

Basic Safety Training Refresher Standard

V12

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1. LIST OF ABBREVIATIONS

AED	Automatic External Defibrillator
ANSI	American National Standards Institute
AS/NZS	Australia and New Zealand Standard
BST	Basic Safety Training
BSTR	Basic Safety Training Refresher
BWH	Basic Working at Height
CO ₂	Carbon Dioxide
CPR	Cardiopulmonary Resuscitation
CSA	Canadian Standards Association
EN	European Standards
EPIRB	Emergency Position Indicating Radio Beacon
ERC	European Resuscitation Council
GMDSS	Global Maritime Distress and Safety System
GWO	Global Wind Organisation
H.E.L.P.	Heat Escape Lessening Posture
ILCOR	International Liaison Committee on Resuscitation
LSA	Life Saving Appliances
MES	Marine Evacuation Systems
MOB	Man Overboard
PLB	Personal Locating Beacon
PPE	Personal Protective Equipment
PTSD	Post-Traumatic Stress Disorder
SAR	Search and Rescue
SART	Search and Rescue Transponder



SRL	Self-Retractable Lifeline
T.I.L.E.	Task Individual Load Environment
WTG	Wind Turbine Generator

2. TERMS AND DEFINITIONS

Term	Definition
Additional fall protection	<p>Describes the use of an independent, additional suitable fall protection system in conjunction with a primary fall protection system. Typically, used during training to provide fall protection to participants as they learn to use fall protection equipment. Additional fall protection may sometimes be referred to as a “backup”.</p> <p>The additional fall protection system should be chosen in such a way that it will not hinder the exercise. Preferably this additional fall protection is not even noticeable by the participant.</p>
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.
Fall arrest	Preventing the user of a personal fall protection system from colliding with the ground, structure, or any other obstacle during a free fall.
Fall arrest system	Personal fall protection system which limits the impact force on the body of the user during fall arrest
Fall prevention	Preventing the user of a personal fall protection system from going into a free fall
Must	For clarity where the word must is used in this standard it shall have the same meaning as shall
Personal fall protection system	Assembly of components intended to protect the user against falls from height, including a body holding device and an attachment system, which can be connected to a reliable anchorage point
Rescue system	Personal fall protection system by which a person can rescue themselves or others, in such a way that a free fall is prevented
Restraint system	Personal fall protection system which prevents the user from reaching zones where the risk of a fall from height exists
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

Work positioning system Personal fall protection system which enables the user to work in tension or suspension in such a way that free fall is prevented

3. CHANGE LOG

Amendment date	Version	Approved by & date	Description of changes
2 May 2023	12	GWO TC 2023	

Changes throughout

- New layout
- MAC deleted throughout the standard
- GWO Requirements for Training – title updated

Section 2 Terms and definitions

- Definition for “as low as reasonably practicable” added
- Definition for “additional fall protection” added

Section 4. Scope

- Text revised and updated

Section 5.4 Duration

- Text updated to clarify instructions

Section 5.4 Note

- Text revised and updated

Section 5.7 and 5.8 Participant Prerequisites for the BSTR Modules

- Text simplified with “All personnel participating must meet the participant prerequisites described in the GWO Requirements for Training.”

Section 5.9 Training Equipment

- Text Deleted



Section 6 Understanding the GWO Taxonomy

- The section Understanding the GWO taxonomy has been replaced with a referral to the GWO Requirements for Training

First Aid Refresher Module

Section 7.2 Duration of the BSTR First Aid Module

- Text updated to clarify instructions

Section 7.5 First Aid Module Refresher Timetable

- Text updated

Section 10.2 Duration of the BSTR Working at Heights Module

- Text updated to clarify instructions

Section 10.4 Equipment for the BSTR First Aid Module

- Text revised and updated

Working at Heights Refresher Module

Section 10.4 Equipment for Working at Heights Module

- Text revised and updated

Section 10.5 BSTR Working at Heights Module Timetable

- Text updated to clarify instructions

Lesson 5, Element 5.1 Control measures and warm up

- Element 5.1.5 text replaced

Working at Heights with Manual Handling Module

Section 11.2 Duration of the BSTR Working at Heights with Manual Handling Module

- Text updated to clarify instructions

Section 11.4 Equipment for BSTR Working at Heights with Manual Handling Module

- Text revised and updated

Section 11.5 BSTR Working at Heights with Manual Handling Module Timetable

- Text updated to clarify instructions

Lesson 5, Element 5.1 Control measures and warm up

- Element 5.1.5 replaced
-



- Text revised and updated

Equipment List

- Equipment list for working at heights and working at heights & manual handling has been updated
 - All EN/ANSI/GB/BS EN numbers have been updated
 - “Work restraint lanyards” has been changed to “fall restraint lanyards”
 - “Vertical fall arrest system” has been changes to “vertical fall arrest system on a rigid anchor line”
 - “Fixed length fall arrest lanyard” has been changed to “fall arrest lanyard including energy absorber”
 - “Helmets” have been updated to “industrial safety helmet with a chin strap that is released with a force of no less than 150 N and not more than 250 N”
 - “Carabiners” has been changed to “connectors (carabiners)”
- “Evacuation and rescue devices” has been split into two categories: “Rescue devices with lifting capacity” (EN 1496) and “devices for emergency decent” (EN 341)

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 Basic Safety Training Refresher courses that are recommended by the members of GWO. The full standard covers six modules:

1. First Aid
2. Manual Handling
3. Fire Awareness
4. Working at Height
5. Working at Height & Manual Handling Combined
6. Sea Survival

The members of the Global Wind Organisation (GWO) recognise trained persons as competent within basic safety in the wind industry and accept the trained person as possessing the required knowledge to stop an unsafe situation where they as duty-holders are accountable for safety.



This standard has been developed in response to the demand for recognisable safety 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 GWO BST REFRESHER

Upon completion of the Global Wind Organisation (GWO) Basic Safety Training Refresher (BSTR) participants will possess an awareness of the hazards encountered when working within the wind industry and how to control and mitigate these hazards. The BSTR will also equip participants with the knowledge, skills, and confidence to appropriately respond in the event of an emergency and to increase their safety through proper use of personal protective equipment (PPE), emergency equipment and procedures.

The approved GWO Basic Safety Training Refresher (BSTR) refreshes, reviews and builds on participants existing skills and tools obtained during BST Module courses, which include Fire Awareness, First Aid, Working at Heights, and Manual Handling Modules. To enable participants to work in the offshore environment, an additional GWO Sea Survival Module training shall be completed.

5.1 Overview

The GWO Basic Safety Training Refresher is divided into the following six modules:

Module 1: First Aid Refresher

Module 2: Manual Handling Refresher

Module 3: Fire Awareness Refresher

Module 4: Working at Heights Refresher

Module 5: Working at Heights and Manual Handling Combined refresher

Module 6: Sea Survival Refresher

Note *Module 5, Working at Heights & Manual Handling Combined Refresher is a combined module comprising the lessons and elements from both the Working at Heights Module and the Manual Handling Module and is intended to be delivered in one day. The Working at Height & Manual Handling Combined Module can be delivered instead of the two standalone modules. Where the combined module is delivered then the participants shall receive two training records one for working at height and one for manual handling.*



5.2 Target Group

Personnel who will be working in the wind industry or related fields and will have their duties in a wind turbine environment, usually in physical contact with a wind turbine or an offshore wind structure.

Personnel that perform job functions that has been risk assessed by their employer or their workplace duty holder as a function, where training according to one or more modules of the BST standard may mitigate of the identified risks.

5.3 Aims and Objectives

The aim of BSTR is to review and build on previously gained knowledge and skills from BST through theoretical and practical training.

This BSTR training shall enable participants to support and care for themselves and others working in the industry by possessing the knowledge and skills of first aid, working at heights, manual handling, fire awareness, sea survival and in case of an emergency, to be able to evacuate, rescue and provide appropriate first aid to casualties.

5.4 Duration of the BSTR Modules

The total contact time for completing the basic safety training standard is to be *21 hours and 50 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
First Aid Refresher	4 hours 00 minutes
Manual Handling Refresher	3 hours 35 minutes
Fire Awareness Refresher	3 hours 20 minutes
Working at Heights Refresher	8 hours 00 minutes
Working at Heights & Manual handling Refresher	8 hours 00 minutes
Sea Survival Refresher	6 hours 30 minutes

Table 5.4.1 - GWO BSTR Module durations

	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).

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

5.5 Validity Period

The Basic Safety Training Refresher Modules are valid for the period stated in the table below. Certificates and training records shall be renewed before the end of a given validity period. A certificate or training record can be renewed up to two months prior to expiry and maintain the original certification date by uploading the previous certificate's valid until date in WINDA.

If a certificate or training record is renewed outside of two months of expiry, it must carry the new date of certification.

A participant is only allowed to attend a refresher course in the specific training module prior to the date of expiry on the current certificate or training records.

If a certificate or training record is expired, the participant must attend the full Basic Safety Training module(s) to obtain a new training record.

The validity period is automatically calculated in WINDA by entering the course completion date.

Course/module	Certificate Validity (Months)
First Aid Refresher	24 months
Manual Handling Refresher	24 months
Fire Awareness Refresher	24 months
Working at Heights Refresher	24 months
Working at Heights & Manual Handling Refresher	24 months
Sea Survival Refresher	24 months

Table 5.5.1 – GWO BSTR modules certificate validity periods

5.6 Course Codes

Module	Course Code
First Aid Refresher	FAR



Manual Handling	MHR
Fire Awareness	FAWR
Working at Heights	WAHR
Sea Survival	SSR

Table 5.6.1 – GWO BSTR module course codes

5.7 Participant Prerequisites for the BSTR

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



First Aid Refresher Module

(FAR)



7. MODULE 1 – BSTR FIRST AID MODULE

7.1 Aims and Objectives for the BSTR First Aid Module

The aim of this module is to enable participants, through theoretical and practical training, to refresh the participants prior experiences, knowledge, skills, and abilities to enable participants to recognise signs and symptoms of life threatening situations and administer safe and effective first aid in the wind turbine industry/WTG environment in order to save lives, preventing further illness or injury, until the casualty can be handed over to the next level of care in case of an incident in the wind turbine industry/WTG environment.

After having successfully complete this BSTR First Aid module, the participants will have the ability to:

- 1) **Act independently** in recognising, assessing, and prioritising the need for basic first aid and providing lifesaving first aid until the casualty can be handed over to the next level of care in case of an incident in the wind turbine industry/WTG environment (Ability, intermediate level)
- 2) **Take responsibility** for recognising their limitations as a basic first aider, calling for help and enable evacuation off the casualty in case of an incident in the wind turbine industry/WTG environment (Ability, intermediate level)

7.2 Duration of the BSTR First Aid Module

The total contact time for completing the BSTR First Aid 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	10 hours

Table 7.2.1 – 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).

7.3 BSTR First Aid Module 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
BSTR First Aid	Theory	1:12
	Practical	1:6

Table 7.3.1 – GWO First Aid Refresher Module instructor to participant ratio

7.4 Equipment for the BSTR First Aid Module

The equipment required for training as listed in Annex 1 must be available and must fulfil national legal requirements as listed in table Annex 1-1 where applicable.

7.5 BSTR First Aid Module Timetable

The order in which elements of this 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
	TOTAL	
2. Practical application of the primary survey	2.1	Primary survey (“C” A – B – C)
	2.2	“C” – catastrophic external bleeding
	2.3	Unresponsive
	2.4	CPR – unresponsive, not breathing
	2.5	Calling for help
	2.6	Head-to-toe examination
	TOTAL	
3. Scenario-based training	3.1	Practice first aid techniques
	TOTAL	
4. Training Review	4.1	Training review



4.2	Feedback session	
	TOTAL	10 min.
	GRAND TOTAL	240 min.

7.6 Detailed Description of the BSTR First Aid Module

LESSON 1 - INTRODUCTION TO THE TRAINING

20 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) **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)

ELEMENT 1.1 - SAFETY INSTRUCTIONS AND EMERGENCY PROCEDURES

Learning objective:

- 4) The participant **shows 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



The participants shall:

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



ELEMENT 1.2 - FACILITIES

Learning objective:

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



The instructor shall:

- 1.3.1 Explain the timetable of the BSTR First Aid Module, including breaks and mealtimes
- 1.3.2 Give a short introduction to 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 participant can **recognise** the scope and main objectives of the BSTR First Aid Training Module (Knowledge, basic level)



The instructor shall:

- 1.4.1 Present the scope and main learning objectives of the BSTR First Aid Module through a scenario, a challenge or, “Your goal with the BSTR First Aid Module, should you choose to accept is...”-message

Note *A suggested learning activity could be to share stories, present scenarios or personal experiences that show the importance of being able to do basic first aid in the wind industry (what is in it for the participants).*

Note *Where possible, ‘learning objectives – PowerPoint slide(s)’ as part of the introduction should be avoided. Instead use stories, examples or personal experiences that shows the importance of being able to provide basic first aid in the wind industry and the importance of the BSTR First Aid Module.*

- 1.4.2 Involve participants with questions on understanding and individual experiences relevant to the BSTR First Aid Module



The participants shall:

- 1.4.3 Engage in answering questions and share experiences relevant to the BSTR First Aid Module

ELEMENT 1.5 - ONGOING ASSESSMENTS (PARTICIPANT ASSESSMENT FORM)

Learning objective:

- 8) The participant can **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 on relation to the assessment procedure

ELEMENT 1.6 - MOTIVATION

Learning objective:

- 9) The participant **shows 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 BSTR First Aid Module understandings and abilities:

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.*



The participants shall:

- 1.6.2 Engage themselves in discussions and share experiences on BSTR First Aid training

Note *When the participants succeed by trying out on their own, bring their relevant experience into play and apply learning points from the instructor's feedback, the participant develops a positive attitude and responsibility towards the subject and the performance in the work situation*

LESSON 2 - PRACTICAL APPLICATION OF THE PRIMARY SURVEY

80 min.

The aim of this lesson is to refresh the participants prior experiences, knowledge, skills, and abilities to enable the participants to recognise signs and symptoms of life threatening situations and save lives and preventing injury to the casualty by being able to use primary survey to provide the correct and effective lifesaving first aid in case of an emergency situation in the wind industry.



