Inspection, Installation and Maintenance Module

- Text replaced to: The total contact time for completing the Lift Commission, Inspection, Installation and Maintenance Training Module Training Module is 14 hours and 0 minutes. The training provider must not exceed the times per day given in table 9.4.1 below.

Section 9.5. Digital training

- Section- Deleted

Section 9.7. Lift Commission, Inspection, Installation and Maintenance Module Timetable

- Text replaced to: The order in which elements of this Lift Module training are delivered may vary according to the didactical choices of the delivering training provider. The delivery of this module must comply with the requirements described in the GWO Requirements for Training.

Table 9-7 Approx. Duration

- Text replaced to: Duration.

Section 9.8. Formative post-lesson evaluation

- Text replaced to: The participants must conduct an individual theory questionnaire on each lesson, where this is indicated in the relevant element. These questionnaires serve both as a re-cap for the participants on the theoretical topics of the lessons, and they are the instructors' tool to evaluate the participants' theoretical learning outcome and understanding. Questions must be aimed at the lesson's content and posed at the taxonomic level in the relevant learning objectives. They should also challenge the participants according to their professional experience level.
- The theory questionnaire can consist of multiple-choice or descriptive-answer questions, depending on the complexity of the taxonomy level of the learning objectives concerned.
- The questionnaires must be conducted in accordance with the following criteria:
 - 1) There shall be a time limit of maximum 1½ minutes per question.



- 2) The questionnaires must be done individually.
 - 3) Where a participant does not understand the meaning of a question or a multiple-choice
 - 4) Option, the instructor must facilitate the participant to understand the meaning of the question or the multiple-choice options.
 - 5) Participants may use:
 - i. Training material
 - j. Handouts
 - k. Own notes
- Correct answers must be shared at the end of the questionnaire to allow the participants to check and evaluate their answers. To enhance learning, it is recommended letting peer participants evaluate each other's answers.

Annex 1 Equipment List.

Equipment list updated according to GWO standards.

Vertical Aluminium Ladders - Section Deleted