After having successfully completed this lesson, the participants can:

- 10) **Act independently** in providing lifesaving basic first aid by using primary survey to identify and treat life-threatening conditions in a prioritised order in an incident in a WTG environment (Ability, intermediate level). The mentioned life-threatening conditions include:
- a. catastrophic external bleeding
 - b. unresponsive casualty
 - c. unresponsive not breathing casualty

ELEMENT 2.1 - PRIMARY SURVEY (“C” – A – B – C)

Learning objective:

- 11) The participant can **perform** a correct primary survey in incidents (Skills, intermediate level)



The instructor shall:

- 2.1.1 Facilitate practice for the participants in how to do a primary survey (“C”- A-B-C) in incident(s)

Note *The instructor shall give constructive feedback to the participants performance throughout the elements of this lesson*



The participants shall:

- 2.1.2 Engage in the practise of how to do a primary survey (“C”- A-B-C) in incident(s)

Note *The participants shall think about the received feedback and use the feedback to improve their performance throughout the elements of this lesson*

ELEMENT 2.2 - “C” – CATASTROPHIC EXTERNAL BLEEDING

Learning objectives:

- 12) The participant can **solve** the challenge of how to detect catastrophic external bleeding (Ability, basic level)
- 13) The participant can **perform** the correct treatment of a casualty with catastrophic external bleeding including the use of first aid equipment (Skills, intermediate level)



The instructor shall:

- 2.2.1 Facilitate guided practice for the participants in detecting catastrophic external bleeding e.g.:
- a. present examples of 'bleeding' casualties; some casualties with catastrophic external bleeding and some casualties that are bleeding, but not considered to be catastrophic external bleeding (e.g. examples of casualties with arterial bleed and examples of other casualties with venous bleed)
 - b. ask the participants to detect which are the casualties with catastrophic external bleeding and why?
 - c. facilitate practice for the correct treatment of a casualty with catastrophic external bleeding including the use of first aid equipment:
 - c.i direct pressure and dressings
 - c.ii correct use of a tourniquet
 - c.iii use of improvised techniques to control catastrophic external bleeding e.g improvised tourniquet



The participants shall:

- 2.2.2 Engage in the learning activity and practise how to detect catastrophic bleeding
- 2.2.3 Engage in the practice of how to correctly treat a casualty with catastrophic external bleeding including the use of first aid equipment:
- a. direct pressure and dressings
 - b. correct use of a tourniquet and improvised tourniquet (two tourniquets may be required to control bleeding)

ELEMENT 2.3 - UNRESPONSIVE

Learning objective:

- 14) The participant can **perform** first aid to an unresponsive casualty (Skills, intermediate level)



The instructor shall:

- 2.3.1 Facilitate practice for the participants in providing first aid to an unresponsive casualty:



- a. reasons for being unresponsive
- b. threats to the casualty e.g. casualty's airways
- c. primary survey ("C" – A - B - C)
- d. unresponsive and breathing casualty should be managed using positional techniques such as the recovery position (or other national/regional established practices)



The participants shall:

2.3.2 Practise providing first aid to an unresponsive casualty

- a. threats to the casualty e.g. casualty's airways
- b. primary survey ("C" – A - B - C)
- c. unresponsive and breathing casualty should be managed using positional techniques such as the recovery position (or other national/regional established practices)

ELEMENT 2.4 - CPR – UNRESPONSIVE, NOT BREATHING

Learning objectives:

- 15) The participant can **apply** an AED safely and correctly following the AED safety procedures (Skills, intermediate level)
- 16) The participant can **perform** the correct first aid to an unresponsive, not breathing casualty (Skills, intermediate level)



The instructor shall:

- 2.4.1 Facilitate practice for the participants in how to use an AED correctly and safely
- 2.4.2 Facilitate practice for the participants in how to do provide first aid for an unresponsive and not breathing casualty
- 2.4.3 Give constructive feedback to the participants performance in providing first aid to an unresponsive casualty, not breathing casualty



The participants shall:

- 2.4.4 Engage in the practice of correctly and safely using an AED



- 2.4.5 Engage in the practice of how to provide first aid for an unresponsive and not breathing casualty
- a. primary survey (“C” – A - B - C)
 - b. performing CPR on adults both with and without the use of an AED

ELEMENT 2.5 - CALLING FOR HELP

Note *This element can be combined with the other elements of Lesson 2*

Learning objective:

- 17) The participant can **perform** appropriate call for help in case of a first aid incident in the wind industry (Skills, intermediate level)



The instructor shall:

- 2.5.1 Facilitate practise for the participants in how to appropriately call for help in case of a first aid incident in the wind industry
- 2.5.2 Give constructive feedback to the participants’ performance in how to appropriately call for help in case of a first aid incident in the wind industry



The participants shall:

- 2.5.3 Practise calling for help in a first aid incident

ELEMENT 2.6 - HEAD-TO-TOE EXAMINATION

Learning objective:

- 18) The participant can **perform** a correct head-to-toe examination of a casualty (Skills, intermediate level)



The instructor shall:

- 2.6.1 Facilitate practice for the participants in how to do a head-to-toe examination and ask the participants questions about what the focus of a head-to-toe examination is (identifying other injuries) and why a head-to-toe exam is performed
- 2.6.2 Give constructive feedback to the participants performance throughout the activities of this element



The participants shall:

- 2.6.3 Engage in the practice of how to do a head-to-toe examination
- 2.6.4 Engage in answering the questions about what the focus of a head-to-toe examination is and why it is performed

LESSON 3 - SCENARIO-BASED TRAINING

130 min.

The aim of this lesson is to refresh the participants prior experiences, knowledge, skills, abilities to enable the participants to be able to assess, assist and provide the correct lifesaving basic first aid in an incident in the wind industry.

After having successfully completed this lesson, the participants can:

- 19) **Take responsibility** for managing incidents with the correct approach and assessments made in a first aid incident in a WTG environment (Ability, Intermediate level)
- 20) **Act independently** in correctly assessing, assisting, and providing the necessary first aid in a first aid incident in a WTG environment (Ability, Intermediate level)
- 21) **Take responsibility** for the correct use of first aid equipment (Ability, Intermediate level)
- 22) **Discuss** common and expected reactions to acting as a first aider, to an unusual situation and to a casualty (Knowledge, intermediate level)

Note *The instructor must lead a brief warmup of the participants in accordance with Annex 2 of the BSTR Standard – Guideline for warm-up exercises prior to beginning scenario based practical exercises.*



The instructor shall:

- 3.1.1 Explain safety procedures in the training area
- 3.1.2 Facilitate practice for the participants in providing first aid through scenario-based training. As a minimum, the instructor must ensure that each participant practise the following through the scenario-based training:
 - a. managing incidents (following the correct first aid structure for the incident and the condition of the casualty)
 - b. providing necessary lifesaving first aid for a casualty that is unconscious and require CPR
 - c. correct use of first aid equipment



- d. correct and safe use of an AED

3.1.3 Give constructive feedback to and debrief the participants' performance throughout the scenario-based training:

- a. review positive actions observed during exercise
- b. suggest points for improvement
- c. acting as a first aider e.g. what are their reactions to this?
- d. normal reactions to an unusual situation



The participants shall:

3.1.4 Practise providing basic first aid through relevant scenarios. As a minimum, the participants must practise the following through the scenario-based training:

- a. managing incidents (following the correct first aid structure for the incident and the condition of the casualty)
- b. providing necessary lifesaving first aid
- c. correct use of first aid equipment
- d. correct and safe use of an AED

3.1.5 Engage in the debriefing and share their experiences and attitudes

3.1.6 Think about the received feedback and use the feedback to improve their performance

Note *This scenario-based training shall be conducted as group work with one or more participants as first aiders, while the other participants act as casualty/casualties or observer/s. Each participant shall, as a minimum, participate as a first aider i.e. not as a casualty at least two times. Relevant first aid equipment shall be available and used at all times during scenario-based training. To ensure all of the above-mentioned points are covered during scenario-based training, training providers shall combine several of the following first aid situations mentioned below*

Note *Scenarios from the below lists can be combined at will during the scenario-based training as long as all the mandatory scenarios are covered*

The mandatory scenarios to be covered during scenario-based training are:

- a. one electrical incident
- b. one incident with either a stroke (circulatory, respiratory, central nervous system) or a heart attack
- c. two scenarios must include a head-to-toe examination of the casualty



- d. CPR using an AED

Additional scenarios which should be considered included in the scenario-based training are:

- a. dropped object – serious injury
- b. fall from heights
- c. hypovolemic shock
- d. serious external bleeding
- e. unresponsive with normal breathing
- f. serious burns (chemical, electrical, thermal and sun)
- g. hypothermia
- h. crush injury (e.g. finger injuries)
- i. chemical contacts to the eye
- j. minor incident escalating to a serious incident

LESSON 4 - TRAINING REVIEW

10 min.

The aim of this lesson is to enable the participants to think about and process their learning outcome and key takeaways from the module, aiming to achieve a high learning transfer from the module to their way of working.

ELEMENT 4.1 - TRAINING REVIEW



The instructor shall:

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



The participants shall:

- 4.1.2 Think about their learning outcome and key takeaways from the First Aid Refresher Module, aiming to achieve a high learning transfer from the module to their way of working by means of e.g.:
 - a. group discussion or walk and talk



- b. questions and answers in class, or where suitable

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

ELEMENT 4.2 - FEEDBACK SESSION



The instructor shall:

- 4.2.1 Give an overall feedback and feed forward on the participants' learning outcome inspired by the training as well as from the training-review-session
- 4.2.2 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)
- 4.2.3 Encourage the participants to discuss with colleagues about how the BSTR First Aid Module content, methods and techniques are similar or different to the local specific conditions identified after the module completion



Manual Handling Refresher

(MHR)



8. MODULE 2 – BSTR MANUAL HANDLING MODULE

Delivery of the Manual Handling Refresher Module covers same content, duration, learning objectives as described in BST Manual Handling.

The Manual Handling training can consist of first-time participants and refresher participants in the same classroom. The training is designed to allow the more experienced participants to contribute more actively and share their knowledge with the refresher participants.

Note *If training is conducted with first time participants and refresher participants in the same classroom, then first-time participants shall receive a MH record in WINDA and refresher participants shall receive an MHR record in WINDA.*



Fire Awareness Refresher (FAWR)

(FAWR)



9. MODULE 3 – BSTR FIRE AWARENESS MODULE

Delivery of the BSTR Fire Awareness Module covers same content, duration, learning objectives as described in BST Fire Awareness Module.

The fire awareness training can consist of first-time participants and refresher participants in the same classroom. The training is designed to allow the more experienced participants to contribute more actively and share their knowledge with the refresher participants.

Note *If training is conducted with first time participants and refresher participants in the same classroom, then first-time participants shall receive a FAW record in WINDA and refresher participants shall receive a FAWR record in WINDA.*



Working at Heights Refresher

(WAHR)



10. MODULE 4 – BSTR WORKING AT HEIGHTS MODULE

10.1 Aims and Objectives of the BSTR Working at Heights Module

The aim of this BSTR Working at Heights Module is to review and build on previously gained knowledge and skills through theoretical and practical training so that participants can use basic personal protective equipment and perform safe work at heights and safe and comprehensive basic rescue from heights in the wind turbine industry/ WTG environment.

After having successfully completed this BST Working at Heights Module, the participants can **act independently** and safely when using basic personal protective equipment, working at heights, and performing comprehensive basic rescue from heights in a remote wind turbine environment (Ability, intermediate level).

Note *The BSTR Working at Heights Module is not a test for participant's fear of heights.*

10.2 Duration of the BSTR Working at Heights Module

The total contact time for completing the BSTR Working at Heights Module is to be 8 hours and 0 minutes.

The training provider must not exceed the time per day given in the table 10.2.1 below.

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

Table 10.2.1 – 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).

10.3 BSTR Working at Heights Instructor to Participant Ratio

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

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

Module	Session	Instructor to Participant Ratio
BSTR First Aid	Theory	1:12



Practical	1:6
Session (Onsite)	Instructor to Participant Ratio
Theory	1:12
Practical	1:4

Table 10.3.1 – GWO BSTR Working at Heights Module instructor to participant ratio

10.4 Equipment for the BSTR Working at Heights Module

The equipment required for training as listed in Annex 1 must be available and must fulfil national legal requirements as listed in table Annex 1-1 in Annex 1 where applicable.

A generic approach to teaching safety equipment is applied to this module aiming to avoid potential product specific additional training on completion of this module, which may be required by the participant's organisation e.g. prior to site or work.

The generic approach is achieved by teaching a variety of safety equipment products within each safety equipment category (e.g., guided type fall arresters). This enables the participants to conduct pre-use inspection and to use other safety equipment products compared to those taught during this module (based on the manufacturer's user manual).

Additional fall protection must always be used during training activities at height.

The training provider shall introduce control measures that lower the risks and hazards associated with a fall from height to an acceptable level, following the Hierarchy of Controls in their risk assessment GWO recommends a maximum fall factor of 0.5. To calculate this the following formula has been used, based on a maximum allowed lanyard length of 2.00m and a fall of 1.00m.

$$\text{Fall Factor (FF)} = \frac{\text{Distance Fallen}}{\text{Length of lanyard}}$$

$$\text{Factor (FF)} = \frac{1.00 \text{ m}}{2.00 \text{ m}}$$

$$\text{Factor (FF)} = 0.5$$

During the evacuation exercises in this module the anchor points used for the attachment of fall arrest lanyards with energy absorbers must be high enough above the ground (or structure below them) that in the event that a person experiences a fall, the shock absorber in their fall arrest lanyard can fully deploy and prevent the participant from contacting the ground (or structure directly below the anchor point).

During the evacuation exercise the participants must be able to experience a minimum amount of descent using an evacuation or rescue device to ensure that they gain the experience of the speed of descent using these devices. This can be achieved by having the participant descend from a minimum height using a rescue or evacuation device.

To ensure that for all fall protection equipment that may be used that there will be enough clearance below the anchor point, and to ensure that the participants can experience a descent of sufficient duration for meaningful learning transfer, the GWO recommends that the anchor point is a minimum of 6.75m above the ground or structure directly below the anchor point. The recommended 6.75m clearance under the anchor point is explained in detail in Annex 3.



If a training provider deviates from the recommended anchor point height of 6.75m to a lower height, then the following additional control measures must be in place.

- a. The training provider shall document a risk assessment for the lower height, this shall include calculations based on the harness and fall arrest lanyards which will be used during the evacuation exercises. The calculation shall:
 - a.i use the value for maximum shock absorber elongation supplied by the equipment manufacturer, and,
 - a.ii demonstrate that the equipment to be used will prevent the participants and instructors from coming into contact with the ground in the event of a fall, and,
 - a.iii use formulas stated in national legislation or the equipment manufacturer guidelines or where no formula exists use the formula in Annex 1. The potential fall factor shall not exceed 0.5 and participants must experience a descent from a platform that is a minimum of 4.5m above the ground.

10.5 BSTR Working at Heights Module Timetable

The order in which elements of this BSTR training 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 performance assessment form)
	1.6	Motivation
	1.7	Human factors
	TOTAL	15 min.
2. Knowledge Review	2.1	Knowledge of inspection of PPE, rescue, and evacuation device
	2.2	Knowledge of PPE
	2.3	Knowledge of fall arrest systems and work positioning
	2.4	Knowledge of rescue and evacuation devices
	TOTAL	30 min.



3.	PPE Review exercises	3.1	Pre-use inspection	
		3.2	Proper use	
			TOTAL	30 min.
4.	Theory	4.1	Use of SRL for exercises	
		4.2	Safe and competent work and rescue at heights	
		4.3	Correct fitting of a harness	
		4.4	Attachment points	
		4.5	Anchor points	
		4.6	Loads and angles	
		4.7	Falls	
		4.8	Double versus twin fall arrest lanyards	
		4.9	Rescue kit	
			TOTAL	50 min.
5.	Measures to prevent injury during training	5.1	Control measures and warm up	
6.	Individual practical review exercises	6.1	How to attach a guided type fall arrester	
		6.2	Fall restraint and fall arrest lanyards	
		6.3	Work positioning lanyards	
		6.4	Certified and suitable anchor points	
		6.5	Safe and correct use of a self-retractable lifeline (SRL) for exercises	
		6.6	Safe practices when working at heights	
			TOTAL	60 min.
7.	Practical exercises – group	7.1	Safe and correct use of fall protection equipment	
		7.2	Accessing certified and suitable anchor points	
		7.3	User inspections of the rescue and evacuation equipment	
		7.4	Safe and correct use of rescue and evacuation equipment from ladder	
		7.5	Safe and correct rescue and evacuation methods from an evacuation hatch	
		7.6	Safe practises while working at heights	
			TOTAL	200 min.
8.	Training review	8.1	Training feedback	



8.2	Feedback session	
	TOTAL	15 min.
	GRAND TOTAL	420 min.

Table 10.5.1 – GWO BSTR Working at heights module timetable

10.6 Detailed Description of the BSTR Working at Heights Module

LESSON 1 - INTRODUCTION TO THE TRAINING

15 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 BSTR Working at Heights 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)

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 and ask involving questions aimed 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 Alternatively, 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 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 BSTR Working at Heights Module, including breaks and mealtimes
- 1.3.2 Give a short introduction to 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 of the training



ELEMENT 1.4 - SCOPE AND MAIN LEARNING OBJECTIVES

Learning objective:

- 7) The participants can **recognise** the scope and main objectives of the BSTR Working at Heights Module (Knowledge, basic level)



The instructor shall:

- 1.4.1 Present the scope and main learning objectives of the BSTR Working at Heights Module
- 1.4.2 Involve participants with questions on understanding and individual experiences on BSTR Working at Heights Module



The participants shall:

- 1.4.3 Engage in answering questions and share experiences on BSTR Working at Heights Module

ELEMENT 1.5 - ONGOING ASSESSMENTS (PARTICIPANT PERFORMANCE ASSESSMENT FORM)

Learning objective:

- 8) The participants can **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 in discussions 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 of personal involvement in the course
- b. the definition of and the need for BSTR Working at Heights Module understandings and abilities

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*



The participants shall:

1.6.2 Engage themselves in discussions and share experiences on BSTR Working at Heights Module

Note *When the participants succeed by trying out on their own, bring their relevant experience into play and apply learning points from the instructor's feedback, they develop a positive attitude and responsibility towards the subject and the performance in the work situation*

ELEMENT 1.7 - HUMAN FACTORS

The aim of the element is to draw the participants' attention to 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 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 used
- 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 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 wind turbine environments 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 related to BSTR Working at Heights Module. In addition, engage in and reflect on received feedback and take responsibility on their own performance and development during the training



LESSON 2 - KNOWLEDGE REVIEW

30 min.

The aim of this lesson is to reduce the risk of short-term and long-term injury when working at heights in a wind turbine by reviewing the participants' previously acquired knowledge of working at heights and by providing focus areas for the instructor during this refresher module.

After having successfully completed this lesson, the participants can:

- 12) **Explain** hazards and risks associated with working at heights in a WTG (Knowledge, intermediate level)
- 13) **Show interest** in the correct identification of PPE, including identification of European/ Global Standard markings on harness, hard hats, and other PPE (Ability, basic level)

ELEMENT 2.1 - KNOWLEDGE OF INSPECTION OF PPE, RESCUE AND EVACUATION DEVICE

Learning objective:

- 14) The participants can **perform** correct pre-use inspection and inspection of PPE, rescue, and evacuation devices (Skills, intermediate level)



The participants shall:

- 2.1.1 Demonstrate the ability to perform a pre-use inspection of PPE used for working at height
- 2.1.2 Explain the requirements for certification of PPE used for working at height



The instructor shall:

- 2.1.3 Provide constructive feedback on the participants' performance

ELEMENT 2.2 - KNOWLEDGE OF PPE

Learning objective:

- 15) The participants can **explain** when PPE is required for working at heights and their legal responsibilities towards inspection of PPE for working at heights (Knowledge, intermediate level)



The participants shall:

- 2.2.1 Explain when to use PPE for working at heights
- 2.2.2 Explain the legislative requirements for PPE used for working at heights
- 2.2.3 Describe their own legal responsibilities towards PPE used for working at heights



The instructor shall:

- 2.2.4 Provide feedback or clarifications to the participants' explanations

ELEMENT 2.3 - KNOWLEDGE OF FALL ARREST SYSTEMS AND WORK POSITIONING

Learning objective:

- 16) The participants can **explain** when fall arrest systems and work positioning devices are required and their legal responsibilities towards those (Knowledge, intermediate level)



The participants shall:

- 2.3.1 Explain when to use fall arrest systems
- 2.3.2 Explain the legislative requirements, inspection
- 2.3.3 Explain the compliance of rail/ wire systems
- 2.3.4 Discuss how to achieve a good work position during practical exercises



The instructor shall:

- 2.3.5 Provide feedback or clarifications to the participants' explanations

ELEMENT 2.4 - KNOWLEDGE OF RESCUE AND EVACUATION DEVICES

Learning objective:

- 17) The participants can **explain** when various rescue and evacuation equipment is required and the legal inspection requirements of those (Knowledge, intermediate level)



The participants shall:

- 2.4.1 Explain when to use rescue and evacuation devices
- 2.4.2 Describe the legislative requirements for rescue and evacuation devices
- 2.4.3 Explain the requirements for inspection/ certification (vacuum packed/ not vacuum packed)



The instructor shall:

- 2.4.4 Provide feedback or clarifications to the participants' explanations

LESSON 3 - PPE REVIEW EXERCISES

30 min.

The aim of this lesson is to refresh the participants' knowledge, skills and competencies in basic height rescue PPE and personal fall protection use, identification, inspection, and certification.

After having successfully completed this lesson, the participants can:

- 18) **Take responsibility** for the correct pre-use inspection, service, storage, and fitting of harnesses, fall arrest lanyards, work positioning lanyards and other PPE (Ability, intermediate level)

ELEMENT 3.1 - PRE-USE INSPECTION

Learning objective:

- 19) The participants can correctly **perform** a pre-use inspection of PPE used for working at height by a generic approach (Skills, intermediate level)



The participants shall:

- 3.1.1 Explain and practise the pre-use inspection of harnesses, fall arrest systems, fall restraint systems, and self-retractable lines with a focus on a generic approach to pre-use inspection of the equipment



The instructor shall:



3.1.2 Provide constructive feedback on the participants' performance during the practice

ELEMENT 3.2 - PROPER USE

Learning objective:

- 20) The participants can **perform** the correct use, management, and control of PPE used for working at height from a generic approach (Skills, intermediate level)



The instructor shall:

- 3.2.1 Explain and demonstrate with a focus on a generic approach to using the equipment: proper use; management and control of harnesses; fall arrest systems; fall restraint systems and self-retractable lines
- 3.2.2 Facilitate a learning activity such as a discussion about the correct use, management, and control of PPE used for working at height from a generic approach



The participants shall:

- 3.2.3 Engage in the activity and share understandings about the correct use, management, and control of PPE used for working at height from a generic approach

Note *For a detailed description of the elements of the pre-use inspection for each of the items of equipment in this lesson refer to the GWO BST Working at Heights Module, Lessons 3 to 6*

LESSON 4 - THEORY

50 min.

The aim of this lesson is to reduce the risk of short-term and long-term injury when working at heights in a wind turbine and during the practical elements of this course by refreshing the participants knowledge of working at heights and manual handling theory.

Note *The training provider shall, where reasonably practicable and safe to do so, deliver the theoretical training in conjunction with practical elements of this module*

After having successfully completed this lesson, the participants can:

- 21) **Show interest** in safe and competent work and rescue at heights (Ability, basic level)



ELEMENT 4.1 - USE OF SRL FOR EXERCISES

Learning objective:

- 22) The participants can **explain** the use of additional fall protection systems for exercises (Knowledge, intermediate level)



The instructor shall:

- 4.1.1 Explain and demonstrate how to perform a generic pre-use inspection of an SRL
- 4.1.2 Explain and demonstrate the how to use an SRL as an additional fall protection during practical exercises



The participants shall:

- 4.1.3 Ask relevant questions when in doubt

ELEMENT 4.2 - SAFE AND COMPETENT WORK AND RESCUE AT HEIGHTS

Learning objective:

- 23) The participants can **explain** safe and competent work and rescue at heights (Knowledge, intermediate level)



The instructor shall:

- 4.2.1 Explain and demonstrate how to keep oneself and others safe during work and rescue situations



The participants shall:

- 4.2.2 Ask relevant questions when in doubt

ELEMENT 4.3 - CORRECT FITTING OF A HARNESS

Learning objective:

- 24) The participants can **explain** the correct fitting of a harness (Knowledge, intermediate level)



The instructor shall:

- 4.3.1 Explain and demonstrate how to adjust a full body harness so that it fits correctly



The participants shall:

- 4.3.2 Ask relevant questions when in doubt

ELEMENT 4.4 - ATTACHMENT POINTS

Learning objective:

- 25) The participants can **explain** the use of attachment points (Knowledge, intermediate level)



The instructor shall:

- 4.4.1 Explain and demonstrate how to correctly use attachment points
- 4.4.2 Explain the difference between an anchor point and attachment point (approved/ non- approved)



The participants shall:

- 4.4.3 Engage in the discussion and ask relevant questions when in doubt

ELEMENT 4.5 - ANCHOR POINTS

Learning objective:

- 26) The participants can **explain** the use of anchor points (Knowledge, intermediate level)



The instructor shall:

- 4.5.1 Explain and demonstrate how to recognise anchor points
- 4.5.2 Explain the requirements for anchor points



The participants shall:

- 4.5.3 Ask relevant questions when in doubt

ELEMENT 4.6 - LOADS AND ANGLES

Learning objective:

- 27) The participants can **explain** how loads and angles can influence the strength of e.g. a sling (Knowledge, intermediate level)



The instructor shall:

- 4.6.1 Explain the difference between a static and dynamic load
- 4.6.2 Explain how angles can influence the strength of e.g. a sling



The participants shall:

- 4.6.3 Share experiences and ask relevant questions when in doubt

ELEMENT 4.7 - FALLS

Learning objectives:

- 28) The participants can **discuss** common fall indicators on equipment (Knowledge, intermediate level)
- 29) The participants can **explain** the risks of suspension trauma (Knowledge, intermediate level)



The instructor shall:

- 4.7.1 Show examples of and explain fall indicators on equipment
- 4.7.2 Explain how different situations can influence the approach to the rescue, injuries / no injuries
- 4.7.3 Explain the risk of suspension trauma



The participants shall:

- 4.7.4 Share experiences and examples of common fall indicators on equipment

ELEMENT 4.8 - DOUBLE VERSUS TWIN ARREST LANYARD

Learning objective:

- 30) The participants can **explain** how to use a double and twin fall arrest lanyard (Knowledge, intermediate level)



The instructor shall:

- 4.8.1 Show examples of and explain the difference between a double and twin fall arrest lanyard
- 4.8.2 Explain and demonstrate how to use double fall arrest lanyard
- 4.8.3 Explain and demonstrate how to use twin fall arrest lanyard
- 4.8.4 Demonstrate the correct way of using twin and single fall arrest lanyards. This to include double hook climbing on ladder and the required and recommended distance between twin fall arrest lanyard anchor point attachment points on climbing ladders



The participants shall:

- 4.8.5 Share experiences and understanding on how to use a double and twin fall arrest lanyard

ELEMENT 4.9 - RESCUE KIT

Learning objective:

- 31) The participants can **explain** how to perform a pre-use inspection of rescue and evacuation kits (Knowledge, intermediate level)



The instructor shall:

- 4.9.1 Show examples of, and explain the content of, rescue and evacuation kits
- 4.9.2 Demonstrate how to perform a pre-use inspection of rescue and evacuation kits



The participants shall:

- 4.9.3 Share experiences and ask relevant questions when in doubt

LESSON 5 - MEASURES TO PREVENT INJURY DURING TRAINING

20 min.

The aim of this lesson is to reduce the risk of injury during training by ensuring that the participants are briefed in the control measures employed in the training area and to warm up prior to performing rescue exercises.

After having successfully completed this lesson, the participants can:

- 32) **Take responsibility** for control measures employed in the practical training area and for warming up prior to performing rescue exercises (Ability, intermediate level)

ELEMENT 5.1 - CONTROL MEASURES AND WARM UP

Learning objective:

- 33) The participants can **explain** the control measures employed in the practical training area and how to warm up prior to performing rescue exercises (Knowledge, intermediate level)



The instructor shall:

- 5.1.1 Explain further control measures for the specific training facilities and training to avoid injury during the training
- 5.1.2 Verify that the participants can explain the principles of operation of the PPE and equipment to be used during practical training sessions
- 5.1.3 Ensure that any hazardous energy sources which may affect the participants during the practical training sessions are isolated and locked out and that the status of the isolations has been communicated to the participants
- 5.1.4 Lead a warm-up session of the major muscle groups of the body including ankles, wrists and back. See suggested exercises in Annex 2
- 5.1.5 It is the instructor's responsibility to physically verify that each participant who is working at height (including both casualty and rescuer) is always attached to additional fall protection. GWO recommends that a SRL is used as additional fall protection.



The participants shall:

- 5.1.6 Take part in the warm-up session of the major muscle groups and ankles, wrists and back
- 5.1.7 Perform a pre-use inspection of their personal fall protection equipment
- 5.1.8 Perform a 'buddy check' of another participant's personal fall protection equipment

LESSON 6 - INDIVIDUAL PRACTICAL REVIEW EXERCISES

60 min.

The aim of this lesson is to reduce the risk of injury through incorrect basic rescue techniques. By assessing and refreshing the participants' knowledge, skills, and competencies in basic rescue from height, the importance of being able to carry out a rescue at any time during training, as well as when working in wind turbines on a daily basis is reinforced and emphasised.

After having successfully completed this lesson, the participants can:

- 34) **Act independently** in correctly using the relevant PPE, e.g. harnesses, fall arrest lanyards, guided type fall arresters and work positioning lanyards (including identification of anchor points and correct ladder conduct). (Ability, intermediate level)

ELEMENT 6.1 - HOW TO ATTACH A GUIDED TYPE FALL ARRESTER

Learning objective:

- 35) The participants can safely and correctly **perform** the attachment of a fall restraint and fall arrest lanyard to a vertical ladder system (Skills, intermediate level)



The participants shall:

- 6.1.1 Practise how to choose the correct slider / glider for a guided type vertical fall arrest system
- 6.1.2 Practise how to attach the slider / glider safely and correctly to the rail or wire
- 6.1.3 Practise how to attach the slider / glider safely and correctly to the harness



The instructor shall:



- 6.1.4 Provide constructive feedback on the participants' performance during the practice

ELEMENT 6.2 - FALL RESTRAINT AND FALL ARREST LANYARDS

Learning objective:

- 36) The participants can safely and correctly **perform** the attachment of a guided type fall arrester to the fall arrest system (Skills, intermediate level)



The participants shall:

- 6.2.1 Practise how to attach the fall restraint and fall arrest lanyard to a vertical ladder system safely and correctly
- 6.2.2 Practise how to attach fall restraint and fall arrest lanyards to the harness safely and correctly
- 6.2.3 Practise how to correctly use twin and single fall arrest lanyards while double hook climbing maintaining the correct distance between the anchor points



The instructor shall:

- 6.2.4 Provide constructive feedback on the participants' performance during the practice

ELEMENT 6.3 - WORK POSITIONING LANYARDS

Learning objective:

- 37) The participants can **perform** the use a work positioning lanyard in order to leave hands free for work (Skills, intermediate level)



The participants shall:

- 6.3.1 Practise how to use a work positioning lanyard safely and correctly
- 6.3.2 Practise how to work safely with free hands, being secured by a work positioning lanyard



The instructor shall:

- 6.3.3 Provide constructive feedback on the participants' performance during the practice



ELEMENT 6.4 - CERTIFIED AND SUITABLE ANCHOR POINTS

Learning objective:

- 38) The participants can **explain** the requirement for certified and suitable anchor points (Knowledge, intermediate level)



The participants shall:

- 6.4.1 Practise and discuss how to recognise and use certified anchor points



The instructor shall:

- 6.4.2 Provide constructive feedback on the participants' discussions and practice

ELEMENT 6.5 - SAFE AND CORRECT USE OF A SELF RETRACTABLE LIFELINE (SRL) FOR EXERCISES

Learning objectives:

- 39) Safely and correctly **perform** the use of self-retracting lifelines as fall protection system in a wind turbine (Ability, intermediate level)



The instructor shall:

- 6.5.1 Provide constructive feedback on the participants' practise



The participants shall:

- 6.5.2 Practise using self-retracting lifelines, this is to include:
- a. different types of SRL systems that exist and how they are used, what length they come in, and difference between wire-straps
 - b. different maximum angles that are allowed
 - c. how to apply an SRL correctly to the harness, either to the attachment point (dorsal A -point) on the back or to the attachment point (A - point) in the front
 - d. different places an SRL can be secured



- e. importance of using an SRL
- f. how to conduct a pre-use inspection and see if an SRL is approved, possesses documentation and authorisation date

ELEMENT 6.6 - SAFE PRACTICES WHILE WORKING AT HEIGHTS

Learning objective:

- 40) The participants can **take responsibility** for safe practices while working at heights (Ability, intermediate level)



The participants shall:

- 6.6.1 Discuss safe conduct and practise how to assure it while working at height by always being secured with fall protection PPE during practical exercises
- 6.6.2 Discuss and practise how to reduce the risk of dropped objects while working at height by ensuring that equipment is always attached either to the participants harness or a suitable anchor point

LESSON 7 - PRACTICAL EXERCISES – GROUP

200 min.

The aim of the lesson is to enable the participants to use the appropriate methods to control and reduce the risk of injuries when working and rescuing from heights by refreshing the participants' previous knowledge and skills.

After having successfully completed this lesson, the participants can:

- 41) **Perform** correct use of evacuation devices (Skills, intermediate level)
- 42) **Act independently** in approaching rescue situations in WTGs and in using rescue equipment efficiently (Ability, intermediate level)

ELEMENT 7.1 - SAFE AND CORRECT USE OF THE PERSONAL FALL PROTECTION EQUIPMENT

Learning objective:



- 43) The participants can **perform** the safe and correct use of PPE for working at height (Skills, intermediate level)



The participants shall:

- 7.1.1 Practise the ability to safely and correctly use personal fall protection equipment, including an SRL in a wind turbine like environment



The instructor shall:

- 7.1.2 Provide feedback or clarifications to the participants' explanations

ELEMENT 7.2 - ACCESSING CERTIFIED AND SUITABLE ANCHOR POINTS

Learning objective:

- 44) The participants can **distinguish** certified and suitable anchor points from anchor points that are not certified and not suitable (Skills, intermediate level)



The participants shall:

- 7.2.1 Practise how to recognise and (safely and correctly) use both certified and suitable anchor points



The instructor shall:

- 7.2.2 Provide feedback or clarifications to the participants' practice

ELEMENT 7.3 - USER INSPECTIONS OF THE RESCUE AND EVACUATION EQUIPMENT

Learning objective:

- 45) The participants can **perform** a pre-use inspection of the rescue and evacuation equipment applying generic principles (Skills, intermediate level)



The participants shall:

- 7.3.1 Practise how to perform a pre-use inspection of rescue and evacuation devices applying generic principles



The instructor shall:

- 7.3.2 Provide feedback or clarifications to the participants' practice

ELEMENT 7.4 - SAFE AND CORRECT USE OF RESCUE AND EVACUATION EQUIPMENT FROM LADDER

Learning objective:

- 46) The participants can **act independently** in safely and correctly using rescue / evacuation equipment to perform a rescue from a vertical ladder (Ability, intermediate level)



The participants shall:

- 7.4.1 Practise how to perform a basic rescue and evacuation safely and correctly from a vertical ladder



The instructor shall:

- 7.4.2 Provide feedback or clarifications to the participants' practice

ELEMENT 7.5 - SAFE AND CORRECT RESCUE AND EVACUATION METHODS FROM AN EVACUATION HATCH

Learning objective:

- 47) The participants can **perform** safe and correct rescue and evacuation methods (Skills, intermediate level)



The participants shall:

- 7.5.1 Practise the ability to perform a basic rescue and evacuation safely and correctly from an evacuation hatch
- 7.5.2 Practise the ability to perform a passive mode setup, self-rescue from an evacuation hatch
- 7.5.3 Practise the ability to perform an active mode setup, double evacuation from an evacuation hatch: applying a deflection/friction connector on the rescue device; and using a fall restraint lanyard (kept as short as possible) as a connecting element between the rescue / evacuation device and the harness



The instructor shall:

- 7.5.4 Provide constructive feedback on the participants' performance

ELEMENT 7.6 - SAFE PRACTICES WHILE WORKING AT HEIGHTS

Learning objective:

- 48) The participants can **take responsibility** for safe practices while working at heights (Ability, advanced intermediate level)



The participants shall:

- 7.6.1 Practise safe conduct and ability while working at heights
- 7.6.2 Practise the ability to use techniques like attaching equipment to their harness to reduce the risk of dropped objects

Notes

- 1) An Instructor shall be positioned at the height chosen to descend from
- 2) Instructor(s) and participants shall be secured to an anchor point while waiting to descend. This can be achieved by correct use of the fall arrest lanyard
- 3) When participants are demonstrating the evacuation, a safety line that is connected to the participant's harness shall be used. This will be set up and controlled by the instructor and be secured to a different anchor point than the evacuation device
- 4) Although not a requirement of the standard, participants may repeat the evacuation exercises should sufficient time be available

LESSON 8 - TRAINING REVIEW

15 min.

The aim of this lesson is to enable the participants to reflect on and process their learning outcome and key takeaways from the module, aiming to achieve a high learning transfer from the module to their way of working.

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 BSTR Working at Heights Module, aiming to achieve a high learning transfer from the module to their way of working by means of, for example;
- a. group discussions or walk and talk
 - b. questions and 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) In addition, at a later point, discuss with colleagues how the BSTR Working at Heights Module content, methods and techniques are similar or different to the local specific conditions identified after the module completion

10.7 Participant performance assessment

Assessment of learning outcomes:

- a. Participants will be assessed according to the learning outcomes by means of direct observation and supplementary oral questions, where appropriate
- b. The assessment shall be conducted by practical scenarios based on the WTG environment

The participants shall participate and demonstrate:

Correct use of the evacuation/rescue device, including:

- a. user inspection and test
- b. use of correct anchor points
- c. correct behaviour on ladder with PPE



- d. correct self-evacuation using an evacuation / rescue device

Correct rescue methods, including:

- a. rescue of a *conscious* casualty hanging by a guided type vertical fall arrester, secured by their work positioning lanyard (inside of the ladder) with the rescue equipment in a passive setup, preferably utilising a rope clamp for rescue
- b. rescue of an *unconscious* casualty hanging by a fall arrest lanyard (inside of the ladder) with the rescue equipment in an active setup
- c. rescue of a *conscious* casualty secured by their work positioning lanyard (from the outside of the ladder, with hip diversion, i.e. rescue line is diverted using the side D-ring located at the hip of the rescuer's harness. This creates greater space between the casualty and the ladder)

The formal evaluation of knowledge of above scenarios shall be in accordance with the participant performance assessment form (template provided in the GWO Requirements for Training)

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 BST Working at Heights Module



Working at Heights with Manual Handling

(MHR & WAHR)



11. MODULE 5 – BSTR WORKING AT HEIGHTS WITH MANUAL HANDLING MODULE

11.1 Aims and Objectives of the BSTR Working at Heights with Manual Handling Module

The aim of this module is to review and build on previously gained abilities through theoretical and practical training so that participants can use basic personal protective equipment and perform safe work at heights and safe and comprehensive basic rescue from heights in the wind turbine industry/environment. Its further aims are to encourage positive manual handling and ergonomic behaviour, encourage participants to consider alternatives to manual handling through planning and to train participants ability to perform manual handling tasks in a safe manner.

After having successfully completed this BSTR Working at Heights with Manual Handling Module, the participants can **act independently** and safely when using basic personal protective equipment, working at heights, and performing comprehensive basic rescue from heights in a remote wind turbine environment. In addition, they will be able to take responsibility for safe practices of manual handling. (Ability, intermediate level)

Note *The BSTR Module Working at Heights with Manual Handling is not intended to test a participant's fear of heights*

11.2 Duration of the BSTR Working at Heights with Manual Handling Module

The total contact time for completing the BSTR Working at Heights and Manual Handling Module is to be 8 hours 0 minutes.

The training provider must not exceed the times per day given in the table 11.2.1 below.

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

Table 11.2.1 – 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).

11.3 BSTR Working at Heights with Manual Handling Instructor to Participant Ratio

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



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

Module	Session	Instructor to Participant Ratio
BSTR Working at Heights with Manual Handling	Theory	1:12
	Practical	1:6
	Session (On site)	Instructor to Participant Ratio
	Theory	1:12
	Practical	1:4

Table 11.3.1 – Instructor to participant ratio for Working at Heights with Manual Handling Module

11.4 Equipment for BSTR Working at Heights with Manual Handling Module

The equipment required for training as listed in Annex 1 must be available and must fulfil national legal requirements as listed in table Annex 1-4 where applicable.

The generic approach is achieved by teaching a variety of safety equipment products within each safety equipment category (e.g., guided type fall arresters). This enables the participants to conduct pre-use inspection and to use other safety equipment products compared to those taught during this module (based on the manufacturer's user manual).

Additional fall protection must always be used during training activities at height.

The training provider shall introduce control measures that lower the risks and hazards associated with a fall from height to an acceptable level, following the Hierarchy of Controls in their risk assessment.

GWO recommends a maximum fall factor of 0.5. To calculate this the following formula has been used, based on a maximum allowed lanyard length of 2.00m and a fall of 1.00m

$$\text{Fall Factor (FF)} = \frac{\text{Distance Fallen}}{\text{Length of lanyard}}$$

$$\text{Factor (FF)} = \frac{1.00 \text{ m}}{2.00 \text{ m}}$$

$$\text{Factor (FF)} = 0.5$$

During the evacuation exercises in this module the anchor points used for the attachment of fall arrest lanyards with energy absorbers must be high enough above the ground, or structure below them, that in the event that a person experiences a fall the shock absorber in their fall arrest lanyard can fully deploy and prevent the participant from contacting the ground (or structure directly below the anchor point).

During the evacuation exercise the participants must be able to experience a minimum amount of descent using an evacuation or rescue device to ensure that they gain the experience of the speed of descent using these devices. This can be achieved by having the participant descend from a minimum height using a rescue or evacuation device.



To ensure that for all fall protection equipment that may be used that there will be enough clearance below the anchor point, and to ensure that the participants can experience a descent of sufficient duration for meaningful learning transfer, the GWO recommends that the anchor point is a minimum of 6.75m above the ground or structure directly below the anchor point. The recommended 6.75m clearance under the anchor point is explained in detail in annex 1.

If a training provider deviates from the recommended anchor point height of 6.75m to a lower height, then the following additional control measures must be in place,

- a. The training provider shall document a risk assessment for the lower height, this shall include calculations based on the harness and fall arrest lanyards which will be used during the evacuation exercises the calculation shall:
 - a.i use the value for maximum shock absorber elongation supplied by the equipment manufacturer, and,
 - a.ii demonstrate that the equipment to be used will prevent the participants and instructors from coming into contact with the ground in the event of a fall, and,
 - a.iii use formulas stated in national legislation or the equipment manufacturer guidelines or where no formula exists use the formula in Annex 1. The potential fall factor shall not exceed 0.5 and participants must experience a descent from a platform that is a minimum of 4.5m above the ground.

11.5 BSTR Working at Heights with Manual Handling Module timetable

The order in which elements of this BSTR 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 objectives
	1.5	On-going assessments (participant assessment form)
	1.6	Motivation
	1.7	Human factors
	TOTAL	15 min.
2. Knowledge Review	2.1	Knowledge of inspection of PPE, rescue, and evacuation device
	2.2	Knowledge of PPE



	2.3	Knowledge of fall arrest systems and work positioning	
	2.4	Knowledge of rescue and evacuation devices	
	2.5	Knowledge of manual handling	
		TOTAL	30 min.
3.	PPE Review exercises	3.1	Pre-use inspection
		3.2	Proper use
		TOTAL	30 min.
4.	Theory	4.1	Use of SRL for exercises
		4.2	Safe and competent work and rescue at heights
		4.3	Correct fitting of a harness
		4.4	Attachment points
		4.5	Anchor points
		4.6	Loads and angles
		4.7	Falls
		4.8	Double versus twin fall arrest lanyards
		4.9	Rescue kit
		4.10	Manual handling
		TOTAL	50 min.
5.	Measures to prevent injury during training	5.1	Control measures and warm up
		TOTAL	20 min.
6.	Individual practical review exercises	6.1	Safely and correctly move objects utilising correct manual handling techniques to attach a guided type fall arrester
		6.2	Fall restraint and fall arrest lanyards
		6.3	Work positioning lanyards
		6.4	Certified and suitable anchor points
		6.5	Safe and correct use of an SLR for exercises
		6.6	Safe practices while working at heights
		TOTAL	110 min.
7.	Practical exercises – group	7.1	Safe and correct use of personal fall protection equipment
		7.2	Accessing certified and suitable anchor points
		7.3	Pre-use inspections of the rescue and evacuation equipment



	7.4	Safe and correct use of rescue and evacuation equipment from ladder	
	7.5	Safe and correct rescue and evacuation methods from an evacuation hatch	
	7.6	Safe practises while working at heights with proper manual handling	
		TOTAL	210 min.
8.	Training review	8.1	Training feedback
		8.2	Feedback session
		TOTAL	15 min.
		GRAND TOTAL	480 min.

Table 11.5.1 – Working at Heights & Manual handling timetable

11.6 Detailed Description of the BSTR Working at Heights with Manual Handling Module

LESSON 1 - INTRODUCTION TO THE TRAINING

15 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 BSTR Working at Heights with Manual Handling 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)

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 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 Alternatively, 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 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 BSTR Working at Heights with Manual Handling Module, 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 of 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 BSTR Working at Heights with Manual Handling Module (Knowledge, basic level)



The instructor shall:

- 1.4.1 Present the scope and main learning objectives of the BSTR Working at Heights with Manual Handling Training Module
- 1.4.2 Involve participants with questions on understanding and individual experiences on BSTR Working at Heights with Manual Handling Module



The participants shall:

- 1.4.3 Engage in answering questions and share experiences on BSTR Working at Heights with Manual Handling Module

ELEMENT 1.5 - ON-GOING ASSESSMENTS (PARTICIPANT PERFORMANCE ASSESSMENT FORM)

Learning objective:

- 8) The participants can **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:

- 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 of personal involvement in the course
 - b. the definition of and the need for BSTR Working at Heights with Manual Handling understandings and abilities:

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*



The participants shall:

- 1.6.2 Engage themselves in discussions and share experiences on BSTR Working at Heights with Manual Handling Module

Note *When the participants succeed by trying out on their own, bring their relevant experience into play and apply learning points from the instructor's feedback, they develop a positive attitude and responsibility towards the subject and the performance in the work situation*



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 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 used)
- 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 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 wind turbine environments 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 on accidents related to BSTR Working at Heights with Manual Handling Module. In addition, engage in and reflect on received feedback and take responsibility on their own performance and development during the training

LESSON 2 - KNOWLEDGE REVIEW

30 min.

The aim of this lesson is to reduce the risk of short-term and long-term injury when working at height in a wind turbine by reviewing the participants' previously acquired knowledge of working at heights and manual handling and by providing focus areas for the instructor during this refresher module.

After successfully having completed this lesson, the participants can:

- 12) **Explain** hazards and risks associated with working at heights in a WTG (Knowledge, intermediate level)
- 13) **Show interest** in the correct identification of PPE, including identification of European/ global standard markings on harness, hard hats, lanyards, and other PPE (Ability, basic level)

ELEMENT 2.1 - KNOWLEDGE OF INSPECTION OF PPE, RESCUE AND EVACUATION DEVICE

Learning objective:

- 14) The participants can **perform** correct pre-use inspection and inspection of PPE, rescue, and evacuation devices (Skills, intermediate level)



The participants shall:

- 2.1.1 Demonstrate the ability to perform a pre-use inspection of PPE used for working at height
- 2.1.2 Explain the requirements for certification of PPE used for working at height



The instructor shall:

- 2.1.3 Provide constructive feedback on the participants' performance

ELEMENT 2.2 - KNOWLEDGE OF PPE

Learning objective:

- 15) The participants can **explain** when PPE is required for working at heights and their legal responsibilities towards inspection of PPE for working at heights (Knowledge, intermediate level)



The participants shall:

- 2.2.1 Explain when to use PPE for working at height
- 2.2.2 Explain the legislative requirements for PPE used for working at height
- 2.2.3 Describe their own legal responsibilities towards PPE used for working at height



The instructor shall:

- 2.2.4 Provide feedback or clarifications to the participants' explanations

ELEMENT 2.3 - KNOWLEDGE OF FALL ARREST SYSTEMS AND WORK POSITIONING

Learning objective:

- 16) The participants can **explain** when fall arrest systems and work positioning devices are required and their legal responsibilities towards those (Knowledge, intermediate level)



The participants shall:

- 2.3.1 Explain when to use fall arrest systems
- 2.3.2 Explain the legislative requirements, inspection
- 2.3.3 Explain the compliance of rail/ wire systems
- 2.3.4 Demonstrate how to achieve a good work position during practical exercises



The instructor shall:

- 2.3.5 Provide feedback or clarifications to the participants' explanations

ELEMENT 2.4 - KNOWLEDGE OF RESCUE AND EVACUATION DEVICES

Learning objective:

- 17) The participants can **explain** when various rescue and evacuation equipment is required and the legal inspection requirements of those (Knowledge, intermediate level)



The participants shall:

- 2.4.1 Explain when to use rescue and evacuation devices
- 2.4.2 Describe the legislative requirements for rescue and evacuation devices
- 2.4.3 Explain the requirements for inspection/ certification (vacuum packed/ not vacuum packed)



The instructor shall:

- 2.4.4 Provide feedback or clarifications to the participants' explanations

ELEMENT 2.5 - KNOWLEDGE OF MANUAL HANDLING

Learning objective:

- 18) The participants can **describe** the legal requirements and the risks posed by manual handling in a wind turbine (Knowledge, basic level)



The participants shall:

- 2.5.1 Describe applicable local and global legislation and legislative requirements for manual handling
- 2.5.2 Explain the consequences of incorrect manual handling
- 2.5.3 Engage in discussions about:
- a. the risks and hazards posed by manual handling in the wind industry



- b. how to avoid the risks of manual handling in a wind turbine focusing on avoiding manual handling, using suitable handling aids, and planning of manual handling tasks using the TILE principle



The instructor shall:

- 2.5.4 Lead a discussion about the risks and hazards posed by manual handling in the wind industry
- 2.5.5 Lead a discussion about how to avoid the risks of manual handling in a wind turbine focusing on avoiding manual handling, using suitable handling aids, and planning of manual handling tasks using the TILE principle

LESSON 3 - PPE REVIEW EXERCISES

30 min.

The aim of this lesson is to refresh the participants' knowledge, skills and competencies in basic height rescue PPE and personal fall protection use, identification, inspection, and certification.

After having successfully completed this lesson, the participants can:

- 19) **Take responsibility** for the correct pre-use inspection, service, storage, and fitting of harnesses, fall arrest lanyards, work positioning lanyards and other PPE (Ability, intermediate level)

ELEMENT 3.1 - PRE-USE INSPECTION

Learning objective:

- 20) The participants can correctly **perform** a pre-use inspection of PPE used for working at height by a generic approach (Skills, intermediate level)



The instructor shall:

- 3.1.1 Explain and demonstrate pre-use inspection of harnesses, fall arrest systems, fall restraint systems, and self-retractable lines with a focus on a generic approach to pre-use inspection of the equipment
- 3.1.2 Facilitate practice for the participants in the pre-use inspection of harnesses, fall arrest systems, fall restraint systems, and self-retractable lines with a focus on a generic approach to pre-use inspection of the equipment
- 3.1.3 Provide constructive feedback on the participants' performance during the practice



The participants shall:

- 3.1.4 Engage in the practice of pre-use inspection of harnesses, fall arrest systems, fall restraint systems, and self-retractable lines with a focus on a generic approach to pre-use inspection of the equipment

ELEMENT 3.2 - PROPER USE

Learning objective:

- 21) The participants can **perform** the correct use, management, and control of PPE used for working at height from a generic approach (Skills, intermediate level)



The instructor shall:

- 3.2.1 Explain and demonstrate proper use, management, and control of harnesses, fall arrest systems, fall restraint systems, and self-retractable lines with a focus on a generic approach to using the equipment
- 3.2.2 Facilitate a learning activity such as a discussion about the proper use, management, and control of harnesses, fall arrest systems, fall restraint systems, and self-retractable lines with a focus on a generic approach to using the equipment



The participants shall:

- 3.2.3 Engage in activity and ask questions when in doubt

Note *For a detailed description of the elements of the pre-use inspection for each of the items of equipment in this lesson refer to GWO's BST Standard, WaH Module, Lessons 3 to 6*

LESSON 4 - THEORY

50 min.

The aim of this lesson is to reduce the risk of short-term and long-term injury when working at heights in a wind turbine environment and during the practical elements of this course by refreshing the participants knowledge of working at height and manual handling theory.

Note *The training provider shall, where reasonably practicable and safe to do so, deliver the theoretical training in conjunction with practical elements of this module*

After having successfully completed this lesson, the participants can:



- 22) **Show interest** in safe and competent work and rescue at heights (Ability, basic level)

ELEMENT 4.1 - USE OF AN SRL FOR EXERCISES

Learning objective:

- 23) The participants can **explain** the use of additional fall protection systems for exercises (Knowledge, intermediate level)



The instructor shall:

- 4.1.1 Explain and demonstrate how to perform a generic pre-use inspection of an SRL
- 4.1.2 Explain and demonstrate the how to use an SRL as an additional fall protection during practical exercises



The participants shall:

- 4.1.3 Ask relevant questions when in doubt

ELEMENT 4.2 - SAFE AND COMPETENT WORK AND RESCUE AT HEIGHT

Learning objective:

- 24) The participants can **explain** safe and competent work and rescue at height (Knowledge, intermediate level)



The instructor shall:

- 4.2.1 Explain and demonstrate how to keep oneself and others safe during work and rescue situations



The participants shall:

- 4.2.2 Ask relevant questions when in doubt



ELEMENT 4.3 - CORRECT FITTING OF A HARNESS

Learning objective:

- 25) The participants can **explain** the correct fitting of a harness (Knowledge, intermediate level)



The instructor shall:

- 4.3.1 Explain and demonstrate how to adjust a full body harness so that it fits correctly



The participants shall:

- 4.3.2 Ask relevant questions when in doubt

ELEMENT 4.4 - ATTACHMENT POINT

Learning objective:

- 26) The participants can **explain** the use of attachment points (Knowledge, intermediate level)



The instructor shall:

- 4.4.1 Explain and demonstrate how to correctly use attachment points
4.4.2 Explain the difference between an anchor point and attachment point (approved/ non- approved)



The participants shall:

- 4.4.3 Engage in the discussion and ask relevant questions when in doubt

ELEMENT 4.5 - ANCHOR POINTS

Learning objective:

- 27) The participants can **explain** the use of anchor points (Knowledge, intermediate level)



The instructor shall:

- 4.5.1 Explain and demonstrate how to recognise anchor points
- 4.5.2 Explain the requirements for anchor points



The participants shall:

- 4.5.3 Ask relevant questions when in doubt

ELEMENT 4.6 - LOAD AND ANGLES

Learning objective:

- 28) The participants can **explain** how loads and angles can influence the strength of e.g. a sling (Knowledge, intermediate level)



The instructor shall:

- 4.6.1 Explain the difference between a static and dynamic load
- 4.6.2 Explain how angles can influence the strength of e.g. a sling



The participants shall:

- 4.6.3 Share experiences and ask relevant questions when in doubt

ELEMENT 4.7 - FALLS

Learning objective:

- 29) The participants can **discuss** common fall indicators on equipment (Knowledge, intermediate level)
- 30) The participants can **explain** the risks of suspension trauma (Knowledge, intermediate level)



The instructor shall:

- 4.7.1 Show examples of and explain fall indicators on equipment



4.7.2 Explain how different situations can influence the approach to the rescue, injuries / no injuries

4.7.3 Explain the risk of suspension trauma



The participants shall:

4.7.4 Share experiences and examples on common fall indicators on equipment

ELEMENT 4.8 - DOUBLE VERSUS TWIN FALL ARREST LANYARD

Learning objective:

- 31) The participants can **explain** how to use a double and twin fall arrest lanyard (Knowledge, intermediate level)



The instructor shall:

4.8.1 Show examples of and explain the difference between a double and twin fall arrest lanyard

4.8.2 Explain and demonstrate how to use double fall arrest lanyard

4.8.3 Explain and demonstrate how to use twin fall arrest lanyard

4.8.4 Demonstrate the correct way of using twin and single fall arrest lanyards, including double hook climbing on ladder and required and recommended distance between twin fall arrest lanyard anchor point attachment points climbing ladders



The participants shall:

4.8.5 Share experiences and understanding on how to use a double and twin fall arrest lanyard

ELEMENT 4.9 - RESCUE KIT

Learning objective:

- 32) The participants can **explain** how to perform a pre-use inspection of rescue and evacuation kits (Knowledge, intermediate level)



The instructor shall:

- 4.9.1 Show examples of, and explain the content of, rescue and evacuation kits
- 4.9.2 Demonstrate how to perform a pre-use inspection of rescue and evacuation kits



The participants shall:

- 4.9.3 Share experiences and ask relevant questions when in doubt

ELEMENT 4.10 - MANUAL HANDLING

Learning objective:

- 33) The participants can **explain** the principles and focal areas to plan and perform manual handling (Knowledge, intermediate level)



The instructor shall:

- 4.10.1 Lead a discussion about manual handling symptom awareness and typical reporting methods for injuries
- 4.10.2 Explain spinal anatomy and posture
- 4.10.3 Explain and demonstrate how to plan manual handling tasks using the TILE principle considering the load weight, maximum reaching distance and aggravating factors
- 4.10.4 Explain and demonstrate risk controls and manual handling techniques with a focus on avoiding manual handling and using suitable handling aids
- 4.10.5 Inform the participants that they will be observed and evaluated on applying manual handling theory and practical skills during the remaining part of the module



The participants shall:

- 4.10.6 Share experiences and ask relevant questions when in doubt

LESSON 5 - MEASURES TO PREVENT INJURY DURING TRAINING

20 min.



The aim of this lesson is to reduce the risk of injury during training by ensuring that the participants are briefed in the control measures employed in the training area and to warm up prior to performing rescue exercises.

After having successfully completed this lesson, the participants can:

- 34) **Take responsibility** for control measures employed in the practical training area and for warming up prior to performing rescue exercises (Ability, intermediate level)

ELEMENT 5.1 - CONTROL MEASURES AND WARM UP

Learning objective:

- 35) The participants can **explain** the control measures employed in the practical training area and how to warm up prior to performing rescue exercises (Knowledge, intermediate level)



The instructor shall:

- 5.1.1 Explain further control measures for the specific training facilities and training to avoid injury during the training
- 5.1.2 Verify that the participants can explain the principles of operation of the PPE and equipment to be used during practical training sessions
- 5.1.3 Ensure that any hazardous energy sources which may affect the participants during the practical training sessions are isolated and locked out and that the status of the isolations has been communicated to the participants
- 5.1.4 Lead a warm-up session of the major muscle groups of the body including ankles, wrists and back. See suggested exercises in Annex 2
- 5.1.5 It is the instructor's responsibility to physically verify that each participant who is working at height (including both casualty and rescuer) is always attached to additional fall protection. GWO recommends that a SRL is used as additional fall protection.



The participants shall:

- 5.1.6 Take part in the warm-up session of the major muscle groups of the body including ankles, wrists and back
- 5.1.7 Perform a pre-use inspection of their personal fall protection equipment
- 5.1.8 Perform a 'buddy check' of another participant's personal fall protection equipment



LESSON 6 - INDIVIDUAL PRACTICAL REVIEW EXERCISES

110 min.

The aim of this lesson is to reduce the risk of injury through using correct basic rescue techniques. By assessing and refreshing the participants' knowledge, skills, and abilities in basic rescue from height, the importance of being able to carry out a rescue at any time during training, as well as when working in wind turbines on a daily basis is reinforced and emphasised.

After successfully having completed this lesson, the participants can:

- 36) **Act independently** in correctly using the relevant PPE, e.g. harnesses, fall arrest lanyards, guided type fall arresters and work positioning lanyards (including identification of anchor points and correct ladder conduct) (Ability, intermediate level)
- 37) **Take responsibility** for safely and correctly moving objects utilising correct manual handling techniques and a problem-solving approach to manual handling in a wind turbine environment (Ability, intermediate level)

ELEMENT 6.1 - SAFELY AND CORRECTLY MOVE OBJECTS UTILISING CORRECT MANUAL TECHNIQUES TO ATTACH A GUIDED TYPE FALL ARRESTER

Learning objective:

- 38) The participants can safely and correctly **perform** the attachment of a guided type fall arrester to the fall arrest system (Skills, intermediate level)



The instructor shall:

- 6.1.1 Practise how to choose the correct slider / glider for a guided type vertical fall arrest system
- 6.1.2 Practise how to safely and correctly attach the slider / glider to the rail or wire
- 6.1.3 Practise how to safely and correctly attach the slider / glider to the harness



The participants shall:

- 6.1.4 Provide constructive feedback on the participants' discussions and practice

ELEMENT 6.2 - FALL RESTRAINT AND FALL ARREST LANYARDS

Learning objective:



- 39) The participants can safely and correctly **perform** the attachment of a fall restraint and fall arrest lanyard to a vertical ladder system (Skills, intermediate level)



The participants shall:

- 6.2.1 Practise how to safely and correctly attach the fall restraint and fall arrest lanyard to a vertical ladder system
- 6.2.2 Practise how to safely and correctly attach fall restraint and fall arrest lanyards to the harness
- 6.2.3 Practise how to correctly use twin and single fall arrest lanyards while double hook climbing maintaining the correct distance between the anchor points

ELEMENT 6.3 - WORK POSITIONING LANYARDS

Learning objective:

- 40) The participants can **perform** the use a work positioning lanyard in order to leave hands free for work (Skills, intermediate level)



The participants shall:

- 6.3.1 Practise how to safely and correctly use a work positioning lanyard
- 6.3.2 Practise how to work safely with free hands, being secured by a work positioning lanyard



The instructor shall:

- 6.3.3 Provide constructive feedback on the participants' performance during the practice

ELEMENT 6.4 - CERTIFIED AND SUITABLE ANCHOR POINTS

Learning objective:

- 41) The participants can **explain** the requirement for certified and suitable anchor points (Knowledge, intermediate level)



The participants shall:

- 6.4.1 Practice and demonstrate the ability to recognise and use certified anchor points
- 6.4.2 Practice and demonstrate the ability to recognise and use suitable anchor points



The instructor shall:

- 6.4.3 Provide constructive feedback on the participants' discussions and practice

ELEMENT 6.5 - SAFE AND CORRECT USE OF AN SRL FOR EXERCISEES

Learning objectives:

- 42) Safely and correctly **perform** the use of self-retracting lifelines as fall protection system in a wind turbine (Ability, intermediate level)



The instructor shall:

- 6.5.1 Provide constructive feedback on the participants' practise



The participants shall:

- 6.5.2 Practise using self-retracting lifelines, this is to include:
 - a. different types of SRL systems that exist and how they are used, what length they come in, and difference between wire-straps
 - b. different maximum angles that are allowed
 - c. how to apply an SRL correctly to the harness, either to the attachment point (dorsal A -point) on the back or to the attachment point (A - point) in the front
 - d. different places an SRL can be secured
 - e. importance of using an SRL
 - f. how to conduct a pre-use inspection and see if an SRL is approved, possesses documentation and authorisation date



ELEMENT 6.6 - SAFE PRACTICES WHILE WORKING AT HEIGHTS

Learning objectives:

- 43) The participants can **take responsibility** for safe practices while working at heights (Ability, intermediate level)
- 44) The participants can safely and correctly **apply** correct manual handling techniques when moving objects (Skill, intermediate level)
- 45) The participants can **discuss** aspects of their job tasks that could increase their risk of developing muscular/skeletal injuries (Knowledge, intermediate level)
- 46) The participants can **explain** safe practices of manual handling, including the correct handling of equipment (Knowledge, intermediate level)
- 47) The participants can **recognise** signs and symptoms of injuries related to poor manual handling techniques and have knowledge of reporting methods (Knowledge, intermediate level)



The participants shall:

- 6.6.1 Discuss and practise safe conduct and ability while working at height by always being secured with fall protection PPE during practical exercises
- 6.6.2 Discuss and practise how to reduce the risk of dropped objects while working at height by ensuring that equipment is always attached either to the participants harness or a suitable anchor point
- 6.6.3 Discuss and practise safe and correct manual handling techniques during practical exercises through the following:
 - a. planning of manual handling using the TILE. principle considering the load weight, maximum reaching distance and aggravating factors
 - b. eliminating the need for manual handling using the rescue device where possible
- 6.6.4 Practise the ability to apply further control measures where applicable:
 - a. PPE correct fit (e.g. correct sizes, boot laces tied)
 - b. breaking up loads
 - c. protecting pre-existing injuries
 - d. adequate lighting



- e. good housekeeping



The instructor shall:

- 6.6.5 Provide constructive feedback on the participants' practice

LESSON 7 - PRACTICAL EXERCISES – GROUP

210 min.

The aim of the lesson is to enable the participants to use the appropriate methods to control and reduce the risk of injuries when working and rescuing from heights by refreshing the participants' previous knowledge and skills.

After successfully having completed this lesson, the participants can:

- 48) **Perform** correct use of evacuation devices (Skills, intermediate level)
- 49) **Act independently** in approaching rescue situations in WTGs and in using rescue equipment efficiently (Ability, intermediate level)

ELEMENT 7.1 - SAFE AND CORREC USE OF THE PERSONAL FALL PROTECTION EQUIPMENT

Learning objective:

- 50) The participants can **perform** the safe and correct use of PPE for working at height (Skills, intermediate level)



The participants shall:

- 7.1.1 Practise the ability to safely and correctly use personal fall protection equipment, including an SRL in a wind turbine like environment



The instructor shall:

- 7.1.2 Provide feedback or clarifications to the participants' explanations



ELEMENT 7.2 - ACCESSING CERTIFIED AND SUITABLE ANCHOR POINTS

Learning objective:

- 51) The participants can **perform** the ability to access certified and suitable anchor points (Skills, intermediate level)



The participants shall:

- 7.2.1 Practise the ability to recognise and safely and correctly use both certified and suitable anchor points



The instructor shall:

- 7.2.2 Provide feedback or clarifications to the participants' practice

ELEMENT 7.3 - PRE-USE INSPECTIONS OF THE RESCUE AND EVACUATION EQUIPMENT

Learning objective:

- 52) The participants can **perform** a pre-use inspection of the rescue and evacuation equipment applying generic principles (Skills, intermediate level)



The participants shall:

- 7.3.1 Practise the ability to perform a pre-use inspection of rescue and evacuation devices applying generic principles



The instructor shall:

- 7.3.2 Provide feedback or clarifications to the participants' practice

ELEMENT 7.4 - SAFE AND CORRECT USE OF RESCUE AND EVACUATION EQUIPMENT FROM LADDER

Learning objective:

- 53) The participants can **act independently** in safely and correctly using rescue / evacuation equipment to perform a rescue from a vertical ladder (Ability, intermediate level)



The participants shall:

- 7.4.1 Practise the ability to safely and correctly perform a basic rescue and evacuation from a vertical ladder



The instructor shall:

- 7.4.2 Provide feedback or clarifications to the participants' practice

ELEMENT 7.5 - SAFE AND CORRECT RESCUE AND EVACUATION METHODS FROM AN EVACUATION HATCH

Learning objective:

- 54) The participants can **perform** safe and correct rescue and evacuation methods (Skills, intermediate level)



The participants shall:

- 7.5.1 Practise the ability to safely and correctly perform a basic rescue and evacuation from an evacuation hatch
- 7.5.2 Practise the ability to perform a passive mode setup self-rescue from an evacuation hatch
- 7.5.3 Practise the ability to perform an active mode setup, double evacuation from an evacuation hatch: applying a deflection/friction connector on the rescue device; and using a fall restraint lanyard (kept as short as possible) as a connecting element between the rescue / evacuation device and the harness



The instructor shall:

- 7.5.4 Provide constructive feedback on the participants' performance

ELEMENT 7.6 - SAFE PRACTICES WHILE WORKING AT HEIGHTS WITH PROPER MANUAL HANDLING

Learning objective:

- 55) The participants can **take responsibility** for safe practices while working at heights with manual handling (Ability, advanced intermediate level)



The participants shall:



- 7.6.1 Practise safe conduct and ability while working at heights with manual handling
- 7.6.2 Practise the ability to use techniques like attaching equipment to their harness to reduce the risk of dropped objects

- Notes**
- 1) *An Instructor shall be positioned at the height chosen to descend from*
 - 2) *Instructor(s) and participants shall be secured to an anchor point while waiting to descend. This can be achieved by correct use of the fall arrest lanyard*
 - 3) *When participants are demonstrating the evacuation, a safety line that is connected to the participant's harness shall be used. This will be set up and controlled by the instructor and be secured to a different anchor point than the evacuation device*
 - 4) *Although not a requirement of the standard, participants may repeat the evacuation exercises should sufficient time be available*

LESSON 8 - TRAINING REVIEW

15 min.

The aim of this lesson is to enable the participants to reflect on and process their learning outcome and key takeaways from the module, aiming to achieve a high learning transfer from the module to their way of working.

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 BSTR Working at Heights with Manual Handling Module, aiming to achieve a high learning transfer from the module to their way of working by means of e.g.:
- a. group discussions or walk & talk
 - b. questions and 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). In addition, at a later point, discuss with colleagues about how the BSTR Working at Heights with Manual Handling Module content, methods and techniques are similar or different to the local specific conditions identified after the module completion

11.7 Participant performance assessment

Assessment of learning outcomes:

- a. participants will be assessed according to the learning outcomes by means of direct observation and supplementary oral questions, where appropriate.
- b. the assessment shall be conducted by practical scenarios based on the WTG environment.

Each participant shall participate and demonstrate:

Correct Manual Handling throughout, including:

- a. reducing manual handling using suitable handling aids where possible
- b. planning of manual handling tasks using the TILE. principle considering the load weight, maximum reaching distance and aggravating factors
- c. correct manual handling techniques

Practical exercise simulating the loading and unloading of a service truck. Use equipment common to a technician's daily duties. Loading truck exercise should include a dummy to simulate loading a casualty

Correct use of the evacuation/rescue device, including:

- a. user inspection and test
- b. use of correct anchor points
- c. correct behaviour on ladder with PPE

Correct rescue methods, including:



- a. rescue of a conscious casualty hanging by a guided type vertical fall arrester, secured by their work positioning lanyard (inside of the ladder) with the rescue equipment in a passive setup, preferably utilising a rope clamp for rescue
- b. rescue of an unconscious casualty hanging by a fall arrest lanyard (inside of the ladder) with the rescue equipment in an active setup
- c. rescue of a conscious casualty secured by their work positioning lanyard (from the outside of the ladder, with hip diversion, i.e. rescue line is diverted using the side D-ring located at the hip of the rescuer's harness. This creates greater space between the casualty and the ladder)

The formal evaluation of knowledge of above scenarios shall be in accordance with the participant assessment form (template provided in the Requirements for Training). The training provider keeps the participant assessment forms until the completion/ evaluation of the BSTR Module.

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 BSTR Working at Height Module.



Sea Survival Refresher

(SSR)



12. MODULE 6 – BSTR SEA SURVIVAL MODULE

Delivery of the BSTR Sea Survival Module covers same content, duration, learning objectives as described in BST Sea Survival

The sea survival training can consist of first-time participants and refresher participants in the same classroom. The training is designed to allow the more experienced participants to contribute more actively and share their knowledge with the first-time participants

Note *If training is conducted with first time participants and refresher participants in the same classroom then first-time participants shall receive a Sea Survival (SS) record in WINDA and refresher participants shall receive a Sea Survival Refresher(SSR) record in WINDA*



Annexes



ANNEX 1 - EQUIPMENT LISTS

The following pages contain the lists of equipment required for delivering the Basic Safety Training Refresher training standard. Any equipment used by the training provider and participants during the delivery of training under this standard must satisfy or exceed the requirements of the equipment standards for the time being in force in the country where the training is taking place.

Where training takes place in a country where there are no equipment standards for the equipment being used, then the equipment used by the training provider and the participants during the delivery of training under this standard shall satisfy or exceed the requirements of the European (EN) standards.

Note *All equipment shall be maintained and where appropriate, inspected and tested in accordance with current national standards/ legislation and manufacturers' recommendations.*

1. BSTR First Aid

The following equipment is required during the entire duration of the BSTR First Aid training to meet the needs of the BSTR First Aid Module:

1. anatomical torso or graphical representation or illustration of human anatomy
2. airway model or graphical representation or illustration of an airway model
3. a minimum of one (adult) resuscitation dummies per four participants
4. first aid equipment which as a minimum must include:
 - d. AED
 - e. tourniquet
 - f. bandages – pressure dressings
 - g. eye flush
 - h. pocket mask for CPR
 - i. protection gloves
5. make-up kit for first aid scenarios
6. AED training unit and as minimum one AED training unit per resuscitation dummy
7. blankets / thermal protective aid (TPA)

Any equipment used during this GWO training module shall meet or exceed the minimum requirements of the national standards in the country where the training is taking place.



When working in a country where there is no applicable national standard then the equipment shall meet or exceed the minimum requirements of the European standards.

2. BSTR Manual Handling

The following equipment is required during the entire duration of this BSTR Manual Handling training to meet the needs of the BSTR Manual Handling Module:

1. a lumbar vertebrae model for educational purposes
2. a model of a shoulder for educational purposes
3. a load that weighs no more than 30 kg and is unwieldy:
 - a. difficult to grasp
 - b. difficult to grip
 - c. with contents likely to move or shift (e.g. a rescue dummy)
4. other lifting props for manual handling:
 - a. weighing maximum 15kg
5. personal protective equipment.

3. BSTR Fire Awareness

The following equipment is required to meet the needs for the Fire Awareness Refresher Module:

1. handheld CO₂ and water extinguishers
2. fire blankets
3. dummies
4. personal protective equipment (PPE)
5. personal escape mask

Any equipment used during this GWO training module shall meet or exceed the minimum requirements of the national standards in the country where the training is taking place.

When working in a country where there is no applicable national standard then the equipment shall meet or exceed the minimum requirements of the European standards.

4. BSTR Working at Heights



The following equipment is required to instruct the BSTR Working at Heights and BSTR Working at Heights with Manual Handling Modules.

Within each equipment category one product or more must be operative for practical training. Required additional different products are accepted in a limited quantity as products for hands-on demonstration.

The training provider must select the most relevant products according to their geographic location and target audience.

1. full body harness:
 - a. at least two different products
 2. fall restraint lanyards
 - b. at least two different adjustable products
 3. fall arrest lanyards with an energy absorber:
 - c. one flexible Y-type;
 - d. one fixed adjustable Y- or I-type.
 - e. recommended but not required: 1 fixed or flexible V-type.
 4. helmets
 5. vertical fall arrest system with the following sliders / gliders:
 - a. cable guide twist type attachment
 - b. cable guide slot type attachment
 - c. cable guide clamp type attachment
 - d. rail type attachment
 6. self-retractable lifeline (SRL)
 7. slings
- Note** *The European Standard for slings specifies safety requirements and test methods for slings used for mountaineering (slings are used as anchor points and since there are no industrial standard for slings, they must also comply with the requirements in EN795 type B, anchor devices)*
8. connector with mandatory automatic closing and locking system
 9. evacuation / rescue devices:
 - a. one emergency descent and one rescue device, or,



- b. two different rescue devices
- 10. rope clamp for rescue (enabling lifting/safe disconnection of a loaded rope type fall protection lanyard)
- 11. vertical aluminium ladders
- 12. anchor points

Note *The height of the anchor point shall ensure that in the event of a fall there will be enough space below the anchor point to allow the shock absorber in a fixed length fall arrest lanyard to fully deploy while preventing the person who is falling from coming into contact with the ground or structure below the anchor point*

The GWO recommends an anchor point height of 6.75m for the evacuation exercises

The recommended height is based upon the following formula,

$$RD = LL + DD + HH + C,$$

Where:

RD	=	required fall distance clearance (minimum anchor point height)
LL	=	length of lanyard
DD	=	deceleration distance (fall distance)
HH	=	height of suspended worker
C	=	safety factor

The value for HH is the length of the suspended worker after a fall includes factors like the height of the person and harness stretch, to account for these variables this is set to 2.00m.

Using the value for HH (2.00m), the maximum allowed values for LL (2.00m) & DD (1.75m), and the minimum allowed value C (1.00 m), gives ,

$$RD = LL + DD + HH + C$$

And,

$$RD = 2.00 \text{ m} + 1.75 \text{ m} + 2.00 \text{ m} + 1.00 \text{ m},$$

Therefore,

$$RD = 6.75\text{m}$$



Therefore, the GWO recommends that the anchor points used during the evacuation exercises are placed a minimum of 6.75m above the ground or any structure which a person may come into contact with, in the event of a fall.

Any equipment used during this GWO training module shall meet or exceed the minimum requirements of the national standards listed in table Annex 1-1 and Annex 1-2.

When working in a country where there is no applicable national standard then the equipment shall meet or exceed the minimum requirements of the European standards.

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	EN 362	ANSI/ASSP Z359.12	GB/T 23469	BS EN 362
Static ropes	EN 1891	ANSI/ASSP Z459.1 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 descent	EN 341	ANSI/ASSP Z359.4	GB/T 38230 A or GB/T 38230 B or GB/T 38230 C	BS EN 341

Table Annex 1-1 – Country specific equipment standards – Working at Heights

5. BSTR Sea Survival

The following equipment is required to meet the needs for the BSTR Sea Survival Module.

1. rigid lifejackets
2. inflatable lifejackets
3. survival suits
4. helmets
5. inflatable life raft with equipment
6. helicopter rescue sling
7. emergency descent device
8. safety harnesses
9. twin fall arrest lanyards
10. self retractable lifeline (SRL)
11. PPE
12. ladder simulating a WTG boat landing suitable for practicing safe transfer between ladder and boat
13. boat suitable for practicing safe transfer to and from WTG ladder
14. various types of accessories for each detachment quick release, restraint lanyard etc.

Any equipment used during this GWO training module shall meet or exceed the minimum requirements of the national standards listed in Table Annex 1.2



When working in a country where there is no applicable national standard then the equipment shall meet or exceed the minimum requirements of the European standards

Equipment	Country Specific Equipment Standards			
	Europe	North America	China	United Kingdom
Life jackets				
Inflatable	-	-	-	-
Survival suits	-	-	GB/T 9953	-
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/ISEA Z89.1	GB 2811	BS EN 397 +A1
Devices for emergency decent	EN 341	ANSI Z359.4	GB/T 38230 A or GB/T 38230 B or GB/T 38230 C	BS EN 341
Full Body Harness	EN 361+358	ANSI Z359.3 ANSI Z359.11 OSHA 1926.28	GB 6095 +GB 6095 W/GB 6095 Q	BS EN 361+358
Fall arrest lanyard including energy absorber	EN 354 and/or EN 355	ANSI Z359.3 OSHA 1910.28 OSHA 1910.29 1926 Subpart E	GB 24543 W/GB 24543 Q	BS EN 354 and/or BS EN 355
Self-Retracting Lifelines (Retractable type fall arresters)	EN 360	ANSI/ASSP Z359.14	GB 24544	BS EN 360

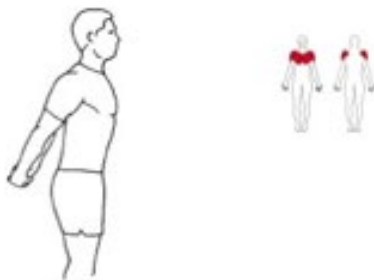
Table Annex 1.2 – Country specific equipment standards – Sea Survival



ANNEX 2 - GUIDELINE FOR WARM-UP EXERCISES

Monday Warm-up routine for wind technicians

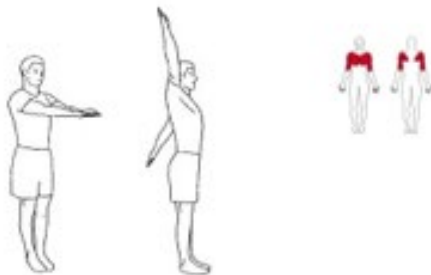
Seven programmes, each with four exercises to be repeated twice; total duration approx. 10 minutes. The exercises are put together to achieve full-body warm-up and stretching.



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

Warm-up programme and illustrations developed and provided by
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Tuesday

Warm-up routine for wind technicians

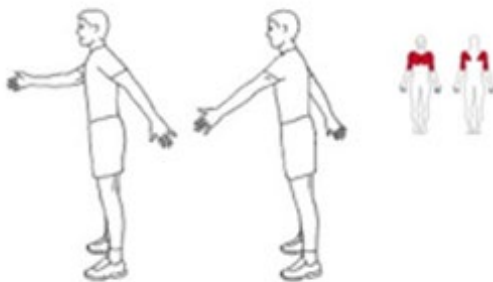
Seven programmes, each with four exercises to be repeated twice; total duration approx. 10 minutes. The exercises are put together to achieve full-body warm-up and stretching.



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.

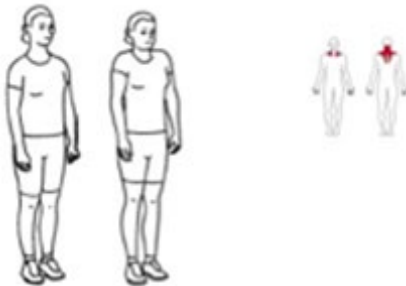
Sets: 2 , Reps: 10



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.

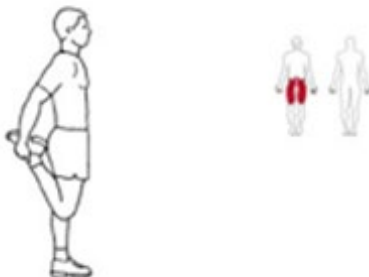
Sets: 2 , Duration: 30 sec



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

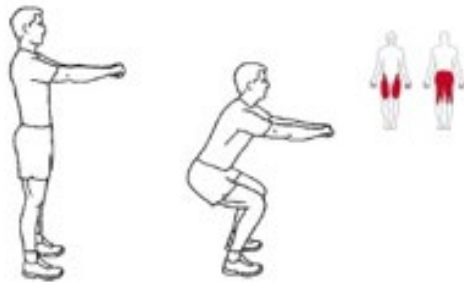
Warm-up programme and illustrations developed and provided by
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Wednesday

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.

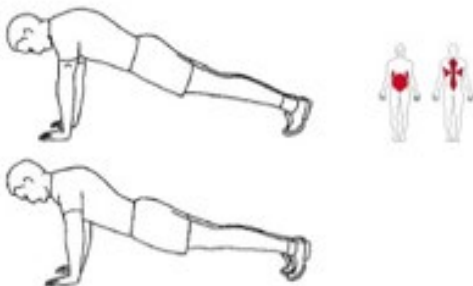


9. Static squat hold

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.

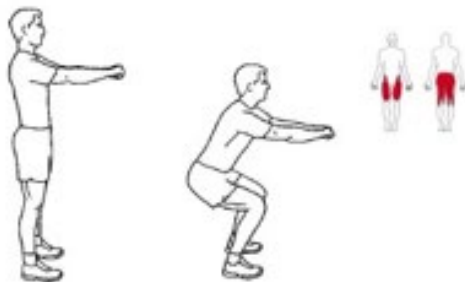


13. Push-ups

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.

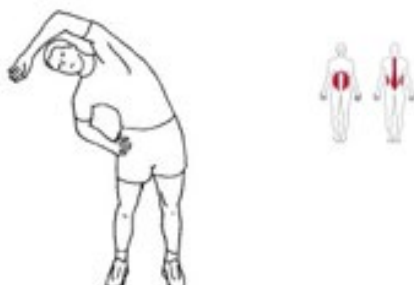
Sets: 2 , Reps: 10



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

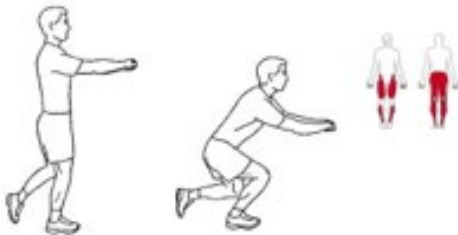
Warm-up program and illustrations developed and provided by
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Friday

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.

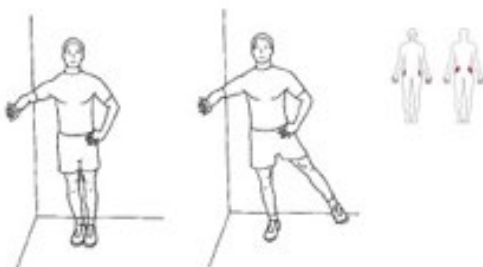
Sets: 2 , Reps: 10



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.

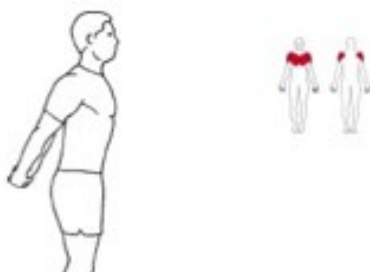
Sets: 2 , Duration: 30 sec



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.

Gentelser: 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.

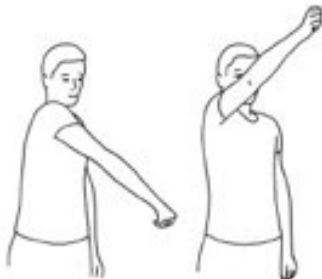
Sets: 2 , Repts: 10



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

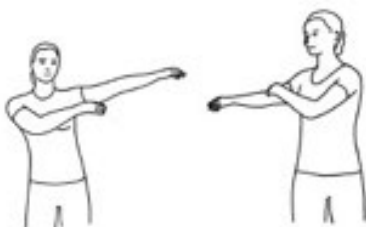


23. Write the number eight

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 Annex3.1 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

1. 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.
2. 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.
3. 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.
4. 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:
 - a. the handling operation must take place with the hands outside the zones in Figure Annex 3.1



- b. the weight exceeds those in Figure Annex3.1
- c. the handling involves torso twisting;
- d. the handling is more frequent than one lifts every two minutes;
- e. the handling is done by a team;
- f. the handling operations are complex, for example, the weights vary significantly or there are several start and finish locations;
- g. the lift does not meet the conditions given for using the guidelines, for example, if the load is difficult to grasp or handle;
- h. 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 Annex3.1 to carrying operations where the load:

- a. is held against the body;
- b. is carried no further than about 10 m without resting;
- c. does not prevent the person from walking normally;
- d. does not obstruct the view of the person carrying it;
- e. does not require the hands to be held below knuckle height or much above elbow height.
- f. 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.



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.

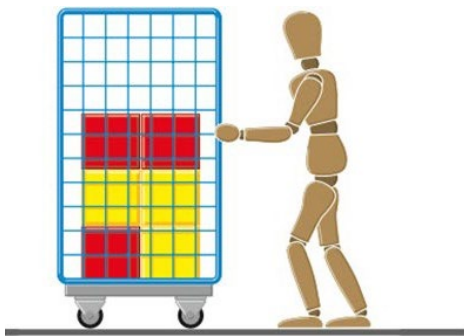
Examples of aggravating factors - categorised related to the four elements of the TILE principle

Basic dynamic risk assessment – TILE principle

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 Annex3.2 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 20 m.



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;

here are extra risk factors like slopes, uneven floors, constricted spaces or trapping hazards

Figure Annex3.2 Acceptable push/pull postures¹

¹ UK Government Copyright (by permission)



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 principle.

T – Task	I – Individuals	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 effort
- 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
- 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
- i. For the Work Environment considerations should include:
- j. constraints on posture, e.g. working on knees, laying on back
- k. restricted spaces
- l. poor floors, e.g. greasy, wet, uneven
- m. variations in levels, e.g., stairs, thresholds
- n. hot/cold/humid conditions
- o. strong air movements, e.g. outside of tower, nacelle, etc.
- p. poor lighting conditions
- q. 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.

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:

- a. 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.
- b. 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.
- c. 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.
- d. 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 – a lift using both hands that takes place in front of and close to the body, without any twisting.

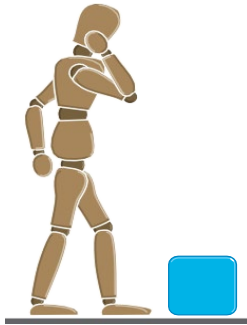
Basic lifting operations



Rocking a load to assess its ease of handling.

Figure Annex3.3 – Basic lifting operations²

² 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.



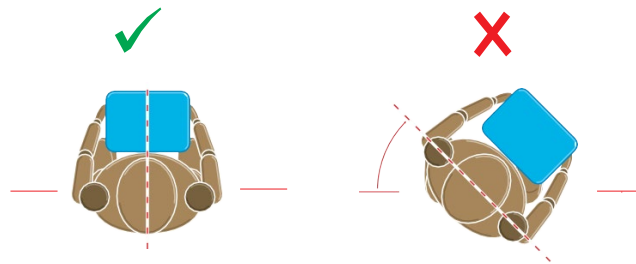
Ensure a good hold on the load. Where possible, hug the load as close as possible to the body. This may be better than gripping it tightly only with the hands.

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)

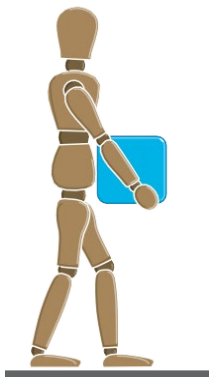
Don't flex the back any further while lifting. This can happen if the legs begin to straighten before starting to raise the load. The worker should start the movement with the strong leg muscles while keeping the back posture constant.

Figure Annex3.4 – Basic lifting operations³

³ UK Government Copyright (by permission)



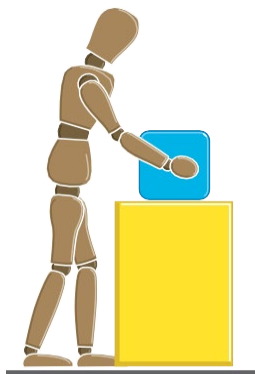
Avoid twisting the back or leaning sideways especially while the back is bent. Keep shoulders level and facing in the same direction as the hips. Turning by moving the feet is better than twisting and lifting at the same time.



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 Annex3.5 – Basic lifting operations⁴

⁴ UK Government Copyright (by permission)



Source of reference

This Annex is based upon:

- a. legal requirements and guidelines of the Danish and UK EHS authorities and legislation on manual handling
- b. G+ Manual Handling Case Studies doc.
- c. <https://www.hse.gov.uk/pubns/books/l23.htm>
- d. Equinor Ergonomics and Manual Handling Study 2018
- e. contains public sector information published by the UK Health and Safety Executive and licensed under the Open Government Licence

Note *Local legal requirements must always be adhered to when performing manual handling.*



ANNEX 4 - VERSION HISTORY

Amendment date	Version	Approved by & date	Description of changes
Oct. 2020	10.1	GWO TC OCT 2020	

- GWO Standard updated to match the Corporate Visual identity of GWO (CVI)
- Each module now contains a cover page and the module name listed in the header as reference.
- New ISO Code added to standard
- All previous versions of the Change log have now been moved to Annex 4. The current change log remains at the start of the standard.
- Duplicate information removed from Section 4. Scope

The following sections have been removed due to this information now included in the new Requirements for Training and Requirements for Certification Bodies (released May 2020)

Section 5

- 5.4 Conformity with other training – section removed
- 5.5 Legal Requirements – Section Removed
- 5.9 Training Equipment section added

Section 6

- 6.1 Staff – section removed
- 6.2 Facilities and Equipment – section removed / Equipment now moved to section 5.9
- 6.3 Theory training facilities – section removed
- 6.4 Practical training facilities – section removed
- 6.5 Training Equipment – section removed

Section 8

- 8.1 Administrative arrangements – section removed



- 8.2 Delegate performance assessment – section removed
- 8.3 Requirement to upload training record in WINDA – section removed (course Codes have now been moved to section 5.6)
- 8.4 Training Providers own Records and Certificates issue – section removed
- 8.5 Delegate performance assessment form – section removed

Annex 1

- Delegate Performance Assessment Form – Section removed

Annex 2

- Medical Assessment Form – Section removed

All section reference numbers have now been updated

Amendment date	Version	Approved by & date	Description of changes
01 October 2021	02.1	GWO TC OCT 2021	

Every lesson 1

New aim in lesson 1 “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.”

Amendment date	Version	Approved by & date	Description of changes
October 2019	10	GWO TC SEPT 2019	

Minor corrections since launch date

- Minor spelling, grammar, and formatting corrections

Document changes

Formatting of document changed and aligned throughout document, includes numbering all sections, lessons, elements, sub-sections, and tables for ease of reference.



Header and footer aligned with other GWO training standards.

Inserted section 2 – Terms and definitions

Annex 3 – manual handling risk assessment moved to annex 5

Inserted annex 4 – guideline for warmup exercises

Imperial measurements included throughout

Anchor point height review

Requirement for anchor point height changed to a recommendation. With additional control measures if using a lower height.

Working at Heights & Manual Handling Review

Working group to combine the two modules. Therefore, V10 of BSTR has 6 modules.

Overall Changes

- Version changed from 9 to 10
- Date changed to reflect most recent date of changes.
- Added level and domain to all learning objectives (e.g., L2 – Knowledge) for ease of understanding)
- Aims for each lesson updated
- Taxonomy action verbs moved to each lesson element
- Added: Manual Handling theory is combined into Working at Heights Refresher module creating a Working at Heights with Manual Handling Refresher module.
- All references to working at height replaced with working at height with manual handling

Section specific changes

Table of contents

- Updated to reflect changes to standard.

2 Terms and definitions

- Inserted

3 Change log

- Format changed for ease of reading

4 Scope



- Changed number of modules from 5 to 6.

9 BSTR Module 1 – First aid refresher

- Numbered to section 9 and all subsequent subsections now 9.x
e.g., 1.1 Aims and objectives of the BSTR first aid module becomes sub-section 9.1.

10 BSTR Module 2 – Manual handling refresher

- Numbered to section 10.
- Format changed for ease of reading.

11 BSTR Module 3 – Fire awareness refresher

- Numbered to section 11.
- Format changed for ease of reading.

12 BSTR Module 4 – Working at height refresher

- Numbered to section 12 and all subsequent subsections now 12.x
e.g., 1.1 Aims and objectives of the BSTR working at height with manual handling refresher module becomes sub-section 12.1.

13 BST Module 5 – Working at height & manual handling refresher

- Numbered to section 13.
- New module.

14 BSTR Module 6 – Sea survival refresher

- Numbered to section 14.
- Format changed for ease of reading.

ANNEX 3 Equipment list

- Moved manual handling risk assessment to annex 5 and inserted equipment list to align with other standards

ANNEX 4 Guideline for warm-up exercises

- Inserted

ANNEX 5 Manual handling risk assessment

- Moved from Annex 3

Sub-Section specific changes

5.1 Overview



- Added working at heights and manual handling combined module.

5.6 Duration of BSTR Modules

- Text in this section has been reworked to clarify the concepts of contact time and total training day.
- Duration given as total contact time for the modules.
- Table 5-6 GWO BSTR Module durations inserted.
- Table 5-7 Maximum duration for training days inserted.

5.7 Duration of BSTR Modules

- Inserted table 5-7 for validity periods.
- Included combined working at height and manual handling module.

6.2 Training Equipment

- 6.2.3 inserted 'the equipment required for the delivery of each module is listed in annex 3.'

8.6 Delegate performance assessment form

- Renamed from Control measures.
- Changed terminology from control measures form to delegate assessment form.

9.2, 12.2 & 13.2 Duration of the xx module

- Reworded to clarify the concepts of contact time and total training day
- Inserted table x-2 with maximum allowed contact time per day and total training day

9.3, 12.3 & 13.3 xx module trainer / delegate ratio

- Table format adjusted and standardised

9.4, 12.4 & 13.4 Equipment for xx module

- Moved to Annex 3

9.5, 12.5 & 13.5 xx module timetables

- Table format adjusted and standardised

9.6, 12.6 & 13.6 Detailed description of the xx module

- Paragraph styles aligned throughout the lessons, elements & notes.
- Bullets removed and replaced with numbering throughout.

9.1 Aims and objectives of the BSTR First Aid module



- Aims updated to include CPR and AED

9.6 Detailed description of the BSTR First Aid module

- Minor spelling corrections throughout.

12.1 Aims and objectives of the BSTR Working at heights module

- Aims updated in line with work done on combined module

12.3 Working at heights Instructor to delegate ratio

- Practical exercise ratio increased from 1:4 to 1:6.
- The ratio remains at 1:4 for onsite training.

12.4 Equipment for Working at heights module

- Equipment list moved to Annex 3.
- Inserted explanation of a generic approach to training
- Added a requirement for the TP to reduce the possible fall factor
- Requirement for an anchor point height of 6.75 m changed to recommendation with additional control measures.

12.5 BSTR Working at heights module timetable

- Updated in line with changes to module based on work done on combined module.

12.6 Detailed description of the BSTR Working at heights module

- Lesson changes in line with the work done on the combined module.

Lesson 1 - Introduction

- Time reduced to 15 minutes in line with other modules.

Lesson 2 – Knowledge Review

- Aim made more specific.
- Learning objectives made more specific.
- Taxonomy action verbs moved to individual sub elements making the elements more specific.

Lesson 3 – PPE Review exercises

- New lesson (was practical review exercises).

Lesson 4 – Theory

- Aim made more specific.
-



- Learning objectives made more specific.
- Inserted Learning objective 8 – Suspension trauma.
- Inserted 4.7.3 for suspension trauma.

Lesson 5 – Measures to prevent injury during training

- New Lesson.

Lesson 6 – Individual practical review exercises

- Aim made more specific.
- Learning objectives made more specific.
- Taxonomy action verbs moved to individual sub elements making the elements more specific.
- Element names shortened.

Lesson 7 – Practical exercises - group

- Moved from Lesson 5.
- Aim made more specific.
- Learning objectives made more specific.
- Taxonomy action verbs moved to individual sub elements making the elements more specific.
- Element names shortened.

12.7 Delegate performance assessment

- Updated inline with work done on combined module.

13 Module 5 – Working at heights with manual handling refresher

- New module.

This module combines the elements of the BSTR working at height refresher and BST manual handling initial modules.

Amendment date	Version	Approved by & date	Description of changes
April 1 2019	9	GWO TC MAR 20 2019	
			Content
			Overall changes



Anatomy

- Anatomy section simplified
- Element: Other systems and vital organs of the human body changed to: Blood filled organs
- Lesson duration reduced to 60 min.
- Changed 'Personal Hygiene' to 'Personal Protective Equipment against infections' and moved the element to 'lesson 4'

Lesson 4

Added secondary survey element to "lesson 4" and added 15 min

Amendment date	Version	Approved by & date	Description of changes
October 1 2018	8	GWO SC on September 20, 2018	

Content

Overall changes

- Removed: The original Sea Survival refresher module

Added: A referral to the BST Sea Survival module, as the refresher is now identical to the core Sea Survival module

Amendment date	Version	Approved by & date	Description of changes
May 31 2017	7	GWO SC on April 27	

Content

- New intro "Scope" replaces "Foreword and Editorial"
 - General section: Target group detailed to "personnel working in a wind turbine environment"
 - General: new section on "Understanding GWO Learning Objectives" incl. Taxonomy Table
 - General: new section on Conformity with other training section added
 - FAR module: including use of AED in CPR lesson, and specified at least one scenario must be based on electrical incident
 - Manual Handling: may now be delivered as combined MH and MHR course, increased discussion based learning, introduced aggravating factors in theoretical lessons, specified scenario-based training.
-



- FAW module: may now be delivered as combined FAW and FAWR course, increased discussion based learning, specified scenario-based training.
- WaH module: tower height specified to minimum 6.75 meters measured from the delegates feet, always ensuring that safe distance is available for fall arrester to work.
- PFPE changed to PPE

Major layout work:

All common administrative elements now only in general sections of standard, and deleted from each of the module descriptions.

- Templates for Control Measures and Medical Self-assessment forms supplied as annex 1+2
- Specific requirements to trainer/delegate ratio, equipment and performance criteria remain in modules

Module learning outcomes and lesson elements merged into “detailed description”.

Amendment date	Version	Approved by & date
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04.10.2016	5	GWO TC OCT 2016
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Description of changes

General

Individual module update versions on front page of standard removed.

Delegate prerequisites

Added prerequisite for Delegate to possess a personal WINDA ID and provide it to the Training Provider prior to completing the course.

All sections

Changed certification requirement from issuing a certificate to instead upload a record of training to WINDA.

Changed requirement from handing out certificates to Delegates to instead ensure that Delegates have provided their WINDA ID.

Validity Period

Changed text to include uploading of records to WINDA

Entire document

Switched logo to new GWO logo

Left the date field in the medical self-check forms blank.



Amendment date	Version	Approved by & date	Description of changes
01.03.2016	4	GWO SC 15.03.2016	<ul style="list-style-type: none"> • Introduction • Updated the requirements for renewal of certificate. • First Aid Module • Corrected trainer/delegate ratio in point 2.2 to 1 instead of 2. • Specified validity period in point 3.2 • Corrected numerical error in point 3.3 • Manual handling • Specified validity period in point 3.2 • Fire Awareness • Specified validity period in point 3.2 • Working at Heights • Specified validity period in point 3.2 • Sea Survival • Specified validity period in point 3.2

Amendment date	Version	Approved by & date	Description of changes
01.12.2015	3	GWO TC DEC 2015	<p>Introduction</p> <ul style="list-style-type: none"> • Removed certification requirement 3 “Type of equipment used in the course and maximum training height (BST Working at Heights Module only)” in Working at Heights module. Removed due to RUK alignment. • Consequence of expired certificates added under Validity period. <p>Working at Heights Module</p> <ul style="list-style-type: none"> • Removed certification requirement 4 from point 3.3 “Type of equipment used in course and maximum training height”. Removed due to RUK alignment. • Removed part of the note in point 3.3 WaH module saying “However, a climb to a higher height than the minimum height stated in this Standard can be an indicator of the Delegate’s capability and aptitude to work at



heights. The maximum height used during the training must be stated on the certificate". Removed due to RUK alignment.

Sea Survival Module

- Alignment with updated requirements set by UK Health and Safety Executive for boat transfer
- Section 1.5: Objective (3) added
- Section 1.6: Lesson 2, Lesson 3, Lesson 4 and Lesson 5 altered
- Section 1.9: Element 2.1, Element 3.2, Element 4.1 and Element 4.2 altered
- MES (Marine Evacuation system) added to List of abbreviations
- Removal of Safe Transfer from Vessel to Vessel exercise due to too high risk while practicing
- Validity reduced to 24 months (Section 3.2)

Equipment for easy detachment added (Section 2.6)

Amendment date	Version	Approved by & date	Description of changes
21.11.2013	2	GWO TC NOV 2013	Entire GWO Basic Safety Training Standard Document (All Modules)

- Correction of minor mistakes
- Time tables aligned with Learning Outcomes (Section 1.6)

Time Tables aligned with Elements (Section 1.9)

Amendment date	Version	Approved by & date	Description of changes
04.11.2013	1	GWO TC NOV 2013	Entire GWO Basic Safety Training Standard Document (All Modules)

- Spelling, grammar corrected (no meanings of sentences have been changed), format corrected
- Delegate prerequisites updated for each Module (Section 1.3)
- Physical Demands updated for each Module (Section 1.4)
- Added Appendix 1A to each Module (GWO's suggestion for Medical Self-Assessment)

Working at Heights Module



Information about Certification (EN, ANSI, etc.) has been added for equipment list for module (Section 2.3, p. 134)

Amendment date	Version	Approved by & date	Description of changes
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17.06.2013			
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			Description of changes
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Draft of Version 0 finalised			
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Amendment date	Version	Approved by & date	Description of changes
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15.04.2013			
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			Description of changes
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Draft of version 0 created			
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